

Qwt User's Guide

6.1.4

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1 Qwt - Qt Widgets for Technical Applications

The Qwt library contains GUI Components and utility classes which are primarily useful for programs with a technical background. Beside a framework for 2D plots it provides scales, sliders, dials, compasses, thermometers, wheels and knobs to control or display values, arrays, or ranges of type double.

1.1 License

Qwt is distributed under the terms of the [Qwt License, Version 1.0](#).

1.2 Platforms

Qwt 6.1 might be usable in all environments where you find [Qt](#). It is compatible with Qt4 (≥ 4.4) and all Qt5 versions.

1.3 What's new

Read the [summary](#) of the most important changes.

1.4 Screenshots

- [Curve Plots](#)
- [Spectrogram, Contour Plot](#)
- [Bar Charts, Histograms](#)
- [Other Plots](#)
- [Dials, Compasses, Knobs, Wheels, Sliders, Thermos](#)

1.5 Downloads

Stable releases or prereleases are available at the Qwt [project page](#).

For getting a snapshot with all bugfixes for the latest 5.2 release:

```
svn export svn://svn.code.sf.net/p/qwt/code/branches/qwt-5.2
```

For getting a snapshot with all bugfixes for the latest 6.1 release:

```
svn export svn://svn.code.sf.net/p/qwt/code/branches/qwt-6.1
```

For getting a development snapshot from the SVN repository:

```
svn export svn://svn.code.sf.net/p/qwt/code/trunk/qwt
```

1.6 Installation

Qwt doesn't distribute binary packages, but today all major Linux distributors offer one. Note, that these packages often don't include the examples.

When no binary packages are available (f.e. on Windows) Qwt needs to be [compiled and installed](#) on the target system.

1.7 Support

- Mailing list
For all kind of Qwt related questions use the Qwt [mailing list](#).
If you prefer newsgroups use the mail to news gateway of [Gmane](#).
- Forum
[Qt Centre](#) is a great resource for Qt related questions. It has a sub forum, that is dedicated to Qwt related questions.
- Individual support
If you are looking for individual support, or need someone who implements your Qwt component/application contact support@qwt-project.org. Sending requests to this address without a good reason for not using public support channels might be silently ignored.

1.8 Related Projects

[QwtPolar](#), a polar plot widget.
[QwtPlot3D](#), an OpenGL 3D plot widget.
[PyQt-Qwt](#), Python PyQt wrapper for Qwt.

1.9 Donations

Sourceforge offers a [Donation System](#) via PayPal. You can use it, if you like to [support](#) the development of Qwt.

1.10 Credits

Authors:

Uwe Rathmann, Josef Wilgen (<= Qwt 0.2)

2 What's new in Qwt 6.1

2.1 New plot items

- [QwtPlotBarChart](#)
Bar chart, see "examples/distrowatch"
- [QwtPlotMultiBarChart](#)
Chart of grouped bars - stacked or aligned side by side. See "examples/barchart"
- [QwtPlotTradingCurve](#)
Candlestick or OHLC charts typically used to describe price movements over time. See "examples/stockchart"
- [QwtPlotShapelItem](#)
A plot item to display rectangles, circles, polygons and all other type of shapes (built from intersections or unifications), that can be expressed by a QPainterPath. See "examples/itemeditor"
- [QwtPlotLegendItem](#)
A legend on the plot canvas. See "examples/legends"
- [QwtPlotZonelItem](#)
A horizontal or vertical section
- [QwtPlotTextLabel](#)
In opposite to a [QwtPlotMarker](#) the text is not aligned to a plot coordinate but according to the geometry of the canvas (f.e top/centered for a title). See "playground/curvetracker".

2.2 Scales beyond linear and logarithmic transformations

QwtScaleTransformation has been replaced by [QwtTransform](#) and its derived classes:

- [QwtTransform](#)
- [QwtNullTransform](#)
- [QwtLogTransform](#)
- [QwtPowerTransform](#)

Individual transformations (f.e. different scaling for special sections) can be implemented by overloading [QwtTransform](#) (see playground/scaleengine).

[QwtLinearScaleEngine](#) and [QwtLogScaleEngine](#) are not limited to base 10 anymore.

2.2.1 Datetime scales

A set of a new classes for displaying datetime values:

- [QwtDate](#)
A collection of methods to convert between QDateTime and doubles
- [QwtDateScaleEngine](#)
A scale engine that aligns and finds ticks in terms of datetime units.
- [QwtDateScaleDraw](#)
A scale draw mapping values to datetime strings.

Scales for Qt::UTC and Qt::LocalTime are supported.

2.3 Redesign of the dial and meter widgets

Many parts of the class design of the dial and meter widgets were left over from the 90s (Qwt 0.2, Qt 1.1).

The derivation tree is simpler and more logical:

- [QwtAbstractScale](#) is a QWidget
- [QwtAbstractSlider](#) is a [QwtAbstractScale](#). (for sliders without scales QAbstractSlider should be the base class)
- [QwtThermo](#) is also a [QwtAbstractScale](#)
- [QwtDial](#), [QwtKnob](#), [QwtSlider](#) are derived from [QwtAbstractSlider](#)
- [QwtCounter](#) is derived from QWidget

QwtDoubleRange has been removed.

All classes use the terminology known from QAbstractSlider - as far as possible. The extended [system for scales](#) is completely supported.

2.4 Basic support for an OpenGL plot canvas

[QwtPlotGLCanvas](#) offers the option to draw plot items using an OpenGL paint engine (QPainterEngine::OpenGL/↔ OpenGL2), This is not what could be implemented with native OpenGL, but it offers hardware acceleration in environments, where the raster paint engine is the only option. (f.e Qt4/Windows, or Qt5 on all platforms).

[QwtPlotGLCanvas](#) is in an experimental state and is not recommended for average use cases.

2.5 A new system for plot legends

[QwtLegend](#) has been decoupled from [QwtPlot](#) and can be replaced by application specific implementations. Plot items and the legend exchange the information using [QwtLegendData](#).

[QwtPlotLegendItem](#) is a new plot item that displays a legend on the plot canvas.

The following examples demonstrate how to use the new system:

- examples/legends
shows how to use the new legend system
- examples/stockchart
implementats a QTreeView with checkable items as legend

2.6 Off-screen paint device for vector graphics

[QwtGraphic](#) can be copied like QImage or QPixmap but is scalable like QSvgGenerator. It is implemented as a record/replay paint device like QPicture.

2.7 QwtWidgetOverlay

[QwtWidgetOverlay](#) is a base class for implementing widget overlays - primarily used for use cases like graphical editors or running cursors for the plot canvas.

The following examples show how to use overlays:

- [examples/itemeditor](#)
- [examples/curvetracker](#)

[QwtPicker](#) (-> [QwtPlotPicker](#), [QwtPlotZoomer](#)) internally uses [QwtWidgetOverlay](#) now, making it easier to implement individual rubber bands.

2.8 QwtSymbol

New symbol types have been introduced:

- [QwtSymbol::Path](#)
- [QwtSymbol::Pixmap](#)
- [QwtSymbol::Graphic](#)
- [QwtSymbol::SvgDocument](#)

[QwtSymbol](#) autodetect the most performant paint strategy for a paint device what is in most situations using a QPixmap cache.

[QwtSymbol::setPinPoint\(\)](#) allows to align the symbol individually, f.e to the position of the peak of an arrow.

2.9 QwtPlotCurve

Some optimizations that got lost with introducing the floating point based render code with Qwt 6.0 have been reenabled. Other specific optimizations have been added.

New paint attributes:

- [QwtPlotCurve::FilterPoints](#)
- [QwtPlotCurve::MinimizeMemory](#)
- [QwtPlotCurve::ImageBuffer](#)

[QwtPlotCurve::CacheSymbols](#) has been removed, as caching is implemented in [QwtSymbol](#) now.

[QwtPlotCurve::drawLines\(\)](#), [QwtPlotCurve::drawDots\(\)](#), [QwtPlotCurve::drawSteps\(\)](#) and [QwtPlotCurve::drawSticks\(\)](#) are virtual now.

2.10 QwtPlot

A footer similar to a title has been added.

QwtPlot::ExternalLegend is obsolete with the new [system for legends](#). The signals QwtPlot::legendClicked(), QwtPlot::legendChecked() have been removed. Applications need to connect to [QwtLegend::clicked\(\)](#) and [QwtLegend::checked\(\)](#).

To support using an OpenGL canvas [QwtPlot::setCanvas](#) has been added. This has 2 important implications for the application code:

- [QwtPlot::canvas\(\)](#) returns QWidget and needs to be casted, when using methods of [QwtPlotCanvas](#).
- [QwtPlotCanvas](#) can be created and assigned in application code, what makes it possible to derive and overload methods.

The initialization of a plot canvas with Qwt 6.1 will probably look like this:

```
QwtPlotCanvas* canvas = new QwtPlotCanvas();
canvas->setXY( ... );
...

plot->setCanvas( canvas );
```

To have a consistent API [QwtPlot::setPlotLayout\(\)](#) has been added,

2.11 Other

2.11.1 QwtScaleDiv

The following methods have been added:

- [QwtScaleDiv::inverted\(\)](#)
- [QwtScaleDiv::bounded\(\)](#)
- [QwtScaleDiv::isEmpty\(\)](#)
- [QwtScaleDiv::isIncreasing\(\)](#)
- QDebug operator

The following methods have been removed:

- [QwtScaleDiv::isValid\(\)](#), [QwtScaleDiv::invalidate\(\)](#)
The valid state was left over from early Qwt versions indicating a state of the autoscaler.

2.11.2 QwtScaleEngine

The following methods have been added:

- [QwtScaleEngine::setBase\(\)](#)
- [QwtScaleEngine::setTransformation\(\)](#)

2.11.3 QwtPlotLayout

The following flags have been added:

- [QwtPlotLayout::IgnoreTitle](#)
- [QwtPlotLayout::IgnoreFooter](#)
- [QwtPlotLayout::setAlignCanvasToScale\(\)](#)

2.11.4 QwtPlotCanvas

Rounded borders (like with style sheets) can configured using [QwtPlotCanvas::setBorderRadius\(\)](#);

2.11.5 Other changes

- [QwtWeedingCurveFitter](#)
[QwtWeedingCurveFitter::setChunkSize\(\)](#) has been added, with drastic performance improvements for huge sets of points.
- [QwtPlotRenderer](#) The frame of the plot canvas can be rendered, what makes the result even closer to WY↔SWYG. [QwtPlotRenderer::exportTo\(\)](#) has been added.
- [QwtSystemClock](#) For Qt >= 4.9 [QwtSystemClock](#) uses QElapsedTimer internally. As it doesn't support a similar feature, [QwtSystemClock::precision\(\)](#) has been removed.
- [QwtPlotAbstractSeriesItem](#)
[QwtPlotAbstractSeriesItem](#) has been split into [QwtPlotSeriesItem](#) and [QwtPlotAbstractSeriesStore](#).
- [QwtText](#)
A metatype declaration has been added, so that [QwtText](#) can be used with QVariant.
- [QwtEventPattern](#), [QwtPanner](#), [QwtMagnifier](#)
Forgotten Qt3 leftovers have been fixed: int -> Qt::KeyboardModifiers
- QPen Qt5/Qt4 incompatibility The default pen width for Qt5 is 1, what makes it a non cosmetic. To hide this nasty incompatibility several [setPen\(\)](#) methods have been added the build pens with a width 0. See [QPen::isCosmetic\(\)](#),
- [qwtUpperSampleIndex\(\)](#)
A binary search algorithm for sorted samples
- [QwtMatrixRasterData](#) [QwtMatrixRasterData::setValue\(\)](#) has been added
- [QwtPicker](#) [QwtPicker::rubberBandWidget\(\)](#), [QwtPicker::trackerWidget\(\)](#) have been replaced by [QwtPicker::rubberBandOverlay\(\)](#) [QwtPicker::trackerOverlay\(\)](#). [QwtPicker::rubberBandMask\(\)](#) has been added. [QwtPicker::pickRect\(\)](#) has been replaced by [QwtPicker::pickArea\(\)](#)
- [QwtPlotItem](#) [QwtPlotItem::ItemInterest](#) has been added. [QwtPlotItem::setRenderThreadCount\(\)](#) was shifted from [QwtPlotRasterItem](#).
- ...

2.12 Summary of the new classes

- [QwtAbstractLegend](#)
- [QwtDate](#)
- [QwtDateScaleDraw](#)
- [QwtDateScaleEngine](#)
- [QwtGraphic](#)
- [QwtLegendData](#)
- [QwtLegendLabel](#)
- [QwtPainterCommand](#)
- [QwtPixelMatrix](#)
- [QwtPlotAbstractBarChart](#)
- [QwtPlotBarChart](#)
- [QwtPlotMultiBarChart](#)
- [QwtPlotGLCanvas](#)
- [QwtPlotLegendItem](#)
- [QwtPlotShapelItem](#)
- [QwtPlotTextLabel](#)
- [QwtPlotTradingCurve](#)
- [QwtPlotZonelItem](#)
- [QwtPointData](#)
- [QwtPointMapper](#)
- [QwtTransform](#), [QwtNullTransform](#), [QwtLogTransform](#), [QwtPowerTransform](#)
- [QwtWidgetOverlay](#)

3 Installing Qwt

3.1 Download

Stable Qwt releases are available from the [Qwt project page](#).

Qwt-6.1.4 consists of 4 files:

- [qwt-6.1.4.zip](#)
Zip file with the Qwt sources and the html documentation for Windows
- [qwt-6.1.4.tar.bz2](#)
Compressed tar file with the Qwt sources and the html documentation for UNIX systems (Linux, Mac, ...)
- [qwt-6.1.4.pdf](#)
Qwt documentation as PDF document.
- [qwt-6.1.4.qch](#)
Qwt documentation as Qt Compressed Help document, that can be loaded into the Qt Assistant or Creator.
In the Qt Creator context sensitive help will be available like for Qt classes.

Precompiled Qwt Designer plugins, that are compatible with some binary packages of the Qt Creator:

- [qwt designer-6.1.4-*.zip](#)

3.2 Installing Qwt

Beside headers, libraries and the html version of the class documentation a proper Qwt installation contains a Designer plugin and a Qwt features file for building applications using Qwt.

All files will be copied to an installation directory, that is configurable by editing qwtconfig.pri. Its default settings is:

- Windows
C:\Qwt-6.1.4
- Unix like systems
/usr/local/qwt-6.1.4

For the rest of the document this install path will be written as `${QWT_ROOT}` and needs to be replaced by the real path in all commands below.

It is not unlikely, to have more than one installation of Qwt on the same system. F.e for using the Qwt Designer plugin in the Qt Creator a version of Qwt is necessary with the same Qt and compiler combination, that had been used for building the Qt Creator (see "Help->About Qt Creator ...").

Installing Qwt is done in 3 steps, that are quite common on UNIX systems.

1. Configuration
In the configuration step all parameters are set to control how to build and install Qwt
2. Build
In the build step binaries are built from the source files.
3. Installation
The installation copies and rearranges all files that are necessary to build Qwt applications to a target directory.

The installation doesn't modify the system beside copying files to a directory in a proper way. After removing build and installation directories the system is in the same state as it was before.

3.2.1 Configuration

Configuring Qwt has to be done by editing the Project files used for building:

- qwtbuild.pri
qwtbuild.pri contains settings for how to build Qwt. All settings of this file are only for building Qwt itself and doesn't have an impact on how an application using Qwt is built. Usually its default settings doesn't need to be modified.
- qwtconfig.pri
qwtconfig.pri defines what modules of Qwt will be built and where to install them. qwtconfig.pri gets installed together with the Qwt features file qwt.prf and all its settings are known to project files for building Qwt applications.

In qwtconfig.pri the meaning of each option is explained in detail - it's worth reading it before running into problems later.

3.2.2 Build and installation

The Qt Creator is a graphical frontend for calling qmake/make and - technically - it could be used for building and installing Qwt. But as this way requires a lot more understanding of details the following step by step instructions are for the easier way using the command line.

3.2.2.1 Unix-like systems

The first step before creating the Makefile is to check that the correct version of qmake is used. F.e. on older Linux distribution you often find a Qt3 qmake and in the path.

The default setting of qmake is to generate a makefile that builds Qwt for the same environment where the version of qmake has been built for. So creating a makefile usually means something like:

```
cd qwt-6.1.4
/usr/local/Qt-5.0.1/bin/qmake qwt.pro
```

The generated Makefile includes all paths related to the chosen Qt version and the next step is:

```
make
```

(On multicore systems you can speed up building the Qwt libraries with running several jobs simultaneously: f.e. "make -j4" on a dual core.)

Finally you have to install everything below the directories you have specified in qwtconfig.pri. Usually this is one of the system directories (/usr/local, /opt, ...) where you don't have write permission and then the installation needs to be done as root:

```
sudo make install
```

(On systems where sudo is not supported you can do the same with: su -c "make install")

3.2.2.2 Windows

Qt packages offer a command line interface, that can be found in the Qt application menu: f.e "All Programs -> Qt -> Command Prompt". It is not mandatory to use it, but probably the easiest way as it offers an environment, where everything is initialized for a version of Qt (f.e qmake is in the PATH).

Creating a makefile usually means something like:

```
cd qwt-6.1.4
qmake qwt.pro
```

The generated makefile includes all paths related to the chosen Qt version.

3.2.2.2.1 MinGW

For MinGW builds the name of the make tool is "mingw32-make"

```
mingw32-make
```

(On multicore systems you can speed up building the Qwt libraries with running several jobs simultaneously↵ : "mingw32-make -j")

Finally you have to install everything below the directories you have specified in qwtconfig.pri.

```
mingw32-make install
```

3.2.2.2 MSVC

For MSVC builds the name of the make tool is "nmake". Alternatively it is possible to use "jom" (<https://wiki.qt.io/Jom>), that is usually included in a Qt Creator package.

```
nmake
```

Finally you have to install everything below the directories you have specified in qwtconfig.pri.

```
nmake install
```

3.3 Qwt and the Qt tool chain

3.3.1 Designer plugin

The Designer plugin and the corresponding Qwt library (if the plugin has not been built self containing) have to be compatible with Qt version of the application loading it (usually the Qt Creator) - what is often a different version of the Qt libraries you want to build your application with. F.e on Windows the Qt Creator is usually built with a MSVC compiler - even if included in a MinGW package !

To help Qt Designer/Creator with locating the Qwt Designer plugin you have to set the environment variable QT_PLUGIN_PATH, modify qt.conf - or install the plugin to one of the application default paths.

The Qt documentation explains all options in detail:

- <https://doc.qt.io/qt-5/deployment-plugins.html>
- <https://doc.qt.io/qtcreator/adding-plugins.html>

F.e. on a Linux system you could add the following lines to .bashrc:

```
QT_PLUGIN_PATH="${QWT_ROOT}/plugins:$QT_PLUGIN_PATH"
export QT_PLUGIN_PATH
```

When the plugin has not been built including the Qwt library (see QwtDesignerSelfContained in qwtconfig.pri) the Qt Designer/Creator also needs to locate the Qwt libraries. On Unix systems the path to the installed library is compiled into the plugin (see rpath, ldd), but on Windows the Qt Creator needs to be configured (([Running a Qwt application](#)) in the same way as for any application using Qwt.

In case of problems the diagnostics of Qt Creator and Designer are very limited (usually none), but setting the environment variable QT_DEBUG_PLUGINS might help. In the Qt Creator it is possible to check which plugins were loaded successfully and for certain problems it also lists those that were recognized but failed (*Tools > Form Editor > About Qt Designer Plugins*).

3.3.2 Online Help

The Qwt class documentation can be loaded into the Qt Creator:

- open the settings dialog from the *Tools->Options* menu
- raise the tab "Help->Documentation".
- press the *Add* button and select qwt-6.1.4.qch.

Now the context sensitive help (*F1*) works for Qwt classes.

For browsing the documentation in the Qt Assistant:

- open the settings dialog from the *Edit->Preferences* menu
- raise the tab *Documentation*.
- press the *Add* button and select qwt-6.1.4.qch.

3.4 Building a Qwt application

All flags and settings that are necessary to compile and link an application using Qwt can be found in the file `${QWT_ROOT}/features/qwt.prf`.

When using qmake it can be included from the application project file in 2 different ways:

- Adding Qwt as qmake feature

When using the qmake feature mechanism you can bind a special version of qmake to a special installation of Qwt without having to add this dependency to the application project. How to add Qwt as feature is documented in the [qmake docs](#).

After adding Qwt as a feature f.e on Linux as a persistent property

```
qmake -set QMAKEFEATURES ${QWT_ROOT}/features
```

.. the following line can be added to the application project file:

```
CONFIG += qwt
```

- Including qwt.prf in the application project file

Instead of using qwt.prf as qmake feature it can be included from the application project file:

```
include ( ${QWT_ROOT}/features/qwt.prf )
```

The advantage of using a direct include is, that all settings of qwt.prf are known to the application project file (qmake features are included after the application project file has been parsed) and it can be implemented depending on - f.e. settings made in qwtconfig.pri.

On Unix platforms it is possible to link a runtime path into the executable, so that the location of the Qwt libraries can be found without having to configure a runtime environment:

- `QMAKE_LFLAGS_RPATH`
- `QMAKE_RPATH`
- `QMAKE_RPATHDIR`

3.5 Running a Qwt application

When using Qwt as shared library (DLL) the **dynamic linker** has to find it according to the rules of the operating system.

3.5.1 Windows

The only reasonable way to configure the runtime environment - without having to copy the Qwt libraries around - is to modify the PATH variable. F.e. this could be done by adding the following line to some batch file:

```
set PATH=%PATH%;${QWT_ROOT}\lib
```

3.5.2 GNU/Linux

Read the documentation about:

- *ldconfig*
- */etc/ld.so.conf*
- *LD_LIBRARY_PATH*

Using the *ldd* command a configuration can be tested.

4 Qwt License, Version 1.0

Qwt License
Version 1.0, January 1, 2003

The Qwt library and included programs are provided under the terms of the GNU LESSER GENERAL PUBLIC LICENSE (LGPL) with the following exceptions:

1. Widgets that are subclassed from Qwt widgets do not constitute a derivative work.
2. Static linking of applications and widgets to the Qwt library does not constitute a derivative work and does not require the author to provide source code for the application or widget, use the shared Qwt libraries, or link their applications or widgets against a user-supplied version of Qwt.

If you link the application or widget to a modified version of Qwt, then the changes to Qwt must be provided under the terms of the LGPL in sections 1, 2, and 4.

3. You do not have to provide a copy of the Qwt license with programs that are linked to the Qwt library, nor do you have to identify the Qwt license in your program or documentation as required by section 6 of the LGPL.

However, programs must still identify their use of Qwt. The following example statement can be included in user documentation to satisfy this requirement:

```
[program/widget] is based in part on the work of
the Qwt project (http://qwt.sf.net).
```

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Version 2.1, February 1999

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[This is the first released version of the Lesser GPL. It also counts
as the successor of the GNU Library Public License, version 2, hence
the version number 2.1.]

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For example, if you distribute copies of the library, whether gratis
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We protect your rights with a two-step method: (1) we copyright the
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To protect each distributor, we want to make it very clear that
there is no warranty for the free library. Also, if the library is
modified by someone else and passed on, the recipients should know
that what they have is not the original version, so that the original
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introduced by others.

Finally, software patents pose a constant threat to the existence of
any free program. We wish to make sure that a company cannot
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General Public License, applies to certain designated libraries, and
is quite different from the ordinary General Public License. We use
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When a program is linked with a library, whether statically or using
a shared library, the combination of the two is legally speaking a
combined work, a derivative of the original library. The ordinary
General Public License therefore permits such linking only if the
entire combination fits its criteria of freedom. The Lesser General
Public License permits more lax criteria for linking other code with
the library.

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does Less to protect the user's freedom than the ordinary General
Public License. It also provides other free software developers Less
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are the reason we use the ordinary General Public License for many

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For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

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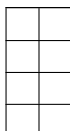
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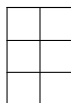
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Ty Coon, President of Vice
```

That's all there is to it!

5 Curve Plots



6 Spectrogram, Contour Plot



7 Bar Charts, Histograms



8 Other Plots



9 Dials, Compasses, Knobs, Wheels, Sliders, Thermos



10 Hierarchical Index

10.1 Class Hierarchy

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11.1 Class List

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12 Class Documentation

12.1 QwtEventPattern::KeyPattern Class Reference

A pattern for key events.

```
#include <qwt_event_pattern.h>
```

Public Member Functions

- [KeyPattern](#) (int keyCode=Qt::Key_unknown, Qt::KeyboardModifiers modifierCodes=Qt::NoModifier)
Constructor.

Public Attributes

- int [key](#)
Key code.
- Qt::KeyboardModifiers [modifiers](#)
Modifiers.

12.1.1 Detailed Description

A pattern for key events.

12.2 QwtEventPattern::MousePattern Class Reference

A pattern for mouse events.

```
#include <qwt_event_pattern.h>
```

Public Member Functions

- [MousePattern](#) (Qt::MouseButton btn=Qt::NoButton, Qt::KeyboardModifiers modifierCodes=Qt::NoModifier)
Constructor.

Public Attributes

- Qt::MouseButton [button](#)
Button.
- Qt::KeyboardModifiers [modifiers](#)
Keyboard modifier.

12.2.1 Detailed Description

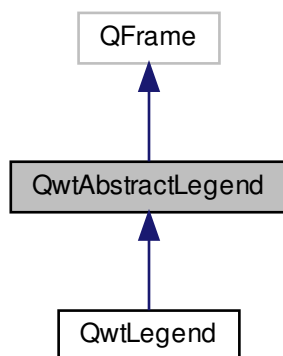
A pattern for mouse events.

12.3 QwtAbstractLegend Class Reference

Abstract base class for legend widgets.

```
#include <qwt_abstract_legend.h>
```

Inheritance diagram for QwtAbstractLegend:



Public Slots

- virtual void [updateLegend](#) (const QVariant &itemInfo, const QList< [QwtLegendData](#) > &data)=0
Update the entries for a plot item.

Public Member Functions

- [QwtAbstractLegend](#) (QWidget *parent=NULL)
- virtual [~QwtAbstractLegend](#) ()
Destructor.
- virtual void [renderLegend](#) (QPainter *painter, const QRectF &rect, bool fillBackground) const =0
- virtual bool [isEmpty](#) () const =0
- virtual int [scrollExtent](#) (Qt::Orientation) const

12.3.1 Detailed Description

Abstract base class for legend widgets.

Legends, that need to be under control of the [QwtPlot](#) layout system need to be derived from [QwtAbstractLegend](#).

Note

Other type of legends can be implemented by connecting to the [QwtPlot::legendDataChanged\(\)](#) signal. But as these legends are unknown to the plot layout system the layout code (on screen and for [QwtPlotRenderer](#)) need to be organized in application code.

See also

[QwtLegend](#)

12.3.2 Constructor & Destructor Documentation

12.3.2.1 QwtAbstractLegend()

```
QwtAbstractLegend::QwtAbstractLegend (
    QWidget * parent = NULL ) [explicit]
```

Constructor

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.3.3 Member Function Documentation

12.3.3.1 isEmpty()

```
virtual bool QwtAbstractLegend::isEmpty ( ) const [pure virtual]
```

Returns

True, when no plot item is inserted

Implemented in [QwtLegend](#).

12.3.3.2 renderLegend()

```
virtual void QwtAbstractLegend::renderLegend (
    QPainter * painter,
    const QRectF & rect,
    bool fillBackground ) const [pure virtual]
```

Render the legend into a given rectangle.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Bounding rectangle
<i>fillBackground</i>	When true, fill rect with the widget background

See also

[renderLegend\(\)](#) is used by [QwtPlotRenderer](#)

Implemented in [QwtLegend](#).

12.3.3.3 scrollExtent()

```
int QwtAbstractLegend::scrollExtent (
    Qt::Orientation orientation ) const [virtual]
```

Return the extent, that is needed for elements to scroll the legend (usually scrollbars),

Parameters

<i>orientation</i>	Orientation
--------------------	-------------

Returns

Extent of the corresponding scroll element

Reimplemented in [QwtLegend](#).

12.3.3.4 updateLegend

```
virtual void QwtAbstractLegend::updateLegend (
    const QVariant & itemInfo,
    const QList< QwtLegendData > & data ) [pure virtual], [slot]
```

Update the entries for a plot item.

Parameters

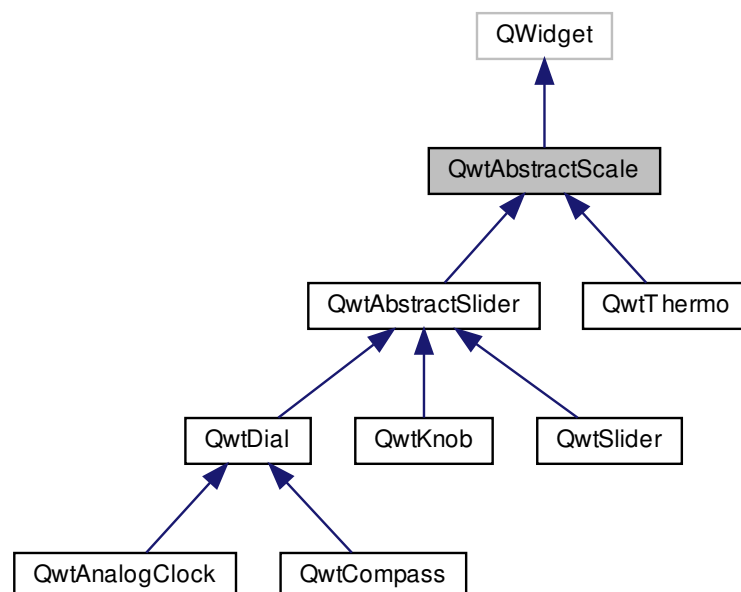
<i>itemInfo</i>	Info about an item
<i>data</i>	List of legend entry attributes for the item

12.4 QwtAbstractScale Class Reference

An abstract base class for widgets having a scale.

```
#include <qwt_abstract_scale.h>
```

Inheritance diagram for QwtAbstractScale:



Public Member Functions

- [QwtAbstractScale](#) (QWidget *parent=NULL)
- virtual [~QwtAbstractScale](#) ()
Destructor.

- void `setScale` (double `lowerBound`, double `upperBound`)

Specify a scale.

- void `setScale` (const `QwtInterval` &)

Specify a scale.

- void `setScale` (const `QwtScaleDiv` &)

Specify a scale.

- const `QwtScaleDiv` & `scaleDiv` () const

- void `setLowerBound` (double value)

- double `lowerBound` () const

- void `setUpperBound` (double value)

- double `upperBound` () const

- void `setScaleStepSize` (double `stepSize`)

Set the step size used for calculating a scale division.

- double `scaleStepSize` () const

- void `setScaleMaxMajor` (int ticks)

Set the maximum number of major tick intervals.

- int `scaleMaxMinor` () const

- void `setScaleMaxMinor` (int ticks)

Set the maximum number of minor tick intervals.

- int `scaleMaxMajor` () const

- void `setScaleEngine` (`QwtScaleEngine` *)

Set a scale engine.

- const `QwtScaleEngine` * `scaleEngine` () const

- `QwtScaleEngine` * `scaleEngine` ()

- int `transform` (double) const

- double `invTransform` (int) const

- bool `isInverted` () const

- double `minimum` () const

- double `maximum` () const

- const `QwtScaleMap` & `scaleMap` () const

Protected Member Functions

- void `rescale` (double `lowerBound`, double `upperBound`, double `stepSize`)

- void `setAbstractScaleDraw` (`QwtAbstractScaleDraw` *)

Set a scale draw.

- const `QwtAbstractScaleDraw` * `abstractScaleDraw` () const

- `QwtAbstractScaleDraw` * `abstractScaleDraw` ()

- virtual void `scaleChange` ()

Notify changed scale.

12.4.1 Detailed Description

An abstract base class for widgets having a scale.

The scale of an `QwtAbstractScale` is determined by a `QwtScaleDiv` definition, that contains the boundaries and the ticks of the scale. The scale is painted using a `QwtScaleDraw` object.

The scale division might be assigned explicitly - but usually it is calculated from the boundaries using a `QwtScaleEngine`.

The scale engine also decides the type of transformation of the scale (linear, logarithmic ...).

12.4.2 Constructor & Destructor Documentation

12.4.2.1 QwtAbstractScale()

```
QwtAbstractScale::QwtAbstractScale (
    QWidget * parent = NULL )
```

Constructor

Parameters

<i>parent</i>	Parent widget
---------------	---------------

Creates a default [QwtScaleDraw](#) and a [QwtLinearScaleEngine](#). The initial scale boundaries are set to [0.0, 100.0]
The [scaleStepSize\(\)](#) is initialized to 0.0, [scaleMaxMajor\(\)](#) to 5 and [scaleMaxMinor](#) to 3.

12.4.3 Member Function Documentation

12.4.3.1 abstractScaleDraw() [1/2]

```
const QwtAbstractScaleDraw * QwtAbstractScale::abstractScaleDraw ( ) const [protected]
```

Returns

Scale draw

See also

[setAbstractScaleDraw\(\)](#)

12.4.3.2 abstractScaleDraw() [2/2]

```
QwtAbstractScaleDraw * QwtAbstractScale::abstractScaleDraw ( ) [protected]
```

Returns

Scale draw

See also

[setAbstractScaleDraw\(\)](#)

12.4.3.3 invTransform()

```
double QwtAbstractScale::invTransform (
    int value ) const
```

Translate a widget coordinate into a scale value

Parameters

<i>value</i>	Widget coordinate
--------------	-------------------

Returns

Corresponding scale coordinate for value

See also

[scaleMap\(\)](#), [transform\(\)](#)

12.4.3.4 isInverted()

```
bool QwtAbstractScale::isInverted ( ) const
```

Returns

True, when the scale is increasing in opposite direction to the widget coordinates

12.4.3.5 lowerBound()

```
double QwtAbstractScale::lowerBound ( ) const
```

Returns

Lower bound of the scale

See also

[setLowerBound\(\)](#), [setScale\(\)](#), [upperBound\(\)](#)

12.4.3.6 maximum()

```
double QwtAbstractScale::maximum ( ) const
```

Returns

The boundary with the larger value

See also

[minimum\(\)](#), [lowerBound\(\)](#), [upperBound\(\)](#)

12.4.3.7 `minimum()`

```
double QwtAbstractScale::minimum ( ) const
```

Returns

The boundary with the smaller value

See also

[maximum\(\)](#), [lowerBound\(\)](#), [upperBound\(\)](#)

12.4.3.8 `rescale()`

```
void QwtAbstractScale::rescale (
    double lowerBound,
    double upperBound,
    double stepSize ) [protected]
```

Recalculate the scale division and update the scale.

Parameters

<i>lowerBound</i>	Lower limit of the scale interval
<i>upperBound</i>	Upper limit of the scale interval
<i>stepSize</i>	Major step size

See also

[scaleChange\(\)](#)

12.4.3.9 `scaleDiv()`

```
const QwtScaleDiv & QwtAbstractScale::scaleDiv ( ) const
```

Returns

Scale boundaries and positions of the ticks

The scale division might have been assigned explicitly or calculated implicitly by [rescale\(\)](#).

12.4.3.10 `scaleEngine()` ^[1/2]

```
const QwtScaleEngine * QwtAbstractScale::scaleEngine ( ) const
```

Returns

Scale engine

See also

[setScaleEngine\(\)](#)

12.4.3.11 `scaleEngine()` [2/2]

```
QwtScaleEngine * QwtAbstractScale::scaleEngine ( )
```

Returns

Scale engine

See also

[setScaleEngine\(\)](#)

12.4.3.12 `scaleMap()`

```
const QwtScaleMap & QwtAbstractScale::scaleMap ( ) const
```

Returns

Map to translate between scale and widget coordinates

12.4.3.13 `scaleMaxMajor()`

```
int QwtAbstractScale::scaleMaxMajor ( ) const
```

Returns

Maximal number of major tick intervals

See also

[setScaleMaxMajor\(\)](#), [scaleMaxMinor\(\)](#)

12.4.3.14 `scaleMaxMinor()`

```
int QwtAbstractScale::scaleMaxMinor ( ) const
```

Returns

Maximal number of minor tick intervals

See also

[setScaleMaxMinor\(\)](#), [scaleMaxMajor\(\)](#)

12.4.3.15 scaleStepSize()

```
double QwtAbstractScale::scaleStepSize ( ) const
```

Returns

Hint for the step size of the scale

See also

[setScaleStepSize\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

12.4.3.16 setAbstractScaleDraw()

```
void QwtAbstractScale::setAbstractScaleDraw (
    QwtAbstractScaleDraw * scaleDraw ) [protected]
```

Set a scale draw.

scaleDraw has to be created with new and will be deleted in the destructor or the next call of [setAbstractScaleDraw\(\)](#).

See also

[abstractScaleDraw\(\)](#)

12.4.3.17 setLowerBound()

```
void QwtAbstractScale::setLowerBound (
    double value )
```

Set the lower bound of the scale

Parameters

<i>value</i>	Lower bound
--------------	-------------

See also

[lowerBound\(\)](#), [setScale\(\)](#), [setUpperBound\(\)](#)

Note

For inverted scales the lower bound is greater than the upper bound

12.4.3.18 setScale() [1/3]

```
void QwtAbstractScale::setScale (
    double lowerBound,
    double upperBound )
```

Specify a scale.

Define a scale by an interval

The ticks are calculated using [scaleMaxMinor\(\)](#), [scaleMaxMajor\(\)](#) and [scaleStepSize\(\)](#).

Parameters

<i>lowerBound</i>	lower limit of the scale interval
<i>upperBound</i>	upper limit of the scale interval

Note

For inverted scales the lower bound is greater than the upper bound

12.4.3.19 setScale() [2/3]

```
void QwtAbstractScale::setScale (
    const QwtInterval & interval )
```

Specify a scale.

Define a scale by an interval

The ticks are calculated using [scaleMaxMinor\(\)](#), [scaleMaxMajor\(\)](#) and [scaleStepSize\(\)](#).

Parameters

<i>interval</i>	Interval
-----------------	----------

12.4.3.20 setScale() [3/3]

```
void QwtAbstractScale::setScale (
    const QwtScaleDiv & scaleDiv )
```

Specify a scale.

[scaleMaxMinor\(\)](#), [scaleMaxMajor\(\)](#) and [scaleStepSize\(\)](#) and have no effect.

Parameters

<i>scaleDiv</i>	Scale division
-----------------	----------------

See also

[setAutoScale\(\)](#)

12.4.3.21 setScaleEngine()

```
void QwtAbstractScale::setScaleEngine (
    QwtScaleEngine * scaleEngine )
```

Set a scale engine.

The scale engine is responsible for calculating the scale division and provides a transformation between scale and widget coordinates.

scaleEngine has to be created with new and will be deleted in the destructor or the next call of setScaleEngine.

12.4.3.22 setScaleMaxMajor()

```
void QwtAbstractScale::setScaleMaxMajor (
    int ticks )
```

Set the maximum number of major tick intervals.

The scale's major ticks are calculated automatically such that the number of major intervals does not exceed ticks.

The default value is 5.

Parameters

<i>ticks</i>	Maximal number of major ticks.
--------------	--------------------------------

See also

[scaleMaxMajor\(\)](#), [setScaleMaxMinor\(\)](#), [setScaleStepSize\(\)](#), [QwtScaleEngine::divideInterval\(\)](#)

12.4.3.23 setScaleMaxMinor()

```
void QwtAbstractScale::setScaleMaxMinor (
    int ticks )
```

Set the maximum number of minor tick intervals.

The scale's minor ticks are calculated automatically such that the number of minor intervals does not exceed ticks. The default value is 3.

Parameters

<i>ticks</i>	Maximal number of minor ticks.
--------------	--------------------------------

See also

[scaleMaxMajor\(\)](#), [setScaleMaxMinor\(\)](#), [setScaleStepSize\(\)](#), [QwtScaleEngine::divideInterval\(\)](#)

12.4.3.24 `setScaleStepSize()`

```
void QwtAbstractScale::setScaleStepSize (
    double stepSize )
```

Set the step size used for calculating a scale division.

The step size is hint for calculating the intervals for the major ticks of the scale. A value of 0.0 is interpreted as no hint.

Parameters

<i>stepSize</i>	Hint for the step size of the scale
-----------------	-------------------------------------

See also

[scaleStepSize\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

Note

Position and distance between the major ticks also depends on [scaleMaxMajor\(\)](#).

12.4.3.25 `setUpperBound()`

```
void QwtAbstractScale::setUpperBound (
    double value )
```

Set the upper bound of the scale

Parameters

<i>value</i>	Upper bound
--------------	-------------

See also

[upperBound\(\)](#), [setScale\(\)](#), [setLowerBound\(\)](#)

Note

For inverted scales the lower bound is greater than the upper bound

12.4.3.26 transform()

```
int QwtAbstractScale::transform (
    double value ) const
```

Translate a scale value into a widget coordinate

Parameters

<i>value</i>	Scale value
--------------	-------------

Returns

Corresponding widget coordinate for value

See also

[scaleMap\(\)](#), [invTransform\(\)](#)

12.4.3.27 upperBound()

```
double QwtAbstractScale::upperBound ( ) const
```

Returns

Upper bound of the scale

See also

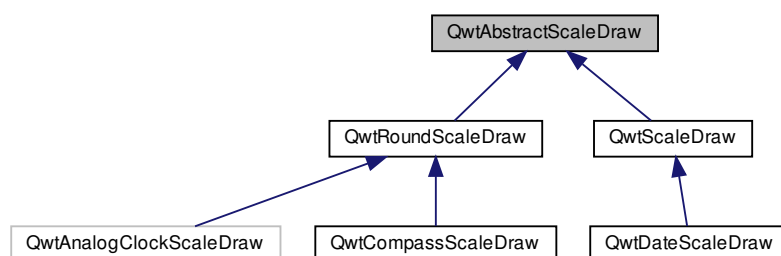
[setUpperBound\(\)](#), [setScale\(\)](#), [lowerBound\(\)](#)

12.5 QwtAbstractScaleDraw Class Reference

A abstract base class for drawing scales.

```
#include <qwt_abstract_scale_draw.h>
```

Inheritance diagram for QwtAbstractScaleDraw:



Public Types

- enum [ScaleComponent](#) { [Backbone](#) = 0x01, [Ticks](#) = 0x02, [Labels](#) = 0x04 }
- typedef QFlags< [ScaleComponent](#) > [ScaleComponents](#)
Scale components.

Public Member Functions

- [QwtAbstractScaleDraw](#) ()
Constructor.
- virtual [~QwtAbstractScaleDraw](#) ()
Destructor.
- void [setScaleDiv](#) (const [QwtScaleDiv](#) &)
- const [QwtScaleDiv](#) & [scaleDiv](#) () const
- void [setTransformation](#) ([QwtTransform](#) *)
- const [QwtScaleMap](#) & [scaleMap](#) () const
- [QwtScaleMap](#) & [scaleMap](#) ()
- void [enableComponent](#) ([ScaleComponent](#), bool enable=true)
- bool [hasComponent](#) ([ScaleComponent](#)) const
- void [setTickLength](#) ([QwtScaleDiv::TickType](#), double length)
- double [tickLength](#) ([QwtScaleDiv::TickType](#)) const
- double [maxTickLength](#) () const
- void [setSpacing](#) (double)
Set the spacing between tick and labels.
- double [spacing](#) () const
Get the spacing.
- void [setPenWidth](#) (int width)
Specify the width of the scale pen.
- int [penWidth](#) () const
- virtual void [draw](#) (QPainter *, const QPalette &) const
Draw the scale.
- virtual [QwtText](#) [label](#) (double) const
Convert a value into its representing label.
- virtual double [extent](#) (const QFont &font) const =0
- void [setMinimumExtent](#) (double)
Set a minimum for the extent.
- double [minimumExtent](#) () const

Protected Member Functions

- virtual void [drawTick](#) (QPainter *painter, double value, double len) const =0
- virtual void [drawBackbone](#) (QPainter *painter) const =0
- virtual void [drawLabel](#) (QPainter *painter, double value) const =0
- void [invalidateCache](#) ()
- const [QwtText](#) & [tickLabel](#) (const QFont &, double value) const
Convert a value into its representing label and cache it.

12.5.1 Detailed Description

A abstract base class for drawing scales.

[QwtAbstractScaleDraw](#) can be used to draw linear or logarithmic scales.

After a scale division has been specified as a [QwtScaleDiv](#) object using [setScaleDiv\(\)](#), the scale can be drawn with the [draw\(\)](#) member.

12.5.2 Member Enumeration Documentation

12.5.2.1 ScaleComponent

```
enum QwtAbstractScaleDraw::ScaleComponent
```

Components of a scale

See also

[enableComponent\(\)](#), [hasComponent](#)

Enumerator

Backbone	Backbone = the line where the ticks are located.
Ticks	Ticks.
Labels	Labels.

12.5.3 Constructor & Destructor Documentation

12.5.3.1 QwtAbstractScaleDraw()

```
QwtAbstractScaleDraw::QwtAbstractScaleDraw ( )
```

Constructor.

The range of the scale is initialized to [0, 100], The spacing (distance between ticks and labels) is set to 4, the tick lengths are set to 4, 6 and 8 pixels

12.5.4 Member Function Documentation

12.5.4.1 draw()

```
void QwtAbstractScaleDraw::draw (
    QPainter * painter,
    const QPalette & palette ) const [virtual]
```

Draw the scale.

Parameters

<i>painter</i>	The painter
<i>palette</i>	Palette, text color is used for the labels, foreground color for ticks and backbone

12.5.4.2 drawBackbone()

```
virtual void QwtAbstractScaleDraw::drawBackbone (
    QPainter * painter ) const [protected], [pure virtual]
```

Draws the baseline of the scale

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[drawTick\(\)](#), [drawLabel\(\)](#)

Implemented in [QwtScaleDraw](#), and [QwtRoundScaleDraw](#).

12.5.4.3 drawLabel()

```
virtual void QwtAbstractScaleDraw::drawLabel (
    QPainter * painter,
    double value ) const [protected], [pure virtual]
```

Draws the label for a major scale tick

Parameters

<i>painter</i>	Painter
<i>value</i>	Value

See also

[drawTick\(\)](#), [drawBackbone\(\)](#)

Implemented in [QwtScaleDraw](#), and [QwtRoundScaleDraw](#).

12.5.4.4 drawTick()

```
virtual void QwtAbstractScaleDraw::drawTick (
    QPainter * painter,
    double value,
    double len ) const [protected], [pure virtual]
```

Draw a tick

Parameters

<i>painter</i>	Painter
<i>value</i>	Value of the tick
<i>len</i>	Length of the tick

See also

[drawBackbone\(\)](#), [drawLabel\(\)](#)

Implemented in [QwtScaleDraw](#), and [QwtRoundScaleDraw](#).

12.5.4.5 enableComponent()

```
void QwtAbstractScaleDraw::enableComponent (
    ScaleComponent component,
    bool enable = true )
```

En/Disable a component of the scale

Parameters

<i>component</i>	Scale component
<i>enable</i>	On/Off

See also

[hasComponent\(\)](#)

12.5.4.6 extent()

```
virtual double QwtAbstractScaleDraw::extent (
    const QFont & font ) const [pure virtual]
```

Calculate the extent

The extent is the distance from the baseline to the outermost pixel of the scale draw in opposite to its orientation. It is at least [minimumExtent\(\)](#) pixels.

Parameters

<i>font</i>	Font used for drawing the tick labels
-------------	---------------------------------------

Returns

Number of pixels

See also

[setMinimumExtent\(\)](#), [minimumExtent\(\)](#)

Implemented in [QwtScaleDraw](#), and [QwtRoundScaleDraw](#).

12.5.4.7 hasComponent()

```
bool QwtAbstractScaleDraw::hasComponent (
    ScaleComponent component ) const
```

Check if a component is enabled

Parameters

<i>component</i>	Component type
------------------	----------------

Returns

true, when component is enabled

See also

[enableComponent\(\)](#)

12.5.4.8 invalidateCache()

```
void QwtAbstractScaleDraw::invalidateCache ( ) [protected]
```

Invalidate the cache used by [tickLabel\(\)](#)

The cache is invalidated, when a new [QwtScaleDiv](#) is set. If the labels need to be changed. while the same [QwtScaleDiv](#) is set, [invalidateCache\(\)](#) needs to be called manually.

12.5.4.9 label()

```
QwtText QwtAbstractScaleDraw::label (
    double value ) const [virtual]
```

Convert a value into its representing label.

The value is converted to a plain text using `QLocale().toString(value)`. This method is often overloaded by applications to have individual labels.

Parameters

<i>value</i>	Value
--------------	-------

Returns

Label string.

Reimplemented in [QwtDateScaleDraw](#), and [QwtCompassScaleDraw](#).

12.5.4.10 maxTickLength()

```
double QwtAbstractScaleDraw::maxTickLength ( ) const
```

Returns

Length of the longest tick

Useful for layout calculations

See also

[tickLength\(\)](#), [setTickLength\(\)](#)

12.5.4.11 minimumExtent()

```
double QwtAbstractScaleDraw::minimumExtent ( ) const
```

Get the minimum extent

Returns

Minimum extent

See also

[extent\(\)](#), [setMinimumExtent\(\)](#)

12.5.4.12 penWidth()

```
int QwtAbstractScaleDraw::penWidth ( ) const
```

Returns

Scale pen width

See also

[setPenWidth\(\)](#)

12.5.4.13 `scaleDiv()`

```
const QwtScaleDiv & QwtAbstractScaleDraw::scaleDiv ( ) const
```

Returns

scale division

12.5.4.14 `scaleMap()` [1/2]

```
const QwtScaleMap & QwtAbstractScaleDraw::scaleMap ( ) const
```

Returns

Map how to translate between scale and pixel values

12.5.4.15 `scaleMap()` [2/2]

```
QwtScaleMap & QwtAbstractScaleDraw::scaleMap ( )
```

Returns

Map how to translate between scale and pixel values

12.5.4.16 `setMinimumExtent()`

```
void QwtAbstractScaleDraw::setMinimumExtent (
    double minExtent )
```

Set a minimum for the extent.

The extent is calculated from the components of the scale draw. In situations, where the labels are changing and the layout depends on the extent (f.e scrolling a scale), setting an upper limit as minimum extent will avoid jumps of the layout.

Parameters

<i>minExtent</i>	Minimum extent
------------------	----------------

See also

[extent\(\)](#), [minimumExtent\(\)](#)

12.5.4.17 setPenWidth()

```
void QwtAbstractScaleDraw::setPenWidth (
    int width )
```

Specify the width of the scale pen.

Parameters

<i>width</i>	Pen width
--------------	-----------

See also

[penWidth\(\)](#)

12.5.4.18 setScaleDiv()

```
void QwtAbstractScaleDraw::setScaleDiv (
    const QwtScaleDiv & scaleDiv )
```

Change the scale division

Parameters

<i>scaleDiv</i>	New scale division
-----------------	--------------------

12.5.4.19 setSpacing()

```
void QwtAbstractScaleDraw::setSpacing (
    double spacing )
```

Set the spacing between tick and labels.

The spacing is the distance between ticks and labels. The default spacing is 4 pixels.

Parameters

<i>spacing</i>	Spacing
----------------	---------

See also

[spacing\(\)](#)

12.5.4.20 `setTickLength()`

```
void QwtAbstractScaleDraw::setTickLength (
    QwtScaleDiv::TickType tickType,
    double length )
```

Set the length of the ticks

Parameters

<i>tickType</i>	Tick type
<i>length</i>	New length

Warning

the length is limited to [0..1000]

12.5.4.21 `setTransformation()`

```
void QwtAbstractScaleDraw::setTransformation (
    QwtTransform * transformation )
```

Change the transformation of the scale

Parameters

<i>transformation</i>	New scale transformation
-----------------------	--------------------------

12.5.4.22 `spacing()`

```
double QwtAbstractScaleDraw::spacing ( ) const
```

Get the spacing.

The spacing is the distance between ticks and labels. The default spacing is 4 pixels.

Returns

Spacing

See also

[setSpacing\(\)](#)

12.5.4.23 tickLabel()

```
const QwtText & QwtAbstractScaleDraw::tickLabel (
    const QFont & font,
    double value ) const [protected]
```

Convert a value into its representing label and cache it.

The conversion between value and label is called very often in the layout and painting code. Unfortunately the calculation of the label sizes might be slow (really slow for rich text in Qt4), so it's necessary to cache the labels.

Parameters

<i>font</i>	Font
<i>value</i>	Value

Returns

Tick label

12.5.4.24 tickLength()

```
double QwtAbstractScaleDraw::tickLength (
    QwtScaleDiv::TickType tickType ) const
```

Returns

Length of the ticks

See also

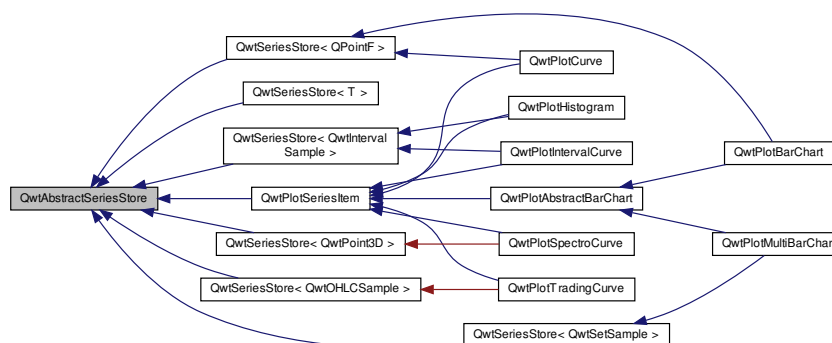
[setTickLength\(\)](#), [maxTickLength\(\)](#)

12.6 QwtAbstractSeriesStore Class Reference

Bridge between [QwtSeriesStore](#) and [QwtPlotSeriesItem](#).

```
#include <qwt_series_store.h>
```

Inheritance diagram for QwtAbstractSeriesStore:



Protected Member Functions

- virtual `~QwtAbstractSeriesStore()`
Destructor.
- virtual void `dataChanged()`=0
`dataChanged()` indicates, that the series has been changed.
- virtual void `setRectOfInterest` (const QRectF &)=0
- virtual QRectF `dataRect()` const =0
- virtual size_t `dataSize()` const =0

12.6.1 Detailed Description

Bridge between [QwtSeriesStore](#) and [QwtPlotSeriesItem](#).

[QwtAbstractSeriesStore](#) is an abstract interface only to make it possible to isolate the template based methods ([QwtSeriesStore](#)) from the regular methods ([QwtPlotSeriesItem](#)) to make it possible to derive from [QwtPlotSeriesItem](#) without any hassle with templates.

12.6.2 Member Function Documentation

12.6.2.1 dataRect()

```
virtual QRectF QwtAbstractSeriesStore::dataRect ( ) const [protected], [pure virtual]
```

Returns

Bounding rectangle of the stored series

Implemented in [QwtSeriesStore< T >](#), [QwtSeriesStore< QwtIntervalSample >](#), [QwtSeriesStore< QwtOHLCSample >](#), [QwtSeriesStore< QPointF >](#), [QwtSeriesStore< QwtSetSample >](#), and [QwtSeriesStore< QwtPoint3D >](#).

12.6.2.2 dataSize()

```
virtual size_t QwtAbstractSeriesStore::dataSize ( ) const [protected], [pure virtual]
```

Returns

Number of samples

Implemented in [QwtSeriesStore< T >](#), [QwtSeriesStore< QwtIntervalSample >](#), [QwtSeriesStore< QwtOHLCSample >](#), [QwtSeriesStore< QPointF >](#), [QwtSeriesStore< QwtSetSample >](#), and [QwtSeriesStore< QwtPoint3D >](#).

12.6.2.3 setRectOfInterest()

```
virtual void QwtAbstractSeriesStore::setRectOfInterest (
    const QRectF & ) [protected], [pure virtual]
```

Set a the "rectangle of interest" for the stored series

See also

[QwtSeriesData<T>::setRectOfInterest\(\)](#)

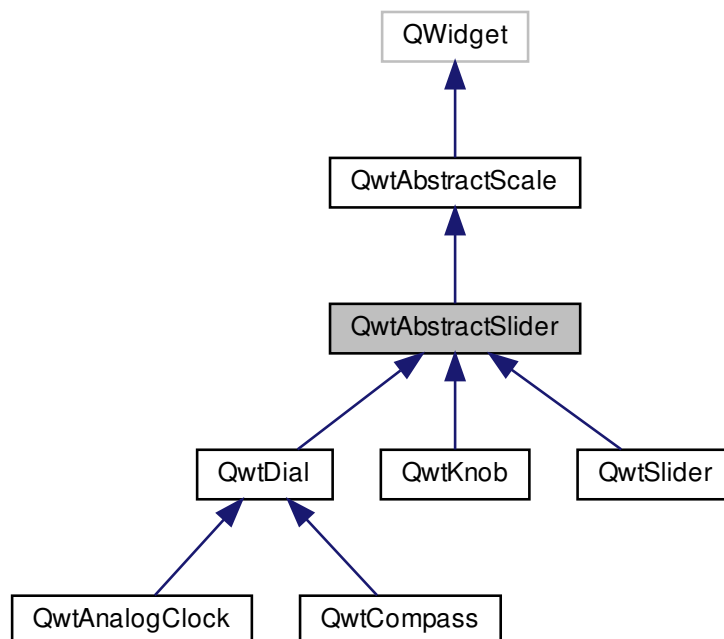
Implemented in [QwtSeriesStore< T >](#), [QwtSeriesStore< QwtIntervalSample >](#), [QwtSeriesStore< QwtOHLCSample >](#), [QwtSeriesStore< QPointF >](#), [QwtSeriesStore< QwtSetSample >](#), and [QwtSeriesStore< QwtPoint3D >](#).

12.7 QwtAbstractSlider Class Reference

An abstract base class for slider widgets with a scale.

```
#include <qwt_abstract_slider.h>
```

Inheritance diagram for QwtAbstractSlider:



Public Slots

- void [setValue](#) (double [value](#))

Signals

- void `valueChanged` (double `value`)
Notify a change of value.
- void `sliderPressed` ()
- void `sliderReleased` ()
- void `sliderMoved` (double `value`)

Public Member Functions

- `QwtAbstractSlider` (QWidget *parent=NULL)
Constructor.
- virtual `~QwtAbstractSlider` ()
Destructor.
- void `setValid` (bool)
- bool `isValid` () const
- double `value` () const
Returns the current value.
- void `setWrapping` (bool)
- bool `wrapping` () const
- void `setTotalSteps` (uint)
Set the number of steps.
- uint `totalSteps` () const
- void `setSingleSteps` (uint)
Set the number of steps for a single increment.
- uint `singleSteps` () const
- void `setPageSteps` (uint)
Set the number of steps for a page increment.
- uint `pageSteps` () const
- void `setStepAlignment` (bool)
Enable step alignment.
- bool `stepAlignment` () const
- void `setTracking` (bool)
Enables or disables tracking.
- bool `isTracking` () const
- void `setReadOnly` (bool)
- bool `isReadOnly` () const
- void `setInvertedControls` (bool)
- bool `invertedControls` () const

Protected Member Functions

- virtual void `mousePressEvent` (QMouseEvent *)
- virtual void `mouseReleaseEvent` (QMouseEvent *)
- virtual void `mouseMoveEvent` (QMouseEvent *)
- virtual void `keyPressEvent` (QKeyEvent *)
- virtual void `wheelEvent` (QWheelEvent *)
- virtual bool `isScrollPosition` (const QPoint &pos) const =0
Determine what to do when the user presses a mouse button.
- virtual double `scrolledTo` (const QPoint &pos) const =0
Determine the value for a new position of the movable part of the slider.
- void `incrementValue` (int stepCount)
- virtual void `scaleChange` ()
- virtual void `sliderChange` ()
Calling update()
- double `incrementedValue` (double `value`, int stepCount) const

12.7.1 Detailed Description

An abstract base class for slider widgets with a scale.

A slider widget displays a value according to a scale. The class is designed as a common super class for widgets like [QwtKnob](#), [QwtDial](#) and [QwtSlider](#).

When the slider is not `readOnly()` its value can be modified by keyboard, mouse and wheel inputs.

The range of the slider is divided into a number of steps from which the value increments according to user inputs depend. Only for linear scales the number of steps correspond with a fixed step size.

12.7.2 Constructor & Destructor Documentation

12.7.2.1 QwtAbstractSlider()

```
QwtAbstractSlider::QwtAbstractSlider (
    QWidget * parent = NULL ) [explicit]
```

Constructor.

The scale is initialized to [0.0, 100.0], the number of steps is set to 100 with 1 and 10 and single and page step sizes. Step alignment is enabled.

The initial value is invalid.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.7.3 Member Function Documentation

12.7.3.1 incrementedValue()

```
double QwtAbstractSlider::incrementedValue (
    double value,
    int stepCount ) const [protected]
```

Increment a value

Parameters

<i>value</i>	Value
<i>stepCount</i>	Number of steps

Returns

Incremented value

12.7.3.2 incrementValue()

```
void QwtAbstractSlider::incrementValue (
    int stepCount ) [protected]
```

Increment the slider

The step size depends on the number of [totalSteps\(\)](#)

Parameters

<i>stepCount</i>	Number of steps
------------------	-----------------

See also

[setTotalSteps\(\)](#), [incrementedValue\(\)](#)

12.7.3.3 invertedControls()

```
bool QwtAbstractSlider::invertedControls ( ) const
```

Returns

True, when the controls are inverted

See also

[setInvertedControls\(\)](#)

12.7.3.4 isReadOnly()

```
bool QwtAbstractSlider::isReadOnly ( ) const
```

In read only mode the slider can't be controlled by mouse or keyboard.

Returns

true if read only

See also

[setReadOnly\(\)](#)

12.7.3.5 isScrollPosition()

```
virtual bool QwtAbstractSlider::isScrollPosition (
    const QPoint & pos ) const [protected], [pure virtual]
```

Determine what to do when the user presses a mouse button.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Return values

<i>True, when</i>	pos is a valid scroll position
-------------------	--------------------------------

See also

[scrolledTo\(\)](#)

Implemented in [QwtKnob](#), [QwtDial](#), and [QwtSlider](#).

12.7.3.6 isTracking()

```
bool QwtAbstractSlider::isTracking ( ) const
```

Returns

True, when tracking has been enabled

See also

[setTracking\(\)](#)

12.7.3.7 isValid()

```
bool QwtAbstractSlider::isValid ( ) const
```

Returns

True, when the value is invalid

12.7.3.8 keyPressEvent()

```
void QwtAbstractSlider::keyPressEvent (
    QKeyEvent * event ) [protected], [virtual]
```

Handles key events

[QwtAbstractSlider](#) handles the following keys:

- Qt::Key_Left
Add/Subtract [singleSteps\(\)](#) in direction to [lowerBound\(\)](#);
- Qt::Key_Right
Add/Subtract [singleSteps\(\)](#) in direction to [upperBound\(\)](#);
- Qt::Key_Down
Subtract [singleSteps\(\)](#), when [invertedControls\(\)](#) is false
- Qt::Key_Up
Add [singleSteps\(\)](#), when [invertedControls\(\)](#) is false
- Qt::Key_PageDown
Subtract [pageSteps\(\)](#), when [invertedControls\(\)](#) is false
- Qt::Key_PageUp
Add [pageSteps\(\)](#), when [invertedControls\(\)](#) is false
- Qt::Key_Home
Set the value to the [minimum\(\)](#)
- Qt::Key_End
Set the value to the [maximum\(\)](#)

Parameters

<i>event</i>	Key event
--------------	-----------

See also

[isReadOnly\(\)](#)

Reimplemented in [QwtCompass](#).

12.7.3.9 mouseMoveEvent()

```
void QwtAbstractSlider::mouseMoveEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse Move Event handler

Parameters

<i>event</i>	Mouse event
--------------	-------------

12.7.3.10 mousePressEvent()

```
void QwtAbstractSlider::mousePressEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse press event handler

Parameters

<i>event</i>	Mouse event
--------------	-------------

Reimplemented in [QwtSlider](#).

12.7.3.11 mouseReleaseEvent()

```
void QwtAbstractSlider::mouseReleaseEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse Release Event handler

Parameters

<i>event</i>	Mouse event
--------------	-------------

Reimplemented in [QwtSlider](#).

12.7.3.12 pageSteps()

```
uint QwtAbstractSlider::pageSteps ( ) const
```

Returns

Number of steps

See also

[setPageSteps\(\)](#), [totalSteps\(\)](#), [singleSteps\(\)](#)

12.7.3.13 scaleChange()

```
void QwtAbstractSlider::scaleChange ( ) [protected], [virtual]
```

Update the slider according to modifications of the scale

Reimplemented from [QwtAbstractScale](#).

Reimplemented in [QwtDial](#), and [QwtSlider](#).

12.7.3.14 scrolledTo()

```
virtual double QwtAbstractSlider::scrolledTo (
    const QPoint & pos ) const [protected], [pure virtual]
```

Determine the value for a new position of the movable part of the slider.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Returns

Value for the mouse position

See also

[isScrollPosition\(\)](#)

Implemented in [QwtKnob](#), [QwtDial](#), and [QwtSlider](#).

12.7.3.15 setInvertedControls()

```
void QwtAbstractSlider::setInvertedControls (
    bool on )
```

Invert wheel and key events

Usually scrolling the mouse wheel "up" and using keys like page up will increase the slider's value towards its maximum. When [invertedControls\(\)](#) is enabled the value is scrolled towards its minimum.

Inverting the controls might be f.e. useful for a vertical slider with an inverted scale (decreasing from top to bottom).

Parameters

<i>on</i>	Invert controls, when true
-----------	----------------------------

See also

[invertedControls\(\)](#), [keyEvent\(\)](#), [wheelEvent\(\)](#)

12.7.3.16 setPageSteps()

```
void QwtAbstractSlider::setPageSteps (
    uint stepCount )
```

Set the number of steps for a page increment.

The range of the slider is divided into a number of steps from which the value increments according to user inputs depend.

Parameters

<i>stepCount</i>	Number of steps
------------------	-----------------

See also

[pageSteps\(\)](#), [setTotalSteps\(\)](#), [setSingleSteps\(\)](#)

12.7.3.17 setReadOnly()

```
void QwtAbstractSlider::setReadOnly (
    bool on )
```

En/Disable read only mode

In read only mode the slider can't be controlled by mouse or keyboard.

Parameters

<i>on</i>	Enables in case of true
-----------	-------------------------

See also

[isReadOnly\(\)](#)

Warning

The focus policy is set to Qt::StrongFocus or Qt::NoFocus

12.7.3.18 setSingleSteps()

```
void QwtAbstractSlider::setSingleSteps (
    uint stepCount )
```

Set the number of steps for a single increment.

The range of the slider is divided into a number of steps from which the value increments according to user inputs depend.

Parameters

<i>stepCount</i>	Number of steps
------------------	-----------------

See also

[singleSteps\(\)](#), [setTotalSteps\(\)](#), [setPageSteps\(\)](#)

12.7.3.19 setStepAlignment()

```
void QwtAbstractSlider::setStepAlignment (
    bool on )
```

Enable step alignment.

When step alignment is enabled values resulting from slider movements are aligned to the step size.

Parameters

<i>on</i>	Enable step alignment when true
-----------	---------------------------------

See also

[stepAlignment\(\)](#)

12.7.3.20 setTotalSteps()

```
void QwtAbstractSlider::setTotalSteps (
    uint stepCount )
```

Set the number of steps.

The range of the slider is divided into a number of steps from which the value increments according to user inputs depend.

The default setting is 100.

Parameters

<i>stepCount</i>	Number of steps
------------------	-----------------

See also

[totalSteps\(\)](#), [setSingleSteps\(\)](#), [setPageSteps\(\)](#)

12.7.3.21 setTracking()

```
void QwtAbstractSlider::setTracking (
    bool on )
```

Enables or disables tracking.

If tracking is enabled, the slider emits the [valueChanged\(\)](#) signal while the movable part of the slider is being dragged. If tracking is disabled, the slider emits the [valueChanged\(\)](#) signal only when the user releases the slider.

Tracking is enabled by default.

Parameters

<i>on</i>	true (enable) or false (disable) tracking.
-----------	--

See also

[isTracking\(\)](#), [sliderMoved\(\)](#)

12.7.3.22 [setValid\(\)](#)

```
void QwtAbstractSlider::setValid (
    bool on )
```

Set the value to be valid/invalid

Parameters

<i>on</i>	When true, the value is invalidated
-----------	-------------------------------------

See also

[setValue\(\)](#)

12.7.3.23 [setValue](#)

```
void QwtAbstractSlider::setValue (
    double value ) [slot]
```

Set the slider to the specified value

Parameters

<i>value</i>	New value
--------------	-----------

See also

[setValid\(\)](#), [sliderChange\(\)](#), [valueChanged\(\)](#)

12.7.3.24 setWrapping()

```
void QwtAbstractSlider::setWrapping (
    bool on )
```

If wrapping is true stepping up from [upperBound\(\)](#) value will take you to the [minimum\(\)](#) value and vice versa.

Parameters

<i>on</i>	En/Disable wrapping
-----------	---------------------

See also

[wrapping\(\)](#)

12.7.3.25 singleSteps()

```
uint QwtAbstractSlider::singleSteps ( ) const
```

Returns

Number of steps

See also

[setSingleSteps\(\)](#), [totalSteps\(\)](#), [pageSteps\(\)](#)

12.7.3.26 sliderMoved

```
void QwtAbstractSlider::sliderMoved (
    double value ) [signal]
```

This signal is emitted when the user moves the slider with the mouse.

Parameters

<i>value</i>	New value
--------------	-----------

See also

[valueChanged\(\)](#)

12.7.3.27 sliderPressed

```
void QwtAbstractSlider::sliderPressed ( ) [signal]
```

This signal is emitted when the user presses the movable part of the slider.

12.7.3.28 sliderReleased

```
void QwtAbstractSlider::sliderReleased ( ) [signal]
```

This signal is emitted when the user releases the movable part of the slider.

12.7.3.29 stepAlignment()

```
bool QwtAbstractSlider::stepAlignment ( ) const
```

Returns

True, when step alignment is enabled

See also

[setStepAlignment\(\)](#)

12.7.3.30 totalSteps()

```
uint QwtAbstractSlider::totalSteps ( ) const
```

Returns

Number of steps

See also

[setTotalSteps\(\)](#), [singleSteps\(\)](#), [pageSteps\(\)](#)

12.7.3.31 valueChanged

```
void QwtAbstractSlider::valueChanged (
    double value ) [signal]
```

Notify a change of value.

When tracking is enabled (default setting), this signal will be emitted every time the value changes.

Parameters

<i>value</i>	New value
--------------	-----------

See also

[setTracking\(\)](#), [sliderMoved\(\)](#)

12.7.3.32 wheelEvent()

```
void QwtAbstractSlider::wheelEvent (
    QWheelEvent * event ) [protected], [virtual]
```

Wheel Event handler

In/decreases the value by s number of steps. The direction depends on the [invertedControls\(\)](#) property.

When the control or shift modifier is pressed the wheel delta (divided by 120) is mapped to an increment according to [pageSteps\(\)](#). Otherwise it is mapped to [singleSteps\(\)](#).

Parameters

<i>event</i>	Wheel event
--------------	-------------

Reimplemented in [QwtDial](#).

12.7.3.33 wrapping()

```
bool QwtAbstractSlider::wrapping ( ) const
```

Returns

True, when wrapping is set

See also

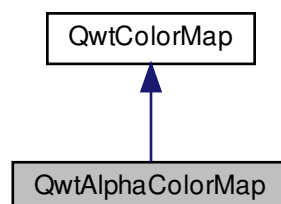
[setWrapping\(\)](#)

12.8 QwtAlphaColorMap Class Reference

[QwtAlphaColorMap](#) varies the alpha value of a color.

```
#include <qwt_color_map.h>
```

Inheritance diagram for QwtAlphaColorMap:



Public Member Functions

- [QwtAlphaColorMap](#) (const QColor &=QColor(Qt::gray))
- virtual [~QwtAlphaColorMap](#) ()
Destructor.
- void [setColor](#) (const QColor &)
- QColor [color](#) () const
- virtual QRgb [rgb](#) (const [QwtInterval](#) &, double value) const
Map a value of a given interval into a alpha value.

Additional Inherited Members

12.8.1 Detailed Description

[QwtAlphaColorMap](#) varies the alpha value of a color.

12.8.2 Constructor & Destructor Documentation

12.8.2.1 QwtAlphaColorMap()

```
QwtAlphaColorMap::QwtAlphaColorMap (
    const QColor & color = QColor( Qt::gray ) )
```

Constructor

Parameters

<i>color</i>	Color of the map
--------------	------------------

12.8.3 Member Function Documentation

12.8.3.1 color()

```
QColor QwtAlphaColorMap::color ( ) const
```

Returns

the color

See also

[setColor\(\)](#)

12.8.3.2 `rgb()`

```
QRgb QwtAlphaColorMap::rgb (
    const QwtInterval & interval,
    double value ) const [virtual]
```

Map a value of a given interval into a alpha value.

$\text{alpha} := (\text{value} - \text{interval.minValue}()) / \text{interval.width}();$

Parameters

<i>interval</i>	Range for all values
<i>value</i>	Value to map into a RGB value

Returns

RGB value, with an alpha value

Implements [QwtColorMap](#).

12.8.3.3 `setColor()`

```
void QwtAlphaColorMap::setColor (
    const QColor & color )
```

Set the color

Parameters

<i>color</i>	Color
--------------	-------

See also

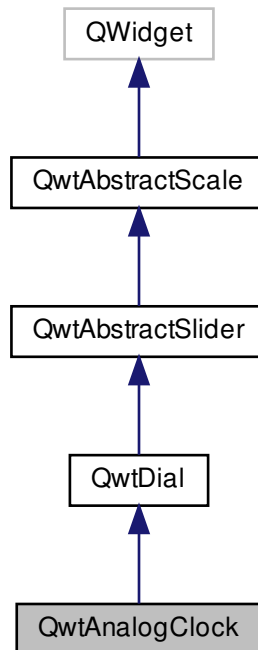
[color\(\)](#)

12.9 QwtAnalogClock Class Reference

An analog clock.

```
#include <qwt_analog_clock.h>
```

Inheritance diagram for QwtAnalogClock:



Public Types

- enum [Hand](#) { [SecondHand](#), [MinuteHand](#), [HourHand](#), [NHands](#) }

Public Slots

- void [setCurrentTime](#) ()
Set the current time.
- void [setTime](#) (const [QTime](#) &)

Public Member Functions

- [QwtAnalogClock](#) ([QWidget](#) *parent=NULL)
- virtual [~QwtAnalogClock](#) ()
Destructor.
- void [setHand](#) ([Hand](#), [QwtDialNeedle](#) *)
- const [QwtDialNeedle](#) * [hand](#) ([Hand](#)) const
- [QwtDialNeedle](#) * [hand](#) ([Hand](#))

Protected Member Functions

- virtual void [drawNeedle](#) (QPainter *, const QPointF &, double radius, double direction, QPalette::ColorGroup) const
Draw the needle.
- virtual void [drawHand](#) (QPainter *, [Hand](#), const QPointF &, double radius, double direction, QPalette::ColorGroup) const

Additional Inherited Members

12.9.1 Detailed Description

An analog clock.

Example

```
#include <qwt_analog_clock.h>

QwtAnalogClock *clock = new QwtAnalogClock(...);
clock->scaleDraw()->setPenWidth(3);
clock->setLineWidth(6);
clock->setFrameShadow(QwtDial::Sunken);
clock->setTime();

// update the clock every second
QTimer *timer = new QTimer(clock);
timer->connect(timer, SIGNAL(timeout()), clock, SLOT(setCurrentTime()));
timer->start(1000);
```

Note

The examples/dials example shows how to use [QwtAnalogClock](#).

12.9.2 Member Enumeration Documentation

12.9.2.1 Hand

```
enum QwtAnalogClock::Hand
```

Hand type

See also

[setHand\(\)](#), [hand\(\)](#)

Enumerator

SecondHand	Needle displaying the seconds.
MinuteHand	Needle displaying the minutes.
HourHand	Needle displaying the hours.
NHands	Number of needles.

12.9.3 Constructor & Destructor Documentation

12.9.3.1 QwtAnalogClock()

```
QwtAnalogClock::QwtAnalogClock (
    QWidget * parent = NULL ) [explicit]
```

Constructor

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.9.4 Member Function Documentation

12.9.4.1 drawHand()

```
void QwtAnalogClock::drawHand (
    QPainter * painter,
    Hand hd,
    const QPointF & center,
    double radius,
    double direction,
    QPalette::ColorGroup cg ) const [protected], [virtual]
```

Draw a clock hand

Parameters

<i>painter</i>	Painter
<i>hd</i>	Specify the type of hand
<i>center</i>	Center of the clock
<i>radius</i>	Maximum length for the hands
<i>direction</i>	Direction of the hand in degrees, counter clockwise
<i>cg</i>	ColorGroup

12.9.4.2 drawNeedle()

```
void QwtAnalogClock::drawNeedle (
    QPainter * painter,
    const QPointF & center,
    double radius,
    double dir,
    QPalette::ColorGroup colorGroup ) const [protected], [virtual]
```

Draw the needle.

A clock has no single needle but three hands instead. [drawNeedle\(\)](#) translates [value\(\)](#) into directions for the hands and calls [drawHand\(\)](#).

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the clock
<i>radius</i>	Maximum length for the hands
<i>dir</i>	Dummy, not used.
<i>colorGroup</i>	ColorGroup

See also

[drawHand\(\)](#)

Reimplemented from [QwtDial](#).

12.9.4.3 [hand\(\)](#) [1/2]

```
const QwtDialNeedle * QwtAnalogClock::hand (
    Hand hd ) const
```

Returns

Clock hand

Parameters

<i>hd</i>	Specifies the type of hand
-----------	----------------------------

See also

[setHand\(\)](#)

12.9.4.4 [hand\(\)](#) [2/2]

```
QwtDialNeedle * QwtAnalogClock::hand (
    Hand hd )
```

Returns

Clock hand

Parameters

<i>hd</i>	Specifies the type of hand
-----------	----------------------------

See also

[setHand\(\)](#)

12.9.4.5 setHand()

```
void QwtAnalogClock::setHand (
    Hand hand,
    QwtDialNeedle * needle )
```

Set a clock hand

Parameters

<i>hand</i>	Specifies the type of hand
<i>needle</i>	Hand

See also

[hand\(\)](#)

12.9.4.6 setTime

```
void QwtAnalogClock::setTime (
    const QTime & time ) [slot]
```

Set a time

Parameters

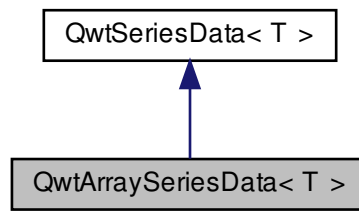
<i>time</i>	Time to display
-------------	-----------------

12.10 QwtArraySeriesData< T > Class Template Reference

Template class for data, that is organized as QVector.

```
#include <qwt_series_data.h>
```

Inheritance diagram for QwtArraySeriesData< T >:



Public Member Functions

- [QwtArraySeriesData](#) ()
Constructor.
- [QwtArraySeriesData](#) (const QVector< T > &[samples](#))
- void [setSamples](#) (const QVector< T > &[samples](#))
- const QVector< T > [samples](#) () const
- virtual size_t [size](#) () const
- virtual T [sample](#) (size_t index) const

Protected Attributes

- QVector< T > [d_samples](#)
Vector of samples.

12.10.1 Detailed Description

```
template<typename T>
class QwtArraySeriesData< T >
```

Template class for data, that is organized as QVector.

QVector uses implicit data sharing and can be passed around as argument efficiently.

12.10.2 Constructor & Destructor Documentation

12.10.2.1 QwtArraySeriesData()

```
template<typename T>
QwtArraySeriesData< T >::QwtArraySeriesData (
    const QVector< T > & samples )
```

Constructor

Parameters

<i>samples</i>	Array of samples
----------------	------------------

12.10.3 Member Function Documentation**12.10.3.1 sample()**

```
template<typename T >
T QwtArraySeriesData< T >::sample (
    size_t index ) const [virtual]
```

Returns

Sample at a specific position

Parameters

<i>index</i>	Index
--------------	-------

Returns

Sample at position index

Implements [QwtSeriesData< T >](#).

12.10.3.2 samples()

```
template<typename T >
const QVector< T > QwtArraySeriesData< T >::samples ( ) const
```

Returns

Array of samples

12.10.3.3 setSamples()

```
template<typename T>
void QwtArraySeriesData< T >::setSamples (
    const QVector< T > & samples )
```

Assign an array of samples

Parameters

<i>samples</i>	Array of samples
----------------	------------------

12.10.3.4 size()

```
template<typename T >
size_t QwtArraySeriesData< T >::size ( ) const [virtual]
```

Returns

Number of samples

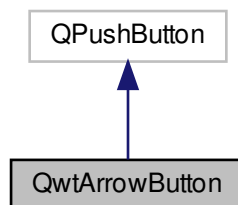
Implements [QwtSeriesData< T >](#).

12.11 QwtArrowButton Class Reference

Arrow Button.

```
#include <qwt_arrow_button.h>
```

Inheritance diagram for QwtArrowButton:



Public Member Functions

- [QwtArrowButton](#) (int *num*, Qt::ArrowType, QWidget *parent=NULL)
- virtual [~QwtArrowButton](#) ()
Destructor.
- Qt::ArrowType [arrowType](#) () const
The direction of the arrows.
- int [num](#) () const
The number of arrows.
- virtual QSize [sizeHint](#) () const
- virtual QSize [minimumSizeHint](#) () const
Return a minimum size hint.

Protected Member Functions

- virtual void [paintEvent](#) (QPaintEvent *event)
- virtual void [drawButtonLabel](#) (QPainter *)
Draw the button label.
- virtual void [drawArrow](#) (QPainter *, const QRect &, Qt::ArrowType) const
- virtual QRect [labelRect](#) () const
- virtual QSize [arrowSize](#) (Qt::ArrowType, const QSize &boundingSize) const
- virtual void [keyPressEvent](#) (QKeyEvent *)

autoRepeat for the space keys

12.11.1 Detailed Description

Arrow Button.

A push button with one or more filled triangles on its front. An Arrow button can have 1 to 3 arrows in a row, pointing up, down, left or right.

12.11.2 Constructor & Destructor Documentation

12.11.2.1 QwtArrowButton()

```
QwtArrowButton::QwtArrowButton (
    int num,
    Qt::ArrowType arrowType,
    QWidget * parent = NULL ) [explicit]
```

Parameters

<i>num</i>	Number of arrows
<i>arrowType</i>	see Qt::ArrowType in the Qt docs.
<i>parent</i>	Parent widget

12.11.3 Member Function Documentation

12.11.3.1 arrowSize()

```
QSize QwtArrowButton::arrowSize (
    Qt::ArrowType arrowType,
    const QSize & boundingSize ) const [protected], [virtual]
```

Calculate the size for a arrow that fits into a rectangle of a given size

Parameters

<i>arrowType</i>	Arrow type
<i>boundingSize</i>	Bounding size

Returns

Size of the arrow

12.11.3.2 drawArrow()

```
void QwtArrowButton::drawArrow (
    QPainter * painter,
    const QRect & r,
    Qt::ArrowType arrowType ) const [protected], [virtual]
```

Draw an arrow int a bounding rectangle

Parameters

<i>painter</i>	Painter
<i>r</i>	Rectangle where to paint the arrow
<i>arrowType</i>	Arrow type

12.11.3.3 drawButtonLabel()

```
void QwtArrowButton::drawButtonLabel (
    QPainter * painter ) [protected], [virtual]
```

Draw the button label.

Parameters

<i>painter</i>	Painter
----------------	---------

See also

The Qt Manual for QPushButton

12.11.3.4 labelRect()

```
QRect QwtArrowButton::labelRect ( ) const [protected], [virtual]
```

Returns

the bounding rectangle for the label

12.11.3.5 `paintEvent()`

```
void QwtArrowButton::paintEvent (
    QPainter * event ) [protected], [virtual]
```

Paint event handler

Parameters

<i>event</i>	Paint event
--------------	-------------

12.11.3.6 `sizeHint()`

```
QSize QwtArrowButton::sizeHint ( ) const [virtual]
```

Returns

a size hint

12.12 QwtClipper Class Reference

Some clipping algorithms.

```
#include <qwt_clipper.h>
```

Static Public Member Functions

- static QPolygon [clipPolygon](#) (const QRect &, const QPolygon &, bool closePolygon=false)
- static QPolygon [clipPolygon](#) (const QRectF &, const QPolygon &, bool closePolygon=false)
- static QPolygonF [clipPolygonF](#) (const QRectF &, const QPolygonF &, bool closePolygon=false)
- static QVector< [QwtInterval](#) > [clipCircle](#) (const QRectF &, const QPointF &, double radius)

12.12.1 Detailed Description

Some clipping algorithms.

12.12.2 Member Function Documentation

12.12.2.1 `clipCircle()`

```
QVector< QwtInterval > QwtClipper::clipCircle (
    const QRectF & clipRect,
    const QPointF & center,
    double radius ) [static]
```

Circle clipping

[clipCircle\(\)](#) divides a circle into intervals of angles representing arcs of the circle. When the circle is completely inside the clip rectangle an interval [0.0, 2 * M_PI] is returned.

Parameters

<i>clipRect</i>	Clip rectangle
<i>center</i>	Center of the circle
<i>radius</i>	Radius of the circle

Returns

Arcs of the circle

12.12.2.2 clipPolygon() [1/2]

```
QPolygon QwtClipper::clipPolygon (
    const QRect & clipRect,
    const QPolygon & polygon,
    bool closePolygon = false ) [static]
```

Sutherland-Hodgman polygon clipping

Parameters

<i>clipRect</i>	Clip rectangle
<i>polygon</i>	Polygon
<i>closePolygon</i>	True, when the polygon is closed

Returns

Clipped polygon

12.12.2.3 clipPolygon() [2/2]

```
QPolygon QwtClipper::clipPolygon (
    const QRectF & clipRect,
    const QPolygon & polygon,
    bool closePolygon = false ) [static]
```

Sutherland-Hodgman polygon clipping

Parameters

<i>clipRect</i>	Clip rectangle
<i>polygon</i>	Polygon
<i>closePolygon</i>	True, when the polygon is closed

Returns

Clipped polygon

12.12.2.4 clipPolygonF()

```
QPolygonF QwtClipper::clipPolygonF (
    const QRectF & clipRect,
    const QPolygonF & polygon,
    bool closePolygon = false ) [static]
```

Sutherland-Hodgman polygon clipping

Parameters

<i>clipRect</i>	Clip rectangle
<i>polygon</i>	Polygon
<i>closePolygon</i>	True, when the polygon is closed

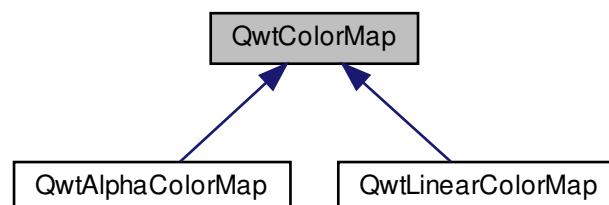
Returns

Clipped polygon

12.13 QwtColorMap Class Reference[QwtColorMap](#) is used to map values into colors.

```
#include <qwt_color_map.h>
```

Inheritance diagram for QwtColorMap:

**Public Types**

- enum [Format](#) { [RGB](#), [Indexed](#) }

Public Member Functions

- [QwtColorMap](#) ([Format](#)=[QwtColorMap::RGB](#))
Constructor.
- virtual [~QwtColorMap](#) ()
Destructor.
- [Format](#) [format](#) () const
- virtual [QRgb](#) [rgb](#) (const [QwtInterval](#) &interval, double value) const =0
- virtual unsigned char [colorIndex](#) (const [QwtInterval](#) &interval, double value) const =0
- [QColor](#) [color](#) (const [QwtInterval](#) &, double value) const
- virtual [QVector](#)< [QRgb](#) > [colorTable](#) (const [QwtInterval](#) &) const

12.13.1 Detailed Description

[QwtColorMap](#) is used to map values into colors.

For displaying 3D data on a 2D plane the 3rd dimension is often displayed using colors, like f.e in a spectrogram.

Each color map is optimized to return colors for only one of the following image formats:

- [QImage::Format_Indexed8](#)
- [QImage::Format_ARGB32](#)

See also

[QwtPlotSpectrogram](#), [QwtScaleWidget](#)

12.13.2 Member Enumeration Documentation

12.13.2.1 Format

```
enum QwtColorMap::Format
```

Format for color mapping

See also

[rgb\(\)](#), [colorIndex\(\)](#), [colorTable\(\)](#)

Enumerator

RGB	The map is intended to map into RGB values.
Indexed	The map is intended to map into 8 bit values, that are indices into the color table.

12.13.3 Member Function Documentation

12.13.3.1 `color()`

```
QColor QwtColorMap::color (
    const QwtInterval & interval,
    double value ) const [inline]
```

Map a value into a color

Parameters

<i>interval</i>	Valid interval for values
<i>value</i>	Value

Returns

Color corresponding to value

Warning

This method is slow for Indexed color maps. If it is necessary to map many values, its better to get the color table once and find the color using [colorIndex\(\)](#).

12.13.3.2 `colorIndex()`

```
virtual unsigned char QwtColorMap::colorIndex (
    const QwtInterval & interval,
    double value ) const [pure virtual]
```

Map a value of a given interval into a color index

Parameters

<i>interval</i>	Range for the values
<i>value</i>	Value

Returns

color index, corresponding to value

Implemented in [QwtLinearColorMap](#).

12.13.3.3 colorTable()

```
QVector< QRgb > QwtColorMap::colorTable (
    const QwtInterval & interval ) const [virtual]
```

Build and return a color map of 256 colors

The color table is needed for rendering indexed images in combination with using [colorIndex\(\)](#).

Parameters

<i>interval</i>	Range for the values
-----------------	----------------------

Returns

A color table, that can be used for a QImage

12.13.3.4 format()

```
QwtColorMap::Format QwtColorMap::format ( ) const [inline]
```

Returns

Intended format of the color map

See also

[Format](#)

12.13.3.5 rgb()

```
virtual QRgb QwtColorMap::rgb (
    const QwtInterval & interval,
    double value ) const [pure virtual]
```

Map a value of a given interval into a RGB value.

Parameters

<i>interval</i>	Range for the values
<i>value</i>	Value

Returns

RGB value, corresponding to value

Implemented in [QwtAlphaColorMap](#), and [QwtLinearColorMap](#).

12.14 QwtColumnRect Class Reference

Directed rectangle representing bounding rectangle and orientation of a column.

```
#include <qwt_column_symbol.h>
```

Public Types

- enum [Direction](#) { [LeftToRight](#), [RightToLeft](#), [BottomToTop](#), [TopToBottom](#) }
Direction of the column.

Public Member Functions

- [QwtColumnRect](#) ()
Build an rectangle with invalid intervals directed BottomToTop.
- [QRectF toRect](#) () const
- [Qt::Orientation orientation](#) () const

Public Attributes

- [QwtInterval hInterval](#)
Interval for the horizontal coordinates.
- [QwtInterval vInterval](#)
Interval for the vertical coordinates.
- [Direction direction](#)
Direction.

12.14.1 Detailed Description

Directed rectangle representing bounding rectangle and orientation of a column.

12.14.2 Member Enumeration Documentation

12.14.2.1 Direction

```
enum QwtColumnRect::Direction
```

Direction of the column.

Enumerator

LeftToRight	From left to right.
RightToLeft	From right to left.
BottomToTop	From bottom to top.
TopToBottom	From top to bottom.

12.14.3 Member Function Documentation

12.14.3.1 orientation()

```
Qt::Orientation QwtColumnRect::orientation ( ) const [inline]
```

Returns

Orientation

12.14.3.2 toRect()

```
QRectF QwtColumnRect::toRect ( ) const [inline]
```

Returns

A normalized QRect built from the intervals

12.15 QwtColumnSymbol Class Reference

A drawing primitive for columns.

```
#include <qwt_column_symbol.h>
```

Public Types

- enum [Style](#) { [NoStyle](#) = -1, [Box](#), [UserStyle](#) = 1000 }
- enum [FrameStyle](#) { [NoFrame](#), [Plain](#), [Raised](#) }

Public Member Functions

- [QwtColumnSymbol](#) ([Style](#)=[NoStyle](#))
- virtual [~QwtColumnSymbol](#) ()
Destructor.
- void [setFrameStyle](#) ([FrameStyle](#))
- [FrameStyle](#) [frameStyle](#) () const
- void [setLineWidth](#) (int width)
- int [lineWidth](#) () const
- void [setPalette](#) (const [QPalette](#) &)
- const [QPalette](#) & [palette](#) () const
- void [setStyle](#) ([Style](#))
- [Style](#) [style](#) () const
- virtual void [draw](#) ([QPainter](#) *, const [QwtColumnRect](#) &) const

Protected Member Functions

- void [drawBox](#) (QPainter *, const [QwtColumnRect](#) &) const

12.15.1 Detailed Description

A drawing primitive for columns.

12.15.2 Member Enumeration Documentation

12.15.2.1 FrameStyle

```
enum QwtColumnSymbol::FrameStyle
```

Frame Style used in [Box style\(\)](#).

See also

[Style](#), [setFrameStyle\(\)](#), [frameStyle\(\)](#), [setStyle\(\)](#), [setPalette\(\)](#)

Enumerator

NoFrame	No frame.
Plain	A plain frame style.
Raised	A raised frame style.

12.15.2.2 Style

```
enum QwtColumnSymbol::Style
```

Style

See also

[setStyle\(\)](#), [style\(\)](#)

Enumerator

NoStyle	No Style, the symbol draws nothing.
Box	The column is painted with a frame depending on the frameStyle() and lineWidth() using the palette() .
UserStyle	Styles \geq QwtColumnSymbol::UserStyle are reserved for derived classes of QwtColumnSymbol that overload draw() with additional application specific symbol types.

12.15.3 Constructor & Destructor Documentation

12.15.3.1 QwtColumnSymbol()

```
QwtColumnSymbol::QwtColumnSymbol (
    Style style = NoStyle )
```

Constructor

Parameters

<i>style</i>	Style of the symbol
--------------	---------------------

See also

[setStyle\(\)](#), [style\(\)](#), [Style](#)

12.15.4 Member Function Documentation

12.15.4.1 draw()

```
void QwtColumnSymbol::draw (
    QPainter * painter,
    const QwtColumnRect & rect ) const [virtual]
```

Draw the symbol depending on its style.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Directed rectangle

See also

[drawBox\(\)](#)

12.15.4.2 drawBox()

```
void QwtColumnSymbol::drawBox (
    QPainter * painter,
    const QwtColumnRect & rect ) const [protected]
```

Draw the symbol when it is in Box style.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Directed rectangle

See also

[draw\(\)](#)

12.15.4.3 frameStyle()

```
QwtColumnSymbol::FrameStyle QwtColumnSymbol::frameStyle ( ) const
```

Returns

Current frame style, that is used for the Box style.

See also

[setFrameStyle\(\)](#), [lineWidth\(\)](#), [setStyle\(\)](#)

12.15.4.4 lineWidth()

```
int QwtColumnSymbol::lineWidth ( ) const
```

Returns

Line width of the frame, that is used for the Box style.

See also

[setLineWidth\(\)](#), [frameStyle\(\)](#), [setStyle\(\)](#)

12.15.4.5 palette()

```
const QPalette & QwtColumnSymbol::palette ( ) const
```

Returns

Current palette

See also

[setPalette\(\)](#)

12.15.4.6 setFrameStyle()

```
void QwtColumnSymbol::setFrameStyle (
    FrameStyle frameStyle )
```

Set the frame, that is used for the Box style.

Parameters

<i>frameStyle</i>	Frame style
-------------------	-------------

See also

[frameStyle\(\)](#), [setLineWidth\(\)](#), [setStyle\(\)](#)

12.15.4.7 setLineWidth()

```
void QwtColumnSymbol::setLineWidth (
    int width )
```

Set the line width of the frame, that is used for the Box style.

Parameters

<i>width</i>	Width
--------------	-------

See also

[lineWidth\(\)](#), [setFrameStyle\(\)](#)

12.15.4.8 setPalette()

```
void QwtColumnSymbol::setPalette (
    const QPalette & palette )
```

Assign a palette for the symbol

Parameters

<i>palette</i>	Palette
----------------	---------

See also

[palette\(\)](#), [setStyle\(\)](#)

12.15.4.9 setStyle()

```
void QwtColumnSymbol::setStyle (
    Style style )
```

Specify the symbol style

Parameters

<i>style</i>	Style
--------------	-------

See also[style\(\)](#), [setPalette\(\)](#)**12.15.4.10 style()**

```
QwtColumnSymbol::Style QwtColumnSymbol::style ( ) const
```

Returns

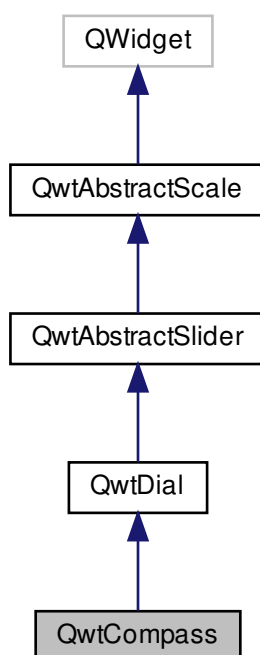
Current symbol style

See also[setStyle\(\)](#)**12.16 QwtCompass Class Reference**

A Compass Widget.

```
#include <qwt_compass.h>
```

Inheritance diagram for QwtCompass:



Public Member Functions

- [QwtCompass](#) (QWidget *parent=NULL)
Constructor.
- virtual [~QwtCompass](#) ()
Destructor.
- void [setRose](#) (QwtCompassRose *rose)
- const [QwtCompassRose](#) * [rose](#) () const
- [QwtCompassRose](#) * [rose](#) ()

Protected Member Functions

- virtual void [drawRose](#) (QPainter *, const QPointF ¢er, double radius, double north, QPalette::ColorGroup) const
- virtual void [drawScaleContents](#) (QPainter *, const QPointF ¢er, double radius) const
- virtual void [keyPressEvent](#) (QKeyEvent *)

Additional Inherited Members

12.16.1 Detailed Description

A Compass Widget.

[QwtCompass](#) is a widget to display and enter directions. It consists of a scale, an optional needle and rose.

Note

The examples/dials example shows how to use [QwtCompass](#).

12.16.2 Constructor & Destructor Documentation

12.16.2.1 QwtCompass()

```
QwtCompass::QwtCompass (
    QWidget * parent = NULL ) [explicit]
```

Constructor.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

Create a compass widget with a scale, no needle and no rose. The default origin is 270.0 with no valid value. It accepts mouse and keyboard inputs and has no step size. The default mode is [QwtDial::RotateNeedle](#).

12.16.3 Member Function Documentation

12.16.3.1 drawRose()

```
void QwtCompass::drawRose (
    QPainter * painter,
    const QPointF & center,
    double radius,
    double north,
    QPalette::ColorGroup cg ) const [protected], [virtual]
```

Draw the compass rose

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the compass
<i>radius</i>	of the circle, where to paint the rose
<i>north</i>	Direction pointing north, in degrees counter clockwise
<i>cg</i>	Color group

12.16.3.2 drawScaleContents()

```
void QwtCompass::drawScaleContents (
    QPainter * painter,
    const QPointF & center,
    double radius ) const [protected], [virtual]
```

Draw the contents of the scale

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the content circle
<i>radius</i>	Radius of the content circle

Reimplemented from [QwtDial](#).

12.16.3.3 keyPressEvent()

```
void QwtCompass::keyPressEvent (
    QKeyEvent * kev ) [protected], [virtual]
```

Handles key events

Beside the keys described in [QwtDial::keyPressEvent](#) numbers from 1-9 (without 5) set the direction according to their position on the num pad.

See also

[isReadOnly\(\)](#)

Reimplemented from [QwtAbstractSlider](#).

12.16.3.4 `rose()` [1/2]

```
const QwtCompassRose * QwtCompass::rose ( ) const
```

Returns

`rose`

See also

[setRose\(\)](#)

12.16.3.5 `rose()` [2/2]

```
QwtCompassRose * QwtCompass::rose ( )
```

Returns

`rose`

See also

[setRose\(\)](#)

12.16.3.6 `setRose()`

```
void QwtCompass::setRose (
    QwtCompassRose * rose )
```

Set a rose for the compass

Parameters

<i>rose</i>	Compass rose
-------------	--------------

Warning

The rose will be deleted, when a different rose is set or in `~QwtCompass`

See also

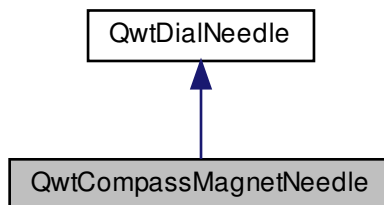
[rose\(\)](#)

12.17 QwtCompassMagnetNeedle Class Reference

A magnet needle for compass widgets.

```
#include <qwt_dial_needle.h>
```

Inheritance diagram for QwtCompassMagnetNeedle:



Public Types

- enum [Style](#) { [TriangleStyle](#), [ThinStyle](#) }
Style of the needle.

Public Member Functions

- [QwtCompassMagnetNeedle](#) ([Style=TriangleStyle](#), const QColor &light=Qt::white, const QColor &dark=Qt::red)
Constructor.

Protected Member Functions

- virtual void [drawNeedle](#) (QPainter *, double length, QPalette::ColorGroup) const

12.17.1 Detailed Description

A magnet needle for compass widgets.

A magnet needle points to two opposite directions indicating north and south.

The following colors are used:

- QPalette::Light
Used for pointing south
- QPalette::Dark
Used for pointing north
- QPalette::Base
Knob (ThinStyle only)

See also

[QwtDial](#), [QwtCompass](#)

12.17.2 Member Enumeration Documentation

12.17.2.1 Style

enum [QwtCompassMagnetNeedle::Style](#)

Style of the needle.

Enumerator

TriangleStyle	A needle with a triangular shape.
ThinStyle	A thin needle.

12.17.3 Member Function Documentation

12.17.3.1 drawNeedle()

```
void QwtCompassMagnetNeedle::drawNeedle (
    QPainter * painter,
    double length,
    QPalette::ColorGroup colorGroup ) const [protected], [virtual]
```

Draw the needle

Parameters

<i>painter</i>	Painter
<i>length</i>	Length of the needle
<i>colorGroup</i>	Color group, used for painting

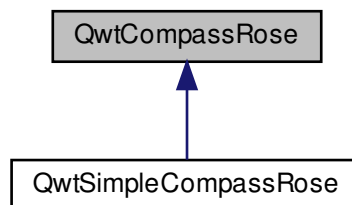
Implements [QwtDialNeedle](#).

12.18 QwtCompassRose Class Reference

Abstract base class for a compass rose.

```
#include <qwt_compass_rose.h>
```

Inheritance diagram for QwtCompassRose:



Public Member Functions

- virtual [~QwtCompassRose](#) ()
Destructor.
- virtual void [setPalette](#) (const QPalette &p)
Assign a palette.
- const QPalette & [palette](#) () const
- virtual void [draw](#) (QPainter *painter, const QPointF ¢er, double radius, double north, QPalette::ColorGroup colorGroup=QPalette::Active) const =0

12.18.1 Detailed Description

Abstract base class for a compass rose.

12.18.2 Member Function Documentation

12.18.2.1 draw()

```
virtual void QwtCompassRose::draw (
    QPainter * painter,
    const QPointF & center,
    double radius,
    double north,
    QPalette::ColorGroup colorGroup = QPalette::Active ) const [pure virtual]
```

Draw the rose

Parameters

<i>painter</i>	Painter
<i>center</i>	Center point
<i>radius</i>	Radius of the rose
<i>north</i>	Position
<i>colorGroup</i>	Color group

Implemented in [QwtSimpleCompassRose](#).

12.18.2.2 palette()

```
const QPalette& QwtCompassRose::palette ( ) const [inline]
```

Returns

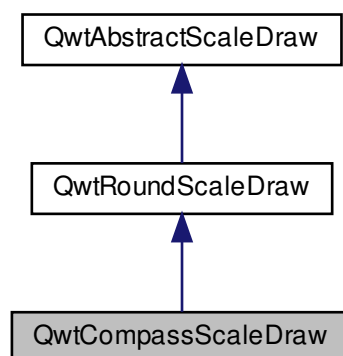
Current palette

12.19 QwtCompassScaleDraw Class Reference

A special scale draw made for [QwtCompass](#).

```
#include <qwt_compass.h>
```

Inheritance diagram for QwtCompassScaleDraw:



Public Member Functions

- [QwtCompassScaleDraw](#) ()
Constructor.
- [QwtCompassScaleDraw](#) (const QMap< double, QString > &map)
Constructor.
- void [setLabelMap](#) (const QMap< double, QString > &map)
Set a map, mapping values to labels.
- QMap< double, QString > [labelMap](#) () const
- virtual [QwtText label](#) (double value) const

Additional Inherited Members

12.19.1 Detailed Description

A special scale draw made for [QwtCompass](#).

[QwtCompassScaleDraw](#) maps values to strings using a special map, that can be modified by the application

The default map consists of the labels N, NE, E, SE, S, SW, W, NW.

See also

[QwtCompass](#)

12.19.2 Constructor & Destructor Documentation

12.19.2.1 [QwtCompassScaleDraw\(\)](#) [1/2]

```
QwtCompassScaleDraw::QwtCompassScaleDraw ( ) [explicit]
```

Constructor.

Initializes a label map for multiples of 45 degrees

12.19.2.2 [QwtCompassScaleDraw\(\)](#) [2/2]

```
QwtCompassScaleDraw::QwtCompassScaleDraw (
    const QMap< double, QString > & map ) [explicit]
```

Constructor.

Parameters

<i>map</i>	Value to label map
------------	--------------------

12.19.3 Member Function Documentation

12.19.3.1 label()

```
QwtText QwtCompassScaleDraw::label (
    double value ) const [virtual]
```

Map a value to a corresponding label

Parameters

<i>value</i>	Value that will be mapped
--------------	---------------------------

[label\(\)](#) looks in the [labelMap\(\)](#) for a corresponding label for value or returns an null text.

Returns

Label

See also

[labelMap\(\)](#), [setLabelMap\(\)](#)

Reimplemented from [QwtAbstractScaleDraw](#).

12.19.3.2 labelMap()

```
QMap< double, QString > QwtCompassScaleDraw::labelMap ( ) const
```

Returns

map, mapping values to labels

See also

[setLabelMap\(\)](#)

12.19.3.3 setLabelMap()

```
void QwtCompassScaleDraw::setLabelMap (
    const QMap< double, QString > & map )
```

Set a map, mapping values to labels.

Parameters

<i>map</i>	Value to label map
------------	--------------------

The values of the major ticks are found by looking into this map. The default map consists of the labels N, NE, E, SE, S, SW, W, NW.

Warning

The map will have no effect for values that are no major tick values. Major ticks can be changed by `QwtScaleDraw::setScale`

See also

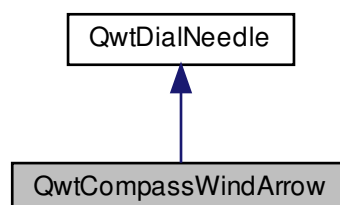
[labelMap\(\)](#), [scaleDraw\(\)](#), [setScale\(\)](#)

12.20 QwtCompassWindArrow Class Reference

An indicator for the wind direction.

```
#include <qwt_dial_needle.h>
```

Inheritance diagram for QwtCompassWindArrow:

**Public Types**

- enum [Style](#) { [Style1](#), [Style2](#) }
Style of the arrow.

Public Member Functions

- [QwtCompassWindArrow](#) ([Style](#), const QColor &light=Qt::white, const QColor &dark=Qt::gray)

Protected Member Functions

- virtual void [drawNeedle](#) (QPainter *, double length, QPalette::ColorGroup) const

12.20.1 Detailed Description

An indicator for the wind direction.

[QwtCompassWindArrow](#) shows the direction where the wind comes from.

- `QPalette::Light`
Used for Style1, or the light half of Style2
- `QPalette::Dark`
Used for the dark half of Style2

See also

[QwtDial](#), [QwtCompass](#)

12.20.2 Member Enumeration Documentation

12.20.2.1 Style

enum [QwtCompassWindArrow::Style](#)

Style of the arrow.

Enumerator

Style1	A needle pointing to the center.
Style2	A needle pointing to the center.

12.20.3 Constructor & Destructor Documentation

12.20.3.1 QwtCompassWindArrow()

```
QwtCompassWindArrow::QwtCompassWindArrow (
    Style style,
    const QColor & light = Qt::white,
    const QColor & dark = Qt::gray )
```

Constructor

Parameters

<i>style</i>	Arrow style
<i>light</i>	Light color
<i>dark</i>	Dark color

12.20.4 Member Function Documentation

12.20.4.1 drawNeedle()

```
void QwtCompassWindArrow::drawNeedle (
    QPainter * painter,
    double length,
    QPalette::ColorGroup colorGroup ) const    [protected], [virtual]
```

Draw the needle

Parameters

<i>painter</i>	Painter
<i>length</i>	Length of the needle
<i>colorGroup</i>	Color group, used for painting

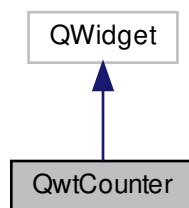
Implements [QwtDialNeedle](#).

12.21 QwtCounter Class Reference

The Counter Widget.

```
#include <qwt_counter.h>
```

Inheritance diagram for QwtCounter:



Public Types

- enum [Button](#) { [Button1](#), [Button2](#), [Button3](#), [ButtonCnt](#) }
Button index.

Public Slots

- void [setValue](#) (double)
Set a new value without adjusting to the step raster.

Signals

- void [buttonReleased](#) (double [value](#))
- void [valueChanged](#) (double [value](#))

Public Member Functions

- [QwtCounter](#) (QWidget *parent=NULL)
- virtual [~QwtCounter](#) ()
Destructor.
- void [setValid](#) (bool)
- bool [isValid](#) () const
- void [setWrapping](#) (bool)
En/Disable wrapping.
- bool [wrapping](#) () const
- bool [isReadOnly](#) () const
- void [setReadOnly](#) (bool)
Allow/disallow the user to manually edit the value.
- void [setNumButtons](#) (int)
- int [numButtons](#) () const
- void [setIncSteps](#) ([QwtCounter::Button](#), int numSteps)
- int [incSteps](#) ([QwtCounter::Button](#)) const
- virtual QSize [sizeHint](#) () const
A size hint.
- double [singleStep](#) () const
- void [setSingleStep](#) (double stepSize)
Set the step size of the counter.
- void [setRange](#) (double min, double max)
Set the minimum and maximum values.
- double [minimum](#) () const
- void [setMinimum](#) (double)
- double [maximum](#) () const
- void [setMaximum](#) (double)
- void [setStepButton1](#) (int nSteps)
- int [stepButton1](#) () const
returns the number of increment steps for button 1
- void [setStepButton2](#) (int nSteps)
- int [stepButton2](#) () const
returns the number of increment steps for button 2
- void [setStepButton3](#) (int nSteps)
- int [stepButton3](#) () const
returns the number of increment steps for button 3
- double [value](#) () const

Protected Member Functions

- virtual bool [event](#) (QEvent *)
- virtual void [wheelEvent](#) (QWheelEvent *)
- virtual void [keyPressEvent](#) (QKeyEvent *)

12.21.1 Detailed Description

The Counter Widget.

A Counter consists of a label displaying a number and one ore more (up to three) push buttons on each side of the label which can be used to increment or decrement the counter's value.

A counter has a range from a minimum value to a maximum value and a step size. When the wrapping property is set the counter is circular.

The number of steps by which a button increments or decrements the value can be specified using [setIncSteps\(\)](#). The number of buttons can be changed with [setNumButtons\(\)](#).

Example:

```
#include <qwt_counter.h>

QwtCounter *counter = new QwtCounter(parent);

counter->setRange(0.0, 100.0);           // From 0.0 to 100
counter->setSingleStep( 1.0 );           // Step size 1.0
counter->setNumButtons(2);               // Two buttons each side
counter->setIncSteps(QwtCounter::Button1, 1); // Button 1 increments 1 step
counter->setIncSteps(QwtCounter::Button2, 20); // Button 2 increments 20
      steps

connect(counter, SIGNAL(valueChanged(double)), myClass, SLOT(newValue(double)));
```

12.21.2 Member Enumeration Documentation

12.21.2.1 Button

```
enum QwtCounter::Button
```

Button index.

Enumerator

Button1	Button intended for minor steps.
Button2	Button intended for medium steps.
Button3	Button intended for large steps.
ButtonCnt	Number of buttons.

12.21.3 Constructor & Destructor Documentation

12.21.3.1 QwtCounter()

```
QwtCounter::QwtCounter (
    QWidget * parent = NULL ) [explicit]
```

The counter is initialized with a range is set to [0.0, 1.0] with 0.01 as single step size. The value is invalid.

The default number of buttons is set to 2. The default increments are:

- Button 1: 1 step
- Button 2: 10 steps
- Button 3: 100 steps

Parameters

<i>parent</i>	
---------------	--

12.21.4 Member Function Documentation

12.21.4.1 buttonReleased

```
void QwtCounter::buttonReleased (  
    double value ) [signal]
```

This signal is emitted when a button has been released

Parameters

<i>value</i>	The new value
--------------	---------------

12.21.4.2 event()

```
bool QwtCounter::event (  
    QEvent * event ) [protected], [virtual]
```

Handle QEvent::PolishRequest events

Parameters

<i>event</i>	Event
--------------	-------

Returns

see QWidget::event()

12.21.4.3 incSteps()

```
int QwtCounter::incSteps (
    QwtCounter::Button button ) const
```

Returns

The number of steps by which a specified button increments the value or 0 if the button is invalid.

Parameters

<i>button</i>	Button index
---------------	--------------

See also

[setIncSteps\(\)](#)

12.21.4.4 isReadOnly()

```
bool QwtCounter::isReadOnly ( ) const
```

Returns

True, when the line line edit is read only. (default is no)

See also

[setReadOnly\(\)](#)

12.21.4.5 isValid()

```
bool QwtCounter::isValid ( ) const
```

Returns

True, if the value is valid

See also

[setValid\(\)](#), [setValue\(\)](#)

12.21.4.6 keyPressEvent()

```
void QwtCounter::keyPressEvent (
    QKeyEvent * event ) [protected], [virtual]
```

Handle key events

- Ctrl + Qt::Key_Home
Step to [minimum\(\)](#)
- Ctrl + Qt::Key_End
Step to [maximum\(\)](#)
- Qt::Key_Up
Increment by `incSteps(QwtCounter::Button1)`
- Qt::Key_Down
Decrement by `incSteps(QwtCounter::Button1)`
- Qt::Key_PageUp
Increment by `incSteps(QwtCounter::Button2)`
- Qt::Key_PageDown
Decrement by `incSteps(QwtCounter::Button2)`
- Shift + Qt::Key_PageUp
Increment by `incSteps(QwtCounter::Button3)`
- Shift + Qt::Key_PageDown
Decrement by `incSteps(QwtCounter::Button3)`

Parameters

<i>event</i>	Key event
--------------	-----------

12.21.4.7 maximum()

```
double QwtCounter::maximum ( ) const
```

Returns

The maximum of the range

See also

[setRange\(\)](#), [setMaximum\(\)](#), [minimum\(\)](#)

12.21.4.8 minimum()

```
double QwtCounter::minimum ( ) const
```

Returns

The minimum of the range

See also

[setRange\(\)](#), [setMinimum\(\)](#), [maximum\(\)](#)

12.21.4.9 numButtons()

```
int QwtCounter::numButtons ( ) const
```

Returns

The number of buttons on each side of the widget.

See also

[setNumButtons\(\)](#)

12.21.4.10 setIncSteps()

```
void QwtCounter::setIncSteps (
    QwtCounter::Button button,
    int numSteps )
```

Specify the number of steps by which the value is incremented or decremented when a specified button is pushed.

Parameters

<i>button</i>	Button index
<i>numSteps</i>	Number of steps

See also

[incSteps\(\)](#)

12.21.4.11 setMaximum()

```
void QwtCounter::setMaximum (
    double value )
```


Set the maximum value of the range

Parameters

<i>value</i>	Maximum value
--------------	---------------

See also

[setRange\(\)](#), [setMinimum\(\)](#), [maximum\(\)](#)

12.21.4.12 setMinimum()

```
void QwtCounter::setMinimum (
    double value )
```

Set the minimum value of the range

Parameters

<i>value</i>	Minimum value
--------------	---------------

See also

[setRange\(\)](#), [setMaximum\(\)](#), [minimum\(\)](#)

Note

The maximum is adjusted if necessary to ensure that the range remains valid.

12.21.4.13 setNumButtons()

```
void QwtCounter::setNumButtons (
    int numButtons )
```

Specify the number of buttons on each side of the label

Parameters

<i>numButtons</i>	Number of buttons
-------------------	-------------------

See also

[numButtons\(\)](#)

12.21.4.14 setRange()

```
void QwtCounter::setRange (
    double min,
    double max )
```

Set the minimum and maximum values.

The maximum is adjusted if necessary to ensure that the range remains valid. The value might be modified to be inside of the range.

Parameters

<i>min</i>	Minimum value
<i>max</i>	Maximum value

See also

[minimum\(\)](#), [maximum\(\)](#)

12.21.4.15 setReadOnly()

```
void QwtCounter::setReadOnly (
    bool on )
```

Allow/disallow the user to manually edit the value.

Parameters

<i>on</i>	True disable editing
-----------	----------------------

See also

[isReadOnly\(\)](#)

12.21.4.16 setSingleStep()

```
void QwtCounter::setSingleStep (
    double stepSize )
```

Set the step size of the counter.

A value ≤ 0.0 disables stepping

Parameters

<i>stepSize</i>	Single step size
-----------------	------------------

See also

[singleStep\(\)](#)

12.21.4.17 `setStepButton1()`

```
void QwtCounter::setStepButton1 (
    int nSteps )
```

Set the number of increment steps for button 1

Parameters

<i>nSteps</i>	Number of steps
---------------	-----------------

12.21.4.18 `setStepButton2()`

```
void QwtCounter::setStepButton2 (
    int nSteps )
```

Set the number of increment steps for button 2

Parameters

<i>nSteps</i>	Number of steps
---------------	-----------------

12.21.4.19 `setStepButton3()`

```
void QwtCounter::setStepButton3 (
    int nSteps )
```

Set the number of increment steps for button 3

Parameters

<i>nSteps</i>	Number of steps
---------------	-----------------

12.21.4.20 `setValid()`

```
void QwtCounter::setValid (
    bool on )
```

Set the counter to be in valid/invalid state

When the counter is set to invalid, no numbers are displayed and the buttons are disabled.

Parameters

<i>on</i>	If true the counter will be set as valid
-----------	--

See also

[setValue\(\)](#), [isValid\(\)](#)

12.21.4.21 setValue

```
void QwtCounter::setValue (
    double value ) [slot]
```

Set a new value without adjusting to the step raster.

The state of the counter is set to be valid.

Parameters

<i>value</i>	New value
--------------	-----------

See also

[isValid\(\)](#), [value\(\)](#), [valueChanged\(\)](#)

Warning

The value is clipped when it lies outside the range.

12.21.4.22 setWrapping()

```
void QwtCounter::setWrapping (
    bool on )
```

En/Disable wrapping.

If wrapping is true stepping up from [maximum\(\)](#) value will take you to the [minimum\(\)](#) value and vice versa.

Parameters

<i>on</i>	En/Disable wrapping
-----------	---------------------

See also

[wrapping\(\)](#)

12.21.4.23 `singleStep()`

```
double QwtCounter::singleStep ( ) const
```

Returns

Single step size

See also

[setSingleStep\(\)](#)

12.21.4.24 `value()`

```
double QwtCounter::value ( ) const
```

Returns

Current value of the counter

See also

[setValue\(\)](#), [valueChanged\(\)](#)

12.21.4.25 `valueChanged`

```
void QwtCounter::valueChanged (
    double value ) [signal]
```

This signal is emitted when the counter's value has changed

Parameters

<i>value</i>	The new value
--------------	---------------

12.21.4.26 `wheelEvent()`

```
void QwtCounter::wheelEvent (
    QWheelEvent * event ) [protected], [virtual]
```

Handle wheel events

Parameters

<i>event</i>	Wheel event
--------------	-------------

12.21.4.27 wrapping()

```
bool QwtCounter::wrapping ( ) const
```

Returns

True, when wrapping is set

See also

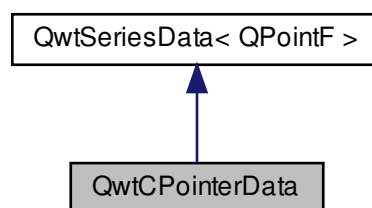
[setWrapping\(\)](#)

12.22 QwtCPointerData Class Reference

Data class containing two pointers to memory blocks of doubles.

```
#include <qwt_point_data.h>
```

Inheritance diagram for QwtCPointerData:



Public Member Functions

- [QwtCPointerData](#) (const double *x, const double *y, size_t size)
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.
- virtual size_t [size](#) () const
- virtual QPointF [sample](#) (size_t index) const
- const double * [xData](#) () const
- const double * [yData](#) () const

Additional Inherited Members

12.22.1 Detailed Description

Data class containing two pointers to memory blocks of doubles.

12.22.2 Constructor & Destructor Documentation

12.22.2.1 QwtCPointerData()

```
QwtCPointerData::QwtCPointerData (
    const double * x,
    const double * y,
    size_t size )
```

Constructor

Parameters

<i>x</i>	Array of x values
<i>y</i>	Array of y values
<i>size</i>	Size of the x and y arrays

Warning

The programmer must assure that the memory blocks referenced by the pointers remain valid during the lifetime of the QwtPlotCPointer object.

See also

[QwtPlotCurve::setData\(\)](#), [QwtPlotCurve::setRawSamples\(\)](#)

12.22.3 Member Function Documentation

12.22.3.1 boundingRect()

```
QRectF QwtCPointerData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

Implements [QwtSeriesData< QPointF >](#).

12.22.3.2 sample()

```
QPointF QwtCPointerData::sample (
    size_t index ) const [virtual]
```

Return the sample at position i

Parameters

<i>index</i>	Index
--------------	-------

Returns

Sample at position i

Implements [QwtSeriesData< QPointF >](#).

12.22.3.3 size()

```
size_t QwtCPointerData::size ( ) const [virtual]
```

Returns

Size of the data set

Implements [QwtSeriesData< QPointF >](#).

12.22.3.4 xData()

```
const double * QwtCPointerData::xData ( ) const
```

Returns

Array of the x-values

12.22.3.5 yData()

```
const double * QwtCPointerData::yData ( ) const
```

Returns

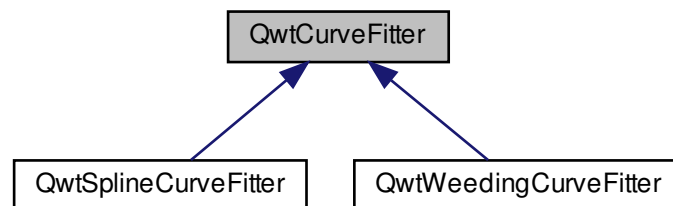
Array of the y-values

12.23 QwtCurveFitter Class Reference

Abstract base class for a curve fitter.

```
#include <qwt_curve_fitter.h>
```

Inheritance diagram for QwtCurveFitter:



Public Member Functions

- virtual [~QwtCurveFitter](#) ()
Destructor.
- virtual QPolygonF [fitCurve](#) (const QPolygonF &polygon) const =0

Protected Member Functions

- [QwtCurveFitter](#) ()
Constructor.

12.23.1 Detailed Description

Abstract base class for a curve fitter.

12.23.2 Member Function Documentation

12.23.2.1 fitCurve()

```
virtual QPolygonF QwtCurveFitter::fitCurve (  
    const QPolygonF & polygon ) const [pure virtual]
```

Find a curve which has the best fit to a series of data points

Parameters

<i>polygon</i>	Series of data points
----------------	-----------------------

Returns

Curve points

Implemented in [QwtWeedingCurveFitter](#), and [QwtSplineCurveFitter](#).

12.24 QwtDate Class Reference

A collection of methods around date/time values.

```
#include <qwt_date.h>
```

Public Types

- enum [Week0Type](#) { [FirstThursday](#), [FirstDay](#) }
- enum [IntervalType](#) { [Millisecond](#), [Second](#), [Minute](#), [Hour](#), [Day](#), [Week](#), [Month](#), [Year](#) }
- enum { [JulianDayForEpoch](#) = 2440588 }

Static Public Member Functions

- static [QDate](#) [minDate](#) ()
- static [QDate](#) [maxDate](#) ()
- static [QDateTime](#) [toDateTime](#) (double value, Qt::TimeSpec=Qt::UTC)
- static double [toDouble](#) (const [QDateTime](#) &)
- static [QDateTime](#) [ceil](#) (const [QDateTime](#) &, [IntervalType](#))
- static [QDateTime](#) [floor](#) (const [QDateTime](#) &, [IntervalType](#))
- static [QDate](#) [dateOfWeek0](#) (int year, [Week0Type](#))
Date of the first day of the first week for a year.
- static int [weekNumber](#) (const [QDate](#) &, [Week0Type](#))
- static int [utcOffset](#) (const [QDateTime](#) &)
- static [QString](#) [toString](#) (const [QDateTime](#) &, const [QString](#) &format, [Week0Type](#))

12.24.1 Detailed Description

A collection of methods around date/time values.

Qt offers convenient classes for dealing with date/time values, but Qwt uses coordinate systems that are based on doubles. [QwtDate](#) offers methods to translate from [QDateTime](#) to double and v.v.

A double is interpreted as the number of milliseconds since 1970-01-01T00:00:00 Universal Coordinated Time - also known as "The Epoch".

While the range of the Julian day in Qt4 is limited to [0, MAX_INT], Qt5 stores it as qint64 offering a huge range of valid dates. As the significance of a double is below this (assuming a fraction of 52 bits) the translation is not bijective with rounding errors for dates very far from Epoch. For a resolution of 1 ms those start to happen for dates above the year 144683.

An axis for a date/time interval is expected to be aligned and divided in time/date units like seconds, minutes, ... [QwtDate](#) offers several algorithms that are needed to calculate these axes.

See also

[QwtDateScaleEngine](#), [QwtDateScaleDraw](#), [QDate](#), [QTime](#)

12.24.2 Member Enumeration Documentation

12.24.2.1 anonymous enum

anonymous enum

Enumerator

JulianDayForEpoch	The Julian day of "The Epoch".
-------------------	--------------------------------

12.24.2.2 IntervalType

enum `QwtDate::IntervalType`

Classification of an time interval

Time intervals needs to be classified to decide how to align and divide it.

Enumerator

Millisecond	The interval is related to milliseconds.
Second	The interval is related to seconds.
Minute	The interval is related to minutes.
Hour	The interval is related to hours.
Day	The interval is related to days.
Week	The interval is related to weeks.
Month	The interval is related to months.
Year	The interval is related to years.

12.24.2.3 Week0Type

enum `QwtDate::Week0Type`

How to identify the first week of year differs between countries.

Enumerator

FirstThursday	According to ISO 8601 the first week of a year is defined as "the week with the year's first Thursday in it". FirstThursday corresponds to the numbering that is implemented in <code>QDate::weekNumber()</code> .
FirstDay	"The week with January 1.1 in it." In the U.S. this definition is more common than FirstThursday.

12.24.3 Member Function Documentation

12.24.3.1 `ceil()`

```
QDateTime QwtDate::ceil (
    const QDateTime & dateTime,
    IntervalType intervalType ) [static]
```

Ceil a datetime according the interval type

Parameters

<i>dateTime</i>	Datetime value
<i>intervalType</i>	Interval type, how to ceil. F.e. when <code>intervalType = QwtDate::Months</code> , the result will be ceiled to the next beginning of a month

Returns

Ceiled datetime

See also

[floor\(\)](#)

12.24.3.2 `dateOfWeek0()`

```
QDate QwtDate::dateOfWeek0 (
    int year,
    Week0Type type ) [static]
```

Date of the first day of the first week for a year.

The first day of a week depends on the current locale (`QLocale::firstDayOfWeek()`).

Parameters

<i>year</i>	Year
<i>type</i>	Option how to identify the first week

Returns

First day of week 0

See also

`QLocale::firstDayOfWeek()`, [weekNumber\(\)](#)

12.24.3.3 floor()

```
QDateTime QwtDate::floor (
    const QDateTime & dateTime,
    IntervalType intervalType ) [static]
```

Floor a datetime according the interval type

Parameters

<i>dateTime</i>	Datetime value
<i>intervalType</i>	Interval type, how to ceil. F.e. when intervalType = QwtDate::Months, the result will be ceiled to the next beginning of a month

Returns

Floored datetime

See also

[floor\(\)](#)

12.24.3.4 maxDate()

```
QDate QwtDate::maxDate ( ) [static]
```

Maximum for the supported date range

The range of valid dates depends on how QDate stores the Julian day internally.

- For Qt4 it is "Tue Jun 3 5874898"
- For Qt5 it is "Tue Dec 31 2147483647"

Returns

maximum of the date range

See also

[minDate\(\)](#)

Note

The maximum differs between Qt4 and Qt5

12.24.3.5 minDate()

```
QDate QwtDate::minDate ( ) [static]
```

Minimum for the supported date range

The range of valid dates depends on how QDate stores the Julian day internally.

- For Qt4 it is "Tue Jan 2 -4713"
- For Qt5 it is "Thu Jan 1 -2147483648"

Returns

minimum of the date range

See also

[maxDate\(\)](#)

12.24.3.6 toDateTime()

```
QDateTime QwtDate::toDateTime (
    double value,
    Qt::TimeSpec timeSpec = Qt::UTC ) [static]
```

Translate from double to QDateTime

Parameters

<i>value</i>	Number of milliseconds since the epoch, 1970-01-01T00:00:00 UTC
<i>timeSpec</i>	Time specification

Returns

Datetime value

See also

[toDouble\(\)](#), [QDateTime::setMSecsSinceEpoch\(\)](#)

Note

The return datetime for `Qt::OffsetFromUTC` will be `Qt::UTC`

12.24.3.7 toDouble()

```
double QwtDate::toDouble (
    const QDateTime & dateTime ) [static]
```

Translate from QDateTime to double

Parameters

<i>dateTime</i>	Datetime value
-----------------	----------------

Returns

Number of milliseconds since 1970-01-01T00:00:00 UTC has passed.

See also

[toDateTime\(\)](#), [QDateTime::toMsecsSinceEpoch\(\)](#)

Warning

For values very far below or above 1970-01-01 UTC rounding errors will happen due to the limited significance of a double.

12.24.3.8 toString()

```
QString QwtDate::toString (
    const QDateTime & dateTime,
    const QString & format,
    Week0Type week0Type ) [static]
```

Translate a datetime into a string

Beside the format expressions documented in [QDateTime::toString\(\)](#) the following expressions are supported:

- **w**
week number: (1 - 53)
- **ww**
week number with a leading zero (01 - 53)

As week 1 usually starts in the previous year a special rule is applied for formats, where the year is expected to match the week number - even if the date belongs to the previous year.

Parameters

<i>dateTime</i>	Datetime value
<i>format</i>	Format string
<i>week0Type</i>	Specification of week 0

Returns

Datetime string

See also

[QDateTime::toString\(\)](#), [weekNumber\(\)](#), [QwtDateScaleDraw](#)

12.24.3.9 utcOffset()

```
int QwtDate::utcOffset (
    const QDateTime & dateTime ) [static]
```

Offset in seconds from Coordinated Universal Time

The offset depends on the time specification of `dateTime`:

- `Qt::UTC` 0, `dateTime` has no offset
- `Qt::OffsetFromUTC` returns `dateTime.utcOffset()`
- `Qt::LocalTime`: number of seconds from the UTC

For `Qt::LocalTime` the offset depends on the timezone and daylight savings.

Parameters

<i>dateTime</i>	Datetime value
-----------------	----------------

Returns

Offset in seconds

12.24.3.10 weekNumber()

```
int QwtDate::weekNumber (
    const QDate & date,
    Week0Type type ) [static]
```

Find the week number of a date

- [QwtDate::FirstThursday](#)
Corresponding to ISO 8601 (see `QDate::weekNumber()`).
- [QwtDate::FirstDay](#)
Number of weeks that have begun since [dateOfWeek0\(\)](#).

Parameters

<i>date</i>	Date
<i>type</i>	Option how to identify the first week

Returns

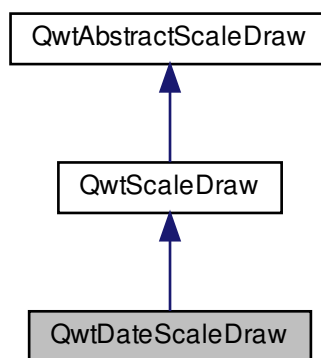
Week number, starting with 1

12.25 QwtDateScaleDraw Class Reference

A class for drawing datetime scales.

```
#include <qwt_date_scale_draw.h>
```

Inheritance diagram for QwtDateScaleDraw:

**Public Member Functions**

- [QwtDateScaleDraw](#) (Qt::TimeSpec=Qt::LocalTime)
Constructor.
- virtual [~QwtDateScaleDraw](#) ()
Destructor.
- void [setDateFormat](#) (QwtDate::IntervalType, const QString &)
- QString [dateFormat](#) (QwtDate::IntervalType) const
- void [setTimeSpec](#) (Qt::TimeSpec)
- Qt::TimeSpec [timeSpec](#) () const
- void [setUtcOffset](#) (int seconds)
- int [utcOffset](#) () const
- void [setWeek0Type](#) (QwtDate::Week0Type)
- QwtDate::Week0Type [week0Type](#) () const
- virtual [QwtText label](#) (double) const
Convert a value into its representing label.
- QDateTime [toDateTime](#) (double) const

Protected Member Functions

- virtual [QwtDate::IntervalType intervalType](#) (const [QwtScaleDiv](#) &) const
- virtual QString [dateFormatOfDate](#) (const QDateTime &, [QwtDate::IntervalType](#)) const

Additional Inherited Members

12.25.1 Detailed Description

A class for drawing datetime scales.

[QwtDateScaleDraw](#) displays values as datetime labels. The format of the labels depends on the alignment of the major tick labels.

The default format strings are:

- Millisecond
"hh:mm:ss:zzz\nddd dd MMM yyyy"
- Second
"hh:mm:ss\nddd dd MMM yyyy"
- Minute
"hh:mm\nddd dd MMM yyyy"
- Hour
"hh:mm\nddd dd MMM yyyy"
- Day
"ddd dd MMM yyyy"
- Week
"Www yyyy"
- Month
"MMM yyyy"
- Year
"yyyy"

The format strings can be modified using [setDateFormat\(\)](#) or individually for each tick label by overloading [dateFormatOfDate\(\)](#),

Usually [QwtDateScaleDraw](#) is used in combination with [QwtDateScaleEngine](#), that calculates scales for datetime intervals.

See also

[QwtDateScaleEngine](#), [QwtPlot::setAxisScaleDraw\(\)](#)

12.25.2 Constructor & Destructor Documentation

12.25.2.1 QwtDateScaleDraw()

```
QwtDateScaleDraw::QwtDateScaleDraw (
    Qt::TimeSpec timeSpec = Qt::LocalTime )
```

Constructor.

The default setting is to display tick labels for the given time specification. The first week of a year is defined like for [QwtDate::FirstThursday](#).

Parameters

<i>timeSpec</i>	Time specification
-----------------	--------------------

See also

[setTimeSpec\(\)](#), [setWeek0Type\(\)](#)

12.25.3 Member Function Documentation**12.25.3.1 dateFormat()**

```
QString QwtDateScaleDraw::dateFormat (
    QwtDate::IntervalType intervalType ) const
```

Parameters

<i>intervalType</i>	Interval type
---------------------	---------------

Returns

Default format string for an datetime interval type

See also

[setDateFormat\(\)](#), [dateFormatOfDate\(\)](#)

12.25.3.2 dateFormatOfDate()

```
QString QwtDateScaleDraw::dateFormatOfDate (
    const QDateTime & dateTime,
    QwtDate::IntervalType intervalType ) const [protected], [virtual]
```

Format string for the representation of a datetime

[dateFormatOfDate\(\)](#) is intended to be overloaded for situations, where formats are individual for specific datetime values.

The default setting ignores `dateTime` and return the default format for the interval type.

Parameters

<i>dateTime</i>	Datetime value
<i>intervalType</i>	Interval type

Returns

Format string

See also

[setDateFormat\(\)](#), [QwtDate::toString\(\)](#)

12.25.3.3 intervalType()

```
QwtDate::IntervalType QwtDateScaleDraw::intervalType (  
    const QwtScaleDiv & scaleDiv ) const [protected], [virtual]
```

Find the less detailed datetime unit, where no rounding errors happen.

Parameters

<i>scaleDiv</i>	Scale division
-----------------	----------------

Returns

Interval type

See also

[dateFormatOfDate\(\)](#)

12.25.3.4 label()

```
QwtText QwtDateScaleDraw::label (  
    double value ) const [virtual]
```

Convert a value into its representing label.

The value is converted to a datetime value using [toDateTime\(\)](#) and converted to a plain text using [QwtDate::toString\(\)](#).

Parameters

<i>value</i>	Value
--------------	-------

Returns

Label string.

See also

[dateFormatOfDate\(\)](#)

Reimplemented from [QwtAbstractScaleDraw](#).

12.25.3.5 setDateFormat()

```
void QwtDateScaleDraw::setDateFormat (
    QwtDate::IntervalType intervalType,
    const QString & format )
```

Set the default format string for an datetime interval type

Parameters

<i>intervalType</i>	Interval type
<i>format</i>	Default format string

See also

[dateFormat\(\)](#), [dateFormatOfDate\(\)](#), [QwtDate::toString\(\)](#)

12.25.3.6 setTimeSpec()

```
void QwtDateScaleDraw::setTimeSpec (
    Qt::TimeSpec timeSpec )
```

Set the time specification used for the tick labels

Parameters

<i>timeSpec</i>	Time specification
-----------------	--------------------

See also

[timeSpec\(\)](#), [setUtcOffset\(\)](#), [toDateTime\(\)](#)

12.25.3.7 setUtcOffset()

```
void QwtDateScaleDraw::setUtcOffset (
    int seconds )
```

Set the offset in seconds from Coordinated Universal Time

Parameters

<i>seconds</i>	Offset in seconds
----------------	-------------------

Note

The offset has no effect beside for the time specification `Qt::OffsetFromUTC`.

See also

`QDate::utcOffset()`, [setTimeSpec\(\)](#), [toDateTime\(\)](#)

12.25.3.8 setWeek0Type()

```
void QwtDateScaleDraw::setWeek0Type (
    QwtDate::Week0Type week0Type )
```

Sets how to identify the first week of a year.

Parameters

<i>week0Type</i>	Mode how to identify the first week of a year
------------------	---

See also

[week0Type\(\)](#).

Note

`week0Type` has no effect beside for intervals classified as [QwtDate::Week](#).

12.25.3.9 timeSpec()

```
Qt::TimeSpec QwtDateScaleDraw::timeSpec ( ) const
```

Returns

Time specification used for the tick labels

See also

[setTimeSpec\(\)](#), [utcOffset\(\)](#), [toDateTime\(\)](#)

12.25.3.10 toDateTime()

```
QDateTime QwtDateScaleDraw::toDateTime (
    double value ) const
```

Translate a double value into a QDateTime object.

Returns

QDateTime object initialized with [timeSpec\(\)](#) and [utcOffset\(\)](#).

See also

[timeSpec\(\)](#), [utcOffset\(\)](#), [QwtDate::toDateTime\(\)](#)

12.25.3.11 utcOffset()

```
int QwtDateScaleDraw::utcOffset ( ) const
```

Returns

Offset in seconds from Coordinated Universal Time

Note

The offset has no effect beside for the time specification `Qt::OffsetFromUTC`.

See also

[QDate::setUtcOffset\(\)](#), [setTimeSpec\(\)](#), [toDateTime\(\)](#)

12.25.3.12 week0Type()

```
QwtDate::Week0Type QwtDateScaleDraw::week0Type ( ) const
```

Returns

Setting how to identify the first week of a year.

See also

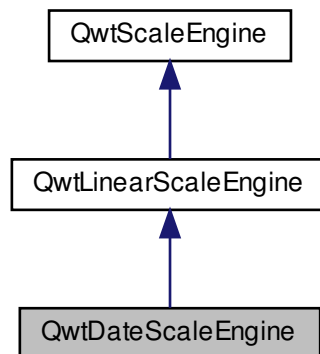
[setWeek0Type\(\)](#)

12.26 QwtDateScaleEngine Class Reference

A scale engine for date/time values.

```
#include <qwt_date_scale_engine.h>
```

Inheritance diagram for QwtDateScaleEngine:



Public Member Functions

- [QwtDateScaleEngine](#) (Qt::TimeSpec=Qt::LocalTime)
Constructor.
- virtual [~QwtDateScaleEngine](#) ()
Destructor.
- void [setTimeSpec](#) (Qt::TimeSpec)
- Qt::TimeSpec [timeSpec](#) () const
- void [setUtcOffset](#) (int seconds)
- int [utcOffset](#) () const
- void [setWeek0Type](#) (QwtDate::Week0Type)
- QwtDate::Week0Type [week0Type](#) () const
- void [setMaxWeeks](#) (int)
- int [maxWeeks](#) () const
- virtual void [autoScale](#) (int maxNumSteps, double &x1, double &x2, double &stepSize) const
- virtual [QwtScaleDiv](#) [divideScale](#) (double x1, double x2, int maxMajorSteps, int maxMinorSteps, double stepSize=0.0) const
Calculate a scale division for a date/time interval.
- virtual [QwtDate::IntervalType](#) [intervalType](#) (const QDateTime &, const QDateTime &, int maxSteps) const
- QDateTime [toDate](#) (double) const

Protected Member Functions

- virtual QDateTime [alignDate](#) (const QDateTime &, double stepSize, [QwtDate::IntervalType](#), bool up) const

Additional Inherited Members

12.26.1 Detailed Description

A scale engine for date/time values.

[QwtDateScaleEngine](#) builds scales from a time intervals. Together with [QwtDateScaleDraw](#) it can be used for axes according to date/time values.

Years, months, weeks, days, hours and minutes are organized in steps with non constant intervals. [QwtDateScaleEngine](#) classifies intervals and aligns the boundaries and tick positions according to this classification.

[QwtDateScaleEngine](#) supports representations depending on `Qt::TimeSpec` specifications. The valid range for scales is limited by the range of `QDateTime`, that differs between Qt4 and Qt5.

Datetime values are expected as the number of milliseconds since 1970-01-01T00:00:00 Universal Coordinated Time - also known as "The Epoch", that can be converted to `QDateTime` using [QwtDate::toDateTime\(\)](#).

See also

[QwtDate](#), [QwtPlot::setAxisScaleEngine\(\)](#), [QwtAbstractScale::setScaleEngine\(\)](#)

12.26.2 Constructor & Destructor Documentation

12.26.2.1 QwtDateScaleEngine()

```
QwtDateScaleEngine::QwtDateScaleEngine (
    Qt::TimeSpec timeSpec = Qt::LocalTime )
```

Constructor.

The engine is initialized to build scales for the given time specification. It classifies intervals > 4 weeks as \geq `Qt::Month`. The first week of a year is defined like for [QwtDate::FirstThursday](#).

Parameters

<i>timeSpec</i>	Time specification
-----------------	--------------------

See also

[setTimeSpec\(\)](#), [setMaxWeeks\(\)](#), [setWeek0Type\(\)](#)

12.26.3 Member Function Documentation

12.26.3.1 alignDate()

```
QDateTime QwtDateScaleEngine::alignDate (
    const QDateTime & dateTime,
    double stepSize,
    QwtDate::IntervalType intervalType,
    bool up ) const [protected], [virtual]
```

Align a date/time value for a step size

For Qt::Day alignments there is no "natural day 0" - instead the first day of the year is used to avoid jumping major ticks positions when panning a scale. For other alignments (f.e according to the first day of the month) [alignDate\(\)](#) has to be overloaded.

Parameters

<i>dateTime</i>	Date/time value
<i>stepSize</i>	Step size
<i>intervalType</i>	Interval type
<i>up</i>	When true dateTime is ceiled - otherwise it is floored

Returns

Aligned date/time value

12.26.3.2 autoScale()

```
void QwtDateScaleEngine::autoScale (
    int maxNumSteps,
    double & x1,
    double & x2,
    double & stepSize ) const [virtual]
```

Align and divide an interval

The algorithm aligns and divides the interval into steps.

Datetime interval divisions are usually not equidistant and the calculated stepSize can only be used as an approximation for the steps calculated by [divideScale\(\)](#).

Parameters

<i>maxNumSteps</i>	Max. number of steps
<i>x1</i>	First limit of the interval (In/Out)
<i>x2</i>	Second limit of the interval (In/Out)
<i>stepSize</i>	Step size (Out)

See also

[QwtScaleEngine::setAttribute\(\)](#)

Reimplemented from [QwtLinearScaleEngine](#).

12.26.3.3 divideScale()

```
QwtScaleDiv QwtDateScaleEngine::divideScale (
    double x1,
    double x2,
    int maxMajorSteps,
    int maxMinorSteps,
    double stepSize = 0.0 ) const [virtual]
```

Calculate a scale division for a date/time interval.

Parameters

<i>x1</i>	First interval limit
<i>x2</i>	Second interval limit
<i>maxMajorSteps</i>	Maximum for the number of major steps
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size. If stepSize == 0, the scaleEngine calculates one.

Returns

Calculated scale division

Reimplemented from [QwtLinearScaleEngine](#).

12.26.3.4 intervalType()

```
QwtDate::IntervalType QwtDateScaleEngine::intervalType (
    const QDateTime & minDate,
    const QDateTime & maxDate,
    int maxSteps ) const [virtual]
```

Classification of a date/time interval division

Parameters

<i>minDate</i>	Minimum (= earlier) of the interval
<i>maxDate</i>	Maximum (= later) of the interval
<i>maxSteps</i>	Maximum for the number of steps

Returns

Interval classification

12.26.3.5 maxWeeks()

```
int QwtDateScaleEngine::maxWeeks ( ) const
```

Returns

Upper limit for the number of weeks, when an interval can be classified as Qt::Week.

See also

[setMaxWeeks\(\)](#), [week0Type\(\)](#)

12.26.3.6 setMaxWeeks()

```
void QwtDateScaleEngine::setMaxWeeks (
    int weeks )
```

Set a upper limit for the number of weeks, when an interval can be classified as Qt::Week.

The default setting is 4 weeks.

Parameters

<i>weeks</i>	Upper limit for the number of weeks
--------------	-------------------------------------

Note

In business charts a year is often divided into weeks [1-52]

See also

[maxWeeks\(\)](#), [setWeek0Type\(\)](#)

12.26.3.7 setTimeSpec()

```
void QwtDateScaleEngine::setTimeSpec (
    Qt::TimeSpec timeSpec )
```

Set the time specification used by the engine

Parameters

<i>timeSpec</i>	Time specification
-----------------	--------------------

See also

[timeSpec\(\)](#), [setUtcOffset\(\)](#), [toDateTime\(\)](#)

12.26.3.8 setUtcOffset()

```
void QwtDateScaleEngine::setUtcOffset (
    int seconds )
```

Set the offset in seconds from Coordinated Universal Time

Parameters

<i>seconds</i>	Offset in seconds
----------------	-------------------

Note

The offset has no effect beside for the time specification `Qt::OffsetFromUTC`.

See also

`QDate::utcOffset()`, [setTimeSpec\(\)](#), [toDateTime\(\)](#)

12.26.3.9 setWeek0Type()

```
void QwtDateScaleEngine::setWeek0Type (
    QwtDate::Week0Type week0Type )
```

Sets how to identify the first week of a year.

Parameters

<i>week0Type</i>	Mode how to identify the first week of a year
------------------	---

See also

[week0Type\(\)](#), [setMaxWeeks\(\)](#)

Note

`week0Type` has no effect beside for intervals classified as [QwtDate::Week](#).

12.26.3.10 timeSpec()

```
Qt::TimeSpec QwtDateScaleEngine::timeSpec ( ) const
```

Returns

Time specification used by the engine

See also

[setTimeSpec\(\)](#), [utcOffset\(\)](#), [toDateTime\(\)](#)

12.26.3.11 toDateTime()

```
QDateTime QwtDateScaleEngine::toDateTime (
    double value ) const
```

Translate a double value into a QDateTime object.

For QDateTime result is bounded by [QwtDate::minDate\(\)](#) and [QwtDate::maxDate\(\)](#)

Returns

QDateTime object initialized with [timeSpec\(\)](#) and [utcOffset\(\)](#).

See also

[timeSpec\(\)](#), [utcOffset\(\)](#), [QwtDate::toDateTime\(\)](#)

12.26.3.12 utcOffset()

```
int QwtDateScaleEngine::utcOffset ( ) const
```

Returns

Offset in seconds from Coordinated Universal Time

Note

The offset has no effect beside for the time specification `Qt::OffsetFromUTC`.

See also

`QDate::setUtcOffset()`, [setTimeSpec\(\)](#), [toDateTime\(\)](#)

12.26.3.13 week0Type()

```
QwtDate::Week0Type QwtDateScaleEngine::week0Type ( ) const
```

Returns

Setting how to identify the first week of a year.

See also

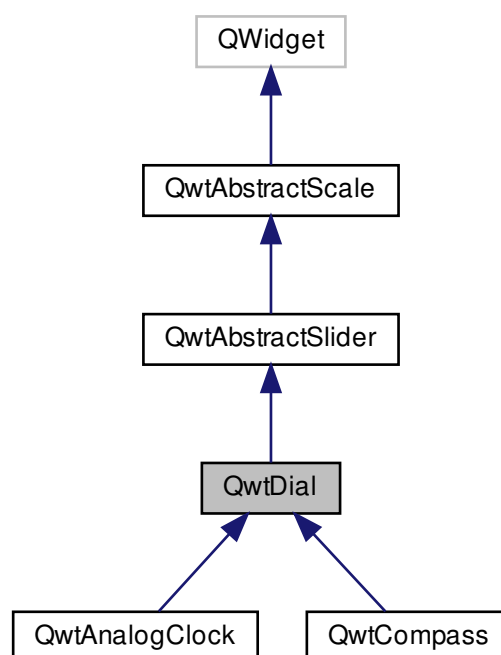
[setWeek0Type\(\)](#), [maxWeeks\(\)](#)

12.27 QwtDial Class Reference

[QwtDial](#) class provides a rounded range control.

```
#include <qwt_dial.h>
```

Inheritance diagram for QwtDial:



Public Types

- enum [Shadow](#) { [Plain](#) = QFrame::Plain, [Raised](#) = QFrame::Raised, [Sunken](#) = QFrame::Sunken }
Frame shadow.
- enum [Mode](#) { [RotateNeedle](#), [RotateScale](#) }
Mode controlling whether the needle or the scale is rotating.

Public Member Functions

- [QwtDial](#) (QWidget *parent=NULL)
Constructor.
- virtual [~QwtDial](#) ()
Destructor.
- void [setFrameShadow](#) ([Shadow](#))
- [Shadow](#) [frameShadow](#) () const
- void [setLineWidth](#) (int)
- int [lineWidth](#) () const
- void [setMode](#) ([Mode](#))
Change the mode of the dial.
- [Mode](#) [mode](#) () const
- void [setScaleArc](#) (double minArc, double maxArc)
- void [setMinScaleArc](#) (double)
- double [minScaleArc](#) () const
- void [setMaxScaleArc](#) (double)
- double [maxScaleArc](#) () const
- virtual void [setOrigin](#) (double)
Change the origin.
- double [origin](#) () const
- void [setNeedle](#) ([QwtDialNeedle](#) *)
- const [QwtDialNeedle](#) * [needle](#) () const
- [QwtDialNeedle](#) * [needle](#) ()
- QRect [boundingRect](#) () const
- QRect [innerRect](#) () const
- virtual QRect [scaleInnerRect](#) () const
- virtual QSize [sizeHint](#) () const
- virtual QSize [minimumSizeHint](#) () const
- void [setScaleDraw](#) ([QwtRoundScaleDraw](#) *)
- [QwtRoundScaleDraw](#) * [scaleDraw](#) ()
- const [QwtRoundScaleDraw](#) * [scaleDraw](#) () const

Protected Member Functions

- virtual void [wheelEvent](#) (QWheelEvent *)
- virtual void [paintEvent](#) (QPaintEvent *)
- virtual void [changeEvent](#) (QEvent *)
- virtual void [drawFrame](#) (QPainter *)
- virtual void [drawContents](#) (QPainter *) const
Draw the contents inside the frame.
- virtual void [drawFocusIndicator](#) (QPainter *) const
- void [invalidateCache](#) ()
- virtual void [drawScale](#) (QPainter *, const QPointF ¢er, double radius) const
- virtual void [drawScaleContents](#) (QPainter *painter, const QPointF ¢er, double radius) const
- virtual void [drawNeedle](#) (QPainter *, const QPointF &, double radius, double direction, QPalette::ColorGroup) const
- virtual double [scrolledTo](#) (const QPoint &) const
Determine the value for a new position of the slider handle.
- virtual bool [isScrollPosition](#) (const QPoint &) const
Determine what to do when the user presses a mouse button.
- virtual void [sliderChange](#) ()
Calling update()
- virtual void [scaleChange](#) ()

Additional Inherited Members

12.27.1 Detailed Description

[QwtDial](#) class provides a rounded range control.

[QwtDial](#) is intended as base class for dial widgets like speedometers, compass widgets, clocks ...

A dial contains a scale and a needle indicating the current value of the dial. Depending on Mode one of them is fixed and the other is rotating. If not [isReadOnly\(\)](#) the dial can be rotated by dragging the mouse or using keyboard inputs (see [QwtAbstractSlider::keyPressEvent\(\)](#)). A dial might be wrapping, what means a rotation below/above one limit continues on the other limit (f.e compass). The scale might cover any arc of the dial, its values are related to the [origin\(\)](#) of the dial.

Often dials have to be updated very often according to values from external devices. For these high refresh rates [QwtDial](#) caches as much as possible. For derived classes it might be necessary to clear these caches manually according to attribute changes using [invalidateCache\(\)](#).

See also

[QwtCompass](#), [QwtAnalogClock](#), [QwtDialNeedle](#)

Note

The controls and dials examples shows different types of dials.
QDial is more similar to [QwtKnob](#) than to [QwtDial](#)

12.27.2 Member Enumeration Documentation

12.27.2.1 Mode

```
enum QwtDial::Mode
```

Mode controlling whether the needle or the scale is rotating.

Enumerator

RotateNeedle	The needle is rotating.
RotateScale	The needle is fixed, the scales are rotating.

12.27.2.2 Shadow

```
enum QwtDial::Shadow
```

Frame shadow.

Unfortunately it is not possible to use `QFrame::Shadow` as a property of a widget that is not derived from `QFrame`. The following enum is made for the designer only. It is safe to use `QFrame::Shadow` instead.

Enumerator

Plain	QFrame::Plain.
Raised	QFrame::Raised.
Sunken	QFrame::Sunken.

12.27.3 Constructor & Destructor Documentation

12.27.3.1 QwtDial()

```
QwtDial::QwtDial (
    QWidget * parent = NULL ) [explicit]
```

Constructor.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

Create a dial widget with no needle. The scale is initialized to [0.0, 360.0] and 360 steps ([QwtAbstractSlider::setTotalSteps\(\)](#)). The origin of the scale is at 90°,

The value is set to 0.0.

The default mode is [QwtDial::RotateNeedle](#).

12.27.4 Member Function Documentation

12.27.4.1 boundingRect()

```
QRect QwtDial::boundingRect ( ) const
```

Returns

bounding rectangle of the dial including the frame

See also

[setLineWidth\(\)](#), [scaleInnerRect\(\)](#), [innerRect\(\)](#)

12.27.4.2 changeEvent()

```
void QwtDial::changeEvent (
    QEvent * event ) [protected], [virtual]
```

Change Event handler

Parameters

<i>event</i>	Change event
--------------	--------------

Invalidates internal paint caches if necessary

12.27.4.3 drawContents()

```
void QwtDial::drawContents (
    QPainter * painter ) const    [protected], [virtual]
```

Draw the contents inside the frame.

QPalette::Window is the background color outside of the frame. QPalette::Base is the background color inside the frame. QPalette::WindowText is the background color inside the scale.

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[boundingRect\(\)](#), [innerRect\(\)](#), [scaleInnerRect\(\)](#), [QWidget::setPalette\(\)](#)

12.27.4.4 drawFocusIndicator()

```
void QwtDial::drawFocusIndicator (
    QPainter * painter ) const    [protected], [virtual]
```

Draw the focus indicator

Parameters

<i>painter</i>	Painter
----------------	---------

12.27.4.5 drawFrame()

```
void QwtDial::drawFrame (
    QPainter * painter )    [protected], [virtual]
```

Draw the frame around the dial

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[lineWidth\(\)](#), [frameShadow\(\)](#)

12.27.4.6 drawNeedle()

```
void QwtDial::drawNeedle (
    QPainter * painter,
    const QPointF & center,
    double radius,
    double direction,
    QPalette::ColorGroup colorGroup ) const [protected], [virtual]
```

Draw the needle

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the dial
<i>radius</i>	Length for the needle
<i>direction</i>	Direction of the needle in degrees, counter clockwise
<i>colorGroup</i>	ColorGroup

Reimplemented in [QwtAnalogClock](#).

12.27.4.7 drawScale()

```
void QwtDial::drawScale (
    QPainter * painter,
    const QPointF & center,
    double radius ) const [protected], [virtual]
```

Draw the scale

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the dial
<i>radius</i>	Radius of the scale

12.27.4.8 drawScaleContents()

```
void QwtDial::drawScaleContents (
    QPainter * painter,
    const QPointF & center,
    double radius ) const [protected], [virtual]
```

Draw the contents inside the scale

Paints nothing.

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the contents circle
<i>radius</i>	Radius of the contents circle

Reimplemented in [QwtCompass](#).

12.27.4.9 `frameShadow()`

```
QwtDial::Shadow QwtDial::frameShadow ( ) const
```

Returns

Frame shadow /sa [setFrameShadow\(\)](#), [lineWidth\(\)](#), [QFrame::frameShadow\(\)](#)

12.27.4.10 `innerRect()`

```
QRect QwtDial::innerRect ( ) const
```

Returns

bounding rectangle of the circle inside the frame

See also

[setLineWidth\(\)](#), [scaleInnerRect\(\)](#), [boundingRect\(\)](#)

12.27.4.11 `invalidateCache()`

```
void QwtDial::invalidateCache ( ) [protected]
```

Invalidate the internal caches used to speed up repainting

12.27.4.12 `isScrollPosition()`

```
bool QwtDial::isScrollPosition (
    const QPoint & pos ) const [protected], [virtual]
```

Determine what to do when the user presses a mouse button.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Return values

<i>True, when</i>	the inner circle contains pos
-------------------	-------------------------------

See also[scrolledTo\(\)](#)

Implements [QwtAbstractSlider](#).

12.27.4.13 lineWidth()

```
int QwtDial::lineWidth ( ) const
```

Returns

Line width of the frame

See also[setLineWidth\(\)](#), [frameShadow\(\)](#), [lineWidth\(\)](#)**12.27.4.14 maxScaleArc()**

```
double QwtDial::maxScaleArc ( ) const
```

Returns

Upper limit of the scale arc

See also[setScaleArc\(\)](#)

12.27.4.15 `minimumSizeHint()`

```
QSize QwtDial::minimumSizeHint ( ) const [virtual]
```

Returns

Minimum size hint

See also

[sizeHint\(\)](#)

12.27.4.16 `minScaleArc()`

```
double QwtDial::minScaleArc ( ) const
```

Returns

Lower limit of the scale arc

See also

[setScaleArc\(\)](#)

12.27.4.17 `mode()`

```
QwtDial::Mode QwtDial::mode ( ) const
```

Returns

Mode of the dial.

See also

[setMode\(\)](#), [origin\(\)](#), [setScaleArc\(\)](#), [value\(\)](#)

12.27.4.18 `needle()` [1/2]

```
const QwtDialNeedle * QwtDial::needle ( ) const
```

Returns

needle

See also

[setNeedle\(\)](#)

12.27.4.19 `needle()` [2/2]

```
QwtDialNeedle * QwtDial::needle ( )
```

Returns

needle

See also

[setNeedle\(\)](#)

12.27.4.20 `origin()`

```
double QwtDial::origin ( ) const
```

The origin is the angle where scale and needle is relative to.

Returns

Origin of the dial

See also

[setOrigin\(\)](#)

12.27.4.21 `paintEvent()`

```
void QwtDial::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Paint the dial

Parameters

<i>event</i>	Paint event
--------------	-------------

12.27.4.22 `scaleChange()`

```
void QwtDial::scaleChange ( ) [protected], [virtual]
```

Invalidate the internal caches and call [QwtAbstractSlider::scaleChange\(\)](#)

Reimplemented from [QwtAbstractSlider](#).

12.27.4.23 scaleDraw() [1/2]

```
QwtRoundScaleDraw * QwtDial::scaleDraw ( )
```

Returns

the scale draw

12.27.4.24 scaleDraw() [2/2]

```
const QwtRoundScaleDraw * QwtDial::scaleDraw ( ) const
```

Returns

the scale draw

12.27.4.25 scaleInnerRect()

```
QRect QwtDial::scaleInnerRect ( ) const [virtual]
```

Returns

rectangle inside the scale

See also

[setLineWidth\(\)](#), [boundingRect\(\)](#), [innerRect\(\)](#)

12.27.4.26 scrolledTo()

```
double QwtDial::scrolledTo (
    const QPoint & pos ) const [protected], [virtual]
```

Determine the value for a new position of the slider handle.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Returns

Value for the mouse position

See also

[isScrollPosition\(\)](#)

Implements [QwtAbstractSlider](#).

12.27.4.27 setFrameShadow()

```
void QwtDial::setFrameShadow (
    Shadow shadow )
```

Sets the frame shadow value from the frame style.

Parameters

<i>shadow</i>	Frame shadow
---------------	--------------

See also

[setLineWidth\(\)](#), [QFrame::setFrameShadow\(\)](#)

12.27.4.28 setLineWidth()

```
void QwtDial::setLineWidth (
    int lineWidth )
```

Sets the line width of the frame

Parameters

<i>lineWidth</i>	Line width
------------------	------------

See also

[setFrameShadow\(\)](#)

12.27.4.29 setMaxScaleArc()

```
void QwtDial::setMaxScaleArc (
    double max )
```

Set the upper limit for the scale arc

Parameters

<i>max</i>	Upper limit of the scale arc
------------	------------------------------

See also

[setScaleArc\(\)](#), [setMinScaleArc\(\)](#)

12.27.4.30 [setMinScaleArc\(\)](#)

```
void QwtDial::setMinScaleArc (
    double min )
```

Set the lower limit for the scale arc

Parameters

<i>min</i>	Lower limit of the scale arc
------------	------------------------------

See also

[setScaleArc\(\)](#), [setMaxScaleArc\(\)](#)

12.27.4.31 [setMode\(\)](#)

```
void QwtDial::setMode (
    Mode mode )
```

Change the mode of the dial.

Parameters

<i>mode</i>	New mode
-------------	----------

In case of [QwtDial::RotateNeedle](#) the needle is rotating, in case of [QwtDial::RotateScale](#), the needle points to [origin\(\)](#) and the scale is rotating.

The default mode is [QwtDial::RotateNeedle](#).

See also

[mode\(\)](#), [setValue\(\)](#), [setOrigin\(\)](#)

12.27.4.32 [setNeedle\(\)](#)

```
void QwtDial::setNeedle (
    QwtDialNeedle * needle )
```

Set a needle for the dial

Parameters

<i>needle</i>	Needle
---------------	--------

Warning

The needle will be deleted, when a different needle is set or in [~QwtDial\(\)](#)

12.27.4.33 setOrigin()

```
void QwtDial::setOrigin (
    double origin ) [virtual]
```

Change the origin.

The origin is the angle where scale and needle is relative to.

Parameters

<i>origin</i>	New origin
---------------	------------

See also

[origin\(\)](#)

12.27.4.34 setScaleArc()

```
void QwtDial::setScaleArc (
    double minArc,
    double maxArc )
```

Change the arc of the scale

Parameters

<i>minArc</i>	Lower limit
<i>maxArc</i>	Upper limit

See also

[minScaleArc\(\)](#), [maxScaleArc\(\)](#)

12.27.4.35 `setScaleDraw()`

```
void QwtDial::setScaleDraw (
    QwtRoundScaleDraw * scaleDraw )
```

Set an individual scale draw

The motivation for setting a scale draw is often to overload [QwtRoundScaleDraw::label\(\)](#) to return individual tick labels.

Parameters

<i>scaleDraw</i>	Scale draw
------------------	------------

Warning

The previous scale draw is deleted

12.27.4.36 `sizeHint()`

```
QSize QwtDial::sizeHint ( ) const [virtual]
```

Returns

Size hint

See also

[minimumSizeHint\(\)](#)

12.27.4.37 `wheelEvent()`

```
void QwtDial::wheelEvent (
    QWheelEvent * event ) [protected], [virtual]
```

Wheel Event handler

Parameters

<i>event</i>	Wheel event
--------------	-------------

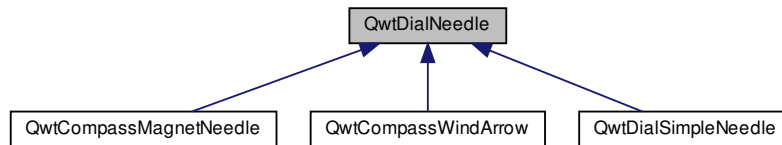
Reimplemented from [QwtAbstractSlider](#).

12.28 QwtDialNeedle Class Reference

Base class for needles that can be used in a [QwtDial](#).

```
#include <qwt_dial_needle.h>
```

Inheritance diagram for QwtDialNeedle:



Public Member Functions

- [QwtDialNeedle](#) ()
Constructor.
- virtual [~QwtDialNeedle](#) ()
Destructor.
- virtual void [setPalette](#) (const QPalette &)
- const QPalette & [palette](#) () const
- virtual void [draw](#) (QPainter *painter, const QPointF ¢er, double length, double direction, QPalette::ColorGroup=QPalette::Active) const

Protected Member Functions

- virtual void [drawNeedle](#) (QPainter *painter, double length, QPalette::ColorGroup colorGroup) const =0
Draw the needle.
- virtual void [drawKnob](#) (QPainter *, double width, const QBrush &, bool sunken) const
Draw the knob.

12.28.1 Detailed Description

Base class for needles that can be used in a [QwtDial](#).

[QwtDialNeedle](#) is a pointer that indicates a value by pointing to a specific direction.

See also

[QwtDial](#), [QwtCompass](#)

12.28.2 Member Function Documentation

12.28.2.1 draw()

```
void QwtDialNeedle::draw (
    QPainter * painter,
    const QPointF & center,
    double length,
    double direction,
    QPalette::ColorGroup colorGroup = QPalette::Active ) const [virtual]
```

Draw the needle

Parameters

<i>painter</i>	Painter
<i>center</i>	Center of the dial, start position for the needle
<i>length</i>	Length of the needle
<i>direction</i>	Direction of the needle, in degrees counter clockwise
<i>colorGroup</i>	Color group, used for painting

12.28.2.2 drawNeedle()

```
virtual void QwtDialNeedle::drawNeedle (
    QPainter * painter,
    double length,
    QPalette::ColorGroup colorGroup ) const [protected], [pure virtual]
```

Draw the needle.

The origin of the needle is at position (0.0, 0.0) pointing in direction 0.0 (= east).

The painter is already initialized with translation and rotation.

Parameters

<i>painter</i>	Painter
<i>length</i>	Length of the needle
<i>colorGroup</i>	Color group, used for painting

See also

[setPalette\(\)](#), [palette\(\)](#)

Implemented in [QwtCompassWindArrow](#), [QwtCompassMagnetNeedle](#), and [QwtDialSimpleNeedle](#).

12.28.2.3 palette()

```
const QPalette & QwtDialNeedle::palette ( ) const
```

Returns

the palette of the needle.

12.28.2.4 setPalette()

```
void QwtDialNeedle::setPalette (
    const QPalette & palette ) [virtual]
```

Sets the palette for the needle.

Parameters

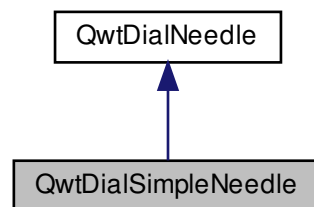
<i>palette</i>	New Palette
----------------	-------------

12.29 QwtDialSimpleNeedle Class Reference

A needle for dial widgets.

```
#include <qwt_dial_needle.h>
```

Inheritance diagram for QwtDialSimpleNeedle:



Public Types

- enum [Style](#) { [Arrow](#), [Ray](#) }
Style of the needle.

Public Member Functions

- [QwtDialSimpleNeedle](#) ([Style](#), bool hasKnob=true, const QColor &mid=Qt::gray, const QColor &base=Qt::darkGray)
- void [setWidth](#) (double [width](#))
- double [width](#) () const

Protected Member Functions

- virtual void [drawNeedle](#) (QPainter *, double length, QPalette::ColorGroup) const

12.29.1 Detailed Description

A needle for dial widgets.

The following colors are used:

- `QPalette::Mid`
Pointer
- `QPalette::Base`
Knob

See also

[QwtDial](#), [QwtCompass](#)

12.29.2 Member Enumeration Documentation

12.29.2.1 Style

```
enum QwtDialSimpleNeedle::Style
```

Style of the needle.

Enumerator

Arrow	Arrow.
Ray	A straight line from the center.

12.29.3 Constructor & Destructor Documentation

12.29.3.1 `QwtDialSimpleNeedle()`

```
QwtDialSimpleNeedle::QwtDialSimpleNeedle (  
    Style style,  
    bool hasKnob = true,  
    const QColor & mid = Qt::gray,  
    const QColor & base = Qt::darkGray )
```

Constructor

Parameters

<i>style</i>	Style
<i>hasKnob</i>	With/Without knob
<i>mid</i>	Middle color
<i>base</i>	Base color

12.29.4 Member Function Documentation

12.29.4.1 drawNeedle()

```
void QwtDialSimpleNeedle::drawNeedle (
    QPainter * painter,
    double length,
    QPalette::ColorGroup colorGroup ) const [protected], [virtual]
```

Draw the needle

Parameters

<i>painter</i>	Painter
<i>length</i>	Length of the needle
<i>colorGroup</i>	Color group, used for painting

Implements [QwtDialNeedle](#).

12.29.4.2 setWidth()

```
void QwtDialSimpleNeedle::setWidth (
    double width )
```

Set the width of the needle

Parameters

<i>width</i>	Width
--------------	-------

See also

[width\(\)](#)

12.29.4.3 width()

```
double QwtDialSimpleNeedle::width ( ) const
```

Returns

the width of the needle

See also

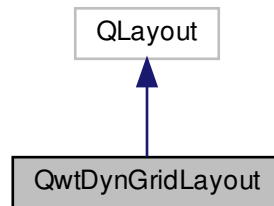
[setWidth\(\)](#)

12.30 QwtDynGridLayout Class Reference

The [QwtDynGridLayout](#) class lays out widgets in a grid, adjusting the number of columns and rows to the current size.

```
#include <qwt_dyngrid_layout.h>
```

Inheritance diagram for QwtDynGridLayout:



Public Member Functions

- [QwtDynGridLayout](#) (QWidget *, int margin=0, int spacing=-1)
- [QwtDynGridLayout](#) (int spacing=-1)
- virtual [~QwtDynGridLayout](#) ()
Destructor.
- virtual void [invalidate](#) ()
Invalidate all internal caches.
- void [setMaxColumns](#) (uint [maxColumns](#))
- uint [maxColumns](#) () const
Return the upper limit for the number of columns.
- uint [numRows](#) () const
- uint [numColumns](#) () const
- virtual void [addItem](#) (QLayoutItem *)
Add an item to the next free position.
- virtual QLayoutItem * [itemAt](#) (int index) const
- virtual QLayoutItem * [takeAt](#) (int index)
- virtual int [count](#) () const
- void [setExpandingDirections](#) (Qt::Orientations)
- virtual Qt::Orientations [expandingDirections](#) () const
Returns whether this layout can make use of more space than [sizeHint\(\)](#).
- QList< QRect > [layoutItems](#) (const QRect &, uint [numColumns](#)) const
- virtual int [maxItemWidth](#) () const
- virtual void [setGeometry](#) (const QRect &rect)
- virtual bool [hasHeightForWidth](#) () const
- virtual int [heightForWidth](#) (int) const
- virtual QSize [sizeHint](#) () const
- virtual bool [isEmpty](#) () const
- uint [itemCount](#) () const
- virtual uint [columnsForWidth](#) (int width) const
Calculate the number of columns for a given width.

Protected Member Functions

- void [layoutGrid](#) (uint [numColumns](#), QVector< int > &rowHeight, QVector< int > &colWidth) const
- void [stretchGrid](#) (const QRect &rect, uint [numColumns](#), QVector< int > &rowHeight, QVector< int > &colWidth) const

12.30.1 Detailed Description

The [QwtDynGridLayout](#) class lays out widgets in a grid, adjusting the number of columns and rows to the current size.

[QwtDynGridLayout](#) takes the space it gets, divides it up into rows and columns, and puts each of the widgets it manages into the correct cell(s). It lays out as many number of columns as possible (limited by [maxColumns\(\)](#)).

12.30.2 Constructor & Destructor Documentation

12.30.2.1 QwtDynGridLayout() [1/2]

```
QwtDynGridLayout::QwtDynGridLayout (
    QWidget * parent,
    int margin = 0,
    int spacing = -1 ) [explicit]
```

Parameters

<i>parent</i>	Parent widget
<i>margin</i>	Margin
<i>spacing</i>	Spacing

12.30.2.2 QwtDynGridLayout() [2/2]

```
QwtDynGridLayout::QwtDynGridLayout (
    int spacing = -1 ) [explicit]
```

Parameters

<i>spacing</i>	Spacing
----------------	---------

12.30.3 Member Function Documentation

12.30.3.1 addItem()

```
void QwtDynGridLayout::addItem (
    QLayoutItem * item ) [virtual]
```

Add an item to the next free position.

Parameters

<i>item</i>	Layout item
-------------	-------------

12.30.3.2 columnsForWidth()

```
uint QwtDynGridLayout::columnsForWidth (
    int width ) const [virtual]
```

Calculate the number of columns for a given width.

The calculation tries to use as many columns as possible (limited by [maxColumns\(\)](#))

Parameters

<i>width</i>	Available width for all columns
--------------	---------------------------------

Returns

Number of columns for a given width

See also

[maxColumns\(\)](#), [setMaxColumns\(\)](#)

12.30.3.3 count()

```
int QwtDynGridLayout::count ( ) const [virtual]
```

Returns

Number of items in the layout

12.30.3.4 `expandingDirections()`

```
Qt::Orientations QwtDynGridLayout::expandingDirections ( ) const [virtual]
```

Returns whether this layout can make use of more space than [sizeHint\(\)](#).

A value of `Qt::Vertical` or `Qt::Horizontal` means that it wants to grow in only one dimension, while `Qt::Vertical | Qt::Horizontal` means that it wants to grow in both dimensions.

Returns

Orientations, where the layout expands

See also

[setExpandingDirections\(\)](#)

12.30.3.5 `hasHeightForWidth()`

```
bool QwtDynGridLayout::hasHeightForWidth ( ) const [virtual]
```

Returns

true: [QwtDynGridLayout](#) implements [heightForWidth\(\)](#).

See also

[heightForWidth\(\)](#)

12.30.3.6 `heightForWidth()`

```
int QwtDynGridLayout::heightForWidth (
    int width ) const [virtual]
```

Returns

The preferred height for this layout, given a width.

See also

[hasHeightForWidth\(\)](#)

12.30.3.7 `isEmpty()`

```
bool QwtDynGridLayout::isEmpty ( ) const [virtual]
```

Returns

true if this layout is empty.

12.30.3.8 `itemAt()`

```
QLayoutItem * QwtDynGridLayout::itemAt (
    int index ) const [virtual]
```

Find the item at a specific index

Parameters

<i>index</i>	Index
--------------	-------

Returns

Item at a specific index

See also

[takeAt\(\)](#)

12.30.3.9 itemCount()

```
uint QwtDynGridLayout::itemCount ( ) const
```

Returns

number of layout items

12.30.3.10 layoutGrid()

```
void QwtDynGridLayout::layoutGrid (
    uint numColumns,
    QVector< int > & rowHeight,
    QVector< int > & colWidth ) const [protected]
```

Calculate the dimensions for the columns and rows for a grid of numColumns columns.

Parameters

<i>numColumns</i>	Number of columns.
<i>rowHeight</i>	Array where to fill in the calculated row heights.
<i>colWidth</i>	Array where to fill in the calculated column widths.

12.30.3.11 layoutItems()

```
QList< QRect > QwtDynGridLayout::layoutItems (
    const QRect & rect,
    uint numColumns ) const
```

Calculate the geometries of the layout items for a layout with numColumns columns and a given rectangle.

Parameters

<i>rect</i>	Rect where to place the items
<i>numColumns</i>	Number of columns

Returns

item geometries

12.30.3.12 maxColumns()

```
uint QwtDynGridLayout::maxColumns ( ) const
```

Return the upper limit for the number of columns.

0 means unlimited, what is the default.

Returns

Upper limit for the number of columns

See also

[setMaxColumns\(\)](#)

12.30.3.13 maxItemWidth()

```
int QwtDynGridLayout::maxItemWidth ( ) const [virtual]
```

Returns

the maximum width of all layout items

12.30.3.14 numColumns()

```
uint QwtDynGridLayout::numColumns ( ) const
```

Returns

Number of columns of the current layout.

See also

[numRows\(\)](#)

Warning

The number of columns might change whenever the geometry changes

12.30.3.15 numRows()

```
uint QwtDynGridLayout::numRows ( ) const
```

Returns

Number of rows of the current layout.

See also

[numColumns\(\)](#)

Warning

The number of rows might change whenever the geometry changes

12.30.3.16 setExpandingDirections()

```
void QwtDynGridLayout::setExpandingDirections (
    Qt::Orientations expanding )
```

Set whether this layout can make use of more space than [sizeHint\(\)](#). A value of Qt::Vertical or Qt::Horizontal means that it wants to grow in only one dimension, while Qt::Vertical | Qt::Horizontal means that it wants to grow in both dimensions. The default value is 0.

Parameters

<i>expanding</i>	Or'd orientations
------------------	-------------------

See also

[expandingDirections\(\)](#)

12.30.3.17 setGeometry()

```
void QwtDynGridLayout::setGeometry (
    const QRect & rect ) [virtual]
```

Reorganizes columns and rows and resizes managed items within a rectangle.

Parameters

<i>rect</i>	Layout geometry
-------------	-----------------

12.30.3.18 setMaxColumns()

```
void QwtDynGridLayout::setMaxColumns (
    uint maxColumns )
```

Limit the number of columns.

Parameters

<i>maxColumns</i>	upper limit, 0 means unlimited
-------------------	--------------------------------

See also

[maxColumns\(\)](#)

12.30.3.19 sizeHint()

```
QSize QwtDynGridLayout::sizeHint ( ) const [virtual]
```

Return the size hint. If [maxColumns\(\)](#) > 0 it is the size for a grid with [maxColumns\(\)](#) columns, otherwise it is the size for a grid with only one row.

Returns

Size hint

See also

[maxColumns\(\)](#), [setMaxColumns\(\)](#)

12.30.3.20 stretchGrid()

```
void QwtDynGridLayout::stretchGrid (
    const QRect & rect,
    uint numColumns,
    QVector< int > & rowHeight,
    QVector< int > & colWidth ) const [protected]
```

Stretch columns in case of `expanding()` & `QSizePolicy::Horizontal` and rows in case of `expanding()` & `QSizePolicy::Vertical` to fill the entire rect. Rows and columns are stretched with the same factor.

Parameters

<i>rect</i>	Bounding rectangle
<i>numColumns</i>	Number of columns
<i>rowHeight</i>	Array to be filled with the calculated row heights
<i>colWidth</i>	Array to be filled with the calculated column widths

See also

`setExpanding()`, `expanding()`

12.30.3.21 `takeAt()`

```
QLayoutItem * QwtDynGridLayout::takeAt (
    int index ) [virtual]
```

Find the item at a specific index and remove it from the layout

Parameters

<i>index</i>	Index
--------------	-------

Returns

Layout item, removed from the layout

See also

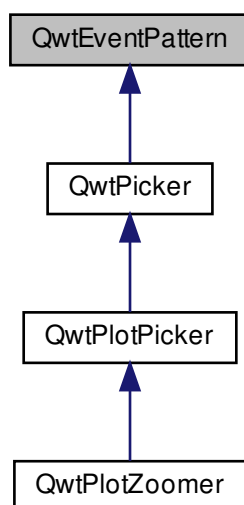
[itemAt\(\)](#)

12.31 QwtEventPattern Class Reference

A collection of event patterns.

```
#include <qwt_event_pattern.h>
```

Inheritance diagram for QwtEventPattern:



Classes

- class [KeyPattern](#)
A pattern for key events.
- class [MousePattern](#)
A pattern for mouse events.

Public Types

- enum [MousePatternCode](#) {
[MouseSelect1](#), [MouseSelect2](#), [MouseSelect3](#), [MouseSelect4](#),
[MouseSelect5](#), [MouseSelect6](#), [MousePatternCount](#) }
Symbolic mouse input codes.
- enum [KeyPatternCode](#) {
[KeySelect1](#), [KeySelect2](#), [KeyAbort](#), [KeyLeft](#),
[KeyRight](#), [KeyUp](#), [KeyDown](#), [KeyRedo](#),
[KeyUndo](#), [KeyHome](#), [KeyPatternCount](#) }
Symbolic keyboard input codes.

Public Member Functions

- [QwtEventPattern](#) ()
- virtual [~QwtEventPattern](#) ()
Destructor.
- void [initMousePattern](#) (int numButtons)
- void [initKeyPattern](#) ()
- void [setMousePattern](#) ([MousePatternCode](#), Qt::MouseButton button, Qt::KeyboardModifiers=Qt::NoModifier)
- void [setKeyPattern](#) ([KeyPatternCode](#), int key, Qt::KeyboardModifiers modifiers=Qt::NoModifier)
- void [setMousePattern](#) (const QVector< [MousePattern](#) > &)
Change the mouse event patterns.
- void [setKeyPattern](#) (const QVector< [KeyPattern](#) > &)
Change the key event patterns.
- const QVector< [MousePattern](#) > & [mousePattern](#) () const
- const QVector< [KeyPattern](#) > & [keyPattern](#) () const
- QVector< [MousePattern](#) > & [mousePattern](#) ()
- QVector< [KeyPattern](#) > & [keyPattern](#) ()
- bool [mouseMatch](#) ([MousePatternCode](#), const QMouseEvent *) const
Compare a mouse event with an event pattern.
- bool [keyMatch](#) ([KeyPatternCode](#), const QKeyEvent *) const
Compare a key event with an event pattern.

Protected Member Functions

- virtual bool [mouseMatch](#) (const [MousePattern](#) &, const QMouseEvent *) const
Compare a mouse event with an event pattern.
- virtual bool [keyMatch](#) (const [KeyPattern](#) &, const QKeyEvent *) const
Compare a key event with an event pattern.

12.31.1 Detailed Description

A collection of event patterns.

[QwtEventPattern](#) introduces an level of indirection for mouse and keyboard inputs. Those are represented by symbolic names, so the application code can be configured by individual mappings.

See also

[QwtPicker](#), [QwtPickerMachine](#), [QwtPlotZoomer](#)

12.31.2 Member Enumeration Documentation

12.31.2.1 KeyPatternCode

```
enum QwtEventPattern::KeyPatternCode
```

Symbolic keyboard input codes.

Individual settings can be configured using [setKeyPattern\(\)](#)

See also

[setKeyPattern\(\)](#), [setMousePattern\(\)](#)

Enumerator

KeySelect1	Qt::Key_Return.
KeySelect2	Qt::Key_Space.
KeyAbort	Qt::Key_Escape.
KeyLeft	Qt::Key_Left.
KeyRight	Qt::Key_Right.
KeyUp	Qt::Key_Up.
KeyDown	Qt::Key_Down.
KeyRedo	Qt::Key_Plus.
KeyUndo	Qt::Key_Minus.
KeyHome	Qt::Key_Escape.
KeyPatternCount	Number of key patterns.

12.31.2.2 MousePatternCode

```
enum QwtEventPattern::MousePatternCode
```

Symbolic mouse input codes.

[QwtEventPattern](#) implements 3 different settings for mice with 1, 2, or 3 buttons that can be activated using [initMousePattern\(\)](#). The default setting is for 3 button mice.

Individual settings can be configured using [setMousePattern\(\)](#).

See also

[initMousePattern\(\)](#), [setMousePattern\(\)](#), [setKeyPattern\(\)](#)

Enumerator

MouseSelect1	<p>The default setting for 1, 2 and 3 button mice is:</p> <ul style="list-style-type: none"> • Qt::LeftButton • Qt::LeftButton • Qt::LeftButton
MouseSelect2	<p>The default setting for 1, 2 and 3 button mice is:</p> <ul style="list-style-type: none"> • Qt::LeftButton + Qt::ControlModifier • Qt::RightButton • Qt::RightButton
MouseSelect3	<p>The default setting for 1, 2 and 3 button mice is:</p> <ul style="list-style-type: none"> • Qt::LeftButton + Qt::AltModifier • Qt::LeftButton + Qt::AltModifier • Qt::MidButton
MouseSelect4	<p>The default setting for 1, 2 and 3 button mice is:</p> <ul style="list-style-type: none"> • Qt::LeftButton + Qt::ShiftModifier • Qt::LeftButton + Qt::ShiftModifier • Qt::LeftButton + Qt::ShiftModifier
MouseSelect5	<p>The default setting for 1, 2 and 3 button mice is:</p> <ul style="list-style-type: none"> • Qt::LeftButton + Qt::ControlButton Qt::ShiftModifier • Qt::RightButton + Qt::ShiftModifier • Qt::RightButton + Qt::ShiftModifier
MouseSelect6	<p>The default setting for 1, 2 and 3 button mice is:</p> <ul style="list-style-type: none"> • Qt::LeftButton + Qt::AltModifier + Qt::ShiftModifier • Qt::LeftButton + Qt::AltModifier Qt::ShiftModifier • Qt::MidButton + Qt::ShiftModifier
MousePatternCount	Number of mouse patterns.

12.31.3 Constructor & Destructor Documentation

12.31.3.1 QwtEventPattern()

```
QwtEventPattern::QwtEventPattern ( )
```

Constructor

See also

[MousePatternCode](#), [KeyPatternCode](#)

12.31.4 Member Function Documentation

12.31.4.1 initKeyPattern()

```
void QwtEventPattern::initKeyPattern ( )
```

Set default mouse patterns.

See also

[KeyPatternCode](#)

12.31.4.2 initMousePattern()

```
void QwtEventPattern::initMousePattern (
    int numButtons )
```

Set default mouse patterns, depending on the number of mouse buttons

Parameters

<i>numButtons</i>	Number of mouse buttons (≤ 3)
-------------------	--------------------------------------

See also

[MousePatternCode](#)

12.31.4.3 keyMatch() [1/2]

```
bool QwtEventPattern::keyMatch (
    KeyPatternCode code,
    const QKeyEvent * event ) const
```

Compare a key event with an event pattern.

A key event matches the pattern when both have the same key value and in the state value the same key flags (Qt::KeyButtonMask) are set.

Parameters

<i>code</i>	Index of the event pattern
<i>event</i>	Key event

Returns

true if matches

See also

[mouseMatch\(\)](#)

12.31.4.4 keyMatch() [2/2]

```
bool QwtEventPattern::keyMatch (
    const KeyPattern & pattern,
    const QKeyEvent * event ) const [protected], [virtual]
```

Compare a key event with an event pattern.

A key event matches the pattern when both have the same key value and in the state value the same key flags (Qt::KeyButtonMask) are set.

Parameters

<i>pattern</i>	Key event pattern
<i>event</i>	Key event

Returns

true if matches

See also

[mouseMatch\(\)](#)

12.31.4.5 keyPattern() [1/2]

```
const QVector< QwtEventPattern::KeyPattern > & QwtEventPattern::keyPattern ( ) const
```

Returns

Key pattern

12.31.4.6 `keyPattern()` [2/2]

```
QVector< QwtEventPattern::KeyPattern > & QwtEventPattern::keyPattern ( )
```

Returns

Key pattern

12.31.4.7 `mouseMatch()` [1/2]

```
bool QwtEventPattern::mouseMatch (
    MousePatternCode code,
    const QMouseEvent * event ) const
```

Compare a mouse event with an event pattern.

A mouse event matches the pattern when both have the same button value and in the state value the same key flags(`Qt::KeyButtonMask`) are set.

Parameters

<i>code</i>	Index of the event pattern
<i>event</i>	Mouse event

Returns

true if matches

See also

[keyMatch\(\)](#)

12.31.4.8 `mouseMatch()` [2/2]

```
bool QwtEventPattern::mouseMatch (
    const MousePattern & pattern,
    const QMouseEvent * event ) const [protected], [virtual]
```

Compare a mouse event with an event pattern.

A mouse event matches the pattern when both have the same button value and in the state value the same key flags(`Qt::KeyButtonMask`) are set.

Parameters

<i>pattern</i>	Mouse event pattern
<i>event</i>	Mouse event

Returns

true if matches

See also

[keyMatch\(\)](#)

12.31.4.9 mousePattern() [1/2]

```
const QVector< QwtEventPattern::MousePattern > & QwtEventPattern::mousePattern ( ) const
```

Returns

Mouse pattern

12.31.4.10 mousePattern() [2/2]

```
QVector< QwtEventPattern::MousePattern > & QwtEventPattern::mousePattern ( )
```

Returns

Mouse pattern

12.31.4.11 setKeyPattern()

```
void QwtEventPattern::setKeyPattern (
    KeyPatternCode pattern,
    int key,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Change one key pattern

Parameters

<i>pattern</i>	Index of the pattern
<i>key</i>	Key
<i>modifiers</i>	Keyboard modifiers

See also

QKeyEvent

12.31.4.12 setMousePattern()

```
void QwtEventPattern::setMousePattern (
    MousePatternCode pattern,
    Qt::MouseButton button,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Change one mouse pattern

Parameters

<i>pattern</i>	Index of the pattern
<i>button</i>	Button
<i>modifiers</i>	Keyboard modifiers

See also

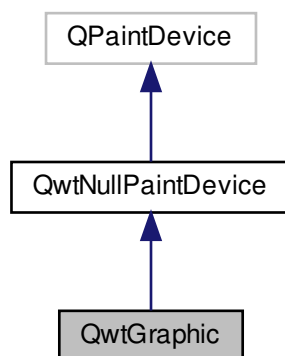
QMouseEvent

12.32 QwtGraphic Class Reference

A paint device for scalable graphics.

```
#include <qwt_graphic.h>
```

Inheritance diagram for QwtGraphic:



Public Types

- enum [RenderHint](#) { [RenderPensUnscaled](#) = 0x1 }
- typedef QFlags< [RenderHint](#) > [RenderHints](#)
Render hints.

Public Member Functions

- [QwtGraphic](#) ()
Constructor.
- [QwtGraphic](#) (const [QwtGraphic](#) &)
Copy constructor.
- virtual [~QwtGraphic](#) ()
Destructor.
- [QwtGraphic](#) & [operator=](#) (const [QwtGraphic](#) &)
Assignment operator.
- void [reset](#) ()
Clear all stored commands.
- bool [isNull](#) () const
- bool [isEmpty](#) () const
- void [render](#) (QPainter *) const
Replay all recorded painter commands.
- void [render](#) (QPainter *, const QSizeF &, Qt::AspectRatioMode=Qt::IgnoreAspectRatio) const
Replay all recorded painter commands.
- void [render](#) (QPainter *, const QRectF &, Qt::AspectRatioMode=Qt::IgnoreAspectRatio) const
Replay all recorded painter commands.
- void [render](#) (QPainter *, const QPointF &, Qt::Alignment=Qt::AlignTop|Qt::AlignLeft) const
Replay all recorded painter commands.
- QPixmap [toPixmap](#) () const
Convert the graphic to a QPixmap.
- QPixmap [toPixmap](#) (const QSize &, Qt::AspectRatioMode=Qt::IgnoreAspectRatio) const
Convert the graphic to a QPixmap.
- QImage [toImage](#) () const
Convert the graphic to a QImage.
- QImage [toImage](#) (const QSize &, Qt::AspectRatioMode=Qt::IgnoreAspectRatio) const
Convert the graphic to a QImage.
- QRectF [scaledBoundingRect](#) (double sx, double sy) const
Calculate the target rectangle for scaling the graphic.
- QRectF [boundingRect](#) () const
- QRectF [controlPointRect](#) () const
- const QVector< [QwtPainterCommand](#) > & [commands](#) () const
- void [setCommands](#) (QVector< [QwtPainterCommand](#) > &)
Append paint commands.
- void [setDefaultSize](#) (const QSizeF &)
Set a default size.
- QSizeF [defaultSize](#) () const
Default size.
- void [setRenderHint](#) ([RenderHint](#), bool on=true)
- bool [testRenderHint](#) ([RenderHint](#)) const

Protected Member Functions

- virtual QSize [sizeMetrics](#) () const
- virtual void [drawPath](#) (const QPainterPath &)
- virtual void [drawPixmap](#) (const QRectF &, const QPixmap &, const QRectF &)
Store a pixmap command in the command list.
- virtual void [drawImage](#) (const QRectF &, const QImage &, const QRectF &, Qt::ImageConversionFlags)
Store a image command in the command list.
- virtual void [updateState](#) (const QPaintEngineState &state)
Store a state command in the command list.

12.32.1 Detailed Description

A paint device for scalable graphics.

[QwtGraphic](#) is the representation of a graphic that is tailored for scalability. Like [QPicture](#) it will be initialized by [QPainter](#) operations and can be replayed later to any target paint device.

While the usual image representations [QImage](#) and [QPixmap](#) are not scalable Qt offers two paint devices, that might be candidates for representing a vector graphic:

- [QPicture](#)
Unfortunately [QPicture](#) had been forgotten, when Qt4 introduced floating point based render engines. Its API is still on integers, what make it unusable for proper scaling.
- [QSvgRenderer](#)/[QSvgGenerator](#)
Unfortunately [QSvgRenderer](#) hides to much information about its nodes in internal APIs, that are necessary for proper layout calculations. Also it is derived from [QObject](#) and can't be copied like [QImage](#)/[QPixmap](#).

[QwtGraphic](#) maps all scalable drawing primitives to a [QPainterPath](#) and stores them together with the painter state changes (pen, brush, transformation ...) in a list of [QwtPaintCommands](#). For being a complete [QPaintDevice](#) it also stores pixmaps or images, what is somehow against the idea of the class, because these objects can't be scaled without a loss in quality.

The main issue about scaling a [QwtGraphic](#) object are the pens used for drawing the outlines of the painter paths. While non cosmetic pens ([QPen::isCosmetic\(\)](#)) are scaled with the same ratio as the path, cosmetic pens have a fixed width. A graphic might have paths with different pens - cosmetic and non-cosmetic.

[QwtGraphic](#) caches 2 different rectangles:

- control point rectangle
The control point rectangle is the bounding rectangle of all control point rectangles of the painter paths, or the target rectangle of the pixmaps/images.
- bounding rectangle
The bounding rectangle extends the control point rectangle by what is needed for rendering the outline with an unscaled pen.

Because the offset for drawing the outline depends on the shape of the painter path (the peak of a triangle is different than the flat side) scaling with a fixed aspect ratio always needs to be calculated from the control point rectangle.

See also

[QwtPainterCommand](#)

12.32.2 Member Typedef Documentation

12.32.2.1 RenderHints

```
typedef QFlags<RenderHint> QwtGraphic::RenderHints
```

Render hints.

The default setting is to disable all hints

12.32.3 Member Enumeration Documentation

12.32.3.1 RenderHint

```
enum QwtGraphic::RenderHint
```

Hint how to render a graphic

See also

[setRenderHint\(\)](#), [testRenderHint\(\)](#)

Enumerator

RenderPensUnscaled	<p>When rendering a QwtGraphic a specific scaling between the controlPointRect() and the coordinates of the target rectangle is set up internally in render(). When RenderPensUnscaled is set this specific scaling is applied for the control points only, but not for the pens. All other painter transformations (set up by application code) are supposed to work like usual.</p> <p>See also</p> <p>render();</p>
--------------------	--

12.32.4 Constructor & Destructor Documentation

12.32.4.1 QwtGraphic() [1/2]

```
QwtGraphic::QwtGraphic ( )
```

Constructor.

Initializes a null graphic

See also

[isNull\(\)](#)

12.32.4.2 QwtGraphic() [2/2]

```
QwtGraphic::QwtGraphic (
    const QwtGraphic & other )
```

Copy constructor.

Parameters

<i>other</i>	Source
--------------	--------

See also[operator=\(\)](#)**12.32.5 Member Function Documentation****12.32.5.1 boundingRect()**

```
QRectF QwtGraphic::boundingRect ( ) const
```

The bounding rectangle is the [controlPointRect\(\)](#) extended by the areas needed for rendering the outlines with unscaled pens.

Returns

Bounding rectangle of the graphic

See also[controlPointRect\(\)](#), [scaledBoundingRect\(\)](#)**12.32.5.2 commands()**

```
const QVector< QwtPainterCommand > & QwtGraphic::commands ( ) const
```

Returns

List of recorded paint commands

See also[setCommands\(\)](#)

12.32.5.3 controlPointRect()

```
QRectF QwtGraphic::controlPointRect ( ) const
```

The control point rectangle is the bounding rectangle of all control points of the paths and the target rectangles of the images/pixmaps.

Returns

Control point rectangle

See also

[boundingRect\(\)](#), [scaledBoundingRect\(\)](#)

12.32.5.4 defaultSize()

```
QSizeF QwtGraphic::defaultSize ( ) const
```

Default size.

When a non empty size has been assigned by [setDefaultSize\(\)](#) this size will be returned. Otherwise the default size is the size of the bounding rectangle.

The default size is used in all methods rendering the graphic, where no size is explicitly specified.

Returns

Default size

See also

[setDefaultSize\(\)](#), [boundingRect\(\)](#)

12.32.5.5 drawImage()

```
void QwtGraphic::drawImage (
    const QRectF & rect,
    const QImage & image,
    const QRectF & subRect,
    Qt::ImageConversionFlags flags ) [protected], [virtual]
```

Store a image command in the command list.

Parameters

<i>rect</i>	target rectangle
<i>image</i>	Image to be painted
<i>subRect</i>	Rectangle of the pixmap to be painted
<i>flags</i>	Image conversion flags

See also

`QPaintEngine::drawImage()`

Reimplemented from [QwtNullPaintDevice](#).

12.32.5.6 `drawPath()`

```
void QwtGraphic::drawPath (
    const QPainterPath & path ) [protected], [virtual]
```

Store a path command in the command list

Parameters

<i>path</i>	Painter path
-------------	--------------

See also

`QPaintEngine::drawPath()`

Reimplemented from [QwtNullPaintDevice](#).

12.32.5.7 `drawPixmap()`

```
void QwtGraphic::drawPixmap (
    const QRectF & rect,
    const QPixmap & pixmap,
    const QRectF & subRect ) [protected], [virtual]
```

Store a pixmap command in the command list.

Parameters

<i>rect</i>	target rectangle
<i>pixmap</i>	Pixmap to be painted
<i>subRect</i>	Reactangle of the pixmap to be painted

See also

`QPaintEngine::drawPixmap()`

Reimplemented from [QwtNullPaintDevice](#).

12.32.5.8 isEmpty()

```
bool QwtGraphic::isEmpty ( ) const
```

Returns

True, when the bounding rectangle is empty

See also

[boundingRect\(\)](#), [isNull\(\)](#)

12.32.5.9 isNull()

```
bool QwtGraphic::isNull ( ) const
```

Returns

True, when no painter commands have been stored

See also

[isEmpty\(\)](#), [commands\(\)](#)

12.32.5.10 operator=()

```
QwtGraphic & QwtGraphic::operator= (
    const QwtGraphic & other )
```

Assignment operator.

Parameters

<i>other</i>	Source
--------------	--------

Returns

A reference of this object

12.32.5.11 render() [1/4]

```
void QwtGraphic::render (
    QPainter * painter ) const
```

Replay all recorded painter commands.

Parameters

<i>painter</i>	Qt painter
----------------	------------

12.32.5.12 render() [2/4]

```
void QwtGraphic::render (
    QPainter * painter,
    const QSizeF & size,
    Qt::AspectRatioMode aspectRatioMode = Qt::IgnoreAspectRatio ) const
```

Replay all recorded painter commands.

The graphic is scaled to fit into the rectangle of the given size starting at (0, 0).

Parameters

<i>painter</i>	Qt painter
<i>size</i>	Size for the scaled graphic
<i>aspectRatioMode</i>	Mode how to scale - See Qt::AspectRatioMode

12.32.5.13 render() [3/4]

```
void QwtGraphic::render (
    QPainter * painter,
    const QRectF & rect,
    Qt::AspectRatioMode aspectRatioMode = Qt::IgnoreAspectRatio ) const
```

Replay all recorded painter commands.

The graphic is scaled to fit into the given rectangle

Parameters

<i>painter</i>	Qt painter
<i>rect</i>	Rectangle for the scaled graphic
<i>aspectRatioMode</i>	Mode how to scale - See Qt::AspectRatioMode

12.32.5.14 render() [4/4]

```
void QwtGraphic::render (
    QPainter * painter,
    const QPointF & pos,
    Qt::Alignment alignment = Qt::AlignTop | Qt::AlignLeft ) const
```

Replay all recorded painter commands.

The graphic is scaled to the [defaultSize\(\)](#) and aligned to a position.

Parameters

<i>painter</i>	Qt painter
<i>pos</i>	Reference point, where to render
<i>alignment</i>	Flags how to align the target rectangle to pos.

12.32.5.15 `reset()`

```
void QwtGraphic::reset ( )
```

Clear all stored commands.

See also

[isNull\(\)](#)

12.32.5.16 `scaledBoundingRect()`

```
QRectF QwtGraphic::scaledBoundingRect (
    double sx,
    double sy ) const
```

Calculate the target rectangle for scaling the graphic.

Parameters

<i>sx</i>	Horizontal scaling factor
<i>sy</i>	Vertical scaling factor

Note

In case of paths that are painted with a cosmetic pen (see `QPen::isCosmetic()`) the target rectangle is different to multiplying the bounding rectangle.

Returns

Scaled bounding rectangle

See also

[boundingRect\(\)](#), [controlPointRect\(\)](#)

12.32.5.17 `setCommands()`

```
void QwtGraphic::setCommands (
    QVector< QwtPainterCommand > & commands )
```

Append paint commands.

Parameters

<i>commands</i>	Paint commands
-----------------	----------------

See also

[commands\(\)](#)

12.32.5.18 setDefaultSize()

```
void QwtGraphic::setDefaultSize (
    const QSizeF & size )
```

Set a default size.

The default size is used in all methods rendering the graphic, where no size is explicitly specified. Assigning an empty size means, that the default size will be calculated from the bounding rectangle.

The default setting is an empty size.

Parameters

<i>size</i>	Default size
-------------	--------------

See also

[defaultSize\(\)](#), [boundingRect\(\)](#)

12.32.5.19 setRenderHint()

```
void QwtGraphic::setRenderHint (
    RenderHint hint,
    bool on = true )
```

Toggle an render hint

Parameters

<i>hint</i>	Render hint
<i>on</i>	true/false

See also

[testRenderHint\(\)](#), [RenderHint](#)

12.32.5.20 sizeMetrics()

```
QSize QwtGraphic::sizeMetrics ( ) const [protected], [virtual]
```

Returns

Ceiled [defaultSize\(\)](#)

Implements [QwtNullPaintDevice](#).

12.32.5.21 testRenderHint()

```
bool QwtGraphic::testRenderHint (
    RenderHint hint ) const
```

Test a render hint

Parameters

<i>hint</i>	Render hint
-------------	-------------

Returns

true/false

See also

[setRenderHint\(\)](#), [RenderHint](#)

12.32.5.22 toImage() [1/2]

```
QImage QwtGraphic::toImage ( ) const
```

Convert the graphic to a QImage.

All pixels of the image get initialized by 0 (transparent) before the graphic is scaled and rendered on it.

The format of the image is QImage::Format_ARGB32_Premultiplied.

The size of the image is the default size (ceiled to integers) of the graphic.

Returns

The graphic as image in default size

See also

[defaultSize\(\)](#), [toPixmap\(\)](#), [render\(\)](#)

12.32.5.23 toImage() [2/2]

```
QImage QwtGraphic::toImage (
    const QSize & size,
    Qt::AspectRatioMode aspectRatioMode = Qt::IgnoreAspectRatio ) const
```

Convert the graphic to a QImage.

All pixels of the image get initialized by 0 (transparent) before the graphic is scaled and rendered on it.

The format of the image is QImage::Format_ARGB32_Premultiplied.

Parameters

<i>size</i>	Size of the image
<i>aspectRatioMode</i>	Aspect ratio how to scale the graphic

Returns

The graphic as image

See also

[toPixmap\(\)](#), [render\(\)](#)

12.32.5.24 toPixmap() [1/2]

```
QPixmap QwtGraphic::toPixmap ( ) const
```

Convert the graphic to a QPixmap.

All pixels of the pixmap get initialized by Qt::transparent before the graphic is scaled and rendered on it.

The size of the pixmap is the default size (ceiled to integers) of the graphic.

Returns

The graphic as pixmap in default size

See also

[defaultSize\(\)](#), [toImage\(\)](#), [render\(\)](#)

12.32.5.25 toPixmap() [2/2]

```
QPixmap QwtGraphic::toPixmap (
    const QSize & size,
    Qt::AspectRatioMode aspectRatioMode = Qt::IgnoreAspectRatio ) const
```

Convert the graphic to a QPixmap.

All pixels of the pixmap get initialized by Qt::transparent before the graphic is scaled and rendered on it.

Parameters

<i>size</i>	Size of the image
<i>aspectRatioMode</i>	Aspect ratio how to scale the graphic

Returns

The graphic as pixmap

See also

[toImage\(\)](#), [render\(\)](#)

12.32.5.26 updateState()

```
void QwtGraphic::updateState (
    const QPaintEngineState & state ) [protected], [virtual]
```

Store a state command in the command list.

Parameters

<i>state</i>	State to be stored
--------------	--------------------

See also

[QPaintEngine::updateState\(\)](#)

Reimplemented from [QwtNullPaintDevice](#).

12.33 QwtInterval Class Reference

A class representing an interval.

```
#include <qwt_interval.h>
```

Public Types

- enum [BorderFlag](#) { [IncludeBorders](#) = 0x00, [ExcludeMinimum](#) = 0x01, [ExcludeMaximum](#) = 0x02, [ExcludeBorders](#) = ExcludeMinimum | ExcludeMaximum }
- typedef QFlags< [BorderFlag](#) > [BorderFlags](#)
Border flags.

Public Member Functions

- [QwtInterval](#) ()
Default Constructor.
- [QwtInterval](#) (double [minValue](#), double [maxValue](#), [BorderFlags](#)=[IncludeBorders](#))
- void [setInterval](#) (double [minValue](#), double [maxValue](#), [BorderFlags](#)=[IncludeBorders](#))
- [QwtInterval normalized](#) () const
Normalize the limits of the interval.
- [QwtInterval inverted](#) () const
- [QwtInterval limited](#) (double lowerBound, double upperBound) const
- bool [operator==](#) (const [QwtInterval](#) &) const
Compare two intervals.
- bool [operator!=](#) (const [QwtInterval](#) &) const
Compare two intervals.
- void [setBorderFlags](#) ([BorderFlags](#))
- [BorderFlags borderFlags](#) () const
- double [minValue](#) () const
- double [maxValue](#) () const
- double [width](#) () const
Return the width of an interval.
- void [setMinValue](#) (double)
- void [setMaxValue](#) (double)
- bool [contains](#) (double value) const
- bool [intersects](#) (const [QwtInterval](#) &) const
Test if two intervals overlap.
- [QwtInterval intersect](#) (const [QwtInterval](#) &) const
Intersect 2 intervals.
- [QwtInterval unite](#) (const [QwtInterval](#) &) const
Unite 2 intervals.
- [QwtInterval operator|](#) (const [QwtInterval](#) &) const
- [QwtInterval operator &](#) (const [QwtInterval](#) &) const
- [QwtInterval & operator|=](#) (const [QwtInterval](#) &) const
Unite this interval with the given interval.
- [QwtInterval & operator &=](#) (const [QwtInterval](#) &) const
- [QwtInterval extend](#) (double value) const
Extend the interval.
- [QwtInterval operator|](#) (double) const
- [QwtInterval & operator|=](#) (double)
- bool [isValid](#) () const
- bool [isNull](#) () const
- void [invalidate](#) ()
- [QwtInterval symmetrize](#) (double value) const

12.33.1 Detailed Description

A class representing an interval.

The interval is represented by 2 doubles, the lower and the upper limit.

12.33.2 Member Enumeration Documentation

12.33.2.1 BorderFlag

enum `QwtInterval::BorderFlag`

Flag indicating if a border is included or excluded

See also

[setBorderFlags\(\)](#), [borderFlags\(\)](#)

Enumerator

IncludeBorders	Min/Max values are inside the interval.
ExcludeMinimum	Min value is not included in the interval.
ExcludeMaximum	Max value is not included in the interval.
ExcludeBorders	Min/Max values are not included in the interval.

12.33.3 Constructor & Destructor Documentation

12.33.3.1 QwtInterval() [1/2]

`QwtInterval::QwtInterval () [inline]`

Default Constructor.

Creates an invalid interval [0.0, -1.0]

See also

[setInterval\(\)](#), [isValid\(\)](#)

12.33.3.2 QwtInterval() [2/2]

```
QwtInterval::QwtInterval (
    double minValue,
    double maxValue,
    BorderFlags borderFlags = IncludeBorders ) [inline]
```

Constructor

Build an interval with from min/max values

Parameters

<i>minValue</i>	Minimum value
<i>maxValue</i>	Maximum value
<i>borderFlags</i>	Include/Exclude borders

12.33.4 Member Function Documentation

12.33.4.1 borderFlags()

```
QwtInterval::BorderFlags QwtInterval::borderFlags ( ) const [inline]
```

Returns

Border flags

See also

[setBorderFlags\(\)](#)

12.33.4.2 contains()

```
bool QwtInterval::contains (
    double value ) const
```

Test if a value is inside an interval

Parameters

<i>value</i>	Value
--------------	-------

Returns

true, if value \geq [minValue\(\)](#) && value \leq [maxValue\(\)](#)

12.33.4.3 extend()

```
QwtInterval QwtInterval::extend (
    double value ) const
```

Extend the interval.

If value is below [minValue\(\)](#), value becomes the lower limit. If value is above [maxValue\(\)](#), value becomes the upper limit.

[extend\(\)](#) has no effect for invalid intervals

Parameters

<i>value</i>	Value
--------------	-------

Returns

extended interval

See also

[isValid\(\)](#)

12.33.4.4 intersect()

```
QwtInterval QwtInterval::intersect (
    const QwtInterval & other ) const
```

Intersect 2 intervals.

Parameters

<i>other</i>	Interval to be intersect with
--------------	-------------------------------

Returns

Intersection

12.33.4.5 intersects()

```
bool QwtInterval::intersects (
    const QwtInterval & other ) const
```

Test if two intervals overlap.

Parameters

<i>other</i>	Interval
--------------	----------

Returns

True, when the intervals are intersecting

12.33.4.6 invalidate()

```
void QwtInterval::invalidate ( ) [inline]
```

Invalidate the interval

The limits are set to interval [0.0, -1.0]

See also

[isValid\(\)](#)

12.33.4.7 inverted()

```
QwtInterval QwtInterval::inverted ( ) const
```

Invert the limits of the interval

Returns

Inverted interval

See also

[normalized\(\)](#)

12.33.4.8 isNull()

```
bool QwtInterval::isNull ( ) const [inline]
```

Returns

true, if [isValid\(\)](#) && ([minValue\(\)](#) >= [maxValue\(\)](#))

12.33.4.9 isValid()

```
bool QwtInterval::isValid ( ) const [inline]
```

A interval is valid when [minValue\(\)](#) <= [maxValue\(\)](#). In case of [QwtInterval::ExcludeBorders](#) it is true when [minValue\(\)](#) < [maxValue\(\)](#)

Returns

True, when the interval is valid

12.33.4.10 limited()

```
QwtInterval QwtInterval::limited (
    double lowerBound,
    double upperBound ) const
```

Limit the interval, keeping the border modes

Parameters

<i>lowerBound</i>	Lower limit
<i>upperBound</i>	Upper limit

Returns

Limited interval

12.33.4.11 `maxValue()`

```
double QwtInterval::maxValue ( ) const [inline]
```

Returns

Upper limit of the interval

12.33.4.12 `minValue()`

```
double QwtInterval::minValue ( ) const [inline]
```

Returns

Lower limit of the interval

12.33.4.13 `normalized()`

```
QwtInterval QwtInterval::normalized ( ) const
```

Normalize the limits of the interval.

If `maxValue()` < `minValue()` the limits will be inverted.

Returns

Normalized interval

See also

[isValid\(\)](#), [inverted\(\)](#)

12.33.4.14 `operator!=()`

```
bool QwtInterval::operator!= (
    const QwtInterval & other ) const [inline]
```

Compare two intervals.

Parameters

<i>other</i>	Interval to compare with
--------------	--------------------------

Returns

True, when this and other are not equal

12.33.4.15 operator==()

```
bool QwtInterval::operator==(
    const QwtInterval & other ) const [inline]
```

Compare two intervals.

Parameters

<i>other</i>	Interval to compare with
--------------	--------------------------

Returns

True, when this and other are equal

12.33.4.16 operator" | () [1/2]

```
QwtInterval QwtInterval::operator| (
    const QwtInterval & other ) const [inline]
```

Union of two intervals

Parameters

<i>other</i>	Interval to unite with
--------------	------------------------

Returns

Union of this and other

See also

[unite\(\)](#)

12.33.4.17 `operator" | ()` [2/2]

```
QwtInterval QwtInterval::operator| (  
    double value ) const [inline]
```

Extend an interval

Parameters

<i>value</i>	Value
--------------	-------

Returns

Extended interval

See also

[extend\(\)](#)

12.33.4.18 `operator" |=()` [1/2]

```
QwtInterval & QwtInterval::operator|= (
    const QwtInterval & other )
```

Unite this interval with the given interval.

Parameters

<i>other</i>	Interval to be united with
--------------	----------------------------

Returns

This interval

12.33.4.19 `operator" |=()` [2/2]

```
QwtInterval & QwtInterval::operator|= (
    double value )
```

Extend an interval

Parameters

<i>value</i>	Value
--------------	-------

Returns

Reference of the extended interval

See also

[extend\(\)](#)

12.33.4.20 `setBorderFlags()`

```
void QwtInterval::setBorderFlags (
    BorderFlags borderFlags ) [inline]
```

Change the border flags

Parameters

<i>borderFlags</i>	Or'd BorderMode flags
--------------------	-----------------------

See also

[borderFlags\(\)](#)

12.33.4.21 `setInterval()`

```
void QwtInterval::setInterval (
    double minValue,
    double maxValue,
    BorderFlags borderFlags = IncludeBorders ) [inline]
```

Assign the limits of the interval

Parameters

<i>minValue</i>	Minimum value
<i>maxValue</i>	Maximum value
<i>borderFlags</i>	Include/Exclude borders

12.33.4.22 `setMaxValue()`

```
void QwtInterval::setMaxValue (
    double maxValue ) [inline]
```

Assign the upper limit of the interval

Parameters

<i>maxValue</i>	Maximum value
-----------------	---------------

12.33.4.23 `setMinValue()`

```
void QwtInterval::setMinValue (
    double minValue ) [inline]
```

Assign the lower limit of the interval

Parameters

<i>minValue</i>	Minimum value
-----------------	---------------

12.33.4.24 symmetrize()

```
QwtInterval QwtInterval::symmetrize (
    double value ) const
```

Adjust the limit that is closer to value, so that value becomes the center of the interval.

Parameters

<i>value</i>	Center
--------------	--------

Returns

Interval with value as center

12.33.4.25 width()

```
double QwtInterval::width ( ) const [inline]
```

Return the width of an interval.

The width of invalid intervals is 0.0, otherwise the result is `maxValue() - minValue()`.

Returns

Interval width

See also

[isValid\(\)](#)

12.34 QwtIntervalSample Class Reference

A sample of the types (x1-x2, y) or (x, y1-y2)

```
#include <qwt_samples.h>
```

Public Member Functions

- [QwtIntervalSample](#) ()
Constructor.
- [QwtIntervalSample](#) (double, const [QwtInterval](#) &)
Constructor.
- [QwtIntervalSample](#) (double [value](#), double min, double max)
Constructor.
- bool [operator==](#) (const [QwtIntervalSample](#) &) const
Compare operator.
- bool [operator!=](#) (const [QwtIntervalSample](#) &) const
Compare operator.

Public Attributes

- double [value](#)
Value.
- [QwtInterval](#) [interval](#)
Interval.

12.34.1 Detailed Description

A sample of the types (x1-x2, y) or (x, y1-y2)

12.34.2 Constructor & Destructor Documentation

12.34.2.1 QwtIntervalSample()

```
QwtIntervalSample::QwtIntervalSample ( ) [inline]
```

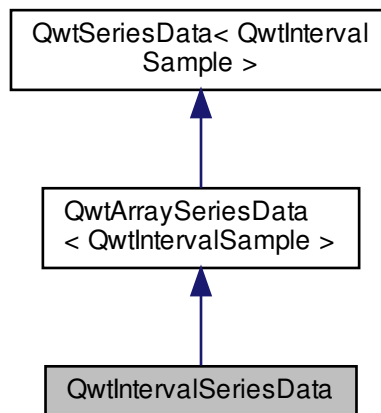
Constructor The value is set to 0.0, the interval is invalid

12.35 QwtIntervalSeriesData Class Reference

Interface for iterating over an array of intervals.

```
#include <qwt_series_data.h>
```

Inheritance diagram for QwtIntervalSeriesData:



Public Member Functions

- [QwtIntervalSeriesData](#) (const QVector< [QwtIntervalSample](#) > &=QVector< [QwtIntervalSample](#) >())
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.

Additional Inherited Members

12.35.1 Detailed Description

Interface for iterating over an array of intervals.

12.35.2 Constructor & Destructor Documentation

12.35.2.1 QwtIntervalSeriesData()

```
QwtIntervalSeriesData::QwtIntervalSeriesData (
    const QVector< QwtIntervalSample > & samples = QVector<QwtIntervalSample> () )
```

Constructor

Parameters

<i>samples</i>	Samples
----------------	---------

12.35.3 Member Function Documentation

12.35.3.1 boundingRect()

```
QRectF QwtIntervalSeriesData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

Implements [QwtSeriesData< QwtIntervalSample >](#).

12.36 QwtIntervalSymbol Class Reference

A drawing primitive for displaying an interval like an error bar.

```
#include <qwt_interval_symbol.h>
```

Public Types

- enum [Style](#) { [NoSymbol](#) = -1, [Bar](#), [Box](#), [UserSymbol](#) = 1000 }
Symbol style.

Public Member Functions

- [QwtIntervalSymbol](#) ([Style](#)=[NoSymbol](#))
- [QwtIntervalSymbol](#) (const [QwtIntervalSymbol](#) &)
Copy constructor.
- virtual [~QwtIntervalSymbol](#) ()
Destructor.
- [QwtIntervalSymbol](#) & [operator=](#) (const [QwtIntervalSymbol](#) &)
Assignment operator.
- bool [operator==](#) (const [QwtIntervalSymbol](#) &) const
Compare two symbols.
- bool [operator!=](#) (const [QwtIntervalSymbol](#) &) const
Compare two symbols.
- void [setWidth](#) (int)
- int [width](#) () const
- void [setBrush](#) (const [QBrush](#) &)
Assign a brush.
- const [QBrush](#) & [brush](#) () const
- void [setPen](#) (const [QColor](#) &, qreal [width](#)=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setPen](#) (const [QPen](#) &)
- const [QPen](#) & [pen](#) () const
- void [setStyle](#) ([Style](#))
- [Style](#) [style](#) () const
- virtual void [draw](#) ([QPainter](#) *, Qt::Orientation, const [QPointF](#) &from, const [QPointF](#) &to) const

12.36.1 Detailed Description

A drawing primitive for displaying an interval like an error bar.

See also

[QwtPlotIntervalCurve](#)

12.36.2 Member Enumeration Documentation

12.36.2.1 Style

```
enum QwtIntervalSymbol::Style
```

Symbol style.

Enumerator

NoSymbol	No Style. The symbol cannot be drawn.
Bar	The symbol displays a line with caps at the beginning/end. The size of the caps depends on the symbol width() .
Box	The symbol displays a plain rectangle using pen() and brush() . The size of the rectangle depends on the translated interval and the width() ,
UserSymbol	Styles \geq UserSymbol are reserved for derived classes of QwtIntervalSymbol that overload draw() with additional application specific symbol types.

12.36.3 Constructor & Destructor Documentation

12.36.3.1 QwtIntervalSymbol()

```
QwtIntervalSymbol::QwtIntervalSymbol (
    Style style = NoSymbol )
```

Constructor

Parameters

<i>style</i>	Style of the symbol
--------------	---------------------

See also

[setStyle\(\)](#), [style\(\)](#), [Style](#)

12.36.4 Member Function Documentation

12.36.4.1 brush()

```
const QBrush & QwtIntervalSymbol::brush ( ) const
```

Returns

Brush

See also

[setBrush\(\)](#)

12.36.4.2 draw()

```
void QwtIntervalSymbol::draw (
    QPainter * painter,
    Qt::Orientation orientation,
    const QPointF & from,
    const QPointF & to ) const [virtual]
```

Draw a symbol depending on its style

Parameters

<i>painter</i>	Painter
<i>orientation</i>	Orientation
<i>from</i>	Start point of the interval in target device coordinates
<i>to</i>	End point of the interval in target device coordinates

See also

[setStyle\(\)](#)

12.36.4.3 pen()

```
const QPen & QwtIntervalSymbol::pen ( ) const
```

Returns

Pen

See also

[setPen\(\)](#), [brush\(\)](#)

12.36.4.4 setBrush()

```
void QwtIntervalSymbol::setBrush (
    const QBrush & brush )
```

Assign a brush.

The brush is used for the Box style.

Parameters

<i>brush</i>	Brush
--------------	-------

See also

[brush\(\)](#)

12.36.4.5 setPen() [1/2]

```
void QwtIntervalSymbol::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see `QPen::isCosmetic()`). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.36.4.6 setPen() [2/2]

```
void QwtIntervalSymbol::setPen (
    const QPen & pen )
```

Assign a pen

Parameters

<i>pen</i>	Pen
------------	-----

See also[pen\(\)](#), [setBrush\(\)](#)**12.36.4.7 setStyle()**

```
void QwtIntervalSymbol::setStyle (
    Style style )
```

Specify the symbol style

Parameters

<i>style</i>	Style
--------------	-------

See also[style\(\)](#), [Style](#)**12.36.4.8 setWidth()**

```
void QwtIntervalSymbol::setWidth (
    int width )
```

Specify the width of the symbol It is used depending on the style.

Parameters

<i>width</i>	Width
--------------	-------

See also[width\(\)](#), [setStyle\(\)](#)**12.36.4.9 style()**

```
QwtIntervalSymbol::Style QwtIntervalSymbol::style ( ) const
```

Returns

Current symbol style

See also

[setStyle\(\)](#)

12.36.4.10 width()

```
int QwtIntervalSymbol::width ( ) const
```

Returns

Width of the symbol.

See also

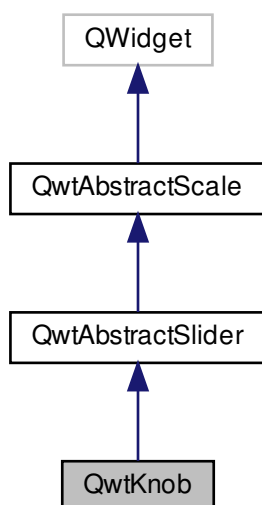
[setWidth\(\)](#), [setStyle\(\)](#)

12.37 QwtKnob Class Reference

The Knob Widget.

```
#include <qwt_knob.h>
```

Inheritance diagram for QwtKnob:



Public Types

- enum `KnobStyle` { `Flat`, `Raised`, `Sunken`, `Styled` }
Style of the knob surface.
- enum `MarkerStyle` {
 `NoMarker` = -1, `Tick`, `Triangle`, `Dot`,
 `Nub`, `Notch` }
Marker type.

Public Member Functions

- `QwtKnob` (`QWidget *parent=NULL`)
Constructor.
- virtual `~QwtKnob` ()
Destructor.
- void `setAlignment` (`Qt::Alignment`)
Set the alignment of the knob.
- `Qt::Alignment alignment` () const
- void `setKnobWidth` (int)
Change the knob's width.
- int `knobWidth` () const
Return the width of the knob.
- void `setNumTurns` (int)
Set the number of turns.
- int `numTurns` () const
- void `setTotalAngle` (double angle)
Set the total angle by which the knob can be turned.
- double `totalAngle` () const
- void `setKnobStyle` (`KnobStyle`)
Set the knob type.
- `KnobStyle knobStyle` () const
- void `setBorderWidth` (int)
Set the knob's border width.
- int `borderWidth` () const
Return the border width.
- void `setMarkerStyle` (`MarkerStyle`)
Set the marker type of the knob.
- `MarkerStyle markerStyle` () const
- void `setMarkerSize` (int)
Set the size of the marker.
- int `markerSize` () const
- virtual `QSize sizeHint` () const
- virtual `QSize minimumSizeHint` () const
- void `setScaleDraw` (`QwtRoundScaleDraw *`)
- const `QwtRoundScaleDraw * scaleDraw` () const
- `QwtRoundScaleDraw * scaleDraw` ()
- `QRect knobRect` () const

Protected Member Functions

- virtual void [paintEvent](#) (QPaintEvent *)
- virtual void [changeEvent](#) (QEvent *)
- virtual void [drawKnob](#) (QPainter *, const QRectF &) const
Draw the knob.
- virtual void [drawFocusIndicator](#) (QPainter *) const
- virtual void [drawMarker](#) (QPainter *, const QRectF &, double angle) const
Draw the marker at the knob's front.
- virtual double [scrolledTo](#) (const QPoint &) const
Determine the value for a new position of the mouse.
- virtual bool [isScrollPosition](#) (const QPoint &) const
Determine what to do when the user presses a mouse button.

Additional Inherited Members

12.37.1 Detailed Description

The Knob Widget.

The [QwtKnob](#) widget imitates look and behavior of a volume knob on a radio. It looks similar to [QDial](#) - not to [QwtDial](#).

The value range of a knob might be divided into several turns.

The layout of the knob depends on the [knobWidth\(\)](#).

- width > 0 The diameter of the knob is fixed and the knob is aligned according to the [alignment\(\)](#) flags inside of the contentsRect().
- width <= 0 The knob is extended to the minimum of width/height of the contentsRect() and aligned in the other direction according to [alignment\(\)](#).

Setting a fixed [knobWidth\(\)](#) is helpful to align several knobs with different scale labels.

12.37.2 Member Enumeration Documentation

12.37.2.1 KnobStyle

```
enum QwtKnob::KnobStyle
```

Style of the knob surface.

Depending on the KnobStyle the surface of the knob is filled from the brushes of the widget palette().

See also

[setKnobStyle\(\)](#), [knobStyle\(\)](#)

Enumerator

Flat	Fill the knob with a brush from <code>QPalette::Button</code> .
Raised	Build a gradient from <code>QPalette::Midlight</code> and <code>QPalette::Button</code> .
Sunken	Build a gradient from <code>QPalette::Midlight</code> , <code>QPalette::Button</code> and <code>QPalette::Midlight</code>
Styled	Build a radial gradient from <code>QPalette::Button</code> like it is used for <code>QDial</code> in various Qt styles.

12.37.2.2 MarkerStyle

```
enum QwtKnob::MarkerStyle
```

Marker type.

The marker indicates the current value on the knob The default setting is a Notch marker.

See also

[setMarkerStyle\(\)](#), [setMarkerSize\(\)](#)

Enumerator

NoMarker	Don't paint any marker.
Tick	Paint a single tick in <code>QPalette::ButtonText</code> color.
Triangle	Paint a triangle in <code>QPalette::ButtonText</code> color.
Dot	Paint a circle in <code>QPalette::ButtonText</code> color.
Nub	Draw a raised ellipse with a gradient build from <code>QPalette::Light</code> and <code>QPalette::Mid</code>
Notch	Draw a sunken ellipse with a gradient build from <code>QPalette::Light</code> and <code>QPalette::Mid</code>

12.37.3 Constructor & Destructor Documentation

12.37.3.1 QwtKnob()

```
QwtKnob::QwtKnob (
    QWidget * parent = NULL ) [explicit]
```

Constructor.

Construct a knob with an angle of 270°. The style is [QwtKnob::Raised](#) and the marker style is [QwtKnob::Notch](#). The width of the knob is set to 50 pixels.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

See also

[setTotalAngle\(\)](#)

12.37.4 Member Function Documentation

12.37.4.1 alignment()

```
Qt::Alignment QwtKnob::alignment ( ) const
```

Returns

Alignment of the knob inside of contentsRect()

See also

[setAlignment\(\)](#), [knobWidth\(\)](#), [knobRect\(\)](#)

12.37.4.2 changeEvent()

```
void QwtKnob::changeEvent (
    QEvent * event ) [protected], [virtual]
```

Handle QEvent::StyleChange and QEvent::FontChange;

Parameters

<i>event</i>	Change event
--------------	--------------

12.37.4.3 drawFocusIndicator()

```
void QwtKnob::drawFocusIndicator (
    QPainter * painter ) const [protected], [virtual]
```

Draw the focus indicator

Parameters

<i>painter</i>	Painter
----------------	---------

12.37.4.4 drawKnob()

```
void QwtKnob::drawKnob (
```

```
QPainter * painter,
const QRectF & knobRect ) const [protected], [virtual]
```

Draw the knob.

Parameters

<i>painter</i>	painter
<i>knobRect</i>	Bounding rectangle of the knob (without scale)

12.37.4.5 drawMarker()

```
void QwtKnob::drawMarker (
    QPainter * painter,
    const QRectF & rect,
    double angle ) const [protected], [virtual]
```

Draw the marker at the knob's front.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Bounding rectangle of the knob without scale
<i>angle</i>	Angle of the marker in degrees (clockwise, 0 at the 12 o'clock position)

12.37.4.6 isScrollPosition()

```
bool QwtKnob::isScrollPosition (
    const QPoint & pos ) const [protected], [virtual]
```

Determine what to do when the user presses a mouse button.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Return values

<i>True, when</i>	pos is inside the circle of the knob.
-------------------	---------------------------------------

See also

[scrolledTo\(\)](#)

Implements [QwtAbstractSlider](#).

12.37.4.7 knobRect()

```
QRect QwtKnob::knobRect ( ) const
```

Calculate the bounding rectangle of the knob without the scale

Returns

Bounding rectangle of the knob

See also

[knobWidth\(\)](#), [alignment\(\)](#), [QWidget::contentsRect\(\)](#)

12.37.4.8 knobStyle()

```
QwtKnob::KnobStyle QwtKnob::knobStyle ( ) const
```

Returns

Marker type of the knob

See also

[setKnobStyle\(\)](#), [setBorderWidth\(\)](#)

12.37.4.9 markerSize()

```
int QwtKnob::markerSize ( ) const
```

Returns

Marker size

See also

[setMarkerSize\(\)](#)

12.37.4.10 markerStyle()

```
QwtKnob::MarkerStyle QwtKnob::markerStyle ( ) const
```

Returns

Marker type of the knob

See also

[setMarkerStyle\(\)](#), [setMarkerSize\(\)](#)

12.37.4.11 `minimumSizeHint()`

```
QSize QwtKnob::minimumSizeHint ( ) const [virtual]
```

Returns

Minimum size hint

See also

[sizeHint\(\)](#)

12.37.4.12 `numTurns()`

```
int QwtKnob::numTurns ( ) const
```

Returns

Number of turns.

When the total angle is below 360° [numTurns\(\)](#) is ceiled to 1.

See also

[setNumTurns\(\)](#), [setTotalAngle\(\)](#), [totalAngle\(\)](#)

12.37.4.13 `paintEvent()`

```
void QwtKnob::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Repaint the knob

Parameters

<i>event</i>	Paint event
--------------	-------------

12.37.4.14 `scaleDraw()` [1/2]

```
const QwtRoundScaleDraw * QwtKnob::scaleDraw ( ) const
```

Returns

the scale draw of the knob

See also

[setScaleDraw\(\)](#)

12.37.4.15 scaleDraw() [2/2]

```
QwtRoundScaleDraw * QwtKnob::scaleDraw ( )
```

Returns

the scale draw of the knob

See also

[setScaleDraw\(\)](#)

12.37.4.16 scrolledTo()

```
double QwtKnob::scrolledTo (
    const QPoint & pos ) const [protected], [virtual]
```

Determine the value for a new position of the mouse.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Returns

Value for the mouse position

See also

[isScrollPosition\(\)](#)

Implements [QwtAbstractSlider](#).

12.37.4.17 setAlignment()

```
void QwtKnob::setAlignment (
    Qt::Alignment alignment )
```

Set the alignment of the knob.

Similar to a `QLabel::alignment()` the flags decide how to align the knob inside of `contentsRect()`.

The default setting is `Qt::AlignCenter`

Parameters

<i>alignment</i>	Or'd alignment flags
------------------	----------------------

See also

[alignment\(\)](#), [setKnobWidth\(\)](#), [knobRect\(\)](#)

12.37.4.18 setBorderWidth()

```
void QwtKnob::setBorderWidth (
    int borderWidth )
```

Set the knob's border width.

Parameters

<i>borderWidth</i>	new border width
--------------------	------------------

12.37.4.19 setKnobStyle()

```
void QwtKnob::setKnobStyle (
    KnobStyle knobStyle )
```

Set the knob type.

Parameters

<i>knobStyle</i>	Knob type
------------------	-----------

See also

[knobStyle\(\)](#), [setBorderWidth\(\)](#)

12.37.4.20 setKnobWidth()

```
void QwtKnob::setKnobWidth (
    int width )
```

Change the knob's width.

Setting a fixed value for the diameter of the knob is helpful for aligning several knobs in a row.

Parameters

<i>width</i>	New width
--------------	-----------

See also

[knobWidth\(\)](#), [setAlignment\(\)](#)

Note

Modifies the `sizePolicy()`

12.37.4.21 `setMarkerSize()`

```
void QwtKnob::setMarkerSize (
    int size )
```

Set the size of the marker.

When setting a size ≤ 0 the marker will automatically scaled to 40% of the radius of the knob.

See also

[markerSize\(\)](#), [markerStyle\(\)](#)

12.37.4.22 `setMarkerStyle()`

```
void QwtKnob::setMarkerStyle (
    MarkerStyle markerStyle )
```

Set the marker type of the knob.

Parameters

<i>markerStyle</i>	Marker type
--------------------	-------------

See also

[markerStyle\(\)](#), [setMarkerSize\(\)](#)

12.37.4.23 `setNumTurns()`

```
void QwtKnob::setNumTurns (
    int numTurns )
```

Set the number of turns.

When `numTurns > 1` the knob can be turned several times around its axis

- otherwise the total angle is floored to 360°.

See also

[numTurns\(\)](#), [totalAngle\(\)](#), [setTotalAngle\(\)](#)

12.37.4.24 `setScaleDraw()`

```
void QwtKnob::setScaleDraw (
    QwtRoundScaleDraw * scaleDraw )
```

Change the scale draw of the knob

For changing the labels of the scales, it is necessary to derive from [QwtRoundScaleDraw](#) and overload [QwtRoundScaleDraw::label\(\)](#).

See also

[scaleDraw\(\)](#)

12.37.4.25 `setTotalAngle()`

```
void QwtKnob::setTotalAngle (
    double angle )
```

Set the total angle by which the knob can be turned.

Parameters

<i>angle</i>	Angle in degrees.
--------------	-------------------

The angle has to be between [10, 360] degrees. Angles above 360 (so that the knob can be turned several times around its axis) have to be set using [setNumTurns\(\)](#).

The default angle is 270 degrees.

See also

[totalAngle\(\)](#), [setNumTurns\(\)](#)

12.37.4.26 sizeHint()

```
QSize QwtKnob::sizeHint ( ) const [virtual]
```

Returns

[sizeHint\(\)](#)

12.37.4.27 totalAngle()

```
double QwtKnob::totalAngle ( ) const
```

Returns

the total angle

See also

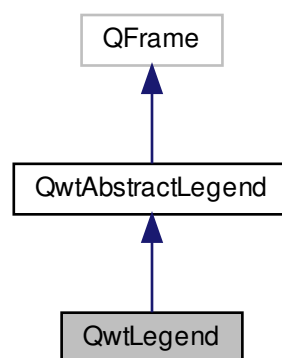
[setTotalAngle\(\)](#), [setNumTurns\(\)](#), [numTurns\(\)](#)

12.38 QwtLegend Class Reference

The legend widget.

```
#include <qwt_legend.h>
```

Inheritance diagram for QwtLegend:



Public Slots

- virtual void [updateLegend](#) (const QVariant &, const QList< [QwtLegendData](#) > &)
Update the entries for an item.

Signals

- void [clicked](#) (const QVariant &[itemInfo](#), int index)
- void [checked](#) (const QVariant &[itemInfo](#), bool on, int index)

Public Member Functions

- [QwtLegend](#) (QWidget *parent=NULL)
- virtual [~QwtLegend](#) ()
Destructor.
- void [setMaxColumns](#) (uint numColumns)
Set the maximum number of entries in a row.
- uint [maxColumns](#) () const
- void [setDefaultItemMode](#) ([QwtLegendData::Mode](#))
Set the default mode for legend labels.
- [QwtLegendData::Mode defaultItemMode](#) () const
- QWidget * [contentsWidget](#) ()
- const QWidget * [contentsWidget](#) () const
- QWidget * [legendWidget](#) (const QVariant &) const
- QList< QWidget * > [legendWidgets](#) (const QVariant &) const
- QVariant [itemInfo](#) (const QWidget *) const
- virtual bool [eventFilter](#) (QObject *, QEvent *)
- virtual QSize [sizeHint](#) () const
Return a size hint.
- virtual int [heightForWidth](#) (int width) const
- QScrollBar * [horizontalScrollBar](#) () const
- QScrollBar * [verticalScrollBar](#) () const
- virtual void [renderLegend](#) (QPainter *, const QRectF &, bool fillBackground) const
- virtual void [renderItem](#) (QPainter *, const QWidget *, const QRectF &, bool fillBackground) const
- virtual bool [isEmpty](#) () const
- virtual int [scrollExtent](#) (Qt::Orientation) const

Protected Slots

- void [itemClicked](#) ()
- void [itemChecked](#) (bool)

Protected Member Functions

- virtual QWidget * [createWidget](#) (const [QwtLegendData](#) &) const
Create a widget to be inserted into the legend.
- virtual void [updateWidget](#) (QWidget *widget, const [QwtLegendData](#) &)
Update the widget.

12.38.1 Detailed Description

The legend widget.

The [QwtLegend](#) widget is a tabular arrangement of legend items. Legend items might be any type of widget, but in general they will be a [QwtLegendLabel](#).

See also

[QwtLegendLabel](#), [QwtPlotItem](#), [QwtPlot](#)

12.38.2 Constructor & Destructor Documentation

12.38.2.1 QwtLegend()

```
QwtLegend::QwtLegend (  
    QWidget * parent = NULL ) [explicit]
```

Constructor

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.38.3 Member Function Documentation

12.38.3.1 checked

```
void QwtLegend::checked (  
    const QVariant & itemInfo,  
    bool on,  
    int index ) [signal]
```

A signal which is emitted when the user has clicked on a legend label, which is in [QwtLegendData::Checkable](#) mode

Parameters

<i>itemInfo</i>	Info for the item of the selected legend label
<i>index</i>	Index of the legend label in the list of widgets that are associated with the plot item
<i>on</i>	True when the legend label is checked

Note

clicks are disabled as default

See also

[setDefaultItemMode\(\)](#), [defaultItemMode\(\)](#), [QwtPlot::itemToInfo\(\)](#)

12.38.3.2 clicked

```
void QwtLegend::clicked (  
    const QVariant & itemInfo,  
    int index ) [signal]
```

A signal which is emitted when the user has clicked on a legend label, which is in [QwtLegendData::Clickable](#) mode.

Parameters

<i>itemInfo</i>	Info for the item item of the selected legend item
<i>index</i>	Index of the legend label in the list of widgets that are associated with the plot item

Note

clicks are disabled as default

See also

[setDefaultItemMode\(\)](#), [defaultItemMode\(\)](#), [QwtPlot::itemToInfo\(\)](#)

12.38.3.3 contentsWidget() [1/2]

```
QWidget * QwtLegend::contentsWidget ( )
```

The contents widget is the only child of the viewport of the internal QScrollArea and the parent widget of all legend items.

Returns

Container widget of the legend items

12.38.3.4 contentsWidget() [2/2]

```
const QWidget * QwtLegend::contentsWidget ( ) const
```

The contents widget is the only child of the viewport of the internal QScrollArea and the parent widget of all legend items.

Returns

Container widget of the legend items

12.38.3.5 createWidget()

```
QWidget * QwtLegend::createWidget (
    const QwtLegendData & legendData ) const [protected], [virtual]
```

Create a widget to be inserted into the legend.

The default implementation returns a [QwtLegendLabel](#).

Parameters

<i>legendData</i>	Attributes of the legend entry
-------------------	--------------------------------

Returns

Widget representing data on the legend

Note

[updateWidget\(\)](#) will called soon after [createWidget\(\)](#) with the same attributes.

12.38.3.6 defaultItemMode()

```
QwtLegendData::Mode QwtLegend::defaultItemMode ( ) const
```

Returns

Default item mode

See also

[setDefaultItemMode\(\)](#)

12.38.3.7 eventFilter()

```
bool QwtLegend::eventFilter (
    QObject * object,
    QEvent * event ) [virtual]
```

Handle QEvent::ChildRemoved and QEvent::LayoutRequest events for the [contentsWidget\(\)](#).

Parameters

<i>object</i>	Object to be filtered
<i>event</i>	Event

Returns

Forwarded to QwtAbstractLegend::eventFilter()

12.38.3.8 heightForWidth()

```
int QwtLegend::heightForWidth (
    int width ) const [virtual]
```

Returns

The preferred height, for a width.

Parameters

<i>width</i>	Width
--------------	-------

12.38.3.9 horizontalScrollBar()

```
QScrollBar * QwtLegend::horizontalScrollBar ( ) const
```

Returns

Horizontal scrollbar

See also

[verticalScrollBar\(\)](#)

12.38.3.10 isEmpty()

```
bool QwtLegend::isEmpty ( ) const [virtual]
```

Returns

True, when no item is inserted

Implements [QwtAbstractLegend](#).

12.38.3.11 itemChecked

```
void QwtLegend::itemChecked (
    bool on ) [protected], [slot]
```

Called internally when the legend has been checked Emits a [checked\(\)](#) signal.

12.38.3.12 itemClicked

```
void QwtLegend::itemClicked ( ) [protected], [slot]
```

Called internally when the legend has been clicked on. Emits a [clicked\(\)](#) signal.

12.38.3.13 itemInfo()

```
QVariant QwtLegend::itemInfo (
    const QWidget * widget ) const
```

Find the item that is associated to a widget

Parameters

<i>widget</i>	Widget on the legend
---------------	----------------------

Returns

Associated item info

See also

[legendWidget\(\)](#)

12.38.3.14 legendWidget()

```
QWidget * QwtLegend::legendWidget (
    const QVariant & itemInfo ) const
```

Returns

First widget in the list of widgets associated to an item

Parameters

<i>itemInfo</i>	Info about an item
-----------------	--------------------

See also

[itemInfo\(\)](#), [QwtPlot::itemToInfo\(\)](#)

Note

Almost all types of items have only one widget

12.38.3.15 legendWidgets()

```
QList< QWidget * > QwtLegend::legendWidgets (
    const QVariant & itemInfo ) const
```

Returns

List of widgets associated to a item

Parameters

<i>itemInfo</i>	Info about an item
-----------------	--------------------

See also

[legendWidget\(\)](#), [itemInfo\(\)](#), [QwtPlot::itemToInfo\(\)](#)

12.38.3.16 maxColumns()

```
uint QwtLegend::maxColumns ( ) const
```

Returns

Maximum number of entries in a row

See also

[setMaxColumns\(\)](#), [QwtDynGridLayout::maxColumns\(\)](#)

12.38.3.17 renderItem()

```
void QwtLegend::renderItem (
    QPainter * painter,
    const QWidget * widget,
    const QRectF & rect,
    bool fillBackground ) const [virtual]
```

Render a legend entry into a given rectangle.

Parameters

<i>painter</i>	Painter
<i>widget</i>	Widget representing a legend entry
<i>rect</i>	Bounding rectangle
<i>fillBackground</i>	When true, fill rect with the widget background

Note

When widget is not derived from [QwtLegendLabel](#) renderItem does nothing beside the background

12.38.3.18 renderLegend()

```
void QwtLegend::renderLegend (
    QPainter * painter,
    const QRectF & rect,
    bool fillBackground ) const [virtual]
```

Render the legend into a given rectangle.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Bounding rectangle
<i>fillBackground</i>	When true, fill rect with the widget background

See also

[renderLegend\(\)](#) is used by [QwtPlotRenderer](#) - not by [QwtLegend](#) itself

Implements [QwtAbstractLegend](#).

12.38.3.19 scrollExtent()

```
int QwtLegend::scrollExtent (
    Qt::Orientation orientation ) const [virtual]
```

Return the extent, that is needed for the scrollbars

Parameters

<i>orientation</i>	Orientation
--------------------	-------------

Returns

The width of the vertical scrollbar for Qt::Horizontal and v.v.

Reimplemented from [QwtAbstractLegend](#).

12.38.3.20 setDefaultItemMode()

```
void QwtLegend::setDefaultItemMode (
    QwtLegendData::Mode mode )
```

Set the default mode for legend labels.

Legend labels will be constructed according to the attributes in a [QwtLegendData](#) object. When it doesn't contain a value for the [QwtLegendData::ModeRole](#) the label will be initialized with the default mode of the legend.

Parameters

<i>mode</i>	Default item mode
-------------	-------------------

See also

[itemMode\(\)](#), [QwtLegendData::value\(\)](#), [QwtPlotItem::legendData\(\)](#)

Note

Changing the mode doesn't have any effect on existing labels.

12.38.3.21 setMaxColumns()

```
void QwtLegend::setMaxColumns (
    uint numColumns )
```

Set the maximum number of entries in a row.

F.e when the maximum is set to 1 all items are aligned vertically. 0 means unlimited

Parameters

<i>numColumns</i>	Maximum number of entries in a row
-------------------	------------------------------------

See also

[maxColumns\(\)](#), [QwtDynGridLayout::setMaxColumns\(\)](#)

12.38.3.22 updateLegend

```
void QwtLegend::updateLegend (
    const QVariant & itemInfo,
    const QList< QwtLegendData > & legendData ) [virtual], [slot]
```

Update the entries for an item.

Parameters

<i>itemInfo</i>	Info for an item
<i>legendData</i>	List of legend entry attributes for the item

12.38.3.23 updateWidget()

```
void QwtLegend::updateWidget (
    QWidget * widget,
    const QwtLegendData & legendData ) [protected], [virtual]
```

Update the widget.

Parameters

<i>widget</i>	Usually a QwtLegendLabel
<i>legendData</i>	Attributes to be displayed

See also

[createWidget\(\)](#)

Note

When widget is no [QwtLegendLabel](#) [updateWidget\(\)](#) does nothing.

12.38.3.24 verticalScrollBar()

```
QScrollBar * QwtLegend::verticalScrollBar ( ) const
```

Returns

Vertical scrollbar

See also

[horizontalScrollBar\(\)](#)

12.39 QwtLegendData Class Reference

Attributes of an entry on a legend.

```
#include <qwt_legend_data.h>
```

Public Types

- enum [Mode](#) { [ReadOnly](#), [Clickable](#), [Checkable](#) }
Mode defining how a legend entry interacts.
- enum [Role](#) { [ModeRole](#), [TitleRole](#), [IconRole](#), [UserRole](#) = 32 }
Identifier how to interpret a QVariant.

Public Member Functions

- [QwtLegendData](#) ()
Constructor.
- [~QwtLegendData](#) ()
Destructor.
- void [setValues](#) (const QMap< int, QVariant > &)
- const QMap< int, QVariant > & [values](#) () const
- void [setValue](#) (int role, const QVariant &)
- QVariant [value](#) (int role) const
- bool [hasRole](#) (int role) const
- bool [isValid](#) () const
- [QwtGraphic](#) [icon](#) () const
- [QwtText](#) [title](#) () const
- [Mode](#) [mode](#) () const

12.39.1 Detailed Description

Attributes of an entry on a legend.

[QwtLegendData](#) is an abstract container (like [QAbstractModel](#)) to exchange attributes, that are only known between to the plot item and the legend.

By overloading [QwtPlotItem::legendData\(\)](#) any other set of attributes could be used, that can be handled by a modified (or completely different) implementation of a legend.

See also

[QwtLegend](#), [QwtPlotLegendItem](#)

Note

The stockchart example implements a legend as a tree with checkable items

12.39.2 Member Enumeration Documentation

12.39.2.1 Mode

enum [QwtLegendData::Mode](#)

Mode defining how a legend entry interacts.

Enumerator

ReadOnly	The legend item is not interactive, like a label.
Clickable	The legend item is clickable, like a push button.
Checkable	The legend item is checkable, like a checkable button.

12.39.3 Member Function Documentation

12.39.3.1 hasRole()

```
bool QwtLegendData::hasRole (
    int role ) const
```

Parameters

<i>role</i>	Attribute role
-------------	----------------

Returns

True, when the internal map has an entry for role

12.39.3.2 icon()

```
QwtGraphic QwtLegendData::icon ( ) const
```

Returns

Value of the IconRole attribute

12.39.3.3 isValid()

```
bool QwtLegendData::isValid ( ) const
```

Returns

True, when the internal map is empty

12.39.3.4 mode()

```
QwtLegendData::Mode QwtLegendData::mode ( ) const
```

Returns

Value of the ModeRole attribute

12.39.3.5 setValue()

```
void QwtLegendData::setValue (
    int role,
    const QVariant & data )
```

Set an attribute value

Parameters

<i>role</i>	Attribute role
<i>data</i>	Attribute value

See also

[value\(\)](#)

12.39.3.6 setValues()

```
void QwtLegendData::setValues (
    const QMap< int, QVariant > & map )
```

Set the legend attributes

[QwtLegendData](#) actually is a `QMap<int, QVariant>` with some convenience interfaces

Parameters

<i>map</i>	Values
------------	--------

See also

[values\(\)](#)

12.39.3.7 title()

```
QwtText QwtLegendData::title ( ) const
```

Returns

Value of the TitleRole attribute

12.39.3.8 value()

```
QVariant QwtLegendData::value (
    int role ) const
```

Parameters

<i>role</i>	Attribute role
-------------	----------------

Returns

Attribute value for a specific role

12.39.3.9 values()

```
const QMap< int, QVariant > & QwtLegendData::values ( ) const
```

Returns

Legend attributes

See also

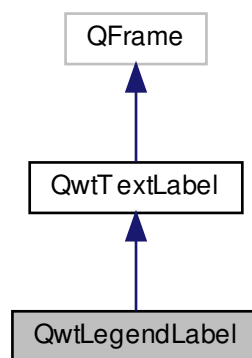
[setValues\(\)](#)

12.40 QwtLegendLabel Class Reference

A widget representing something on a [QwtLegend](#).

```
#include <qwt_legend_label.h>
```

Inheritance diagram for QwtLegendLabel:



Public Slots

- void [setChecked](#) (bool on)

Signals

- void [clicked](#) ()
Signal, when the legend item has been clicked.
- void [pressed](#) ()
Signal, when the legend item has been pressed.
- void [released](#) ()
Signal, when the legend item has been released.
- void [checked](#) (bool)
Signal, when the legend item has been toggled.

Public Member Functions

- [QwtLegendLabel](#) (QWidget *parent=0)
- virtual [~QwtLegendLabel](#) ()
Destructor.
- void [setData](#) (const [QwtLegendData](#) &)
- const [QwtLegendData](#) & [data](#) () const
- void [setItemMode](#) ([QwtLegendData::Mode](#))
- [QwtLegendData::Mode](#) [itemMode](#) () const
- void [setSpacing](#) (int [spacing](#))
Change the spacing between icon and text.
- int [spacing](#) () const
- virtual void [setText](#) (const [QwtText](#) &)
- void [setIcon](#) (const QPixmap &)
- QPixmap [icon](#) () const
- virtual QSize [sizeHint](#) () const
Return a size hint.
- bool [isChecked](#) () const
Return true, if the item is checked.

Protected Member Functions

- void [setDown](#) (bool)
Set the item being down.
- bool [isDown](#) () const
Return true, if the item is down.
- virtual void [paintEvent](#) (QPaintEvent *)
Paint event.
- virtual void [mousePressEvent](#) (QMouseEvent *)
Handle mouse press events.
- virtual void [mouseReleaseEvent](#) (QMouseEvent *)
Handle mouse release events.
- virtual void [keyPressEvent](#) (QKeyEvent *)
Handle key press events.
- virtual void [keyReleaseEvent](#) (QKeyEvent *)
Handle key release events.

12.40.1 Detailed Description

A widget representing something on a [QwtLegend](#).

12.40.2 Constructor & Destructor Documentation

12.40.2.1 QwtLegendLabel()

```
QwtLegendLabel::QwtLegendLabel (
    QWidget * parent = 0 ) [explicit]
```


Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.40.3 Member Function Documentation

12.40.3.1 data()

```
const QwtLegendData & QwtLegendLabel::data ( ) const
```

Returns

Attributes of the label

See also

[setData\(\)](#), [QwtPlotItem::legendData\(\)](#)

12.40.3.2 icon()

```
QPixmap QwtLegendLabel::icon ( ) const
```

Returns

Pixmap representing a plot item

See also

[setIcon\(\)](#)

12.40.3.3 itemMode()

```
QwtLegendData::Mode QwtLegendLabel::itemMode ( ) const
```

Returns

Item mode

See also

[setItemMode\(\)](#)

12.40.3.4 setChecked

```
void QwtLegendLabel::setChecked (
    bool on ) [slot]
```

Check/Uncheck a the item

Parameters

<i>on</i>	check/uncheck
-----------	---------------

See also

[setItemMode\(\)](#)

12.40.3.5 setData()

```
void QwtLegendLabel::setData (
    const QwtLegendData & legendData )
```

Set the attributes of the legend label

Parameters

<i>legendData</i>	Attributes of the label
-------------------	-------------------------

See also

[data\(\)](#)

12.40.3.6 setIcon()

```
void QwtLegendLabel::setIcon (
    const QPixmap & icon )
```

Assign the icon

Parameters

<i>icon</i>	Pixmap representing a plot item
-------------	---------------------------------

See also

[icon\(\)](#), [QwtPlotItem::legendIcon\(\)](#)

12.40.3.7 setItemMode()

```
void QwtLegendLabel::setItemMode (
    QwtLegendData::Mode mode )
```

Set the item mode The default is [QwtLegendData::ReadOnly](#)

Parameters

<i>mode</i>	Item mode
-------------	-----------

See also

[itemMode\(\)](#)

12.40.3.8 setSpacing()

```
void QwtLegendLabel::setSpacing (
    int spacing )
```

Change the spacing between icon and text.

Parameters

<i>spacing</i>	Spacing
----------------	---------

See also

[spacing\(\)](#), [QwtTextLabel::margin\(\)](#)

12.40.3.9 setText()

```
void QwtLegendLabel::setText (
    const QwtText & text ) [virtual]
```

Set the text to the legend item

Parameters

<i>text</i>	Text label
-------------	------------

See also

[QwtTextLabel::text\(\)](#)

Reimplemented from [QwtTextLabel](#).

12.40.3.10 spacing()

```
int QwtLegendLabel::spacing ( ) const
```

Returns

Spacing between icon and text

See also

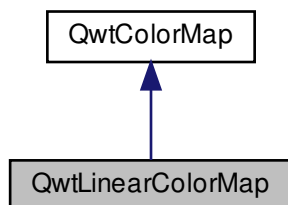
[setSpacing\(\)](#), [QwtTextLabel::margin\(\)](#)

12.41 QwtLinearColorMap Class Reference

[QwtLinearColorMap](#) builds a color map from color stops.

```
#include <qwt_color_map.h>
```

Inheritance diagram for QwtLinearColorMap:

**Public Types**

- enum [Mode](#) { [FixedColors](#), [ScaledColors](#) }

Public Member Functions

- [QwtLinearColorMap](#) ([QwtColorMap::Format](#)=[QwtColorMap::RGB](#))
- [QwtLinearColorMap](#) (const QColor &[color1](#), const QColor &[color2](#), [QwtColorMap::Format](#)=[QwtColorMap::RGB](#))
- virtual [~QwtLinearColorMap](#) ()
Destructor.
- void [setMode](#) ([Mode](#))
Set the mode of the color map.
- [Mode](#) [mode](#) () const
- void [setColorInterval](#) (const QColor &[color1](#), const QColor &[color2](#))
- void [addColorStop](#) (double value, const QColor &)
- QVector< double > [colorStops](#) () const
- QColor [color1](#) () const
- QColor [color2](#) () const
- virtual QRgb [rgb](#) (const [QwtInterval](#) &, double value) const
- virtual unsigned char [colorIndex](#) (const [QwtInterval](#) &, double value) const
Map a value of a given interval into a color index.

12.41.1 Detailed Description

[QwtLinearColorMap](#) builds a color map from color stops.

A color stop is a color at a specific position. The valid range for the positions is [0.0, 1.0]. When mapping a value into a color it is translated into this interval according to [mode\(\)](#).

12.41.2 Member Enumeration Documentation

12.41.2.1 Mode

```
enum QwtLinearColorMap::Mode
```

Mode of color map

See also

[setMode\(\)](#), [mode\(\)](#)

Enumerator

FixedColors	Return the color from the next lower color stop.
ScaledColors	Interpolating the colors of the adjacent stops.

12.41.3 Constructor & Destructor Documentation

12.41.3.1 QwtLinearColorMap() [1/2]

```
QwtLinearColorMap::QwtLinearColorMap (
    QwtColorMap::Format format = QwtColorMap::RGB )
```

Build a color map with two stops at 0.0 and 1.0. The color at 0.0 is Qt::blue, at 1.0 it is Qt::yellow.

Parameters

<i>format</i>	Preferred format of the color map
---------------	-----------------------------------

12.41.3.2 QwtLinearColorMap() [2/2]

```
QwtLinearColorMap::QwtLinearColorMap (
    const QColor & color1,
```

```
const QColor & color2,
QwtColorMap::Format format = QwtColorMap::RGB )
```

Build a color map with two stops at 0.0 and 1.0.

Parameters

<i>color1</i>	Color used for the minimum value of the value interval
<i>color2</i>	Color used for the maximum value of the value interval
<i>format</i>	Preferred format for the color map

12.41.4 Member Function Documentation

12.41.4.1 addColorStop()

```
void QwtLinearColorMap::addColorStop (
    double value,
    const QColor & color )
```

Add a color stop

The value has to be in the range [0.0, 1.0]. F.e. a stop at position 17.0 for a range [10.0,20.0] must be passed as: (17.0 - 10.0) / (20.0 - 10.0)

Parameters

<i>value</i>	Value between [0.0, 1.0]
<i>color</i>	Color stop

12.41.4.2 color1()

```
QColor QwtLinearColorMap::color1 ( ) const
```

Returns

the first color of the color range

See also

[setColorInterval\(\)](#)

12.41.4.3 color2()

```
QColor QwtLinearColorMap::color2 ( ) const
```

Returns

the second color of the color range

See also

[setColorInterval\(\)](#)

12.41.4.4 colorIndex()

```
unsigned char QwtLinearColorMap::colorIndex (
    const QwtInterval & interval,
    double value ) const [virtual]
```

Map a value of a given interval into a color index.

Parameters

<i>interval</i>	Range for all values
<i>value</i>	Value to map into a color index

Returns

Index, between 0 and 255

Implements [QwtColorMap](#).

12.41.4.5 colorStops()

```
QVector< double > QwtLinearColorMap::colorStops ( ) const
```

Returns

Positions of color stops in increasing order

12.41.4.6 mode()

```
QwtLinearColorMap::Mode QwtLinearColorMap::mode ( ) const
```

Returns

Mode of the color map

See also

[setMode\(\)](#)

12.41.4.7 `rgb()`

```
QRgb QwtLinearColorMap::rgb (
    const QwtInterval & interval,
    double value ) const [virtual]
```

Map a value of a given interval into a RGB value

Parameters

<i>interval</i>	Range for all values
<i>value</i>	Value to map into a RGB value

Returns

RGB value for value

Implements [QwtColorMap](#).

12.41.4.8 `setColorInterval()`

```
void QwtLinearColorMap::setColorInterval (
    const QColor & color1,
    const QColor & color2 )
```

Set the color range

Add stops at 0.0 and 1.0.

Parameters

<i>color1</i>	Color used for the minimum value of the value interval
<i>color2</i>	Color used for the maximum value of the value interval

See also

[color1\(\)](#), [color2\(\)](#)

12.41.4.9 `setMode()`

```
void QwtLinearColorMap::setMode (
    Mode mode )
```

Set the mode of the color map.

FixedColors means the color is calculated from the next lower color stop. ScaledColors means the color is calculated by interpolating the colors of the adjacent stops.

See also

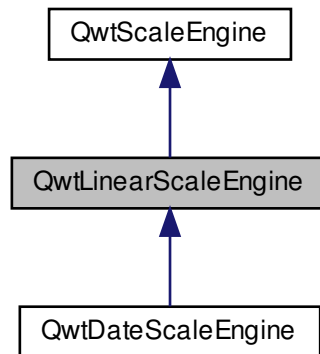
[mode\(\)](#)

12.42 QwtLinearScaleEngine Class Reference

A scale engine for linear scales.

```
#include <qwt_scale_engine.h>
```

Inheritance diagram for QwtLinearScaleEngine:



Public Member Functions

- [QwtLinearScaleEngine](#) (uint [base](#)=10)
- virtual [~QwtLinearScaleEngine](#) ()
Destructor.
- virtual void [autoScale](#) (int maxNumSteps, double &x1, double &x2, double &stepSize) const
- virtual [QwtScaleDiv](#) [divideScale](#) (double x1, double x2, int maxMajorSteps, int maxMinorSteps, double stepSize=0.0) const
Calculate a scale division for an interval.

Protected Member Functions

- [QwtInterval](#) [align](#) (const [QwtInterval](#) &, double stepSize) const
Align an interval to a step size.
- void [buildTicks](#) (const [QwtInterval](#) &, double stepSize, int maxMinorSteps, QList< double > ticks[[QwtScaleDiv::NTickTypes](#)]) const
Calculate ticks for an interval.
- QList< double > [buildMajorTicks](#) (const [QwtInterval](#) &interval, double stepSize) const
Calculate major ticks for an interval.
- void [buildMinorTicks](#) (const QList< double > &majorTicks, int maxMinorSteps, double stepSize, QList< double > &minorTicks, QList< double > &mediumTicks) const
Calculate minor/medium ticks for major ticks.

Additional Inherited Members

12.42.1 Detailed Description

A scale engine for linear scales.

The step size will fit into the pattern $\{1, 2, 5\} \cdot 10^n$, where n is an integer.

12.42.2 Constructor & Destructor Documentation

12.42.2.1 QwtLinearScaleEngine()

```
QwtLinearScaleEngine::QwtLinearScaleEngine (
    uint base = 10 )
```

Constructor

Parameters

<i>base</i>	Base of the scale engine
-------------	--------------------------

See also

[setBase\(\)](#)

12.42.3 Member Function Documentation

12.42.3.1 align()

```
QwtInterval QwtLinearScaleEngine::align (
    const QwtInterval & interval,
    double stepSize ) const [protected]
```

Align an interval to a step size.

The limits of an interval are aligned that both are integer multiples of the step size.

Parameters

<i>interval</i>	Interval
<i>stepSize</i>	Step size

Returns

Aligned interval

12.42.3.2 autoScale()

```
void QwtLinearScaleEngine::autoScale (
    int maxNumSteps,
    double & x1,
    double & x2,
    double & stepSize ) const [virtual]
```

Align and divide an interval

Parameters

<i>maxNumSteps</i>	Max. number of steps
<i>x1</i>	First limit of the interval (In/Out)
<i>x2</i>	Second limit of the interval (In/Out)
<i>stepSize</i>	Step size (Out)

See also

[setAttribute\(\)](#)

Implements [QwtScaleEngine](#).

Reimplemented in [QwtDateScaleEngine](#).

12.42.3.3 buildMajorTicks()

```
QList< double > QwtLinearScaleEngine::buildMajorTicks (
    const QwtInterval & interval,
    double stepSize ) const [protected]
```

Calculate major ticks for an interval.

Parameters

<i>interval</i>	Interval
<i>stepSize</i>	Step size

Returns

Calculated ticks

12.42.3.4 buildMinorTicks()

```
void QwtLinearScaleEngine::buildMinorTicks (
    const QList< double > & majorTicks,
    int maxMinorSteps,
    double stepSize,
    QList< double > & minorTicks,
    QList< double > & mediumTicks ) const [protected]
```

Calculate minor/medium ticks for major ticks.

Parameters

<i>majorTicks</i>	Major ticks
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size
<i>minorTicks</i>	Array to be filled with the calculated minor ticks
<i>mediumTicks</i>	Array to be filled with the calculated medium ticks

12.42.3.5 buildTicks()

```
void QwtLinearScaleEngine::buildTicks (
    const QwtInterval & interval,
    double stepSize,
    int maxMinorSteps,
    QList< double > ticks[QwtScaleDiv::NTickTypes] ) const [protected]
```

Calculate ticks for an interval.

Parameters

<i>interval</i>	Interval
<i>stepSize</i>	Step size
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>ticks</i>	Arrays to be filled with the calculated ticks

See also

[buildMajorTicks\(\)](#), [buildMinorTicks](#)

12.42.3.6 divideScale()

```
QwtScaleDiv QwtLinearScaleEngine::divideScale (
    double x1,
    double x2,
    int maxMajorSteps,
    int maxMinorSteps,
    double stepSize = 0.0 ) const [virtual]
```

Calculate a scale division for an interval.

Parameters

<i>x1</i>	First interval limit
<i>x2</i>	Second interval limit
<i>maxMajorSteps</i>	Maximum for the number of major steps
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size. If stepSize == 0, the engine calculates one.

Returns

Calculated scale division

Implements [QwtScaleEngine](#).

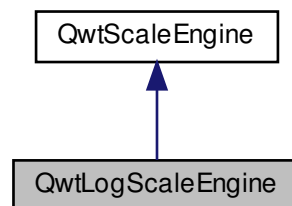
Reimplemented in [QwtDateScaleEngine](#).

12.43 QwtLogScaleEngine Class Reference

A scale engine for logarithmic scales.

```
#include <qwt_scale_engine.h>
```

Inheritance diagram for QwtLogScaleEngine:



Public Member Functions

- [QwtLogScaleEngine](#) (uint [base](#)=10)
- virtual [~QwtLogScaleEngine](#) ()
Destructor.
- virtual void [autoScale](#) (int maxNumSteps, double &x1, double &x2, double &stepSize) const
- virtual [QwtScaleDiv divideScale](#) (double x1, double x2, int maxMajorSteps, int maxMinorSteps, double stepSize=0.0) const
Calculate a scale division for an interval.

Protected Member Functions

- [QwtInterval align](#) (const [QwtInterval](#) &, double stepSize) const
Align an interval to a step size.
- void [buildTicks](#) (const [QwtInterval](#) &, double stepSize, int maxMinorSteps, QList< double > ticks[[QwtScaleDiv::NTickTypes](#)]) const
Calculate ticks for an interval.
- QList< double > [buildMajorTicks](#) (const [QwtInterval](#) &interval, double stepSize) const
Calculate major ticks for an interval.
- void [buildMinorTicks](#) (const QList< double > &majorTicks, int maxMinorSteps, double stepSize, QList< double > &minorTicks, QList< double > &mediumTicks) const
Calculate minor/medium ticks for major ticks.

Additional Inherited Members

12.43.1 Detailed Description

A scale engine for logarithmic scales.

The step size is measured in *decades* and the major step size will be adjusted to fit the pattern $\{1, 2, 3, 5\} \cdot 10^n$, where n is a natural number including zero.

Warning

the step size as well as the margins are measured in *decades*.

12.43.2 Constructor & Destructor Documentation

12.43.2.1 QwtLogScaleEngine()

```
QwtLogScaleEngine::QwtLogScaleEngine (
    uint base = 10 )
```

Constructor

Parameters

<i>base</i>	Base of the scale engine
-------------	--------------------------

See also

[setBase\(\)](#)

12.43.3 Member Function Documentation

12.43.3.1 align()

```
QwtInterval QwtLogScaleEngine::align (
    const QwtInterval & interval,
    double stepSize ) const [protected]
```

Align an interval to a step size.

The limits of an interval are aligned that both are integer multiples of the step size.

Parameters

<i>interval</i>	Interval
<i>stepSize</i>	Step size

Returns

Aligned interval

12.43.3.2 autoScale()

```
void QwtLogScaleEngine::autoScale (
    int maxNumSteps,
    double & x1,
    double & x2,
    double & stepSize ) const [virtual]
```

Align and divide an interval

Parameters

<i>maxNumSteps</i>	Max. number of steps
<i>x1</i>	First limit of the interval (In/Out)
<i>x2</i>	Second limit of the interval (In/Out)
<i>stepSize</i>	Step size (Out)

See also

[QwtScaleEngine::setAttribute\(\)](#)

Implements [QwtScaleEngine](#).

12.43.3.3 buildMajorTicks()

```
QList< double > QwtLogScaleEngine::buildMajorTicks (
    const QwtInterval & interval,
    double stepSize ) const [protected]
```

Calculate major ticks for an interval.

Parameters

<i>interval</i>	Interval
<i>stepSize</i>	Step size

Returns

Calculated ticks

12.43.3.4 buildMinorTicks()

```
void QwtLogScaleEngine::buildMinorTicks (
    const QList< double > & majorTicks,
    int maxMinorSteps,
    double stepSize,
    QList< double > & minorTicks,
    QList< double > & mediumTicks ) const [protected]
```

Calculate minor/medium ticks for major ticks.

Parameters

<i>majorTicks</i>	Major ticks
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size
<i>minorTicks</i>	Array to be filled with the calculated minor ticks
<i>mediumTicks</i>	Array to be filled with the calculated medium ticks

12.43.3.5 buildTicks()

```
void QwtLogScaleEngine::buildTicks (
    const QwtInterval & interval,
    double stepSize,
    int maxMinorSteps,
    QList< double > ticks[QwtScaleDiv::NTickTypes] ) const [protected]
```

Calculate ticks for an interval.

Parameters

<i>interval</i>	Interval
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size
<i>ticks</i>	Arrays to be filled with the calculated ticks

See also

[buildMajorTicks\(\)](#), [buildMinorTicks](#)

12.43.3.6 divideScale()

```
QwtScaleDiv QwtLogScaleEngine::divideScale (
    double x1,
    double x2,
    int maxMajorSteps,
    int maxMinorSteps,
    double stepSize = 0.0 ) const [virtual]
```

Calculate a scale division for an interval.

Parameters

<i>x1</i>	First interval limit
<i>x2</i>	Second interval limit
<i>maxMajorSteps</i>	Maximum for the number of major steps
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size. If stepSize == 0, the engine calculates one.

Returns

Calculated scale division

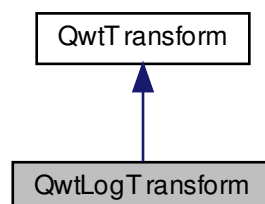
Implements [QwtScaleEngine](#).

12.44 QwtLogTransform Class Reference

Logarithmic transformation.

```
#include <qwt_transform.h>
```

Inheritance diagram for QwtLogTransform:



Public Member Functions

- [QwtLogTransform](#) ()
Constructor.
- virtual [~QwtLogTransform](#) ()
Destructor.
- virtual double [transform](#) (double value) const
- virtual double [invTransform](#) (double value) const
- virtual double [bounded](#) (double value) const
- virtual [QwtTransform](#) * [copy](#) () const

Public Attributes

- QT_STATIC_CONST double [LogMin](#) = 1.0e-150
Smallest allowed value for logarithmic scales: 1.0e-150.
- QT_STATIC_CONST double [LogMax](#) = 1.0e150
Largest allowed value for logarithmic scales: 1.0e150.

12.44.1 Detailed Description

Logarithmic transformation.

[QwtLogTransform](#) modifies the values using `log()` and `exp()`.

Note

In the calculations of [QwtScaleMap](#) the base of the log function has no effect on the mapping. So [QwtLogTransform](#) can be used for `log2()`, `log10()` or any other logarithmic scale.

12.44.2 Member Function Documentation

12.44.2.1 [bounded\(\)](#)

```
double QwtLogTransform::bounded (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be bounded
--------------	---------------------

Returns

`qBound(LogMin, value, LogMax)`

Reimplemented from [QwtTransform](#).

12.44.2.2 copy()

```
QwtTransform * QwtLogTransform::copy ( ) const [virtual]
```

Returns

Clone of the transformation

Implements [QwtTransform](#).

12.44.2.3 invTransform()

```
double QwtLogTransform::invTransform (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be transformed
--------------	-------------------------

Returns

$\exp(\text{value})$

Implements [QwtTransform](#).

12.44.2.4 transform()

```
double QwtLogTransform::transform (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be transformed
--------------	-------------------------

Returns

$\log(\text{value})$

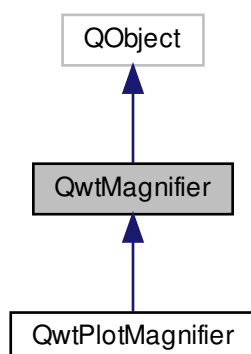
Implements [QwtTransform](#).

12.45 QwtMagnifier Class Reference

[QwtMagnifier](#) provides zooming, by magnifying in steps.

```
#include <qwt_magnifier.h>
```

Inheritance diagram for QwtMagnifier:



Public Member Functions

- [QwtMagnifier](#) (QWidget *)
- virtual [~QwtMagnifier](#) ()
Destructor.
- QWidget * [parentWidget](#) ()
- const QWidget * [parentWidget](#) () const
- void [setEnabled](#) (bool)
En/disable the magnifier.
- bool [isEnabled](#) () const
- void [setMouseFactor](#) (double)
Change the mouse factor.
- double [mouseFactor](#) () const
- void [setMouseButton](#) (Qt::MouseButton, Qt::KeyboardModifiers=Qt::NoModifier)
- void [getMouseButton](#) (Qt::MouseButton &, Qt::KeyboardModifiers &) const
- void [setWheelFactor](#) (double)
Change the wheel factor.
- double [wheelFactor](#) () const
- void [setWheelModifiers](#) (Qt::KeyboardModifiers)
- Qt::KeyboardModifiers [wheelModifiers](#) () const
- void [setKeyFactor](#) (double)
Change the key factor.
- double [keyFactor](#) () const
- void [setZoomInKey](#) (int key, Qt::KeyboardModifiers=Qt::NoModifier)
- void [getZoomInKey](#) (int &key, Qt::KeyboardModifiers &) const
Retrieve the settings of the zoom in key.
- void [setZoomOutKey](#) (int key, Qt::KeyboardModifiers=Qt::NoModifier)
- void [getZoomOutKey](#) (int &key, Qt::KeyboardModifiers &) const
Retrieve the settings of the zoom out key.
- virtual bool [eventFilter](#) (QObject *, QEvent *)
Event filter.

Protected Member Functions

- virtual void [rescale](#) (double factor)=0
- virtual void [widgetMouseEvent](#) (QMouseEvent *)
- virtual void [widgetMouseReleaseEvent](#) (QMouseEvent *)
- virtual void [widgetMouseMoveEvent](#) (QMouseEvent *)
- virtual void [widgetWheelEvent](#) (QWheelEvent *)
- virtual void [widgetKeyPressEvent](#) (QKeyEvent *)
- virtual void [widgetKeyReleaseEvent](#) (QKeyEvent *)

12.45.1 Detailed Description

[QwtMagnifier](#) provides zooming, by magnifying in steps.

Using [QwtMagnifier](#) a plot can be zoomed in/out in steps using keys, the mouse wheel or moving a mouse button in vertical direction.

12.45.2 Constructor & Destructor Documentation

12.45.2.1 QwtMagnifier()

```
QwtMagnifier::QwtMagnifier (
    QWidget * parent ) [explicit]
```

Constructor

Parameters

<i>parent</i>	Widget to be magnified
---------------	------------------------

12.45.3 Member Function Documentation

12.45.3.1 eventFilter()

```
bool QwtMagnifier::eventFilter (
    QObject * object,
    QEvent * event ) [virtual]
```

Event filter.

When [isEnabled\(\)](#) is true, the mouse events of the observed widget are filtered.

Parameters

<i>object</i>	Object to be filtered
<i>event</i>	Event

Returns

Forwarded to `QObject::eventFilter()`

See also

[widgetMouseEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseMoveEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#) [widgetKeyReleaseEvent\(\)](#)

12.45.3.2 `getMouseButton()`

```
void QwtMagnifier::getMouseButton (
    Qt::MouseButton & button,
    Qt::KeyboardModifiers & modifiers ) const
```

See also

[setMouseButton\(\)](#)

12.45.3.3 `getZoomInKey()`

```
void QwtMagnifier::getZoomInKey (
    int & key,
    Qt::KeyboardModifiers & modifiers ) const
```

Retrieve the settings of the zoom in key.

Parameters

<i>key</i>	Key code, see <code>Qt::Key</code>
<i>modifiers</i>	Keyboard modifiers

See also

[setZoomInKey\(\)](#)

12.45.3.4 `getZoomOutKey()`

```
void QwtMagnifier::getZoomOutKey (
    int & key,
    Qt::KeyboardModifiers & modifiers ) const
```

Retrieve the settings of the zoom out key.

Parameters

<i>key</i>	Key code, see Qt::Key
<i>modifiers</i>	Keyboard modifiers

See also[setZoomOutKey\(\)](#)**12.45.3.5 isEnabled()**

```
bool QwtMagnifier::isEnabled ( ) const
```

Returns

true when enabled, false otherwise

See also[setEnabled\(\)](#), [eventFilter\(\)](#)**12.45.3.6 keyFactor()**

```
double QwtMagnifier::keyFactor ( ) const
```

Returns

Key factor

See also[setKeyFactor\(\)](#)**12.45.3.7 mouseFactor()**

```
double QwtMagnifier::mouseFactor ( ) const
```

Returns

Mouse factor

See also[setMouseFactor\(\)](#)

12.45.3.8 `parentWidget()` [1/2]

```
QWidget * QwtMagnifier::parentWidget ( )
```

Returns

Parent widget, where the rescaling happens

12.45.3.9 `parentWidget()` [2/2]

```
const QWidget * QwtMagnifier::parentWidget ( ) const
```

Returns

Parent widget, where the rescaling happens

12.45.3.10 `rescale()`

```
virtual void QwtMagnifier::rescale (
    double factor ) [protected], [pure virtual]
```

Rescale the parent widget

Parameters

<i>factor</i>	Scale factor
---------------	--------------

Implemented in [QwtPlotMagnifier](#).

12.45.3.11 `setEnabled()`

```
void QwtMagnifier::setEnabled (
    bool on )
```

En/disable the magnifier.

When enabled is true an event filter is installed for the observed widget, otherwise the event filter is removed.

Parameters

<i>on</i>	true or false
-----------	---------------

See also

[isEnabled\(\)](#), [eventFilter\(\)](#)

12.45.3.12 setKeyFactor()

```
void QwtMagnifier::setKeyFactor (
    double factor )
```

Change the key factor.

The key factor defines the ratio between the current range on the parent widget and the zoomed range for each key press of the zoom in/out keys. The default value is 0.9.

Parameters

<i>factor</i>	Key factor
---------------	------------

See also

[keyFactor\(\)](#), [setZoomInKey\(\)](#), [setZoomOutKey\(\)](#), [setWheelFactor](#), [setMouseFactor\(\)](#)

12.45.3.13 setMouseButton()

```
void QwtMagnifier::setMouseButton (
    Qt::MouseButton button,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Assign the mouse button, that is used for zooming in/out. The default value is Qt::RightButton.

Parameters

<i>button</i>	Button
<i>modifiers</i>	Keyboard modifiers

See also

[getMouseButton\(\)](#)

12.45.3.14 setMouseFactor()

```
void QwtMagnifier::setMouseFactor (
    double factor )
```

Change the mouse factor.

The mouse factor defines the ratio between the current range on the parent widget and the zoomed range for each vertical mouse movement. The default value is 0.95.

Parameters

<i>factor</i>	Wheel factor
---------------	--------------

See also

[mouseFactor\(\)](#), [setMouseButton\(\)](#), [setWheelFactor\(\)](#), [setKeyFactor\(\)](#)

12.45.3.15 setWheelFactor()

```
void QwtMagnifier::setWheelFactor (
    double factor )
```

Change the wheel factor.

The wheel factor defines the ratio between the current range on the parent widget and the zoomed range for each step of the wheel.

Use values > 1 for magnification (i.e. 2.0) and values < 1 for scaling down (i.e. $1/2.0 = 0.5$). You can use this feature for inverting the direction of the wheel.

The default value is 0.9.

Parameters

<i>factor</i>	Wheel factor
---------------	--------------

See also

[wheelFactor\(\)](#), [setWheelButtonState\(\)](#), [setMouseFactor\(\)](#), [setKeyFactor\(\)](#)

12.45.3.16 setWheelModifiers()

```
void QwtMagnifier::setWheelModifiers (
    Qt::KeyboardModifiers modifiers )
```

Assign keyboard modifiers for zooming in/out using the wheel. The default modifiers are Qt::NoModifiers.

Parameters

<i>modifiers</i>	Keyboard modifiers
------------------	--------------------

See also

[wheelModifiers\(\)](#)

12.45.3.17 setZoomInKey()

```
void QwtMagnifier::setZoomInKey (
    int key,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Assign the key, that is used for zooming in. The default combination is Qt::Key_Plus + Qt::NoModifier.

Parameters

<i>key</i>	
<i>modifiers</i>	

See also

[getZoomInKey\(\)](#), [setZoomOutKey\(\)](#)

12.45.3.18 setZoomOutKey()

```
void QwtMagnifier::setZoomOutKey (
    int key,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Assign the key, that is used for zooming out. The default combination is Qt::Key_Minus + Qt::NoModifier.

Parameters

<i>key</i>	
<i>modifiers</i>	

See also

[getZoomOutKey\(\)](#), [setZoomOutKey\(\)](#)

12.45.3.19 wheelFactor()

```
double QwtMagnifier::wheelFactor ( ) const
```

Returns

Wheel factor

See also

[setWheelFactor\(\)](#)

12.45.3.20 wheelModifiers()

```
Qt::KeyboardModifiers QwtMagnifier::wheelModifiers ( ) const
```

Returns

Wheel modifiers

See also

[setWheelModifiers\(\)](#)

12.45.3.21 widgetKeyPressEvent()

```
void QwtMagnifier::widgetKeyPressEvent (
    QKeyEvent * keyEvent ) [protected], [virtual]
```

Handle a key press event for the observed widget.

Parameters

<i>keyEvent</i>	Key event
-----------------	-----------

See also

[eventFilter\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.45.3.22 widgetKeyReleaseEvent()

```
void QwtMagnifier::widgetKeyReleaseEvent (
    QKeyEvent * keyEvent ) [protected], [virtual]
```

Handle a key release event for the observed widget.

Parameters

<i>keyEvent</i>	Key event
-----------------	-----------

See also

[eventFilter\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.45.3.23 widgetMouseMoveEvent()

```
void QwtMagnifier::widgetMouseMoveEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse move event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#),

12.45.3.24 widgetMousePressEvent()

```
void QwtMagnifier::widgetMousePressEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse press event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseMoveEvent\(\)](#)

12.45.3.25 widgetMouseReleaseEvent()

```
void QwtMagnifier::widgetMouseReleaseEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse release event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseMoveEvent\(\)](#),

12.45.3.26 widgetWheelEvent()

```
void QwtMagnifier::widgetWheelEvent (
    QWheelEvent * wheelEvent ) [protected], [virtual]
```

Handle a wheel event for the observed widget.

Parameters

<i>wheelEvent</i>	Wheel event
-------------------	-------------

See also

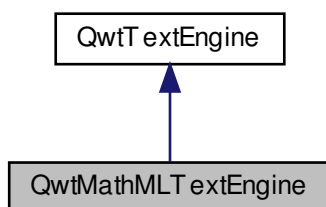
[eventFilter\(\)](#)

12.46 QwtMathMLTextEngine Class Reference

Text Engine for the MathML renderer of the Qt solutions package.

```
#include <qwt_mathml_text_engine.h>
```

Inheritance diagram for QwtMathMLTextEngine:



Public Member Functions

- [QwtMathMLTextEngine \(\)](#)
Constructor.
- virtual [~QwtMathMLTextEngine \(\)](#)
Destructor.
- virtual double [heightForWidth](#) (const QFont &font, int flags, const QString &text, double width) const
- virtual QSizeF [textSize](#) (const QFont &font, int flags, const QString &text) const
- virtual void [draw](#) (QPainter *painter, const QRectF &rect, int flags, const QString &text) const
- virtual bool [mightRender](#) (const QString &) const
- virtual void [textMargins](#) (const QFont &, const QString &, double &left, double &right, double &top, double &bottom) const

Additional Inherited Members

12.46.1 Detailed Description

Text Engine for the MathML renderer of the Qt solutions package.

To enable MathML support the following code needs to be added to the application:

```
#include <qwt_mathml_text_engine.h>

QwtText::setTextEngine( QwtText::MathMLText, new
    QwtMathMLTextEngine() );
```

See also

[QwtTextEngine](#), [QwtText::setTextEngine](#)

Warning

Unfortunately the MathML renderer doesn't support rotating of texts.

12.46.2 Member Function Documentation

12.46.2.1 draw()

```
void QwtMathMLTextEngine::draw (
    QPainter * painter,
    const QRectF & rect,
    int flags,
    const QString & text ) const [virtual]
```

Draw the text in a clipping rectangle

Parameters

<i>painter</i>	Painter
<i>rect</i>	Clipping rectangle
<i>flags</i>	Bitwise OR of the flags like in for QPainter::drawText
<i>text</i>	Text to be rendered

Implements [QwtTextEngine](#).

12.46.2.2 heightForWidth()

```
double QwtMathMLTextEngine::heightForWidth (
    const QFont & font,
```

```
int flags,
const QString & text,
double width ) const [virtual]
```

Find the height for a given width

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText
<i>text</i>	Text to be rendered
<i>width</i>	Width

Returns

Calculated height

Implements [QwtTextEngine](#).

12.46.2.3 mightRender()

```
bool QwtMathMLTextEngine::mightRender (
    const QString & text ) const [virtual]
```

Test if a string can be rendered by [QwtMathMLTextEngine](#)

Parameters

<i>text</i>	Text to be tested
-------------	-------------------

Returns

true, if text begins with "<math>".

Implements [QwtTextEngine](#).

12.46.2.4 textMargins()

```
void QwtMathMLTextEngine::textMargins (
    const QFont & ,
    const QString & ,
    double & left,
    double & right,
    double & top,
    double & bottom ) const [virtual]
```

Return margins around the texts

Parameters

<i>left</i>	Return 0
<i>right</i>	Return 0
<i>top</i>	Return 0
<i>bottom</i>	Return 0

Implements [QwtTextEngine](#).

12.46.2.5 textSize()

```
QSizeF QwtMathMLTextEngine::textSize (
    const QFont & font,
    int flags,
    const QString & text ) const [virtual]
```

Returns the size, that is needed to render text

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText
<i>text</i>	Text to be rendered

Returns

Caluclated size

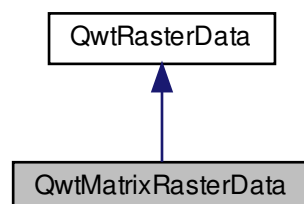
Implements [QwtTextEngine](#).

12.47 QwtMatrixRasterData Class Reference

A class representing a matrix of values as raster data.

```
#include <qwt_matrix_raster_data.h>
```

Inheritance diagram for QwtMatrixRasterData:



Public Types

- enum [ResampleMode](#) { [NearestNeighbour](#), [BilinearInterpolation](#) }
Resampling algorithm The default setting is NearestNeighbour;.

Public Member Functions

- [QwtMatrixRasterData](#) ()
Constructor.
- virtual [~QwtMatrixRasterData](#) ()
Destructor.
- void [setResampleMode](#) ([ResampleMode](#) mode)
Set the resampling algorithm.
- [ResampleMode](#) [resampleMode](#) () const
- virtual void [setInterval](#) (Qt::Axis, const [QwtInterval](#) &)
Assign the bounding interval for an axis.
- void [setValueMatrix](#) (const QVector< double > &values, int [numColumns](#))
Assign a value matrix.
- const QVector< double > [valueMatrix](#) () const
- void [setValue](#) (int row, int col, double [value](#))
Change a single value in the matrix.
- int [numColumns](#) () const
- int [numRows](#) () const
- virtual QRectF [pixelHint](#) (const QRectF &) const
Calculate the pixel hint.
- virtual double [value](#) (double x, double y) const

12.47.1 Detailed Description

A class representing a matrix of values as raster data.

[QwtMatrixRasterData](#) implements an interface for a matrix of equidistant values, that can be used by a [QwtPlotRasterItem](#). It implements a couple of resampling algorithms, to provide values for positions, that or not on the value matrix.

12.47.2 Member Enumeration Documentation

12.47.2.1 ResampleMode

```
enum QwtMatrixRasterData::ResampleMode
```

Resampling algorithm The default setting is NearestNeighbour;.

Enumerator

NearestNeighbour	Return the value from the matrix, that is nearest to the the requested position.
BilinearInterpolation	Interpolate the value from the distances and values of the 4 surrounding values in the matrix,

12.47.3 Member Function Documentation

12.47.3.1 numColumns()

```
int QwtMatrixRasterData::numColumns ( ) const
```

Returns

Number of columns of the value matrix

See also

[valueMatrix\(\)](#), [numRows\(\)](#), [setValueMatrix\(\)](#)

12.47.3.2 numRows()

```
int QwtMatrixRasterData::numRows ( ) const
```

Returns

Number of rows of the value matrix

See also

[valueMatrix\(\)](#), [numColumns\(\)](#), [setValueMatrix\(\)](#)

12.47.3.3 pixelHint()

```
QRectF QwtMatrixRasterData::pixelHint (
    const QRectF & area ) const [virtual]
```

Calculate the pixel hint.

[pixelHint\(\)](#) returns the geometry of a pixel, that can be used to calculate the resolution and alignment of the plot item, that is representing the data.

- NearestNeighbour
[pixelHint\(\)](#) returns the surrounding pixel of the top left value in the matrix.
- BilinearInterpolation
Returns an empty rectangle recommending to render in target device (f.e. screen) resolution.

Parameters

<i>area</i>	Requested area, ignored
-------------	-------------------------

Returns

Calculated hint

See also

[ResampleMode](#), [setMatrix\(\)](#), [setInterval\(\)](#)

Reimplemented from [QwtRasterData](#).

12.47.3.4 resampleMode()

```
QwtMatrixRasterData::ResampleMode QwtMatrixRasterData::resampleMode ( ) const
```

Returns

resampling algorithm

See also

[setResampleMode\(\)](#), [value\(\)](#)

12.47.3.5 setInterval()

```
void QwtMatrixRasterData::setInterval (
    Qt::Axis axis,
    const QwtInterval & interval ) [virtual]
```

Assign the bounding interval for an axis.

Setting the bounding intervals for the X/Y axis is mandatory to define the positions for the values of the value matrix. The interval in Z direction defines the possible range for the values in the matrix, what is f.e used by [QwtPlotSpectrogram](#) to map values to colors. The Z-interval might be the bounding interval of the values in the matrix, but usually it isn't. (f.e a interval of 0.0-100.0 for values in percentage)

Parameters

<i>axis</i>	X, Y or Z axis
<i>interval</i>	Interval

See also

[QwtRasterData::interval\(\)](#), [setValueMatrix\(\)](#)

Reimplemented from [QwtRasterData](#).

12.47.3.6 setResampleMode()

```
void QwtMatrixRasterData::setResampleMode (
    ResampleMode mode )
```

Set the resampling algorithm.

Parameters

<i>mode</i>	Resampling mode
-------------	-----------------

See also

[resampleMode\(\)](#), [value\(\)](#)

12.47.3.7 setValue()

```
void QwtMatrixRasterData::setValue (
    int row,
    int col,
    double value )
```

Change a single value in the matrix.

Parameters

<i>row</i>	Row index
<i>col</i>	Column index
<i>value</i>	New value

See also

[value\(\)](#), [setValueMatrix\(\)](#)

12.47.3.8 setValueMatrix()

```
void QwtMatrixRasterData::setValueMatrix (
    const QVector< double > & values,
    int numColumns )
```

Assign a value matrix.

The positions of the values are calculated by dividing the bounding rectangle of the X/Y intervals into equidistant rectangles (pixels). Each value corresponds to the center of a pixel.

Parameters

<i>values</i>	Vector of values
<i>numColumns</i>	Number of columns

See also

[valueMatrix\(\)](#), [numColumns\(\)](#), [numRows\(\)](#), [setInterval\(\)](#)

12.47.3.9 value()

```
double QwtMatrixRasterData::value (
    double x,
    double y ) const [virtual]
```

Returns

the value at a raster position

Parameters

<i>x</i>	X value in plot coordinates
<i>y</i>	Y value in plot coordinates

See also

[ResampleMode](#)

Implements [QwtRasterData](#).

12.47.3.10 valueMatrix()

```
const QVector< double > QwtMatrixRasterData::valueMatrix ( ) const
```

Returns

Value matrix

See also

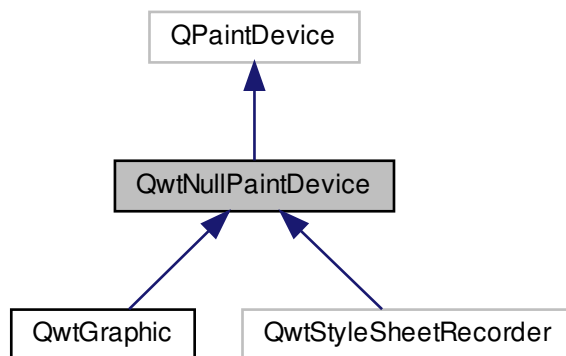
[setValueMatrix\(\)](#), [numColumns\(\)](#), [numRows\(\)](#), [setInterval\(\)](#)

12.48 QwtNullPaintDevice Class Reference

A null paint device doing nothing.

```
#include <qwt_null_paintdevice.h>
```

Inheritance diagram for QwtNullPaintDevice:



Public Types

- enum [Mode](#) { [NormalMode](#), [PolygonPathMode](#), [PathMode](#) }
Render mode.

Public Member Functions

- [QwtNullPaintDevice](#) ()
Constructor.
- virtual [~QwtNullPaintDevice](#) ()
Destructor.
- void [setMode](#) ([Mode](#))
- [Mode](#) [mode](#) () const
- virtual [QPaintEngine](#) * [paintEngine](#) () const
See QPaintDevice::paintEngine()
- virtual int [metric](#) ([PaintDeviceMetric](#)) const
- virtual void [drawRects](#) (const [QRect](#) *, int)
See QPaintEngine::drawRects()
- virtual void [drawRects](#) (const [QRectF](#) *, int)
See QPaintEngine::drawRects()
- virtual void [drawLines](#) (const [QLine](#) *, int)
See QPaintEngine::drawLines()
- virtual void [drawLines](#) (const [QLineF](#) *, int)
See QPaintEngine::drawLines()
- virtual void [drawEllipse](#) (const [QRectF](#) &)

- See QPaintEngine::drawEllipse()*
- virtual void [drawEllipse](#) (const QRect &)
See QPaintEngine::drawEllipse()
- virtual void [drawPath](#) (const QPainterPath &)
See QPaintEngine::drawPath()
- virtual void [drawPoints](#) (const QPointF *, int)
See QPaintEngine::drawPoints()
- virtual void [drawPoints](#) (const QPoint *, int)
See QPaintEngine::drawPoints()
- virtual void [drawPolygon](#) (const QPointF *, int, QPaintEngine::PolygonDrawMode)
See QPaintEngine::drawPolygon()
- virtual void [drawPolygon](#) (const QPoint *, int, QPaintEngine::PolygonDrawMode)
See QPaintEngine::drawPolygon()
- virtual void [drawPixmap](#) (const QRectF &, const QPixmap &, const QRectF &)
See QPaintEngine::drawPixmap()
- virtual void [drawTextItem](#) (const QPointF &, const QTextItem &)
See QPaintEngine::drawTextItem()
- virtual void [drawTiledPixmap](#) (const QRectF &, const QPixmap &, const QPointF &)
See QPaintEngine::drawTiledPixmap()
- virtual void [drawImage](#) (const QRectF &, const QImage &, const QRectF &, Qt::ImageConversionFlags)
See QPaintEngine::drawImage()
- virtual void [updateState](#) (const QPaintEngineState &)
See QPaintEngine::updateState()

Protected Member Functions

- virtual QSize [sizeMetrics](#) () const =0

12.48.1 Detailed Description

A null paint device doing nothing.

Sometimes important layout/rendering geometries are not available or changeable from the public Qt class interface. (f.e hidden in the style implementation).

[QwtNullPaintDevice](#) can be used to manipulate or filter out this information by analyzing the stream of paint primitives.

F.e. [QwtNullPaintDevice](#) is used by [QwtPlotCanvas](#) to identify styled backgrounds with rounded corners.

12.48.2 Member Enumeration Documentation

12.48.2.1 Mode

```
enum QwtNullPaintDevice::Mode
```

Render mode.

See also

[setMode\(\)](#), [mode\(\)](#)

Enumerator

NormalMode	All vector graphic primitives are painted by the corresponding draw methods
PolygonPathMode	<p>Vector graphic primitives (beside polygons) are mapped to a QPainterPath and are painted by drawPath. In PathMode mode only a few draw methods are called:</p> <ul style="list-style-type: none"> • drawPath() • drawPixmap() • drawImage() • drawPolygon()
PathMode	<p>Vector graphic primitives are mapped to a QPainterPath and are painted by drawPath. In PathMode mode only a few draw methods are called:</p> <ul style="list-style-type: none"> • drawPath() • drawPixmap() • drawImage()

12.48.3 Member Function Documentation

12.48.3.1 metric()

```
int QwtNullPaintDevice::metric (
    PaintDeviceMetric deviceMetric ) const [virtual]
```

See [QPaintDevice::metric\(\)](#)

Parameters

<i>deviceMetric</i>	Type of metric
---------------------	----------------

Returns

Metric information for the given paint device metric.

See also

[sizeMetrics\(\)](#)

12.48.3.2 mode()

```
QwtNullPaintDevice::Mode QwtNullPaintDevice::mode ( ) const
```

Returns

Render mode

See also

[setMode\(\)](#)

12.48.3.3 setMode()

```
void QwtNullPaintDevice::setMode (
    Mode mode )
```

Set the render mode

Parameters

<i>mode</i>	New mode
-------------	----------

See also

[mode\(\)](#)

12.48.3.4 sizeMetrics()

```
virtual QSize QwtNullPaintDevice::sizeMetrics ( ) const [protected], [pure virtual]
```

Returns

Size needed to implement [metric\(\)](#)

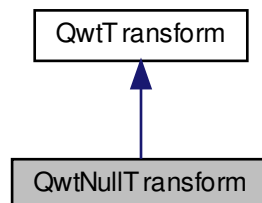
Implemented in [QwtGraphic](#).

12.49 QwtNullTransform Class Reference

Null transformation.

```
#include <qwt_transform.h>
```

Inheritance diagram for QwtNullTransform:



Public Member Functions

- [QwtNullTransform](#) ()
Constructor.
- virtual [~QwtNullTransform](#) ()
Destructor.
- virtual double [transform](#) (double value) const
- virtual double [invTransform](#) (double value) const
- virtual [QwtTransform](#) * [copy](#) () const

12.49.1 Detailed Description

Null transformation.

[QwtNullTransform](#) returns the values unmodified.

12.49.2 Member Function Documentation

12.49.2.1 [copy\(\)](#)

```
QwtTransform * QwtNullTransform::copy ( ) const [virtual]
```

Returns

Clone of the transformation

Implements [QwtTransform](#).

12.49.2.2 [invTransform\(\)](#)

```
double QwtNullTransform::invTransform (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be transformed
--------------	-------------------------

Returns

value unmodified

Implements [QwtTransform](#).

12.49.2.3 transform()

```
double QwtNullTransform::transform (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be transformed
--------------	-------------------------

Returns

value unmodified

Implements [QwtTransform](#).

12.50 QwtOHLCSample Class Reference

Open-High-Low-Close sample used in financial charts.

```
#include <qwt_samples.h>
```

Public Member Functions

- [QwtOHLCSample](#) (double [time](#)=0.0, double [open](#)=0.0, double [high](#)=0.0, double [low](#)=0.0, double [close](#)=0.0)
- [QwtInterval boundingInterval](#) () const
Calculate the bounding interval of the OHLC values.
- bool [isValid](#) () const
Check if a sample is valid.

Public Attributes

- double [time](#)
- double [open](#)
Opening price.
- double [high](#)
Highest price.
- double [low](#)
Lowest price.
- double [close](#)
Closing price.

12.50.1 Detailed Description

Open-High-Low-Close sample used in financial charts.

In financial charts the movement of a price in a time interval is often represented by the opening/closing prices and the lowest/highest prices in this interval.

See also

[QwtTradingChartData](#)

12.50.2 Constructor & Destructor Documentation

12.50.2.1 QwtOHLCSample()

```
QwtOHLCSample::QwtOHLCSample (
    double t = 0.0,
    double o = 0.0,
    double h = 0.0,
    double l = 0.0,
    double c = 0.0 ) [inline]
```

Constructor

Parameters

<i>t</i>	Time value
<i>o</i>	Open value
<i>h</i>	High value
<i>l</i>	Low value
<i>c</i>	Close value

12.50.3 Member Function Documentation

12.50.3.1 boundingInterval()

```
QwtInterval QwtOHLCSample::boundingInterval ( ) const [inline]
```

Calculate the bounding interval of the OHLC values.

For valid samples the limits of this interval are always low/high.

Returns

Bounding interval

See also

[isValid\(\)](#)

12.50.3.2 isValid()

```
bool QwtOHLCSample::isValid ( ) const [inline]
```

Check if a sample is valid.

A sample is valid, when all of the following checks are true:

- low ≤ high
- low ≤ open ≤ high
- low ≤ close ≤ high

Returns

True, when the sample is valid

12.50.4 Member Data Documentation

12.50.4.1 time

```
double QwtOHLCSample::time
```

Time of the sample, usually a number representing a specific interval - like a day.

12.51 QwtPainter Class Reference

A collection of QPainter workarounds.

```
#include <qwt_painter.h>
```

Static Public Member Functions

- static void [setPolylineSplitting](#) (bool)
En/Disable line splitting for the raster paint engine.
- static bool [polylineSplitting](#) ()
- static void [setRoundingAlignment](#) (bool)
- static bool [roundingAlignment](#) ()
- static bool [roundingAlignment](#) (QPainter *)
- static void [drawText](#) (QPainter *, double x, double y, const QString &)
Wrapper for QPainter::drawText()
- static void [drawText](#) (QPainter *, const QPointF &, const QString &)
Wrapper for QPainter::drawText()
- static void [drawText](#) (QPainter *, double x, double y, double w, double h, int flags, const QString &)
Wrapper for QPainter::drawText()
- static void [drawText](#) (QPainter *, const QRectF &, int flags, const QString &)
Wrapper for QPainter::drawText()

- static void [drawSimpleRichText](#) (QPainter *, const QRectF &, int flags, const QTextDocument &)
- static void [drawRect](#) (QPainter *, double x, double y, double w, double h)
Wrapper for QPainter::drawRect()
- static void [drawRect](#) (QPainter *, const QRectF &rect)
Wrapper for QPainter::drawRect()
- static void [fillRect](#) (QPainter *, const QRectF &, const QBrush &)
Wrapper for QPainter::fillRect()
- static void [drawEllipse](#) (QPainter *, const QRectF &)
Wrapper for QPainter::drawEllipse()
- static void [drawPie](#) (QPainter *, const QRectF &, int a, int alen)
Wrapper for QPainter::drawPie()
- static void [drawLine](#) (QPainter *, double x1, double y1, double x2, double y2)
Wrapper for QPainter::drawLine()
- static void [drawLine](#) (QPainter *, const QPointF &p1, const QPointF &p2)
Wrapper for QPainter::drawLine()
- static void [drawLine](#) (QPainter *, const QLineF &)
Wrapper for QPainter::drawLine()
- static void [drawPolygon](#) (QPainter *, const QPolygonF &)
Wrapper for QPainter::drawPolygon()
- static void [drawPolyline](#) (QPainter *, const QPolygonF &)
Wrapper for QPainter::drawPolyline()
- static void [drawPolyline](#) (QPainter *, const QPointF *, int pointCount)
Wrapper for QPainter::drawPolyline()
- static void [drawPolygon](#) (QPainter *, const QPolygon &)
Wrapper for QPainter::drawPolygon()
- static void [drawPolyline](#) (QPainter *, const QPolygon &)
Wrapper for QPainter::drawPolyline()
- static void [drawPolyline](#) (QPainter *, const QPoint *, int pointCount)
Wrapper for QPainter::drawPolyline()
- static void [drawPoint](#) (QPainter *, const QPoint &)
Wrapper for QPainter::drawPoint()
- static void [drawPoints](#) (QPainter *, const QPolygon &)
Wrapper for QPainter::drawPoints()
- static void [drawPoints](#) (QPainter *, const QPoint *, int pointCount)
Wrapper for QPainter::drawPoints()
- static void [drawPoint](#) (QPainter *, double x, double y)
Wrapper for QPainter::drawPoint()
- static void [drawPoint](#) (QPainter *, const QPointF &)
Wrapper for QPainter::drawPoint()
- static void [drawPoints](#) (QPainter *, const QPolygonF &)
Wrapper for QPainter::drawPoints()
- static void [drawPoints](#) (QPainter *, const QPointF *, int pointCount)
Wrapper for QPainter::drawPoints()
- static void [drawPath](#) (QPainter *, const QPainterPath &)
Wrapper for QPainter::drawPath()
- static void [drawImage](#) (QPainter *, const QRectF &, const QImage &)
Wrapper for QPainter::drawImage()
- static void [drawPixmap](#) (QPainter *, const QRectF &, const QPixmap &)
Wrapper for QPainter::drawPixmap()
- static void [drawRoundFrame](#) (QPainter *, const QRectF &, const QPalette &, int lineWidth, int frameStyle)

- static void [drawRoundedFrame](#) (QPainter *, const QRectF &, double xRadius, double yRadius, const QPalette &, int lineWidth, int frameStyle)
- static void [drawFrame](#) (QPainter *, const QRectF &rect, const QPalette &palette, QPalette::ColorRole foregroundRole, int frameWidth, int midLineWidth, int frameStyle)
- static void [drawFocusRect](#) (QPainter *, const QWidget *)
Draw a focus rectangle on a widget using its style.
- static void [drawFocusRect](#) (QPainter *, const QWidget *, const QRect &)
Draw a focus rectangle on a widget using its style.
- static void [drawColorBar](#) (QPainter *painter, const [QwtColorMap](#) &, const [QwtInterval](#) &, const [QwtScaleMap](#) &, Qt::Orientation, const QRectF &)
- static bool [isAligning](#) (QPainter *painter)
- static bool [isX11GraphicsSystem](#) ()
- static void [fillPixmap](#) (const QWidget *, QPixmap &, const QPoint &offset=QPoint())
- static void [drawBackground](#) (QPainter *painter, const QRectF &rect, const QWidget *widget)
- static QPixmap [backingStore](#) (QWidget *, const QSize &)

12.51.1 Detailed Description

A collection of QPainter workarounds.

12.51.2 Member Function Documentation

12.51.2.1 [backingStore\(\)](#)

```
QPixmap QwtPainter::backingStore (
    QWidget * widget,
    const QSize & size ) [static]
```

Returns

A pixmap that can be used as backing store

Parameters

<i>widget</i>	Widget, for which the backingstore is intended
<i>size</i>	Size of the pixmap

12.51.2.2 [drawBackground\(\)](#)

```
void QwtPainter::drawBackground (
    QPainter * painter,
    const QRectF & rect,
    const QWidget * widget ) [static]
```

Fill rect with the background of a widget

Parameters

<i>painter</i>	Painter
<i>rect</i>	Rectangle to be filled
<i>widget</i>	Widget

See also

QStyle::PE_Widget, QWidget::backgroundRole()

12.51.2.3 drawColorBar()

```
void QwtPainter::drawColorBar (
    QPainter * painter,
    const QwtColorMap & colorMap,
    const QwtInterval & interval,
    const QwtScaleMap & scaleMap,
    Qt::Orientation orientation,
    const QRectF & rect ) [static]
```

Draw a color bar into a rectangle

Parameters

<i>painter</i>	Painter
<i>colorMap</i>	Color map
<i>interval</i>	Value range
<i>scaleMap</i>	Scale map
<i>orientation</i>	Orientation
<i>rect</i>	Traget rectangle

12.51.2.4 drawFrame()

```
void QwtPainter::drawFrame (
    QPainter * painter,
    const QRectF & rect,
    const QPalette & palette,
    QPalette::ColorRole foregroundRole,
    int frameWidth,
    int midLineWidth,
    int frameStyle ) [static]
```

Draw a rectangular frame

Parameters

<i>painter</i>	Painter
<i>rect</i>	Frame rectangle

Parameters

<i>palette</i>	Palette
<i>foregroundRole</i>	Foreground role used for QFrame::Plain
<i>frameWidth</i>	Frame width
<i>midLineWidth</i>	Used for QFrame::Box
<i>frameStyle</i>	bitwise OR'ed value of QFrame::Shape and QFrame::Shadow

12.51.2.5 drawRoundedFrame()

```
void QPainter::drawRoundedFrame (
    QPainter * painter,
    const QRectF & rect,
    double xRadius,
    double yRadius,
    const QPalette & palette,
    int lineWidth,
    int frameStyle ) [static]
```

Draw a rectangular frame with rounded borders

Parameters

<i>painter</i>	Painter
<i>rect</i>	Frame rectangle
<i>xRadius</i>	x-radius of the ellipses defining the corners
<i>yRadius</i>	y-radius of the ellipses defining the corners
<i>palette</i>	QPalette::WindowText is used for plain borders QPalette::Dark and QPalette::Light for raised or sunken borders
<i>lineWidth</i>	Line width
<i>frameStyle</i>	bitwise OR'ed value of QFrame::Shape and QFrame::Shadow

12.51.2.6 drawRoundFrame()

```
void QPainter::drawRoundFrame (
    QPainter * painter,
    const QRectF & rect,
    const QPalette & palette,
    int lineWidth,
    int frameStyle ) [static]
```

Draw a round frame

Parameters

<i>painter</i>	Painter
<i>rect</i>	Frame rectangle
<i>palette</i>	QPalette::WindowText is used for plain borders QPalette::Dark and QPalette::Light for raised or sunken borders
<i>lineWidth</i>	Line width
<i>frameStyle</i>	bitwise OR'ed value of QFrame::Shape and QFrame::Shadow

12.51.2.7 drawSimpleRichText()

```
void QwtPainter::drawSimpleRichText (
    QPainter * painter,
    const QRectF & rect,
    int flags,
    const QTextDocument & text ) [static]
```

Draw a text document into a rectangle

Parameters

<i>painter</i>	Painter
<i>rect</i>	Traget rectangle
<i>flags</i>	Alignments/Text flags, see QPainter::drawText()
<i>text</i>	Text document

12.51.2.8 fillPixmap()

```
void QwtPainter::fillPixmap (
    const QWidget * widget,
    QPixmap & pixmap,
    const QPoint & offset = QPoint() ) [static]
```

Fill a pixmap with the content of a widget

In Qt >= 5.0 QPixmap::fill() is a nop, in Qt 4.x it is buggy for backgrounds with gradients. Thus [fillPixmap\(\)](#) offers an alternative implementation.

Parameters

<i>widget</i>	Widget
<i>pixmap</i>	Pixmap to be filled
<i>offset</i>	Offset

See also

QPixmap::fill()

12.51.2.9 isAligning()

```
bool QwtPainter::isAligning (
    QPainter * painter ) [static]
```

Check if the painter is using a paint engine, that aligns coordinates to integers. Today these are all paint engines beside QPainterEngine::Pdf and QPainterEngine::SVG.

If we have an integer based paint engine it is also checked if the painter has a transformation matrix, that rotates or scales.

Parameters

<i>painter</i>	Painter
----------------	---------

Returns

true, when the painter is aligning

See also

[setRoundingAlignment\(\)](#)

12.51.2.10 isX11GraphicsSystem()

```
bool QwtPainter::isX11GraphicsSystem ( ) [static]
```

Check is the application is running with the X11 graphics system that has some special capabilities that can be used for incremental painting to a widget.

Returns

True, when the graphics system is X11

12.51.2.11 polylineSplitting()

```
bool QwtPainter::polylineSplitting ( ) [inline], [static]
```

Returns

True, when line splitting for the raster paint engine is enabled.

See also

[setPolylineSplitting\(\)](#)

12.51.2.12 roundingAlignment() [1/2]

```
bool QwtPainter::roundingAlignment ( ) [inline], [static]
```

Check whether coordinates should be rounded, before they are painted to a paint engine that rounds to integer values. For other paint engines (PDF, SVG), this flag has no effect.

Returns

True, when rounding is enabled

See also

[setRoundingAlignment\(\)](#), [isAligning\(\)](#)

12.51.2.13 roundingAlignment() [2/2]

```
bool QwtPainter::roundingAlignment (
    QPainter * painter ) [inline], [static]
```

Returns

[roundingAlignment\(\)](#) && [isAligning\(painter\)](#);

Parameters

<i>painter</i>	Painter
----------------	---------

12.51.2.14 setPolylineSplitting()

```
void QwtPainter::setPolylineSplitting (
    bool enable ) [static]
```

En/Disable line splitting for the raster paint engine.

In some Qt versions the raster paint engine paints polylines of many points much faster when they are split in smaller chunks: f.e all supported Qt versions \geq Qt 5.0 when drawing an antialiased polyline with a pen width ≥ 2 .

Also the raster paint engine has a nasty bug in many versions (Qt 4.8 - ...) for short lines (<https://codereview.qt-project.org/#/c/99456>), that is worked around in this mode.

The default setting is true.

See also

[polylineSplitting\(\)](#)

12.51.2.15 setRoundingAlignment()

```
void QwtPainter::setRoundingAlignment (
    bool enable ) [static]
```

Enable whether coordinates should be rounded, before they are painted to a paint engine that floors to integer values. For other paint engines (PDF, SVG) this flag has no effect. [QwtPainter](#) stores this flag only, the rounding itself is done in the painting code (f.e the plot items).

The default setting is true.

See also

[roundingAlignment\(\)](#), [isAligning\(\)](#)

12.52 QwtPainterCommand Class Reference

```
#include <qwt_painter_command.h>
```

Classes

- struct **ImageData**
Attributes how to paint a QImage.
- struct **PixmapData**
Attributes how to paint a QPixmap.
- struct **StateData**
Attributes of a state change.

Public Types

- enum [Type](#) {
 [Invalid](#) = -1, [Path](#), [Pixmap](#), [Image](#),
 [State](#) }

Type of the paint command.

Public Member Functions

- [QwtPainterCommand](#) ()
 Construct an invalid command.
- [QwtPainterCommand](#) (const [QwtPainterCommand](#) &)
- [QwtPainterCommand](#) (const QPainterPath &)
 Copy constructor.
- [QwtPainterCommand](#) (const QRectF &rect, const QPixmap &, const QRectF &subRect)
- [QwtPainterCommand](#) (const QRectF &rect, const QImage &, const QRectF &subRect, Qt::ImageConversionFlags)
- [QwtPainterCommand](#) (const QPaintEngineState &)
- [~QwtPainterCommand](#) ()
 Destructor.
- [QwtPainterCommand](#) & operator= (const [QwtPainterCommand](#) &)
- [Type](#) type () const
- QPainterPath * [path](#) ()
- const QPainterPath * [path](#) () const
- QPixmapData * [pixmapData](#) ()
- const QPixmapData * [pixmapData](#) () const
- ImageData * [imageData](#) ()
- const ImageData * [imageData](#) () const
- StateData * [stateData](#) ()
- const StateData * [stateData](#) () const

12.52.1 Detailed Description

[QwtPainterCommand](#) represents the attributes of a paint operation how it is used between QPainter and QPainterDevice

It is used by [QwtGraphic](#) to record and replay paint operations

See also

[QwtGraphic::commands\(\)](#)

12.52.2 Member Enumeration Documentation

12.52.2.1 Type

```
enum QwtPainterCommand::Type
```

Type of the paint command.

Enumerator

Invalid	Invalid command.
Path	Draw a QPainterPath.
Pixmap	Draw a QPixmap.
Image	Draw a QImage.
State	QPainter state change.

12.52.3 Constructor & Destructor Documentation

12.52.3.1 QwtPainterCommand() [1/4]

```
QwtPainterCommand::QwtPainterCommand (
    const QwtPainterCommand & other )
```

Copy constructor

Parameters

<i>other</i>	Command to be copied
--------------	----------------------

12.52.3.2 QwtPainterCommand() [2/4]

```
QwtPainterCommand::QwtPainterCommand (
    const QRectF & rect,
    const QPixmap & pixmap,
    const QRectF & subRect )
```

Constructor for Pixmap paint operation

Parameters

<i>rect</i>	Target rectangle
<i>pixmap</i>	Pixmap
<i>subRect</i>	Rectangle inside the pixmap

See also

[QPainter::drawPixmap\(\)](#)

12.52.3.3 QwtPainterCommand() [3/4]

```
QwtPainterCommand::QwtPainterCommand (
    const QRectF & rect,
```



```
const QImage & image,
const QRectF & subRect,
Qt::ImageConversionFlags flags )
```

Constructor for Image paint operation

Parameters

<i>rect</i>	Target rectangle
<i>image</i>	Image
<i>subRect</i>	Rectangle inside the image
<i>flags</i>	Conversion flags

See also

QPainter::drawImage()

12.52.3.4 QwtPainterCommand() [4 / 4]

```
QwtPainterCommand::QwtPainterCommand (
const QPaintEngineState & state )
```

Constructor for State paint operation

Parameters

<i>state</i>	Paint engine state
--------------	--------------------

12.52.4 Member Function Documentation

12.52.4.1 imageData() [1 / 2]

```
QwtPainterCommand::ImageData * QwtPainterCommand::imageData ( )
```

Returns

Attributes how to paint a QImage

12.52.4.2 imageData() [2 / 2]

```
const QwtPainterCommand::ImageData * QwtPainterCommand::imageData ( ) const [inline]
```

Returns

Attributes how to paint a QImage

12.52.4.3 operator=()

```
QwtPainterCommand & QwtPainterCommand::operator= (
    const QwtPainterCommand & other )
```

Assignment operator

Parameters

<i>other</i>	Command to be copied
--------------	----------------------

Returns

Modified command

12.52.4.4 path() [1/2]

```
QPainterPath * QwtPainterCommand::path ( )
```

Returns

Painter path to be painted

12.52.4.5 path() [2/2]

```
const QPainterPath * QwtPainterCommand::path ( ) const [inline]
```

Returns

Painter path to be painted

12.52.4.6 pixmapData() [1/2]

```
QwtPainterCommand::PixmapData * QwtPainterCommand::pixmapData ( )
```

Returns

Attributes how to paint a QPixmap

12.52.4.7 pixmapData() [2/2]

```
const QwtPainterCommand::PixmapData * QwtPainterCommand::pixmapData ( ) const [inline]
```

Returns

Attributes how to paint a QPixmap

12.52.4.8 stateData() [1/2]

```
QwtPainterCommand::StateData * QwtPainterCommand::stateData ( )
```

Returns

Attributes of a state change

12.52.4.9 stateData() [2/2]

```
const QwtPainterCommand::StateData * QwtPainterCommand::stateData ( ) const [inline]
```

Returns

Attributes of a state change

12.52.4.10 type()

```
QwtPainterCommand::Type QwtPainterCommand::type ( ) const [inline]
```

Returns

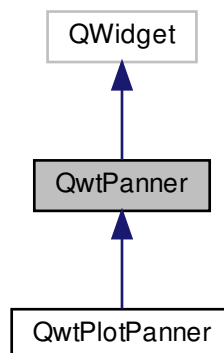
Type of the command

12.53 QwtPanner Class Reference

[QwtPanner](#) provides panning of a widget.

```
#include <qwt_panner.h>
```

Inheritance diagram for QwtPanner:



Signals

- void [panned](#) (int dx, int dy)
- void [moved](#) (int dx, int dy)

Public Member Functions

- [QwtPanner](#) (QWidget *parent)
- virtual [~QwtPanner](#) ()
Destructor.
- void [setEnabled](#) (bool)
En/disable the panner.
- bool [isEnabled](#) () const
- void [setMouseButton](#) (Qt::MouseButton, Qt::KeyboardModifiers=Qt::NoModifier)
- void [getMouseButton](#) (Qt::MouseButton &button, Qt::KeyboardModifiers &) const
Get mouse button and modifiers used for panning.
- void [setAbortKey](#) (int key, Qt::KeyboardModifiers=Qt::NoModifier)
- void [getAbortKey](#) (int &key, Qt::KeyboardModifiers &) const
Get the abort key and modifiers.
- void [setCursor](#) (const QCursor &)
- const QCursor [cursor](#) () const
- void [setOrientations](#) (Qt::Orientations)
- Qt::Orientations [orientations](#) () const
Return the orientation, where panning is enabled.
- bool [isOrientationEnabled](#) (Qt::Orientation) const
- virtual bool [eventFilter](#) (QObject *, QEvent *)
Event filter.

Protected Member Functions

- virtual void [widgetMouseEvent](#) (QMouseEvent *)
- virtual void [widgetMouseReleaseEvent](#) (QMouseEvent *)
- virtual void [widgetMouseMoveEvent](#) (QMouseEvent *)
- virtual void [widgetKeyPressEvent](#) (QKeyEvent *)
- virtual void [widgetKeyReleaseEvent](#) (QKeyEvent *)
- virtual void [paintEvent](#) (QPaintEvent *)
Paint event.
- virtual QPixmap [contentsMask](#) () const
Calculate a mask for the contents of the panned widget.
- virtual QPixmap [grab](#) () const

12.53.1 Detailed Description

[QwtPanner](#) provides panning of a widget.

[QwtPanner](#) grabs the contents of a widget, that can be dragged in all directions. The offset between the start and the end position is emitted by the [panned](#) signal.

[QwtPanner](#) grabs the content of the widget into a pixmap and moves the pixmap around, without initiating any repaint events for the widget. Areas, that are not part of content are not painted while panning. This makes panning fast enough for widgets, where repaints are too slow for mouse movements.

For widgets, where repaints are very fast it might be better to implement panning manually by mapping mouse events into paint events.

12.53.2 Constructor & Destructor Documentation

12.53.2.1 QwtPanner()

```
QwtPanner::QwtPanner (
    QWidget * parent )
```

Creates an panner that is enabled for the left mouse button.

Parameters

<i>parent</i>	Parent widget to be panned
---------------	----------------------------

12.53.3 Member Function Documentation

12.53.3.1 contentsMask()

```
QBitmap QwtPanner::contentsMask ( ) const [protected], [virtual]
```

Calculate a mask for the contents of the panned widget.

Sometimes only parts of the contents of a widget should be panned. F.e. for a widget with a styled background with rounded borders only the area inside of the border should be panned.

Returns

An empty bitmap, indicating no mask

Reimplemented in [QwtPlotPanner](#).

12.53.3.2 cursor()

```
const QCursor QwtPanner::cursor ( ) const
```

Returns

Cursor that is active while panning

See also

[setCursor\(\)](#)

12.53.3.3 eventFilter()

```
bool QwtPanner::eventFilter (
    QObject * object,
    QEvent * event ) [virtual]
```

Event filter.

When [isEnabled\(\)](#) is true mouse events of the observed widget are filtered.

Parameters

<i>object</i>	Object to be filtered
<i>event</i>	Event

Returns

Always false, beside for paint events for the parent widget.

See also

[widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseMoveEvent\(\)](#)

12.53.3.4 grab()

```
QPixmap QwtPanner::grab ( ) const [protected], [virtual]
```

Grab the widget into a pixmap.

Returns

Grabbed pixmap

Reimplemented in [QwtPlotPanner](#).

12.53.3.5 isEnabled()

```
bool QwtPanner::isEnabled ( ) const
```

Returns

true when enabled, false otherwise

See also

[setEnabled](#), [eventFilter\(\)](#)

12.53.3.6 isOrientationEnabled()

```
bool QwtPanner::isOrientationEnabled (
    Qt::Orientation o ) const
```

Returns

True if an orientation is enabled

See also

[orientations\(\)](#), [setOrientations\(\)](#)

12.53.3.7 moved

```
void QwtPanner::moved (
    int dx,
    int dy ) [signal]
```

Signal emitted, while the widget moved, but panning is not finished.

Parameters

<i>dx</i>	Offset in horizontal direction
<i>dy</i>	Offset in vertical direction

12.53.3.8 paintEvent()

```
void QwtPanner::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Paint event.

Repaint the grabbed pixmap on its current position and fill the empty spaces by the background of the parent widget.

Parameters

<i>event</i>	Paint event
--------------	-------------

12.53.3.9 panned

```
void QwtPanner::panned (
    int dx,
    int dy ) [signal]
```

Signal emitted, when panning is done

Parameters

<i>dx</i>	Offset in horizontal direction
<i>dy</i>	Offset in vertical direction

12.53.3.10 setAbortKey()

```
void QwtPanner::setAbortKey (
    int key,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Change the abort key The defaults are Qt::Key_Escape and Qt::NoModifiers

Parameters

<i>key</i>	Key (See Qt::Keycode)
<i>modifiers</i>	Keyboard modifiers

12.53.3.11 setCursor()

```
void QwtPanner::setCursor (
    const QCursor & cursor )
```

Change the cursor, that is active while panning The default is the cursor of the parent widget.

Parameters

<i>cursor</i>	New cursor
---------------	------------

See also

[setCursor\(\)](#)

12.53.3.12 setEnabled()

```
void QwtPanner::setEnabled (
    bool on )
```

En/disable the panner.

When enabled is true an event filter is installed for the observed widget, otherwise the event filter is removed.

Parameters

<i>on</i>	true or false
-----------	---------------

See also

[isEnabled\(\)](#), [eventFilter\(\)](#)

12.53.3.13 setMouseButton()

```
void QwtPanner::setMouseButton (
    Qt::MouseButton button,
    Qt::KeyboardModifiers modifiers = Qt::NoModifier )
```

Change the mouse button and modifiers used for panning The defaults are Qt::LeftButton and Qt::NoModifier

12.53.3.14 setOrientations()

```
void QwtPanner::setOrientations (
    Qt::Orientations o )
```

Set the orientations, where panning is enabled The default value is in both directions: Qt::Horizontal | Qt::Vertical

/param o Orientation

12.53.3.15 widgetKeyPressEvent()

```
void QwtPanner::widgetKeyPressEvent (
    QKeyEvent * keyEvent ) [protected], [virtual]
```

Handle a key press event for the observed widget.

Parameters

<i>keyEvent</i>	Key event
-----------------	-----------

See also

[eventFilter\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.53.3.16 widgetKeyReleaseEvent()

```
void QwtPanner::widgetKeyReleaseEvent (
    QKeyEvent * keyEvent ) [protected], [virtual]
```

Handle a key release event for the observed widget.

Parameters

<i>keyEvent</i>	Key event
-----------------	-----------

See also

[eventFilter\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.53.3.17 widgetMouseMoveEvent()

```
void QwtPanner::widgetMouseMoveEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse move event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#)

12.53.3.18 widgetMousePressEvent()

```
void QwtPanner::widgetMousePressEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse press event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseMoveEvent\(\)](#),

12.53.3.19 widgetMouseReleaseEvent()

```
void QwtPanner::widgetMouseReleaseEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse release event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

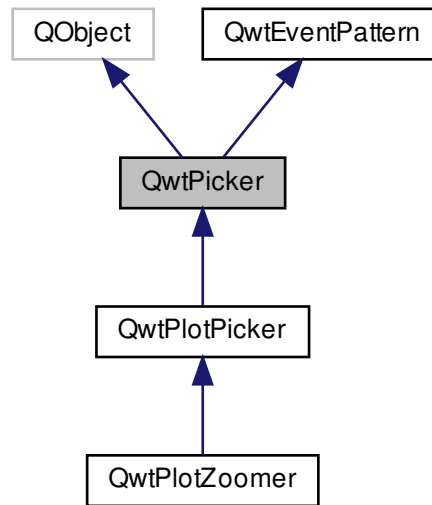
[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseMoveEvent\(\)](#),

12.54 QwtPicker Class Reference

[QwtPicker](#) provides selections on a widget.

```
#include <qwt_picker.h>
```

Inheritance diagram for QwtPicker:



Public Types

- enum RubberBand {
NoRubberBand = 0, HLineRubberBand, VLineRubberBand, CrossRubberBand,
RectRubberBand, EllipseRubberBand, PolygonRubberBand, UserRubberBand = 100 }
- enum DisplayMode { AlwaysOff, AlwaysOn, ActiveOnly }
Display mode.
- enum ResizeMode { Stretch, KeepSize }

Public Slots

- void **setEnabled** (bool)
En/disable the picker.

Signals

- void **activated** (bool on)
- void **selected** (const QPolygon &polygon)
- void **appended** (const QPoint &pos)
- void **moved** (const QPoint &pos)
- void **removed** (const QPoint &pos)
- void **changed** (const QPolygon &selection)

Public Member Functions

- [QwtPicker](#) (QWidget *parent)
- [QwtPicker](#) (RubberBand rubberBand, DisplayMode trackerMode, QWidget *)
- virtual [~QwtPicker](#) ()

Destructor.

- void [setStateMachine](#) (QwtPickerMachine *)
- const [QwtPickerMachine](#) * [stateMachine](#) () const
- [QwtPickerMachine](#) * [stateMachine](#) ()
- void [setRubberBand](#) (RubberBand)
- [RubberBand](#) [rubberBand](#) () const
- void [setTrackerMode](#) (DisplayMode)

Set the display mode of the tracker.

- [DisplayMode](#) [trackerMode](#) () const
- void [setResizeMode](#) (ResizeMode)

Set the resize mode.

- [ResizeMode](#) [resizeMode](#) () const
- void [setRubberBandPen](#) (const QPen &)
- QPen [rubberBandPen](#) () const
- void [setTrackerPen](#) (const QPen &)
- QPen [trackerPen](#) () const
- void [setTrackerFont](#) (const QFont &)
- QFont [trackerFont](#) () const
- bool [isEnabled](#) () const
- bool [isActive](#) () const
- virtual bool [eventFilter](#) (QObject *, QEvent *)

Event filter.

- QWidget * [parentWidget](#) ()
- Return the parent widget, where the selection happens.*
- const QWidget * [parentWidget](#) () const

Return the parent widget, where the selection happens.

- virtual QPainterPath [pickArea](#) () const
- virtual void [drawRubberBand](#) (QPainter *) const
- virtual void [drawTracker](#) (QPainter *) const
- virtual QRegion [rubberBandMask](#) () const
- virtual [QwtText](#) [trackerText](#) (const QPoint &pos) const

Return the label for a position.

- QPoint [trackerPosition](#) () const
- virtual QRect [trackerRect](#) (const QFont &) const
- QPolygon [selection](#) () const

Protected Member Functions

- virtual QPolygon [adjustedPoints](#) (const QPolygon &) const

Map the [pickedPoints\(\)](#) into a [selection\(\)](#)

- virtual void [transition](#) (const QEvent *)
- virtual void [begin](#) ()
- virtual void [append](#) (const QPoint &)
- virtual void [move](#) (const QPoint &)
- virtual void [remove](#) ()
- virtual bool [end](#) (bool ok=true)

Close a selection setting the state to inactive.

- virtual bool [accept](#) (QPolygon &) const
Validate and fix up the selection.
- virtual void [reset](#) ()
- virtual void [widgetMouseEvent](#) (QMouseEvent *)
- virtual void [widgetMouseReleaseEvent](#) (QMouseEvent *)
- virtual void [widgetMouseDoubleClickEvent](#) (QMouseEvent *)
- virtual void [widgetMouseMoveEvent](#) (QMouseEvent *)
- virtual void [widgetWheelEvent](#) (QWheelEvent *)
- virtual void [widgetKeyPressEvent](#) (QKeyEvent *)
- virtual void [widgetKeyReleaseEvent](#) (QKeyEvent *)
- virtual void [widgetEnterEvent](#) (QEvent *)
- virtual void [widgetLeaveEvent](#) (QEvent *)
- virtual void [stretchSelection](#) (const QSize &oldSize, const QSize &newSize)
- virtual void [updateDisplay](#) ()
Update the state of rubber band and tracker label.
- const [QwtWidgetOverlay](#) * [rubberBandOverlay](#) () const
- const [QwtWidgetOverlay](#) * [trackerOverlay](#) () const
- const QPolygon & [pickedPoints](#) () const

12.54.1 Detailed Description

[QwtPicker](#) provides selections on a widget.

[QwtPicker](#) filters all enter, leave, mouse and keyboard events of a widget and translates them into an array of selected points.

The way how the points are collected depends on type of state machine that is connected to the picker. Qwt offers a couple of predefined state machines for selecting:

- Nothing
[QwtPickerTrackerMachine](#)
- Single points
[QwtPickerClickPointMachine](#), [QwtPickerDragPointMachine](#)
- Rectangles
[QwtPickerClickRectMachine](#), [QwtPickerDragRectMachine](#)
- Polygons
[QwtPickerPolygonMachine](#)

While these state machines cover the most common ways to collect points it is also possible to implement individual machines as well.

[QwtPicker](#) translates the picked points into a selection using the [adjustedPoints\(\)](#) method. [adjustedPoints\(\)](#) is intended to be reimplemented to fix up the selection according to application specific requirements. (F.e. when an application accepts rectangles of a fixed aspect ratio only.)

Optionally [QwtPicker](#) support the process of collecting points by a rubber band and tracker displaying a text for the current mouse position.

Example

```

#include <qwt_picker.h>
#include <qwt_picker_machine.h>

QwtPicker *picker = new QwtPicker(widget);
picker->setStateMachine(new QwtPickerDragRectMachine);
picker->setTrackerMode(QwtPicker::ActiveOnly);
picker->setRubberBand(QwtPicker::RectRubberBand);

```

The state machine triggers the following commands:

- [begin\(\)](#)
Activate/Initialize the selection.
- [append\(\)](#)
Add a new point
- [move\(\)](#)
Change the position of the last point.
- [remove\(\)](#)
Remove the last point.
- [end\(\)](#)
Terminate the selection and call accept to validate the picked points.

The picker is active ([isActive\(\)](#)), between [begin\(\)](#) and [end\(\)](#). In active state the rubber band is displayed, and the tracker is visible in case of trackerMode is ActiveOnly or AlwaysOn.

The cursor can be moved using the arrow keys. All selections can be aborted using the abort key. ([QwtEventPattern::KeyPatternCode](#))

Warning

In case of QWidget::NoFocus the focus policy of the observed widget is set to QWidget::WheelFocus and mouse tracking will be manipulated while the picker is active, or if [trackerMode\(\)](#) is AlwaysOn.

12.54.2 Member Enumeration Documentation**12.54.2.1 DisplayMode**

```
enum QwtPicker::DisplayMode
```

Display mode.

See also

[setTrackerMode\(\)](#), [trackerMode\(\)](#), [isActive\(\)](#)

Enumerator

AlwaysOff	Display never.
AlwaysOn	Display always.
ActiveOnly	Display only when the selection is active.

12.54.2.2 ResizeMode

enum [QwtPicker::ResizeMode](#)

Controls what to do with the selected points of an active selection when the observed widget is resized.

The default value is [QwtPicker::Stretch](#).

See also

[setResizeMode\(\)](#)

Enumerator

Stretch	All points are scaled according to the new size,.
KeepSize	All points remain unchanged.

12.54.2.3 RubberBand

enum [QwtPicker::RubberBand](#)

Rubber band style

The default value is [QwtPicker::NoRubberBand](#).

See also

[setRubberBand\(\)](#), [rubberBand\(\)](#)

Enumerator

NoRubberBand	No rubberband.
HLineRubberBand	A horizontal line (only for QwtPickerMachine::PointSelection)
VLineRubberBand	A vertical line (only for QwtPickerMachine::PointSelection)
CrossRubberBand	A crosshair (only for QwtPickerMachine::PointSelection)
RectRubberBand	A rectangle (only for QwtPickerMachine::RectSelection)
EllipseRubberBand	An ellipse (only for QwtPickerMachine::RectSelection)
PolygonRubberBand	A polygon (only for QwtPickerMachine::PolygonSelection)
UserRubberBand	Values \geq UserRubberBand can be used to define additional rubber bands.

12.54.3 Constructor & Destructor Documentation

12.54.3.1 QwtPicker() [1/2]

```
QwtPicker::QwtPicker (
    QWidget * parent ) [explicit]
```

Constructor

Creates an picker that is enabled, but without a state machine. rubber band and tracker are disabled.

Parameters

<i>parent</i>	Parent widget, that will be observed
---------------	--------------------------------------

12.54.3.2 QwtPicker() [2/2]

```
QwtPicker::QwtPicker (
    RubberBand rubberBand,
    DisplayMode trackerMode,
    QWidget * parent ) [explicit]
```

Constructor

Parameters

<i>rubberBand</i>	Rubber band style
<i>trackerMode</i>	Tracker mode
<i>parent</i>	Parent widget, that will be observed

12.54.4 Member Function Documentation

12.54.4.1 accept()

```
bool QwtPicker::accept (
    QPolygon & selection ) const [protected], [virtual]
```

Validate and fix up the selection.

Accepts all selections unmodified

Parameters

<i>selection</i>	Selection to validate and fix up
------------------	----------------------------------

Returns

true, when accepted, false otherwise

Reimplemented in [QwtPlotZoomer](#).

12.54.4.2 activated

```
void QwtPicker::activated (
    bool on ) [signal]
```

A signal indicating, when the picker has been activated. Together with [setEnabled\(\)](#) it can be used to implement selections with more than one picker.

Parameters

<i>on</i>	True, when the picker has been activated
-----------	--

12.54.4.3 adjustedPoints()

```
QPolygon QwtPicker::adjustedPoints (
    const QPolygon & points ) const [protected], [virtual]
```

Map the [pickedPoints\(\)](#) into a [selection\(\)](#)

[adjustedPoints\(\)](#) maps the points, that have been collected on the [parentWidget\(\)](#) into a [selection\(\)](#). The default implementation simply returns the points unmodified.

The reason, why a [selection\(\)](#) differs from the picked points depends on the application requirements. F.e. :

- A rectangular selection might need to have a specific aspect ratio only.
- A selection could accept non intersecting polygons only.
- ...

The example below is for a rectangular selection, where the first point is the center of the selected rectangle.

Example

```
QPolygon MyPicker::adjustedPoints( const QPolygon &points ) const
{
    QPolygon adjusted;
    if ( points.size() == 2 )
    {
        const int width = qAbs( points[1].x() - points[0].x() );
        const int height = qAbs( points[1].y() - points[0].y() );

        QRect rect( 0, 0, 2 * width, 2 * height );
        rect.moveCenter( points[0] );

        adjusted += rect.topLeft();
        adjusted += rect.bottomRight();
    }
    return adjusted;
}
```

Parameters

<i>points</i>	Selected points
---------------	-----------------

Returns

Selected points unmodified

12.54.4.4 `append()`

```
void QwtPicker::append (
    const QPoint & pos ) [protected], [virtual]
```

Append a point to the selection and update rubber band and tracker. The [appended\(\)](#) signal is emitted.

Parameters

<i>pos</i>	Additional point
------------	------------------

See also

[isActive\(\)](#), [begin\(\)](#), [end\(\)](#), [move\(\)](#), [appended\(\)](#)

Reimplemented in [QwtPlotPicker](#).

12.54.4.5 `appended`

```
void QwtPicker::appended (
    const QPoint & pos ) [signal]
```

A signal emitted when a point has been appended to the selection

Parameters

<i>pos</i>	Position of the appended point.
------------	---------------------------------

See also

[append\(\)](#), [moved\(\)](#)

12.54.4.6 `begin()`

```
void QwtPicker::begin ( ) [protected], [virtual]
```

Open a selection setting the state to active

See also

[isActive\(\)](#), [end\(\)](#), [append\(\)](#), [move\(\)](#)

Reimplemented in [QwtPlotZoomer](#).

12.54.4.7 changed

```
void QwtPicker::changed (
    const QPolygon & selection ) [signal]
```

A signal emitted when the active selection has been changed. This might happen when the observed widget is resized.

Parameters

<i>selection</i>	Changed selection
------------------	-------------------

See also

[stretchSelection\(\)](#)

12.54.4.8 drawRubberBand()

```
void QwtPicker::drawRubberBand (
    QPainter * painter ) const [virtual]
```

Draw a rubber band, depending on [rubberBand\(\)](#)

Parameters

<i>painter</i>	Painter, initialized with a clip region
----------------	---

See also

[rubberBand\(\)](#), [RubberBand](#)

12.54.4.9 drawTracker()

```
void QwtPicker::drawTracker (
    QPainter * painter ) const [virtual]
```

Draw the tracker

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[trackerRect\(\)](#), [trackerText\(\)](#)

12.54.4.10 `end()`

```
bool QwtPicker::end (
    bool ok = true ) [protected], [virtual]
```

Close a selection setting the state to inactive.

The selection is validated and maybe fixed by [accept\(\)](#).

Parameters

<i>ok</i>	If true, complete the selection and emit a selected signal otherwise discard the selection.
-----------	---

Returns

true if the selection is accepted, false otherwise

See also

[isActive\(\)](#), [begin\(\)](#), [append\(\)](#), [move\(\)](#), [selected\(\)](#), [accept\(\)](#)

Reimplemented in [QwtPlotZoomer](#), and [QwtPlotPicker](#).

12.54.4.11 `eventFilter()`

```
bool QwtPicker::eventFilter (
    QObject * object,
    QEvent * event ) [virtual]
```

Event filter.

When [isEnabled\(\)](#) is true all events of the observed widget are filtered. Mouse and keyboard events are translated into widgetMouse- and widgetKey- and widgetWheel-events. Paint and Resize events are handled to keep rubber band and tracker up to date.

Parameters

<i>object</i>	Object to be filtered
<i>event</i>	Event

Returns

Always false.

See also

[widgetEnterEvent\(\)](#), [widgetLeaveEvent\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetMouseMoveEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#), [QObject::installEventFilter\(\)](#), [QObject::event\(\)](#)

12.54.4.12 isActive()

```
bool QwtPicker::isActive ( ) const
```

A picker is active between [begin\(\)](#) and [end\(\)](#).

Returns

true if the selection is active.

12.54.4.13 isEnabled()

```
bool QwtPicker::isEnabled ( ) const
```

Returns

true when enabled, false otherwise

See also

[setEnabled\(\)](#), [eventFilter\(\)](#)

12.54.4.14 move()

```
void QwtPicker::move (
    const QPoint & pos ) [protected], [virtual]
```

Move the last point of the selection The [moved\(\)](#) signal is emitted.

Parameters

<i>pos</i>	New position
------------	--------------

See also

[isActive\(\)](#), [begin\(\)](#), [end\(\)](#), [append\(\)](#)

Reimplemented in [QwtPlotPicker](#).

12.54.4.15 moved

```
void QwtPicker::moved (
    const QPoint & pos ) [signal]
```

A signal emitted whenever the last appended point of the selection has been moved.

Parameters

<i>pos</i>	Position of the moved last point of the selection.
------------	--

See also

[move\(\)](#), [appended\(\)](#)

12.54.4.16 pickArea()

```
QPainterPath QwtPicker::pickArea ( ) const [virtual]
```

Find the area of the observed widget, where selection might happen.

Returns

[parentWidget\(\)->contentsRect\(\)](#)

12.54.4.17 pickedPoints()

```
const QPolygon & QwtPicker::pickedPoints ( ) const [protected]
```

Return the points, that have been collected so far. The [selection\(\)](#) is calculated from the [pickedPoints\(\)](#) in [adjustedPoints\(\)](#).

Returns

Picked points

12.54.4.18 remove()

```
void QwtPicker::remove ( ) [protected], [virtual]
```

Remove the last point of the selection The [removed\(\)](#) signal is emitted.

See also

[isActive\(\)](#), [begin\(\)](#), [end\(\)](#), [append\(\)](#), [move\(\)](#)

12.54.4.19 removed

```
void QwtPicker::removed (
    const QPoint & pos ) [signal]
```

A signal emitted whenever the last appended point of the selection has been removed.

Parameters

<i>pos</i>	Position of the point, that has been removed
------------	--

See also

[remove\(\)](#), [appended\(\)](#)

12.54.4.20 reset()

```
void QwtPicker::reset ( ) [protected], [virtual]
```

Reset the state machine and terminate (`end(false)`) the selection

12.54.4.21 resizeMode()

```
QwtPicker::ResizeMode QwtPicker::resizeMode ( ) const
```

Returns

Resize mode

See also

[setResizeMode\(\)](#), [ResizeMode](#)

12.54.4.22 rubberBand()

```
QwtPicker::RubberBand QwtPicker::rubberBand ( ) const
```

Returns

Rubber band style

See also

[setRubberBand\(\)](#), [RubberBand](#), [rubberBandPen\(\)](#)

12.54.4.23 rubberBandMask()

```
QRegion QwtPicker::rubberBandMask ( ) const [virtual]
```

Calculate the mask for the rubber band overlay

Returns

Region for the mask

See also

[QWidget::setMask\(\)](#)

12.54.4.24 rubberBandOverlay()

```
const QwtWidgetOverlay * QwtPicker::rubberBandOverlay ( ) const [protected]
```

Returns

Overlay displaying the rubber band

12.54.4.25 rubberBandPen()

```
QPen QwtPicker::rubberBandPen ( ) const
```

Returns

Rubber band pen

See also

[setRubberBandPen\(\)](#), [rubberBand\(\)](#)

12.54.4.26 selected

```
void QwtPicker::selected (
    const QPolygon & polygon ) [signal]
```

A signal emitting the selected points, at the end of a selection.

Parameters

<i>polygon</i>	Selected points
----------------	-----------------

12.54.4.27 selection()

```
QPolygon QwtPicker::selection ( ) const
```

Returns

Selected points

See also

[pickedPoints\(\)](#), [adjustedPoints\(\)](#)

12.54.4.28 setEnabled

```
void QwtPicker::setEnabled (
    bool enabled ) [slot]
```

En/disable the picker.

When enabled is true an event filter is installed for the observed widget, otherwise the event filter is removed.

Parameters

<i>enabled</i>	true or false
----------------	---------------

See also

[isEnabled\(\)](#), [eventFilter\(\)](#)

12.54.4.29 setResizeMode()

```
void QwtPicker::setResizeMode (
    ResizeMode mode )
```

Set the resize mode.

The resize mode controls what to do with the selected points of an active selection when the observed widget is resized.

Stretch means the points are scaled according to the new size, KeepSize means the points remain unchanged.

The default mode is Stretch.

Parameters

<i>mode</i>	Resize mode
-------------	-------------

See also

[resizeMode\(\)](#), [ResizeMode](#)

12.54.4.30 setRubberBand()

```
void QwtPicker::setRubberBand (
    RubberBand rubberBand )
```

Set the rubber band style

Parameters

<i>rubberBand</i>	Rubber band style The default value is NoRubberBand.
-------------------	--

See also

[rubberBand\(\)](#), [RubberBand](#), [setRubberBandPen\(\)](#)

12.54.4.31 setRubberBandPen()

```
void QwtPicker::setRubberBandPen (
    const QPen & pen )
```

Set the pen for the rubberband

Parameters

<i>pen</i>	Rubber band pen
------------	-----------------

See also

[rubberBandPen\(\)](#), [setRubberBand\(\)](#)

12.54.4.32 setStateMachine()

```
void QwtPicker::setStateMachine (
    QwtPickerMachine * stateMachine )
```

Set a state machine and delete the previous one

Parameters

<i>stateMachine</i>	State machine
---------------------	---------------

See also

[stateMachine\(\)](#)12.54.4.33 `setTrackerFont()`

```
void QwtPicker::setTrackerFont (
    const QFont & font )
```

Set the font for the tracker

Parameters

<i>font</i>	Tracker font
-------------	--------------

See also

[trackerFont\(\)](#), [setTrackerMode\(\)](#), [setTrackerPen\(\)](#)12.54.4.34 `setTrackerMode()`

```
void QwtPicker::setTrackerMode (
    DisplayMode mode )
```

Set the display mode of the tracker.

A tracker displays information about current position of the cursor as a string. The display mode controls if the tracker has to be displayed whenever the observed widget has focus and cursor (AlwaysOn), never (AlwaysOff), or only when the selection is active (ActiveOnly).

Parameters

<i>mode</i>	Tracker display mode
-------------	----------------------

Warning

In case of AlwaysOn, mouseTracking will be enabled for the observed widget.

See also

[trackerMode\(\)](#), [DisplayMode](#)

12.54.4.35 setTrackerPen()

```
void QwtPicker::setTrackerPen (
    const QPen & pen )
```

Set the pen for the tracker

Parameters

<i>pen</i>	Tracker pen
------------	-------------

See also

[trackerPen\(\)](#), [setTrackerMode\(\)](#), [setTrackerFont\(\)](#)

12.54.4.36 stateMachine() [1/2]

```
const QwtPickerMachine * QwtPicker::stateMachine ( ) const
```

Returns

Assigned state machine

See also

[setStateMachine\(\)](#)

12.54.4.37 stateMachine() [2/2]

```
QwtPickerMachine * QwtPicker::stateMachine ( )
```

Returns

Assigned state machine

See also

[setStateMachine\(\)](#)

12.54.4.38 stretchSelection()

```
void QwtPicker::stretchSelection (
    const QSize & oldSize,
    const QSize & newSize ) [protected], [virtual]
```

Scale the selection by the ratios of oldSize and newSize The [changed\(\)](#) signal is emitted.

Parameters

<i>oldSize</i>	Previous size
<i>newSize</i>	Current size

See also

[ResizeMode](#), [setResizeMode\(\)](#), [resizeMode\(\)](#)

12.54.4.39 trackerFont()

```
QFont QwtPicker::trackerFont ( ) const
```

Returns

Tracker font

See also

[setTrackerFont\(\)](#), [trackerMode\(\)](#), [trackerPen\(\)](#)

12.54.4.40 trackerMode()

```
QwtPicker::DisplayMode QwtPicker::trackerMode ( ) const
```

Returns

Tracker display mode

See also

[setTrackerMode\(\)](#), [DisplayMode](#)

12.54.4.41 trackerOverlay()

```
const QwtWidgetOverlay * QwtPicker::trackerOverlay ( ) const [protected]
```

Returns

Overlay displaying the tracker text

12.54.4.42 `trackerPen()`

```
QPen QwtPicker::trackerPen ( ) const
```

Returns

Tracker pen

See also

[setTrackerPen\(\)](#), [trackerMode\(\)](#), [trackerFont\(\)](#)

12.54.4.43 `trackerPosition()`

```
QPoint QwtPicker::trackerPosition ( ) const
```

Returns

Current position of the tracker

12.54.4.44 `trackerRect()`

```
QRect QwtPicker::trackerRect (
    const QFont & font ) const [virtual]
```

Calculate the bounding rectangle for the tracker text from the current position of the tracker

Parameters

<i>font</i>	Font of the tracker text
-------------	--------------------------

Returns

Bounding rectangle of the tracker text

See also

[trackerPosition\(\)](#)

12.54.4.45 `trackerText()`

```
QwtText QwtPicker::trackerText (
    const QPoint & pos ) const [virtual]
```

Return the label for a position.

In case of HLineRubberBand the label is the value of the y position, in case of VLineRubberBand the value of the x position. Otherwise the label contains x and y position separated by a ',' .

The format for the string conversion is "%d".

Parameters

<i>pos</i>	Position
------------	----------

Returns

Converted position as string

Reimplemented in [QwtPlotPicker](#).

12.54.4.46 transition()

```
void QwtPicker::transition (
    const QEvent * event ) [protected], [virtual]
```

Passes an event to the state machine and executes the resulting commands. Append and Move commands use the current position of the cursor (`QCursor::pos()`).

Parameters

<i>event</i>	Event
--------------	-------

12.54.4.47 widgetEnterEvent()

```
void QwtPicker::widgetEnterEvent (
    QEvent * event ) [protected], [virtual]
```

Handle a enter event for the observed widget.

Parameters

<i>event</i>	Qt event
--------------	----------

See also

[eventFilter\(\)](#), [widgetMouseEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.54.4.48 widgetKeyPressEvent()

```
void QwtPicker::widgetKeyPressEvent (
    QKeyEvent * keyEvent ) [protected], [virtual]
```

Handle a key press event for the observed widget.

Selections can be completely done by the keyboard. The arrow keys move the cursor, the abort key aborts a selection. All other keys are handled by the current state machine.

Parameters

<i>keyEvent</i>	Key event
-----------------	-----------

See also

[eventFilter\(\)](#), [widgetMouseEvent\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetMouseMoveEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#), [stateMachine\(\)](#), [QwtEventPattern::KeyPatternCode](#)

Reimplemented in [QwtPlotZoomer](#).

12.54.4.49 widgetKeyReleaseEvent()

```
void QwtPicker::widgetKeyReleaseEvent (
    QKeyEvent * keyEvent ) [protected], [virtual]
```

Handle a key release event for the observed widget.

Passes the event to the state machine.

Parameters

<i>keyEvent</i>	Key event
-----------------	-----------

See also

[eventFilter\(\)](#), [widgetMouseEvent\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetMouseMoveEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [stateMachine\(\)](#)

12.54.4.50 widgetLeaveEvent()

```
void QwtPicker::widgetLeaveEvent (
    QEvent * event ) [protected], [virtual]
```

Handle a leave event for the observed widget.

Parameters

<i>event</i>	Qt event
--------------	----------

See also

[eventFilter\(\)](#), [widgetMouseEvent\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.54.4.51 widgetMouseDoubleClickEvent()

```
void QwtPicker::widgetMouseDoubleClickEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle mouse double click event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseMoveEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.54.4.52 widgetMouseMoveEvent()

```
void QwtPicker::widgetMouseMoveEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse move event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.54.4.53 widgetMousePressEvent()

```
void QwtPicker::widgetMousePressEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse press event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetMouseMoveEvent\(\)](#), [widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.54.4.54 widgetMouseEvent()

```
void QwtPicker::widgetMouseEvent (
    QMouseEvent * mouseEvent ) [protected], [virtual]
```

Handle a mouse release event for the observed widget.

Parameters

<i>mouseEvent</i>	Mouse event
-------------------	-------------

See also

[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#), [widgetMouseMoveEvent\(\)](#),
[widgetWheelEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

Reimplemented in [QwtPlotZoomer](#).

12.54.4.55 widgetWheelEvent()

```
void QwtPicker::widgetWheelEvent (
    QWheelEvent * wheelEvent ) [protected], [virtual]
```

Handle a wheel event for the observed widget.

Move the last point of the selection in case of [isActive\(\)](#) == true

Parameters

<i>wheelEvent</i>	Wheel event
-------------------	-------------

See also

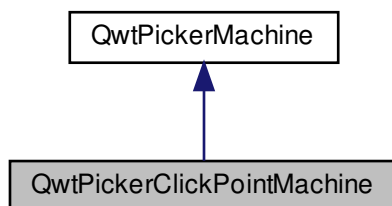
[eventFilter\(\)](#), [widgetMousePressEvent\(\)](#), [widgetMouseReleaseEvent\(\)](#), [widgetMouseDoubleClickEvent\(\)](#),
[widgetMouseMoveEvent\(\)](#), [widgetKeyPressEvent\(\)](#), [widgetKeyReleaseEvent\(\)](#)

12.55 QwtPickerClickPointMachine Class Reference

A state machine for point selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerClickPointMachine:



Public Member Functions

- [QwtPickerClickPointMachine \(\)](#)
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.55.1 Detailed Description

A state machine for point selections.

Pressing [QwtEventPattern::MouseSelect1](#) or [QwtEventPattern::KeySelect1](#) selects a point.

See also

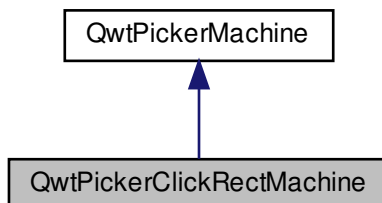
[QwtEventPattern::MousePatternCode](#), [QwtEventPattern::KeyPatternCode](#)

12.56 QwtPickerClickRectMachine Class Reference

A state machine for rectangle selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerClickRectMachine:



Public Member Functions

- [QwtPickerClickRectMachine](#) ()
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.56.1 Detailed Description

A state machine for rectangle selections.

Pressing [QwtEventPattern::MouseSelect1](#) starts the selection, releasing it selects the first point. Pressing it again selects the second point and terminates the selection. Pressing [QwtEventPattern::KeySelect1](#) also starts the selection, a second press selects the first point. A third one selects the second point and terminates the selection.

See also

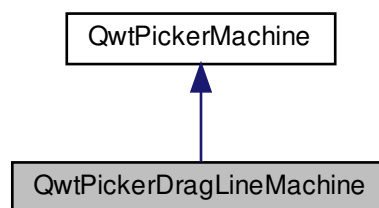
[QwtEventPattern::MousePatternCode](#), [QwtEventPattern::KeyPatternCode](#)

12.57 QwtPickerDragLineMachine Class Reference

A state machine for line selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerDragLineMachine:



Public Member Functions

- [QwtPickerDragLineMachine](#) ()
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.57.1 Detailed Description

A state machine for line selections.

Pressing [QwtEventPattern::MouseSelect1](#) selects the first point, releasing it the second point. Pressing [QwtEventPattern::KeySelect1](#) also selects the first point, a second press selects the second point and terminates the selection.

A common use case of [QwtPickerDragLineMachine](#) are pickers for distance measurements.

See also

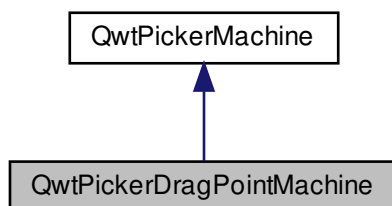
[QwtEventPattern::MousePatternCode](#), [QwtEventPattern::KeyPatternCode](#)

12.58 QwtPickerDragPointMachine Class Reference

A state machine for point selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerDragPointMachine:



Public Member Functions

- [QwtPickerDragPointMachine](#) ()
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.58.1 Detailed Description

A state machine for point selections.

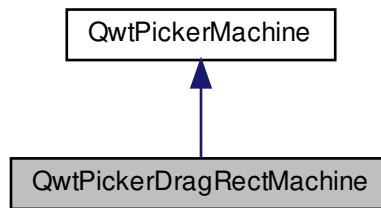
Pressing [QwtEventPattern::MouseSelect1](#) or [QwtEventPattern::KeySelect1](#) starts the selection, releasing [QwtEventPattern::MouseSelect1](#) or a second press of [QwtEventPattern::KeySelect1](#) terminates it.

12.59 QwtPickerDragRectMachine Class Reference

A state machine for rectangle selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerDragRectMachine:



Public Member Functions

- [QwtPickerDragRectMachine](#) ()
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.59.1 Detailed Description

A state machine for rectangle selections.

Pressing [QwtEventPattern::MouseSelect1](#) selects the first point, releasing it the second point. Pressing [QwtEventPattern::KeySelect1](#) also selects the first point, a second press selects the second point and terminates the selection.

See also

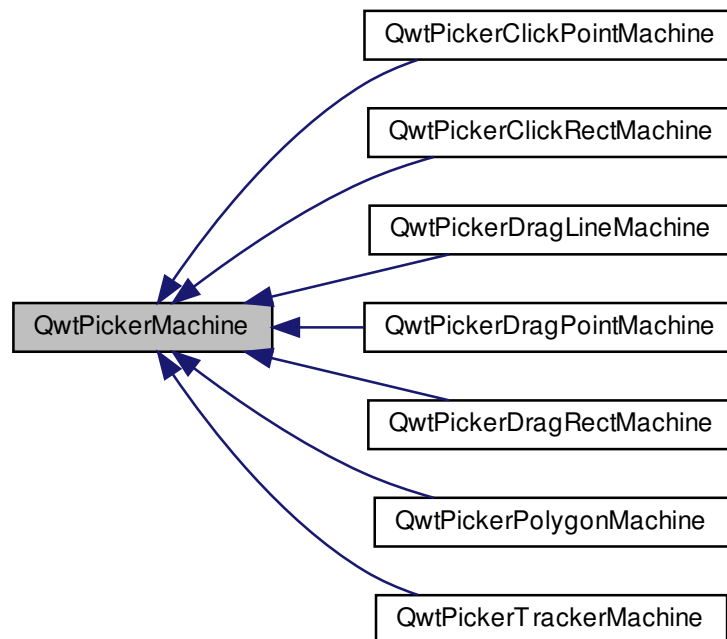
[QwtEventPattern::MousePatternCode](#), [QwtEventPattern::KeyPatternCode](#)

12.60 QwtPickerMachine Class Reference

A state machine for [QwtPicker](#) selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerMachine:



Public Types

- enum [SelectionType](#) { [NoSelection](#) = -1, [PointSelection](#), [RectSelection](#), [PolygonSelection](#) }
- enum [Command](#) {
Begin, **Append**, **Move**, **Remove**,
End }

Commands - the output of a state machine.

Public Member Functions

- [QwtPickerMachine](#) ([SelectionType](#))
Constructor.
- virtual [~QwtPickerMachine](#) ()
Destructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)=0
Transition.
- void [reset](#) ()
Set the current state to 0.

- `int state () const`
Return the current state.
- `void setState (int)`
Change the current state.
- `SelectionType selectionType () const`
Return the selection type.

12.60.1 Detailed Description

A state machine for [QwtPicker](#) selections.

[QwtPickerMachine](#) accepts key and mouse events and translates them into selection commands.

See also

[QwtEventPattern::MousePatternCode](#), [QwtEventPattern::KeyPatternCode](#)

12.60.2 Member Enumeration Documentation

12.60.2.1 SelectionType

```
enum QwtPickerMachine::SelectionType
```

Type of a selection.

See also

[selectionType\(\)](#)

Enumerator

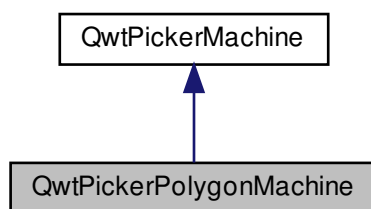
NoSelection	The state machine not usable for any type of selection.
PointSelection	The state machine is for selecting a single point.
RectSelection	The state machine is for selecting a rectangle (2 points).
PolygonSelection	The state machine is for selecting a polygon (many points).

12.61 QwtPickerPolygonMachine Class Reference

A state machine for polygon selections.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerPolygonMachine:



Public Member Functions

- [QwtPickerPolygonMachine](#) ()
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.61.1 Detailed Description

A state machine for polygon selections.

Pressing [QwtEventPattern::MouseSelect1](#) or [QwtEventPattern::KeySelect1](#) starts the selection and selects the first point, or appends a point. Pressing [QwtEventPattern::MouseSelect2](#) or [QwtEventPattern::KeySelect2](#) appends the last point and terminates the selection.

See also

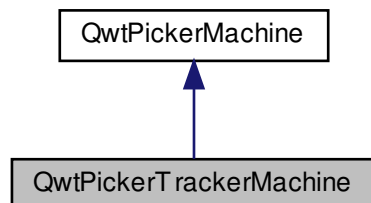
[QwtEventPattern::MousePatternCode](#), [QwtEventPattern::KeyPatternCode](#)

12.62 QwtPickerTrackerMachine Class Reference

A state machine for indicating mouse movements.

```
#include <qwt_picker_machine.h>
```

Inheritance diagram for QwtPickerTrackerMachine:



Public Member Functions

- [QwtPickerTrackerMachine](#) ()
Constructor.
- virtual QList< [Command](#) > [transition](#) (const [QwtEventPattern](#) &, const QEvent *)
Transition.

Additional Inherited Members

12.62.1 Detailed Description

A state machine for indicating mouse movements.

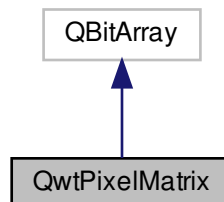
[QwtPickerTrackerMachine](#) supports displaying information corresponding to mouse movements, but is not intended for selecting anything. Begin/End are related to Enter/Leave events.

12.63 QwtPixelMatrix Class Reference

A bit field corresponding to the pixels of a rectangle.

```
#include <qwt_pixel_matrix.h>
```

Inheritance diagram for QwtPixelMatrix:



Public Member Functions

- [QwtPixelMatrix](#) (const QRect &[rect](#))
Constructor.
- [~QwtPixelMatrix](#) ()
Destructor.
- void [setRect](#) (const QRect &[rect](#))
- QRect [rect](#) () const
- bool [testPixel](#) (int x, int y) const
Test if a pixel has been set.
- bool [testAndSetPixel](#) (int x, int y, bool on)
Set a pixel and test if a pixel has been set before.
- int [index](#) (int x, int y) const
Calculate the index in the bit field corresponding to a position.

12.63.1 Detailed Description

A bit field corresponding to the pixels of a rectangle.

[QwtPixelMatrix](#) is intended to filter out duplicates in an unsorted array of points.

12.63.2 Constructor & Destructor Documentation

12.63.2.1 QwtPixelMatrix()

```
QwtPixelMatrix::QwtPixelMatrix (
    const QRect & rect )
```

Constructor.

Parameters

<i>rect</i>	Bounding rectangle for the matrix
-------------	-----------------------------------

12.63.3 Member Function Documentation

12.63.3.1 index()

```
int QwtPixelMatrix::index (
    int x,
    int y ) const [inline]
```

Calculate the index in the bit field corresponding to a position.

Parameters

<i>x</i>	X-coordinate
<i>y</i>	Y-coordinate

Returns

Index, when [rect\(\)](#) contains pos - otherwise -1.

12.63.3.2 rect()

```
QRect QwtPixelMatrix::rect ( ) const
```

Returns

Bounding rectangle

12.63.3.3 setRect()

```
void QwtPixelMatrix::setRect (
    const QRect & rect )
```

Set the bounding rectangle of the matrix

Parameters

<i>rect</i>	Bounding rectangle
-------------	--------------------

Note

All bits are cleared

12.63.3.4 testAndSetPixel()

```
bool QwtPixelMatrix::testAndSetPixel (
    int x,
    int y,
    bool on ) [inline]
```

Set a pixel and test if a pixel has been set before.

Parameters

<i>x</i>	X-coordinate
<i>y</i>	Y-coordinate
<i>on</i>	Set/Clear the pixel

Returns

true, when pos is outside of [rect\(\)](#), or when the pixel was set before.

12.63.3.5 testPixel()

```
bool QwtPixelMatrix::testPixel (
    int x,
    int y ) const [inline]
```

Test if a pixel has been set.

Parameters

<i>x</i>	X-coordinate
<i>y</i>	Y-coordinate

Returns

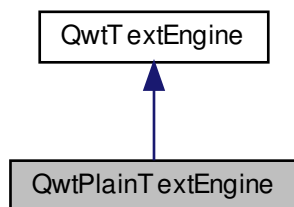
true, when pos is outside of [rect\(\)](#), or when the pixel has already been set.

12.64 QwtPlainTextEngine Class Reference

A text engine for plain texts.

```
#include <qwt_text_engine.h>
```

Inheritance diagram for QwtPlainTextEngine:

**Public Member Functions**

- [QwtPlainTextEngine](#) ()
Constructor.
- virtual [~QwtPlainTextEngine](#) ()
Destructor.
- virtual double [heightForWidth](#) (const QFont &font, int flags, const QString &text, double width) const
- virtual QSizeF [textSize](#) (const QFont &font, int flags, const QString &text) const
- virtual void [draw](#) (QPainter *painter, const QRectF &rect, int flags, const QString &text) const
Draw the text in a clipping rectangle.
- virtual bool [mightRender](#) (const QString &) const
- virtual void [textMargins](#) (const QFont &, const QString &, double &left, double &right, double &top, double &bottom) const

Additional Inherited Members**12.64.1 Detailed Description**

A text engine for plain texts.

[QwtPlainTextEngine](#) renders texts using the basic Qt classes QPainter and QFontMetrics.

12.64.2 Member Function Documentation

12.64.2.1 draw()

```
void QwtPlainTextEngine::draw (
    QPainter * painter,
    const QRectF & rect,
    int flags,
    const QString & text ) const [virtual]
```

Draw the text in a clipping rectangle.

A wrapper for QPainter::drawText.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Clipping rectangle
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText
<i>text</i>	Text to be rendered

Implements [QwtTextEngine](#).

12.64.2.2 heightForWidth()

```
double QwtPlainTextEngine::heightForWidth (
    const QFont & font,
    int flags,
    const QString & text,
    double width ) const [virtual]
```

Find the height for a given width

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText
<i>text</i>	Text to be rendered
<i>width</i>	Width

Returns

Calculated height

Implements [QwtTextEngine](#).

12.64.2.3 mightRender()

```
bool QwtPlainTextEngine::mightRender (
    const QString & ) const [virtual]
```

Test if a string can be rendered by this text engine.

Returns

Always true. All texts can be rendered by [QwtPlainTextEngine](#)

Implements [QwtTextEngine](#).

12.64.2.4 textMargins()

```
void QwtPlainTextEngine::textMargins (
    const QFont & font,
    const QString & ,
    double & left,
    double & right,
    double & top,
    double & bottom ) const [virtual]
```

Return margins around the texts

Parameters

<i>font</i>	Font of the text
<i>left</i>	Return 0
<i>right</i>	Return 0
<i>top</i>	Return value for the top margin
<i>bottom</i>	Return value for the bottom margin

Implements [QwtTextEngine](#).

12.64.2.5 textSize()

```
QSizeF QwtPlainTextEngine::textSize (
    const QFont & font,
    int flags,
    const QString & text ) const [virtual]
```

Returns the size, that is needed to render text

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText
<i>text</i>	Text to be rendered

Returns

Calculated size

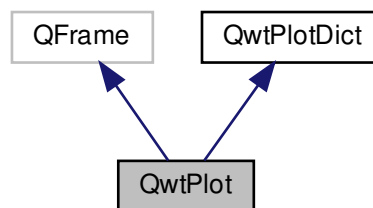
Implements [QwtTextEngine](#).

12.65 QwtPlot Class Reference

A 2-D plotting widget.

```
#include <qwt_plot.h>
```

Inheritance diagram for QwtPlot:

**Public Types**

- enum [Axis](#) {
 [yLeft](#), [yRight](#), [xBottom](#), [xTop](#),
 [axisCnt](#) }
 Axis index.
- enum [LegendPosition](#) { [LeftLegend](#), [RightLegend](#), [BottomLegend](#), [TopLegend](#) }

Public Slots

- virtual void [replot](#) ()
 Redraw the plot.
- void [autoRefresh](#) ()
 Replots the plot if [autoReplot\(\)](#) is true.

Signals

- void [itemAttached](#) ([QwtPlotItem](#) *plotItem, bool on)
- void [legendDataChanged](#) (const QVariant &itemInfo, const QList< [QwtLegendData](#) > &data)

Public Member Functions

- [QwtPlot](#) (QWidget *=[NULL](#))
Constructor.
- [QwtPlot](#) (const [QwtText](#) &[title](#), QWidget *=[NULL](#))
Constructor.
- virtual [~QwtPlot](#) ()
Destructor.
- void [applyProperties](#) (const [QString](#) &)
- [QString](#) [grabProperties](#) () const
- void [setAutoReplot](#) (bool=[true](#))
Set or reset the autoReplot option.
- bool [autoReplot](#) () const
- void [setPlotLayout](#) ([QwtPlotLayout](#) *)
Assign a new plot layout.
- [QwtPlotLayout](#) * [plotLayout](#) ()
- const [QwtPlotLayout](#) * [plotLayout](#) () const
- void [setTitle](#) (const [QString](#) &)
- void [setTitle](#) (const [QwtText](#) &)
- [QwtText](#) [title](#) () const
- [QwtTextLabel](#) * [titleLabel](#) ()
- const [QwtTextLabel](#) * [titleLabel](#) () const
- void [setFooter](#) (const [QString](#) &)
- void [setFooter](#) (const [QwtText](#) &)
- [QwtText](#) [footer](#) () const
- [QwtTextLabel](#) * [footerLabel](#) ()
- const [QwtTextLabel](#) * [footerLabel](#) () const
- void [setCanvas](#) (QWidget *)
Set the drawing canvas of the plot widget.
- QWidget * [canvas](#) ()
- const QWidget * [canvas](#) () const
- void [setCanvasBackground](#) (const [QBrush](#) &)
Change the background of the plotting area.
- [QBrush](#) [canvasBackground](#) () const
- virtual [QwtScaleMap](#) [canvasMap](#) (int axisId) const
- double [invTransform](#) (int axisId, int pos) const
- double [transform](#) (int axisId, double value) const
Transform a value into a coordinate in the plotting region.
- [QwtScaleEngine](#) * [axisScaleEngine](#) (int axisId)
- const [QwtScaleEngine](#) * [axisScaleEngine](#) (int axisId) const
- void [setAxisScaleEngine](#) (int axisId, [QwtScaleEngine](#) *)
- void [setAxisAutoScale](#) (int axisId, bool on=[true](#))
Enable autoscaling for a specified axis.
- bool [axisAutoScale](#) (int axisId) const
- void [enableAxis](#) (int axisId, bool tf=[true](#))
Enable or disable a specified axis.
- bool [axisEnabled](#) (int axisId) const
- void [setAxisFont](#) (int axisId, const [QFont](#) &)
Change the font of an axis.
- [QFont](#) [axisFont](#) (int axisId) const
- void [setAxisScale](#) (int axisId, double min, double max, double stepSize=[0](#))
Disable autoscaling and specify a fixed scale for a selected axis.
- void [setAxisScaleDiv](#) (int axisId, const [QwtScaleDiv](#) &)

- Disable autoscaling and specify a fixed scale for a selected axis.*

 - void [setAxisScaleDraw](#) (int axisId, [QwtScaleDraw](#) *)

Set a scale draw.
- double [axisStepSize](#) (int axisId) const

Return the step size parameter that has been set in [setAxisScale](#).
- [QwtInterval](#) [axisInterval](#) (int axisId) const

Return the current interval of the specified axis.
- const [QwtScaleDiv](#) & [axisScaleDiv](#) (int axisId) const

Return the scale division of a specified axis.
- const [QwtScaleDraw](#) * [axisScaleDraw](#) (int axisId) const

Return the scale draw of a specified axis.
- [QwtScaleDraw](#) * [axisScaleDraw](#) (int axisId)

Return the scale draw of a specified axis.
- const [QwtScaleWidget](#) * [axisWidget](#) (int axisId) const
- [QwtScaleWidget](#) * [axisWidget](#) (int axisId)
- void [setAxisLabelAlignment](#) (int axisId, Qt::Alignment)
- void [setAxisLabelRotation](#) (int axisId, double rotation)
- void [setAxisTitle](#) (int axisId, const QString &)

Change the title of a specified axis.
- void [setAxisTitle](#) (int axisId, const [QwtText](#) &)

Change the title of a specified axis.
- [QwtText](#) [axisTitle](#) (int axisId) const
- void [setAxisMaxMinor](#) (int axisId, int maxMinor)
- int [axisMaxMinor](#) (int axisId) const
- void [setAxisMaxMajor](#) (int axisId, int maxMajor)
- int [axisMaxMajor](#) (int axisId) const
- void [insertLegend](#) ([QwtAbstractLegend](#) *, [LegendPosition](#)=[QwtPlot::RightLegend](#), double ratio=-1.0)

Insert a legend.
- [QwtAbstractLegend](#) * [legend](#) ()
- const [QwtAbstractLegend](#) * [legend](#) () const
- void [updateLegend](#) ()
- void [updateLegend](#) (const [QwtPlotItem](#) *)
- virtual QSize [sizeHint](#) () const
- virtual QSize [minimumSizeHint](#) () const

Return a minimum size hint.
- virtual void [updateLayout](#) ()

Adjust plot content to its current size.
- virtual void [drawCanvas](#) (QPainter *)
- void [updateAxes](#) ()

Rebuild the axes scales.
- void [updateCanvasMargins](#) ()

Update the canvas margins.
- virtual void [getCanvasMarginsHint](#) (const [QwtScaleMap](#) maps[], const QRectF &canvasRect, double &left, double &top, double &right, double &bottom) const

Calculate the canvas margins.
- virtual bool [event](#) (QEvent *)

Adds handling of layout requests.
- virtual bool [eventFilter](#) (QObject *, QEvent *)

Event filter.
- virtual void [drawItems](#) (QPainter *, const QRectF &, const [QwtScaleMap](#) maps[[axisCnt](#)]) const
- virtual QVariant [itemToInfo](#) ([QwtPlotItem](#) *) const

Build an information, that can be used to identify a plot item on the legend.
- virtual [QwtPlotItem](#) * [infoToItem](#) (const QVariant &) const

Identify the plot item according to an item info object, that has been generated from [itemToInfo\(\)](#).

Protected Member Functions

- virtual void [resizeEvent](#) (QResizeEvent *e)

Static Protected Member Functions

- static bool [axisValid](#) (int axisId)

12.65.1 Detailed Description

A 2-D plotting widget.

[QwtPlot](#) is a widget for plotting two-dimensional graphs. An unlimited number of plot items can be displayed on its canvas. Plot items might be curves ([QwtPlotCurve](#)), markers ([QwtPlotMarker](#)), the grid ([QwtPlotGrid](#)), or anything else derived from [QwtPlotItem](#). A plot can have up to four axes, with each plot item attached to an x- and a y axis. The scales at the axes can be explicitly set ([QwtScaleDiv](#)), or are calculated from the plot items, using algorithms ([QwtScaleEngine](#)) which can be configured separately for each axis.

The simpleplot example is a good starting point to see how to set up a plot widget.

Example

The following example shows (schematically) the most simple way to use [QwtPlot](#). By default, only the left and bottom axes are visible and their scales are computed automatically.

```
#include <qwt_plot.h>
#include <qwt_plot_curve.h>

QwtPlot *myPlot = new QwtPlot( "Two Curves", parent );

// add curves
QwtPlotCurve *curve1 = new QwtPlotCurve( "Curve 1" );
QwtPlotCurve *curve2 = new QwtPlotCurve( "Curve 2" );

// connect or copy the data to the curves
curve1->setData( ... );
curve2->setData( ... );

curve1->attach( myPlot );
curve2->attach( myPlot );

// finally, refresh the plot
myPlot->replot();
```

12.65.2 Member Enumeration Documentation

12.65.2.1 Axis

```
enum QwtPlot::Axis
```

Axis index.

Enumerator

yLeft	Y axis left of the canvas.
yRight	Y axis right of the canvas.
xBottom	X axis below the canvas.
xTop	X axis above the canvas.
axisCnt	Number of axes.

12.65.2.2 LegendPosition

```
enum QwtPlot::LegendPosition
```

Position of the legend, relative to the canvas.

See also

```
insertLegend()
```

Enumerator

LeftLegend	The legend will be left from the QwtPlot::yLeft axis.
RightLegend	The legend will be right from the QwtPlot::yRight axis.
BottomLegend	The legend will be below the footer.
TopLegend	The legend will be above the title.

12.65.3 Constructor & Destructor Documentation

12.65.3.1 QwtPlot() [1/2]

```
QwtPlot::QwtPlot (
    QWidget * parent = NULL ) [explicit]
```

Constructor.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.65.3.2 QwtPlot() [2/2]

```
QwtPlot::QwtPlot (
    const QwtText & title,
    QWidget * parent = NULL ) [explicit]
```

Constructor.

Parameters

<i>title</i>	Title text
<i>parent</i>	Parent widget

12.65.4 Member Function Documentation

12.65.4.1 applyProperties()

```
void QwtPlot::applyProperties (
    const QString & )
```

This method is intended for manipulating the plot widget from a specific editor in the Qwt designer plugin.

Warning

The plot editor has never been implemented.

12.65.4.2 autoReplot()

```
bool QwtPlot::autoReplot ( ) const
```

Returns

true if the autoReplot option is set.

See also

[setAutoReplot\(\)](#)

12.65.4.3 axisAutoScale()

```
bool QwtPlot::axisAutoScale (
    int axisId ) const
```

Returns

True, if autoscaling is enabled

Parameters

<i>axisId</i>	Axis index
---------------	------------

12.65.4.4 axisEnabled()

```
bool QwtPlot::axisEnabled (
    int axisId ) const
```

Returns

True, if a specified axis is enabled

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
----------------------------	------------

12.65.4.5 axisFont()

```
QFont QwtPlot::axisFont (
    int axisId ) const
```

Returns

The font of the scale labels for a specified axis

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
----------------------------	------------

12.65.4.6 axisInterval()

```
QwtInterval QwtPlot::axisInterval (
    int axisId ) const
```

Return the current interval of the specified axis.

This is only a convenience function for `axisScaleDiv(axisId)->interval()`;

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
----------------------------	------------

Returns

Scale interval

See also

[QwtScaleDiv](#), [axisScaleDiv\(\)](#)

12.65.4.7 axisMaxMajor()

```
int QwtPlot::axisMaxMajor (
    int axisId ) const
```

Returns

The maximum number of major ticks for a specified axis

Parameters

<i>axisId</i>	Axis index
---------------	------------

See also

[setAxisMaxMajor\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

12.65.4.8 axisMaxMinor()

```
int QwtPlot::axisMaxMinor (
    int axisId ) const
```

Returns

the maximum number of minor ticks for a specified axis

Parameters

<i>axisId</i>	Axis index
---------------	------------

See also

[setAxisMaxMinor\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

12.65.4.9 axisScaleDiv()

```
const QwtScaleDiv & QwtPlot::axisScaleDiv (
    int axisId ) const
```

Return the scale division of a specified axis.

`axisScaleDiv(axisId).lowerBound()`, `axisScaleDiv(axisId).upperBound()` are the current limits of the axis scale.

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
----------------------------	------------

Returns

Scale division

See also

[QwtScaleDiv](#), [setAxisScaleDiv\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

12.65.4.10 `axisScaleDraw()` [1/2]

```
const QwtScaleDraw * QwtPlot::axisScaleDraw (
    int axisId ) const
```

Return the scale draw of a specified axis.

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
----------------------------	------------

Returns

Specified `scaleDraw` for axis, or NULL if axis is invalid.

12.65.4.11 `axisScaleDraw()` [2/2]

```
QwtScaleDraw * QwtPlot::axisScaleDraw (
    int axisId )
```

Return the scale draw of a specified axis.

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
----------------------------	------------

Returns

Specified `scaleDraw` for axis, or NULL if axis is invalid.

12.65.4.12 axisScaleEngine() [1/2]

```
QwtScaleEngine * QwtPlot::axisScaleEngine (
    int axisId )
```

Parameters

<i>axisId</i>	Axis index
---------------	------------

Returns

Scale engine for a specific axis

12.65.4.13 axisScaleEngine() [2/2]

```
const QwtScaleEngine * QwtPlot::axisScaleEngine (
    int axisId ) const
```

Parameters

<i>axisId</i>	Axis index
---------------	------------

Returns

Scale engine for a specific axis

12.65.4.14 axisStepSize()

```
double QwtPlot::axisStepSize (
    int axisId ) const
```

Return the step size parameter that has been set in setAxisScale.

This doesn't need to be the step size of the current scale.

Parameters

<i>axisId</i>	Axis index
---------------	------------

Returns

step size parameter value

See also

[setAxisScale\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

12.65.4.15 axisTitle()

```
QwtText QwtPlot::axisTitle (
    int axisId ) const
```

Returns

Title of a specified axis

Parameters

<i>axisId</i>	Axis index
---------------	------------

12.65.4.16 axisValid()

```
bool QwtPlot::axisValid (
    int axisId ) [static], [protected]
```

Returns

true if the specified axis exists, otherwise false

Parameters

<i>axisId</i>	axis index
---------------	------------

12.65.4.17 axisWidget() [1/2]

```
const QwtScaleWidget * QwtPlot::axisWidget (
    int axisId ) const
```

Returns

Scale widget of the specified axis, or NULL if axisId is invalid.

Parameters

<i>axisId</i>	Axis index
---------------	------------

12.65.4.18 axisWidget() [2/2]

```
QwtScaleWidget * QwtPlot::axisWidget (
    int axisId )
```

Returns

Scale widget of the specified axis, or NULL if axisId is invalid.

Parameters

<i>axisId</i>	Axis index
---------------	------------

12.65.4.19 canvas() [1/2]

```
QWidget * QwtPlot::canvas ( )
```

Returns

the plot's canvas

12.65.4.20 canvas() [2/2]

```
const QWidget * QwtPlot::canvas ( ) const
```

Returns

the plot's canvas

12.65.4.21 canvasBackground()

```
QBrush QwtPlot::canvasBackground ( ) const
```

Nothing else than: [canvas\(\)](#)->palette().brush(QPalette::Normal, QPalette::Window);

Returns

Background brush of the plotting area.

See also

[setCanvasBackground\(\)](#)

12.65.4.22 canvasMap()

```
QwtScaleMap QwtPlot::canvasMap (
    int axisId ) const [virtual]
```

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis
----------------------------	------

Returns

Map for the axis on the canvas. With this map pixel coordinates can translated to plot coordinates and vice versa.

See also

[QwtScaleMap](#), [transform\(\)](#), [invTransform\(\)](#)

12.65.4.23 drawCanvas()

```
void QwtPlot::drawCanvas (
    QPainter * painter ) [virtual]
```

Redraw the canvas.

Parameters

<i>painter</i>	Painter used for drawing
----------------	--------------------------

Warning

`drawCanvas` calls `drawItems` what is also used for printing. Applications that like to add individual plot items better overload [drawItems\(\)](#)

See also

[drawItems\(\)](#)

12.65.4.24 drawItems()

```
void QwtPlot::drawItems (
    QPainter * painter,
    const QRectF & canvasRect,
    const QwtScaleMap maps[axisCnt] ) const [virtual]
```

Redraw the canvas items.

Parameters

<i>painter</i>	Painter used for drawing
<i>canvasRect</i>	Bounding rectangle where to paint
<i>maps</i>	QwtPlot::axisCnt maps, mapping between plot and paint device coordinates

Note

Usually `canvasRect` is `contentsRect()` of the plot canvas. Due to a bug in Qt this rectangle might be wrong for certain frame styles (f.e `QFrame::Box`) and it might be necessary to fix the margins manually using `QWidget::setContentsMargins()`

12.65.4.25 enableAxis()

```
void QwtPlot::enableAxis (
    int axisId,
    bool tf = true )
```

Enable or disable a specified axis.

When an axis is disabled, this only means that it is not visible on the screen. Curves, markers and can be attached to disabled axes, and transformation of screen coordinates into values works as normal.

Only `xBottom` and `yLeft` are enabled by default.

Parameters

<i>axisId</i>	Axis index
<i>tf</i>	true (enabled) or false (disabled)

12.65.4.26 event()

```
bool QwtPlot::event (
    QEvent * event ) [virtual]
```

Adds handling of layout requests.

Parameters

<i>event</i>	Event
--------------	-------

Returns

See `QFrame::event()`

12.65.4.27 eventFilter()

```
bool QwtPlot::eventFilter (
    QObject * object,
    QEvent * event ) [virtual]
```

Event filter.

The plot handles the following events for the canvas:

- `QEvent::Resize` The canvas margins might depend on its size
- `QEvent::ContentsRectChange` The layout needs to be recalculated

Parameters

<i>object</i>	Object to be filtered
<i>event</i>	Event

Returns

See `QFrame::eventFilter()`

See also

[updateCanvasMargins\(\)](#), [updateLayout\(\)](#)

12.65.4.28 footer()

```
QwtText QwtPlot::footer ( ) const
```

Returns

Text of the footer

12.65.4.29 footerLabel() [1/2]

```
QwtTextLabel * QwtPlot::footerLabel ( )
```

Returns

Footer label widget.

12.65.4.30 footerLabel() [2/2]

```
const QwtTextLabel * QwtPlot::footerLabel ( ) const
```

Returns

Footer label widget.

12.65.4.31 getCanvasMarginsHint()

```
void QwtPlot::getCanvasMarginsHint (
    const QwtScaleMap maps[],
    const QRectF & canvasRect,
    double & left,
    double & top,
    double & right,
    double & bottom ) const [virtual]
```

Calculate the canvas margins.

Parameters

<i>maps</i>	QwtPlot::axisCnt maps, mapping between plot and paint device coordinates
<i>canvasRect</i>	Bounding rectangle where to paint
<i>left</i>	Return parameter for the left margin
<i>top</i>	Return parameter for the top margin
<i>right</i>	Return parameter for the right margin
<i>bottom</i>	Return parameter for the bottom margin

Plot items might indicate, that they need some extra space at the borders of the canvas by the [QwtPlotItem::Margins](#) flag.

[updateCanvasMargins\(\)](#), [QwtPlotItem::getCanvasMarginHint\(\)](#)

12.65.4.32 `grabProperties()`

```
QString QwtPlot::grabProperties ( ) const
```

This method is intended for manipulating the plot widget from a specific editor in the Qwt designer plugin.

Returns

QString()

Warning

The plot editor has never been implemented.

12.65.4.33 `infoToItem()`

```
QwtPlotItem * QwtPlot::infoToItem (
    const QVariant & itemInfo ) const [virtual]
```

Identify the plot item according to an item info object, that has been generated from [itemToInfo\(\)](#).

The default implementation simply tries to unwrap a [QwtPlotItem](#) pointer:

```
if ( itemInfo.canConvert<QwtPlotItem *>() )
    return qvariant_cast<QwtPlotItem *>( itemInfo );
```

Parameters

<i>itemInfo</i>	Plot item
-----------------	-----------

Returns

A plot item, when successful, otherwise a NULL pointer.

See also

[itemToInfo\(\)](#)

12.65.4.34 insertLegend()

```
void QwtPlot::insertLegend (
    QwtAbstractLegend * legend,
    QwtPlot::LegendPosition pos = QwtPlot::RightLegend,
    double ratio = -1.0 )
```

Insert a legend.

If the position legend is [QwtPlot::LeftLegend](#) or [QwtPlot::RightLegend](#) the legend will be organized in one column from top to down. Otherwise the legend items will be placed in a table with a best fit number of columns from left to right.

[insertLegend\(\)](#) will set the plot widget as parent for the legend. The legend will be deleted in the destructor of the plot or when another legend is inserted.

Legends, that are not inserted into the layout of the plot widget need to connect to the [legendDataChanged\(\)](#) signal. Calling [updateLegend\(\)](#) initiates this signal for an initial update. When the application code wants to implement its own layout this also needs to be done for rendering plots to a document (see [QwtPlotRenderer](#)).

Parameters

<i>legend</i>	Legend
<i>pos</i>	The legend's position. For top/left position the number of columns will be limited to 1, otherwise it will be set to unlimited.
<i>ratio</i>	Ratio between legend and the bounding rectangle of title, canvas and axes. The legend will be shrunk if it would need more space than the given ratio. The ratio is limited to]0.0 .. 1.0]. In case of ≤ 0.0 it will be reset to the default ratio. The default vertical/horizontal ratio is 0.33/0.5.

See also

[legend\(\)](#), [QwtPlotLayout::legendPosition\(\)](#), [QwtPlotLayout::setLegendPosition\(\)](#)

12.65.4.35 invTransform()

```
double QwtPlot::invTransform (
    int axisId,
    int pos ) const
```

Transform the x or y coordinate of a position in the drawing region into a value.

Parameters

<i>axisId</i>	Axis index
<i>pos</i>	position

Returns

Position as axis coordinate

Warning

The position can be an x or a y coordinate, depending on the specified axis.

12.65.4.36 itemAttached

```
void QwtPlot::itemAttached (
    QwtPlotItem * plotItem,
    bool on ) [signal]
```

A signal indicating, that an item has been attached/detached

Parameters

<i>plotItem</i>	Plot item
<i>on</i>	Attached/Detached

12.65.4.37 itemToInfo()

```
QVariant QwtPlot::itemToInfo (
    QwtPlotItem * plotItem ) const [virtual]
```

Build an information, that can be used to identify a plot item on the legend.

The default implementation simply wraps the plot item into a QVariant object. When overloading [itemToInfo\(\)](#) usually [infoToItem\(\)](#) needs to reimplemented too.

```
QVariant itemInfo;
qVariantSetValue( itemInfo, plotItem );
```

Parameters

<i>plotItem</i>	Plot item
-----------------	-----------

Returns

Plot item embedded in a QVariant

See also

[infoToItem\(\)](#)

12.65.4.38 legend() [1/2]

```
QwtAbstractLegend * QwtPlot::legend ( )
```

Returns

the plot's legend

See also

[insertLegend\(\)](#)

12.65.4.39 legend() [2/2]

```
const QwtAbstractLegend * QwtPlot::legend ( ) const
```

Returns

the plot's legend

See also

[insertLegend\(\)](#)

12.65.4.40 legendDataChanged

```
void QwtPlot::legendDataChanged (
    const QVariant & itemInfo,
    const QList< QwtLegendData > & data ) [signal]
```

A signal with the attributes how to update the legend entries for a plot item.

Parameters

<i>itemInfo</i>	Info about a plot item, build from itemToInfo()
<i>data</i>	Attributes of the entries (usually ≤ 1) for the plot item.

See also

[itemToInfo\(\)](#), [infoToItem\(\)](#), [QwtAbstractLegend::updateLegend\(\)](#)

12.65.4.41 plotLayout() [1/2]

```
QwtPlotLayout * QwtPlot::plotLayout ( )
```

Returns

the plot's layout

12.65.4.42 plotLayout() [2/2]

```
const QwtPlotLayout * QwtPlot::plotLayout ( ) const
```

Returns

the plot's layout

12.65.4.43 replot

```
void QwtPlot::replot ( ) [virtual], [slot]
```

Redraw the plot.

If the `autoReplot` option is not set (which is the default) or if any curves are attached to raw data, the plot has to be refreshed explicitly in order to make changes visible.

See also

[updateAxes\(\)](#), [setAutoReplot\(\)](#)

12.65.4.44 resizeEvent()

```
void QwtPlot::resizeEvent (
    QResizeEvent * e ) [protected], [virtual]
```

Resize and update internal layout

Parameters

<i>e</i>	Resize event
----------	--------------

12.65.4.45 setAutoReplot()

```
void QwtPlot::setAutoReplot (
    bool tf = true )
```

Set or reset the `autoReplot` option.

If the `autoReplot` option is set, the plot will be updated implicitly by manipulating member functions. Since this may be time-consuming, it is recommended to leave this option switched off and call [replot\(\)](#) explicitly if necessary.

The `autoReplot` option is set to false by default, which means that the user has to call [replot\(\)](#) in order to make changes visible.

Parameters

<i>tf</i>	true or false. Defaults to true.
-----------	----------------------------------

See also

[replot\(\)](#)

12.65.4.46 setAxisAutoScale()

```
void QwtPlot::setAxisAutoScale (
    int axisId,
    bool on = true )
```

Enable autoscaling for a specified axis.

This member function is used to switch back to autoscaling mode after a fixed scale has been set. Autoscaling is enabled by default.

Parameters

<i>axisId</i>	Axis index
<i>on</i>	On/Off

See also

[setAxisScale\(\)](#), [setAxisScaleDiv\(\)](#), [updateAxes\(\)](#)

Note

The autoscaling flag has no effect until [updateAxes\(\)](#) is executed (called by [replot\(\)](#)).

12.65.4.47 setAxisFont()

```
void QwtPlot::setAxisFont (
    int axisId,
    const QFont & font )
```

Change the font of an axis.

Parameters

<i>axisId</i>	Axis index
<i>font</i>	Font

Warning

This function changes the font of the tick labels, not of the axis title.

12.65.4.48 setAxisLabelAlignment()

```
void QwtPlot::setAxisLabelAlignment (
    int axisId,
    Qt::Alignment alignment )
```

Change the alignment of the tick labels

Parameters

<i>axisId</i>	Axis index
<i>alignment</i>	Or'd Qt::AlignmentFlags see <qnamespace.h>

See also

[QwtScaleDraw::setLabelAlignment\(\)](#)

12.65.4.49 setAxisLabelRotation()

```
void QwtPlot::setAxisLabelRotation (
    int axisId,
    double rotation )
```

Rotate all tick labels

Parameters

<i>axisId</i>	Axis index
<i>rotation</i>	Angle in degrees. When changing the label rotation, the label alignment might be adjusted too.

See also

[QwtScaleDraw::setLabelRotation\(\)](#), [setAxisLabelAlignment\(\)](#)

12.65.4.50 setAxisMaxMajor()

```
void QwtPlot::setAxisMaxMajor (
    int axisId,
    int maxMajor )
```

Set the maximum number of major scale intervals for a specified axis

Parameters

<i>axisId</i>	Axis index
<i>maxMajor</i>	Maximum number of major steps

See also

[axisMaxMajor\(\)](#)

12.65.4.51 setAxisMaxMinor()

```
void QwtPlot::setAxisMaxMinor (
    int axisId,
    int maxMinor )
```

Set the maximum number of minor scale intervals for a specified axis

Parameters

<i>axisId</i>	Axis index
<i>maxMinor</i>	Maximum number of minor steps

See also

[axisMaxMinor\(\)](#)

12.65.4.52 setAxisScale()

```
void QwtPlot::setAxisScale (
    int axisId,
    double min,
    double max,
    double stepSize = 0 )
```

Disable autoscaling and specify a fixed scale for a selected axis.

In [updateAxes\(\)](#) the scale engine calculates a scale division from the specified parameters, that will be assigned to the scale widget. So updates of the scale widget usually happen delayed with the next replot.

Parameters

<i>axisId</i>	Axis index
<i>min</i>	Minimum of the scale
<i>max</i>	Maximum of the scale
<i>stepSize</i>	Major step size. If <code>step == 0</code> , the step size is calculated automatically using the <code>maxMajor</code> setting.

See also

[setAxisMaxMajor\(\)](#), [setAxisAutoScale\(\)](#), [axisStepSize\(\)](#), [QwtScaleEngine::divideScale\(\)](#)

12.65.4.53 **setAxisScaleDiv()**

```
void QwtPlot::setAxisScaleDiv (
    int axisId,
    const QwtScaleDiv & scaleDiv )
```

Disable autoscaling and specify a fixed scale for a selected axis.

The scale division will be stored locally only until the next call of [updateAxes\(\)](#). So updates of the scale widget usually happen delayed with the next replot.

Parameters

<i>axisId</i>	Axis index
<i>scaleDiv</i>	Scale division

See also

[setAxisScale\(\)](#), [setAxisAutoScale\(\)](#)

12.65.4.54 **setAxisScaleDraw()**

```
void QwtPlot::setAxisScaleDraw (
    int axisId,
    QwtScaleDraw * scaleDraw )
```

Set a scale draw.

Parameters

<i>axisId</i>	Axis index
<i>scaleDraw</i>	Object responsible for drawing scales.

By passing `scaleDraw` it is possible to extend [QwtScaleDraw](#) functionality and let it take place in [QwtPlot](#). Please note that `scaleDraw` has to be created with `new` and will be deleted by the corresponding `QwtScale` member (like a child object).

See also

[QwtScaleDraw](#), [QwtScaleWidget](#)

Warning

The attributes of `scaleDraw` will be overwritten by those of the previous [QwtScaleDraw](#).

12.65.4.55 `setAxisScaleEngine()`

```
void QwtPlot::setAxisScaleEngine (
    int axisId,
    QwtScaleEngine * scaleEngine )
```

Change the scale engine for an axis

Parameters

<i>axisId</i>	Axis index
<i>scaleEngine</i>	Scale engine

See also

[axisScaleEngine\(\)](#)

12.65.4.56 `setAxisTitle()` [1/2]

```
void QwtPlot::setAxisTitle (
    int axisId,
    const QString & title )
```

Change the title of a specified axis.

Parameters

<i>axisId</i>	Axis index
<i>title</i>	axis title

12.65.4.57 `setAxisTitle()` [2/2]

```
void QwtPlot::setAxisTitle (
    int axisId,
    const QwtText & title )
```

Change the title of a specified axis.

Parameters

<i>axis</i> ↔ <i>Id</i>	Axis index
<i>title</i>	Axis title

12.65.4.58 `setCanvas()`

```
void QwtPlot::setCanvas (
    QWidget * canvas )
```

Set the drawing canvas of the plot widget.

[QwtPlot](#) invokes methods of the canvas as meta methods (see [QMetaObject](#)). In opposite to using conventional C++ techniques like virtual methods they allow to use canvas implementations that are derived from [QWidget](#) or [QGLWidget](#).

The following meta methods could be implemented:

- [replot\(\)](#) When the canvas doesn't offer a replot method, [QwtPlot](#) calls [update\(\)](#) instead.
- [borderPath\(\)](#) The border path is necessary to clip the content of the canvas When the canvas doesn't have any special border (f.e rounded corners) it is o.k. not to implement this method.

The default canvas is a [QwtPlotCanvas](#)

Parameters

<i>canvas</i>	Canvas Widget
---------------	---------------

See also

[canvas\(\)](#)

12.65.4.59 `setCanvasBackground()`

```
void QwtPlot::setCanvasBackground (
    const QBrush & brush )
```

Change the background of the plotting area.

Sets brush to [QPalette::Window](#) of all color groups of the palette of the canvas. Using [canvas\(\)->setPalette\(\)](#) is a more powerful way to set these colors.

Parameters

<i>brush</i>	New background brush
--------------	----------------------

See also

[canvasBackground\(\)](#)

12.65.4.60 setFooter() [1/2]

```
void QwtPlot::setFooter (
    const QString & text )
```

Change the text the footer

Parameters

<i>text</i>	New text of the footer
-------------	------------------------

12.65.4.61 setFooter() [2/2]

```
void QwtPlot::setFooter (
    const QwtText & text )
```

Change the text the footer

Parameters

<i>text</i>	New text of the footer
-------------	------------------------

12.65.4.62 setPlotLayout()

```
void QwtPlot::setPlotLayout (
    QwtPlotLayout * layout )
```

Assign a new plot layout.

Parameters

<i>layout</i>	Layout()
---------------	----------

See also

[plotLayout\(\)](#)

12.65.4.63 setTitle() [1/2]

```
void QwtPlot::setTitle (
    const QString & title )
```

Change the plot's title

Parameters

<i>title</i>	New title
--------------	-----------

12.65.4.64 setTitle() [2/2]

```
void QwtPlot::setTitle (
    const QwtText & title )
```

Change the plot's title

Parameters

<i>title</i>	New title
--------------	-----------

12.65.4.65 sizeHint()

```
QSize QwtPlot::sizeHint ( ) const [virtual]
```

Returns

Size hint for the plot widget

See also

[minimumSizeHint\(\)](#)

12.65.4.66 title()

```
QwtText QwtPlot::title ( ) const
```

Returns

Title of the plot

12.65.4.67 `titleLabel()` [1/2]

```
QwtTextLabel * QwtPlot::titleLabel ( )
```

Returns

Title label widget.

12.65.4.68 `titleLabel()` [2/2]

```
const QwtTextLabel * QwtPlot::titleLabel ( ) const
```

Returns

Title label widget.

12.65.4.69 `transform()`

```
double QwtPlot::transform (
    int axisId,
    double value ) const
```

Transform a value into a coordinate in the plotting region.

Parameters

<i>axisId</i>	Axis index
<i>value</i>	value

Returns

X or Y coordinate in the plotting region corresponding to the value.

12.65.4.70 `updateAxes()`

```
void QwtPlot::updateAxes ( )
```

Rebuild the axes scales.

In case of autoscaling the boundaries of a scale are calculated from the bounding rectangles of all plot items, having the `QwtPlotItem::AutoScale` flag enabled (`QwtScaleEngine::autoScale()`). Then a scale division is calculated (`QwtScaleEngine::divideScale()`) and assigned to scale widget.

When the scale boundaries have been assigned with `setAxisScale()` a scale division is calculated (`QwtScaleEngine::divideScale()`) for this interval and assigned to the scale widget.

When the scale has been set explicitly by [setAxisScaleDiv\(\)](#) the locally stored scale division gets assigned to the scale widget.

The scale widget indicates modifications by emitting a [QwtScaleWidget::scaleDivChanged\(\)](#) signal.

[updateAxes\(\)](#) is usually called by [replot\(\)](#).

See also

[setAxisAutoScale\(\)](#), [setAxisScale\(\)](#), [setAxisScaleDiv\(\)](#), [replot\(\)](#) [QwtPlotItem::boundingRect\(\)](#)

12.65.4.71 [updateCanvasMargins\(\)](#)

```
void QwtPlot::updateCanvasMargins ( )
```

Update the canvas margins.

Plot items might indicate, that they need some extra space at the borders of the canvas by the [QwtPlotItem::Margins](#) flag.

[getCanvasMarginsHint\(\)](#), [QwtPlotItem::getCanvasMarginHint\(\)](#)

12.65.4.72 [updateLayout\(\)](#)

```
void QwtPlot::updateLayout ( ) [virtual]
```

Adjust plot content to its current size.

See also

[resizeEvent\(\)](#)

12.65.4.73 [updateLegend\(\)](#) [1/2]

```
void QwtPlot::updateLegend ( )
```

Emit [legendDataChanged\(\)](#) for all plot item

See also

[QwtPlotItem::legendData\(\)](#), [legendDataChanged\(\)](#)

12.65.4.74 [updateLegend\(\)](#) [2/2]

```
void QwtPlot::updateLegend (
    const QwtPlotItem * plotItem )
```

Emit [legendDataChanged\(\)](#) for a plot item

Parameters

<i>plotItem</i>	Plot item
-----------------	-----------

See also

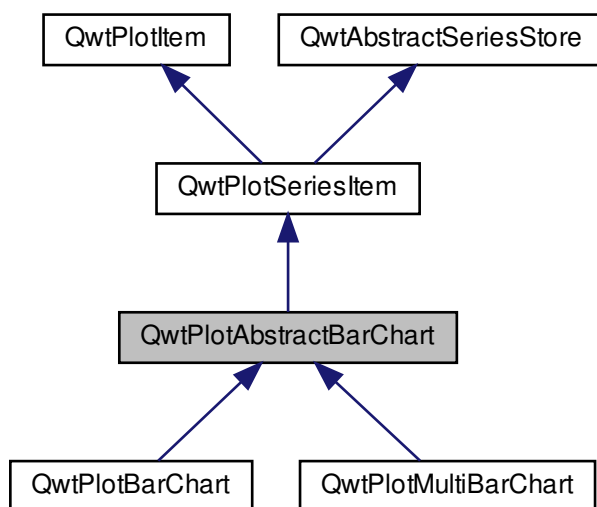
[QwtPlotItem::legendData\(\)](#), [legendDataChanged\(\)](#)

12.66 QwtPlotAbstractBarChart Class Reference

Abstract base class for bar chart items.

```
#include <qwt_plot_abstract_barchart.h>
```

Inheritance diagram for QwtPlotAbstractBarChart:



Public Types

- enum [LayoutPolicy](#) { [AutoAdjustSamples](#), [ScaleSamplesToAxes](#), [ScaleSampleToCanvas](#), [FixedSampleSize](#) }
- Mode how to calculate the bar width.*

Public Member Functions

- [QwtPlotAbstractBarChart](#) (const [QwtText](#) &title)
- virtual [~QwtPlotAbstractBarChart](#) ()
- Destructor.*
- void [setLayoutPolicy](#) ([LayoutPolicy](#))
- [LayoutPolicy](#) [layoutPolicy](#) () const
- void [setLayoutHint](#) (double)
- double [layoutHint](#) () const
- void [setSpacing](#) (int)
- Set the spacing.*
- int [spacing](#) () const
- void [setMargin](#) (int)
- Set the margin.*
- int [margin](#) () const
- void [setBaseline](#) (double)
- Set the baseline.*
- double [baseline](#) () const
- virtual void [getCanvasMarginHint](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, double &left, double &top, double &right, double &bottom) const
- Calculate a hint for the canvas margin.*

Protected Member Functions

- double [sampleWidth](#) (const [QwtScaleMap](#) &map, double canvasSize, double boundingSize, double value) const

12.66.1 Detailed Description

Abstract base class for bar chart items.

In opposite to almost all other plot items bar charts can't be displayed inside of their bounding rectangle and need a special API how to calculate the width of the bars and how they affect the layout of the attached plot.

12.66.2 Member Enumeration Documentation

12.66.2.1 LayoutPolicy

```
enum QwtPlotAbstractBarChart::LayoutPolicy
```

Mode how to calculate the bar width.

[setLayoutPolicy\(\)](#), [setLayoutHint\(\)](#), [barWidthHint\(\)](#)

Enumerator

AutoAdjustSamples	The sample width is calculated by dividing the bounding rectangle by the number of samples. The layoutHint() is used as a minimum width in paint device coordinates. See also boundingRectangle()
ScaleSamplesToAxes	layoutHint() defines an interval in axis coordinates
ScaleSampleToCanvas	The bar width is calculated by multiplying layoutHint() with the height or width of the canvas. See also boundingRectangle()
FixedSampleSize	layoutHint() defines a fixed width in paint device coordinates.

12.66.3 Constructor & Destructor Documentation

12.66.3.1 QwtPlotAbstractBarChart()

```
QwtPlotAbstractBarChart::QwtPlotAbstractBarChart (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the chart
--------------	--------------------

12.66.4 Member Function Documentation

12.66.4.1 baseline()

```
double QwtPlotAbstractBarChart::baseline ( ) const
```

Returns

Value for the origin of the bar chart

See also

[setBaseline\(\)](#), [QwtPlotSeriesItem::orientation\(\)](#)

12.66.4.2 getCanvasMarginHint()

```
void QwtPlotAbstractBarChart::getCanvasMarginHint (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    double & left,
    double & top,
    double & right,
    double & bottom ) const [virtual]
```

Calculate a hint for the canvas margin.

Bar charts need to reserve some space for displaying the bars for the first and the last sample. The hint is calculated from the [layoutHint\(\)](#) depending on the [layoutPolicy\(\)](#).

The margins are in target device coordinates (pixels on screen)

Parameters

<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates
<i>left</i>	Returns the left margin
<i>top</i>	Returns the top margin
<i>right</i>	Returns the right margin
<i>bottom</i>	Returns the bottom margin

Returns

Margin

See also

[layoutPolicy\(\)](#), [layoutHint\(\)](#), [QwtPlotItem::Margins](#) [QwtPlot::getCanvasMarginsHint\(\)](#), [QwtPlot::updateCanvasMargins\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.66.4.3 layoutHint()

```
double QwtPlotAbstractBarChart::layoutHint ( ) const
```

The combination of [layoutPolicy\(\)](#) and [layoutHint\(\)](#) define how the width of the bars is calculated

Returns

Layout policy of the chart item

See also

[LayoutPolicy](#), [setLayoutHint\(\)](#), [layoutPolicy\(\)](#)

12.66.4.4 `layoutPolicy()`

```
QwtPlotAbstractBarChart::LayoutPolicy QwtPlotAbstractBarChart::layoutPolicy ( ) const
```

The combination of `layoutPolicy()` and `layoutHint()` define how the width of the bars is calculated

Returns

Layout policy of the chart item

See also

[setLayoutPolicy\(\)](#), [layoutHint\(\)](#)

12.66.4.5 `margin()`

```
int QwtPlotAbstractBarChart::margin ( ) const
```

Returns

Margin between the outmost bars and the `contentsRect()` of the canvas.

See also

[setMargin\(\)](#), [spacing\(\)](#)

12.66.4.6 `sampleWidth()`

```
double QwtPlotAbstractBarChart::sampleWidth (
    const QwtScaleMap & map,
    double canvasSize,
    double boundingSize,
    double value ) const [protected]
```

Calculate the width for a sample in paint device coordinates

Parameters

<i>map</i>	Scale map for the corresponding scale
<i>canvasSize</i>	Size of the canvas in paint device coordinates
<i>boundingSize</i>	Bounding size of the chart in plot coordinates (used in <code>AutoAdjustSamples</code> mode)
<i>value</i>	Value of the sample

Returns

Sample width

See also

[layoutPolicy\(\)](#), [layoutHint\(\)](#)

12.66.4.7 `setBaseline()`

```
void QwtPlotAbstractBarChart::setBaseline (
    double value )
```

Set the baseline.

The baseline is the origin for the chart. Each bar is painted from the baseline in the direction of the sample value. In case of a horizontal [orientation\(\)](#) the baseline is interpreted as x - otherwise as y - value.

The default value for the baseline is 0.

Parameters

<i>value</i>	Value for the baseline
--------------	------------------------

See also

[baseline\(\)](#), [QwtPlotSeriesItem::orientation\(\)](#)

12.66.4.8 `setLayoutHint()`

```
void QwtPlotAbstractBarChart::setLayoutHint (
    double hint )
```

The combination of [layoutPolicy\(\)](#) and [layoutHint\(\)](#) define how the width of the bars is calculated

Parameters

<i>hint</i>	Layout hint
-------------	-------------

See also

[LayoutPolicy](#), [layoutPolicy\(\)](#), [layoutHint\(\)](#)

12.66.4.9 `setLayoutPolicy()`

```
void QwtPlotAbstractBarChart::setLayoutPolicy (
    LayoutPolicy policy )
```

The combination of [layoutPolicy\(\)](#) and [layoutHint\(\)](#) define how the width of the bars is calculated

Parameters

<i>policy</i>	Layout policy
---------------	---------------

See also

[layoutPolicy\(\)](#), [layoutHint\(\)](#)

12.66.4.10 setMargin()

```
void QwtPlotAbstractBarChart::setMargin (
    int margin )
```

Set the margin.

The margin is the distance between the outmost bars and the contentsRect() of the canvas. The default setting is 5 pixels.

Parameters

<i>margin</i>	Margin
---------------	--------

See also

[spacing\(\)](#), [margin\(\)](#)

12.66.4.11 setSpacing()

```
void QwtPlotAbstractBarChart::setSpacing (
    int spacing )
```

Set the spacing.

The spacing is the distance between 2 samples (bars for [QwtPlotBarChart](#) or a group of bars for [QwtPlotMultiBarChart](#)) in paint device coordinates.

See also

[spacing\(\)](#)

12.66.4.12 spacing()

```
int QwtPlotAbstractBarChart::spacing ( ) const
```

Returns

Spacing between 2 samples (bars or groups of bars)

See also

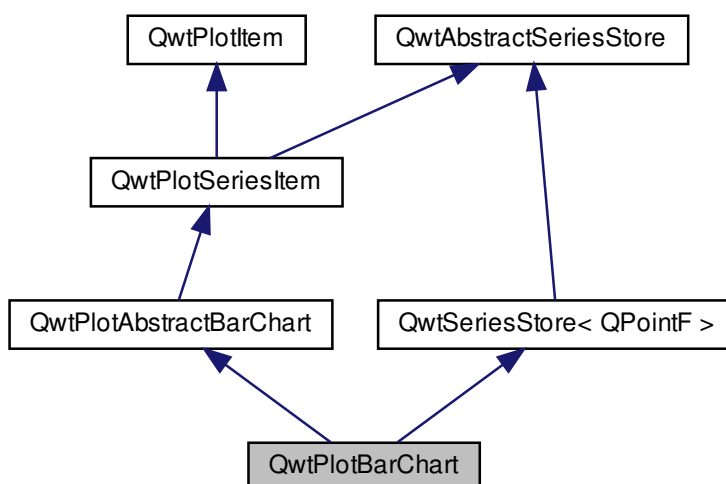
[setSpacing\(\)](#), [margin\(\)](#)

12.67 QwtPlotBarChart Class Reference

[QwtPlotBarChart](#) displays a series of a values as bars.

```
#include <qwt_plot_barchart.h>
```

Inheritance diagram for QwtPlotBarChart:



Public Types

- enum [LegendMode](#) { [LegendChartTitle](#), [LegendBarTitles](#) }
Legend modes.

Public Member Functions

- [QwtPlotBarChart](#) (const QString &title=QString())
- [QwtPlotBarChart](#) (const [QwtText](#) &title)
- virtual [~QwtPlotBarChart](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setSamples](#) (const QVector< QPointF > &)
- void [setSamples](#) (const QVector< double > &)
- void [setSamples](#) ([QwtSeriesData](#)< QPointF > *)
- void [setSymbol](#) ([QwtColumnSymbol](#) *)
Assign a symbol.
- const [QwtColumnSymbol](#) * [symbol](#) () const
- void [setLegendMode](#) ([LegendMode](#))
- [LegendMode](#) [legendMode](#) () const
- virtual void [drawSeries](#) (QPainter *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
- virtual QRectF [boundingRect](#) () const
- virtual [QwtColumnSymbol](#) * [specialSymbol](#) (int sampleIndex, const QPointF &) const
- virtual [QwtText](#) [barTitle](#) (int sampleIndex) const
Return the title of a bar.

Protected Member Functions

- virtual void [drawSample](#) (QPainter *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, const [QwtInterval](#) &boundingInterval, int index, const QPointF &sample) const
- virtual void [drawBar](#) (QPainter *, int sampleIndex, const QPointF &sample, const [QwtColumnRect](#) &) const
- QList< [QwtLegendData](#) > [legendData](#) () const
Return all information, that is needed to represent the item on the legend.
- [QwtGraphic legendIcon](#) (int index, const QSizeF &) const

12.67.1 Detailed Description

[QwtPlotBarChart](#) displays a series of a values as bars.

Each bar might be customized individually by implementing a [specialSymbol\(\)](#). Otherwise it is rendered using a default symbol.

Depending on its [orientation\(\)](#) the bars are displayed horizontally or vertically. The bars cover the interval between the [baseline\(\)](#) and the value.

By activating the LegendBarTitles mode each sample will have its own entry on the legend.

The most common use case of a bar chart is to display a list of y coordinates, where the x coordinate is simply the index in the list. But for other situations (f.e. when values are related to dates) it is also possible to set x coordinates explicitly.

See also

[QwtPlotMultiBarChart](#), [QwtPlotHistogram](#), [QwtPlotCurve::Sticks](#), [QwtPlotSeriesItem::orientation\(\)](#), [QwtPlotAbstractBarChart::ba](#)

12.67.2 Member Enumeration Documentation

12.67.2.1 LegendMode

```
enum QwtPlotBarChart::LegendMode
```

Legend modes.

The default setting is [QwtPlotBarChart::LegendChartTitle](#).

See also

[setLegendMode\(\)](#), [legendMode\(\)](#)

Enumerator

LegendChartTitle	One entry on the legend showing the default symbol and the title() of the chart See also QwtPlotItem::title()
LegendBarTitles	One entry for each value showing the individual symbol of the corresponding bar and the bar title.
Generated by Doxygen	See also specialSymbol() , barTitle()

12.67.3 Constructor & Destructor Documentation

12.67.3.1 QwtPlotBarChart() [1/2]

```
QwtPlotBarChart::QwtPlotBarChart (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.67.3.2 QwtPlotBarChart() [2/2]

```
QwtPlotBarChart::QwtPlotBarChart (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.67.4 Member Function Documentation

12.67.4.1 barTitle()

```
QwtText QwtPlotBarChart::barTitle (
    int sampleIndex ) const [virtual]
```

Return the title of a bar.

In LegendBarTitles mode the title is displayed on the legend entry corresponding to a bar.

The default implementation is a dummy, that is intended to be overloaded.

Parameters

<i>sampleIndex</i>	Index of the bar
--------------------	------------------

Returns

An empty text

See also

[LegendBarTitles](#)

12.67.4.2 boundingRect()

```
QRectF QwtPlotBarChart::boundingRect ( ) const [virtual]
```

Returns

Bounding rectangle of all samples. For an empty series the rectangle is invalid.

Reimplemented from [QwtPlotSeriesItem](#).

12.67.4.3 drawBar()

```
void QwtPlotBarChart::drawBar (
    QPainter * painter,
    int sampleIndex,
    const QPointF & sample,
    const QwtColumnRect & rect ) const [protected], [virtual]
```

Draw a bar

Parameters

<i>painter</i>	Painter
<i>sampleIndex</i>	Index of the sample represented by the bar
<i>sample</i>	Value of the sample
<i>rect</i>	Bounding rectangle of the bar

12.67.4.4 drawSample()

```
void QwtPlotBarChart::drawSample (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    const QwtInterval & boundingInterval,
    int index,
    const QPointF & sample ) const [protected], [virtual]
```

Draw a sample

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rect of the canvas
<i>boundingInterval</i>	Bounding interval of sample values
<i>index</i>	Index of the sample
<i>sample</i>	Value of the sample

See also

[drawSeries\(\)](#)

12.67.4.5 drawSeries()

```
void QwtPlotBarChart::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw an interval of the bar chart

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rect of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted. If to < 0 the curve will be painted to its last point.

See also

[drawSymbols\(\)](#)

Implements [QwtPlotSeriesItem](#).

12.67.4.6 legendData()

```
QList< QwtLegendData > QwtPlotBarChart::legendData ( ) const [protected], [virtual]
```

Return all information, that is needed to represent the item on the legend.

In case of [LegendBarTitles](#) an entry for each bar is returned, otherwise the chart is represented like any other plot item from its [title\(\)](#) and the [legendIcon\(\)](#).

Returns

Information, that is needed to represent the item on the legend

See also

[title\(\)](#), [setLegendMode\(\)](#), [barTitle\(\)](#), [QwtLegend](#), [QwtPlotLegendItem](#)

Reimplemented from [QwtPlotItem](#).

12.67.4.7 legendIcon()

```
QwtGraphic QwtPlotBarChart::legendIcon (
    int index,
    const QSizeF & size ) const [protected], [virtual]
```

Returns

Icon representing a bar or the chart on the legend

When the [legendMode\(\)](#) is [LegendBarTitles](#) the icon shows the bar corresponding to index - otherwise the bar displays the default symbol.

Parameters

<i>index</i>	Index of the legend entry
<i>size</i>	Icon size

See also

[setLegendMode\(\)](#), [drawBar\(\)](#), [QwtPlotItem::setLegendIconSize\(\)](#), [QwtPlotItem::legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.67.4.8 legendMode()

```
QwtPlotBarChart::LegendMode QwtPlotBarChart::legendMode ( ) const
```

Returns

Legend mode

See also

[setLegendMode\(\)](#)

12.67.4.9 rtti()

```
int QwtPlotBarChart::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotBarChart](#)

Reimplemented from [QwtPlotItem](#).

12.67.4.10 setLegendMode()

```
void QwtPlotBarChart::setLegendMode (
    LegendMode mode )
```

Set the mode that decides what to display on the legend

In case of LegendBarTitles [barTitle\(\)](#) needs to be overloaded to return individual titles for each bar.

Parameters

<i>mode</i>	New mode
-------------	----------

See also

[legendMode\(\)](#), [legendData\(\)](#), [barTitle\(\)](#), [QwtPlotItem::ItemAttribute](#)

12.67.4.11 setSamples() [1/3]

```
void QwtPlotBarChart::setSamples (
    const QVector< QPointF > & samples )
```

Initialize data with an array of points

Parameters

<i>samples</i>	Vector of points
----------------	------------------

Note

QVector is implicitly shared

QPolygonF is derived from QVector<QPointF>

12.67.4.12 setSamples() [2/3]

```
void QwtPlotBarChart::setSamples (
    const QVector< double > & samples )
```

Initialize data with an array of doubles

The indices in the array are taken as x coordinate, while the doubles are interpreted as y values.

Parameters

<i>samples</i>	Vector of y coordinates
----------------	-------------------------

Note

QVector is implicitly shared

12.67.4.13 setSamples() [3/3]

```
void QwtPlotBarChart::setSamples (
    QwtSeriesData< QPointF > * data )
```

Assign a series of samples

[setSamples\(\)](#) is just a wrapper for [setData\(\)](#) without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.67.4.14 setSymbol()

```
void QwtPlotBarChart::setSymbol (
    QwtColumnSymbol * symbol )
```

Assign a symbol.

The bar chart will take the ownership of the symbol, hence the previously set symbol will be delete by setting a new one. If *symbol* is NULL no symbol will be drawn.

Parameters

<i>symbol</i>	Symbol
---------------	--------

See also

[symbol\(\)](#)

12.67.4.15 specialSymbol()

```
QwtColumnSymbol * QwtPlotBarChart::specialSymbol (
    int sampleIndex,
    const QPointF & sample ) const [virtual]
```

Needs to be overloaded to return a non default symbol for a specific sample

Parameters

<i>sampleIndex</i>	Index of the sample represented by the bar
<i>sample</i>	Value of the sample

Returns

NULL, indicating to use the default symbol

12.67.4.16 symbol()

```
const QwtColumnSymbol * QwtPlotBarChart::symbol ( ) const
```

Returns

Current symbol or NULL, when no symbol has been assigned

See also

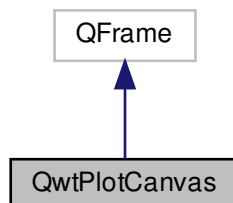
[setSymbol\(\)](#)

12.68 QwtPlotCanvas Class Reference

Canvas of a [QwtPlot](#).

```
#include <qwt_plot_canvas.h>
```

Inheritance diagram for QwtPlotCanvas:



Public Types

- enum [PaintAttribute](#) { [BackingStore](#) = 1, [Opaque](#) = 2, [HackStyledBackground](#) = 4, [ImmediatePaint](#) = 8 }
Paint attributes.
- enum [FocusIndicator](#) { [NoFocusIndicator](#), [CanvasFocusIndicator](#), [ItemFocusIndicator](#) }
Focus indicator The default setting is NoFocusIndicator.
- typedef QFlags< [PaintAttribute](#) > [PaintAttributes](#)
Paint attributes.

Public Slots

- void [replot](#) ()

Public Member Functions

- [QwtPlotCanvas](#) ([QwtPlot](#) * = NULL)
Constructor.
- virtual [~QwtPlotCanvas](#) ()
Destructor.
- [QwtPlot](#) * [plot](#) ()
Return parent plot widget.
- const [QwtPlot](#) * [plot](#) () const
Return parent plot widget.
- void [setFocusIndicator](#) ([FocusIndicator](#))
- [FocusIndicator](#) [focusIndicator](#) () const
- void [setBorderRadius](#) (double)
- double [borderRadius](#) () const
- void [setPaintAttribute](#) ([PaintAttribute](#), bool on=true)
Changing the paint attributes.
- bool [testPaintAttribute](#) ([PaintAttribute](#)) const
- const QPixmap * [backingStore](#) () const
- void [invalidateBackingStore](#) ()
Invalidate the internal backing store.
- virtual bool [event](#) (QEvent *)
- Q_INVOKABLE QPainterPath [borderPath](#) (const QRect &) const

Protected Member Functions

- virtual void [paintEvent](#) (QPaintEvent *)
- virtual void [resizeEvent](#) (QResizeEvent *)
- virtual void [drawFocusIndicator](#) (QPainter *)
- virtual void [drawBorder](#) (QPainter *)
- void [updateStyleSheetInfo](#) ()
Update the cached information about the current style sheet.

12.68.1 Detailed Description

Canvas of a [QwtPlot](#).

Canvas is the widget where all plot items are displayed

See also

[QwtPlot::setCanvas\(\)](#), [QwtPlotGLCanvas](#)

12.68.2 Member Enumeration Documentation

12.68.2.1 FocusIndicator

enum `QwtPlotCanvas::FocusIndicator`

Focus indicator The default setting is NoFocusIndicator.

See also

[setFocusIndicator\(\)](#), [focusIndicator\(\)](#), [drawFocusIndicator\(\)](#)

Enumerator

NoFocusIndicator	Don't paint a focus indicator.
CanvasFocusIndicator	The focus is related to the complete canvas. Paint the focus indicator using drawFocusIndicator()
ItemFocusIndicator	The focus is related to an item (curve, point, ...) on the canvas. It is up to the application to display a focus indication using f.e. highlighting.

12.68.2.2 PaintAttribute

enum `QwtPlotCanvas::PaintAttribute`

Paint attributes.

The default setting enables BackingStore and Opaque.

See also

[setPaintAttribute\(\)](#), [testPaintAttribute\(\)](#)

Enumerator

BackingStore	<p>Paint double buffered reusing the content of the pixmap buffer when possible. Using a backing store might improve the performance significantly, when working with widget overlays (like rubber bands). Disabling the cache might improve the performance for incremental paints (using QwtPlotDirectPainter).</p> <p>See also</p> <p>backingStore(), invalidateBackingStore()</p>
Opaque	<p>Try to fill the complete contents rectangle of the plot canvas. When using styled backgrounds Qt assumes, that the canvas doesn't fill its area completely (f.e because of rounded borders) and fills the area below the canvas. When this is done with gradients it might result in a serious performance bottleneck - depending on the size.</p> <p>When the Opaque attribute is enabled the canvas tries to identify the gaps with some heuristics and to fill those only.</p>
	<p>Warning</p> <p>Will not work for semitransparent backgrounds</p> <p>Generated by Doxygen</p>

Enumerator

HackStyledBackground	Try to improve painting of styled backgrounds. QwtPlotCanvas supports the box model attributes for customizing the layout with style sheets. Unfortunately the design of Qt style sheets has no concept how to handle backgrounds with rounded corners - beside of padding. When HackStyledBackground is enabled the plot canvas tries to separate the background from the background border by reverse engineering to paint the background before and the border after the plot items. In this order the border gets perfectly antialiased and you can avoid some pixel artifacts in the corners.
ImmediatePaint	When ImmediatePaint is set replot() calls <code>repaint()</code> instead of <code>update()</code> . See also replot() , <code>QWidget::repaint()</code> , <code>QWidget::update()</code>

12.68.3 Constructor & Destructor Documentation

12.68.3.1 QwtPlotCanvas()

```
QwtPlotCanvas::QwtPlotCanvas (
    QwtPlot * plot = NULL ) [explicit]
```

Constructor.

Parameters

<i>plot</i>	Parent plot widget
-------------	--------------------

See also

[QwtPlot::setCanvas\(\)](#)

12.68.4 Member Function Documentation

12.68.4.1 backingStore()

```
const QPixmap * QwtPlotCanvas::backingStore ( ) const
```

Returns

Backing store, might be null

12.68.4.2 borderPath()

```
QPainterPath QwtPlotCanvas::borderPath (
    const QRect & rect ) const
```

Calculate the painter path for a styled or rounded border

When the canvas has no styled background or rounded borders the painter path is empty.

Parameters

<i>rect</i>	Bounding rectangle of the canvas
-------------	----------------------------------

Returns

Painter path, that can be used for clipping

12.68.4.3 borderRadius()

```
double QwtPlotCanvas::borderRadius ( ) const
```

Returns

Radius for the corners of the border frame

See also

[setBorderRadius\(\)](#)

12.68.4.4 drawBorder()

```
void QwtPlotCanvas::drawBorder (
    QPainter * painter ) [protected], [virtual]
```

Draw the border of the plot canvas

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[setBorderRadius\(\)](#)

12.68.4.5 drawFocusIndicator()

```
void QwtPlotCanvas::drawFocusIndicator (
    QPainter * painter ) [protected], [virtual]
```

Draw the focus indication

Parameters

<i>painter</i>	Painter
----------------	---------

12.68.4.6 event()

```
bool QwtPlotCanvas::event (
    QEvent * event ) [virtual]
```

Qt event handler for QEvent::PolishRequest and QEvent::StyleChange

Parameters

<i>event</i>	Qt Event
--------------	----------

Returns

See QFrame::event()

12.68.4.7 focusIndicator()

```
QwtPlotCanvas::FocusIndicator QwtPlotCanvas::focusIndicator ( ) const
```

Returns

Focus indicator

See also

[FocusIndicator](#), [setFocusIndicator\(\)](#)

12.68.4.8 paintEvent()

```
void QwtPlotCanvas::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Paint event

Parameters

<i>event</i>	Paint event
--------------	-------------

12.68.4.9 replot

```
void QwtPlotCanvas::replot ( ) [slot]
```

Invalidate the paint cache and repaint the canvas

See also

[invalidatePaintCache\(\)](#)

12.68.4.10 resizeEvent()

```
void QwtPlotCanvas::resizeEvent (
    QResizeEvent * event ) [protected], [virtual]
```

Resize event

Parameters

<i>event</i>	Resize event
--------------	--------------

12.68.4.11 setBorderRadius()

```
void QwtPlotCanvas::setBorderRadius (
    double radius )
```

Set the radius for the corners of the border frame

Parameters

<i>radius</i>	Radius of a rounded corner
---------------	----------------------------

See also

[borderRadius\(\)](#)

12.68.4.12 setFocusIndicator()

```
void QwtPlotCanvas::setFocusIndicator (
    FocusIndicator focusIndicator )
```

Set the focus indicator

See also

[FocusIndicator](#), [focusIndicator\(\)](#)

12.68.4.13 `setPaintAttribute()`

```
void QwtPlotCanvas::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```

Changing the paint attributes.

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off

See also

[testPaintAttribute\(\)](#), [backingStore\(\)](#)

12.68.4.14 `testPaintAttribute()`

```
bool QwtPlotCanvas::testPaintAttribute (
    PaintAttribute attribute ) const
```

Test whether a paint attribute is enabled

Parameters

<i>attribute</i>	Paint attribute
------------------	-----------------

Returns

true, when attribute is enabled

See also

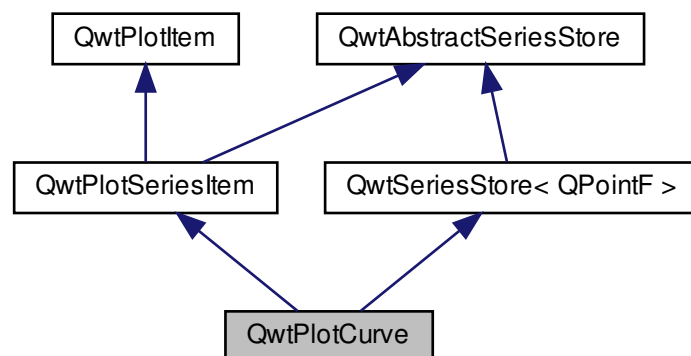
[setPaintAttribute\(\)](#)

12.69 QwtPlotCurve Class Reference

A plot item, that represents a series of points.

```
#include <qwt_plot_curve.h>
```

Inheritance diagram for QwtPlotCurve:



Public Types

- enum [CurveStyle](#) {
[NoCurve](#) = -1, [Lines](#), [Sticks](#), [Steps](#),
[Dots](#), [UserCurve](#) = 100 }
- enum [CurveAttribute](#) { [Inverted](#) = 0x01, [Fitted](#) = 0x02 }
- enum [LegendAttribute](#) { [LegendNoAttribute](#) = 0x00, [LegendShowLine](#) = 0x01, [LegendShowSymbol](#) = 0x02,
[LegendShowBrush](#) = 0x04 }
- enum [PaintAttribute](#) { [ClipPolygons](#) = 0x01, [FilterPoints](#) = 0x02, [MinimizeMemory](#) = 0x04, [ImageBuffer](#) = 0x08
}
- typedef QFlags< [CurveAttribute](#) > [CurveAttributes](#)
Curve attributes.
- typedef QFlags< [LegendAttribute](#) > [LegendAttributes](#)
Legend attributes.
- typedef QFlags< [PaintAttribute](#) > [PaintAttributes](#)
Paint attributes.

Public Member Functions

- [QwtPlotCurve](#) (const QString &[title](#)=QString())
- [QwtPlotCurve](#) (const [QwtText](#) &[title](#))
- virtual [~QwtPlotCurve](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setPaintAttribute](#) ([PaintAttribute](#), bool on=true)
- bool [testPaintAttribute](#) ([PaintAttribute](#)) const
- void [setLegendAttribute](#) ([LegendAttribute](#), bool on=true)
- bool [testLegendAttribute](#) ([LegendAttribute](#)) const
- void [setRawSamples](#) (const double *xData, const double *yData, int size)
Initialize the data by pointing to memory blocks which are not managed by [QwtPlotCurve](#).
- void [setSamples](#) (const double *xData, const double *yData, int size)
- void [setSamples](#) (const QVector< double > &xData, const QVector< double > &yData)

- Initialize data with x- and y-arrays (explicitly shared)*
- void [setSamples](#) (const QVector< QPointF > &)
- void [setSamples](#) (QwtSeriesData< QPointF > *)
- int [closestPoint](#) (const QPoint &pos, double *dist=NULL) const
- double [minXValue](#) () const
[boundingRect\(\).left\(\)](#)
- double [maxXValue](#) () const
[boundingRect\(\).right\(\)](#)
- double [minYValue](#) () const
[boundingRect\(\).top\(\)](#)
- double [maxYValue](#) () const
[boundingRect\(\).bottom\(\)](#)
- void [setCurveAttribute](#) (CurveAttribute, bool on=true)
- bool [testCurveAttribute](#) (CurveAttribute) const
- void [setPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setPen](#) (const QPen &)
- const QPen & [pen](#) () const
- void [setBrush](#) (const QBrush &)
- Assign a brush.*
- const QBrush & [brush](#) () const
- void [setBaseline](#) (double)
- Set the value of the baseline.*
- double [baseline](#) () const
- void [setStyle](#) (CurveStyle style)
- CurveStyle style () const
- void [setSymbol](#) (QwtSymbol *)
- Assign a symbol.*
- const QwtSymbol * [symbol](#) () const
- void [setCurveFitter](#) (QwtCurveFitter *)
- QwtCurveFitter * [curveFitter](#) () const
- virtual void [drawSeries](#) (QPainter *, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- virtual QwtGraphic [legendIcon](#) (int index, const QSizeF &) const

Protected Member Functions

- void [init](#) ()
- Initialize internal members.*
- virtual void [drawCurve](#) (QPainter *, int style, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- Draw the line part (without symbols) of a curve interval.*
- virtual void [drawSymbols](#) (QPainter *, const QwtSymbol &, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- virtual void [drawLines](#) (QPainter *, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- Draw lines.*
- virtual void [drawSticks](#) (QPainter *, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- virtual void [drawDots](#) (QPainter *, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- virtual void [drawSteps](#) (QPainter *, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect, int from, int to) const
- virtual void [fillCurve](#) (QPainter *, const QwtScaleMap &, const QwtScaleMap &, const QRectF &canvasRect, QPolygonF &) const
- void [closePolyline](#) (QPainter *, const QwtScaleMap &, const QwtScaleMap &, QPolygonF &) const
- Complete a polygon to be a closed polygon including the area between the original polygon and the baseline.*

12.69.1 Detailed Description

A plot item, that represents a series of points.

A curve is the representation of a series of points in the x-y plane. It supports different display styles, interpolation (f.e. spline) and symbols.

Usage

- a) Assign curve properties** When a curve is created, it is configured to draw black solid lines with in [QwtPlotCurve::Lines](#) style and no symbols. You can change this by calling [setPen\(\)](#), [setStyle\(\)](#) and [setSymbol\(\)](#).
- b) Connect/Assign data.** [QwtPlotCurve](#) gets its points using a [QwtSeriesData](#) object offering a bridge to the real storage of the points (like [QAbstractItemModel](#)). There are several convenience classes derived from [QwtSeriesData](#), that also store the points inside (like [QStandardItemModel](#)). [QwtPlotCurve](#) also offers a couple of variations of [setSamples\(\)](#), that build [QwtSeriesData](#) objects from arrays internally.
- c) Attach the curve to a plot** See [QwtPlotItem::attach\(\)](#)

Example:

see examples/bode

See also

[QwtPointSeriesData](#), [QwtSymbol](#), [QwtScaleMap](#)

12.69.2 Member Enumeration Documentation

12.69.2.1 CurveAttribute

```
enum QwtPlotCurve::CurveAttribute
```

Attribute for drawing the curve

See also

[setCurveAttribute\(\)](#), [testCurveAttribute\(\)](#), [curveFitter\(\)](#)

Enumerator

Inverted	For QwtPlotCurve::Steps only. Draws a step function from the right to the left.
Fitted	Only in combination with QwtPlotCurve::Lines A QwtCurveFitter tries to interpolate/smooth the curve, before it is painted. Note Curve fitting requires temporary memory for calculating coefficients and additional points. If painting in QwtPlotCurve::Fitted mode is slow it might be better to fit the points, before they are passed to QwtPlotCurve .

12.69.2.2 CurveStyle

```
enum QwtPlotCurve::CurveStyle
```

Curve styles.

See also

[setStyle\(\)](#), [style\(\)](#)

Enumerator

NoCurve	Don't draw a curve. Note: This doesn't affect the symbols.
Lines	Connect the points with straight lines. The lines might be interpolated depending on the 'Fitted' attribute. Curve fitting can be configured using setCurveFitter() .
Sticks	Draw vertical or horizontal sticks (depending on the orientation()) from a baseline which is defined by setBaseline() .
Steps	Connect the points with a step function. The step function is drawn from the left to the right or vice versa, depending on the QwtPlotCurve::Inverted attribute.
Dots	Draw dots at the locations of the data points. Note: This is different from a dotted line (see setPen()), and faster as a curve in QwtPlotCurve::NoStyle style and a symbol painting a point.
UserCurve	Styles \geq QwtPlotCurve::UserCurve are reserved for derived classes of QwtPlotCurve that overload drawCurve() with additional application specific curve types.

12.69.2.3 LegendAttribute

```
enum QwtPlotCurve::LegendAttribute
```

Attributes how to represent the curve on the legend

See also

[setLegendAttribute\(\)](#), [testLegendAttribute\(\)](#), [QwtPlotItem::legendData\(\)](#), [legendIcon\(\)](#)

Enumerator

LegendNoAttribute	QwtPlotCurve tries to find a color representing the curve and paints a rectangle with it.
LegendShowLine	If the style() is not QwtPlotCurve::NoCurve a line is painted with the curve pen() .
LegendShowSymbol	If the curve has a valid symbol it is painted.
LegendShowBrush	If the curve has a brush a rectangle filled with the curve brush() is painted.

12.69.2.4 PaintAttribute

```
enum QwtPlotCurve::PaintAttribute
```

Attributes to modify the drawing algorithm. The default setting enables ClipPolygons | FilterPoints

See also

[setPaintAttribute\(\)](#), [testPaintAttribute\(\)](#)

Enumerator

ClipPolygons	Clip polygons before painting them. In situations, where points are far outside the visible area (f.e when zooming deep) this might be a substantial improvement for the painting performance
FilterPoints	Tries to reduce the data that has to be painted, by sorting out duplicates, or paintings outside the visible area. Might have a notable impact on curves with many close points. Only a couple of very basic filtering algorithms are implemented.
MinimizeMemory	Minimize memory usage that is temporarily needed for the translated points, before they get painted. This might slow down the performance of painting
ImageBuffer	Render the points to a temporary image and paint the image. This is a very special optimization for Dots style, when having a huge amount of points. With a reasonable number of points QPainter::drawPoints() will be faster.

12.69.3 Constructor & Destructor Documentation

12.69.3.1 QwtPlotCurve() [1/2]

```
QwtPlotCurve::QwtPlotCurve (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.69.3.2 QwtPlotCurve() [2/2]

```
QwtPlotCurve::QwtPlotCurve (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.69.4 Member Function Documentation

12.69.4.1 `baseline()`

```
double QwtPlotCurve::baseline ( ) const
```

Returns

Value of the baseline

See also

[setBaseline\(\)](#)

12.69.4.2 `brush()`

```
const QBrush & QwtPlotCurve::brush ( ) const
```

Returns

Brush used to fill the area between lines and the baseline

See also

[setBrush\(\)](#), [setBaseline\(\)](#), [baseline\(\)](#)

12.69.4.3 `closePolyline()`

```
void QwtPlotCurve::closePolyline (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    QPolygonF & polygon ) const [protected]
```

Complete a polygon to be a closed polygon including the area between the original polygon and the baseline.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	X map
<i>yMap</i>	Y map
<i>polygon</i>	Polygon to be completed

12.69.4.4 `closestPoint()`

```
int QwtPlotCurve::closestPoint (
    const QPoint & pos,
    double * dist = NULL ) const
```

Find the closest curve point for a specific position

Parameters

<i>pos</i>	Position, where to look for the closest curve point
<i>dist</i>	If <i>dist</i> != NULL, closestPoint() returns the distance between the position and the closest curve point

Returns

Index of the closest curve point, or -1 if none can be found (f.e when the curve has no points)

Note

[closestPoint\(\)](#) implements a dumb algorithm, that iterates over all points

12.69.4.5 `curveFitter()`

```
QwtCurveFitter * QwtPlotCurve::curveFitter ( ) const
```

Get the curve fitter. If curve fitting is disabled NULL is returned.

Returns

Curve fitter

See also

[setCurveFitter\(\)](#), [Fitted](#)

12.69.4.6 `drawCurve()`

```
void QwtPlotCurve::drawCurve (
    QPainter * painter,
    int style,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw the line part (without symbols) of a curve interval.

Parameters

<i>painter</i>	Painter
<i>style</i>	curve style, see QwtPlotCurve::CurveStyle
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	index of the first point to be painted
<i>to</i>	index of the last point to be painted

See also

[draw\(\)](#), [drawDots\(\)](#), [drawLines\(\)](#), [drawSteps\(\)](#), [drawSticks\(\)](#)

12.69.4.7 drawDots()

```
void QwtPlotCurve::drawDots (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw dots

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	index of the first point to be painted
<i>to</i>	index of the last point to be painted

See also

[draw\(\)](#), [drawCurve\(\)](#), [drawSticks\(\)](#), [drawLines\(\)](#), [drawSteps\(\)](#)

12.69.4.8 drawLines()

```
void QwtPlotCurve::drawLines (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
```

```
int from,
int to ) const [protected], [virtual]
```

Draw lines.

If the CurveAttribute Fitted is enabled a [QwtCurveFitter](#) tries to interpolate/smooth the curve, before it is painted.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	index of the first point to be painted
<i>to</i>	index of the last point to be painted

See also

[setCurveAttribute\(\)](#), [setCurveFitter\(\)](#), [draw\(\)](#), [drawLines\(\)](#), [drawDots\(\)](#), [drawSteps\(\)](#), [drawSticks\(\)](#)

12.69.4.9 drawSeries()

```
void QwtPlotCurve::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw an interval of the curve

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted. If to < 0 the curve will be painted to its last point.

See also

[drawCurve\(\)](#), [drawSymbols\(\)](#),

Implements [QwtPlotSeriesItem](#).

12.69.4.10 drawSteps()

```
void QwtPlotCurve::drawSteps (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw step function

The direction of the steps depends on Inverted attribute.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	index of the first point to be painted
<i>to</i>	index of the last point to be painted

See also

[CurveAttribute](#), [setCurveAttribute\(\)](#), [draw\(\)](#), [drawCurve\(\)](#), [drawDots\(\)](#), [drawLines\(\)](#), [drawSticks\(\)](#)

12.69.4.11 drawSticks()

```
void QwtPlotCurve::drawSticks (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw sticks

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	index of the first point to be painted
<i>to</i>	index of the last point to be painted

See also

[draw\(\)](#), [drawCurve\(\)](#), [drawDots\(\)](#), [drawLines\(\)](#), [drawSteps\(\)](#)

12.69.4.12 drawSymbols()

```
void QwtPlotCurve::drawSymbols (
    QPainter * painter,
    const QwtSymbol & symbol,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw symbols

Parameters

<i>painter</i>	Painter
<i>symbol</i>	Curve symbol
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted

See also

[setSymbol\(\)](#), [drawSeries\(\)](#), [drawCurve\(\)](#)

12.69.4.13 fillCurve()

```
void QwtPlotCurve::fillCurve (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    QPolygonF & polygon ) const [protected], [virtual]
```

Fill the area between the curve and the baseline with the curve brush

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>polygon</i>	Polygon - will be modified !

See also

[setBrush\(\)](#), [setBaseline\(\)](#), [setStyle\(\)](#)

12.69.4.14 `legendIcon()`

```
QwtGraphic QwtPlotCurve::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

Icon representing the curve on the legend

Parameters

<i>index</i>	Index of the legend entry (ignored as there is only one)
<i>size</i>	Icon size

See also

[QwtPlotItem::setLegendIconSize\(\)](#), [QwtPlotItem::legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.69.4.15 `pen()`

```
const QPen & QwtPlotCurve::pen ( ) const
```

Returns

Pen used to draw the lines

See also

[setPen\(\)](#), [brush\(\)](#)

12.69.4.16 `rtti()`

```
int QwtPlotCurve::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotCurve](#)

Reimplemented from [QwtPlotItem](#).

12.69.4.17 setBaseline()

```
void QwtPlotCurve::setBaseline (
    double value )
```

Set the value of the baseline.

The baseline is needed for filling the curve with a brush or the Sticks drawing style.

The interpretation of the baseline depends on the [orientation\(\)](#). With Qt::Horizontal, the baseline is interpreted as a horizontal line at y = [baseline\(\)](#), with Qt::Vertical, it is interpreted as a vertical line at x = [baseline\(\)](#).

The default value is 0.0.

Parameters

<i>value</i>	Value of the baseline
--------------	-----------------------

See also

[baseline\(\)](#), [setBrush\(\)](#), [setStyle\(\)](#), [QwtPlotAbstractSeriesItem::orientation\(\)](#)

12.69.4.18 setBrush()

```
void QwtPlotCurve::setBrush (
    const QBrush & brush )
```

Assign a brush.

In case of `brush.style() != QBrush::NoBrush` and `style() != QwtPlotCurve::Sticks` the area between the curve and the baseline will be filled.

In case `!brush.color().isValid()` the area will be filled by `pen.color()`. The fill algorithm simply connects the first and the last curve point to the baseline. So the curve data has to be sorted (ascending or descending).

Parameters

<i>brush</i>	New brush
--------------	-----------

See also

[brush\(\)](#), [setBaseline\(\)](#), [baseline\(\)](#)

12.69.4.19 setCurveAttribute()

```
void QwtPlotCurve::setCurveAttribute (
    CurveAttribute attribute,
    bool on = true )
```

Specify an attribute for drawing the curve

Parameters

<i>attribute</i>	Curve attribute
<i>on</i>	On/Off

/sa [testCurveAttribute\(\)](#), [setCurveFitter\(\)](#)

12.69.4.20 [setCurveFitter\(\)](#)

```
void QwtPlotCurve::setCurveFitter (
    QwtCurveFitter * curveFitter )
```

Assign a curve fitter

The curve fitter "smooths" the curve points, when the Fitted CurveAttribute is set. [setCurveFitter\(NULL\)](#) also disables curve fitting.

The curve fitter operates on the translated points (= widget coordinates) to be functional for logarithmic scales. Obviously this is less performant for fitting algorithms, that reduce the number of points.

For situations, where curve fitting is used to improve the performance of painting huge series of points it might be better to execute the fitter on the curve points once and to cache the result in the [QwtSeriesData](#) object.

Parameters

curveFitter()	Curve fitter
-------------------------------	--------------

See also

[Fitted](#)

12.69.4.21 [setLegendAttribute\(\)](#)

```
void QwtPlotCurve::setLegendAttribute (
    LegendAttribute attribute,
    bool on = true )
```

Specify an attribute how to draw the legend icon

Parameters

<i>attribute</i>	Attribute
<i>on</i>	On/Off /sa testLegendAttribute() . legendIcon()

12.69.4.22 [setPaintAttribute\(\)](#)

```
void QwtPlotCurve::setPaintAttribute (
```

```
PaintAttribute attribute,
bool on = true )
```

Specify an attribute how to draw the curve

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off

See also

[testPaintAttribute\(\)](#)

12.69.4.23 setPen() [1/2]

```
void QwtPlotCurve::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see `QPen::isCosmetic()`). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.69.4.24 setPen() [2/2]

```
void QwtPlotCurve::setPen (
    const QPen & pen )
```

Assign a pen

Parameters

<i>pen</i>	New pen
------------	---------

See also

[pen\(\)](#), [brush\(\)](#)

12.69.4.25 `setRawSamples()`

```
void QwtPlotCurve::setRawSamples (
    const double * xData,
    const double * yData,
    int size )
```

Initialize the data by pointing to memory blocks which are not managed by [QwtPlotCurve](#).

`setRawSamples` is provided for efficiency. It is important to keep the pointers during the lifetime of the underlying [QwtCPointerData](#) class.

Parameters

<i>xData</i>	pointer to x data
<i>yData</i>	pointer to y data
<i>size</i>	size of x and y

See also

[QwtCPointerData](#)

12.69.4.26 `setSamples()` [1/4]

```
void QwtPlotCurve::setSamples (
    const double * xData,
    const double * yData,
    int size )
```

Set data by copying x- and y-values from specified memory blocks. Contrary to [setRawSamples\(\)](#), this function makes a 'deep copy' of the data.

Parameters

<i>xData</i>	pointer to x values
<i>yData</i>	pointer to y values
<i>size</i>	size of xData and yData

See also

[QwtPointArrayData](#)

12.69.4.27 setSamples() [2/4]

```
void QwtPlotCurve::setSamples (
    const QVector< double > & xData,
    const QVector< double > & yData )
```

Initialize data with x- and y-arrays (explicitly shared)

Parameters

<i>xData</i>	x data
<i>yData</i>	y data

See also

[QwtPointArrayData](#)

12.69.4.28 setSamples() [3/4]

```
void QwtPlotCurve::setSamples (
    const QVector< QPointF > & samples )
```

Initialize data with an array of points.

Parameters

<i>samples</i>	Vector of points
----------------	------------------

Note

QVector is implicitly shared
 QPolygonF is derived from QVector<QPointF>

12.69.4.29 setSamples() [4/4]

```
void QwtPlotCurve::setSamples (
    QwtSeriesData< QPointF > * data )
```

Assign a series of points

[setSamples\(\)](#) is just a wrapper for [setData\(\)](#) without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.69.4.30 `setStyle()`

```
void QwtPlotCurve::setStyle (
    CurveStyle style )
```

Set the curve's drawing style

Parameters

<i>style</i>	Curve style
--------------	-------------

See also

[style\(\)](#)

12.69.4.31 `setSymbol()`

```
void QwtPlotCurve::setSymbol (
    QwtSymbol * symbol )
```

Assign a symbol.

The curve will take the ownership of the symbol, hence the previously set symbol will be delete by setting a new one. If *symbol* is NULL no symbol will be drawn.

Parameters

<i>symbol</i>	Symbol
---------------	--------

See also

[symbol\(\)](#)

12.69.4.32 `style()`

```
QwtPlotCurve::CurveStyle QwtPlotCurve::style ( ) const
```

Returns

Style of the curve

See also

[setStyle\(\)](#)

12.69.4.33 symbol()

```
const QwtSymbol * QwtPlotCurve::symbol ( ) const
```

Returns

Current symbol or NULL, when no symbol has been assigned

See also

[setSymbol\(\)](#)

12.69.4.34 testCurveAttribute()

```
bool QwtPlotCurve::testCurveAttribute (
    CurveAttribute attribute ) const
```

Returns

true, if attribute is enabled

See also

[setCurveAttribute\(\)](#)

12.69.4.35 testLegendAttribute()

```
bool QwtPlotCurve::testLegendAttribute (
    LegendAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

[setLegendAttribute\(\)](#)

12.69.4.36 testPaintAttribute()

```
bool QwtPlotCurve::testPaintAttribute (
    PaintAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

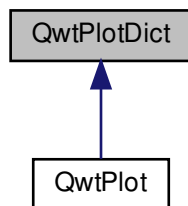
[setPaintAttribute\(\)](#)

12.70 QwtPlotDict Class Reference

A dictionary for plot items.

```
#include <qwt_plot_dict.h>
```

Inheritance diagram for QwtPlotDict:



Public Member Functions

- [QwtPlotDict](#) ()
- virtual [~QwtPlotDict](#) ()
- void [setAutoDelete](#) (bool)
- bool [autoDelete](#) () const
- const QwtPlotItemList & [itemList](#) () const
A QwtPlotItemList of all attached plot items.
- QwtPlotItemList [itemList](#) (int rtti) const
- void [detachItems](#) (int rtti=[QwtPlotItem::Rtti_PlotItem](#), bool [autoDelete](#)=true)

Protected Member Functions

- void [insertItem](#) ([QwtPlotItem](#) *)
- void [removeItem](#) ([QwtPlotItem](#) *)

12.70.1 Detailed Description

A dictionary for plot items.

[QwtPlotDict](#) organizes plot items in increasing z-order. If [autoDelete\(\)](#) is enabled, all attached items will be deleted in the destructor of the dictionary. [QwtPlotDict](#) can be used to get access to all [QwtPlotItem](#) items - or all items of a specific type - that are currently on the plot.

See also

[QwtPlotItem::attach\(\)](#), [QwtPlotItem::detach\(\)](#), [QwtPlotItem::z\(\)](#)

12.70.2 Constructor & Destructor Documentation

12.70.2.1 QwtPlotDict()

```
QwtPlotDict::QwtPlotDict ( ) [explicit]
```

Constructor

Auto deletion is enabled.

See also

[setAutoDelete\(\)](#), [QwtPlotItem::attach\(\)](#)

12.70.2.2 ~QwtPlotDict()

```
QwtPlotDict::~~QwtPlotDict ( ) [virtual]
```

Destructor

If [autoDelete\(\)](#) is on, all attached items will be deleted

See also

[setAutoDelete\(\)](#), [autoDelete\(\)](#), [QwtPlotItem::attach\(\)](#)

12.70.3 Member Function Documentation

12.70.3.1 autoDelete()

```
bool QwtPlotDict::autoDelete ( ) const
```

Returns

true if auto deletion is enabled

See also

[setAutoDelete\(\)](#), [insertItem\(\)](#)

12.70.3.2 detachItems()

```
void QwtPlotDict::detachItems (
    int rtti = QwtPlotItem::Rtti\_PlotItem,
    bool autoDelete = true )
```

Detach items from the dictionary

Parameters

<i>rtti</i>	In case of QwtPlotItem::Rtti_PlotItem detach all items otherwise only those items of the type <i>rtti</i> .
<i>autoDelete</i>	If true, delete all detached items

12.70.3.3 insertItem()

```
void QwtPlotDict::insertItem (
    QwtPlotItem * item ) [protected]
```

Insert a plot item

Parameters

<i>item</i>	PlotItem
-------------	----------

See also

[removeItem\(\)](#)

12.70.3.4 itemList() [1/2]

```
const QwtPlotItemList & QwtPlotDict::itemList ( ) const
```

A [QwtPlotItemList](#) of all attached plot items.

Use caution when iterating these lists, as removing/detaching an item will invalidate the iterator. Instead you can place pointers to objects to be removed in a removal list, and traverse that list later.

Returns

List of all attached plot items.

12.70.3.5 itemList() [2/2]

```
QwtPlotItemList QwtPlotDict::itemList (
    int rtti ) const
```

Returns

List of all attached plot items of a specific type.

Parameters

<i>rtti</i>	See QwtPlotItem::RttiValues
-------------	---

See also

[QwtPlotItem::rtti\(\)](#)

12.70.3.6 removeItem()

```
void QwtPlotDict::removeItem (
    QwtPlotItem * item )    [protected]
```

Remove a plot item

Parameters

<i>item</i>	PlotItem
-------------	----------

See also

[insertItem\(\)](#)

12.70.3.7 setAutoDelete()

```
void QwtPlotDict::setAutoDelete (
    bool autoDelete )
```

En/Disable Auto deletion

If Auto deletion is on all attached plot items will be deleted in the destructor of [QwtPlotDict](#). The default value is on.

See also

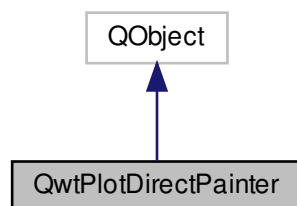
[autoDelete\(\)](#), [insertItem\(\)](#)

12.71 QwtPlotDirectPainter Class Reference

Painter object trying to paint incrementally.

```
#include <qwt_plot_directpainter.h>
```

Inheritance diagram for QwtPlotDirectPainter:



Public Types

- enum `Attribute` { `AtomicPainter` = 0x01, `FullRepaint` = 0x02, `CopyBackingStore` = 0x04 }
- *Paint attributes.*
- typedef `QFlags< Attribute >` `Attributes`
- *Paint attributes.*

Public Member Functions

- `QwtPlotDirectPainter` (`QObject *parent=NULL`)
- *Constructor.*
- virtual `~QwtPlotDirectPainter` ()
- *Destructor.*
- void `setAttribute` (`Attribute`, bool on)
- bool `testAttribute` (`Attribute`) const
- void `setClipping` (bool)
- bool `hasClipping` () const
- void `setClipRegion` (const `QRegion &`)
- *Assign a clip region and enable clipping.*
- `QRegion` `clipRegion` () const
- void `drawSeries` (`QwtPlotSeriesItem *`, int from, int to)
- *Draw a set of points of a seriesItem.*
- void `reset` ()
- *Close the internal QPainter.*
- virtual bool `eventFilter` (`QObject *`, `QEvent *`)
- *Event filter.*

12.71.1 Detailed Description

Painter object trying to paint incrementally.

Often applications want to display samples while they are collected. When there are too many samples complete replots will be expensive to be processed in a collection cycle.

`QwtPlotDirectPainter` offers an API to paint subsets (f.e all additions points) without erasing/repainting the plot canvas.

On certain environments it might be important to calculate a proper clip region before painting. F.e. for Qt Embedded only the clipped part of the backing store will be copied to a (maybe unaccelerated) frame buffer.

Warning

Incremental painting will only help when no replot is triggered by another operation (like changing scales) and nothing needs to be erased.

12.71.2 Member Enumeration Documentation

12.71.2.1 Attribute

```
enum QwtPlotDirectPainter::Attribute
```

Paint attributes.

See also

[setAttribute\(\)](#), [testAttribute\(\)](#), [drawSeries\(\)](#)

Enumerator

AtomicPainter	Initializing a QPainter is an expensive operation. When AtomicPainter is set each call of drawSeries() opens/closes a temporary QPainter. Otherwise QwtPlotDirectPainter tries to use the same QPainter as long as possible.
FullRepaint	When FullRepaint is set the plot canvas is explicitly repainted after the samples have been rendered.
CopyBackingStore	When QwtPlotCanvas::BackingStore is enabled the painter has to paint to the backing store and the widget. In certain situations/environments it might be faster to paint to the backing store only and then copy the backing store to the canvas. This flag can also be useful for settings, where Qt fills the the clip region with the widget background.

12.71.3 Member Function Documentation

12.71.3.1 clipRegion()

```
QRegion QwtPlotDirectPainter::clipRegion ( ) const
```

Returns

Currently set clip region.

See also

[setClipRegion\(\)](#), [setClipping\(\)](#), [hasClipping\(\)](#)

12.71.3.2 drawSeries()

```
void QwtPlotDirectPainter::drawSeries (
    QwtPlotSeriesItem * seriesItem,
    int from,
    int to )
```

Draw a set of points of a seriesItem.

When observing an measurement while it is running, new points have to be added to an existing seriesItem. [drawSeries\(\)](#) can be used to display them avoiding a complete redraw of the canvas.

Setting `plot()->canvas()->setAttribute(Qt::WA_PaintOutsidePaintEvent, true);` will result in faster painting, if the paint engine of the canvas widget supports this feature.

Parameters

<i>seriesItem</i>	Item to be painted
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted. If <code>to < 0</code> the series will be painted to its last point.

12.71.3.3 hasClipping()

```
bool QwtPlotDirectPainter::hasClipping ( ) const
```

Returns

true, when clipping is enabled

See also

[setClipping\(\)](#), [clipRegion\(\)](#), [setClipRegion\(\)](#)

12.71.3.4 setAttribute()

```
void QwtPlotDirectPainter::setAttribute (
    Attribute attribute,
    bool on )
```

Change an attribute

Parameters

<i>attribute</i>	Attribute to change
<i>on</i>	On/Off

See also

[Attribute](#), [testAttribute\(\)](#)

12.71.3.5 setClipping()

```
void QwtPlotDirectPainter::setClipping (
    bool enable )
```

En/Disables clipping

Parameters

<i>enable</i>	Enables clipping is true, disable it otherwise
---------------	--

See also

[hasClipping\(\)](#), [clipRegion\(\)](#), [setClipRegion\(\)](#)

12.71.3.6 setClipRegion()

```
void QwtPlotDirectPainter::setClipRegion (
    const QRegion & region )
```

Assign a clip region and enable clipping.

Depending on the environment setting a proper clip region might improve the performance heavily. F.e. on Qt embedded only the clipped part of the backing store will be copied to a (maybe unaccelerated) frame buffer device.

Parameters

<i>region</i>	Clip region
---------------	-------------

See also

[clipRegion\(\)](#), [hasClipping\(\)](#), [setClipping\(\)](#)

12.71.3.7 testAttribute()

```
bool QwtPlotDirectPainter::testAttribute (
    Attribute attribute ) const
```

Returns

True, when attribute is enabled

Parameters

<i>attribute</i>	Attribute to be tested
------------------	------------------------

See also

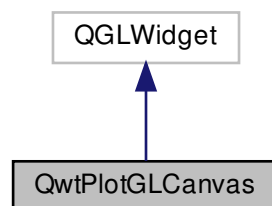
[Attribute](#), [setAttribute\(\)](#)

12.72 QwtPlotGLCanvas Class Reference

An alternative canvas for a [QwtPlot](#) derived from QGLWidget.

```
#include <qwt_plot_glc canvas.h>
```

Inheritance diagram for QwtPlotGLCanvas:



Public Types

- enum [Shadow](#) { [Plain](#) = QFrame::Plain, [Raised](#) = QFrame::Raised, [Sunken](#) = QFrame::Sunken }
Frame shadow.
- enum [Shape](#) { **NoFrame** = QFrame::NoFrame, **Box** = QFrame::Box, **Panel** = QFrame::Panel }
Frame shape.

Public Slots

- void [replot](#) ()
Calls repaint()

Public Member Functions

- [QwtPlotGLCanvas](#) ([QwtPlot](#) **parent*)
Constructor.
- virtual [~QwtPlotGLCanvas](#) ()
Destructor.
- void [setFrameStyle](#) (int *style*)
- int [frameStyle](#) () const
- void [setFrameShadow](#) ([Shadow](#))
- [Shadow](#) [frameShadow](#) () const
- void [setFrameShape](#) ([Shape](#))
- [Shape](#) [frameShape](#) () const
- void [setLineWidth](#) (int)
- int [lineWidth](#) () const
- void [setMidLineWidth](#) (int)
- int [midLineWidth](#) () const
- int [frameWidth](#) () const
- QRect [frameRect](#) () const
- Q_INVOKABLE QPainterPath [borderPath](#) (const QRect &) const
- virtual bool [event](#) (QEvent *)

Protected Member Functions

- virtual void [paintEvent](#) (QPaintEvent *)
- virtual void [drawBackground](#) (QPainter *)
- virtual void [drawBorder](#) (QPainter *)
- virtual void [drawItems](#) (QPainter *)

12.72.1 Detailed Description

An alternative canvas for a [QwtPlot](#) derived from QGLWidget.

[QwtPlotGLCanvas](#) implements the very basics to act as canvas inside of a [QwtPlot](#) widget. It might be extended to a full featured alternative to [QwtPlotCanvas](#) in a future version of Qwt.

Even if [QwtPlotGLCanvas](#) is not derived from QFrame it imitates its API. When using style sheets it supports the box model - beside backgrounds with rounded borders.

See also

[QwtPlot::setCanvas\(\)](#), [QwtPlotCanvas](#)

Note

With Qt4 you might want to use the QPaintEngine::OpenGL paint engine (see [QGL::setPreferredPaintEngine\(\)](#)). On a Linux test system QPaintEngine::OpenGL2 shows very basic problems like translated geometries.

12.72.2 Member Enumeration Documentation

12.72.2.1 Shadow

```
enum QwtPlotGLCanvas::Shadow
```

Frame shadow.

Unfortunately it is not possible to use QFrame::Shadow as a property of a widget that is not derived from QFrame. The following enum is made for the designer only. It is safe to use QFrame::Shadow instead.

Enumerator

Plain	QFrame::Plain.
Raised	QFrame::Raised.
Sunken	QFrame::Sunken.

12.72.2.2 Shape

```
enum QwtPlotGLCanvas::Shape
```

Frame shape.

Unfortunately it is not possible to use `QFrame::Shape` as a property of a widget that is not derived from `QFrame`. The following enum is made for the designer only. It is safe to use `QFrame::Shadow` instead.

Note

`QFrame::StyledPanel` and `QFrame::WinPanel` are unsupported and will be displayed as `QFrame::Panel`.

12.72.3 Constructor & Destructor Documentation

12.72.3.1 QwtPlotGLCanvas()

```
QwtPlotGLCanvas::QwtPlotGLCanvas (
    QwtPlot * plot = NULL ) [explicit]
```

Constructor.

Parameters

<i>plot</i>	Parent plot widget
-------------	--------------------

See also

[QwtPlot::setCanvas\(\)](#)

12.72.4 Member Function Documentation

12.72.4.1 borderPath()

```
QPainterPath QwtPlotGLCanvas::borderPath (
    const QRect & rect ) const
```

Returns

Empty path

12.72.4.2 drawBackground()

```
void QwtPlotGLCanvas::drawBackground (
    QPainter * painter )    [protected], [virtual]
```

Draw the background of the canvas

Parameters

<i>painter</i>	Painter
----------------	---------

12.72.4.3 drawBorder()

```
void QwtPlotGLCanvas::drawBorder (
    QPainter * painter )    [protected], [virtual]
```

Draw the border of the canvas

Parameters

<i>painter</i>	Painter
----------------	---------

12.72.4.4 drawItems()

```
void QwtPlotGLCanvas::drawItems (
    QPainter * painter )    [protected], [virtual]
```

Draw the plot items

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[QwtPlot::drawCanvas\(\)](#)

12.72.4.5 event()

```
bool QwtPlotGLCanvas::event (
    QEvent * event )    [virtual]
```

Qt event handler for QEvent::PolishRequest and QEvent::StyleChange

Parameters

<i>event</i>	Qt Event
--------------	----------

Returns

See QGLWidget::event()

12.72.4.6 frameRect()

```
QRect QwtPlotGLCanvas::frameRect ( ) const
```

Returns

The rectangle where the frame is drawn in.

12.72.4.7 frameShadow()

```
QwtPlotGLCanvas::Shadow QwtPlotGLCanvas::frameShadow ( ) const
```

Returns

Frame shadow

See also

[setFrameShadow\(\)](#), [QFrame::setFrameShadow\(\)](#)

12.72.4.8 frameShape()

```
QwtPlotGLCanvas::Shape QwtPlotGLCanvas::frameShape ( ) const
```

Returns

Frame shape

See also

[setFrameShape\(\)](#), [QFrame::frameShape\(\)](#)

12.72.4.9 `frameStyle()`

```
int QwtPlotGLCanvas::frameStyle ( ) const
```

Returns

The bitwise OR between a [frameShape\(\)](#) and a [frameShadow\(\)](#)

See also

[setFrameStyle\(\)](#), [QFrame::frameStyle\(\)](#)

12.72.4.10 `frameWidth()`

```
int QwtPlotGLCanvas::frameWidth ( ) const
```

Returns

Frame width depending on the style, line width and midline width.

12.72.4.11 `lineWidth()`

```
int QwtPlotGLCanvas::lineWidth ( ) const
```

Returns

Line width of the frame

See also

[setLineWidth\(\)](#), [midLineWidth\(\)](#)

12.72.4.12 `midLineWidth()`

```
int QwtPlotGLCanvas::midLineWidth ( ) const
```

Returns

Midline width of the frame

See also

[setMidLineWidth\(\)](#), [lineWidth\(\)](#)

12.72.4.13 `paintEvent()`

```
void QwtPlotGLCanvas::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Paint event

Parameters

<i>event</i>	Paint event
--------------	-------------

See also[QwtPlot::drawCanvas\(\)](#)**12.72.4.14 setFrameShadow()**

```
void QwtPlotGLCanvas::setFrameShadow (
    Shadow shadow )
```

Set the frame shadow

Parameters

<i>shadow</i>	Frame shadow
---------------	--------------

See also[frameShadow\(\)](#), [setFrameShape\(\)](#), [QFrame::setFrameShadow\(\)](#)**12.72.4.15 setFrameShape()**

```
void QwtPlotGLCanvas::setFrameShape (
    Shape shape )
```

Set the frame shape

Parameters

<i>shape</i>	Frame shape
--------------	-------------

See also[frameShape\(\)](#), [setFrameShadow\(\)](#), [QFrame::frameShape\(\)](#)**12.72.4.16 setFrameStyle()**

```
void QwtPlotGLCanvas::setFrameStyle (
    int style )
```

Set the frame style

Parameters

<i>style</i>	The bitwise OR between a shape and a shadow.
--------------	--

See also

[frameStyle\(\)](#), [QFrame::setFrameStyle\(\)](#), [setFrameShadow\(\)](#), [setFrameShape\(\)](#)

12.72.4.17 `setLineWidth()`

```
void QwtPlotGLCanvas::setLineWidth (
    int width )
```

Set the frame line width

The default line width is 2 pixels.

Parameters

<i>width</i>	Line width of the frame
--------------	-------------------------

See also

[lineWidth\(\)](#), [setMidLineWidth\(\)](#)

12.72.4.18 `setMidLineWidth()`

```
void QwtPlotGLCanvas::setMidLineWidth (
    int width )
```

Set the frame mid line width

The default midline width is 0 pixels.

Parameters

<i>width</i>	Midline width of the frame
--------------	----------------------------

See also

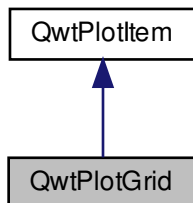
[midLineWidth\(\)](#), [setLineWidth\(\)](#)

12.73 QwtPlotGrid Class Reference

A class which draws a coordinate grid.

```
#include <qwt_plot_grid.h>
```

Inheritance diagram for QwtPlotGrid:



Public Member Functions

- [QwtPlotGrid](#) ()
Enables major grid, disables minor grid.
- virtual [~QwtPlotGrid](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [enableX](#) (bool)
Enable or disable vertical grid lines.
- bool [xEnabled](#) () const
- void [enableY](#) (bool)
Enable or disable horizontal grid lines.
- bool [yEnabled](#) () const
- void [enableXMin](#) (bool)
Enable or disable minor vertical grid lines.
- bool [xMinEnabled](#) () const
- void [enableYMin](#) (bool)
Enable or disable minor horizontal grid lines.
- bool [yMinEnabled](#) () const
- void [setXDiv](#) (const [QwtScaleDiv](#) &)
- const [QwtScaleDiv](#) & [xScaleDiv](#) () const
- void [setYDiv](#) (const [QwtScaleDiv](#) &)
- const [QwtScaleDiv](#) & [yScaleDiv](#) () const
- void [setPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setPen](#) (const QPen &)
- void [setMajorPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setMajorPen](#) (const QPen &)
- const QPen & [majorPen](#) () const
- void [setMinorPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setMinorPen](#) (const QPen &)
- const QPen & [minorPen](#) () const
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect) const
Draw the grid.
- virtual void [updateScaleDiv](#) (const [QwtScaleDiv](#) &xScaleDiv, const [QwtScaleDiv](#) &yScaleDiv)

Additional Inherited Members

12.73.1 Detailed Description

A class which draws a coordinate grid.

The [QwtPlotGrid](#) class can be used to draw a coordinate grid. A coordinate grid consists of major and minor vertical and horizontal grid lines. The locations of the grid lines are determined by the X and Y scale divisions which can be assigned with [setXDiv\(\)](#) and [setYDiv\(\)](#). The [draw\(\)](#) member draws the grid within a bounding rectangle.

12.73.2 Member Function Documentation

12.73.2.1 draw()

```
void QwtPlotGrid::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the grid.

The grid is drawn into the bounding rectangle such that grid lines begin and end at the rectangle's borders. The X and Y maps are used to map the scale divisions into the drawing region screen.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	X axis map
<i>yMap</i>	Y axis
<i>canvasRect</i>	Contents rectangle of the plot canvas

Implements [QwtPlotItem](#).

12.73.2.2 enableX()

```
void QwtPlotGrid::enableX (
    bool on )
```

Enable or disable vertical grid lines.

Parameters

<i>on</i>	Enable (true) or disable
-----------	--------------------------

See also

Minor grid lines can be enabled or disabled with [enableXMin\(\)](#)

12.73.2.3 enableXMin()

```
void QwtPlotGrid::enableXMin (
    bool on )
```

Enable or disable minor vertical grid lines.

Parameters

<i>on</i>	Enable (true) or disable
-----------	--------------------------

See also

[enableX\(\)](#)

12.73.2.4 enableY()

```
void QwtPlotGrid::enableY (
    bool on )
```

Enable or disable horizontal grid lines.

Parameters

<i>on</i>	Enable (true) or disable
-----------	--------------------------

See also

Minor grid lines can be enabled or disabled with [enableYMin\(\)](#)

12.73.2.5 enableYMin()

```
void QwtPlotGrid::enableYMin (
    bool on )
```

Enable or disable minor horizontal grid lines.

Parameters

<i>on</i>	Enable (true) or disable
-----------	--------------------------

See also

[enableY\(\)](#)

12.73.2.6 majorPen()

```
const QPen & QwtPlotGrid::majorPen ( ) const
```

Returns

the pen for the major grid lines

See also

[setMajorPen\(\)](#), [setMinorPen\(\)](#), [setPen\(\)](#)

12.73.2.7 minorPen()

```
const QPen & QwtPlotGrid::minorPen ( ) const
```

Returns

the pen for the minor grid lines

See also

[setMinorPen\(\)](#), [setMajorPen\(\)](#), [setPen\(\)](#)

12.73.2.8 rtti()

```
int QwtPlotGrid::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotGrid](#)

Reimplemented from [QwtPlotItem](#).

12.73.2.9 setMajorPen() [1/2]

```
void QwtPlotGrid::setMajorPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen for both major grid lines

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see [QPen::isCosmetic\(\)](#)). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.73.2.10 setMajorPen() [2/2]

```
void QwtPlotGrid::setMajorPen (
    const QPen & pen )
```

Assign a pen for the major grid lines

Parameters

<i>pen</i>	Pen
------------	-----

See also

[majorPen\(\)](#), [setMinorPen\(\)](#), [setPen\(\)](#)

12.73.2.11 setMinorPen() [1/2]

```
void QwtPlotGrid::setMinorPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen for the minor grid lines

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see [QPen::isCosmetic\(\)](#)). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.73.2.12 setMinorPen() [2/2]

```
void QwtPlotGrid::setMinorPen (
    const QPen & pen )
```

Assign a pen for the minor grid lines

Parameters

<i>pen</i>	Pen
------------	-----

See also

[minorPen\(\)](#), [setMajorPen\(\)](#), [setPen\(\)](#)

12.73.2.13 setPen() [1/2]

```
void QwtPlotGrid::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen for both major and minor grid lines

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see `QPen::isCosmetic()`). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.73.2.14 setPen() [2/2]

```
void QwtPlotGrid::setPen (
    const QPen & pen )
```

Assign a pen for both major and minor grid lines

Parameters

<i>pen</i>	Pen
------------	-----

See also

[setMajorPen\(\)](#), [setMinorPen\(\)](#)

12.73.2.15 setXDiv()

```
void QwtPlotGrid::setXDiv (
    const QwtScaleDiv & scaleDiv )
```

Assign an x axis scale division

Parameters

<i>scaleDiv</i>	Scale division
-----------------	----------------

12.73.2.16 setYDiv()

```
void QwtPlotGrid::setYDiv (
    const QwtScaleDiv & scaleDiv )
```

Assign a y axis division

Parameters

<i>scaleDiv</i>	Scale division
-----------------	----------------

12.73.2.17 updateScaleDiv()

```
void QwtPlotGrid::updateScaleDiv (
    const QwtScaleDiv & xScaleDiv,
    const QwtScaleDiv & yScaleDiv ) [virtual]
```

Update the grid to changes of the axes scale division

Parameters

<i>xScaleDiv</i>	Scale division of the x-axis
<i>yScaleDiv</i>	Scale division of the y-axis

See also

[QwtPlot::updateAxes\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.73.2.18 xEnabled()

```
bool QwtPlotGrid::xEnabled ( ) const
```

Returns

true if vertical grid lines are enabled

See also

[enableX\(\)](#)

12.73.2.19 xMinEnabled()

```
bool QwtPlotGrid::xMinEnabled ( ) const
```

Returns

true if minor vertical grid lines are enabled

See also

[enableXMin\(\)](#)

12.73.2.20 xScaleDiv()

```
const QwtScaleDiv & QwtPlotGrid::xScaleDiv ( ) const
```

Returns

the scale division of the x axis

12.73.2.21 `yEnabled()`

```
bool QwtPlotGrid::yEnabled ( ) const
```

Returns

true if horizontal grid lines are enabled

See also

[enableY\(\)](#)

12.73.2.22 `yMinEnabled()`

```
bool QwtPlotGrid::yMinEnabled ( ) const
```

Returns

true if minor horizontal grid lines are enabled

See also

[enableYMin\(\)](#)

12.73.2.23 `yScaleDiv()`

```
const QwtScaleDiv & QwtPlotGrid::yScaleDiv ( ) const
```

Returns

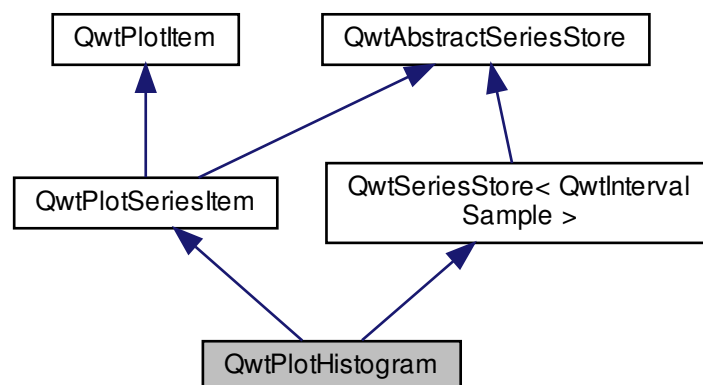
the scale division of the y axis

12.74 **QwtPlotHistogram Class Reference**

[QwtPlotHistogram](#) represents a series of samples, where an interval is associated with a value ($y = f([x_1, x_2])$).

```
#include <qwt_plot_histogram.h>
```

Inheritance diagram for QwtPlotHistogram:



Public Types

- enum [HistogramStyle](#) { [Outline](#), [Columns](#), [Lines](#), [UserStyle](#) = 100 }

Public Member Functions

- [QwtPlotHistogram](#) (const QString &title=QString())
- [QwtPlotHistogram](#) (const [QwtText](#) &title)
- virtual [~QwtPlotHistogram](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setPen](#) (const QPen &)
- const QPen & [pen](#) () const
- void [setBrush](#) (const QBrush &)
- const QBrush & [brush](#) () const
- void [setSamples](#) (const QVector< [QwtIntervalSample](#) > &)
- void [setSamples](#) ([QwtSeriesData](#)< [QwtIntervalSample](#) > *)
- void [setBaseline](#) (double)
Set the value of the baseline.
- double [baseline](#) () const
- void [setStyle](#) ([HistogramStyle](#) style)
- [HistogramStyle](#) [style](#) () const
- void [setSymbol](#) (const [QwtColumnSymbol](#) *)
Assign a symbol.
- const [QwtColumnSymbol](#) * [symbol](#) () const
- virtual void [drawSeries](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
- virtual QRectF [boundingRect](#) () const
- virtual [QwtGraphic legendIcon](#) (int index, const QSizeF &) const

Protected Member Functions

- virtual [QwtColumnRect](#) [columnRect](#) (const [QwtIntervalSample](#) &, const [QwtScaleMap](#) &, const [QwtScaleMap](#) &) const
- virtual void [drawColumn](#) (QPainter *, const [QwtColumnRect](#) &, const [QwtIntervalSample](#) &) const
- void [drawColumns](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, int from, int to) const
- void [drawOutline](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, int from, int to) const
- void [drawLines](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, int from, int to) const

12.74.1 Detailed Description

[QwtPlotHistogram](#) represents a series of samples, where an interval is associated with a value ($y = f([x_1, x_2])$).

The representation depends on the [style\(\)](#) and an optional [symbol\(\)](#) that is displayed for each interval.

Note

The term "histogram" is used in a different way in the areas of digital image processing and statistics. Wikipedia introduces the terms "image histogram" and "color histogram" to avoid confusions. While "image histograms" can be displayed by a [QwtPlotCurve](#) there is no applicable plot item for a "color histogram" yet.

See also

[QwtPlotBarChart](#), [QwtPlotMultiBarChart](#)

12.74.2 Member Enumeration Documentation

12.74.2.1 HistogramStyle

```
enum QwtPlotHistogram::HistogramStyle
```

Histogram styles. The default style is [QwtPlotHistogram::Columns](#).

See also

[setStyle\(\)](#), [style\(\)](#), [setSymbol\(\)](#), [symbol\(\)](#), [setBaseline\(\)](#)

Enumerator

Outline	Draw an outline around the area, that is build by all intervals using the pen() and fill it with the brush() . The outline style requires, that the intervals are in increasing order and not overlapping.
Columns	Draw a column for each interval. When a symbol() has been set the symbol is used otherwise the column is displayed as plain rectangle using pen() and brush() .
Lines	Draw a simple line using the pen() for each interval.
UserStyle	Styles \geq UserStyle are reserved for derived classes that overload drawSeries() with additional application specific ways to display a histogram.

12.74.3 Constructor & Destructor Documentation

12.74.3.1 QwtPlotHistogram() [1/2]

```
QwtPlotHistogram::QwtPlotHistogram (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the histogram.
--------------	-------------------------

12.74.3.2 QwtPlotHistogram() [2/2]

```
QwtPlotHistogram::QwtPlotHistogram (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the histogram.
--------------	-------------------------

12.74.4 Member Function Documentation

12.74.4.1 baseline()

```
double QwtPlotHistogram::baseline ( ) const
```

Returns

Value of the baseline

See also

[setBaseline\(\)](#)

12.74.4.2 boundingRect()

```
QRectF QwtPlotHistogram::boundingRect ( ) const [virtual]
```

Returns

Bounding rectangle of all samples. For an empty series the rectangle is invalid.

Reimplemented from [QwtPlotSeriesItem](#).

12.74.4.3 brush()

```
const QBrush & QwtPlotHistogram::brush ( ) const
```

Returns

Brush used in a [style\(\)](#) depending way.

See also

[setPen\(\)](#), [brush\(\)](#)

12.74.4.4 columnRect()

```
QwtColumnRect QwtPlotHistogram::columnRect (
    const QwtIntervalSample & sample,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap ) const [protected], [virtual]
```

Calculate the area that is covered by a sample

Parameters

<i>sample</i>	Sample
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.

Returns

Rectangle, that is covered by a sample

12.74.4.5 drawColumn()

```
void QwtPlotHistogram::drawColumn (
    QPainter * painter,
    const QwtColumnRect & rect,
    const QwtIntervalSample & sample ) const [protected], [virtual]
```

Draw a column for a sample in Columns [style\(\)](#).

When a [symbol\(\)](#) has been set the symbol is used otherwise the column is displayed as plain rectangle using [pen\(\)](#) and [brush\(\)](#).

Parameters

<i>painter</i>	Painter
<i>rect</i>	Rectangle where to paint the column in paint device coordinates
<i>sample</i>	Sample to be displayed

Note

In applications, where different intervals need to be displayed in a different way (f.e different colors or even using different symbols) it is recommended to overload [drawColumn\(\)](#).

12.74.4.6 drawColumns()

```
void QwtPlotHistogram::drawColumns (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    int from,
    int to ) const [protected]
```

Draw a histogram in Columns [style\(\)](#)

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If to < 0 the histogram will be painted to its last point.

See also

[setStyle\(\)](#), [style\(\)](#), [setSymbol\(\)](#), [drawColumn\(\)](#)

12.74.4.7 drawLines()

```
void QwtPlotHistogram::drawLines (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    int from,
    int to ) const [protected]
```

Draw a histogram in Lines [style\(\)](#)

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If to < 0 the histogram will be painted to its last point.

See also

[setStyle\(\)](#), [style\(\)](#), [setPen\(\)](#)

12.74.4.8 drawOutline()

```
void QwtPlotHistogram::drawOutline (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    int from,
    int to ) const [protected]
```

Draw a histogram in Outline [style\(\)](#)

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If to < 0 the histogram will be painted to its last point.

See also

[setStyle\(\)](#), [style\(\)](#)

Warning

The outline style requires, that the intervals are in increasing order and not overlapping.

12.74.4.9 drawSeries()

```
void QwtPlotHistogram::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw a subset of the histogram samples

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If to < 0 the series will be painted to its last sample.

See also

[drawOutline\(\)](#), [drawLines\(\)](#), [drawColumns](#)

Implements [QwtPlotSeriesItem](#).

12.74.4.10 legendIcon()

```
QwtGraphic QwtPlotHistogram::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

A plain rectangle without pen using the [brush\(\)](#)

Parameters

<i>index</i>	Index of the legend entry (ignored as there is only one)
<i>size</i>	Icon size

Returns

A graphic displaying the icon

See also

[QwtPlotItem::setLegendIconSize\(\)](#), [QwtPlotItem::legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.74.4.11 pen()

```
const QPen & QwtPlotHistogram::pen ( ) const
```

Returns

Pen used in a [style\(\)](#) depending way.

See also

[setPen\(\)](#), [brush\(\)](#)

12.74.4.12 rtti()

```
int QwtPlotHistogram::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotHistogram](#)

Reimplemented from [QwtPlotItem](#).

12.74.4.13 setBaseline()

```
void QwtPlotHistogram::setBaseline (
    double value )
```

Set the value of the baseline.

Each column representing an [QwtIntervalSample](#) is defined by its interval and the interval between baseline and the value of the sample.

The default value of the baseline is 0.0.

Parameters

<i>value</i>	Value of the baseline
--------------	-----------------------

See also

[baseline\(\)](#)

12.74.4.14 **setBrush()**

```
void QwtPlotHistogram::setBrush (
    const QBrush & brush )
```

Assign a brush, that is used in a [style\(\)](#) depending way.

Parameters

<i>brush</i>	New brush
--------------	-----------

See also

[pen\(\)](#), [brush\(\)](#)

12.74.4.15 **setPen()** [1/2]

```
void QwtPlotHistogram::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see `QPen::isCosmetic()`). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.74.4.16 setPen() [2/2]

```
void QwtPlotHistogram::setPen (
    const QPen & pen )
```

Assign a pen, that is used in a [style\(\)](#) depending way.

Parameters

<i>pen</i>	New pen
------------	---------

See also

[pen\(\)](#), [brush\(\)](#)

12.74.4.17 setSamples() [1/2]

```
void QwtPlotHistogram::setSamples (
    const QVector< QwtIntervalSample > & samples )
```

Initialize data with an array of samples.

Parameters

<i>samples</i>	Vector of points
----------------	------------------

12.74.4.18 setSamples() [2/2]

```
void QwtPlotHistogram::setSamples (
    QwtSeriesData< QwtIntervalSample > * data )
```

Assign a series of samples

[setSamples\(\)](#) is just a wrapper for [setData\(\)](#) without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.74.4.19 `setStyle()`

```
void QwtPlotHistogram::setStyle (
    HistogramStyle style )
```

Set the histogram's drawing style

Parameters

<i>style</i>	Histogram style
--------------	-----------------

See also

[HistogramStyle](#), [style\(\)](#)

12.74.4.20 `setSymbol()`

```
void QwtPlotHistogram::setSymbol (
    const QwtColumnSymbol * symbol )
```

Assign a symbol.

In Column style an optional symbol can be assigned, that is responsible for displaying the rectangle that is defined by the interval and the distance between [baseline\(\)](#) and value. When no symbol has been defined the area is displayed as plain rectangle using [pen\(\)](#) and [brush\(\)](#).

See also

[style\(\)](#), [symbol\(\)](#), [drawColumn\(\)](#), [pen\(\)](#), [brush\(\)](#)

Note

In applications, where different intervals need to be displayed in a different way (f.e different colors or even using different symbols) it is recommended to overload [drawColumn\(\)](#).

12.74.4.21 `style()`

```
QwtPlotHistogram::HistogramStyle QwtPlotHistogram::style ( ) const
```

Returns

Style of the histogram

See also

[HistogramStyle](#), [setStyle\(\)](#)

12.74.4.22 symbol()

```
const QwtColumnSymbol * QwtPlotHistogram::symbol ( ) const
```

Returns

Current symbol or NULL, when no symbol has been assigned

See also

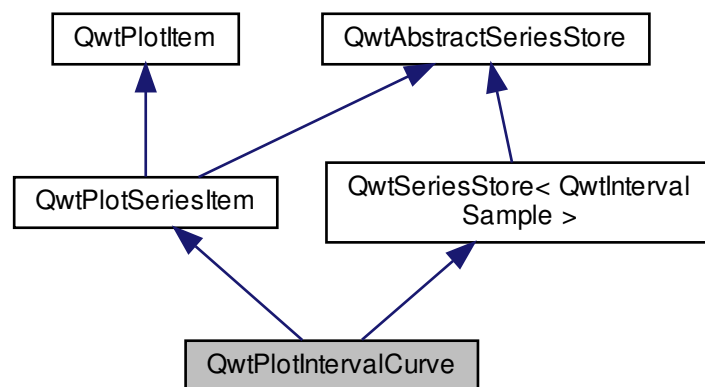
[setSymbol\(\)](#)

12.75 QwtPlotIntervalCurve Class Reference

[QwtPlotIntervalCurve](#) represents a series of samples, where each value is associated with an interval ($[y1, y2] = f(x)$).

```
#include <qwt_plot_intervalcurve.h>
```

Inheritance diagram for QwtPlotIntervalCurve:



Public Types

- enum [CurveStyle](#) { [NoCurve](#), [Tube](#), [UserCurve](#) = 100 }
Curve styles. The default setting is [QwtPlotIntervalCurve::Tube](#).
- enum [PaintAttribute](#) { [ClipPolygons](#) = 0x01, [ClipSymbol](#) = 0x02 }
- typedef QFlags< [PaintAttribute](#) > [PaintAttributes](#)
Paint attributes.

Public Member Functions

- [QwtPlotIntervalCurve](#) (const QString &title=QString())
- [QwtPlotIntervalCurve](#) (const [QwtText](#) &title)
- virtual [~QwtPlotIntervalCurve](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setPaintAttribute](#) ([PaintAttribute](#), bool on=true)
- bool [testPaintAttribute](#) ([PaintAttribute](#)) const
- void [setSamples](#) (const QVector< [QwtIntervalSample](#) > &)
- void [setSamples](#) ([QwtSeriesData](#)< [QwtIntervalSample](#) > *)
- void [setPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setPen](#) (const QPen &)
Assign a pen.
- const QPen & [pen](#) () const
- void [setBrush](#) (const QBrush &)
- const QBrush & [brush](#) () const
- void [setStyle](#) ([CurveStyle](#) style)
- [CurveStyle](#) style () const
- void [setSymbol](#) (const [QwtIntervalSymbol](#) *)
- const [QwtIntervalSymbol](#) * [symbol](#) () const
- virtual void [drawSeries](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
- virtual QRectF [boundingRect](#) () const
- virtual [QwtGraphic legendIcon](#) (int index, const QSizeF &) const

Protected Member Functions

- void [init](#) ()
Initialize internal members.
- virtual void [drawTube](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
- virtual void [drawSymbols](#) (QPainter *, const [QwtIntervalSymbol](#) &, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const

12.75.1 Detailed Description

[QwtPlotIntervalCurve](#) represents a series of samples, where each value is associated with an interval ($[y1, y2] = f(x)$).

The representation depends on the [style\(\)](#) and an optional [symbol\(\)](#) that is displayed for each interval. [QwtPlotIntervalCurve](#) might be used to display error bars or the area between 2 curves.

12.75.2 Member Enumeration Documentation

12.75.2.1 CurveStyle

```
enum QwtPlotIntervalCurve::CurveStyle
```

Curve styles. The default setting is [QwtPlotIntervalCurve::Tube](#).

See also

[setStyle\(\)](#), [style\(\)](#)

Enumerator

NoCurve	Don't draw a curve. Note: This doesn't affect the symbols.
Tube	Build 2 curves from the upper and lower limits of the intervals and draw them with the pen() . The area between the curves is filled with the brush() .
UserCurve	Styles \geq QwtPlotIntervalCurve::UserCurve are reserved for derived classes that overload drawSeries() with additional application specific curve types.

12.75.2.2 PaintAttribute

```
enum QwtPlotIntervalCurve::PaintAttribute
```

Attributes to modify the drawing algorithm.

See also

[setPaintAttribute\(\)](#), [testPaintAttribute\(\)](#)

Enumerator

ClipPolygons	Clip polygons before painting them. In situations, where points are far outside the visible area (f.e when zooming deep) this might be a substantial improvement for the painting performance.
ClipSymbol	Check if a symbol is on the plot canvas before painting it.

12.75.3 Constructor & Destructor Documentation

12.75.3.1 QwtPlotIntervalCurve() [1/2]

```
QwtPlotIntervalCurve::QwtPlotIntervalCurve (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.75.3.2 QwtPlotIntervalCurve() [2/2]

```
QwtPlotIntervalCurve::QwtPlotIntervalCurve (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.75.4 Member Function Documentation

12.75.4.1 boundingRect()

```
QRectF QwtPlotIntervalCurve::boundingRect ( ) const [virtual]
```

Returns

Bounding rectangle of all samples. For an empty series the rectangle is invalid.

Reimplemented from [QwtPlotSeriesItem](#).

12.75.4.2 brush()

```
const QBrush & QwtPlotIntervalCurve::brush ( ) const
```

Returns

Brush used to fill the area in Tube [style\(\)](#)

See also

[setBrush\(\)](#), [setStyle\(\)](#), [CurveStyle](#)

12.75.4.3 drawSeries()

```
void QwtPlotIntervalCurve::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw a subset of the samples

Parameters

<i>painter</i>	Painter	Generated by Doxygen
<i>xMap</i>	Maps x-values into pixel coordinates.	
<i>yMap</i>	Maps y-values into pixel coordinates.	
<i>canvasRect</i>	Contents rectangle of the canvas	
<i>from</i>	Index of the first sample to be painted	
<i>to</i>	Index of the last sample to be painted. If to < 0 the series will be painted to its last sample.	

See also

[drawTube\(\)](#), [drawSymbols\(\)](#)

Implements [QwtPlotSeriesItem](#).

12.75.4.4 drawSymbols()

```
void QwtPlotIntervalCurve::drawSymbols (
    QPainter * painter,
    const QwtIntervalSymbol & symbol,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw symbols for a subset of the samples

Parameters

<i>painter</i>	Painter
<i>symbol</i>	Interval symbol
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted

See also

[setSymbol\(\)](#), [drawSeries\(\)](#), [drawTube\(\)](#)

12.75.4.5 drawTube()

```
void QwtPlotIntervalCurve::drawTube (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw a tube

Builds 2 curves from the upper and lower limits of the intervals and draws them with the [pen\(\)](#). The area between the curves is filled with the [brush\(\)](#).

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If <i>to</i> < 0 the series will be painted to its last sample.

See also

[drawSeries\(\)](#), [drawSymbols\(\)](#)

12.75.4.6 `legendIcon()`

```
QwtGraphic QwtPlotIntervalCurve::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

Icon for the legend

In case of Tube [style\(\)](#) the icon is a plain rectangle filled with the [brush\(\)](#). If a symbol is assigned it is scaled to size.

Parameters

<i>index</i>	Index of the legend entry (ignored as there is only one)
<i>size</i>	Icon size

See also

[QwtPlotItem::setLegendIconSize\(\)](#), [QwtPlotItem::legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.75.4.7 `pen()`

```
const QPen & QwtPlotIntervalCurve::pen ( ) const
```

Returns

Pen used to draw the lines

See also

[setPen\(\)](#), [brush\(\)](#)

12.75.4.8 rtti()

```
int QwtPlotIntervalCurve::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotIntervalCurve](#)

Reimplemented from [QwtPlotItem](#).

12.75.4.9 setBrush()

```
void QwtPlotIntervalCurve::setBrush (
    const QBrush & brush )
```

Assign a brush.

The brush is used to fill the area in Tube [style\(\)](#).

Parameters

<i>brush</i>	Brush
--------------	-------

See also

[brush\(\)](#), [pen\(\)](#), [setStyle\(\)](#), [CurveStyle](#)

12.75.4.10 setPaintAttribute()

```
void QwtPlotIntervalCurve::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```

Specify an attribute how to draw the curve

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off

See also

[testPaintAttribute\(\)](#)

12.75.4.11 setPen() [1/2]

```
void QwtPlotIntervalCurve::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see QPen::isCosmetic()). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.75.4.12 setPen() [2/2]

```
void QwtPlotIntervalCurve::setPen (
    const QPen & pen )
```

Assign a pen.

Parameters

<i>pen</i>	New pen
------------	---------

See also

[pen\(\)](#), [brush\(\)](#)

12.75.4.13 setSamples() [1/2]

```
void QwtPlotIntervalCurve::setSamples (
    const QVector< QwtIntervalSample > & samples )
```

Initialize data with an array of samples.

Parameters

<i>samples</i>	Vector of samples
----------------	-------------------

12.75.4.14 setSamples() [2/2]

```
void QwtPlotIntervalCurve::setSamples (
    QwtSeriesData< QwtIntervalSample > * data )
```

Assign a series of samples

[setSamples\(\)](#) is just a wrapper for [setData\(\)](#) without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.75.4.15 setStyle()

```
void QwtPlotIntervalCurve::setStyle (
    CurveStyle style )
```

Set the curve's drawing style

Parameters

<i>style</i>	Curve style
--------------	-------------

See also

[CurveStyle](#), [style\(\)](#)

12.75.4.16 setSymbol()

```
void QwtPlotIntervalCurve::setSymbol (
    const QwtIntervalSymbol * symbol )
```

Assign a symbol.

Parameters

<i>symbol</i>	Symbol
---------------	--------

See also

[symbol\(\)](#)

12.75.4.17 style()

```
QwtPlotIntervalCurve::CurveStyle QwtPlotIntervalCurve::style ( ) const
```

Returns

Style of the curve

See also

[setStyle\(\)](#)

12.75.4.18 symbol()

```
const QwtIntervalSymbol * QwtPlotIntervalCurve::symbol ( ) const
```

Returns

Current symbol or NULL, when no symbol has been assigned

See also

[setSymbol\(\)](#)

12.75.4.19 testPaintAttribute()

```
bool QwtPlotIntervalCurve::testPaintAttribute (
    PaintAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

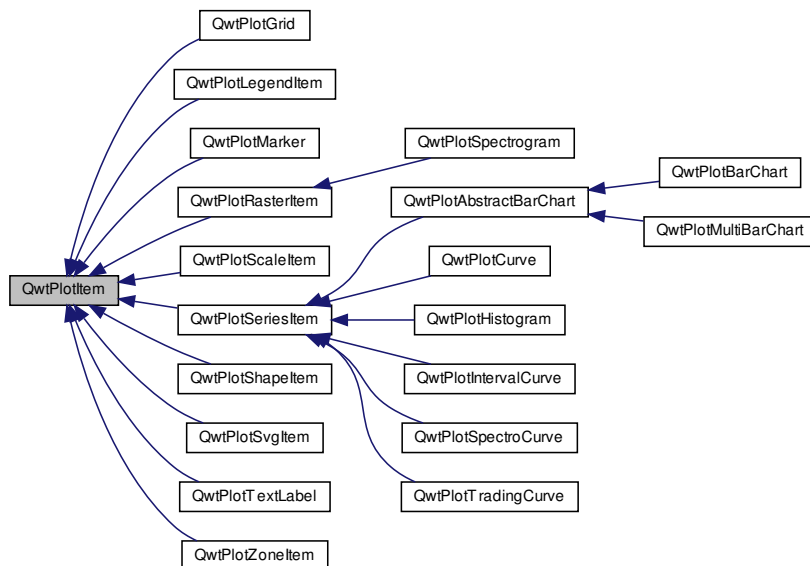
[PaintAttribute](#), [setPaintAttribute\(\)](#)

12.76 QwtPlotItem Class Reference

Base class for items on the plot canvas.

```
#include <qwt_plot_item.h>
```

Inheritance diagram for QwtPlotItem:



Public Types

- enum [RttiValues](#) {
[Rtti_PlotItem](#) = 0, [Rtti_PlotGrid](#), [Rtti_PlotScale](#), [Rtti_PlotLegend](#),
[Rtti_PlotMarker](#), [Rtti_PlotCurve](#), [Rtti_PlotSpectroCurve](#), [Rtti_PlotIntervalCurve](#),
[Rtti_PlotHistogram](#), [Rtti_PlotSpectrogram](#), [Rtti_PlotSVG](#), [Rtti_PlotTradingCurve](#),
[Rtti_PlotBarChart](#), [Rtti_PlotMultiBarChart](#), [Rtti_PlotShape](#), [Rtti_PlotTextLabel](#),
[Rtti_PlotZone](#), [Rtti_PlotUserItem](#) = 1000 }

Runtime type information.

- enum [ItemAttribute](#) { [Legend](#) = 0x01, [AutoScale](#) = 0x02, [Margins](#) = 0x04 }

Plot Item Attributes.

- enum [ItemInterest](#) { [ScaleInterest](#) = 0x01, [LegendInterest](#) = 0x02 }

Plot Item Interests.

- enum [RenderHint](#) { [RenderAntialiased](#) = 0x1 }

Render hints.

- typedef QFlags< [ItemAttribute](#) > [ItemAttributes](#)

Plot Item Attributes.

- typedef QFlags< [ItemInterest](#) > [ItemInterests](#)

Plot Item Interests.

- typedef QFlags< [RenderHint](#) > [RenderHints](#)

Render hints.

Public Member Functions

- [QwtPlotItem](#) (const [QwtText](#) &title=[QwtText](#)())
- virtual [~QwtPlotItem](#) ()
Destroy the [QwtPlotItem](#).
- void [attach](#) ([QwtPlot](#) *plot)
Attach the item to a plot.
- void [detach](#) ()
This method detaches a [QwtPlotItem](#) from any [QwtPlot](#) it has been associated with.
- [QwtPlot](#) * [plot](#) () const
Return attached plot.
- void [setTitle](#) (const [QString](#) &title)
- void [setTitle](#) (const [QwtText](#) &title)
- const [QwtText](#) & [title](#) () const
- virtual int [rtti](#) () const
- void [setItemAttribute](#) ([ItemAttribute](#), bool on=true)
- bool [testItemAttribute](#) ([ItemAttribute](#)) const
- void [setItemInterest](#) ([ItemInterest](#), bool on=true)
- bool [testItemInterest](#) ([ItemInterest](#)) const
- void [setRenderHint](#) ([RenderHint](#), bool on=true)
- bool [testRenderHint](#) ([RenderHint](#)) const
- void [setRenderThreadCount](#) (uint numThreads)
- uint [renderThreadCount](#) () const
- void [setLegendIconSize](#) (const [QSize](#) &)
- [QSize](#) [legendIconSize](#) () const
- double [z](#) () const
- void [setZ](#) (double [z](#))
Set the z value.
- void [show](#) ()
Show the item.
- void [hide](#) ()
Hide the item.
- virtual void [setVisible](#) (bool)
- bool [isVisible](#) () const
- void [setAxes](#) (int [xAxis](#), int [yAxis](#))
- void [setXAxis](#) (int axis)
- int [xAxis](#) () const
Return xAxis.
- void [setYAxis](#) (int axis)
- int [yAxis](#) () const
Return yAxis.
- virtual void [itemChanged](#) ()
- virtual void [legendChanged](#) ()
- virtual void [draw](#) ([QPainter](#) *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QRectF](#) &canvasRect) const =0
Draw the item.
- virtual [QRectF](#) [boundingRect](#) () const
- virtual void [getCanvasMarginHint](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QRectF](#) &canvasRect, double &left, double &top, double &right, double &bottom) const
Calculate a hint for the canvas margin.
- virtual void [updateScaleDiv](#) (const [QwtScaleDiv](#) &, const [QwtScaleDiv](#) &)
Update the item to changes of the axes scale division.
- virtual void [updateLegend](#) (const [QwtPlotItem](#) *, const [QList](#)< [QwtLegendData](#) > &)

Update the item to changes of the legend info.

- `QRectF scaleRect` (const [QwtScaleMap](#) &, const [QwtScaleMap](#) &) const

Calculate the bounding scale rectangle of 2 maps.

- `QRectF paintRect` (const [QwtScaleMap](#) &, const [QwtScaleMap](#) &) const

Calculate the bounding paint rectangle of 2 maps.

- virtual `QList< QwtLegendData > legendData` () const

Return all information, that is needed to represent the item on the legend.

- virtual `QwtGraphic legendIcon` (int index, const `QSizeF` &) const

Protected Member Functions

- `QwtGraphic defaultIcon` (const `QBrush` &, const `QSizeF` &) const

Return a default icon from a brush.

12.76.1 Detailed Description

Base class for items on the plot canvas.

A plot item is "something", that can be painted on the plot canvas, or only affects the scales of the plot widget. They can be categorized as:

- Representator
A "Representator" is an item that represents some sort of data on the plot canvas. The different representator classes are organized according to the characteristics of the data:
 - [QwtPlotMarker](#) Represents a point or a horizontal/vertical coordinate
 - [QwtPlotCurve](#) Represents a series of points
 - [QwtPlotSpectrogram](#) ([QwtPlotRasterItem](#)) Represents raster data
 - ...
- Decorators
A "Decorator" is an item, that displays additional information, that is not related to any data:
 - [QwtPlotGrid](#)
 - [QwtPlotScaleItem](#)
 - [QwtPlotSvgItem](#)
 - ...

Depending on the [QwtPlotItem::ItemAttribute](#) flags, an item is included into autoscaling or has an entry on the legend.

Before misusing the existing item classes it might be better to implement a new type of plot item (don't implement a watermark as spectrogram). Deriving a new type of [QwtPlotItem](#) primarily means to implement the `QwtPlotItem::draw()` method.

See also

The `cpuplot` example shows the implementation of additional [plot](#) items.

12.76.2 Member Enumeration Documentation

12.76.2.1 ItemAttribute

```
enum QwtPlotItem::ItemAttribute
```

Plot Item Attributes.

Various aspects of a plot widget depend on the attributes of the attached plot items. If and how a single plot item participates in these updates depends on its attributes.

See also

[setItemAttribute\(\)](#), [testItemAttribute\(\)](#), [ItemInterest](#)

Enumerator

Legend	The item is represented on the legend.
AutoScale	The boundingRect() of the item is included in the autoscaling calculation as long as its width or height is ≥ 0.0 .
Margins	The item needs extra space to display something outside its bounding rectangle. See also getCanvasMarginHint()

12.76.2.2 ItemInterest

```
enum QwtPlotItem::ItemInterest
```

Plot Item Interests.

Plot items might depend on the situation of the corresponding plot widget. By enabling an interest the plot item will be notified, when the corresponding attribute of the plot widgets has changed.

See also

[setItemAttribute\(\)](#), [testItemAttribute\(\)](#), [ItemInterest](#)

Enumerator

ScaleInterest	The item is interested in updates of the scales See also updateScaleDiv()
---------------	---

Enumerator

LegendInterest	<p>The item is interested in updates of the legend (of other items) This flag is intended for items, that want to implement a legend for displaying entries of other plot item.</p> <p>Note</p> <p>If the plot item wants to be represented on a legend enable QwtPlotItem::Legend instead.</p> <p>See also</p> <p>updateLegend()</p>
----------------	---

12.76.2.3 RenderHint

```
enum QwtPlotItem::RenderHint
```

Render hints.

Enumerator

RenderAntialiased	Enable antialiasing.
-------------------	----------------------

12.76.2.4 RttiValues

```
enum QwtPlotItem::RttiValues
```

Runtime type information.

RttiValues is used to cast plot items, without having to enable runtime type information of the compiler.

Enumerator

Rtti_PlotItem	Unspecific value, that can be used, when it doesn't matter.
Rtti_PlotGrid	For QwtPlotGrid .
Rtti_PlotScale	For QwtPlotScaleItem .
Rtti_PlotLegend	For QwtPlotLegendItem .
Rtti_PlotMarker	For QwtPlotMarker .
Rtti_PlotCurve	For QwtPlotCurve .
Rtti_PlotSpectroCurve	For QwtPlotSpectroCurve .
Rtti_PlotIntervalCurve	For QwtPlotIntervalCurve .
Rtti_PlotHistogram	For QwtPlotHistogram .
Rtti_PlotSpectrogram	For QwtPlotSpectrogram .
Rtti_PlotSVG	For QwtPlotSvgItem .
Rtti_PlotTradingCurve	For QwtPlotTradingCurve .
Rtti_PlotBarChart	For QwtPlotBarChart .
Rtti_PlotMultiBarChart	For QwtPlotMultiBarChart .

Enumerator

Rtti_PlotShape	For QwtPlotShapelItem .
Rtti_PlotTextLabel	For QwtPlotTextLabel .
Rtti_PlotZone	For QwtPlotZoneItem .
Rtti_PlotUserItem	Values \geq Rtti_PlotUserItem are reserved for plot items not implemented in the Qwt library.

12.76.3 Constructor & Destructor Documentation

12.76.3.1 QwtPlotItem()

```
QwtPlotItem::QwtPlotItem (
    const QwtText & title = QwtText\(\) ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the item
--------------	-------------------

12.76.4 Member Function Documentation

12.76.4.1 attach()

```
void QwtPlotItem::attach (
    QwtPlot * plot )
```

Attach the item to a plot.

This method will attach a [QwtPlotItem](#) to the [QwtPlot](#) argument. It will first detach the [QwtPlotItem](#) from any plot from a previous call to attach (if necessary). If a NULL argument is passed, it will detach from any [QwtPlot](#) it was attached to.

Parameters

<i>plot</i>	Plot widget
-------------	-------------

See also

[detach\(\)](#)

12.76.4.2 boundingRect()

```
QRectF QwtPlotItem::boundingRect ( ) const [virtual]
```

Returns

An invalid bounding rect: QRectF(1.0, 1.0, -2.0, -2.0)

Note

A width or height < 0.0 is ignored by the autoscaler

Reimplemented in [QwtPlotTradingCurve](#), [QwtPlotMarker](#), [QwtPlotIntervalCurve](#), [QwtPlotHistogram](#), [QwtPlotRasterItem](#), [QwtPlotShapelItem](#), [QwtPlotBarChart](#), [QwtPlotMultiBarChart](#), [QwtPlotZonItem](#), [QwtPlotSeriesItem](#), and [QwtPlotSvgItem](#).

12.76.4.3 defaultIcon()

```
QwtGraphic QwtPlotItem::defaultIcon (
    const QBrush & brush,
    const QSizeF & size ) const [protected]
```

Return a default icon from a brush.

The default icon is a filled rectangle used in several derived classes as [legendIcon\(\)](#).

Parameters

<i>brush</i>	Fill brush
<i>size</i>	Icon size

Returns

A filled rectangle

12.76.4.4 detach()

```
void QwtPlotItem::detach ( )
```

This method detaches a [QwtPlotItem](#) from any [QwtPlot](#) it has been associated with.

[detach\(\)](#) is equivalent to calling `attach(NULL)`

See also

[attach\(\)](#)

12.76.4.5 draw()

```
virtual void QwtPlotItem::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [pure virtual]
```

Draw the item.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rect of the canvas in painter coordinates

Implemented in [QwtPlotMarker](#), [QwtPlotLegendItem](#), [QwtPlotRasterItem](#), [QwtPlotShapelItem](#), [QwtPlotSpectrogram](#), [QwtPlotScaleItem](#), [QwtPlotGrid](#), [QwtPlotTextLabel](#), [QwtPlotZonItem](#), [QwtPlotSvgItem](#), and [QwtPlotSeriesItem](#).

12.76.4.6 getCanvasMarginHint()

```
void QwtPlotItem::getCanvasMarginHint (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    double & left,
    double & top,
    double & right,
    double & bottom ) const [virtual]
```

Calculate a hint for the canvas margin.

When the [QwtPlotItem::Margins](#) flag is enabled the plot item indicates, that it needs some margins at the borders of the canvas. This is f.e. used by bar charts to reserve space for displaying the bars.

The margins are in target device coordinates (pixels on screen)

Parameters

<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates
<i>left</i>	Returns the left margin
<i>top</i>	Returns the top margin
<i>right</i>	Returns the right margin
<i>bottom</i>	Returns the bottom margin

The default implementation returns 0 for all margins

See also

[QwtPlot::getCanvasMarginsHint\(\)](#), [QwtPlot::updateCanvasMargins\(\)](#)

Reimplemented in [QwtPlotAbstractBarChart](#).

12.76.4.7 isVisible()

```
bool QwtPlotItem::isVisible ( ) const
```

Returns

true if visible

See also

[setVisible\(\)](#), [show\(\)](#), [hide\(\)](#)

12.76.4.8 itemChanged()

```
void QwtPlotItem::itemChanged ( ) [virtual]
```

Update the legend and call [QwtPlot::autoRefresh\(\)](#) for the parent plot.

See also

[QwtPlot::legendChanged\(\)](#), [QwtPlot::autoRefresh\(\)](#)

12.76.4.9 legendChanged()

```
void QwtPlotItem::legendChanged ( ) [virtual]
```

Update the legend of the parent plot.

See also

[QwtPlot::updateLegend\(\)](#), [itemChanged\(\)](#)

12.76.4.10 legendData()

```
QList< QwtLegendData > QwtPlotItem::legendData ( ) const [virtual]
```

Return all information, that is needed to represent the item on the legend.

Most items are represented by one entry on the legend showing an icon and a text, but f.e. [QwtPlotMultiBarChart](#) displays one entry for each bar.

[QwtLegendData](#) is basically a list of QVariants that makes it possible to overload and reimplement [legendData\(\)](#) to return almost any type of information, that is understood by the receiver that acts as the legend.

The default implementation returns one entry with the [title\(\)](#) of the item and the [legendIcon\(\)](#).

Returns

Data, that is needed to represent the item on the legend

See also

[title\(\)](#), [legendIcon\(\)](#), [QwtLegend](#), [QwtPlotLegendItem](#)

Reimplemented in [QwtPlotBarChart](#), and [QwtPlotMultiBarChart](#).

12.76.4.11 legendIcon()

```
QwtGraphic QwtPlotItem::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

Icon representing the item on the legend

The default implementation returns an invalid icon

Parameters

<i>index</i>	Index of the legend entry (usually there is only one)
<i>size</i>	Icon size

See also

[setLegendIconSize\(\)](#), [legendData\(\)](#)

Reimplemented in [QwtPlotCurve](#), [QwtPlotTradingCurve](#), [QwtPlotMarker](#), [QwtPlotIntervalCurve](#), [QwtPlotHistogram](#), [QwtPlotBarChart](#), [QwtPlotShapeltem](#), and [QwtPlotMultiBarChart](#).

12.76.4.12 legendIconSize()

```
QSize QwtPlotItem::legendIconSize ( ) const
```

Returns

Legend icon size

See also

[setLegendIconSize\(\)](#), [legendIcon\(\)](#)

12.76.4.13 paintRect()

```
QRectF QwtPlotItem::paintRect (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap ) const
```

Calculate the bounding paint rectangle of 2 maps.

Parameters

<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.

Returns

Bounding paint rectangle of the scale maps, not normalized

12.76.4.14 renderThreadCount()

```
uint QwtPlotItem::renderThreadCount ( ) const
```

Returns

Number of threads to be used for rendering. If numThreads() is set to 0, the system specific ideal thread count is used.

12.76.4.15 rtti()

```
int QwtPlotItem::rtti ( ) const [virtual]
```

Return rtti for the specific class represented. [QwtPlotItem](#) is simply a virtual interface class, and base classes will implement this method with specific rtti values so a user can differentiate them.

The rtti value is useful for environments, where the runtime type information is disabled and it is not possible to do a `dynamic_cast<...>`.

Returns

rtti value

See also

[RttiValues](#)

Reimplemented in [QwtPlotCurve](#), [QwtPlotTradingCurve](#), [QwtPlotShapelItem](#), [QwtPlotSpectrogram](#), [QwtPlotIntervalCurve](#), [QwtPlotHistogram](#), [QwtPlotMarker](#), [QwtPlotBarChart](#), [QwtPlotMultiBarChart](#), [QwtPlotLegendItem](#), [QwtPlotScaleItem](#), [QwtPlotTextLabel](#), [QwtPlotSpectroCurve](#), [QwtPlotSvgItem](#), [QwtPlotGrid](#), and [QwtPlotZonItem](#).

12.76.4.16 scaleRect()

```
QRectF QwtPlotItem::scaleRect (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap ) const
```

Calculate the bounding scale rectangle of 2 maps.

Parameters

<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.

Returns

Bounding scale rect of the scale maps, not normalized

12.76.4.17 setAxes()

```
void QwtPlotItem::setAxes (
    int xAxis,
    int yAxis )
```

Set X and Y axis

The item will painted according to the coordinates of its Axes.

Parameters

<i>xAxis</i>	X Axis (QwtPlot::xBottom or QwtPlot::xTop)
<i>yAxis</i>	Y Axis (QwtPlot::yLeft or QwtPlot::yRight)

See also

[setXAxis\(\)](#), [setYAxis\(\)](#), [xAxis\(\)](#), [yAxis\(\)](#), [QwtPlot::Axis](#)

12.76.4.18 setItemAttribute()

```
void QwtPlotItem::setItemAttribute (
    ItemAttribute attribute,
    bool on = true )
```

Toggle an item attribute

Parameters

<i>attribute</i>	Attribute type
<i>on</i>	true/false

See also

[testItemAttribute\(\)](#), [ItemInterest](#)

12.76.4.19 setItemInterest()

```
void QwtPlotItem::setItemInterest (
    ItemInterest interest,
    bool on = true )
```

Toggle an item interest

Parameters

<i>interest</i>	Interest type
<i>on</i>	true/false

See also

[testItemInterest\(\)](#), [ItemAttribute](#)

12.76.4.20 setLegendIconSize()

```
void QwtPlotItem::setLegendIconSize (
    const QSize & size )
```

Set the size of the legend icon

The default setting is 8x8 pixels

Parameters

<i>size</i>	Size
-------------	------

See also

[legendIconSize\(\)](#), [legendIcon\(\)](#)

12.76.4.21 `setRenderHint()`

```
void QwtPlotItem::setRenderHint (
    RenderHint hint,
    bool on = true )
```

Toggle an render hint

Parameters

<i>hint</i>	Render hint
<i>on</i>	true/false

See also

[testRenderHint\(\)](#), [RenderHint](#)

12.76.4.22 `setRenderThreadCount()`

```
void QwtPlotItem::setRenderThreadCount (
    uint numThreads )
```

On multi core systems rendering of certain plot item (f.e [QwtPlotRasterItem](#)) can be done in parallel in several threads.

The default setting is set to 1.

Parameters

<i>numThreads</i>	Number of threads to be used for rendering. If numThreads is set to 0, the system specific ideal thread count is used.
-------------------	--

The default thread count is 1 (= no additional threads)

12.76.4.23 `setTitle()` [1/2]

```
void QwtPlotItem::setTitle (
    const QString & title )
```

Set a new title

Parameters

<i>title</i>	Title
--------------	-------

See also

[title\(\)](#)

12.76.4.24 setTitle() [2/2]

```
void QwtPlotItem::setTitle (
    const QwtText & title )
```

Set a new title

Parameters

<i>title</i>	Title
--------------	-------

See also

[title\(\)](#)

12.76.4.25 setVisible()

```
void QwtPlotItem::setVisible (
    bool on ) [virtual]
```

Show/Hide the item

Parameters

<i>on</i>	Show if true, otherwise hide
-----------	------------------------------

See also

[isVisible\(\)](#), [show\(\)](#), [hide\(\)](#)

12.76.4.26 setXAxis()

```
void QwtPlotItem::setXAxis (
    int axis )
```

Set the X axis

The item will painted according to the coordinates its Axes.

Parameters

<i>axis</i>	X Axis (QwtPlot::xBottom or QwtPlot::xTop)
-------------	--

See also

[setAxes\(\)](#), [setYAxis\(\)](#), [xAxis\(\)](#), [QwtPlot::Axis](#)

12.76.4.27 `setYAxis()`

```
void QwtPlotItem::setYAxis (
    int axis )
```

Set the Y axis

The item will painted according to the coordinates its Axes.

Parameters

<i>axis</i>	Y Axis (QwtPlot::yLeft or QwtPlot::yRight)
-------------	--

See also

[setAxes\(\)](#), [setXAxis\(\)](#), [yAxis\(\)](#), [QwtPlot::Axis](#)

12.76.4.28 `setZ()`

```
void QwtPlotItem::setZ (
    double z )
```

Set the z value.

Plot items are painted in increasing z-order.

Parameters

<i>z</i>	Z-value
----------	---------

See also

[z\(\)](#), [QwtPlotDict::itemList\(\)](#)

12.76.4.29 `testItemAttribute()`

```
bool QwtPlotItem::testItemAttribute (
    ItemAttribute attribute ) const
```

Test an item attribute

Parameters

<i>attribute</i>	Attribute type
------------------	----------------

Returns

true/false

See also

[setItemAttribute\(\)](#), [ItemInterest](#)

12.76.4.30 testItemInterest()

```
bool QwtPlotItem::testItemInterest (
    ItemInterest interest ) const
```

Test an item interest

Parameters

<i>interest</i>	Interest type
-----------------	---------------

Returns

true/false

See also

[setItemInterest\(\)](#), [ItemAttribute](#)

12.76.4.31 testRenderHint()

```
bool QwtPlotItem::testRenderHint (
    RenderHint hint ) const
```

Test a render hint

Parameters

<i>hint</i>	Render hint
-------------	-------------

Returns

true/false

See also

[setRenderHint\(\)](#), [RenderHint](#)

12.76.4.32 title()

```
const QwtText & QwtPlotItem::title ( ) const
```

Returns

Title of the item

See also

[setTitle\(\)](#)

12.76.4.33 updateLegend()

```
void QwtPlotItem::updateLegend (
    const QwtPlotItem * item,
    const QList< QwtLegendData > & data ) [virtual]
```

Update the item to changes of the legend info.

Plot items that want to display a legend (not those, that want to be displayed on a legend !) will have to implement [updateLegend\(\)](#).

[updateLegend\(\)](#) is only called when the LegendInterest interest is enabled. The default implementation does nothing.

Parameters

<i>item</i>	Plot item to be displayed on a legend
<i>data</i>	Attributes how to display item on the legend

See also

[QwtPlotLegendItem](#)

Note

Plot items, that want to be displayed on a legend need to enable the [QwtPlotItem::Legend](#) flag and to implement [legendData\(\)](#) and [legendIcon\(\)](#)

Reimplemented in [QwtPlotLegendItem](#).

12.76.4.34 updateScaleDiv()

```
void QwtPlotItem::updateScaleDiv (
    const QwtScaleDiv & xScaleDiv,
    const QwtScaleDiv & yScaleDiv ) [virtual]
```

Update the item to changes of the axes scale division.

Update the item, when the axes of plot have changed. The default implementation does nothing, but items that depend on the scale division (like [QwtPlotGrid\(\)](#)) have to reimplement [updateScaleDiv\(\)](#)

[updateScaleDiv\(\)](#) is only called when the ScaleInterest interest is enabled. The default implementation does nothing.

Parameters

<i>xScaleDiv</i>	Scale division of the x-axis
<i>yScaleDiv</i>	Scale division of the y-axis

See also

[QwtPlot::updateAxes\(\)](#), [ScaleInterest](#)

Reimplemented in [QwtPlotScaleItem](#), [QwtPlotGrid](#), and [QwtPlotSeriesItem](#).

12.76.4.35 z()

```
double QwtPlotItem::z ( ) const
```

Plot items are painted in increasing z-order.

Returns

[setZ\(\)](#), [QwtPlotDict::itemList\(\)](#)

12.77 QwtPlotLayout Class Reference

Layout engine for [QwtPlot](#).

```
#include <qwt_plot_layout.h>
```

Public Types

- enum [Option](#) {
[AlignScales](#) = 0x01, [IgnoreScrollbars](#) = 0x02, [IgnoreFrames](#) = 0x04, [IgnoreLegend](#) = 0x08,
[IgnoreTitle](#) = 0x10, [IgnoreFooter](#) = 0x20 }
- typedef QFlags< [Option](#) > [Options](#)
Layout options.

Public Member Functions

- [QwtPlotLayout](#) ()
Constructor.
- virtual [~QwtPlotLayout](#) ()
Destructor.
- void [setCanvasMargin](#) (int margin, int axis=-1)
- int [canvasMargin](#) (int axisId) const
- void [setAlignCanvasToScales](#) (bool)
Set the align-canvas-to-axis-scales flag for all axes.
- void [setAlignCanvasToScale](#) (int axisId, bool)
- bool [alignCanvasToScale](#) (int axisId) const
- void [setSpacing](#) (int)
- int [spacing](#) () const
- void [setLegendPosition](#) (QwtPlot::LegendPosition pos, double ratio)
Specify the position of the legend.
- void [setLegendPosition](#) (QwtPlot::LegendPosition pos)
Specify the position of the legend.
- [QwtPlot::LegendPosition legendPosition](#) () const
- void [setLegendRatio](#) (double ratio)
- double [legendRatio](#) () const
- virtual QSize [minimumSizeHint](#) (const [QwtPlot](#) *) const
- virtual void [activate](#) (const [QwtPlot](#) *, const QRectF &plotRect, [Options](#) options=0x00)
Recalculate the geometry of all components.
- virtual void [invalidate](#) ()
- QRectF [titleRect](#) () const
- QRectF [footerRect](#) () const
- QRectF [legendRect](#) () const
- QRectF [scaleRect](#) (int axis) const
- QRectF [canvasRect](#) () const

Protected Member Functions

- void [setTitleRect](#) (const QRectF &)
Set the geometry for the title.
- void [setFooterRect](#) (const QRectF &)
Set the geometry for the footer.
- void [setLegendRect](#) (const QRectF &)
Set the geometry for the legend.
- void [setScaleRect](#) (int axis, const QRectF &)
Set the geometry for an axis.
- void [setCanvasRect](#) (const QRectF &)
Set the geometry for the canvas.
- QRectF [layoutLegend](#) ([Options](#) options, const QRectF &) const
- QRectF [alignLegend](#) (const QRectF &[canvasRect](#), const QRectF &[legendRect](#)) const
- void [expandLineBreaks](#) ([Options](#) options, const QRectF &rect, int &dimTitle, int &dimFooter, int dim←
Axes[QwtPlot::axisCnt]) const
- void [alignScales](#) ([Options](#) options, QRectF &[canvasRect](#), QRectF [scaleRect](#)[QwtPlot::axisCnt]) const

12.77.1 Detailed Description

Layout engine for [QwtPlot](#).

It is used by the [QwtPlot](#) widget to organize its internal widgets or by `QwtPlot::print()` to render its content to a `QPaintDevice` like a `QPrinter`, `QPixmap/QImage` or `QSvgRenderer`.

See also

[QwtPlot::setPlotLayout\(\)](#)

12.77.2 Member Enumeration Documentation

12.77.2.1 Option

```
enum QwtPlotLayout::Option
```

Options to configure the plot layout engine

See also

[activate\(\)](#), [QwtPlotRenderer](#)

Enumerator

<code>AlignScales</code>	Unused.
<code>IgnoreScrollbars</code>	Ignore the dimension of the scrollbars. There are no scrollbars, when the plot is not rendered to widgets.
<code>IgnoreFrames</code>	Ignore all frames.
<code>IgnoreLegend</code>	Ignore the legend.
<code>IgnoreTitle</code>	Ignore the title.
<code>IgnoreFooter</code>	Ignore the footer.

12.77.3 Member Function Documentation

12.77.3.1 `activate()`

```
void QwtPlotLayout::activate (
    const QwtPlot * plot,
    const QRectF & plotRect,
    Options options = 0x00 ) [virtual]
```

Recalculate the geometry of all components.

Parameters

<i>plot</i>	Plot to be layout
<i>plotRect</i>	Rectangle where to place the components
<i>options</i>	Layout options

See also

[invalidate\(\)](#), [titleRect\(\)](#), [footerRect\(\)](#), [legendRect\(\)](#), [scaleRect\(\)](#), [canvasRect\(\)](#)

12.77.3.2 alignCanvasToScale()

```
bool QwtPlotLayout::alignCanvasToScale (
    int axisId ) const
```

Return the align-canvas-to-axis-scales setting. The canvas may:

- extend beyond the axis scale ends to maximize its size
- align with the axis scale ends to control its size.

Parameters

<i>axisId</i>	Axis index
---------------	------------

Returns

align-canvas-to-axis-scales setting

See also

[setAlignCanvasToScale\(\)](#), [setAlignCanvasToScale\(\)](#), [setCanvasMargin\(\)](#)

12.77.3.3 alignLegend()

```
QRectF QwtPlotLayout::alignLegend (
    const QRectF & canvasRect,
    const QRectF & legendRect ) const [protected]
```

Align the legend to the canvas

Parameters

<i>canvasRect</i>	Geometry of the canvas
<i>legendRect</i>	Maximum geometry for the legend

Returns

Geometry for the aligned legend

12.77.3.4 alignScales()

```
void QwtPlotLayout::alignScales (
    Options options,
    QRectF & canvasRect,
    QRectF scaleRect[QwtPlot::axisCnt] ) const [protected]
```

Align the ticks of the axis to the canvas borders using the empty corners.

Parameters

<i>options</i>	Layout options
<i>canvasRect</i>	Geometry of the canvas (IN/OUT)
<i>scaleRect</i>	Geometries of the scales (IN/OUT)

See also

[Options](#)

12.77.3.5 canvasMargin()

```
int QwtPlotLayout::canvasMargin (
    int axisId ) const
```

Parameters

<i>axisId</i>	Axis index
---------------	------------

Returns

Margin around the scale tick borders

See also

[setCanvasMargin\(\)](#)

12.77.3.6 canvasRect()

```
QRectF QwtPlotLayout::canvasRect ( ) const
```

Returns

Geometry for the canvas

See also

[activate\(\)](#), [invalidate\(\)](#)

12.77.3.7 expandLineBreaks()

```
void QwtPlotLayout::expandLineBreaks (
    Options options,
    const QRectF & rect,
    int & dimTitle,
    int & dimFooter,
    int dimAxes[QwtPlot::axisCnt] ) const [protected]
```

Expand all line breaks in text labels, and calculate the height of their widgets in orientation of the text.

Parameters

<i>options</i>	Options how to layout the legend
<i>rect</i>	Bounding rectangle for title, footer, axes and canvas.
<i>dimTitle</i>	Expanded height of the title widget
<i>dimFooter</i>	Expanded height of the footer widget
<i>dimAxes</i>	Expanded heights of the axis in axis orientation.

See also

[Options](#)

12.77.3.8 footerRect()

```
QRectF QwtPlotLayout::footerRect ( ) const
```

Returns

Geometry for the footer

See also

[activate\(\)](#), [invalidate\(\)](#)

12.77.3.9 invalidate()

```
void QwtPlotLayout::invalidate ( ) [virtual]
```

Invalidate the geometry of all components.

See also

[activate\(\)](#)

12.77.3.10 layoutLegend()

```
QRectF QwtPlotLayout::layoutLegend (
    Options options,
    const QRectF & rect ) const [protected]
```

Find the geometry for the legend

Parameters

<i>options</i>	Options how to layout the legend
<i>rect</i>	Rectangle where to place the legend

Returns

Geometry for the legend

See also

[Options](#)

12.77.3.11 legendPosition()

```
QwtPlot::LegendPosition QwtPlotLayout::legendPosition ( ) const
```

Returns

Position of the legend

See also

[setLegendPosition\(\)](#), [QwtPlot::setLegendPosition\(\)](#), [QwtPlot::legendPosition\(\)](#)

12.77.3.12 legendRatio()

```
double QwtPlotLayout::legendRatio ( ) const
```

Returns

The relative size of the legend in the plot.

See also

[setLegendPosition\(\)](#)

12.77.3.13 legendRect()

```
QRectF QwtPlotLayout::legendRect ( ) const
```

Returns

Geometry for the legend

See also

[activate\(\)](#), [invalidate\(\)](#)

12.77.3.14 minimumSizeHint()

```
QSize QwtPlotLayout::minimumSizeHint (
    const QwtPlot * plot ) const [virtual]
```

Returns

Minimum size hint

Parameters

<i>plot</i>	Plot widget
-------------	-------------

See also

[QwtPlot::minimumSizeHint\(\)](#)

12.77.3.15 scaleRect()

```
QRectF QwtPlotLayout::scaleRect (
    int axis ) const
```


Parameters

<i>axis</i>	Axis index
-------------	------------

Returns

Geometry for the scale

See also

[activate\(\)](#), [invalidate\(\)](#)

12.77.3.16 `setAlignCanvasToScale()`

```
void QwtPlotLayout::setAlignCanvasToScale (
    int axisId,
    bool on )
```

Change the align-canvas-to-axis-scales setting. The canvas may:

- extend beyond the axis scale ends to maximize its size,
- align with the axis scale ends to control its size.

The *axisId* parameter is somehow confusing as it identifies a border of the plot and not the axes, that are aligned. F.e when [QwtPlot::yLeft](#) is set, the left end of the the x-axes ([QwtPlot::xTop](#), [QwtPlot::xBottom](#)) is aligned.

Parameters

<i>axisId</i>	Axis index
<i>on</i>	New align-canvas-to-axis-scales setting

See also

[setCanvasMargin\(\)](#), [alignCanvasToScale\(\)](#), [setAlignCanvasToScales\(\)](#)

Warning

In case of `on == true` [canvasMargin\(\)](#) will have no effect

12.77.3.17 `setAlignCanvasToScales()`

```
void QwtPlotLayout::setAlignCanvasToScales (
    bool on )
```

Set the align-canvas-to-axis-scales flag for all axes.

Parameters

<i>on</i>	True/False
-----------	------------

See also

[setAlignCanvasToScale\(\)](#), [alignCanvasToScale\(\)](#)

12.77.3.18 `setCanvasMargin()`

```
void QwtPlotLayout::setCanvasMargin (
    int margin,
    int axis = -1 )
```

Change a margin of the canvas. The margin is the space above/below the scale ticks. A negative margin will be set to -1, excluding the borders of the scales.

Parameters

<i>margin</i>	New margin
<i>axis</i>	One of QwtPlot::Axis . Specifies where the position of the margin. -1 means margin at all borders.

See also

[canvasMargin\(\)](#)

Warning

The margin will have no effect when [alignCanvasToScale\(\)](#) is true

12.77.3.19 `setCanvasRect()`

```
void QwtPlotLayout::setCanvasRect (
    const QRectF & rect ) [protected]
```

Set the geometry for the canvas.

This method is intended to be used from derived layouts overloading [activate\(\)](#)

See also

[canvasRect\(\)](#), [activate\(\)](#)

12.77.3.20 setFooterRect()

```
void QwtPlotLayout::setFooterRect (
    const QRectF & rect ) [protected]
```

Set the geometry for the footer.

This method is intended to be used from derived layouts overloading [activate\(\)](#)

See also

[footerRect\(\)](#), [activate\(\)](#)

12.77.3.21 setLegendPosition() [1/2]

```
void QwtPlotLayout::setLegendPosition (
    QwtPlot::LegendPosition pos,
    double ratio )
```

Specify the position of the legend.

Parameters

<i>pos</i>	The legend's position.
<i>ratio</i>	Ratio between legend and the bounding rectangle of title, footer, canvas and axes. The legend will be shrunk if it would need more space than the given ratio. The ratio is limited to]0.0 .. 1.0]. In case of <= 0.0 it will be reset to the default ratio. The default vertical/horizontal ratio is 0.33/0.5.

See also

[QwtPlot::setLegendPosition\(\)](#)

12.77.3.22 setLegendPosition() [2/2]

```
void QwtPlotLayout::setLegendPosition (
    QwtPlot::LegendPosition pos )
```

Specify the position of the legend.

Parameters

<i>pos</i>	The legend's position. Valid values are QwtPlot::LeftLegend , QwtPlot::RightLegend , QwtPlot::TopLegend , QwtPlot::BottomLegend .
------------	---

See also

[QwtPlot::setLegendPosition\(\)](#)

12.77.3.23 setLegendRatio()

```
void QwtPlotLayout::setLegendRatio (
    double ratio )
```

Specify the relative size of the legend in the plot

Parameters

<i>ratio</i>	Ratio between legend and the bounding rectangle of title, footer, canvas and axes. The legend will be shrunk if it would need more space than the given ratio. The ratio is limited to]0.0 .. 1.0]. In case of ≤ 0.0 it will be reset to the default ratio. The default vertical/horizontal ratio is 0.33/0.5.
--------------	--

12.77.3.24 setLegendRect()

```
void QwtPlotLayout::setLegendRect (
    const QRectF & rect ) [protected]
```

Set the geometry for the legend.

This method is intended to be used from derived layouts overloading [activate\(\)](#)

Parameters

<i>rect</i>	Rectangle for the legend
-------------	--------------------------

See also

[legendRect\(\)](#), [activate\(\)](#)

12.77.3.25 setScaleRect()

```
void QwtPlotLayout::setScaleRect (
    int axis,
    const QRectF & rect ) [protected]
```

Set the geometry for an axis.

This method is intended to be used from derived layouts overloading [activate\(\)](#)

Parameters

<i>axis</i>	Axis index
<i>rect</i>	Rectangle for the scale

See also

[scaleRect\(\)](#), [activate\(\)](#)

12.77.3.26 setSpacing()

```
void QwtPlotLayout::setSpacing (
    int spacing )
```

Change the spacing of the plot. The spacing is the distance between the plot components.

Parameters

<i>spacing</i>	New spacing
----------------	-------------

See also

[setCanvasMargin\(\)](#), [spacing\(\)](#)

12.77.3.27 setTitleRect()

```
void QwtPlotLayout::setTitleRect (
    const QRectF & rect ) [protected]
```

Set the geometry for the title.

This method is intended to be used from derived layouts overloading [activate\(\)](#)

See also

[titleRect\(\)](#), [activate\(\)](#)

12.77.3.28 spacing()

```
int QwtPlotLayout::spacing ( ) const
```

Returns

Spacing

See also

[margin\(\)](#), [setSpacing\(\)](#)

12.77.3.29 titleRect()

```
QRectF QwtPlotLayout::titleRect ( ) const
```

Returns

Geometry for the title

See also

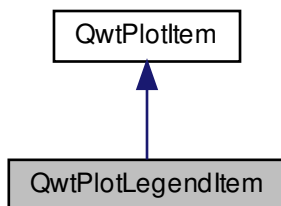
[activate\(\)](#), [invalidate\(\)](#)

12.78 QwtPlotLegendItem Class Reference

A class which draws a legend inside the plot canvas.

```
#include <qwt_plot_legenditem.h>
```

Inheritance diagram for QwtPlotLegendItem:



Public Types

- enum [BackgroundMode](#) { [LegendBackground](#), [ItemBackground](#) }
Background mode.

Public Member Functions

- [QwtPlotLegendItem](#) ()
Constructor.
- virtual [~QwtPlotLegendItem](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setAlignment](#) (Qt::Alignment)
Set the alignmnet.
- Qt::Alignment [alignment](#) () const
- void [setMaxColumns](#) (uint)

Limit the number of columns.

- uint [maxColumns](#) () const
- void [setMargin](#) (int)

Set the margin around legend items.

- int [margin](#) () const
- void [setSpacing](#) (int)

Set the spacing between the legend items.

- int [spacing](#) () const
- void [setItemMargin](#) (int)
- int [itemMargin](#) () const
- void [setItemSpacing](#) (int)
- int [itemSpacing](#) () const
- void [setFont](#) (const QFont &)
- QFont [font](#) () const
- void [setBorderDistance](#) (int)

Set the margin between the legend and the canvas border.

- int [borderDistance](#) () const
- void [setBorderRadius](#) (double)
- double [borderRadius](#) () const
- void [setBorderPen](#) (const QPen &)
- QPen [borderPen](#) () const
- void [setBackgroundBrush](#) (const QBrush &)

Set the background brush.

- QBrush [backgroundBrush](#) () const
- void [setBackgroundMode](#) (BackgroundMode)

Set the background mode.

- BackgroundMode [backgroundMode](#) () const
- void [setTextPen](#) (const QPen &)

Set the pen for drawing text labels.

- QPen [textPen](#) () const
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect) const
- void [clearLegend](#) ()

Remove all items from the legend.

- virtual void [updateLegend](#) (const [QwtPlotItem](#) *, const QList< [QwtLegendData](#) > &)
- virtual QRect [geometry](#) (const QRectF &canvasRect) const
- virtual QSize [minimumSize](#) (const [QwtLegendData](#) &) const
- virtual int [heightForWidth](#) (const [QwtLegendData](#) &, int width) const
- QList< const [QwtPlotItem](#) * > [plotItems](#) () const
- QList< QRect > [legendGeometries](#) (const [QwtPlotItem](#) *) const

Protected Member Functions

- virtual void [drawLegendData](#) (QPainter *painter, const [QwtPlotItem](#) *, const [QwtLegendData](#) &, const QRectF &) const
- virtual void [drawBackground](#) (QPainter *, const QRectF &rect) const

12.78.1 Detailed Description

A class which draws a legend inside the plot canvas.

[QwtPlotLegendItem](#) can be used to draw a inside the plot canvas. It can be used together with a [QwtLegend](#) or instead of it to have more space for the plot canvas.

In opposite to [QwtLegend](#) the legend item is not interactive. To identify mouse clicks on a legend item an event filter needs to be installed catching mouse events ob the plot canvas. The geometries of the legend items are available using [legendGeometries\(\)](#).

The legend item is aligned to plot canvas according to its [alignment\(\)](#) flags. It might have a background for the complete legend (usually semi transparent) or for each legend item.

Note

An external [QwtLegend](#) with a transparent background on top the plot canvas might be another option with a similar effect.

12.78.2 Member Enumeration Documentation

12.78.2.1 BackgroundMode

```
enum QwtPlotLegendItem::BackgroundMode
```

Background mode.

Depending on the mode the complete legend or each item might have an background.

The default setting is LegendBackground.

See also

[setBackgroundMode\(\)](#), [setBackgroundBrush\(\)](#), [drawBackground\(\)](#)

Enumerator

LegendBackground	The legend has a background.
ItemBackground	Each item has a background.

12.78.3 Member Function Documentation

12.78.3.1 alignment()

```
Qt::Alignment QwtPlotLegendItem::alignment ( ) const
```


Returns

Alignment flags

See also

[setAlignment\(\)](#)

12.78.3.2 backgroundBrush()

```
QBrush QwtPlotLegendItem::backgroundBrush ( ) const
```

Returns

Brush is used to fill the background

See also

[setBackgroundBrush\(\)](#), [backgroundMode\(\)](#), [drawBackground\(\)](#)

12.78.3.3 backgroundMode()

```
QwtPlotLegendItem::BackgroundMode QwtPlotLegendItem::backgroundMode ( ) const
```

Returns

backgroundMode

See also

[setBackgroundMode\(\)](#), [backgroundBrush\(\)](#), [drawBackground\(\)](#)

12.78.3.4 borderDistance()

```
int QwtPlotLegendItem::borderDistance ( ) const
```

Returns

Margin between the legend and the canvas border

See also

[margin\(\)](#)

12.78.3.5 borderPen()

```
QPen QwtPlotLegendItem::borderPen ( ) const
```

Returns

Pen for drawing the border

See also

[setBorderPen\(\)](#), [backgroundBrush\(\)](#)

12.78.3.6 borderRadius()

```
double QwtPlotLegendItem::borderRadius ( ) const
```

Returns

Radius of the border

See also

[setBorderRadius\(\)](#), [setBorderPen\(\)](#)

12.78.3.7 draw()

```
void QwtPlotLegendItem::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the legend

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x Scale Map
<i>yMap</i>	y Scale Map
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates

Implements [QwtPlotItem](#).

12.78.3.8 drawBackground()

```
void QwtPlotLegendItem::drawBackground (
    QPainter * painter,
    const QRectF & rect ) const [protected], [virtual]
```

Draw a rounded rect

Parameters

<i>painter</i>	Painter
<i>rect</i>	Bounding rectangle

See also

[setBorderRadius\(\)](#), [setBorderPen\(\)](#), [setBackgroundBrush\(\)](#), [setBackgroundMode\(\)](#)

12.78.3.9 drawLegendData()

```
void QwtPlotLegendItem::drawLegendData (
    QPainter * painter,
    const QwtPlotItem * plotItem,
    const QwtLegendData & data,
    const QRectF & rect ) const [protected], [virtual]
```

Draw an entry on the legend

Parameters

<i>painter</i>	Qt Painter
<i>plotItem</i>	Plot item, represented by the entry
<i>data</i>	Attributes of the legend entry
<i>rect</i>	Bounding rectangle for the entry

12.78.3.10 font()

```
QFont QwtPlotLegendItem::font ( ) const
```

Returns

Font used for drawing the text label

See also

[setFont\(\)](#)

12.78.3.11 geometry()

```
QRect QwtPlotLegendItem::geometry (
    const QRectF & canvasRect ) const [virtual]
```

Calculate the geometry of the legend on the canvas

Parameters

<i>canvasRect</i>	Geometry of the canvas
-------------------	------------------------

Returns

Geometry of the legend

12.78.3.12 heightForWidth()

```
int QwtPlotLegendItem::heightForWidth (
    const QwtLegendData & data,
    int width ) const [virtual]
```

Returns

The preferred height, for a width.

Parameters

<i>data</i>	Attributes of the legend entry
<i>width</i>	Width

12.78.3.13 itemMargin()

```
int QwtPlotLegendItem::itemMargin ( ) const
```

Returns

Margin around each item

See also

[setItemMargin\(\)](#), [itemSpacing\(\)](#), [margin\(\)](#), [spacing\(\)](#)

12.78.3.14 itemSpacing()

```
int QwtPlotLegendItem::itemSpacing ( ) const
```

Returns

Spacing inside of each item

See also

[setItemSpacing\(\)](#), [itemMargin\(\)](#), [margin\(\)](#), [spacing\(\)](#)

12.78.3.15 legendGeometries()

```
QList< QRect > QwtPlotLegendItem::legendGeometries (
    const QwtPlotItem * plotItem ) const
```

Returns

Geometries of the items of a plot item

Note

Usually a plot item has only one entry on the legend

12.78.3.16 margin()

```
int QwtPlotLegendItem::margin ( ) const
```

Returns

Margin around the legend items

See also

[setMargin\(\)](#), [spacing\(\)](#), [itemMargin\(\)](#), [itemSpacing\(\)](#)

12.78.3.17 maxColumns()

```
uint QwtPlotLegendItem::maxColumns ( ) const
```

Returns

Maximum number of columns

See also

[maxColumns\(\)](#), [QwtDynGridLayout::maxColumns\(\)](#)

12.78.3.18 minimumSize()

```
QSize QwtPlotLegendItem::minimumSize (
    const QwtLegendData & data ) const [virtual]
```

Minimum size hint needed to display an entry

Parameters

<i>data</i>	Attributes of the legend entry
-------------	--------------------------------

Returns

Minimum size

12.78.3.19 `plotItems()`

```
QList< const QwtPlotItem *> QwtPlotLegendItem::plotItems ( ) const
```

Returns

All plot items with an entry on the legend

Note

A plot item might have more than one entry on the legend

12.78.3.20 `rtti()`

```
int QwtPlotLegendItem::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotLegend](#)

Reimplemented from [QwtPlotItem](#).

12.78.3.21 `setAlignment()`

```
void QwtPlotLegendItem::setAlignment (
    Qt::Alignment alignment )
```

Set the alignmnet.

Alignment means the position of the legend relative to the geometry of the plot canvas.

Parameters

<i>alignment</i>	Alignment flags
------------------	-----------------

See also

[alignment\(\)](#), [setMaxColumns\(\)](#)

Note

To align a legend with many items horizontally the number of columns need to be limited

12.78.3.22 setBackgroundBrush()

```
void QwtPlotLegendItem::setBackgroundBrush (
    const QBrush & brush )
```

Set the background brush.

The brush is used to fill the background

Parameters

<i>brush</i>	Brush
--------------	-------

See also

[backgroundBrush\(\)](#), [setBackgroundMode\(\)](#), [drawBackground\(\)](#)

12.78.3.23 setBackgroundMode()

```
void QwtPlotLegendItem::setBackgroundMode (
    BackgroundMode mode )
```

Set the background mode.

Depending on the mode the complete legend or each item might have an background.

The default setting is LegendBackground.

See also

[backgroundMode\(\)](#), [setBackgroundBrush\(\)](#), [drawBackground\(\)](#)

12.78.3.24 setBorderDistance()

```
void QwtPlotLegendItem::setBorderDistance (
    int distance )
```

Set the margin between the legend and the canvas border.

The default setting for the margin is 10 pixels.

Parameters

<i>distance</i>	Margin in pixels
-----------------	------------------

See also[setMargin\(\)](#)**12.78.3.25 setBorderPen()**

```
void QwtPlotLegendItem::setBorderPen (
    const QPen & pen )
```

Set the pen for drawing the border

Parameters

<i>pen</i>	Border pen
------------	------------

See also[borderPen\(\)](#), [setBackgroundBrush\(\)](#)**12.78.3.26 setBorderRadius()**

```
void QwtPlotLegendItem::setBorderRadius (
    double radius )
```

Set the radius for the border

Parameters

<i>radius</i>	A value ≤ 0 defines a rectangular border
---------------	---

See also[borderRadius\(\)](#), [setBorderPen\(\)](#)**12.78.3.27 setFont()**

```
void QwtPlotLegendItem::setFont (
    const QFont & font )
```

Change the font used for drawing the text label

Parameters

<i>font</i>	Legend font
-------------	-------------

See also

[font\(\)](#)

12.78.3.28 setItemMargin()

```
void QwtPlotLegendItem::setItemMargin (
    int margin )
```

Set the margin around each item

Parameters

<i>margin</i>	Margin
---------------	--------

See also

[itemMargin\(\)](#), [setItemSpacing\(\)](#), [setMargin\(\)](#), [setSpacing\(\)](#)

12.78.3.29 setItemSpacing()

```
void QwtPlotLegendItem::setItemSpacing (
    int spacing )
```

Set the spacing inside of each item

Parameters

<i>spacing</i>	Spacing
----------------	---------

See also

[itemSpacing\(\)](#), [setItemMargin\(\)](#), [setMargin\(\)](#), [setSpacing\(\)](#)

12.78.3.30 setMargin()

```
void QwtPlotLegendItem::setMargin (
    int margin )
```

Set the margin around legend items.

The default setting for the margin is 0.

Parameters

<i>margin</i>	Margin in pixels
---------------	------------------

See also

[margin\(\)](#), [setSpacing\(\)](#), [setItemMargin\(\)](#), [setItemSpacing\(\)](#)

12.78.3.31 setMaxColumns()

```
void QwtPlotLegendItem::setMaxColumns (
    uint maxColumns )
```

Limit the number of columns.

When aligning the legend horizontally (Qt::AlignLeft, Qt::AlignRight) the number of columns needs to be limited to avoid, that the width of the legend grows with an increasing number of entries.

Parameters

<i>maxColumns</i>	Maximum number of columns. 0 means unlimited.
-------------------	---

See also

[maxColumns\(\)](#), [QwtDynGridLayout::setMaxColumns\(\)](#)

12.78.3.32 setSpacing()

```
void QwtPlotLegendItem::setSpacing (
    int spacing )
```

Set the spacing between the legend items.

Parameters

<i>spacing</i>	Spacing in pixels
----------------	-------------------

See also

[spacing\(\)](#), [setMargin\(\)](#)

12.78.3.33 setTextPen()

```
void QwtPlotLegendItem::setTextPen (
    const QPen & pen )
```

Set the pen for drawing text labels.

Parameters

<i>pen</i>	Text pen
------------	----------

See also

[textPen\(\)](#), [setFont\(\)](#)

12.78.3.34 spacing()

```
int QwtPlotLegendItem::spacing ( ) const
```

Returns

Spacing between the legend items

See also

[setSpacing\(\)](#), [margin\(\)](#), [itemSpacing\(\)](#), [itemMargin\(\)](#)

12.78.3.35 textPen()

```
QPen QwtPlotLegendItem::textPen ( ) const
```

Returns

Pen for drawing text labels

See also

[setTextPen\(\)](#), [font\(\)](#)

12.78.3.36 updateLegend()

```
void QwtPlotLegendItem::updateLegend (
    const QwtPlotItem * plotItem,
    const QList< QwtLegendData > & data ) [virtual]
```

Update the legend items according to modifications of a plot item

Parameters

<i>plotItem</i>	Plot item
<i>data</i>	Attributes of the legend entries

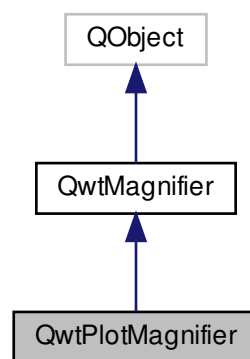
Reimplemented from [QwtPlotItem](#).

12.79 QwtPlotMagnifier Class Reference

[QwtPlotMagnifier](#) provides zooming, by magnifying in steps.

```
#include <qwt_plot_magnifier.h>
```

Inheritance diagram for QwtPlotMagnifier:



Public Member Functions

- [QwtPlotMagnifier](#) (QWidget *)
- virtual [~QwtPlotMagnifier](#) ()
Destructor.
- void [setAxisEnabled](#) (int axis, bool on)
En/Disable an axis.
- bool [isAxisEnabled](#) (int axis) const
- QWidget * [canvas](#) ()
Return observed plot canvas.
- const QWidget * [canvas](#) () const
Return Observed plot canvas.
- [QwtPlot](#) * [plot](#) ()
Return plot widget, containing the observed plot canvas.
- const [QwtPlot](#) * [plot](#) () const
Return plot widget, containing the observed plot canvas.

Protected Member Functions

- virtual void [rescale](#) (double factor)

12.79.1 Detailed Description

[QwtPlotMagnifier](#) provides zooming, by magnifying in steps.

Using [QwtPlotMagnifier](#) a plot can be zoomed in/out in steps using keys, the mouse wheel or moving a mouse button in vertical direction.

Together with [QwtPlotZoomer](#) and [QwtPlotPanner](#) it is possible to implement individual and powerful navigation of the plot canvas.

See also

[QwtPlotZoomer](#), [QwtPlotPanner](#), [QwtPlot](#)

12.79.2 Constructor & Destructor Documentation

12.79.2.1 QwtPlotMagnifier()

```
QwtPlotMagnifier::QwtPlotMagnifier (
    QWidget * canvas ) [explicit]
```

Constructor

Parameters

<i>canvas</i>	Plot canvas to be magnified
---------------	-----------------------------

12.79.3 Member Function Documentation

12.79.3.1 isAxisEnabled()

```
bool QwtPlotMagnifier::isAxisEnabled (
    int axis ) const
```

Test if an axis is enabled

Parameters

<i>axis</i>	Axis, see QwtPlot::Axis
-------------	---

Returns

True, if the axis is enabled

See also

[setAxisEnabled\(\)](#)

12.79.3.2 rescale()

```
void QwtPlotMagnifier::rescale (
    double factor ) [protected], [virtual]
```

Zoom in/out the axes scales

Parameters

<i>factor</i>	A value < 1.0 zooms in, a value > 1.0 zooms out.
---------------	--

Implements [QwtMagnifier](#).

12.79.3.3 setAxisEnabled()

```
void QwtPlotMagnifier::setAxisEnabled (
    int axis,
    bool on )
```

En/Disable an axis.

Only Axes that are enabled will be zoomed. All other axes will remain unchanged.

Parameters

<i>axis</i>	Axis, see QwtPlot::Axis
<i>on</i>	On/Off

See also

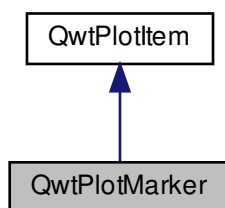
[isAxisEnabled\(\)](#)

12.80 QwtPlotMarker Class Reference

A class for drawing markers.

```
#include <qwt_plot_marker.h>
```

Inheritance diagram for QwtPlotMarker:



Public Types

- enum `LineStyle` { `NoLine`, `HLine`, `VLine`, `Cross` }

Public Member Functions

- `QwtPlotMarker` (const `QString` &`title`=`QString`())
Sets alignment to `Qt::AlignCenter`, and style to `QwtPlotMarker::NoLine`.
- `QwtPlotMarker` (const `QwtText` &`title`)
Sets alignment to `Qt::AlignCenter`, and style to `QwtPlotMarker::NoLine`.
- virtual `~QwtPlotMarker` ()
Destructor.
- virtual int `rtti` () const
- double `xValue` () const
Return x Value.
- double `yValue` () const
Return y Value.
- `QPointF` `value` () const
Return Value.
- void `setXValue` (double)
Set X Value.
- void `setYValue` (double)
Set Y Value.
- void `setValue` (double, double)
Set Value.
- void `setValue` (const `QPointF` &)
Set Value.
- void `setLineStyle` (`LineStyle`)
Set the line style.
- `LineStyle` `lineStyle` () const
- void `setLinePen` (const `QColor` &, qreal width=0.0, `Qt::PenStyle`=`Qt::SolidLine`)
- void `setLinePen` (const `QPen` &)
- const `QPen` & `linePen` () const
- void `setSymbol` (const `QwtSymbol` *)
Assign a symbol.

- const [QwtSymbol](#) * [symbol](#) () const
- void [setLabel](#) (const [QwtText](#) &)
Set the label.
- [QwtText](#) [label](#) () const
- void [setLabelAlignment](#) (Qt::Alignment)
Set the alignment of the label.
- Qt::Alignment [labelAlignment](#) () const
- void [setLabelOrientation](#) (Qt::Orientation)
Set the orientation of the label.
- Qt::Orientation [labelOrientation](#) () const
- void [setSpacing](#) (int)
Set the spacing.
- int [spacing](#) () const
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &) const
- virtual QRectF [boundingRect](#) () const
- virtual [QwtGraphic legendIcon](#) (int index, const QSizeF &) const

Protected Member Functions

- virtual void [drawLines](#) (QPainter *, const QRectF &, const QPointF &) const
- virtual void [drawLabel](#) (QPainter *, const QRectF &, const QPointF &) const

12.80.1 Detailed Description

A class for drawing markers.

A marker can be a horizontal line, a vertical line, a symbol, a label or any combination of them, which can be drawn around a center point inside a bounding rectangle.

The [setSymbol\(\)](#) member assigns a symbol to the marker. The symbol is drawn at the specified point.

With [setLabel\(\)](#), a label can be assigned to the marker. The [setLabelAlignment\(\)](#) member specifies where the label is drawn. All the Align*-constants in Qt::AlignmentFlags (see Qt documentation) are valid. The interpretation of the alignment depends on the marker's line style. The alignment refers to the center point of the marker, which means, for example, that the label would be printed left above the center point if the alignment was set to Qt::AlignLeft | Qt::AlignTop.

Note

[QwtPlotTextLabel](#) is intended to align a text label according to the geometry of canvas (unrelated to plot coordinates)

12.80.2 Member Enumeration Documentation

12.80.2.1 LineStyle

```
enum QwtPlotMarker::LineStyle
```

Line styles.

See also

[setLineStyle\(\)](#), [lineStyle\(\)](#)

Enumerator

NoLine	No line.
HLine	A horizontal line.
VLine	A vertical line.
Cross	A crosshair.

12.80.3 Member Function Documentation

12.80.3.1 boundingRect()

```
QRectF QwtPlotMarker::boundingRect ( ) const [virtual]
```

Returns

An invalid bounding rect: QRectF(1.0, 1.0, -2.0, -2.0)

Note

A width or height < 0.0 is ignored by the autoscaler

Reimplemented from [QwtPlotItem](#).

12.80.3.2 draw()

```
void QwtPlotMarker::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the marker

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x Scale Map
<i>yMap</i>	y Scale Map
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates

Implements [QwtPlotItem](#).

12.80.3.3 drawLabel()

```
void QwtPlotMarker::drawLabel (
    QPainter * painter,
    const QRectF & canvasRect,
    const QPointF & pos ) const [protected], [virtual]
```

Align and draw the text label of the marker

Parameters

<i>painter</i>	Painter
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates
<i>pos</i>	Position of the marker, translated into widget coordinates

See also

[drawLabel\(\)](#), [QwtSymbol::drawSymbol\(\)](#)

12.80.3.4 drawLines()

```
void QwtPlotMarker::drawLines (
    QPainter * painter,
    const QRectF & canvasRect,
    const QPointF & pos ) const [protected], [virtual]
```

Draw the lines marker

Parameters

<i>painter</i>	Painter
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates
<i>pos</i>	Position of the marker, translated into widget coordinates

See also

[drawLabel\(\)](#), [QwtSymbol::drawSymbol\(\)](#)

12.80.3.5 label()

```
QwtText QwtPlotMarker::label ( ) const
```

Returns

the label

See also

[setLabel\(\)](#)

12.80.3.6 `labelAlignment()`

```
Qt::Alignment QwtPlotMarker::labelAlignment ( ) const
```

Returns

the label alignment

See also

[setLabelAlignment\(\)](#), [setLabelOrientation\(\)](#)

12.80.3.7 `labelOrientation()`

```
Qt::Orientation QwtPlotMarker::labelOrientation ( ) const
```

Returns

the label orientation

See also

[setLabelOrientation\(\)](#), [labelAlignment\(\)](#)

12.80.3.8 `legendIcon()`

```
QwtGraphic QwtPlotMarker::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

Icon representing the marker on the legend

Parameters

<i>index</i>	Index of the legend entry (usually there is only one)
<i>size</i>	Icon size

See also

[setLegendIconSize\(\)](#), [legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.80.3.9 linePen()

```
const QPen & QwtPlotMarker::linePen ( ) const
```

Returns

the line pen

See also

[setLinePen\(\)](#)

12.80.3.10 lineStyle()

```
QwtPlotMarker::LineStyle QwtPlotMarker::lineStyle ( ) const
```

Returns

the line style

See also

[setLineStyle\(\)](#)

12.80.3.11 rtti()

```
int QwtPlotMarker::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotMarker](#)

Reimplemented from [QwtPlotItem](#).

12.80.3.12 setLabel()

```
void QwtPlotMarker::setLabel (
    const QwtText & label )
```

Set the label.

Parameters

<i>label</i>	Label text
--------------	------------

See also

[label\(\)](#)

12.80.3.13 `setLabelAlignment()`

```
void QwtPlotMarker::setLabelAlignment (
    Qt::Alignment align )
```

Set the alignment of the label.

In case of [QwtPlotMarker::HLine](#) the alignment is relative to the y position of the marker, but the horizontal flags correspond to the canvas rectangle. In case of [QwtPlotMarker::VLine](#) the alignment is relative to the x position of the marker, but the vertical flags correspond to the canvas rectangle.

In all other styles the alignment is relative to the marker's position.

Parameters

<i>align</i>	Alignment.
--------------	------------

See also

[labelAlignment\(\)](#), [labelOrientation\(\)](#)

12.80.3.14 `setLabelOrientation()`

```
void QwtPlotMarker::setLabelOrientation (
    Qt::Orientation orientation )
```

Set the orientation of the label.

When orientation is `Qt::Vertical` the label is rotated by 90.0 degrees (from bottom to top).

Parameters

<i>orientation</i>	Orientation of the label
--------------------	--------------------------

See also

[labelOrientation\(\)](#), [setLabelAlignment\(\)](#)

12.80.3.15 `setLinePen()` [1/2]

```
void QwtPlotMarker::setLinePen (
    const QColor & color,
```

```
qreal width = 0.0,  
Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a line pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see `QPen::isCosmetic()`). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

`pen()`, `brush()`

12.80.3.16 `setLinePen()` [2/2]

```
void QwtPlotMarker::setLinePen (  
    const QPen & pen )
```

Specify a pen for the line.

Parameters

<i>pen</i>	New pen
------------	---------

See also

[linePen\(\)](#)

12.80.3.17 `setLineStyle()`

```
void QwtPlotMarker::setLineStyle (  
    LineStyle style )
```

Set the line style.

Parameters

<i>style</i>	Line style.
--------------	-------------

See also

[lineStyle\(\)](#)

12.80.3.18 `setSpacing()`

```
void QwtPlotMarker::setSpacing (
    int spacing )
```

Set the spacing.

When the label is not centered on the marker position, the spacing is the distance between the position and the label.

Parameters

<i>spacing</i>	Spacing
----------------	---------

See also

[spacing\(\)](#), [setLabelAlignment\(\)](#)

12.80.3.19 `setSymbol()`

```
void QwtPlotMarker::setSymbol (
    const QwtSymbol * symbol )
```

Assign a symbol.

Parameters

<i>symbol</i>	New symbol
---------------	------------

See also

[symbol\(\)](#)

12.80.3.20 `spacing()`

```
int QwtPlotMarker::spacing ( ) const
```

Returns

the spacing

See also

[setSpacing\(\)](#)

12.80.3.21 symbol()

```
const QwtSymbol * QwtPlotMarker::symbol ( ) const
```

Returns

the symbol

See also

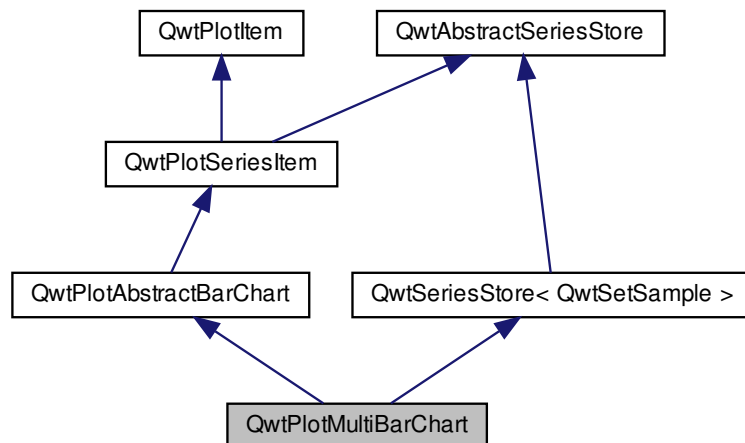
[setSymbol\(\)](#), [QwtSymbol](#)

12.81 QwtPlotMultiBarChart Class Reference

[QwtPlotMultiBarChart](#) displays a series of a samples that consist each of a set of values.

```
#include <qwt_plot_multi_barchart.h>
```

Inheritance diagram for QwtPlotMultiBarChart:



Public Types

- enum [ChartStyle](#) { [Grouped](#), [Stacked](#) }
- Chart styles.*

Public Member Functions

- [QwtPlotMultiBarChart](#) (const [QString](#) &[title](#)=[QString](#)())
- [QwtPlotMultiBarChart](#) (const [QwtText](#) &[title](#))
- virtual [~QwtPlotMultiBarChart](#) ()
- *Destructor.*
- virtual int [rtti](#) () const
- void [setBarTitles](#) (const [QList](#)< [QwtText](#) > &)
- *Set the titles for the bars.*
- [QList](#)< [QwtText](#) > [barTitles](#) () const
- void [setSamples](#) (const [QVector](#)< [QwtSetSample](#) > &)
- void [setSamples](#) (const [QVector](#)< [QVector](#)< double > > &)
- void [setSamples](#) ([QwtSeriesData](#)< [QwtSetSample](#) > *)
- void [setStyle](#) ([ChartStyle](#) style)
- [ChartStyle](#) style () const
- void [setSymbol](#) (int valueIndex, [QwtColumnSymbol](#) *)
- *Add a symbol to the symbol map.*
- const [QwtColumnSymbol](#) * [symbol](#) (int valueIndex) const
- void [resetSymbolMap](#) ()
- virtual void [drawSeries](#) ([QPainter](#) *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QRectF](#) &canvasRect, int from, int to) const
- virtual [QRectF](#) [boundingRect](#) () const
- virtual [QList](#)< [QwtLegendData](#) > [legendData](#) () const
- virtual [QwtGraphic](#) [legendIcon](#) (int index, const [QSizeF](#) &) const

Protected Member Functions

- [QwtColumnSymbol](#) * [symbol](#) (int valueIndex)
- virtual [QwtColumnSymbol](#) * [specialSymbol](#) (int sampleIndex, int valueIndex) const
- *Create a symbol for special values.*
- virtual void [drawSample](#) ([QPainter](#) *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QRectF](#) &canvasRect, const [QwtInterval](#) &boundingInterval, int index, const [QwtSetSample](#) &sample) const
- virtual void [drawBar](#) ([QPainter](#) *, int sampleIndex, int valueIndex, const [QwtColumnRect](#) &) const
- void [drawStackedBars](#) ([QPainter](#) *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QRectF](#) &canvasRect, int index, double [sampleWidth](#), const [QwtSetSample](#) &sample) const
- void [drawGroupedBars](#) ([QPainter](#) *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QRectF](#) &canvasRect, int index, double [sampleWidth](#), const [QwtSetSample](#) &sample) const

12.81.1 Detailed Description

[QwtPlotMultiBarChart](#) displays a series of a samples that consist each of a set of values.

Each value is displayed as a bar, the bars of each set can be organized side by side or accumulated.

Each bar of a set is rendered by a [QwtColumnSymbol](#), that is set by [setSymbol\(\)](#). The bars of different sets use the same symbols. Exceptions are possible by overloading [specialSymbol\(\)](#) or overloading [drawBar\(\)](#).

Depending on its [orientation\(\)](#) the bars are displayed horizontally or vertically. The bars cover the interval between the [baseline\(\)](#) and the value.

In opposite to most other plot items, [QwtPlotMultiBarChart](#) returns more than one entry for the legend - one for each symbol.

See also

[QwtPlotBarChart](#), [QwtPlotHistogram](#) [QwtPlotSeriesItem::orientation\(\)](#), [QwtPlotAbstractBarChart::baseline\(\)](#)

12.81.2 Member Enumeration Documentation

12.81.2.1 ChartStyle

```
enum QwtPlotMultiBarChart::ChartStyle
```

Chart styles.

The default setting is [QwtPlotMultiBarChart::Grouped](#).

See also

[setStyle\(\)](#), [style\(\)](#)

Enumerator

Grouped	The bars of a set are displayed side by side.
Stacked	The bars are displayed on top of each other accumulating to a single bar. All values of a set need to have the same sign.

12.81.3 Constructor & Destructor Documentation

12.81.3.1 QwtPlotMultiBarChart() [1/2]

```
QwtPlotMultiBarChart::QwtPlotMultiBarChart (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the chart
--------------	--------------------

12.81.3.2 QwtPlotMultiBarChart() [2/2]

```
QwtPlotMultiBarChart::QwtPlotMultiBarChart (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the chart
--------------	--------------------

12.81.4 Member Function Documentation

12.81.4.1 `barTitles()`

```
QList< QwtText > QwtPlotMultiBarChart::barTitles ( ) const
```

Returns

Bar titles

See also

[setBarTitles\(\)](#), [legendData\(\)](#)

12.81.4.2 `boundingRect()`

```
QRectF QwtPlotMultiBarChart::boundingRect ( ) const [virtual]
```

Returns

Bounding rectangle of all samples. For an empty series the rectangle is invalid.

Reimplemented from [QwtPlotSeriesItem](#).

12.81.4.3 `drawBar()`

```
void QwtPlotMultiBarChart::drawBar (
    QPainter * painter,
    int sampleIndex,
    int valueIndex,
    const QwtColumnRect & rect ) const [protected], [virtual]
```

Draw a bar

Parameters

<i>painter</i>	Painter
<i>sampleIndex</i>	Index of the sample - might be -1 when the bar is painted for the legend
<i>valueIndex</i>	Index of a value in a set
<i>rect</i>	Directed target rectangle for the bar

See also

[drawSeries\(\)](#)

12.81.4.4 drawGroupedBars()

```
void QwtPlotMultiBarChart::drawGroupedBars (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int index,
    double sampleWidth,
    const QwtSetSample & sample ) const [protected]
```

Draw a grouped sample

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>index</i>	Index of the sample to be painted
<i>sampleWidth</i>	Bounding width for all bars of the sample
<i>sample</i>	Sample

See also

[drawSeries\(\)](#), [sampleWidth\(\)](#)

12.81.4.5 drawSample()

```
void QwtPlotMultiBarChart::drawSample (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    const QwtInterval & boundingInterval,
    int index,
    const QwtSetSample & sample ) const [protected], [virtual]
```

Draw a sample

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>boundingInterval</i>	Bounding interval of sample values
<i>index</i>	Index of the sample to be painted
<i>sample</i>	Sample value

See also

[drawSeries\(\)](#)

12.81.4.6 drawSeries()

```
void QwtPlotMultiBarChart::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw an interval of the bar chart

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted. If to < 0 the curve will be painted to its last point.

See also

[drawSymbols\(\)](#)

Implements [QwtPlotSeriesItem](#).

12.81.4.7 drawStackedBars()

```
void QwtPlotMultiBarChart::drawStackedBars (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int index,
    double sampleWidth,
    const QwtSetSample & sample ) const [protected]
```

Draw a stacked sample

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>index</i>	Index of the sample to be painted
<i>sampleWidth</i>	Width of the bars
<i>sample</i>	Sample

See also

[drawSeries\(\)](#), [sampleWidth\(\)](#)

12.81.4.8 legendData()

```
QList< QwtLegendData > QwtPlotMultiBarChart::legendData ( ) const [virtual]
```

Returns

Information to be displayed on the legend

The chart is represented by a list of entries - one for each bar title. Each element contains a bar title and an icon showing its corresponding bar.

See also

[barTitles\(\)](#), [legendIcon\(\)](#), [legendIconSize\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.81.4.9 legendIcon()

```
QwtGraphic QwtPlotMultiBarChart::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

Icon for representing a bar on the legend

Parameters

<i>index</i>	Index of the bar
<i>size</i>	Icon size

Returns

An icon showing a bar

See also

[drawBar\(\)](#), [legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.81.4.10 resetSymbolMap()

```
void QwtPlotMultiBarChart::resetSymbolMap ( )
```

Remove all symbols from the symbol map

12.81.4.11 rtti()

```
int QwtPlotMultiBarChart::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotBarChart](#)

Reimplemented from [QwtPlotItem](#).

12.81.4.12 setBarTitles()

```
void QwtPlotMultiBarChart::setBarTitles (
    const QList< QwtText > & titles )
```

Set the titles for the bars.

The titles are used for the legend.

Parameters

<i>titles</i>	Bar titles
---------------	------------

See also

[barTitles\(\)](#), [legendData\(\)](#)

12.81.4.13 setSamples() [1/3]

```
void QwtPlotMultiBarChart::setSamples (
    const QVector< QwtSetSample > & samples )
```

Initialize data with an array of samples.

Parameters

<i>samples</i>	Vector of points
----------------	------------------

12.81.4.14 setSamples() [2/3]

```
void QwtPlotMultiBarChart::setSamples (
    const QVector< QVector< double > > & samples )
```

Initialize data with an array of samples.

Parameters

<i>samples</i>	Vector of points
----------------	------------------

12.81.4.15 setSamples() [3/3]

```
void QwtPlotMultiBarChart::setSamples (
    QwtSeriesData< QwtSetSample > * data )
```

Assign a series of samples

[setSamples\(\)](#) is just a wrapper for [setData\(\)](#) without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.81.4.16 setStyle()

```
void QwtPlotMultiBarChart::setStyle (
    ChartStyle style )
```

Set the style of the chart

Parameters

<i>style</i>	Chart style
--------------	-------------

See also

[style\(\)](#)

12.81.4.17 `setSymbol()`

```
void QwtPlotMultiBarChart::setSymbol (
    int valueIndex,
    QwtColumnSymbol * symbol )
```

Add a symbol to the symbol map.

Assign a default symbol for drawing the bar representing all values with the same index in a set.

Parameters

<i>valueIndex</i>	Index of a value in a set
<i>symbol</i>	Symbol used for drawing a bar

See also

[symbol\(\)](#), [resetSymbolMap\(\)](#), [specialSymbol\(\)](#)

12.81.4.18 `specialSymbol()`

```
QwtColumnSymbol * QwtPlotMultiBarChart::specialSymbol (
    int sampleIndex,
    int valueIndex ) const [protected], [virtual]
```

Create a symbol for special values.

Usually the symbols for displaying a bar are set by `setSymbols()` and common for all sets. By overloading [specialSymbol\(\)](#) it is possible to create a temporary [symbol\(\)](#) for displaying a special value.

The symbol has to be created by new each time [specialSymbol\(\)](#) is called. As soon as the symbol is painted this symbol gets deleted.

When no symbol (NULL) is returned, the value will be displayed with the standard symbol that is used for all symbols with the same `valueIndex`.

Parameters

<i>sampleIndex</i>	Index of the sample
<i>valueIndex</i>	Index of the value in the set

Returns

NULL, meaning that the value is not special

12.81.4.19 `style()`

```
QwtPlotMultiBarChart::ChartStyle QwtPlotMultiBarChart::style ( ) const
```

Returns

Style of the chart

See also

[setStyle\(\)](#)

12.81.4.20 symbol() [1/2]

```
const QwtColumnSymbol * QwtPlotMultiBarChart::symbol (
    int valueIndex ) const
```

Find a symbol in the symbol map

Parameters

<i>valueIndex</i>	Index of a value in a set
-------------------	---------------------------

Returns

The symbol, that had been set by [setSymbol\(\)](#) or NULL.

See also

[setSymbol\(\)](#), [specialSymbol\(\)](#), [drawBar\(\)](#)

12.81.4.21 symbol() [2/2]

```
QwtColumnSymbol * QwtPlotMultiBarChart::symbol (
    int valueIndex ) [protected]
```

Find a symbol in the symbol map

Parameters

<i>valueIndex</i>	Index of a value in a set
-------------------	---------------------------

Returns

The symbol, that had been set by [setSymbol\(\)](#) or NULL.

See also

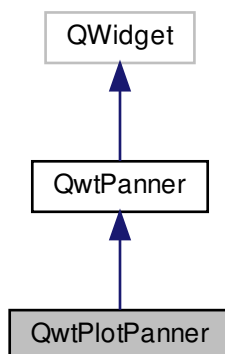
[setSymbol\(\)](#), [specialSymbol\(\)](#), [drawBar\(\)](#)

12.82 QwtPlotPanner Class Reference

[QwtPlotPanner](#) provides panning of a plot canvas.

```
#include <qwt_plot_panner.h>
```

Inheritance diagram for QwtPlotPanner:



Public Member Functions

- [QwtPlotPanner](#) (QWidget *)
A panner for the canvas of a [QwtPlot](#).
- virtual [~QwtPlotPanner](#) ()
Destructor.
- QWidget * [canvas](#) ()
Return observed plot canvas.
- const QWidget * [canvas](#) () const
Return Observed plot canvas.
- [QwtPlot](#) * [plot](#) ()
Return plot widget, containing the observed plot canvas.
- const [QwtPlot](#) * [plot](#) () const
Return plot widget, containing the observed plot canvas.
- void [setAxisEnabled](#) (int axis, bool on)
En/Disable an axis.
- bool [isAxisEnabled](#) (int axis) const

Protected Slots

- virtual void [moveCanvas](#) (int dx, int dy)

Protected Member Functions

- virtual QPixmap [contentsMask](#) () const
- virtual QPixmap [grab](#) () const

Additional Inherited Members

12.82.1 Detailed Description

[QwtPlotPanner](#) provides panning of a plot canvas.

[QwtPlotPanner](#) is a panner for a plot canvas, that adjusts the scales of the axes after dropping the canvas on its new position.

Together with [QwtPlotZoomer](#) and [QwtPlotMagnifier](#) powerful ways of navigating on a [QwtPlot](#) widget can be implemented easily.

Note

The axes are not updated, while dragging the canvas

See also

[QwtPlotZoomer](#), [QwtPlotMagnifier](#)

12.82.2 Constructor & Destructor Documentation

12.82.2.1 QwtPlotPanner()

```
QwtPlotPanner::QwtPlotPanner (
    QWidget * canvas ) [explicit]
```

A panner for the canvas of a [QwtPlot](#).

The panner is enabled for all axes

Parameters

<i>canvas</i>	Plot canvas to pan, also the parent object
---------------	--

See also

[setAxisEnabled\(\)](#)

12.82.3 Member Function Documentation

12.82.3.1 contentsMask()

```
QBitmap QwtPlotPanner::contentsMask ( ) const [protected], [virtual]
```

Calculate a mask from the border path of the canvas

Returns

Mask as bitmap

See also

[QwtPlotCanvas::borderPath\(\)](#)

Reimplemented from [QwtPanner](#).

12.82.3.2 grab()

```
QPixmap QwtPlotPanner::grab ( ) const [protected], [virtual]
```

Returns

Pixmap with the content of the canvas

Reimplemented from [QwtPanner](#).

12.82.3.3 isAxisEnabled()

```
bool QwtPlotPanner::isAxisEnabled (
    int axis ) const
```

Test if an axis is enabled

Parameters

<i>axis</i>	Axis, see QwtPlot::Axis
-------------	---

Returns

True, if the axis is enabled

See also

[setAxisEnabled\(\)](#), [moveCanvas\(\)](#)

12.82.3.4 moveCanvas

```
void QwtPlotPanner::moveCanvas (
    int dx,
    int dy ) [protected], [virtual], [slot]
```

Adjust the enabled axes according to dx/dy

Parameters

<i>dx</i>	Pixel offset in x direction
<i>dy</i>	Pixel offset in y direction

See also

[QwtPanner::panned\(\)](#)

12.82.3.5 setAxisEnabled()

```
void QwtPlotPanner::setAxisEnabled (
    int axis,
    bool on )
```

En/Disable an axis.

Axes that are enabled will be synchronized to the result of panning. All other axes will remain unchanged.

Parameters

<i>axis</i>	Axis, see QwtPlot::Axis
<i>on</i>	On/Off

See also

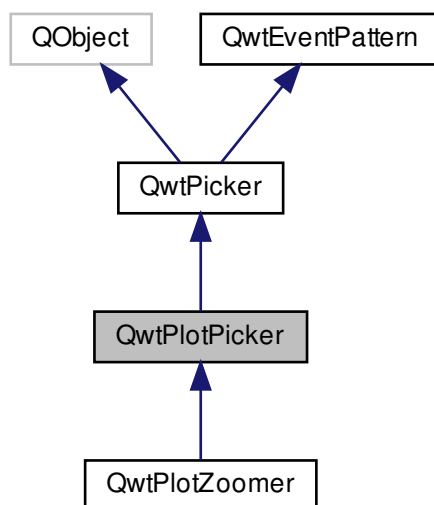
[isAxisEnabled\(\)](#), [moveCanvas\(\)](#)

12.83 QwtPlotPicker Class Reference

[QwtPlotPicker](#) provides selections on a plot canvas.

```
#include <qwt_plot_picker.h>
```

Inheritance diagram for QwtPlotPicker:



Signals

- void [selected](#) (const QPointF &pos)
- void [selected](#) (const QRectF &rect)
- void [selected](#) (const QVector< QPointF > &pa)
- void [appended](#) (const QPointF &pos)
- void [moved](#) (const QPointF &pos)

Public Member Functions

- [QwtPlotPicker](#) (QWidget *canvas)
Create a plot picker.
- virtual [~QwtPlotPicker](#) ()
Destructor.
- [QwtPlotPicker](#) (int xAxis, int yAxis, QWidget *)
- [QwtPlotPicker](#) (int xAxis, int yAxis, RubberBand rubberBand, DisplayMode trackerMode, QWidget *)
- virtual void [setAxis](#) (int xAxis, int yAxis)
- int [xAxis](#) () const
Return x axis.
- int [yAxis](#) () const
Return y axis.
- [QwtPlot](#) * [plot](#) ()
- const [QwtPlot](#) * [plot](#) () const
- QWidget * [canvas](#) ()
- const QWidget * [canvas](#) () const

Protected Member Functions

- QRectF [scaleRect](#) () const
 - QRectF [invTransform](#) (const QRect &) const
 - QRect [transform](#) (const QRectF &) const
 - QPointF [invTransform](#) (const QPoint &) const
 - QPoint [transform](#) (const QPointF &) const
 - virtual [QwtText trackerText](#) (const QPoint &) const
 - virtual [QwtText trackerTextF](#) (const QPointF &) const
- Translate a position into a position string.*
- virtual void [move](#) (const QPoint &)
 - virtual void [append](#) (const QPoint &)
 - virtual bool [end](#) (bool ok=true)

Additional Inherited Members

12.83.1 Detailed Description

[QwtPlotPicker](#) provides selections on a plot canvas.

[QwtPlotPicker](#) is a [QwtPicker](#) tailored for selections on a plot canvas. It is set to a x-Axis and y-Axis and translates all pixel coordinates into this coordinate system.

12.83.2 Constructor & Destructor Documentation

12.83.2.1 QwtPlotPicker() [1/3]

```
QwtPlotPicker::QwtPlotPicker (
    QWidget * canvas ) [explicit]
```

Create a plot picker.

The picker is set to those x- and y-axis of the plot that are enabled. If both or no x-axis are enabled, the picker is set to [QwtPlot::xBottom](#). If both or no y-axis are enabled, it is set to [QwtPlot::yLeft](#).

Parameters

<i>canvas</i>	Plot canvas to observe, also the parent object
---------------	--

See also

[QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#), [scaleRect\(\)](#)

12.83.2.2 QwtPlotPicker() [2/3]

```
QwtPlotPicker::QwtPlotPicker (
    int xAxis,
```

```
int yAxis,
QWidget * canvas ) [explicit]
```

Create a plot picker

Parameters

<i>xAxis</i>	Set the x axis of the picker
<i>yAxis</i>	Set the y axis of the picker
<i>canvas</i>	Plot canvas to observe, also the parent object

See also

[QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#), [scaleRect\(\)](#)

12.83.2.3 QwtPlotPicker() [3/3]

```
QwtPlotPicker::QwtPlotPicker (
    int xAxis,
    int yAxis,
    RubberBand rubberBand,
    DisplayMode trackerMode,
    QWidget * canvas ) [explicit]
```

Create a plot picker

Parameters

<i>xAxis</i>	X axis of the picker
<i>yAxis</i>	Y axis of the picker
<i>rubberBand</i>	Rubber band style
<i>trackerMode</i>	Tracker mode
<i>canvas</i>	Plot canvas to observe, also the parent object

See also

[QwtPicker](#), [QwtPicker::setSelectionFlags\(\)](#), [QwtPicker::setRubberBand\(\)](#), [QwtPicker::setTrackerMode](#), [QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#), [scaleRect\(\)](#)

12.83.3 Member Function Documentation

12.83.3.1 append()

```
void QwtPlotPicker::append (
    const QPoint & pos ) [protected], [virtual]
```

Append a point to the selection and update rubber band and tracker.

Parameters

<i>pos</i>	Additional point
------------	------------------

See also

[isActive](#), [begin\(\)](#), [end\(\)](#), [move\(\)](#), [appended\(\)](#)

Note

The [appended\(const QPoint &\)](#), [appended\(const QDoublePoint &\)](#) signals are emitted.

Reimplemented from [QwtPicker](#).

12.83.3.2 appended

```
void QwtPlotPicker::appended (
    const QPointF & pos ) [signal]
```

A signal emitted when a point has been appended to the selection

Parameters

<i>pos</i>	Position of the appended point.
------------	---------------------------------

See also

[append\(\). moved\(\)](#)

12.83.3.3 canvas() [1/2]

```
QWidget * QwtPlotPicker::canvas ( )
```

Returns

Observed plot canvas

12.83.3.4 canvas() [2/2]

```
const QWidget * QwtPlotPicker::canvas ( ) const
```

Returns

Observed plot canvas

12.83.3.5 end()

```
bool QwtPlotPicker::end (
    bool ok = true )    [protected], [virtual]
```

Close a selection setting the state to inactive.

Parameters

<i>ok</i>	If true, complete the selection and emit selected signals otherwise discard the selection.
-----------	--

Returns

True if the selection has been accepted, false otherwise

Reimplemented from [QwtPicker](#).

Reimplemented in [QwtPlotZoomer](#).

12.83.3.6 invTransform() [1/2]

```
QRectF QwtPlotPicker::invTransform (
    const QRect & rect ) const [protected]
```

Translate a rectangle from pixel into plot coordinates

Returns

Rectangle in plot coordinates

See also

[transform\(\)](#)

12.83.3.7 invTransform() [2/2]

```
QPointF QwtPlotPicker::invTransform (
    const QPoint & pos ) const [protected]
```

Translate a point from pixel into plot coordinates

Returns

Point in plot coordinates

See also

[transform\(\)](#)

12.83.3.8 move()

```
void QwtPlotPicker::move (
    const QPoint & pos ) [protected], [virtual]
```

Move the last point of the selection

Parameters

<i>pos</i>	New position
------------	--------------

See also

[isActive](#), [begin\(\)](#), [end\(\)](#), [append\(\)](#)

Note

The [moved\(const QPoint &\)](#), [moved\(const QDoublePoint &\)](#) signals are emitted.

Reimplemented from [QwtPicker](#).

12.83.3.9 moved

```
void QwtPlotPicker::moved (
    const QPointF & pos ) [signal]
```

A signal emitted whenever the last appended point of the selection has been moved.

Parameters

<i>pos</i>	Position of the moved last point of the selection.
------------	--

See also

[move\(\)](#), [appended\(\)](#)

12.83.3.10 plot() [1/2]

```
QwtPlot * QwtPlotPicker::plot ( )
```

Returns

Plot widget, containing the observed plot canvas

12.83.3.11 plot() [2/2]

```
const QwtPlot * QwtPlotPicker::plot ( ) const
```

Returns

Plot widget, containing the observed plot canvas

12.83.3.12 scaleRect()

```
QRectF QwtPlotPicker::scaleRect ( ) const [protected]
```

Returns

Normalized bounding rectangle of the axes

See also

[QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#).

12.83.3.13 selected [1/3]

```
void QwtPlotPicker::selected (
    const QPointF & pos ) [signal]
```

A signal emitted in case of [QwtPickerMachine::PointSelection](#).

Parameters

<i>pos</i>	Selected point
------------	----------------

12.83.3.14 selected [2/3]

```
void QwtPlotPicker::selected (
    const QRectF & rect ) [signal]
```

A signal emitted in case of [QwtPickerMachine::RectSelection](#).

Parameters

<i>rect</i>	Selected rectangle
-------------	--------------------

12.83.3.15 selected [3/3]

```
void QwtPlotPicker::selected (
    const QVector< QPointF > & pa ) [signal]
```

A signal emitting the selected points, at the end of a selection.

Parameters

<i>pa</i>	Selected points
-----------	-----------------

12.83.3.16 `setAxis()`

```
void QwtPlotPicker::setAxis (
    int xAxis,
    int yAxis ) [virtual]
```

Set the x and y axes of the picker

Parameters

<i>xAxis</i>	X axis
<i>yAxis</i>	Y axis

Reimplemented in [QwtPlotZoomer](#).

12.83.3.17 `trackerText()`

```
QwtText QwtPlotPicker::trackerText (
    const QPoint & pos ) const [protected], [virtual]
```

Translate a pixel position into a position string

Parameters

<i>pos</i>	Position in pixel coordinates
------------	-------------------------------

Returns

Position string

Reimplemented from [QwtPicker](#).

12.83.3.18 `trackerTextF()`

```
QwtText QwtPlotPicker::trackerTextF (
    const QPointF & pos ) const [protected], [virtual]
```

Translate a position into a position string.

In case of `HLineRubberBand` the label is the value of the y position, in case of `VLineRubberBand` the value of the x position. Otherwise the label contains x and y position separated by a ',' .

The format for the double to string conversion is "%.4f".

Parameters

<i>pos</i>	Position
------------	----------

Returns

Position string

12.83.3.19 transform() [1/2]

```
QRect QwtPlotPicker::transform (
    const QRectF & rect ) const [protected]
```

Translate a rectangle from plot into pixel coordinates

Returns

Rectangle in pixel coordinates

See also

[invTransform\(\)](#)

12.83.3.20 transform() [2/2]

```
QPoint QwtPlotPicker::transform (
    const QPointF & pos ) const [protected]
```

Translate a point from plot into pixel coordinates

Returns

Point in pixel coordinates

See also

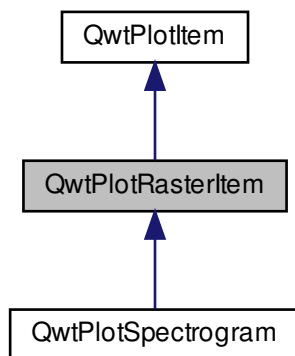
[invTransform\(\)](#)

12.84 QwtPlotRasterItem Class Reference

A class, which displays raster data.

```
#include <qwt_plot_rasteritem.h>
```

Inheritance diagram for QwtPlotRasterItem:



Public Types

- enum [CachePolicy](#) { [NoCache](#), [PaintCache](#) }
Cache policy The default policy is NoCache.
- enum [PaintAttribute](#) { [PaintInDeviceResolution](#) = 1 }
- typedef QFlags< [PaintAttribute](#) > [PaintAttributes](#)
Paint attributes.

Public Member Functions

- [QwtPlotRasterItem](#) (const QString &title=QString())
Constructor.
- [QwtPlotRasterItem](#) (const [QwtText](#) &title)
Constructor.
- virtual [~QwtPlotRasterItem](#) ()
Destructor.
- void [setPaintAttribute](#) ([PaintAttribute](#), bool on=true)
- bool [testPaintAttribute](#) ([PaintAttribute](#)) const
- void [setAlpha](#) (int [alpha](#))
Set an alpha value for the raster data.
- int [alpha](#) () const
- void [setCachePolicy](#) ([CachePolicy](#))
- [CachePolicy](#) [cachePolicy](#) () const
- void [invalidateCache](#) ()
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect) const
Draw the raster data.
- virtual QRectF [pixelHint](#) (const QRectF &) const
Pixel hint.
- virtual [QwtInterval](#) [interval](#) (Qt::Axis) const
- virtual QRectF [boundingRect](#) () const

Protected Member Functions

- virtual QImage [renderImage](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &area, const QSize &imageSize) const =0
Render an image.
- virtual [QwtScaleMap imageMap](#) (Qt::Orientation, const [QwtScaleMap](#) &map, const QRectF &area, const QSize &imageSize, double pixelSize) const
Calculate a scale map for painting to an image.

12.84.1 Detailed Description

A class, which displays raster data.

Raster data is a grid of pixel values, that can be represented as a QImage. It is used for many types of information like spectrograms, cartograms, geographical maps ...

Often a plot has several types of raster data organized in layers. (f.e a geographical map, with weather statistics). Using [setAlpha\(\)](#) raster items can be stacked easily.

[QwtPlotRasterItem](#) is only implemented for images of the following formats: QImage::Format_Indexed8, QImage::Format_ARGB32.

See also

[QwtPlotSpectrogram](#)

12.84.2 Member Enumeration Documentation

12.84.2.1 CachePolicy

```
enum QwtPlotRasterItem::CachePolicy
```

Cache policy The default policy is NoCache.

Enumerator

NoCache	renderImage() is called each time the item has to be repainted
PaintCache	renderImage() is called, whenever the image cache is not valid, or the scales, or the size of the canvas has changed. This type of cache is useful for improving the performance of hide/show operations or manipulations of the alpha value. All other situations are handled by the canvas backing store.

12.84.2.2 PaintAttribute

```
enum QwtPlotRasterItem::PaintAttribute
```

Attributes to modify the drawing algorithm.

See also

[setPaintAttribute\(\)](#), [testPaintAttribute\(\)](#)

Enumerator

PaintInDeviceResolution	When the image is rendered according to the data pixels (QwtRasterData::pixelHint()) it can be expanded to paint device resolution before it is passed to QPainter. The expansion algorithm rounds the pixel borders in the same way as the axis ticks, what is usually better than the scaling algorithm implemented in Qt. Disabling this flag might make sense, to reduce the size of a document/file. If this is possible for a document format depends on the implementation of the specific QPaintEngine.
-------------------------	---

12.84.3 Member Function Documentation

12.84.3.1 `alpha()`

```
int QwtPlotRasterItem::alpha ( ) const
```

Returns

Alpha value of the raster item

See also

[setAlpha\(\)](#)

12.84.3.2 `boundingRect()`

```
QRectF QwtPlotRasterItem::boundingRect ( ) const [virtual]
```

Returns

Bounding rectangle of the data

See also

[QwtPlotRasterItem::interval\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.84.3.3 cachePolicy()

```
QwtPlotRasterItem::CachePolicy QwtPlotRasterItem::cachePolicy ( ) const
```

Returns

Cache policy

See also

[CachePolicy](#), [setCachePolicy\(\)](#)

12.84.3.4 draw()

```
void QwtPlotRasterItem::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the raster data.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	X-Scale Map
<i>yMap</i>	Y-Scale Map
<i>canvasRect</i>	Contents rectangle of the plot canvas

Implements [QwtPlotItem](#).

Reimplemented in [QwtPlotSpectrogram](#).

12.84.3.5 imageMap()

```
QwtScaleMap QwtPlotRasterItem::imageMap (
    Qt::Orientation orientation,
    const QwtScaleMap & map,
    const QRectF & area,
    const QSize & imageSize,
    double pixelSize ) const [protected], [virtual]
```

Calculate a scale map for painting to an image.

Parameters

<i>orientation</i>	Orientation, Qt::Horizontal means a X axis
<i>map</i>	Scale map for rendering the plot item
<i>area</i>	Area to be painted on the image
<i>imageSize</i>	Image size
<i>pixelSize</i>	Width/Height of a data pixel

Returns

Calculated scale map

12.84.3.6 interval()

```
QwtInterval QwtPlotRasterItem::interval (
    Qt::Axis axis ) const [virtual]
```

Returns

Bounding interval for an axis

This method is intended to be reimplemented by derived classes. The default implementation returns an invalid interval.

Parameters

<i>axis</i>	X, Y, or Z axis
-------------	-----------------

Reimplemented in [QwtPlotSpectrogram](#).

12.84.3.7 invalidateCache()

```
void QwtPlotRasterItem::invalidateCache ( )
```

Invalidate the paint cache

See also

[setCachePolicy\(\)](#)

12.84.3.8 pixelHint()

```
QRectF QwtPlotRasterItem::pixelHint (
    const QRectF & area ) const [virtual]
```

Pixel hint.

The geometry of a pixel is used to calculate the resolution and alignment of the rendered image.

Width and height of the hint need to be the horizontal and vertical distances between 2 neighbored points. The center of the hint has to be the position of any point (it doesn't matter which one).

Limiting the resolution of the image might significantly improve the performance and heavily reduce the amount of memory when rendering a QImage from the raster data.

The default implementation returns an empty rectangle (QRectF()), meaning, that the image will be rendered in target device (f.e screen) resolution.

Parameters

<i>area</i>	In most implementations the resolution of the data doesn't depend on the requested area.
-------------	--

Returns

Bounding rectangle of a pixel

See also

`render()`, [renderImage\(\)](#)

Reimplemented in [QwtPlotSpectrogram](#).

12.84.3.9 `renderImage()`

```
virtual QImage QwtPlotRasterItem::renderImage (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & area,
    const QSize & imageSize ) const    [protected], [pure virtual]
```

Render an image.

An implementation of `render()` might iterate over all pixels of `imageRect`. Each pixel has to be translated into the corresponding position in scale coordinates using the maps. This position can be used to look up a value in a implementation specific way and to map it into a color.

Parameters

<i>xMap</i>	X-Scale Map
<i>yMap</i>	Y-Scale Map
<i>area</i>	Requested area for the image in scale coordinates
<i>imageSize</i>	Requested size of the image

Returns

Rendered image

Implemented in [QwtPlotSpectrogram](#).

12.84.3.10 `setAlpha()`

```
void QwtPlotRasterItem::setAlpha (
    int alpha )
```

Set an alpha value for the raster data.

Often a plot has several types of raster data organized in layers. (f.e a geographical map, with weather statistics). Using [setAlpha\(\)](#) raster items can be stacked easily.

The alpha value is a value [0, 255] to control the transparency of the image. 0 represents a fully transparent color, while 255 represents a fully opaque color.

Parameters

<i>alpha</i>	Alpha value
--------------	-------------

- $\alpha \geq 0$
All alpha values of the pixels returned by [renderImage\(\)](#) will be set to alpha, beside those with an alpha value of 0 (invalid pixels).
- $\alpha < 0$ The alpha values returned by [renderImage\(\)](#) are not changed.

The default alpha value is -1.

See also

[alpha\(\)](#)

12.84.3.11 [setCachePolicy\(\)](#)

```
void QwtPlotRasterItem::setCachePolicy (
    QwtPlotRasterItem::CachePolicy policy )
```

Change the cache policy

The default policy is NoCache

Parameters

<i>policy</i>	Cache policy
---------------	--------------

See also

[CachePolicy](#), [cachePolicy\(\)](#)

12.84.3.12 [setPaintAttribute\(\)](#)

```
void QwtPlotRasterItem::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```

Specify an attribute how to draw the raster item

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off /sa PaintAttribute, testPaintAttribute()

12.84.3.13 testPaintAttribute()

```
bool QwtPlotRasterItem::testPaintAttribute (
    PaintAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

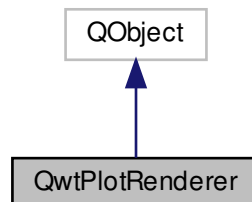
[PaintAttribute](#), [setPaintAttribute\(\)](#)

12.85 QwtPlotRenderer Class Reference

Renderer for exporting a plot to a document, a printer or anything else, that is supported by QPainter/QPaintDevice.

```
#include <qwt_plot_renderer.h>
```

Inheritance diagram for QwtPlotRenderer:



Public Types

- enum [DiscardFlag](#) {
[DiscardNone](#) = 0x00, [DiscardBackground](#) = 0x01, [DiscardTitle](#) = 0x02, [DiscardLegend](#) = 0x04,
[DiscardCanvasBackground](#) = 0x08, [DiscardFooter](#) = 0x10, [DiscardCanvasFrame](#) = 0x20 }
Disard flags.
- enum [LayoutFlag](#) { [DefaultLayout](#) = 0x00, [FrameWithScales](#) = 0x01 }
Layout flags.
- typedef QFlags< [DiscardFlag](#) > [DiscardFlags](#)
Disard flags.
- typedef QFlags< [LayoutFlag](#) > [LayoutFlags](#)
Layout flags.

Public Member Functions

- [QwtPlotRenderer](#) (QObject *!=NULL)
- virtual [~QwtPlotRenderer](#) ()
- Destructor.*
- void [setDiscardFlag](#) ([DiscardFlag](#) flag, bool on=true)
- bool [testDiscardFlag](#) ([DiscardFlag](#) flag) const
- void [setDiscardFlags](#) ([DiscardFlags](#) flags)
- [DiscardFlags](#) [discardFlags](#) () const
- void [setLayoutFlag](#) ([LayoutFlag](#) flag, bool on=true)
- bool [testLayoutFlag](#) ([LayoutFlag](#) flag) const
- void [setLayoutFlags](#) ([LayoutFlags](#) flags)
- [LayoutFlags](#) [layoutFlags](#) () const
- void [renderDocument](#) ([QwtPlot](#) *, const QString &fileName, const QSizeF &sizeMM, int resolution=85)
- void [renderDocument](#) ([QwtPlot](#) *, const QString &fileName, const QString &format, const QSizeF &sizeMM, int resolution=85)
- void [renderTo](#) ([QwtPlot](#) *, [QPrinter](#) &) const
- Render the plot to a QPrinter.*
- void [renderTo](#) ([QwtPlot](#) *, [QPaintDevice](#) &) const
- Render the plot to a QPaintDevice.*
- virtual void [render](#) ([QwtPlot](#) *, [QPainter](#) *, const QRectF &plotRect) const
- virtual void [renderTitle](#) (const [QwtPlot](#) *, [QPainter](#) *, const QRectF &titleRect) const
- virtual void [renderFooter](#) (const [QwtPlot](#) *, [QPainter](#) *, const QRectF &footerRect) const
- virtual void [renderScale](#) (const [QwtPlot](#) *, [QPainter](#) *, int axisId, int startDist, int endDist, int baseDist, const QRectF &scaleRect) const
- Paint a scale into a given rectangle. Paint the scale into a given rectangle.*
- virtual void [renderCanvas](#) (const [QwtPlot](#) *, [QPainter](#) *, const QRectF &canvasRect, const [QwtScaleMap](#) *maps) const
- virtual void [renderLegend](#) (const [QwtPlot](#) *, [QPainter](#) *, const QRectF &legendRect) const
- bool [exportTo](#) ([QwtPlot](#) *, const QString &documentName, const QSizeF &sizeMM=QSizeF(300, 200), int resolution=85)
- Execute a file dialog and render the plot to the selected file.*

12.85.1 Detailed Description

Renderer for exporting a plot to a document, a printer or anything else, that is supported by QPainter/QPaintDevice.

12.85.2 Member Enumeration Documentation

Enumerator

12.85.2.1 DiscardFlag

```
enum QwtPlotRenderer::DiscardFlag
```

Discard flags.

Enumerator

DiscardNone	Render all components of the plot.
DiscardBackground	Don't render the background of the plot.
DiscardTitle	Don't render the title of the plot.
DiscardLegend	Don't render the legend of the plot.
DiscardCanvasBackground	Don't render the background of the canvas.
DiscardFooter	Don't render the footer of the plot.
DiscardCanvasFrame	Don't render the frame of the canvas Note This flag has no effect when using style sheets, where the frame is part of the background

12.85.2.2 LayoutFlag

```
enum QwtPlotRenderer::LayoutFlag
```

Layout flags.

See also

[setLayoutFlag\(\)](#), [testLayoutFlag\(\)](#)

Enumerator

DefaultLayout	Use the default layout as on screen.
FrameWithScales	Instead of the scales a box is painted around the plot canvas, where the scale ticks are aligned to.

12.85.3 Constructor & Destructor Documentation

12.85.3.1 QwtPlotRenderer()

```
QwtPlotRenderer::QwtPlotRenderer (
    QObject * parent = NULL ) [explicit]
```

Constructor

Parameters

<i>parent</i>	Parent object
---------------	---------------

12.85.4 Member Function Documentation

12.85.4.1 discardFlags()

```
QwtPlotRenderer::DiscardFlags QwtPlotRenderer::discardFlags ( ) const
```

Returns

Flags, indicating what to discard from rendering

See also

[DiscardFlag](#), [setDiscardFlags\(\)](#), [setDiscardFlag\(\)](#), [testDiscardFlag\(\)](#)

12.85.4.2 exportTo()

```
bool QwtPlotRenderer::exportTo (
    QwtPlot * plot,
    const QString & documentName,
    const QSizeF & sizeMM = QSizeF( 300, 200 ),
    int resolution = 85 )
```

Execute a file dialog and render the plot to the selected file.

Parameters

<i>plot</i>	Plot widget
<i>documentName</i>	Default document name
<i>sizeMM</i>	Size for the document in millimeters.
<i>resolution</i>	Resolution in dots per Inch (dpi)

Returns

True, when exporting was successful

See also

[renderDocument\(\)](#)

12.85.4.3 layoutFlags()

```
QwtPlotRenderer::LayoutFlags QwtPlotRenderer::layoutFlags ( ) const
```

Returns

Layout flags

See also

[LayoutFlag](#), [setLayoutFlags\(\)](#), [setLayoutFlag\(\)](#), [testLayoutFlag\(\)](#)

12.85.4.4 render()

```
void QwtPlotRenderer::render (
    QwtPlot * plot,
    QPainter * painter,
    const QRectF & plotRect ) const [virtual]
```

Paint the contents of a [QwtPlot](#) instance into a given rectangle.

Parameters

<i>plot</i>	Plot to be rendered
<i>painter</i>	Painter
<i>plotRect</i>	Bounding rectangle

See also

[renderDocument\(\)](#), [renderTo\(\)](#), [QwtPainter::setRoundingAlignment\(\)](#)

12.85.4.5 renderCanvas()

```
void QwtPlotRenderer::renderCanvas (
    const QwtPlot * plot,
    QPainter * painter,
    const QRectF & canvasRect,
    const QwtScaleMap * maps ) const [virtual]
```

Render the canvas into a given rectangle.

Parameters

<i>plot</i>	Plot widget
<i>painter</i>	Painter
<i>maps</i>	Maps mapping between plot and paint device coordinates
<i>canvasRect</i>	Canvas rectangle

12.85.4.6 `renderDocument()` [1/2]

```
void QwtPlotRenderer::renderDocument (
    QwtPlot * plot,
    const QString & fileName,
    const QSizeF & sizeMM,
    int resolution = 85 )
```

Render a plot to a file

The format of the document will be auto-detected from the suffix of the file name.

Parameters

<i>plot</i>	Plot widget
<i>fileName</i>	Path of the file, where the document will be stored
<i>sizeMM</i>	Size for the document in millimeters.
<i>resolution</i>	Resolution in dots per Inch (dpi)

12.85.4.7 `renderDocument()` [2/2]

```
void QwtPlotRenderer::renderDocument (
    QwtPlot * plot,
    const QString & fileName,
    const QString & format,
    const QSizeF & sizeMM,
    int resolution = 85 )
```

Render a plot to a file

Supported formats are:

- pdf
Portable Document Format PDF
- ps
Postscript
- svg
Scalable Vector Graphics SVG
- all image formats supported by Qt
see `QImageWriter::supportedImageFormats()`

Scalable vector graphic formats like PDF or SVG are superior to raster graphics formats.

Parameters

<i>plot</i>	Plot widget
<i>fileName</i>	Path of the file, where the document will be stored
<i>format</i>	Format for the document
<i>sizeMM</i>	Size for the document in millimeters.
<i>resolution</i>	Resolution in dots per Inch (dpi)

See also

[renderTo\(\)](#), [render\(\)](#), [QwtPainter::setRoundingAlignment\(\)](#)

12.85.4.8 renderFooter()

```
void QwtPlotRenderer::renderFooter (
    const QwtPlot * plot,
    QPainter * painter,
    const QRectF & footerRect ) const [virtual]
```

Render the footer into a given rectangle.

Parameters

<i>plot</i>	Plot widget
<i>painter</i>	Painter
<i>footerRect</i>	Bounding rectangle for the footer

12.85.4.9 renderLegend()

```
void QwtPlotRenderer::renderLegend (
    const QwtPlot * plot,
    QPainter * painter,
    const QRectF & legendRect ) const [virtual]
```

Render the legend into a given rectangle.

Parameters

<i>plot</i>	Plot widget
<i>painter</i>	Painter
<i>legendRect</i>	Bounding rectangle for the legend

12.85.4.10 renderScale()

```
void QwtPlotRenderer::renderScale (
    const QwtPlot * plot,
    QPainter * painter,
    int axisId,
    int startDist,
    int endDist,
    int baseDist,
    const QRectF & scaleRect ) const [virtual]
```

Paint a scale into a given rectangle. Paint the scale into a given rectangle.

Parameters

<i>plot</i>	Plot widget
<i>painter</i>	Painter
<i>axisId</i>	Axis
<i>startDist</i>	Start border distance
<i>endDist</i>	End border distance
<i>baseDist</i>	Base distance
<i>scaleRect</i>	Bounding rectangle for the scale

12.85.4.11 `renderTitle()`

```
void QwtPlotRenderer::renderTitle (
    const QwtPlot * plot,
    QPainter * painter,
    const QRectF & titleRect ) const [virtual]
```

Render the title into a given rectangle.

Parameters

<i>plot</i>	Plot widget
<i>painter</i>	Painter
<i>titleRect</i>	Bounding rectangle for the title

12.85.4.12 `renderTo()` [1/2]

```
void QwtPlotRenderer::renderTo (
    QwtPlot * plot,
    QPainter & printer ) const
```

Render the plot to a QPainter.

This function renders the contents of a [QwtPlot](#) instance to `QPaintDevice` object. The size is derived from the printer metrics.

Parameters

<i>plot</i>	Plot to be rendered
<i>printer</i>	Printer to paint on

See also

[renderDocument\(\)](#), [render\(\)](#), [QwtPainter::setRoundingAlignment\(\)](#)

12.85.4.13 `renderTo()` [2/2]

```
void QwtPlotRenderer::renderTo (
    QwtPlot * plot,
    QPaintDevice & paintDevice ) const
```

Render the plot to a `QPaintDevice`.

This function renders the contents of a `QwtPlot` instance to `QPaintDevice` object. The target rectangle is derived from its device metrics.

Parameters

<i>plot</i>	Plot to be rendered
<i>paintDevice</i>	device to paint on, f.e a <code>QImage</code>

See also

[renderDocument\(\)](#), [render\(\)](#), [QwtPainter::setRoundingAlignment\(\)](#)

12.85.4.14 `setDiscardFlag()`

```
void QwtPlotRenderer::setDiscardFlag (
    DiscardFlag flag,
    bool on = true )
```

Change a flag, indicating what to discard from rendering

Parameters

<i>flag</i>	Flag to change
<i>on</i>	On/Off

See also

[DiscardFlag](#), [testDiscardFlag\(\)](#), [setDiscardFlags\(\)](#), [discardFlags\(\)](#)

12.85.4.15 `setDiscardFlags()`

```
void QwtPlotRenderer::setDiscardFlags (
    DiscardFlags flags )
```

Set the flags, indicating what to discard from rendering

Parameters

<i>flags</i>	Flags
--------------	-------

See also

[DiscardFlag](#), [setDiscardFlag\(\)](#), [testDiscardFlag\(\)](#), [discardFlags\(\)](#)

12.85.4.16 `setLayoutFlag()`

```
void QwtPlotRenderer::setLayoutFlag (
    LayoutFlag flag,
    bool on = true )
```

Change a layout flag

Parameters

<i>flag</i>	Flag to change
<i>on</i>	On/Off

See also

[LayoutFlag](#), [testLayoutFlag\(\)](#), [setLayoutFlags\(\)](#), [layoutFlags\(\)](#)

12.85.4.17 `setLayoutFlags()`

```
void QwtPlotRenderer::setLayoutFlags (
    LayoutFlags flags )
```

Set the layout flags

Parameters

<i>flags</i>	Flags
--------------	-------

See also

[LayoutFlag](#), [setLayoutFlag\(\)](#), [testLayoutFlag\(\)](#), [layoutFlags\(\)](#)

12.85.4.18 `testDiscardFlag()`

```
bool QwtPlotRenderer::testDiscardFlag (
    DiscardFlag flag ) const
```

Returns

True, if flag is enabled.

Parameters

<i>flag</i>	Flag to be tested
-------------	-------------------

See also

[DiscardFlag](#), [setDiscardFlag\(\)](#), [setDiscardFlags\(\)](#), [discardFlags\(\)](#)

12.85.4.19 testLayoutFlag()

```
bool QwtPlotRenderer::testLayoutFlag (
    LayoutFlag flag ) const
```

Returns

True, if flag is enabled.

Parameters

<i>flag</i>	Flag to be tested
-------------	-------------------

See also

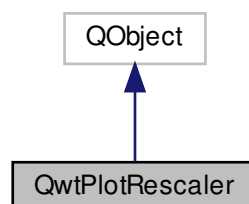
[LayoutFlag](#), [setLayoutFlag\(\)](#), [setLayoutFlags\(\)](#), [layoutFlags\(\)](#)

12.86 QwtPlotRescaler Class Reference

[QwtPlotRescaler](#) takes care of fixed aspect ratios for plot scales.

```
#include <qwt_plot_rescaler.h>
```

Inheritance diagram for QwtPlotRescaler:



Public Types

- enum [RescalePolicy](#) { [Fixed](#), [Expanding](#), [Fitting](#) }
- enum [ExpandingDirection](#) { [ExpandUp](#), [ExpandDown](#), [ExpandBoth](#) }

Public Member Functions

- [QwtPlotRescaler](#) (QWidget *[canvas](#), int [referenceAxis](#)=[QwtPlot::xBottom](#), [RescalePolicy](#)=[Expanding](#))
- virtual [~QwtPlotRescaler](#) ()
Destructor.
- void [setEnabled](#) (bool)
En/disable the rescaler.
- bool [isEnabled](#) () const
- void [setRescalePolicy](#) ([RescalePolicy](#))
- [RescalePolicy](#) [rescalePolicy](#) () const
- void [setExpandingDirection](#) ([ExpandingDirection](#))
- void [setExpandingDirection](#) (int [axis](#), [ExpandingDirection](#))
- [ExpandingDirection](#) [expandingDirection](#) (int [axis](#)) const
- void [setReferenceAxis](#) (int [axis](#))
- int [referenceAxis](#) () const
- void [setAspectRatio](#) (double [ratio](#))
- void [setAspectRatio](#) (int [axis](#), double [ratio](#))
- double [aspectRatio](#) (int [axis](#)) const
- void [setIntervalHint](#) (int [axis](#), const [QwtInterval](#) &)
- [QwtInterval](#) [intervalHint](#) (int [axis](#)) const
- QWidget * [canvas](#) ()
- const QWidget * [canvas](#) () const
- [QwtPlot](#) * [plot](#) ()
- const [QwtPlot](#) * [plot](#) () const
- virtual bool [eventFilter](#) (QObject *, QEvent *)
Event filter for the plot canvas.
- void [rescale](#) () const
Adjust the plot axes scales.

Protected Member Functions

- virtual void [canvasResizeEvent](#) (QResizeEvent *)
- virtual void [rescale](#) (const QSize &oldSize, const QSize &newSize) const
- virtual [QwtInterval](#) [expandScale](#) (int [axis](#), const QSize &oldSize, const QSize &newSize) const
- virtual [QwtInterval](#) [syncScale](#) (int [axis](#), const [QwtInterval](#) &reference, const QSize &size) const
- virtual void [updateScales](#) ([QwtInterval](#) intervals[[QwtPlot::axisCnt](#)]) const
- Qt::Orientation [orientation](#) (int [axis](#)) const
- [QwtInterval](#) [interval](#) (int [axis](#)) const
- [QwtInterval](#) [expandInterval](#) (const [QwtInterval](#) &, double [width](#), [ExpandingDirection](#)) const

12.86.1 Detailed Description

[QwtPlotRescaler](#) takes care of fixed aspect ratios for plot scales.

[QwtPlotRescaler](#) auto adjusts the axes of a [QwtPlot](#) according to fixed aspect ratios.

12.86.2 Member Enumeration Documentation

12.86.2.1 ExpandingDirection

```
enum QwtPlotRescaler::ExpandingDirection
```

When [rescalePolicy\(\)](#) is set to Expanding its direction depends on ExpandingDirection

Enumerator

ExpandUp	The upper limit of the scale is adjusted.
ExpandDown	The lower limit of the scale is adjusted.
ExpandBoth	Both limits of the scale are adjusted.

12.86.2.2 RescalePolicy

```
enum QwtPlotRescaler::RescalePolicy
```

The rescale policy defines how to rescale the reference axis and their depending axes.

See also

[ExpandingDirection](#), [setIntervalHint\(\)](#)

Enumerator

Fixed	The interval of the reference axis remains unchanged, when the geometry of the canvas changes. All other axes will be adjusted according to their aspect ratio.
Expanding	The interval of the reference axis will be shrunk/expanded, when the geometry of the canvas changes. All other axes will be adjusted according to their aspect ratio. The interval, that is represented by one pixel is fixed.
Fitting	The intervals of the axes are calculated, so that all axes include their interval hint.

12.86.3 Constructor & Destructor Documentation

12.86.3.1 QwtPlotRescaler()

```
QwtPlotRescaler::QwtPlotRescaler (
    QWidget * canvas,
    int referenceAxis = QwtPlot::xBottom,
    RescalePolicy policy = Expanding ) [explicit]
```

Constructor

Parameters

<i>canvas</i>	Canvas
<i>referenceAxis</i>	Reference axis, see RescalePolicy
<i>policy</i>	Rescale policy

See also

[setRescalePolicy\(\)](#), [setReferenceAxis\(\)](#)

12.86.4 Member Function Documentation**12.86.4.1 aspectRatio()**

```
double QwtPlotRescaler::aspectRatio (
    int axis ) const
```

Returns

Aspect ratio between an axis and the reference axis.

Parameters

<i>axis</i>	Axis index (see QwtPlot::AxisId)
-------------	------------------------------------

See also

[setAspectRatio\(\)](#)

12.86.4.2 canvas() [1/2]

```
QWidget * QwtPlotRescaler::canvas ( )
```

Returns

plot canvas

12.86.4.3 canvas() [2/2]

```
const QWidget * QwtPlotRescaler::canvas ( ) const
```

Returns

plot canvas

12.86.4.4 canvasResizeEvent()

```
void QwtPlotRescaler::canvasResizeEvent (
    QResizeEvent * event ) [protected], [virtual]
```

Event handler for resize events of the plot canvas

Parameters

<i>event</i>	Resize event
--------------	--------------

See also

[rescale\(\)](#)

12.86.4.5 expandingDirection()

```
QwtPlotRescaler::ExpandingDirection QwtPlotRescaler::expandingDirection (
    int axis ) const
```

Returns

Direction in which an axis should be expanded

Parameters

<i>axis</i>	Axis index (see QwtPlot::AxisId)
-------------	------------------------------------

See also

[setExpandingDirection\(\)](#)

12.86.4.6 expandInterval()

```
QwtInterval QwtPlotRescaler::expandInterval (
    const QwtInterval & interval,
    double width,
    ExpandingDirection direction ) const [protected]
```

Expand the interval

Parameters

<i>interval</i>	Interval to be expanded
<i>width</i>	Distance to be added to the interval
<i>direction</i>	Direction of the expand operation

Returns

Expanded interval

12.86.4.7 expandScale()

```
QwtInterval QwtPlotRescaler::expandScale (
    int axis,
    const QSize & oldSize,
    const QSize & newSize ) const [protected], [virtual]
```

Calculate the new scale interval of a plot axis

Parameters

<i>axis</i>	Axis index (see <code>QwtPlot::AxisId</code>)
<i>oldSize</i>	Previous size of the canvas
<i>newSize</i>	New size of the canvas

Returns

Calculated new interval for the axis

12.86.4.8 interval()

```
QwtInterval QwtPlotRescaler::interval (
    int axis ) const [protected]
```

Parameters

<i>axis</i>	Axis index (see <code>QwtPlot::AxisId</code>)
-------------	---

Returns

Normalized interval of an axis

12.86.4.9 intervalHint()

```
QwtInterval QwtPlotRescaler::intervalHint (
    int axis ) const
```

Parameters

<i>axis</i>	Axis, see QwtPlot::Axis
-------------	---

Returns

Interval hint

See also[setIntervalHint\(\)](#), [RescalePolicy](#)**12.86.4.10 isEnabled()**

```
bool QwtPlotRescaler::isEnabled ( ) const
```

Returns

true when enabled, false otherwise

See also[setEnabled](#), [eventFilter\(\)](#)**12.86.4.11 orientation()**

```
Qt::Orientation QwtPlotRescaler::orientation (
    int axis ) const [protected]
```

Returns

Orientation of an axis

Parameters

<i>axis</i>	Axis index (see QwtPlot::AxisId)
-------------	--

12.86.4.12 plot() ^[1/2]

```
QwtPlot * QwtPlotRescaler::plot ( )
```

Returns

plot widget

12.86.4.13 `plot()` [2/2]

```
const QwtPlot * QwtPlotRescaler::plot ( ) const
```

Returns

plot widget

12.86.4.14 `referenceAxis()`

```
int QwtPlotRescaler::referenceAxis ( ) const
```

Returns

Reference axis (see `RescalePolicy`)

See also

[setReferenceAxis\(\)](#)

12.86.4.15 `rescale()`

```
void QwtPlotRescaler::rescale (
    const QSize & oldSize,
    const QSize & newSize ) const [protected], [virtual]
```

Adjust the plot axes scales

Parameters

<i>oldSize</i>	Previous size of the canvas
<i>newSize</i>	New size of the canvas

12.86.4.16 `rescalePolicy()`

```
QwtPlotRescaler::RescalePolicy QwtPlotRescaler::rescalePolicy ( ) const
```

Returns

Rescale policy

See also

[setRescalePolicy\(\)](#)

12.86.4.17 setAspectRatio() [1/2]

```
void QwtPlotRescaler::setAspectRatio (
    double ratio )
```

Set the aspect ratio between the scale of the reference axis and the other scales. The default ratio is 1.0

Parameters

<i>ratio</i>	Aspect ratio
--------------	--------------

See also

[aspectRatio\(\)](#)

12.86.4.18 setAspectRatio() [2/2]

```
void QwtPlotRescaler::setAspectRatio (
    int axis,
    double ratio )
```

Set the aspect ratio between the scale of the reference axis and another scale. The default ratio is 1.0

Parameters

<i>axis</i>	Axis index (see <code>QwtPlot::AxisId</code>)
<i>ratio</i>	Aspect ratio

See also

[aspectRatio\(\)](#)

12.86.4.19 setEnabled()

```
void QwtPlotRescaler::setEnabled (
    bool on )
```

En/disable the rescaler.

When enabled is true an event filter is installed for the canvas, otherwise the event filter is removed.

Parameters

<i>on</i>	true or false
-----------	---------------

See also

[isEnabled\(\)](#), [eventFilter\(\)](#)

12.86.4.20 [setExpandingDirection\(\)](#) [1/2]

```
void QwtPlotRescaler::setExpandingDirection (
    ExpandingDirection direction )
```

Set the direction in which all axis should be expanded

Parameters

<i>direction</i>	Direction
------------------	-----------

See also

[expandingDirection\(\)](#)

12.86.4.21 [setExpandingDirection\(\)](#) [2/2]

```
void QwtPlotRescaler::setExpandingDirection (
    int axis,
    ExpandingDirection direction )
```

Set the direction in which an axis should be expanded

Parameters

<i>axis</i>	Axis index (see <code>QwtPlot::AxisId</code>)
<i>direction</i>	Direction

See also

[expandingDirection\(\)](#)

12.86.4.22 [setIntervalHint\(\)](#)

```
void QwtPlotRescaler::setIntervalHint (
    int axis,
    const QwtInterval & interval )
```

Set an interval hint for an axis

In Fitting mode, the hint is used as minimal interval that always needs to be displayed.

Parameters

<i>axis</i>	Axis, see QwtPlot::Axis
<i>interval</i>	Axis

See also

[intervalHint\(\)](#), [RescalePolicy](#)

12.86.4.23 setReferenceAxis()

```
void QwtPlotRescaler::setReferenceAxis (
    int axis )
```

Set the reference axis (see [RescalePolicy](#))

Parameters

<i>axis</i>	Axis index (QwtPlot::Axis)
-------------	--

See also

[referenceAxis\(\)](#)

12.86.4.24 setRescalePolicy()

```
void QwtPlotRescaler::setRescalePolicy (
    RescalePolicy policy )
```

Change the rescale policy

Parameters

<i>policy</i>	Rescale policy
---------------	----------------

See also

[rescalePolicy\(\)](#)

12.86.4.25 syncScale()

```
QwtInterval QwtPlotRescaler::syncScale (
    int axis,
```

```
const QwtInterval & reference,  
const QSize & size ) const [protected], [virtual]
```

Synchronize an axis scale according to the scale of the reference axis

Parameters

<i>axis</i>	Axis index (see QwtPlot::AxisId)
<i>reference</i>	Interval of the reference axis
<i>size</i>	Size of the canvas

Returns

New interval for axis

12.86.4.26 updateScales()

```
void QwtPlotRescaler::updateScales (
    QwtInterval intervals[QwtPlot::axisCnt] ) const [protected], [virtual]
```

Update the axes scales

Parameters

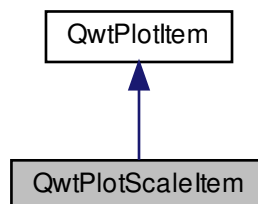
<i>intervals</i>	Scale intervals
------------------	-----------------

12.87 QwtPlotScaleItem Class Reference

A class which draws a scale inside the plot canvas.

```
#include <qwt_plot_scaleitem.h>
```

Inheritance diagram for QwtPlotScaleItem:



Public Member Functions

- [QwtPlotScaleItem](#) ([QwtScaleDraw::Alignment](#)=[QwtScaleDraw::BottomScale](#), const double pos=0.0)
Constructor for scale item at the position pos.

- virtual `~QwtPlotScaleItem ()`
Destructor.
- virtual int `rtti () const`
- void `setScaleDiv (const QwtScaleDiv &)`
Assign a scale division.
- const `QwtScaleDiv & scaleDiv () const`
- void `setScaleDivFromAxis (bool on)`
- bool `isScaleDivFromAxis () const`
- void `setPalette (const QPalette &)`
- QPalette `palette () const`
- void `setFont (const QFont &)`
- QFont `font () const`
- void `setScaleDraw (QwtScaleDraw *)`
Set a scale draw.
- const `QwtScaleDraw * scaleDraw () const`
- `QwtScaleDraw * scaleDraw ()`
- void `setPosition (double pos)`
- double `position () const`
- void `setBorderDistance (int)`
Align the scale to the canvas.
- int `borderDistance () const`
- void `setAlignment (QwtScaleDraw::Alignment)`
- virtual void `draw (QPainter *, const QwtScaleMap &xMap, const QwtScaleMap &yMap, const QRectF &canvasRect) const`
Draw the scale.
- virtual void `updateScaleDiv (const QwtScaleDiv &, const QwtScaleDiv &)`
Update the item to changes of the axes scale division.

Additional Inherited Members

12.87.1 Detailed Description

A class which draws a scale inside the plot canvas.

`QwtPlotScaleItem` can be used to draw an axis inside the plot canvas. It might be synchronized to one of the axis of the plot, but can also display its own ticks and labels.

It is allowed to synchronize the scale item with a disabled axis. In plots with vertical and horizontal scale items, it might be necessary to remove ticks at the intersections, by overloading `updateScaleDiv()`.

The scale might be at a specific position (f.e 0.0) or it might be aligned to a canvas border.

Example

The following example shows how to replace the left axis, by a scale item at the x position 0.0.

```
QwtPlotScaleItem *scaleItem = new QwtPlotScaleItem(
    QwtScaleDraw::RightScale, 0.0 );
scaleItem->setFont( plot->axisWidget( QwtPlot::yLeft )->font() );
scaleItem->attach(plot);

plot->enableAxis( QwtPlot::yLeft, false );
```


12.87.2 Constructor & Destructor Documentation

12.87.2.1 QwtPlotScaleItem()

```
QwtPlotScaleItem::QwtPlotScaleItem (
    QwtScaleDraw::Alignment alignment = QwtScaleDraw::BottomScale,
    const double pos = 0.0 ) [explicit]
```

Constructor for scale item at the position pos.

Parameters

<i>alignment</i>	In case of QwtScaleDraw::BottomScale or QwtScaleDraw::TopScale the scale item is corresponding to the xAxis() , otherwise it corresponds to the yAxis() .
<i>pos</i>	x or y position, depending on the corresponding axis.

See also

[setPosition\(\)](#), [setAlignment\(\)](#)

12.87.3 Member Function Documentation

12.87.3.1 borderDistance()

```
int QwtPlotScaleItem::borderDistance ( ) const
```

Returns

Distance from a canvas border

See also

[setBorderDistance\(\)](#), [setPosition\(\)](#)

12.87.3.2 font()

```
QFont QwtPlotScaleItem::font ( ) const
```

Returns

tick label font

See also

[setFont\(\)](#)

12.87.3.3 isScaleDivFromAxis()

```
bool QwtPlotScaleItem::isScaleDivFromAxis ( ) const
```

Returns

True, if the synchronization of the scale division with the corresponding axis is enabled.

See also

[setScaleDiv\(\)](#), [setScaleDivFromAxis\(\)](#)

12.87.3.4 palette()

```
QPalette QwtPlotScaleItem::palette ( ) const
```

Returns

palette

See also

[setPalette\(\)](#)

12.87.3.5 position()

```
double QwtPlotScaleItem::position ( ) const
```

Returns

Position of the scale

See also

[setPosition\(\)](#), [setAlignment\(\)](#)

12.87.3.6 rtti()

```
int QwtPlotScaleItem::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotScale](#)

Reimplemented from [QwtPlotItem](#).

12.87.3.7 scaleDiv()

```
const QwtScaleDiv & QwtPlotScaleItem::scaleDiv ( ) const
```

Returns

Scale division

12.87.3.8 scaleDraw() [1/2]

```
const QwtScaleDraw * QwtPlotScaleItem::scaleDraw ( ) const
```

Returns

Scale draw

See also

[setScaleDraw\(\)](#)

12.87.3.9 scaleDraw() [2/2]

```
QwtScaleDraw * QwtPlotScaleItem::scaleDraw ( )
```

Returns

Scale draw

See also

[setScaleDraw\(\)](#)

12.87.3.10 setAlignment()

```
void QwtPlotScaleItem::setAlignment (
    QwtScaleDraw::Alignment alignment )
```

Change the alignment of the scale

The alignment sets the orientation of the scale and the position of the ticks:

- [QwtScaleDraw::BottomScale](#): horizontal, ticks below
- [QwtScaleDraw::TopScale](#): horizontal, ticks above
- [QwtScaleDraw::LeftScale](#): vertical, ticks left
- [QwtScaleDraw::RightScale](#): vertical, ticks right

For horizontal scales the position corresponds to [QwtPlotItem::yAxis\(\)](#), otherwise to [QwtPlotItem::xAxis\(\)](#).

See also

[scaleDraw\(\)](#), [QwtScaleDraw::alignment\(\)](#), [setPosition\(\)](#)

12.87.3.11 `setBorderDistance()`

```
void QwtPlotScaleItem::setBorderDistance (
    int distance )
```

Align the scale to the canvas.

If distance is ≥ 0 the scale will be aligned to a border of the contents rectangle of the canvas. If `alignment()` is [QwtScaleDraw::LeftScale](#), the scale will be aligned to the right border, if it is [QwtScaleDraw::TopScale](#) it will be aligned to the bottom (and vice versa),

If distance is < 0 the scale will be at the [position\(\)](#).

Parameters

<i>distance</i>	Number of pixels between the canvas border and the backbone of the scale.
-----------------	---

See also

[setPosition\(\)](#), [borderDistance\(\)](#)

12.87.3.12 `setFont()`

```
void QwtPlotScaleItem::setFont (
    const QFont & font )
```

Change the tick label font

See also

[font\(\)](#)

12.87.3.13 `setPalette()`

```
void QwtPlotScaleItem::setPalette (
    const QPalette & palette )
```

Set the palette

See also

[QwtAbstractScaleDraw::draw\(\)](#), [palette\(\)](#)

12.87.3.14 `setPosition()`

```
void QwtPlotScaleItem::setPosition (
    double pos )
```

Change the position of the scale

The position is interpreted as y value for horizontal axes and as x value for vertical axes.

The border distance is set to -1.

Parameters

<i>pos</i>	New position
------------	--------------

See also

[position\(\)](#), [setAlignment\(\)](#)

12.87.3.15 `setScaleDiv()`

```
void QwtPlotScaleItem::setScaleDiv (
    const QwtScaleDiv & scaleDiv )
```

Assign a scale division.

When assigning a `scaleDiv` the scale division won't be synchronized with the corresponding axis anymore.

Parameters

<i>scaleDiv</i>	Scale division
-----------------	----------------

See also

[scaleDiv\(\)](#), [setScaleDivFromAxis\(\)](#), [isScaleDivFromAxis\(\)](#)

12.87.3.16 `setScaleDivFromAxis()`

```
void QwtPlotScaleItem::setScaleDivFromAxis (
    bool on )
```

Enable/Disable the synchronization of the scale division with the corresponding axis.

Parameters

<i>on</i>	true/false
-----------	------------

See also

[isScaleDivFromAxis\(\)](#)

12.87.3.17 `setScaleDraw()`

```
void QwtPlotScaleItem::setScaleDraw (
    QwtScaleDraw * scaleDraw )
```

Set a scale draw.

Parameters

<i>scaleDraw</i>	object responsible for drawing scales.
------------------	--

The main use case for replacing the default [QwtScaleDraw](#) is to overload [QwtAbstractScaleDraw::label](#), to replace or swallow tick labels.

See also

[scaleDraw\(\)](#)

12.87.3.18 updateScaleDiv()

```
void QwtPlotScaleItem::updateScaleDiv (
    const QwtScaleDiv & xScaleDiv,
    const QwtScaleDiv & yScaleDiv ) [virtual]
```

Update the item to changes of the axes scale division.

In case of [isScaleDivFromAxis\(\)](#), the scale draw is synchronized to the correspond axis.

Parameters

<i>xScaleDiv</i>	Scale division of the x-axis
<i>yScaleDiv</i>	Scale division of the y-axis

See also

[QwtPlot::updateAxes\(\)](#)

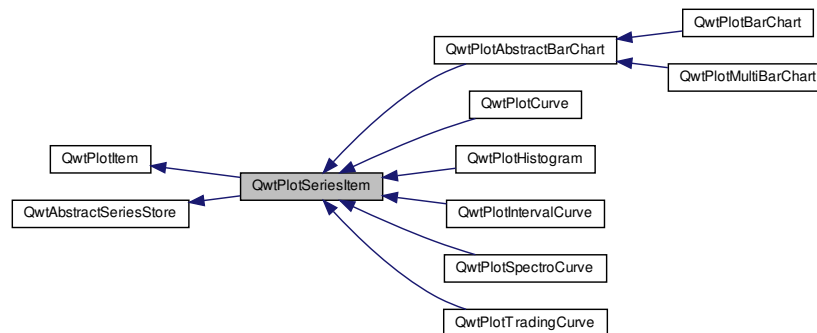
Reimplemented from [QwtPlotItem](#).

12.88 QwtPlotSeriesItem Class Reference

Base class for plot items representing a series of samples.

```
#include <qwt_plot_seriesitem.h>
```

Inheritance diagram for QwtPlotSeriesItem:



Public Member Functions

- [QwtPlotSeriesItem](#) (const QString &title=QString())
- [QwtPlotSeriesItem](#) (const [QwtText](#) &title)
- virtual [~QwtPlotSeriesItem](#) ()
Destructor.
- void [setOrientation](#) (Qt::Orientation)
- Qt::Orientation [orientation](#) () const
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &) const
Draw the complete series.
- virtual void [drawSeries](#) (QPainter *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const =0
- virtual QRectF [boundingRect](#) () const
- virtual void [updateScaleDiv](#) (const [QwtScaleDiv](#) &, const [QwtScaleDiv](#) &)
Update the item to changes of the axes scale division.

Protected Member Functions

- virtual void [dataChanged](#) ()
[dataChanged\(\)](#) indicates, that the series has been changed.

Additional Inherited Members

12.88.1 Detailed Description

Base class for plot items representing a series of samples.

12.88.2 Constructor & Destructor Documentation

12.88.2.1 QwtPlotSeriesItem() [1/2]

```
QwtPlotSeriesItem::QwtPlotSeriesItem (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.88.2.2 QwtPlotSeriesItem() [2/2]

```
QwtPlotSeriesItem::QwtPlotSeriesItem (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.88.3 Member Function Documentation

12.88.3.1 boundingRect()

```
QRectF QwtPlotSeriesItem::boundingRect ( ) const [virtual]
```

Returns

An invalid bounding rect: QRectF(1.0, 1.0, -2.0, -2.0)

Note

A width or height < 0.0 is ignored by the autoscaler

Reimplemented from [QwtPlotItem](#).

Reimplemented in [QwtPlotTradingCurve](#), [QwtPlotIntervalCurve](#), [QwtPlotHistogram](#), [QwtPlotBarChart](#), and [QwtPlotMultiBarChart](#).

12.88.3.2 draw()

```
void QwtPlotSeriesItem::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the complete series.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas

Implements [QwtPlotItem](#).

12.88.3.3 drawSeries()

```
virtual void QwtPlotSeriesItem::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [pure virtual]
```

Draw a subset of the samples

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted. If to < 0 the curve will be painted to its last point.

Implemented in [QwtPlotCurve](#), [QwtPlotTradingCurve](#), [QwtPlotIntervalCurve](#), [QwtPlotHistogram](#), [QwtPlotBarChart](#), [QwtPlotMultiBarChart](#), and [QwtPlotSpectroCurve](#).

12.88.3.4 orientation()

```
Qt::Orientation QwtPlotSeriesItem::orientation ( ) const
```

Returns

Orientation of the plot item

See also

[setOrientation\(\)](#)

12.88.3.5 setOrientation()

```
void QwtPlotSeriesItem::setOrientation (
    Qt::Orientation orientation )
```

Set the orientation of the item.

The [orientation\(\)](#) might be used in specific way by a plot item. F.e. a [QwtPlotCurve](#) uses it to identify how to display the curve int [QwtPlotCurve::Steps](#) or [QwtPlotCurve::Sticks](#) style.

See also

[orientation\(\)](#)

12.88.3.6 updateScaleDiv()

```
void QwtPlotSeriesItem::updateScaleDiv (
    const QwtScaleDiv & xScaleDiv,
    const QwtScaleDiv & yScaleDiv ) [virtual]
```

Update the item to changes of the axes scale division.

Update the item, when the axes of plot have changed. The default implementation does nothing, but items that depend on the scale division (like [QwtPlotGrid\(\)](#)) have to reimplement [updateScaleDiv\(\)](#)

[updateScaleDiv\(\)](#) is only called when the ScaleInterest interest is enabled. The default implementation does nothing.

Parameters

<i>xScaleDiv</i>	Scale division of the x-axis
<i>yScaleDiv</i>	Scale division of the y-axis

See also

[QwtPlot::updateAxes\(\)](#), [ScaleInterest](#)

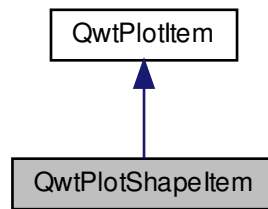
Reimplemented from [QwtPlotItem](#).

12.89 QwtPlotShapeItem Class Reference

A plot item, which displays any graphical shape, that can be defined by a QPainterPath.

```
#include <qwt_plot_shapeitem.h>
```

Inheritance diagram for QwtPlotShapeltem:



Public Types

- enum `PaintAttribute` { `ClipPolygons` = 0x01 }
- enum `LegendMode` { `LegendShape`, `LegendColor` }
Mode how to display the item on the legend.
- typedef `QFlags< PaintAttribute >` `PaintAttributes`
Paint attributes.

Public Member Functions

- `QwtPlotShapeltem` (const `QString` &`title`=`QString`())
Constructor.
- `QwtPlotShapeltem` (const `QwtText` &`title`)
Constructor.
- virtual `~QwtPlotShapeltem` ()
Destructor.
- void `setPaintAttribute` (`PaintAttribute`, bool `on`=true)
- bool `testPaintAttribute` (`PaintAttribute`) const
- void `setLegendMode` (`LegendMode`)
- `LegendMode` `legendMode` () const
- void `setRect` (const `QRectF` &)
Set a path built from a rectangle.
- void `setPolygon` (const `QPolygonF` &)
Set a path built from a polygon.
- void `setShape` (const `QPainterPath` &)
Set the shape to be displayed.
- `QPainterPath` `shape` () const
- void `setPen` (const `QColor` &, qreal `width`=0.0, `Qt::PenStyle`=`Qt::SolidLine`)
- void `setPen` (const `QPen` &)
Assign a pen.
- `QPen` `pen` () const
- void `setBrush` (const `QBrush` &)
- `QBrush` `brush` () const
- void `setRenderTolerance` (double)
Set the tolerance for the weeding optimization.

- double [renderTolerance](#) () const
- virtual QRectF [boundingRect](#) () const
Bounding rectangle of the shape.
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect) const
- virtual [QwtGraphic legendIcon](#) (int index, const QSizeF &) const
- virtual int [rtti](#) () const

Additional Inherited Members

12.89.1 Detailed Description

A plot item, which displays any graphical shape, that can be defined by a QPainterPath.

A QPainterPath is a shape composed from intersecting and uniting regions, rectangles, ellipses or irregular areas defined by lines, and curves. [QwtPlotShapelItem](#) displays a shape with a pen and brush.

[QwtPlotShapelItem](#) offers a couple of optimizations like clipping or weeding. These algorithms need to convert the painter path into polygons that might be less performant for paths built from curves and ellipses.

See also

[QwtPlotZone](#)

12.89.2 Member Enumeration Documentation

12.89.2.1 LegendMode

```
enum QwtPlotShapelItem::LegendMode
```

Mode how to display the item on the legend.

Enumerator

LegendShape	Display a scaled down version of the shape.
LegendColor	Display a filled rectangle.

12.89.2.2 PaintAttribute

```
enum QwtPlotShapelItem::PaintAttribute
```

Attributes to modify the drawing algorithm. The default disables all attributes

See also

[setPaintAttribute\(\)](#), [testPaintAttribute\(\)](#)

Enumerator

ClipPolygons	Clip polygons before painting them. In situations, where points are far outside the visible area (f.e when zooming deep) this might be a substantial improvement for the painting performance. But polygon clipping will convert the painter path into polygons what might introduce a negative impact on the performance of paths composed from curves or ellipses.
--------------	--

12.89.3 Constructor & Destructor Documentation

12.89.3.1 QwtPlotShapeltem() [1/2]

```
QwtPlotShapeItem::QwtPlotShapeItem (
    const QString & title = QString() ) [explicit]
```

Constructor.

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): true
- [QwtPlotItem::Legend](#): false

Parameters

<i>title</i>	Title
--------------	-------

12.89.3.2 QwtPlotShapeltem() [2/2]

```
QwtPlotShapeItem::QwtPlotShapeItem (
    const QwtText & title ) [explicit]
```

Constructor.

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): true
- [QwtPlotItem::Legend](#): false

Parameters

<i>title</i>	Title
--------------	-------

12.89.4 Member Function Documentation

12.89.4.1 brush()

```
QBrush QwtPlotShapeItem::brush ( ) const
```

Returns

Brush used to fill the shape

See also

[setBrush\(\)](#), [pen\(\)](#)

12.89.4.2 draw()

```
void QwtPlotShapeItem::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the shape item

Parameters

<i>painter</i>	Painter
<i>xMap</i>	X-Scale Map
<i>yMap</i>	Y-Scale Map
<i>canvasRect</i>	Contents rect of the plot canvas

Implements [QwtPlotItem](#).

12.89.4.3 legendIcon()

```
QwtGraphic QwtPlotShapeItem::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

A rectangle filled with the color of the brush (or the pen)

Parameters

<i>index</i>	Index of the legend entry (usually there is only one)
<i>size</i>	Icon size

See also

[setLegendIconSize\(\)](#), [legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.89.4.4 legendMode()

```
QwtPlotShapeItem::LegendMode QwtPlotShapeItem::legendMode ( ) const
```

Returns

Mode how to represent the item on the legend

See also

[legendMode\(\)](#)

12.89.4.5 pen()

```
QPen QwtPlotShapeItem::pen ( ) const
```

Returns

Pen used to draw the outline of the shape

See also

[setPen\(\)](#), [brush\(\)](#)

12.89.4.6 renderTolerance()

```
double QwtPlotShapeItem::renderTolerance ( ) const
```

Returns

Tolerance for the weeding optimization

See also

[setRenderTolerance\(\)](#)

12.89.4.7 rtti()

```
int QwtPlotShapeItem::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotShape](#)

Reimplemented from [QwtPlotItem](#).

12.89.4.8 setBrush()

```
void QwtPlotShapeItem::setBrush (
    const QBrush & brush )
```

Assign a brush.

The brush is used to fill the path

Parameters

<i>brush</i>	Brush
--------------	-------

See also

[brush\(\)](#), [pen\(\)](#)

12.89.4.9 setLegendMode()

```
void QwtPlotShapeItem::setLegendMode (
    LegendMode mode )
```

Set the mode how to represent the item on the legend

Parameters

<i>mode</i>	Mode
-------------	------

See also

[legendMode\(\)](#)

12.89.4.10 setPaintAttribute()

```
void QwtPlotShapeItem::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```


Specify an attribute how to draw the shape

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off

See also

[testPaintAttribute\(\)](#)

12.89.4.11 setPen() [1/2]

```
void QwtPlotShapeItem::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see QPen::isCosmetic()). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.89.4.12 setPen() [2/2]

```
void QwtPlotShapeItem::setPen (
    const QPen & pen )
```

Assign a pen.

The pen is used to draw the outline of the shape

Parameters

<i>pen</i>	Pen
------------	-----

See also

[pen\(\)](#), [brush\(\)](#)

12.89.4.13 `setPolygon()`

```
void QwtPlotShapeItem::setPolygon (
    const QPolygonF & polygon )
```

Set a path built from a polygon.

Parameters

<i>polygon</i>	Polygon
----------------	---------

See also

[setShape\(\)](#), [setRect\(\)](#), [shape\(\)](#)

12.89.4.14 `setRect()`

```
void QwtPlotShapeItem::setRect (
    const QRectF & rect )
```

Set a path built from a rectangle.

Parameters

<i>rect</i>	Rectangle
-------------	-----------

See also

[setShape\(\)](#), [setPolygon\(\)](#), [shape\(\)](#)

12.89.4.15 `setRenderTolerance()`

```
void QwtPlotShapeItem::setRenderTolerance (
    double tolerance )
```

Set the tolerance for the weeding optimization.

After translating the shape into target device coordinate (usually widget geometries) the painter path can be simplified by a point weeding algorithm (Douglas-Peucker).

For shapes built from curves and ellipses weeding might have the opposite effect because they have to be expanded to polygons.

Parameters

<i>tolerance</i>	Accepted error when reducing the number of points A value ≤ 0.0 disables weeding.
------------------	--

See also

[renderTolerance\(\)](#), [QwtWeedingCurveFitter](#)

12.89.4.16 `setShape()`

```
void QwtPlotShapeItem::setShape (
    const QPainterPath & shape )
```

Set the shape to be displayed.

Parameters

<i>shape</i>	Shape
--------------	-------

See also

[setShape\(\)](#), [shape\(\)](#)

12.89.4.17 `shape()`

```
QPainterPath QwtPlotShapeItem::shape ( ) const
```

Returns

Shape to be displayed

See also

[setShape\(\)](#)

12.89.4.18 `testPaintAttribute()`

```
bool QwtPlotShapeItem::testPaintAttribute (
    PaintAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

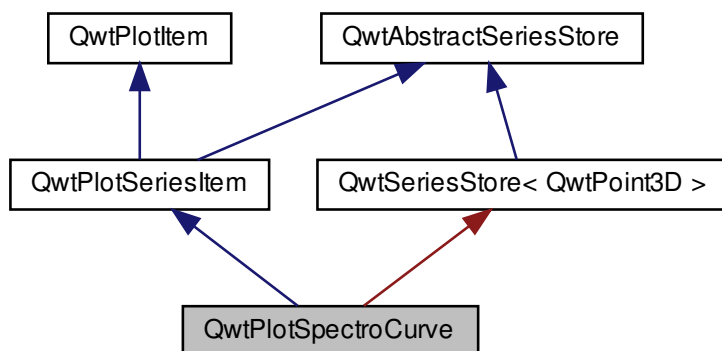
[setPaintAttribute\(\)](#)

12.90 QwtPlotSpectroCurve Class Reference

Curve that displays 3D points as dots, where the z coordinate is mapped to a color.

```
#include <qwt_plot_spectrocurve.h>
```

Inheritance diagram for QwtPlotSpectroCurve:



Public Types

- enum [PaintAttribute](#) { [ClipPoints](#) = 1 }
Paint attributes.
- typedef QFlags< [PaintAttribute](#) > [PaintAttributes](#)
Paint attributes.

Public Member Functions

- [QwtPlotSpectroCurve](#) (const QString &title=QString())
- [QwtPlotSpectroCurve](#) (const [QwtText](#) &title)
- virtual [~QwtPlotSpectroCurve](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setPaintAttribute](#) ([PaintAttribute](#), bool on=true)
- bool [testPaintAttribute](#) ([PaintAttribute](#)) const
- void [setSamples](#) (const QVector< [QwtPoint3D](#) > &)
- void [setSamples](#) ([QwtSeriesData](#)< [QwtPoint3D](#) > *)
- void [setColorMap](#) ([QwtColorMap](#) *)
- const [QwtColorMap](#) * [colorMap](#) () const
- void [setColorRange](#) (const [QwtInterval](#) &)
- [QwtInterval](#) & [colorRange](#) () const
- virtual void [drawSeries](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
- void [setPenWidth](#) (double)
- double [penWidth](#) () const

Protected Member Functions

- virtual void [drawDots](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const

12.90.1 Detailed Description

Curve that displays 3D points as dots, where the z coordinate is mapped to a color.

12.90.2 Member Enumeration Documentation

12.90.2.1 PaintAttribute

```
enum QwtPlotSpectroCurve::PaintAttribute
```

Paint attributes.

Enumerator

ClipPoints	Clip points outside the canvas rectangle.
----------------------------	---

12.90.3 Constructor & Destructor Documentation

12.90.3.1 QwtPlotSpectroCurve() [1/2]

```
QwtPlotSpectroCurve::QwtPlotSpectroCurve (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.90.3.2 QwtPlotSpectroCurve() [2/2]

```
QwtPlotSpectroCurve::QwtPlotSpectroCurve (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.90.4 Member Function Documentation

12.90.4.1 colorMap()

```
const QwtColorMap * QwtPlotSpectroCurve::colorMap ( ) const
```

Returns

Color Map used for mapping the intensity values to colors

See also

[setColorMap\(\)](#), [setColorRange\(\)](#), [QwtColorMap::color\(\)](#)

12.90.4.2 colorRange()

```
QwtInterval & QwtPlotSpectroCurve::colorRange ( ) const
```

Returns

Value interval, that corresponds to the color map

See also

[setColorRange\(\)](#), [setColorMap\(\)](#), [QwtColorMap::color\(\)](#)

12.90.4.3 drawDots()

```
void QwtPlotSpectroCurve::drawDots (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw a subset of the points

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If <i>to</i> < 0 the series will be painted to its last sample.

See also

[drawSeries\(\)](#)

12.90.4.4 drawSeries()

```
void QwtPlotSpectroCurve::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw a subset of the points

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first sample to be painted
<i>to</i>	Index of the last sample to be painted. If <i>to</i> < 0 the series will be painted to its last sample.

See also

[drawDots\(\)](#)

Implements [QwtPlotSeriesItem](#).

12.90.4.5 penWidth()

```
double QwtPlotSpectroCurve::penWidth ( ) const
```

Returns

Pen width used to draw a dot

See also

[setPenWidth\(\)](#)

12.90.4.6 `rtti()`

```
int QwtPlotSpectroCurve::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotSpectroCurve](#)

Reimplemented from [QwtPlotItem](#).

12.90.4.7 `setColorMap()`

```
void QwtPlotSpectroCurve::setColorMap (
    QwtColorMap * colorMap )
```

Change the color map

Often it is useful to display the mapping between intensities and colors as an additional plot axis, showing a color bar.

Parameters

<i>colorMap</i>	Color Map
-----------------	-----------

See also

[colorMap\(\)](#), [setColorRange\(\)](#), [QwtColorMap::color\(\)](#), [QwtScaleWidget::setColorBarEnabled\(\)](#), [QwtScaleWidget::setColorMap\(\)](#)

12.90.4.8 `setColorRange()`

```
void QwtPlotSpectroCurve::setColorRange (
    const QwtInterval & interval )
```

Set the value interval, that corresponds to the color map

Parameters

<i>interval</i>	interval.minValue() corresponds to 0.0, interval.maxValue() to 1.0 on the color map.
-----------------	--

See also

[colorRange\(\)](#), [setColorMap\(\)](#), [QwtColorMap::color\(\)](#)

12.90.4.9 setPaintAttribute()

```
void QwtPlotSpectroCurve::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```

Specify an attribute how to draw the curve

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off /sa PaintAttribute, testPaintAttribute()

12.90.4.10 setPenWidth()

```
void QwtPlotSpectroCurve::setPenWidth (
    double penWidth )
```

Assign a pen width

Parameters

<i>penWidth</i>	New pen width
-----------------	---------------

See also

[penWidth\(\)](#)

12.90.4.11 setSamples() [1/2]

```
void QwtPlotSpectroCurve::setSamples (
    const QVector< QwtPoint3D > & samples )
```

Initialize data with an array of samples.

Parameters

<i>samples</i>	Vector of points
----------------	------------------

12.90.4.12 `setSamples()` [2/2]

```
void QwtPlotSpectroCurve::setSamples (
    QwtSeriesData< QwtPoint3D > * data )
```

Assign a series of samples

`setSamples()` is just a wrapper for `setData()` without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.90.4.13 `testPaintAttribute()`

```
bool QwtPlotSpectroCurve::testPaintAttribute (
    PaintAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

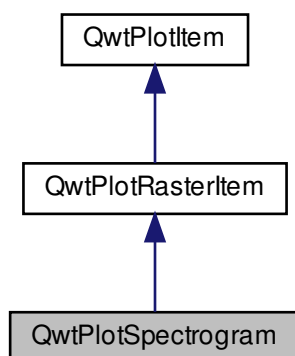
[PaintAttribute](#), [setPaintAttribute\(\)](#)

12.91 `QwtPlotSpectrogram` Class Reference

A plot item, which displays a spectrogram.

```
#include <qwt_plot_spectrogram.h>
```

Inheritance diagram for `QwtPlotSpectrogram`:



Public Types

- enum [DisplayMode](#) { [ImageMode](#) = 0x01, [ContourMode](#) = 0x02 }
- typedef QFlags< [DisplayMode](#) > [DisplayModes](#)
Display modes.

Public Member Functions

- [QwtPlotSpectrogram](#) (const QString &[title](#)=QString())
- virtual [~QwtPlotSpectrogram](#) ()
Destructor.
- void [setDisplayMode](#) ([DisplayMode](#), bool on=true)
- bool [testDisplayMode](#) ([DisplayMode](#)) const
- void [setData](#) ([QwtRasterData](#) *[data](#))
- const [QwtRasterData](#) * [data](#) () const
- [QwtRasterData](#) * [data](#) ()
- void [setColorMap](#) ([QwtColorMap](#) *)
- const [QwtColorMap](#) * [colorMap](#) () const
- virtual [QwtInterval](#) [interval](#) (Qt::Axis) const
- virtual QRectF [pixelHint](#) (const QRectF &) const
Pixel hint.
- void [setDefaultContourPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setDefaultContourPen](#) (const QPen &)
Set the default pen for the contour lines.
- QPen [defaultContourPen](#) () const
- virtual QPen [contourPen](#) (double level) const
Calculate the pen for a contour line.
- void [setConrecFlag](#) ([QwtRasterData::ConrecFlag](#), bool on)
- bool [testConrecFlag](#) ([QwtRasterData::ConrecFlag](#)) const
- void [setContourLevels](#) (const QList< double > &)
- QList< double > [contourLevels](#) () const
- virtual int [rtti](#) () const
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &[xMap](#), const [QwtScaleMap](#) &[yMap](#), const QRectF &[canvasRect](#)) const
Draw the spectrogram.

Protected Member Functions

- virtual QImage [renderImage](#) (const [QwtScaleMap](#) &[xMap](#), const [QwtScaleMap](#) &[yMap](#), const QRectF &[area](#), const QSize &[imageSize](#)) const
Render an image from data and color map.
- virtual QSize [contourRasterSize](#) (const QRectF &, const QRect &) const
Return the raster to be used by the CONREC contour algorithm.
- virtual [QwtRasterData::ContourLines](#) [renderContourLines](#) (const QRectF &[rect](#), const QSize &[raster](#)) const
- virtual void [drawContourLines](#) (QPainter *, const [QwtScaleMap](#) &[xMap](#), const [QwtScaleMap](#) &[yMap](#), const [QwtRasterData::ContourLines](#) &) const
- void [renderTile](#) (const [QwtScaleMap](#) &[xMap](#), const [QwtScaleMap](#) &[yMap](#), const QRect &[tile](#), QImage *) const
Render a tile of an image.

12.91.1 Detailed Description

A plot item, which displays a spectrogram.

A spectrogram displays 3-dimensional data, where the 3rd dimension (the intensity) is displayed using colors. The colors are calculated from the values using a color map.

On multi-core systems the performance of the image composition can often be improved by dividing the area into tiles - each of them rendered in a different thread (see [QwtPlotItem::setRenderThreadCount\(\)](#)).

In ContourMode contour lines are painted for the contour levels.

See also

[QwtRasterData](#), [QwtColorMap](#), [QwtPlotItem::setRenderThreadCount\(\)](#)

12.91.2 Member Enumeration Documentation

12.91.2.1 DisplayMode

```
enum QwtPlotSpectrogram::DisplayMode
```

The display mode controls how the raster data will be represented.

See also

[setDisplayMode\(\)](#), [testDisplayMode\(\)](#)

Enumerator

ImageMode	The values are mapped to colors using a color map.
ContourMode	The data is displayed using contour lines.

12.91.3 Constructor & Destructor Documentation

12.91.3.1 QwtPlotSpectrogram()

```
QwtPlotSpectrogram::QwtPlotSpectrogram (
    const QString & title = QString() ) [explicit]
```

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): true
- [QwtPlotItem::Legend](#): false

The z value is initialized by 8.0.

Parameters

<i>title</i>	Title
--------------	-------

See also

[QwtPlotItem::setItemAttribute\(\)](#), [QwtPlotItem::setZ\(\)](#)

12.91.4 Member Function Documentation

12.91.4.1 colorMap()

```
const QwtColorMap * QwtPlotSpectrogram::colorMap ( ) const
```

Returns

Color Map used for mapping the intensity values to colors

See also

[setColorMap\(\)](#)

12.91.4.2 contourLevels()

```
QList< double > QwtPlotSpectrogram::contourLevels ( ) const
```

Returns

Levels of the contour lines.

The levels are sorted in increasing order.

See also

[contourLevels\(\)](#), [renderContourLines\(\)](#), [QwtRasterData::contourLines\(\)](#)

12.91.4.3 contourPen()

```
QPen QwtPlotSpectrogram::contourPen (
    double level ) const [virtual]
```

Calculate the pen for a contour line.

The color of the pen is the color for level calculated by the color map

Parameters

<i>level</i>	Contour level
--------------	---------------

Returns

Pen for the contour line

Note

contourPen is only used if `defaultContourPen().style() == Qt::NoPen`

See also

[setDefaultContourPen\(\)](#), [setColorMap\(\)](#), [setContourLevels\(\)](#)

12.91.4.4 contourRasterSize()

```
QSize QwtPlotSpectrogram::contourRasterSize (
    const QRectF & area,
    const QRect & rect ) const [protected], [virtual]
```

Return the raster to be used by the CONREC contour algorithm.

A larger size will improve the precision of the CONREC algorithm, but will slow down the time that is needed to calculate the lines.

The default implementation returns `rect.size() / 2` bounded to the resolution depending on `pixelSize()`.

Parameters

<i>area</i>	Rectangle, where to calculate the contour lines
<i>rect</i>	Rectangle in pixel coordinates, where to paint the contour lines

Returns

Raster to be used by the CONREC contour algorithm.

Note

The size will be bounded to `rect.size()`.

See also

[drawContourLines\(\)](#), [QwtRasterData::contourLines\(\)](#)

12.91.4.5 data() [1/2]

```
const QwtRasterData * QwtPlotSpectrogram::data ( ) const
```

Returns

Spectrogram data

See also

[setData\(\)](#)

12.91.4.6 data() [2/2]

```
QwtRasterData * QwtPlotSpectrogram::data ( )
```

Returns

Spectrogram data

See also

[setData\(\)](#)

12.91.4.7 defaultContourPen()

```
QPen QwtPlotSpectrogram::defaultContourPen ( ) const
```

Returns

Default contour pen

See also

[setDefaultContourPen\(\)](#)

12.91.4.8 draw()

```
void QwtPlotSpectrogram::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the spectrogram.

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates

See also

[setDisplayMode\(\)](#), [renderImage\(\)](#), [QwtPlotRasterItem::draw\(\)](#), [drawContourLines\(\)](#)

Reimplemented from [QwtPlotRasterItem](#).

12.91.4.9 drawContourLines()

```
void QwtPlotSpectrogram::drawContourLines (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QwtRasterData::ContourLines & contourLines ) const [protected], [virtual]
```

Paint the contour lines

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>contourLines</i>	Contour lines

See also

[renderContourLines\(\)](#), [defaultContourPen\(\)](#), [contourPen\(\)](#)

12.91.4.10 interval()

```
QwtInterval QwtPlotSpectrogram::interval (
    Qt::Axis axis ) const [virtual]
```

Returns

Bounding interval for an axis

The default implementation returns the interval of the associated raster data object.

Parameters

<i>axis</i>	X, Y, or Z axis
-------------	-----------------

See also

[QwtRasterData::interval\(\)](#)

Reimplemented from [QwtPlotRasterItem](#).

12.91.4.11 pixelHint()

```
QRectF QwtPlotSpectrogram::pixelHint (
    const QRectF & area ) const [virtual]
```

Pixel hint.

The geometry of a pixel is used to calculate the resolution and alignment of the rendered image.

The default implementation returns [data\(\)->pixelHint\(rect \)](#);

Parameters

<i>area</i>	In most implementations the resolution of the data doesn't depend on the requested area.
-------------	--

Returns

Bounding rectangle of a pixel

See also

[QwtPlotRasterItem::pixelHint\(\)](#), [QwtRasterData::pixelHint\(\)](#), [render\(\)](#), [renderImage\(\)](#)

Reimplemented from [QwtPlotRasterItem](#).

12.91.4.12 renderContourLines()

```
QwtRasterData::ContourLines QwtPlotSpectrogram::renderContourLines (
    const QRectF & rect,
    const QSize & raster ) const [protected], [virtual]
```

Calculate contour lines

Parameters

<i>rect</i>	Rectangle, where to calculate the contour lines
<i>raster</i>	Raster, used by the CONREC algorithm

Returns

Calculated contour lines

See also

[contourLevels\(\)](#), [setConrecFlag\(\)](#), [QwtRasterData::contourLines\(\)](#)

12.91.4.13 renderImage()

```
QImage QwtPlotSpectrogram::renderImage (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & area,
    const QSize & imageSize ) const [protected], [virtual]
```

Render an image from data and color map.

For each pixel of area the value is mapped into a color.

Parameters

<i>xMap</i>	X-Scale Map
<i>yMap</i>	Y-Scale Map
<i>area</i>	Requested area for the image in scale coordinates
<i>imageSize</i>	Size of the requested image

Returns

A QImage::Format_Indexed8 or QImage::Format_ARGB32 depending on the color map.

See also

[QwtRasterData::value\(\)](#), [QwtColorMap::rgb\(\)](#), [QwtColorMap::colorIndex\(\)](#)

Implements [QwtPlotRasterItem](#).

12.91.4.14 renderTile()

```
void QwtPlotSpectrogram::renderTile (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRect & tile,
    QImage * image ) const [protected]
```

Render a tile of an image.

Rendering in tiles can be used to composite an image in parallel threads.

Parameters

<i>xMap</i>	X-Scale Map
<i>yMap</i>	Y-Scale Map
<i>tile</i>	Geometry of the tile in image coordinates
<i>image</i>	Image to be rendered

12.91.4.15 rtti()

```
int QwtPlotSpectrogram::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotSpectrogram](#)

Reimplemented from [QwtPlotItem](#).

12.91.4.16 setColorMap()

```
void QwtPlotSpectrogram::setColorMap (
    QwtColorMap * colorMap )
```

Change the color map

Often it is useful to display the mapping between intensities and colors as an additional plot axis, showing a color bar.

Parameters

<i>colorMap</i>	Color Map
-----------------	-----------

See also

[colorMap\(\)](#), [QwtScaleWidget::setColorBarEnabled\(\)](#), [QwtScaleWidget::setColorMap\(\)](#)

12.91.4.17 setConrecFlag()

```
void QwtPlotSpectrogram::setConrecFlag (
    QwtRasterData::ConrecFlag flag,
    bool on )
```

Modify an attribute of the CONREC algorithm, used to calculate the contour lines.

Parameters

<i>flag</i>	CONREC flag
<i>on</i>	On/Off

See also

[testConrecFlag\(\)](#), [renderContourLines\(\)](#), [QwtRasterData::contourLines\(\)](#)

12.91.4.18 setContourLevels()

```
void QwtPlotSpectrogram::setContourLevels (
    const QList< double > & levels )
```

Set the levels of the contour lines

Parameters

<i>levels</i>	Values of the contour levels
---------------	------------------------------

See also

[contourLevels\(\)](#), [renderContourLines\(\)](#), [QwtRasterData::contourLines\(\)](#)

Note

`contourLevels` returns the same levels but sorted.

12.91.4.19 setData()

```
void QwtPlotSpectrogram::setData (
    QwtRasterData * data )
```

Set the data to be displayed

Parameters

<i>data</i>	Spectrogram Data
-------------	------------------

See also

[data\(\)](#)

12.91.4.20 setDefaultContourPen() [1/2]

```
void QwtPlotSpectrogram::setDefaultContourPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign the default pen for the contour lines

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see `QPen::isCosmetic()`). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

`pen()`, `brush()`

12.91.4.21 setDefaultContourPen() [2/2]

```
void QwtPlotSpectrogram::setDefaultContourPen (
    const QPen & pen )
```

Set the default pen for the contour lines.

If the spectrogram has a valid default contour pen a contour line is painted using the default contour pen. Otherwise (`pen.style() == Qt::NoPen`) the pen is calculated for each contour level using [contourPen\(\)](#).

See also

[defaultContourPen\(\)](#), [contourPen\(\)](#)

12.91.4.22 setDisplayMode()

```
void QwtPlotSpectrogram::setDisplayMode (
    DisplayMode mode,
    bool on = true )
```

The display mode controls how the raster data will be represented.

Parameters

<i>mode</i>	Display mode
<i>on</i>	On/Off

The default setting enables ImageMode.

See also

[DisplayMode](#), `displayMode()`

12.91.4.23 testConrecFlag()

```
bool QwtPlotSpectrogram::testConrecFlag (
    QwtRasterData::ConrecFlag flag ) const
```

Test an attribute of the CONREC algorithm, used to calculate the contour lines.

Parameters

<i>flag</i>	CONREC flag
-------------	-------------

Returns

true, is enabled

The default setting enables [QwtRasterData::IgnoreAllVerticesOnLevel](#)

See also

`setConrecClag()`, `renderContourLines()`, [QwtRasterData::contourLines\(\)](#)

12.91.4.24 testDisplayMode()

```
bool QwtPlotSpectrogram::testDisplayMode (
    DisplayMode mode ) const
```

The display mode controls how the raster data will be represented.

Parameters

<i>mode</i>	Display mode
-------------	--------------

Returns

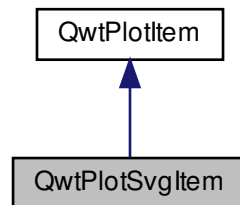
true if mode is enabled

12.92 QwtPlotSvgItem Class Reference

A plot item, which displays data in Scalable Vector Graphics (SVG) format.

```
#include <qwt_plot_svgitem.h>
```

Inheritance diagram for QwtPlotSvgItem:



Public Member Functions

- [QwtPlotSvgItem](#) (const QString &[title](#)=QString())
Constructor.
- [QwtPlotSvgItem](#) (const [QwtText](#) &[title](#))
Constructor.
- virtual [~QwtPlotSvgItem](#) ()
Destructor.
- bool [loadFile](#) (const QRectF &, const QString &fileName)
- bool [loadData](#) (const QRectF &, const QByteArray &)
- virtual QRectF [boundingRect](#) () const
Bounding rectangle of the item.
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect) const
- virtual int [rtti](#) () const

Protected Member Functions

- const QSvgRenderer & [renderer](#) () const
- QSvgRenderer & [renderer](#) ()
- void [render](#) (QPainter *, const QRectF &[viewBox](#), const QRectF &rect) const
- QRectF [viewBox](#) (const QRectF &rect) const

Additional Inherited Members

12.92.1 Detailed Description

A plot item, which displays data in Scalable Vector Graphics (SVG) format.

SVG images are often used to display maps

12.92.2 Constructor & Destructor Documentation

12.92.2.1 QwtPlotSvgItem() [1/2]

```
QwtPlotSvgItem::QwtPlotSvgItem (
    const QString & title = QString() ) [explicit]
```

Constructor.

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): true
- [QwtPlotItem::Legend](#): false

Parameters

<i>title</i>	Title
--------------	-------

12.92.2.2 QwtPlotSvgItem() [2/2]

```
QwtPlotSvgItem::QwtPlotSvgItem (
    const QwtText & title ) [explicit]
```

Constructor.

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): true
- [QwtPlotItem::Legend](#): false

Parameters

<i>title</i>	Title
--------------	-------

12.92.3 Member Function Documentation

12.92.3.1 draw()

```
void QwtPlotSvgItem::draw (
    QPainter * painter,
```



```
const QwtScaleMap & xMap,  
const QwtScaleMap & yMap,  
const QRectF & canvasRect ) const [virtual]
```

Draw the SVG item

Parameters

<i>painter</i>	Painter
<i>xMap</i>	X-Scale Map
<i>yMap</i>	Y-Scale Map
<i>canvasRect</i>	Contents rect of the plot canvas

Implements [QwtPlotItem](#).

12.92.3.2 loadData()

```
bool QwtPlotSvgItem::loadData (  
    const QRectF & rect,  
    const QByteArray & data )
```

Load SVG data

Parameters

<i>rect</i>	Bounding rectangle
<i>data</i>	in SVG format

Returns

true, if the SVG data could be loaded

12.92.3.3 loadFile()

```
bool QwtPlotSvgItem::loadFile (  
    const QRectF & rect,  
    const QString & fileName )
```

Load a SVG file

Parameters

<i>rect</i>	Bounding rectangle
<i>fileName</i>	SVG file name

Returns

true, if the SVG file could be loaded

12.92.3.4 render()

```
void QwtPlotSvgItem::render (
    QPainter * painter,
    const QRectF & viewBox,
    const QRectF & rect ) const [protected]
```

Render the SVG data

Parameters

<i>painter</i>	Painter
<i>viewBox</i>	View Box, see <code>QSvgRenderer::viewBox()</code>
<i>rect</i>	Target rectangle on the paint device

12.92.3.5 renderer() [1/2]

```
const QSvgRenderer & QwtPlotSvgItem::renderer ( ) const [protected]
```

Returns

Renderer used to render the SVG data

12.92.3.6 renderer() [2/2]

```
QSvgRenderer & QwtPlotSvgItem::renderer ( ) [protected]
```

Returns

Renderer used to render the SVG data

12.92.3.7 rtti()

```
int QwtPlotSvgItem::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotSVG](#)

Reimplemented from [QwtPlotItem](#).

12.92.3.8 viewBox()

```
QRectF QwtPlotSvgItem::viewBox (
    const QRectF & rect ) const [protected]
```

Calculate the view box from rect and [boundingRect\(\)](#).

Parameters

<i>rect</i>	Rectangle in scale coordinates
-------------	--------------------------------

Returns

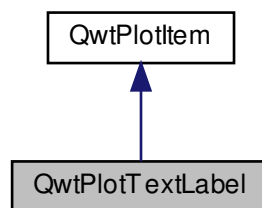
View box, see `QSvgRenderer::viewBox()`

12.93 QwtPlotTextLabel Class Reference

A plot item, which displays a text label.

```
#include <qwt_plot_textlabel.h>
```

Inheritance diagram for QwtPlotTextLabel:



Public Member Functions

- [QwtPlotTextLabel](#) ()
Constructor.
- virtual [~QwtPlotTextLabel](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setText](#) (const [QwtText](#) &)
- [QwtText](#) [text](#) () const
- void [setMargin](#) (int [margin](#))
- int [margin](#) () const
- virtual [QRectF](#) [textRect](#) (const [QRectF](#) &, const [QSizeF](#) &) const
Align the text label.

Protected Member Functions

- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &, const [QwtScaleMap](#) &, const [QRectF](#) &) const
- void [invalidateCache](#) ()
Invalidate all internal cache.

Additional Inherited Members

12.93.1 Detailed Description

A plot item, which displays a text label.

[QwtPlotTextLabel](#) displays a text label aligned to the plot canvas.

In opposite to [QwtPlotMarker](#) the position of the label is unrelated to plot coordinates.

As drawing a text is an expensive operation the label is cached in a pixmap to speed up replots.

Example

The following code shows how to add a title.

```
QwtText title( "Plot Title" );
title.setRenderFlags( Qt::AlignHCenter | Qt::AlignTop );

QFont font;
font.setBold( true );
title.setFont( font );

QwtPlotTextLabel *titleLabel = new QwtPlotTextLabel();
titleLabel->setText( title );
titleLabel->attach( plot );
```

See also

[QwtPlotMarker](#)

12.93.2 Constructor & Destructor Documentation

12.93.2.1 QwtPlotTextLabel()

```
QwtPlotTextLabel::QwtPlotTextLabel ( )
```

Constructor.

Initializes an text label with an empty text

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): true
- [QwtPlotItem::Legend](#): false

The z value is initialized by 150

See also

[QwtPlotItem::setItemAttribute\(\)](#), [QwtPlotItem::setZ\(\)](#)

12.93.3 Member Function Documentation

12.93.3.1 draw()

```
void QwtPlotTextLabel::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [protected], [virtual]
```

Draw the text label

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x Scale Map
<i>yMap</i>	y Scale Map
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates

See also

[textRect\(\)](#)Implements [QwtPlotItem](#).

12.93.3.2 margin()

```
int QwtPlotTextLabel::margin ( ) const
```

Returns

Margin added to the contentsMargins() of the canvas

See also

[setMargin\(\)](#)

12.93.3.3 rtti()

```
int QwtPlotTextLabel::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotTextLabel](#)Reimplemented from [QwtPlotItem](#).

12.93.3.4 setMargin()

```
void QwtPlotTextLabel::setMargin (
    int margin )
```

Set the margin

The margin is the distance between the contentsRect() of the plot canvas and the rectangle where the label can be displayed.

Parameters

<i>margin</i>	Margin
---------------	--------

See also

[margin\(\)](#), [textRect\(\)](#)

12.93.3.5 setText()

```
void QwtPlotTextLabel::setText (
    const QwtText & text )
```

Set the text

The label will be aligned to the plot canvas according to the alignment flags of text.

Parameters

<i>text</i>	Text to be displayed
-------------	----------------------

See also

[text\(\)](#), [QwtText::renderFlags\(\)](#)

12.93.3.6 text()

```
QwtText QwtPlotTextLabel::text ( ) const
```

Returns

Text to be displayed

See also

[setText\(\)](#)

12.93.3.7 textRect()

```
QRectF QwtPlotTextLabel::textRect (
    const QRectF & rect,
    const QSizeF & textSize ) const [virtual]
```

Align the text label.

Parameters

<i>rect</i>	Canvas rectangle with margins subtracted
<i>textSize</i>	Size required to draw the text

Returns

A rectangle aligned according the the alignment flags of the text.

See also

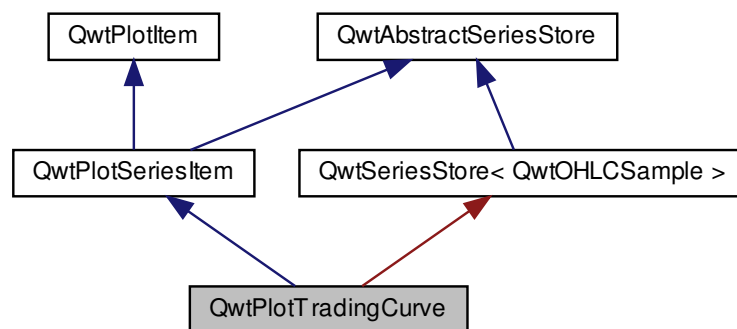
[setMargin\(\)](#), [QwtText::renderFlags\(\)](#), [QwtText::textSize\(\)](#)

12.94 QwtPlotTradingCurve Class Reference

[QwtPlotTradingCurve](#) illustrates movements in the price of a financial instrument over time.

```
#include <qwt_plot_tradingcurve.h>
```

Inheritance diagram for QwtPlotTradingCurve:



Public Types

- enum [SymbolStyle](#) { [NoSymbol](#) = -1, [Bar](#), [CandleStick](#), [UserSymbol](#) = 100 }
Symbol styles.
- enum [Direction](#) { [Increasing](#), [Decreasing](#) }
Direction of a price movement.
- enum [PaintAttribute](#) { [ClipSymbols](#) = 0x01 }
- typedef QFlags< [PaintAttribute](#) > [PaintAttributes](#)
Paint attributes.

Public Member Functions

- [QwtPlotTradingCurve](#) (const QString &title=QString())
 - [QwtPlotTradingCurve](#) (const [QwtText](#) &title)
 - virtual [~QwtPlotTradingCurve](#) ()
- Destructor.*
- virtual int [rtti](#) () const
 - void [setPaintAttribute](#) ([PaintAttribute](#), bool on=true)
 - bool [testPaintAttribute](#) ([PaintAttribute](#)) const
 - void [setSamples](#) (const QVector< [QwtOHLCSample](#) > &)
 - void [setSamples](#) ([QwtSeriesData](#)< [QwtOHLCSample](#) > *)
 - void [setSymbolStyle](#) ([SymbolStyle](#) style)
 - [SymbolStyle](#) [symbolStyle](#) () const
 - void [setSymbolPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
 - void [setSymbolPen](#) (const QPen &)
- Set the symbol pen.*
- QPen [symbolPen](#) () const
 - void [setSymbolBrush](#) ([Direction](#), const QBrush &)
 - QBrush [symbolBrush](#) ([Direction](#)) const
 - void [setSymbolExtent](#) (double)
- Set the extent of the symbol.*
- double [symbolExtent](#) () const
 - void [setMinSymbolWidth](#) (double)
 - double [minSymbolWidth](#) () const
 - void [setMaxSymbolWidth](#) (double)
 - double [maxSymbolWidth](#) () const
 - virtual void [drawSeries](#) (QPainter *painter, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
 - virtual QRectF [boundingRect](#) () const
 - virtual [QwtGraphic](#) [legendIcon](#) (int index, const QSizeF &) const

Protected Member Functions

- void [init](#) ()
- Initialize internal members.*
- virtual void [drawSymbols](#) (QPainter *, const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect, int from, int to) const
 - virtual void [drawUserSymbol](#) (QPainter *, [SymbolStyle](#), const [QwtOHLCSample](#) &, Qt::Orientation, bool inverted, double symbolWidth) const
- Draw a symbol for a symbol style >= UserSymbol.*
- void [drawBar](#) (QPainter *painter, const [QwtOHLCSample](#) &, Qt::Orientation, bool inverted, double width) const
- Draw a bar.*
- void [drawCandleStick](#) (QPainter *, const [QwtOHLCSample](#) &, Qt::Orientation, double width) const
- Draw a candle stick.*
- virtual double [scaledSymbolWidth](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const QRectF &canvasRect) const

12.94.1 Detailed Description

[QwtPlotTradingCurve](#) illustrates movements in the price of a financial instrument over time.

[QwtPlotTradingCurve](#) supports candlestick or bar (OHLC) charts that are used in the domain of technical analysis.

While the length (height or width depending on [orientation\(\)](#)) of each symbol depends on the corresponding OHLC sample the size of the other dimension can be controlled using:

- [setSymbolExtent\(\)](#)
- [setSymbolMinWidth\(\)](#)
- [setSymbolMaxWidth\(\)](#)

The extent is a size in scale coordinates, so that the symbol width is increasing when the plot is zoomed in. Minimum/Maximum width is in widget coordinates independent from the zoom level. When setting the minimum and maximum to the same value, the width of the symbol is fixed.

12.94.2 Member Enumeration Documentation

12.94.2.1 Direction

enum [QwtPlotTradingCurve::Direction](#)

Direction of a price movement.

Enumerator

Increasing	The closing price is higher than the opening price.
Decreasing	The closing price is lower than the opening price.

12.94.2.2 PaintAttribute

enum [QwtPlotTradingCurve::PaintAttribute](#)

Attributes to modify the drawing algorithm.

See also

[setPaintAttribute\(\)](#), [testPaintAttribute\(\)](#)

Enumerator

ClipSymbols	Check if a symbol is on the plot canvas before painting it.
-------------	---

12.94.2.3 SymbolStyle

```
enum QwtPlotTradingCurve::SymbolStyle
```

Symbol styles.

The default setting is `QwtPlotSeriesItem::CandleStick`.

See also

[setSymbolStyle\(\)](#), [symbolStyle\(\)](#)

Enumerator

NoSymbol	Nothing is displayed.
Bar	A line on the chart shows the price range (the highest and lowest prices) over one unit of time, e.g. one day or one hour. Tick marks project from each side of the line indicating the opening and closing price.
CandleStick	The range between opening/closing price are displayed as a filled box. The fill brush depends on the direction of the price movement. The box is connected to the highest/lowest values by lines.
UserSymbol	<p>SymbolTypes \geq UserSymbol are displayed by drawUserSymbol(), that needs to be overloaded and implemented in derived curve classes.</p> <p>See also</p> <p>drawUserSymbol()</p>

12.94.3 Constructor & Destructor Documentation

12.94.3.1 QwtPlotTradingCurve() [1/2]

```
QwtPlotTradingCurve::QwtPlotTradingCurve (
    const QString & title = QString() ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.94.3.2 QwtPlotTradingCurve() [2/2]

```
QwtPlotTradingCurve::QwtPlotTradingCurve (
    const QwtText & title ) [explicit]
```

Constructor

Parameters

<i>title</i>	Title of the curve
--------------	--------------------

12.94.4 Member Function Documentation

12.94.4.1 boundingRect()

```
QRectF QwtPlotTradingCurve::boundingRect ( ) const [virtual]
```

Returns

Bounding rectangle of all samples. For an empty series the rectangle is invalid.

Reimplemented from [QwtPlotSeriesItem](#).

12.94.4.2 drawBar()

```
void QwtPlotTradingCurve::drawBar (
    QPainter * painter,
    const QwtOHLCSample & sample,
    Qt::Orientation orientation,
    bool inverted,
    double width ) const [protected]
```

Draw a bar.

Parameters

<i>painter</i>	Qt painter, initialized with pen/brush
<i>sample</i>	Sample, already translated into paint device coordinates
<i>orientation</i>	Vertical or horizontal
<i>inverted</i>	When inverted is false the open tick is painted to the left/top, otherwise it is painted right/bottom. The close tick is painted in the opposite direction of the open tick. painted in the opposite d opposite direction.
<i>width</i>	Width or height of the candle, depending on the orientation

See also

[Bar](#)

12.94.4.3 drawCandleStick()

```
void QwtPlotTradingCurve::drawCandleStick (
    QPainter * painter,
    const QwtOHLCSample & sample,
    Qt::Orientation orientation,
    double width ) const [protected]
```

Draw a candle stick.

Parameters

<i>painter</i>	Qt painter, initialized with pen/brush
<i>sample</i>	Samples already translated into paint device coordinates
<i>orientation</i>	Vertical or horizontal
<i>width</i>	Width or height of the candle, depending on the orientation

See also

[CandleStick](#)

12.94.4.4 drawSeries()

```
void QwtPlotTradingCurve::drawSeries (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [virtual]
```

Draw an interval of the curve

Parameters

<i>painter</i>	Painter
<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted. If $to < 0$ the curve will be painted to its last point.

See also

[drawSymbols\(\)](#)

Implements [QwtPlotSeriesItem](#).

12.94.4.5 drawSymbols()

```
void QwtPlotTradingCurve::drawSymbols (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect,
    int from,
    int to ) const [protected], [virtual]
```

Draw symbols

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x map
<i>yMap</i>	y map
<i>canvasRect</i>	Contents rectangle of the canvas
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted

See also

[drawSeries\(\)](#)

12.94.4.6 drawUserSymbol()

```
void QwtPlotTradingCurve::drawUserSymbol (
    QPainter * painter,
    SymbolStyle symbolStyle,
    const QwtOHLCSample & sample,
    Qt::Orientation orientation,
    bool inverted,
    double symbolWidth ) const [protected], [virtual]
```

Draw a symbol for a symbol style \geq UserSymbol.

The implementation does nothing and is intended to be overloaded

Parameters

<i>painter</i>	Qt painter, initialized with pen/brush
<i>symbolStyle</i>	Symbol style
<i>sample</i>	Samples already translated into paint device coordinates
<i>orientation</i>	Vertical or horizontal
<i>inverted</i>	True, when the opposite scale (Qt::Vertical: x, Qt::Horizontal: y) is increasing in the opposite direction as QPainter coordinates.
<i>symbolWidth</i>	Width of the symbol in paint device coordinates

12.94.4.7 legendIcon()

```
QwtGraphic QwtPlotTradingCurve::legendIcon (
    int index,
    const QSizeF & size ) const [virtual]
```

Returns

A rectangle filled with the color of the symbol pen

Parameters

<i>index</i>	Index of the legend entry (usually there is only one)
<i>size</i>	Icon size

See also

[setLegendIconSize\(\)](#), [legendData\(\)](#)

Reimplemented from [QwtPlotItem](#).

12.94.4.8 maxSymbolWidth()

```
double QwtPlotTradingCurve::maxSymbolWidth ( ) const
```

Returns

Maximum for the symbol width

See also

[setMaxSymbolWidth\(\)](#), [minSymbolWidth\(\)](#), [symbolExtent\(\)](#)

12.94.4.9 minSymbolWidth()

```
double QwtPlotTradingCurve::minSymbolWidth ( ) const
```

Returns

Minmum for the symbol width

See also

[setMinSymbolWidth\(\)](#), [maxSymbolWidth\(\)](#), [symbolExtent\(\)](#)

12.94.4.10 rtti()

```
int QwtPlotTradingCurve::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotTradingCurve](#)

Reimplemented from [QwtPlotItem](#).

12.94.4.11 scaledSymbolWidth()

```
double QwtPlotTradingCurve::scaledSymbolWidth (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [protected], [virtual]
```

Calculate the symbol width in paint coordinates

The width is calculated by scaling the symbol extent into paint device coordinates bounded by the minimum/maximum symbol width.

Parameters

<i>xMap</i>	Maps x-values into pixel coordinates.
<i>yMap</i>	Maps y-values into pixel coordinates.
<i>canvasRect</i>	Contents rectangle of the canvas

Returns

Symbol width in paint coordinates

See also

[symbolExtent\(\)](#), [minSymbolWidth\(\)](#), [maxSymbolWidth\(\)](#)

12.94.4.12 setMaxSymbolWidth()

```
void QwtPlotTradingCurve::setMaxSymbolWidth (
    double width )
```

Set a maximum for the symbol width

A value ≤ 0.0 means an unlimited width

Parameters

<i>width</i>	Width in paint device coordinates
--------------	-----------------------------------

See also

[maxSymbolWidth\(\)](#), [setMinSymbolWidth\(\)](#), [setSymbolExtent\(\)](#)

12.94.4.13 `setMinSymbolWidth()`

```
void QwtPlotTradingCurve::setMinSymbolWidth (
    double width )
```

Set a minimum for the symbol width

Parameters

<i>width</i>	Width in paint device coordinates
--------------	-----------------------------------

See also

[minSymbolWidth\(\)](#), [setMaxSymbolWidth\(\)](#), [setSymbolExtent\(\)](#)

12.94.4.14 `setPaintAttribute()`

```
void QwtPlotTradingCurve::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```

Specify an attribute how to draw the curve

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off

See also

[testPaintAttribute\(\)](#)

12.94.4.15 `setSamples()` [1/2]

```
void QwtPlotTradingCurve::setSamples (
    const QVector< QwtOHLCSample > & samples )
```

Initialize data with an array of samples.

Parameters

<i>samples</i>	Vector of samples
----------------	-------------------

See also

QwtPlotSeriesItem::setData()

12.94.4.16 setSamples() [2/2]

```
void QwtPlotTradingCurve::setSamples (
    QwtSeriesData< QwtOHLCSample > * data )
```

Assign a series of samples

[setSamples\(\)](#) is just a wrapper for [setData\(\)](#) without any additional value - beside that it is easier to find for the developer.

Parameters

<i>data</i>	Data
-------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.94.4.17 setSymbolBrush()

```
void QwtPlotTradingCurve::setSymbolBrush (
    Direction direction,
    const QBrush & brush )
```

Set the symbol brush

Parameters

<i>direction</i>	Direction type
<i>brush</i>	Brush used to fill the body of all candlestick symbols with the direction

See also

[symbolBrush\(\)](#), [setSymbolPen\(\)](#)

12.94.4.18 setSymbolExtent()

```
void QwtPlotTradingCurve::setSymbolExtent (
    double extent )
```

Set the extent of the symbol.

The width of the symbol is given in scale coordinates. When painting a symbol the width is scaled into paint device coordinates by [scaledSymbolWidth\(\)](#). The scaled width is bounded by [minSymbolWidth\(\)](#), [maxSymbolWidth\(\)](#)

Parameters

<i>extent</i>	Symbol width in scale coordinates
---------------	-----------------------------------

See also

[symbolExtent\(\)](#), [scaledSymbolWidth\(\)](#), [setMinSymbolWidth\(\)](#), [setMaxSymbolWidth\(\)](#)

12.94.4.19 setSymbolPen() [1/2]

```
void QwtPlotTradingCurve::setSymbolPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign the symbol pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see [QPen::isCosmetic\(\)](#)). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.94.4.20 setSymbolPen() [2/2]

```
void QwtPlotTradingCurve::setSymbolPen (
    const QPen & pen )
```

Set the symbol pen.

The symbol pen is used for rendering the lines of the bar or candlestick symbols

See also

[symbolPen\(\)](#), [setSymbolBrush\(\)](#)

12.94.4.21 setSymbolStyle()

```
void QwtPlotTradingCurve::setSymbolStyle (
    SymbolStyle style )
```

Set the symbol style

Parameters

<i>style</i>	Symbol style
--------------	--------------

See also

[symbolStyle\(\)](#), [setSymbolExtent\(\)](#), [setSymbolPen\(\)](#), [setSymbolBrush\(\)](#)

12.94.4.22 symbolBrush()

```
QBrush QwtPlotTradingCurve::symbolBrush (
    Direction direction ) const
```

Parameters

<i>direction</i>	
------------------	--

Returns

Brush used to fill the body of all candlestick symbols with the direction

See also

[setSymbolPen\(\)](#), [symbolBrush\(\)](#)

12.94.4.23 symbolExtent()

```
double QwtPlotTradingCurve::symbolExtent ( ) const
```

Returns

Extent of a symbol in scale coordinates

See also

[setSymbolExtent\(\)](#), [scaledSymbolWidth\(\)](#), [minSymbolWidth\(\)](#), [maxSymbolWidth\(\)](#)

12.94.4.24 `symbolPen()`

```
QPen QwtPlotTradingCurve::symbolPen ( ) const
```

Returns

Symbol pen

See also

[setSymbolPen\(\)](#), [symbolBrush\(\)](#)

12.94.4.25 `symbolStyle()`

```
QwtPlotTradingCurve::SymbolStyle QwtPlotTradingCurve::symbolStyle ( ) const
```

Returns

Symbol style

See also

[setSymbolStyle\(\)](#), [symbolExtent\(\)](#), [symbolPen\(\)](#), [symbolBrush\(\)](#)

12.94.4.26 `testPaintAttribute()`

```
bool QwtPlotTradingCurve::testPaintAttribute (
    PaintAttribute attribute ) const
```

Returns

True, when attribute is enabled

See also

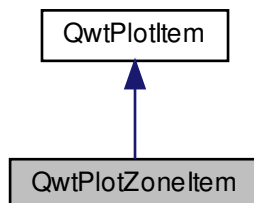
[PaintAttribute](#), [setPaintAttribute\(\)](#)

12.95 `QwtPlotZoneItem` Class Reference

A plot item, which displays a zone.

```
#include <qwt_plot_zoneitem.h>
```

Inheritance diagram for `QwtPlotZoneItem`:



Public Member Functions

- [QwtPlotZoneItem](#) ()
Constructor.
- virtual [~QwtPlotZoneItem](#) ()
Destructor.
- virtual int [rtti](#) () const
- void [setOrientation](#) (Qt::Orientation)
Set the orientation of the zone.
- Qt::Orientation [orientation](#) ()
- void [setInterval](#) (double min, double max)
- void [setInterval](#) (const [QwtInterval](#) &)
- [QwtInterval](#) [interval](#) () const
- void [setPen](#) (const QColor &, qreal width=0.0, Qt::PenStyle=Qt::SolidLine)
- void [setPen](#) (const QPen &)
Assign a pen.
- const QPen & [pen](#) () const
- void [setBrush](#) (const QBrush &)
Assign a brush.
- const QBrush & [brush](#) () const
- virtual void [draw](#) (QPainter *, const [QwtScaleMap](#) &, const [QwtScaleMap](#) &, const QRectF &) const
- virtual QRectF [boundingRect](#) () const

Additional Inherited Members

12.95.1 Detailed Description

A plot item, which displays a zone.

A horizontal zone highlights an interval of the y axis - a vertical zone an interval of the x axis - and is unbounded in the opposite direction. It is filled with a brush and its border lines are optionally displayed with a pen.

Note

For displaying an area that is bounded for x and y coordinates use [QwtPlotShapedItem](#)

12.95.2 Constructor & Destructor Documentation

12.95.2.1 QwtPlotZoneItem()

```
QwtPlotZoneItem::QwtPlotZoneItem ( ) [explicit]
```

Constructor.

Initializes the zone with no pen and a semi transparent gray brush

Sets the following item attributes:

- [QwtPlotItem::AutoScale](#): false
- [QwtPlotItem::Legend](#): false

The z value is initialized by 5

See also

[QwtPlotItem::setItemAttribute\(\)](#), [QwtPlotItem::setZ\(\)](#)

12.95.3 Member Function Documentation

12.95.3.1 boundingRect()

```
QRectF QwtPlotZoneItem::boundingRect ( ) const [virtual]
```

The bounding rectangle is build from the interval in one direction and something invalid for the opposite direction.

Returns

An invalid rectangle with valid boundaries in one direction

Reimplemented from [QwtPlotItem](#).

12.95.3.2 brush()

```
const QBrush & QwtPlotZoneItem::brush ( ) const
```

Returns

Brush used to fill the zone

See also

[setPen\(\)](#), [brush\(\)](#)

12.95.3.3 draw()

```
void QwtPlotZoneItem::draw (
    QPainter * painter,
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & canvasRect ) const [virtual]
```

Draw the zone

Parameters

<i>painter</i>	Painter
<i>xMap</i>	x Scale Map
<i>yMap</i>	y Scale Map
<i>canvasRect</i>	Contents rectangle of the canvas in painter coordinates

Implements [QwtPlotItem](#).

12.95.3.4 interval()

```
QwtInterval QwtPlotZoneItem::interval ( ) const
```

Returns

Zone interval

See also

[setInterval\(\), orientation\(\)](#)

12.95.3.5 orientation()

```
Qt::Orientation QwtPlotZoneItem::orientation ( )
```

Returns

Orientation of the zone

See also

[setOrientation\(\)](#)

12.95.3.6 pen()

```
const QPen & QwtPlotZoneItem::pen ( ) const
```

Returns

Pen used to draw the border lines

See also

[setPen\(\), brush\(\)](#)

12.95.3.7 rtti()

```
int QwtPlotZoneItem::rtti ( ) const [virtual]
```

Returns

[QwtPlotItem::Rtti_PlotZone](#)

Reimplemented from [QwtPlotItem](#).

12.95.3.8 setBrush()

```
void QwtPlotZoneItem::setBrush (
    const QBrush & brush )
```

Assign a brush.

The brush is used to fill the zone

Parameters

<i>brush</i>	Brush
--------------	-------

See also

[pen\(\)](#), [setBrush\(\)](#)

12.95.3.9 `setInterval()` [1/2]

```
void QwtPlotZoneItem::setInterval (
    double min,
    double max )
```

Set the interval of the zone

For a horizontal zone the interval is related to the y axis, for a vertical zone it is related to the x axis.

Parameters

<i>min</i>	Minimum of the interval
<i>max</i>	Maximum of the interval

See also

[interval\(\)](#), [setOrientation\(\)](#)

12.95.3.10 `setInterval()` [2/2]

```
void QwtPlotZoneItem::setInterval (
    const QwtInterval & interval )
```

Set the interval of the zone

For a horizontal zone the interval is related to the y axis, for a vertical zone it is related to the x axis.

Parameters

<i>interval</i>	Zone interval
-----------------	---------------

See also

[interval\(\)](#), [setOrientation\(\)](#)

12.95.3.11 setOrientation()

```
void QwtPlotZoneItem::setOrientation (
    Qt::Orientation orientation )
```

Set the orientation of the zone.

A horizontal zone highlights an interval of the y axis, a vertical zone of the x axis. It is unbounded in the opposite direction.

See also

[orientation\(\)](#), [QwtPlotItem::setAxes\(\)](#)

12.95.3.12 setPen() [1/2]

```
void QwtPlotZoneItem::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see [QPen::isCosmetic\(\)](#)). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.95.3.13 setPen() [2/2]

```
void QwtPlotZoneItem::setPen (
    const QPen & pen )
```

Assign a pen.

The pen is used to draw the border lines of the zone

Parameters

<i>pen</i>	Pen
------------	-----

See also

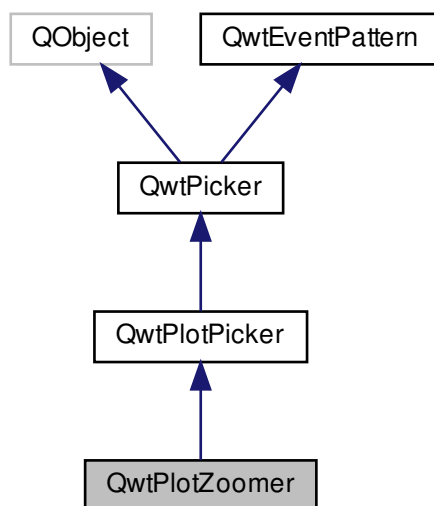
[pen\(\)](#), [setBrush\(\)](#)

12.96 QwtPlotZoomer Class Reference

[QwtPlotZoomer](#) provides stacked zooming for a plot widget.

```
#include <qwt_plot_zoomer.h>
```

Inheritance diagram for [QwtPlotZoomer](#):



Public Slots

- void [moveBy](#) (double dx, double dy)
- virtual void [moveTo](#) (const QPointF &)
- virtual void [zoom](#) (const QRectF &)
Zoom in.
- virtual void [zoom](#) (int offset)
Zoom in or out.

Signals

- void [zoomed](#) (const QRectF &rect)

Public Member Functions

- [QwtPlotZoomer](#) (QWidget *, bool doReplot=true)
Create a zoomer for a plot canvas.
- [QwtPlotZoomer](#) (int xAxis, int yAxis, QWidget *, bool doReplot=true)
Create a zoomer for a plot canvas.
- virtual void [setZoomBase](#) (bool doReplot=true)
- virtual void [setZoomBase](#) (const QRectF &)
Set the initial size of the zoomer.
- QRectF [zoomBase](#) () const
- QRectF [zoomRect](#) () const
- virtual void [setAxis](#) (int xAxis, int yAxis)
- void [setMaxStackDepth](#) (int)
Limit the number of recursive zoom operations to depth.
- int [maxStackDepth](#) () const
- const QStack< QRectF > & [zoomStack](#) () const
- void [setZoomStack](#) (const QStack< QRectF > &, int [zoomRectIndex](#)=-1)
Assign a zoom stack.
- uint [zoomRectIndex](#) () const

Protected Member Functions

- virtual void [rescale](#) ()
- virtual QSizeF [minZoomSize](#) () const
Limit zooming by a minimum rectangle.
- virtual void [widgetMouseEvent](#) (QMouseEvent *)
- virtual void [widgetKeyPressEvent](#) (QKeyEvent *)
- virtual void [begin](#) ()
- virtual bool [end](#) (bool ok=true)
- virtual bool [accept](#) (QPolygon &) const
Check and correct a selected rectangle.

Additional Inherited Members

12.96.1 Detailed Description

[QwtPlotZoomer](#) provides stacked zooming for a plot widget.

[QwtPlotZoomer](#) selects rectangles from user inputs (mouse or keyboard) translates them into plot coordinates and adjusts the axes to them. The selection is supported by a rubber band and optionally by displaying the coordinates of the current mouse position.

Zooming can be repeated as often as possible, limited only by [maxStackDepth\(\)](#) or [minZoomSize\(\)](#). Each rectangle is pushed on a stack.

The default setting how to select rectangles is a [QwtPickerDragRectMachine](#) with the following bindings:

- [QwtEventPattern::MouseSelect1](#)
The first point of the zoom rectangle is selected by a mouse press, the second point from the position, where the mouse is released.

- [QwtEventPattern::KeySelect1](#)
The first key press selects the first, the second key press selects the second point.
- [QwtEventPattern::KeyAbort](#)
Discard the selection in the state, where the first point is selected.

To traverse the zoom stack the following bindings are used:

- [QwtEventPattern::MouseSelect3](#), [QwtEventPattern::KeyUndo](#)
Zoom out one position on the zoom stack
- [QwtEventPattern::MouseSelect6](#), [QwtEventPattern::KeyRedo](#)
Zoom in one position on the zoom stack
- [QwtEventPattern::MouseSelect2](#), [QwtEventPattern::KeyHome](#)
Zoom to the zoom base

The [setKeyPattern\(\)](#) and [setMousePattern\(\)](#) functions can be used to configure the zoomer actions. The following example shows, how to configure the 'I' and 'O' keys for zooming in and out one position on the zoom stack. The "Home" key is used to "unzoom" the plot.

```
zoomer = new QwtPlotZoomer( plot );
zoomer->setKeyPattern( QwtEventPattern::KeyRedo, Qt::Key_I, Qt::ShiftModifier );
zoomer->setKeyPattern( QwtEventPattern::KeyUndo, Qt::Key_O, Qt::ShiftModifier );
zoomer->setKeyPattern( QwtEventPattern::KeyHome, Qt::Key_Home );
```

[QwtPlotZoomer](#) is tailored for plots with one x and y axis, but it is allowed to attach a second [QwtPlotZoomer](#) (without rubber band and tracker) for the other axes.

Note

The realtime example includes an derived zoomer class that adds scrollbars to the plot canvas.

See also

[QwtPlotPanner](#), [QwtPlotMagnifier](#)

12.96.2 Constructor & Destructor Documentation

12.96.2.1 QwtPlotZoomer() [1/2]

```
QwtPlotZoomer::QwtPlotZoomer (
    QWidget * canvas,
    bool doReplot = true ) [explicit]
```

Create a zoomer for a plot canvas.

The zoomer is set to those x- and y-axis of the parent plot of the canvas that are enabled. If both or no x-axis are enabled, the picker is set to [QwtPlot::xBottom](#). If both or no y-axis are enabled, it is set to [QwtPlot::yLeft](#).

The zoomer is initialized with a [QwtPickerDragRectMachine](#), the tracker mode is set to [QwtPicker::ActiveOnly](#) and the rubber band is set to [QwtPicker::RectRubberBand](#)

Parameters

<i>canvas</i>	Plot canvas to observe, also the parent object
<i>doReplot</i>	Call QwtPlot::replot() for the attached plot before initializing the zoomer with its scales. This might be necessary, when the plot is in a state with pending scale changes.

See also

[QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#), [setZoomBase\(\)](#)

12.96.2.2 QwtPlotZoomer() [2/2]

```
QwtPlotZoomer::QwtPlotZoomer (
    int xAxis,
    int yAxis,
    QWidget * canvas,
    bool doReplot = true ) [explicit]
```

Create a zoomer for a plot canvas.

The zoomer is initialized with a [QwtPickerDragRectMachine](#), the tracker mode is set to [QwtPicker::ActiveOnly](#) and the rubber band is set to [QwtPicker::RectRubberBand](#)

Parameters

<i>xAxis</i>	X axis of the zoomer
<i>yAxis</i>	Y axis of the zoomer
<i>canvas</i>	Plot canvas to observe, also the parent object
<i>doReplot</i>	Call QwtPlot::replot() for the attached plot before initializing the zoomer with its scales. This might be necessary, when the plot is in a state with pending scale changes.

See also

[QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#), [setZoomBase\(\)](#)

12.96.3 Member Function Documentation

12.96.3.1 accept()

```
bool QwtPlotZoomer::accept (
    QPolygon & pa ) const [protected], [virtual]
```

Check and correct a selected rectangle.

Reject rectangles with a height or width < 2, otherwise expand the selected rectangle to a minimum size of 11x11 and accept it.

Returns

true If the rectangle is accepted, or has been changed to an accepted one.

Reimplemented from [QwtPicker](#).

12.96.3.2 begin()

```
void QwtPlotZoomer::begin ( ) [protected], [virtual]
```

Rejects selections, when the stack depth is too deep, or the zoomed rectangle is [minZoomSize\(\)](#).

See also

[minZoomSize\(\)](#), [maxStackDepth\(\)](#)

Reimplemented from [QwtPicker](#).

12.96.3.3 end()

```
bool QwtPlotZoomer::end (
    bool ok = true ) [protected], [virtual]
```

Expand the selected rectangle to [minZoomSize\(\)](#) and zoom in if accepted.

Parameters

<i>ok</i>	If true, complete the selection and emit selected signals otherwise discard the selection.
-----------	--

See also

[accept\(\)](#), [minZoomSize\(\)](#)

Returns

True if the selection has been accepted, false otherwise

Reimplemented from [QwtPlotPicker](#).

12.96.3.4 maxStackDepth()

```
int QwtPlotZoomer::maxStackDepth ( ) const
```

Returns

Maximal depth of the zoom stack.

See also

[setMaxStackDepth\(\)](#)

12.96.3.5 minZoomSize()

```
QSizeF QwtPlotZoomer::minZoomSize ( ) const [protected], [virtual]
```

Limit zooming by a minimum rectangle.

Returns

[zoomBase\(\).width\(\)](#) / 10e4, [zoomBase\(\).height\(\)](#) / 10e4

12.96.3.6 moveBy

```
void QwtPlotZoomer::moveBy (
    double dx,
    double dy ) [slot]
```

Move the current zoom rectangle.

Parameters

<i>dx</i>	X offset
<i>dy</i>	Y offset

Note

The changed rectangle is limited by the zoom base

12.96.3.7 moveTo

```
void QwtPlotZoomer::moveTo (
    const QPointF & pos ) [virtual], [slot]
```

Move the the current zoom rectangle.

Parameters

<i>pos</i>	New position
------------	--------------

See also

[QRectF::moveTo\(\)](#)

Note

The changed rectangle is limited by the zoom base

12.96.3.8 rescale()

```
void QwtPlotZoomer::rescale ( ) [protected], [virtual]
```

Adjust the observed plot to [zoomRect\(\)](#)

Note

Initiates [QwtPlot::replot\(\)](#)

12.96.3.9 setAxis()

```
void QwtPlotZoomer::setAxis (
    int xAxis,
    int yAxis ) [virtual]
```

Reinitialize the axes, and set the zoom base to their scales.

Parameters

<i>xAxis</i>	X axis
<i>yAxis</i>	Y axis

Reimplemented from [QwtPlotPicker](#).

12.96.3.10 setMaxStackDepth()

```
void QwtPlotZoomer::setMaxStackDepth (
    int depth )
```

Limit the number of recursive zoom operations to depth.

A value of -1 set the depth to unlimited, 0 disables zooming. If the current zoom rectangle is below depth, the plot is unzoomed.

Parameters

<i>depth</i>	Maximum for the stack depth
--------------	-----------------------------

See also

[maxStackDepth\(\)](#)

Note

depth doesn't include the zoom base, so [zoomStack\(\).count\(\)](#) might be [maxStackDepth\(\)](#) + 1.

12.96.3.11 setZoomBase() [1/2]

```
void QwtPlotZoomer::setZoomBase (
    bool doReplot = true ) [virtual]
```

Reinitialized the zoom stack with [scaleRect\(\)](#) as base.

Parameters

<i>doReplot</i>	Call QwtPlot::replot() for the attached plot before initializing the zoomer with its scales. This might be necessary, when the plot is in a state with pending scale changes.
-----------------	---

See also

[zoomBase\(\)](#), [scaleRect\(\)](#) [QwtPlot::autoReplot\(\)](#), [QwtPlot::replot\(\)](#).

12.96.3.12 setZoomBase() [2/2]

```
void QwtPlotZoomer::setZoomBase (
    const QRectF & base ) [virtual]
```

Set the initial size of the zoomer.

base is united with the current [scaleRect\(\)](#) and the zoom stack is reinitialized with it as zoom base. plot is zoomed to [scaleRect\(\)](#).

Parameters

<i>base</i>	Zoom base
-------------	-----------

See also

[zoomBase\(\)](#), [scaleRect\(\)](#)

12.96.3.13 setZoomStack()

```
void QwtPlotZoomer::setZoomStack (
    const QStack< QRectF > & zoomStack,
    int zoomRectIndex = -1 )
```

Assign a zoom stack.

In combination with other types of navigation it might be useful to modify to manipulate the complete zoom stack.

Parameters

<i>zoomStack</i>	New zoom stack
<i>zoomRectIndex</i>	Index of the current position of zoom stack. In case of -1 the current position is at the top of the stack.

Note

The zoomed signal might be emitted.

See also

[zoomStack\(\)](#), [zoomRectIndex\(\)](#)

12.96.3.14 widgetKeyPressEvent()

```
void QwtPlotZoomer::widgetKeyPressEvent (
    QKeyEvent * ke ) [protected], [virtual]
```

Qt::Key_Plus zooms in, Qt::Key_Minus zooms out one position on the zoom stack, Qt::Key_Escape zooms out to the zoom base.

Changes the current position on the stack, but doesn't pop any rectangle.

Note

The keys codes can be changed, using [QwtEventPattern::setKeyPattern](#): 3, 4, 5

Reimplemented from [QwtPicker](#).

12.96.3.15 widgetMouseReleaseEvent()

```
void QwtPlotZoomer::widgetMouseReleaseEvent (
    QMouseEvent * me ) [protected], [virtual]
```

Qt::MidButton zooms out one position on the zoom stack, Qt::RightButton to the zoom base.

Changes the current position on the stack, but doesn't pop any rectangle.

Note

The mouse events can be changed, using [QwtEventPattern::setMousePattern](#): 2, 1

Reimplemented from [QwtPicker](#).

12.96.3.16 zoom [1/2]

```
void QwtPlotZoomer::zoom (
    const QRectF & rect ) [virtual], [slot]
```

Zoom in.

Clears all rectangles above the current position of the zoom stack and pushes the normalized rectangle on it.

Note

If the maximal stack depth is reached, zoom is ignored.
The zoomed signal is emitted.

12.96.3.17 zoom [2/2]

```
void QwtPlotZoomer::zoom (
    int offset ) [virtual], [slot]
```

Zoom in or out.

Activate a rectangle on the zoom stack with an offset relative to the current position. Negative values of offset will zoom out, positive zoom in. A value of 0 zooms out to the zoom base.

Parameters

<i>offset</i>	Offset relative to the current position of the zoom stack.
---------------	--

Note

The zoomed signal is emitted.

See also

[zoomRectIndex\(\)](#)

12.96.3.18 zoomBase()

```
QRectF QwtPlotZoomer::zoomBase ( ) const
```

Returns

Initial rectangle of the zoomer

See also

[setZoomBase\(\)](#), [zoomRect\(\)](#)

12.96.3.19 zoomed

```
void QwtPlotZoomer::zoomed (
    const QRectF & rect ) [signal]
```

A signal emitting the [zoomRect\(\)](#), when the plot has been zoomed in or out.

Parameters

<i>rect</i>	Current zoom rectangle.
-------------	-------------------------

12.96.3.20 zoomRect()

```
QRectF QwtPlotZoomer::zoomRect ( ) const
```

Returns

Rectangle at the current position on the zoom stack.

See also

[zoomRectIndex\(\)](#), [scaleRect\(\)](#).

12.96.3.21 zoomRectIndex()

```
uint QwtPlotZoomer::zoomRectIndex ( ) const
```

Returns

Index of current position of zoom stack.

12.96.3.22 zoomStack()

```
const QStack< QRectF > & QwtPlotZoomer::zoomStack ( ) const
```

Returns

The zoom stack. [zoomStack\(\)\[0\]](#) is the zoom base, [zoomStack\(\)\[1\]](#) the first zoomed rectangle.

See also

[setZoomStack\(\)](#), [zoomRectIndex\(\)](#)

12.97 QwtPoint3D Class Reference

[QwtPoint3D](#) class defines a 3D point in double coordinates.

```
#include <qwt_point_3d.h>
```

Public Member Functions

- [QwtPoint3D](#) ()
- [QwtPoint3D](#) (double *x*, double *y*, double *z*)
Constructs a point with coordinates specified by x, y and z.
- [QwtPoint3D](#) (const [QwtPoint3D](#) &)
- [QwtPoint3D](#) (const QPointF &)
- bool [isNull](#) () const
- double [x](#) () const
- double [y](#) () const
- double [z](#) () const
- double & [rx](#) ()
- double & [ry](#) ()
- double & [rz](#) ()
- void [setX](#) (double *x*)
Sets the x-coordinate of the point to the value specified by x.
- void [setY](#) (double *y*)
Sets the y-coordinate of the point to the value specified by y.
- void [setZ](#) (double *y*)
Sets the z-coordinate of the point to the value specified by z.
- QPointF [toPoint](#) () const
- bool [operator==](#) (const [QwtPoint3D](#) &) const
- bool [operator!=](#) (const [QwtPoint3D](#) &) const

12.97.1 Detailed Description

[QwtPoint3D](#) class defines a 3D point in double coordinates.

12.97.2 Constructor & Destructor Documentation

12.97.2.1 QwtPoint3D() [1/3]

```
QwtPoint3D::QwtPoint3D ( ) [inline]
```

Constructs a null point.

See also

[isNull\(\)](#)

12.97.2.2 QwtPoint3D() [2/3]

```
QwtPoint3D::QwtPoint3D (
    const QwtPoint3D & other ) [inline]
```

Copy constructor. Constructs a point using the values of the point specified.

12.97.2.3 QwtPoint3D() [3/3]

```
QwtPoint3D::QwtPoint3D (
    const QPointF & other ) [inline]
```

Constructs a point with x and y coordinates from a 2D point, and a z coordinate of 0.

12.97.3 Member Function Documentation

12.97.3.1 isNull()

```
bool QwtPoint3D::isNull ( ) const [inline]
```

Returns

True if the point is null; otherwise returns false.

A point is considered to be null if x, y and z-coordinates are equal to zero.

12.97.3.2 operator!=()

```
bool QwtPoint3D::operator!= (
    const QwtPoint3D & other ) const [inline]
```

Returns

True if this rect and other are different; otherwise returns false.

12.97.3.3 operator==()

```
bool QwtPoint3D::operator== (
    const QwtPoint3D & other ) const [inline]
```

Returns

True, if this point and other are equal; otherwise returns false.

12.97.3.4 rx()

```
double & QwtPoint3D::rx ( ) [inline]
```

Returns

A reference to the x-coordinate of the point.

12.97.3.5 ry()

```
double & QwtPoint3D::ry ( ) [inline]
```

Returns

A reference to the y-coordinate of the point.

12.97.3.6 rz()

```
double & QwtPoint3D::rz ( ) [inline]
```

Returns

A reference to the z-coordinate of the point.

12.97.3.7 toPoint()

```
QPointF QwtPoint3D::toPoint ( ) const [inline]
```

Returns

2D point, where the z coordinate is dropped.

12.97.3.8 x()

```
double QwtPoint3D::x ( ) const [inline]
```

Returns

The x-coordinate of the point.

12.97.3.9 y()

```
double QwtPoint3D::y ( ) const [inline]
```

Returns

The y-coordinate of the point.

12.97.3.10 z()

```
double QwtPoint3D::z ( ) const [inline]
```

Returns

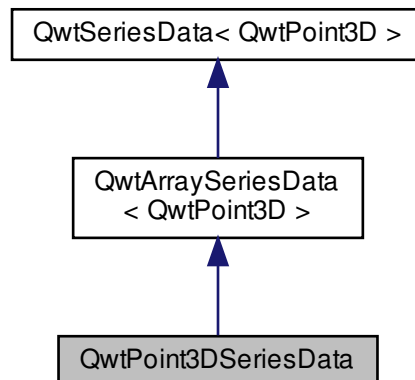
The z-coordinate of the point.

12.98 QwtPoint3DSeriesData Class Reference

Interface for iterating over an array of 3D points.

```
#include <qwt_series_data.h>
```

Inheritance diagram for QwtPoint3DSeriesData:



Public Member Functions

- [QwtPoint3DSeriesData](#) (const QVector< [QwtPoint3D](#) > &=QVector< [QwtPoint3D](#) >())
- virtual QRectF [boundingRect](#) () const

Calculate the bounding rectangle.

Additional Inherited Members

12.98.1 Detailed Description

Interface for iterating over an array of 3D points.

12.98.2 Constructor & Destructor Documentation

12.98.2.1 QwtPoint3DSeriesData()

```
QwtPoint3DSeriesData::QwtPoint3DSeriesData (
    const QVector< QwtPoint3D > & samples = QVector<QwtPoint3D>() )
```

Constructor

Parameters

<i>samples</i>	Samples
----------------	---------

12.98.3 Member Function Documentation

12.98.3.1 boundingRect()

```
QRectF QwtPoint3DSeriesData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

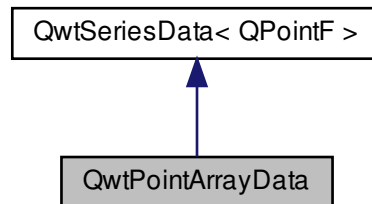
Implements [QwtSeriesData< QwtPoint3D >](#).

12.99 QwtPointArrayData Class Reference

Interface for iterating over two QVector<double> objects.

```
#include <qwt_point_data.h>
```

Inheritance diagram for QwtPointArrayData:



Public Member Functions

- [QwtPointArrayData](#) (const QVector< double > &x, const QVector< double > &y)
- [QwtPointArrayData](#) (const double *x, const double *y, size_t size)
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.
- virtual size_t [size](#) () const
- virtual QPointF [sample](#) (size_t index) const
- const QVector< double > & [xData](#) () const
- const QVector< double > & [yData](#) () const

Additional Inherited Members

12.99.1 Detailed Description

Interface for iterating over two QVector<double> objects.

12.99.2 Constructor & Destructor Documentation

12.99.2.1 QwtPointArrayData() [1/2]

```
QwtPointArrayData::QwtPointArrayData (
    const QVector< double > & x,
    const QVector< double > & y )
```

Constructor

Parameters

<i>x</i>	Array of x values
<i>y</i>	Array of y values

See also

[QwtPlotCurve::setData\(\)](#), [QwtPlotCurve::setSamples\(\)](#)

12.99.2.2 QwtPointArrayData() [2/2]

```
QwtPointArrayData::QwtPointArrayData (
    const double * x,
    const double * y,
    size_t size )
```

Constructor**Parameters**

<i>x</i>	Array of x values
<i>y</i>	Array of y values
<i>size</i>	Size of the x and y arrays

See also

[QwtPlotCurve::setData\(\)](#), [QwtPlotCurve::setSamples\(\)](#)

12.99.3 Member Function Documentation**12.99.3.1 boundingRect()**

```
QRectF QwtPointArrayData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

Implements [QwtSeriesData< QPointF >](#).

12.99.3.2 sample()

```
QPointF QwtPointArrayData::sample (
    size_t index ) const [virtual]
```

Return the sample at position *i*

Parameters

<i>index</i>	Index
--------------	-------

Returns

Sample at position *i*

Implements [QwtSeriesData< QPointF >](#).

12.99.3.3 size()

```
size_t QwtPointArrayData::size ( ) const [virtual]
```

Returns

Size of the data set

Implements [QwtSeriesData< QPointF >](#).

12.99.3.4 xData()

```
const QVector< double > & QwtPointArrayData::xData ( ) const
```

Returns

Array of the x-values

12.99.3.5 yData()

```
const QVector< double > & QwtPointArrayData::yData ( ) const
```

Returns

Array of the y-values

12.100 QwtPointMapper Class Reference

A helper class for translating a series of points.

```
#include <qwt_point_mapper.h>
```

Public Types

- enum [TransformationFlag](#) { [RoundPoints](#) = 0x01, [WeedOutPoints](#) = 0x02 }
Flags affecting the transformation process.
- typedef QFlags< [TransformationFlag](#) > [TransformationFlags](#)
Flags affecting the transformation process.

Public Member Functions

- [QwtPointMapper](#) ()
Constructor.
- [~QwtPointMapper](#) ()
Destructor.
- void [setFlags](#) ([TransformationFlags](#))
- [TransformationFlags](#) [flags](#) () const
- void [setFlag](#) ([TransformationFlag](#), bool on=true)
- bool [testFlag](#) ([TransformationFlag](#)) const
- void [setBoundingRect](#) (const QRectF &)
- QRectF [boundingRect](#) () const
- QPolygonF [toPolygonF](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QwtSeriesData](#)< QPointF > *series, int from, int to) const
Translate a series of points into a QPolygonF.
- QPolygon [toPolygon](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QwtSeriesData](#)< Q↔PointF > *series, int from, int to) const
Translate a series of points into a QPolygon.
- QPolygon [toPoints](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QwtSeriesData](#)< Q↔PointF > *series, int from, int to) const
Translate a series of points into a QPolygon.
- QPolygonF [toPointsF](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QwtSeriesData](#)< Q↔PointF > *series, int from, int to) const
Translate a series into a QPolygonF.
- QImage [toImage](#) (const [QwtScaleMap](#) &xMap, const [QwtScaleMap](#) &yMap, const [QwtSeriesData](#)< QPointF > *series, int from, int to, const QPen &, bool antialiased, uint numThreads) const
Translate a series into a QImage.

12.100.1 Detailed Description

A helper class for translating a series of points.

[QwtPointMapper](#) is a collection of methods and optimizations for translating a series of points into paint device coordinates. It is used by [QwtPlotCurve](#) but might also be useful for similar plot items displaying a [QwtSeriesData<QPointF>](#).

12.100.2 Member Typedef Documentation

12.100.2.1 TransformationFlags

```
typedef QFlags<TransformationFlag> QwtPointMapper::TransformationFlags
```

Flags affecting the transformation process.

See also

[setFlag\(\)](#), [setFlags\(\)](#)

12.100.3 Member Enumeration Documentation

12.100.3.1 TransformationFlag

```
enum QwtPointMapper::TransformationFlag
```

Flags affecting the transformation process.

See also

[setFlag\(\)](#), [setFlags\(\)](#)

Enumerator

RoundPoints	Round points to integer values.
WeedOutPoints	Try to remove points, that are translated to the same position.

12.100.4 Member Function Documentation

12.100.4.1 boundingRect()

```
QRectF QwtPointMapper::boundingRect ( ) const
```

Returns

Bounding rectangle

See also

[setBoundingRect\(\)](#)

12.100.4.2 flags()

```
QwtPointMapper::TransformationFlags QwtPointMapper::flags ( ) const
```

Returns

Flags affecting the transformation process

See also

[setFlags\(\)](#), [setFlag\(\)](#)

12.100.4.3 setBoundingRect()

```
void QwtPointMapper::setBoundingRect (
    const QRectF & rect )
```

Set a bounding rectangle for the point mapping algorithm

A valid bounding rectangle can be used for optimizations

Parameters

<i>rect</i>	Bounding rectangle
-------------	--------------------

See also

[boundingRect\(\)](#)

12.100.4.4 setFlag()

```
void QwtPointMapper::setFlag (
    TransformationFlag flag,
    bool on = true )
```

Modify a flag affecting the transformation process

Parameters

<i>flag</i>	Flag type
<i>on</i>	Value

See also

[flag\(\)](#), [setFlags\(\)](#)

12.100.4.5 setFlags()

```
void QwtPointMapper::setFlags (
    TransformationFlags flags )
```

Set the flags affecting the transformation process

Parameters

<i>flags</i>	Flags
--------------	-------

See also

[flags\(\)](#), [setFlag\(\)](#)

12.100.4.6 testFlag()

```
bool QwtPointMapper::testFlag (
    TransformationFlag flag ) const
```

Returns

True, when the flag is set

Parameters

<i>flag</i>	Flag type
-------------	-----------

See also

[setFlag\(\)](#), [setFlags\(\)](#)

12.100.4.7 toImage()

```
QImage QwtPointMapper::toImage (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QwtSeriesData< QPointF > * series,
    int from,
    int to,
    const QPen & pen,
    bool antialiased,
    uint numThreads ) const
```

Translate a series into a QImage.

Parameters

<i>xMap</i>	x map
<i>yMap</i>	y map
<i>series</i>	Series of points to be mapped
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted
<i>pen</i>	Pen used for drawing a point of the image, where a point is mapped to
<i>antialiased</i>	True, when the dots should be displayed antialiased
<i>numThreads</i>	Number of threads to be used for rendering. If numThreads is set to 0, the system specific ideal thread count is used.

Returns

Image displaying the series

12.100.4.8 toPoints()

```
QPolygon QwtPointMapper::toPoints (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QwtSeriesData< QPointF > * series,
    int from,
    int to ) const
```

Translate a series of points into a QPolygon.

- WeedOutPoints & [boundingRect\(\).isValid\(\)](#) All points that are mapped to the same position will be one point. Points outside of the bounding rectangle are ignored.
- WeedOutPoints & ![boundingRect\(\).isValid\(\)](#) All consecutive points that are mapped to the same position will one point
- !WeedOutPoints & [boundingRect\(\).isValid\(\)](#) Points outside of the bounding rectangle are ignored.

Parameters

<i>xMap</i>	x map
<i>yMap</i>	y map
<i>series</i>	Series of points to be mapped
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted

Returns

Translated polygon

12.100.4.9 toPointsF()

```
QPolygonF QwtPointMapper::toPointsF (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QwtSeriesData< QPointF > * series,
    int from,
    int to ) const
```

Translate a series into a QPolygonF.

- WeedOutPoints & RoundPoints & boundingRect().isValid() All points that are mapped to the same position will be one point. Points outside of the bounding rectangle are ignored.
- WeedOutPoints & RoundPoints & !boundingRect().isValid() All consecutive points that are mapped to the same position will one point
- WeedOutPoints & !RoundPoints All consecutive points that are mapped to the same position will one point
- !WeedOutPoints & boundingRect().isValid() Points outside of the bounding rectangle are ignored.

When RoundPoints is set all points are rounded to integers but returned as PolygonF - what only makes sense when the further processing of the values need a QPolygonF.

Parameters

<i>xMap</i>	x map
<i>yMap</i>	y map
<i>series</i>	Series of points to be mapped
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted

Returns

Translated polygon

12.100.4.10 toPolygon()

```
QPolygon QwtPointMapper::toPolygon (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QwtSeriesData< QPointF > * series,
    int from,
    int to ) const
```

Translate a series of points into a QPolygon.

When the WeedOutPoints flag is enabled consecutive points, that are mapped to the same position will be one point.

Parameters

<i>xMap</i>	x map
<i>yMap</i>	y map
<i>series</i>	Series of points to be mapped
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted

Returns

Translated polygon

12.100.4.11 toPolygonF()

```
QPolygonF QwtPointMapper::toPolygonF (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QwtSeriesData< QPointF > * series,
    int from,
    int to ) const
```

Translate a series of points into a QPolygonF.

When the WeedOutPoints flag is enabled consecutive points, that are mapped to the same position will be one point.

When RoundPoints is set all points are rounded to integers but returned as PolygonF - what only makes sense when the further processing of the values need a QPolygonF.

Parameters

<i>xMap</i>	x map
<i>yMap</i>	y map
<i>series</i>	Series of points to be mapped
<i>from</i>	Index of the first point to be painted
<i>to</i>	Index of the last point to be painted

Returns

Translated polygon

12.101 QwtPointPolar Class Reference

A point in polar coordinates.

```
#include <qwt_point_polar.h>
```

Public Member Functions

- [QwtPointPolar](#) ()
- [QwtPointPolar](#) (double [azimuth](#), double [radius](#))
- [QwtPointPolar](#) (const [QwtPointPolar](#) &)
- [QwtPointPolar](#) (const QPointF &)
- void [setPoint](#) (const QPointF &)
- QPointF [toPoint](#) () const
- bool [isValid](#) () const
Returns true if [radius\(\)](#) ≥ 0.0 .
- bool [isNull](#) () const
Returns true if [radius\(\)](#) ≥ 0.0 .
- double [radius](#) () const
Returns the radius.
- double [azimuth](#) () const
Returns the azimuth.
- double & [rRadius](#) ()
Returns the radius.
- double & [rAzimuth](#) ()
Returns the azimuth.
- void [setRadius](#) (double)
Sets the radius to radius.
- void [setAzimuth](#) (double)
Sets the azimuth to azimuth.
- bool [operator==](#) (const [QwtPointPolar](#) &) const
Compare 2 points.
- bool [operator!=](#) (const [QwtPointPolar](#) &) const
- [QwtPointPolar normalized](#) () const

12.101.1 Detailed Description

A point in polar coordinates.

In polar coordinates a point is determined by an angle and a distance. See http://en.wikipedia.org/wiki/Polar_coordinate_system

12.101.2 Constructor & Destructor Documentation

12.101.2.1 QwtPointPolar() [1/4]

```
QwtPointPolar::QwtPointPolar ( ) [inline]
```

Constructs a null point, with a radius and azimuth set to 0.0.

See also

[QPointF::isNull\(\)](#)

12.101.2.2 QwtPointPolar() [2/4]

```
QwtPointPolar::QwtPointPolar (
    double azimuth,
    double radius ) [inline]
```

Constructs a point with coordinates specified by radius and azimuth.

Parameters

<i>azimuth</i>	Azimuth
<i>radius</i>	Radius

12.101.2.3 `QwtPointPolar()` [3/4]

```
QwtPointPolar::QwtPointPolar (
    const QwtPointPolar & other ) [inline]
```

Constructs a point using the values of the point specified.

Parameters

<i>other</i>	Other point
--------------	-------------

12.101.2.4 `QwtPointPolar()` [4/4]

```
QwtPointPolar::QwtPointPolar (
    const QPointF & p )
```

Convert and assign values from a point in Cartesian coordinates

Parameters

<i>p</i>	Point in Cartesian coordinates
----------	--------------------------------

See also

[setPoint\(\)](#), [toPoint\(\)](#)

12.101.3 Member Function Documentation

12.101.3.1 `normalized()`

```
QwtPointPolar QwtPointPolar::normalized ( ) const
```

Normalize radius and azimuth

When the radius is < 0.0 it is set to 0.0 . The azimuth is a value ≥ 0.0 and $< 2 * M_PI$.

Returns

Normalized point

12.101.3.2 operator!=()

```
bool QwtPointPolar::operator!= (
    const QwtPointPolar & other ) const
```

Compare 2 points

Two points are equal to each other if radius and azimuth-coordinates are the same. Points are not equal, when the azimuth differs, but other.azimuth() == azimuth() % (2 * PI).

Returns

True if the point is not equal to other; otherwise return false.

See also

[normalized\(\)](#)

12.101.3.3 operator==()

```
bool QwtPointPolar::operator== (
    const QwtPointPolar & other ) const
```

Compare 2 points.

Two points are equal to each other if radius and azimuth-coordinates are the same. Points are not equal, when the azimuth differs, but other.azimuth() == azimuth() % (2 * PI).

Returns

True if the point is equal to other; otherwise return false.

See also

[normalized\(\)](#)

12.101.3.4 setPoint()

```
void QwtPointPolar::setPoint (
    const QPointF & p )
```

Convert and assign values from a point in Cartesian coordinates

Parameters

<i>p</i>	Point in Cartesian coordinates
----------	--------------------------------

12.101.3.5 toPoint()

```
QPointF QwtPointPolar::toPoint ( ) const
```

Convert and return values in Cartesian coordinates

Returns

Converted point in Cartesian coordinates

Note

Invalid or null points will be returned as QPointF(0.0, 0.0)

See also

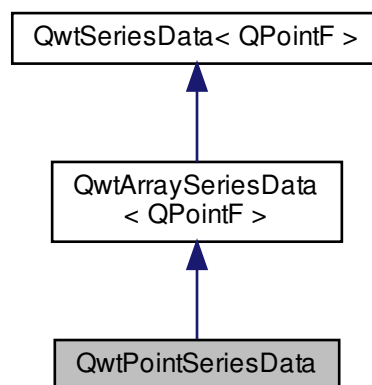
[isValid\(\)](#), [isNull\(\)](#)

12.102 QwtPointSeriesData Class Reference

Interface for iterating over an array of points.

```
#include <qwt_series_data.h>
```

Inheritance diagram for QwtPointSeriesData:



Public Member Functions

- [QwtPointSeriesData](#) (const QVector< QPointF > &=QVector< QPointF >())
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.

Additional Inherited Members

12.102.1 Detailed Description

Interface for iterating over an array of points.

12.102.2 Constructor & Destructor Documentation

12.102.2.1 QwtPointSeriesData()

```
QwtPointSeriesData::QwtPointSeriesData (
    const QVector< QPointF > & samples = QVector<QPointF>() )
```

Constructor

Parameters

<i>samples</i>	Samples
----------------	---------

12.102.3 Member Function Documentation

12.102.3.1 boundingRect()

```
QRectF QwtPointSeriesData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

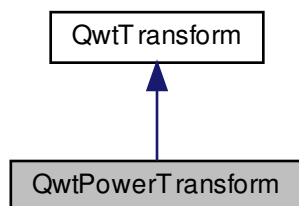
Implements [QwtSeriesData< QPointF >](#).

12.103 QwtPowerTransform Class Reference

A transformation using pow()

```
#include <qwt_transform.h>
```

Inheritance diagram for QwtPowerTransform:



Public Member Functions

- [QwtPowerTransform](#) (double exponent)
- virtual [~QwtPowerTransform](#) ()
Destructor.
- virtual double [transform](#) (double value) const
- virtual double [invTransform](#) (double value) const
- virtual [QwtTransform](#) * [copy](#) () const

12.103.1 Detailed Description

A transformation using pow()

[QwtPowerTransform](#) preserves the sign of a value. F.e. a transformation with a factor of 2 transforms a value of -3 to -9 and v.v. Thus [QwtPowerTransform](#) can be used for scales including negative values.

12.103.2 Constructor & Destructor Documentation

12.103.2.1 QwtPowerTransform()

```
QwtPowerTransform::QwtPowerTransform (
    double exponent )
```

Constructor

Parameters

<i>exponent</i>	Exponent
-----------------	----------

12.103.3 Member Function Documentation

12.103.3.1 copy()

```
QwtTransform * QwtPowerTransform::copy ( ) const [virtual]
```

Returns

Clone of the transformation

Implements [QwtTransform](#).

12.103.3.2 invTransform()

```
double QwtPowerTransform::invTransform (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be transformed
--------------	-------------------------

Returns

Inverse exponentiation preserving the sign

Implements [QwtTransform](#).

12.103.3.3 transform()

```
double QwtPowerTransform::transform (
    double value ) const [virtual]
```

Parameters

<i>value</i>	Value to be transformed
--------------	-------------------------

Returns

Exponentiation preserving the sign

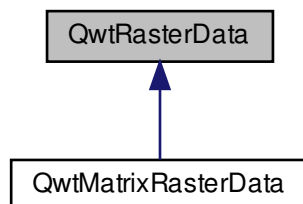
Implements [QwtTransform](#).

12.104 QwtRasterData Class Reference

[QwtRasterData](#) defines an interface to any type of raster data.

```
#include <qwt_raster_data.h>
```

Inheritance diagram for QwtRasterData:



Public Types

- enum [ConrecFlag](#) { [IgnoreAllVerticesOnLevel](#) = 0x01, [IgnoreOutOfRange](#) = 0x02 }
Flags to modify the contour algorithm.
- typedef QMap< double, QPolygonF > [ContourLines](#)
Contour lines.
- typedef QFlags< [ConrecFlag](#) > [ConrecFlags](#)
Flags to modify the contour algorithm.

Public Member Functions

- [QwtRasterData](#) ()
Constructor.
- virtual [~QwtRasterData](#) ()
Destructor.
- virtual void [setInterval](#) (Qt::Axis, const [QwtInterval](#) &)
- const [QwtInterval](#) & [interval](#) (Qt::Axis) const
- virtual QRectF [pixelHint](#) (const QRectF &) const
Pixel hint.
- virtual void [initRaster](#) (const QRectF &, const QSize &raster)
Initialize a raster.
- virtual void [discardRaster](#) ()
Discard a raster.
- virtual double [value](#) (double x, double y) const =0
- virtual [ContourLines](#) [contourLines](#) (const QRectF &rect, const QSize &raster, const QList< double > &levels, [ConrecFlags](#)) const

12.104.1 Detailed Description

[QwtRasterData](#) defines an interface to any type of raster data.

[QwtRasterData](#) is an abstract interface, that is used by [QwtPlotRasterItem](#) to find the values at the pixels of its raster.

Often a raster item is used to display values from a matrix. Then the derived raster data class needs to implement some sort of resampling, that maps the raster of the matrix into the requested raster of the raster item (depending on resolution and scales of the canvas).

12.104.2 Member Enumeration Documentation

12.104.2.1 ConrecFlag

```
enum QwtRasterData::ConrecFlag
```

Flags to modify the contour algorithm.

Enumerator

IgnoreAllVerticesOnLevel	Ignore all vertices on the same level.
IgnoreOutOfRange	Ignore all values, that are out of range.

12.104.3 Member Function Documentation

12.104.3.1 contourLines()

```
QwtRasterData::ContourLines QwtRasterData::contourLines (
    const QRectF & rect,
    const QSize & raster,
    const QList< double > & levels,
    ConrecFlags flags ) const [virtual]
```

Calculate contour lines

Parameters

<i>rect</i>	Bounding rectangle for the contour lines
<i>raster</i>	Number of data pixels of the raster data
<i>levels</i>	List of limits, where to insert contour lines
<i>flags</i>	Flags to customize the contouring algorithm

Returns

Calculated contour lines

An adaption of CONREC, a simple contouring algorithm. <http://local.wasp.uwa.edu.au/~pbourke/papers/conre>

12.104.3.2 discardRaster()

```
void QwtRasterData::discardRaster ( ) [virtual]
```

Discard a raster.

After the composition of an image [QwtPlotSpectrogram](#) calls [discardRaster\(\)](#).

The default implementation does nothing, but if data has been loaded in [initRaster\(\)](#), it could be deleted now.

See also

[initRaster\(\)](#), [value\(\)](#)

12.104.3.3 initRaster()

```
void QwtRasterData::initRaster (
    const QRectF & area,
    const QSize & raster ) [virtual]
```

Initialize a raster.

Before the composition of an image [QwtPlotSpectrogram](#) calls [initRaster\(\)](#), announcing the area and its resolution that will be requested.

The default implementation does nothing, but for data sets that are stored in files, it might be a good idea to reimplement [initRaster\(\)](#), where the data is resampled and loaded into memory.

Parameters

<i>area</i>	Area of the raster
<i>raster</i>	Number of horizontal and vertical pixels

See also

[initRaster\(\)](#), [value\(\)](#)

12.104.3.4 interval()

```
const QwtInterval & QwtRasterData::interval (
    Qt::Axis axis ) const [inline]
```

Returns

Bounding interval for a axis

See also

[setInterval](#)

12.104.3.5 pixelHint()

```
QRectF QwtRasterData::pixelHint (
    const QRectF & area ) const [virtual]
```

Pixel hint.

[pixelHint\(\)](#) returns the geometry of a pixel, that can be used to calculate the resolution and alignment of the plot item, that is representing the data.

Width and height of the hint need to be the horizontal and vertical distances between 2 neighbored points. The center of the hint has to be the position of any point (it doesn't matter which one).

An empty hint indicates, that there are values for any detail level.

Limiting the resolution of the image might significantly improve the performance and heavily reduce the amount of memory when rendering a QImage from the raster data.

The default implementation returns an empty rectangle recommending to render in target device (f.e. screen) resolution.

Parameters

<i>area</i>	In most implementations the resolution of the data doesn't depend on the requested area.
-------------	--

Returns

Bounding rectangle of a pixel

Reimplemented in [QwtMatrixRasterData](#).

12.104.3.6 setInterval()

```
void QwtRasterData::setInterval (
    Qt::Axis axis,
    const QwtInterval & interval ) [virtual]
```

Set the bounding interval for the x, y or z coordinates.

Parameters

<i>axis</i>	Axis
<i>interval</i>	Bounding interval

See also

[interval\(\)](#)

Reimplemented in [QwtMatrixRasterData](#).

12.104.3.7 value()

```
virtual double QwtRasterData::value (
    double x,
    double y ) const [pure virtual]
```

Returns

the value at a raster position

Parameters

<i>x</i>	X value in plot coordinates
<i>y</i>	Y value in plot coordinates

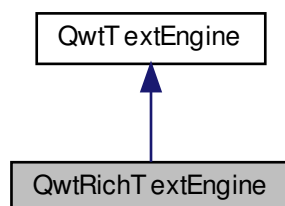
Implemented in [QwtMatrixRasterData](#).

12.105 QwtRichTextEngine Class Reference

A text engine for Qt rich texts.

```
#include <qwt_text_engine.h>
```

Inheritance diagram for QwtRichTextEngine:



Public Member Functions

- [QwtRichTextEngine](#) ()
Constructor.
- virtual double [heightForWidth](#) (const QFont &font, int flags, const QString &text, double width) const
- virtual QSizeF [textSize](#) (const QFont &font, int flags, const QString &text) const
- virtual void [draw](#) (QPainter *painter, const QRectF &rect, int flags, const QString &text) const
- virtual bool [mightRender](#) (const QString &) const
- virtual void [textMargins](#) (const QFont &, const QString &, double &left, double &right, double &top, double &bottom) const

Additional Inherited Members

12.105.1 Detailed Description

A text engine for Qt rich texts.

[QwtRichTextEngine](#) renders Qt rich texts using the classes of the Scribe framework of Qt.

12.105.2 Member Function Documentation

12.105.2.1 draw()

```
void QwtRichTextEngine::draw (
    QPainter * painter,
    const QRectF & rect,
    int flags,
    const QString & text ) const [virtual]
```

Draw the text in a clipping rectangle

Parameters

<i>painter</i>	Painter
<i>rect</i>	Clipping rectangle
<i>flags</i>	Bitwise OR of the flags like in for QPainter::drawText()
<i>text</i>	Text to be rendered

Implements [QwtTextEngine](#).

12.105.2.2 heightForWidth()

```
double QwtRichTextEngine::heightForWidth (
    const QFont & font,
    int flags,
```

```
const QString & text,  
double width ) const [virtual]
```

Find the height for a given width

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText()
<i>text</i>	Text to be rendered
<i>width</i>	Width

Returns

Calculated height

Implements [QwtTextEngine](#).

12.105.2.3 mightRender()

```
bool QwtRichTextEngine::mightRender (
    const QString & text ) const [virtual]
```

Test if a string can be rendered by this text engine

Parameters

<i>text</i>	Text to be tested
-------------	-------------------

Returns

Qt::mightBeRichText(text);

Implements [QwtTextEngine](#).

12.105.2.4 textMargins()

```
void QwtRichTextEngine::textMargins (
    const QFont & ,
    const QString & ,
    double & left,
    double & right,
    double & top,
    double & bottom ) const [virtual]
```

Return margins around the texts

Parameters

<i>left</i>	Return 0
<i>right</i>	Return 0
<i>top</i>	Return 0
<i>bottom</i>	Return 0

Implements [QwtTextEngine](#).

12.105.2.5 `textSize()`

```
QSizeF QwtRichTextEngine::textSize (
    const QFont & font,
    int flags,
    const QString & text ) const [virtual]
```

Returns the size, that is needed to render text

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText()
<i>text</i>	Text to be rendered

Returns

Calculated size

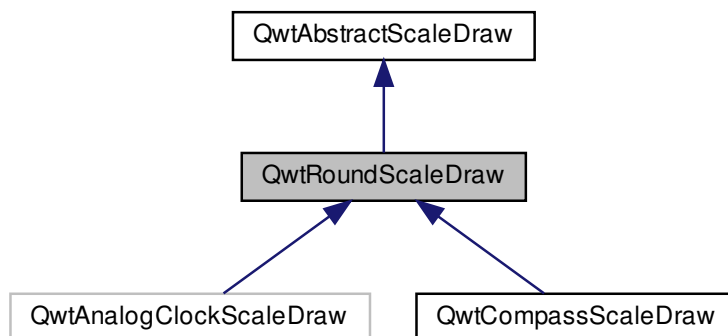
Implements [QwtTextEngine](#).

12.106 QwtRoundScaleDraw Class Reference

A class for drawing round scales.

```
#include <qwt_round_scale_draw.h>
```

Inheritance diagram for QwtRoundScaleDraw:



Public Member Functions

- [QwtRoundScaleDraw](#) ()
Constructor.
- virtual [~QwtRoundScaleDraw](#) ()
Destructor.
- void [setRadius](#) (double [radius](#))
- double [radius](#) () const
- void [moveCenter](#) (double x, double y)
Move the center of the scale draw, leaving the radius unchanged.
- void [moveCenter](#) (const QPointF &)
- QPointF [center](#) () const
Get the center of the scale.
- void [setAngleRange](#) (double angle1, double angle2)
Adjust the baseline circle segment for round scales.
- virtual double [extent](#) (const QFont &) const

Protected Member Functions

- virtual void [drawTick](#) (QPainter *, double value, double len) const
- virtual void [drawBackbone](#) (QPainter *) const
- virtual void [drawLabel](#) (QPainter *, double val) const

Additional Inherited Members

12.106.1 Detailed Description

A class for drawing round scales.

[QwtRoundScaleDraw](#) can be used to draw round scales. The circle segment can be adjusted by [setAngleRange\(\)](#). The geometry of the scale can be specified with [moveCenter\(\)](#) and [setRadius\(\)](#).

After a scale division has been specified as a [QwtScaleDiv](#) object using [QwtAbstractScaleDraw::setScaleDiv\(const QwtScaleDiv &s\)](#), the scale can be drawn with the [QwtAbstractScaleDraw::draw\(\)](#) member.

12.106.2 Constructor & Destructor Documentation

12.106.2.1 QwtRoundScaleDraw()

```
QwtRoundScaleDraw::QwtRoundScaleDraw ( )
```

Constructor.

The range of the scale is initialized to [0, 100], The center is set to (50, 50) with a radius of 50. The angle range is set to [-135, 135].

12.106.3 Member Function Documentation

12.106.3.1 drawBackbone()

```
void QwtRoundScaleDraw::drawBackbone (
    QPainter * painter ) const    [protected], [virtual]
```

Draws the baseline of the scale

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[drawTick\(\)](#), [drawLabel\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.106.3.2 drawLabel()

```
void QwtRoundScaleDraw::drawLabel (
    QPainter * painter,
    double value ) const    [protected], [virtual]
```

Draws the label for a major scale tick

Parameters

<i>painter</i>	Painter
<i>value</i>	Value

See also

[drawTick\(\)](#), [drawBackbone\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.106.3.3 drawTick()

```
void QwtRoundScaleDraw::drawTick (
    QPainter * painter,
    double value,
    double len ) const    [protected], [virtual]
```

Draw a tick

Parameters

<i>painter</i>	Painter
<i>value</i>	Value of the tick
<i>len</i>	Lenght of the tick

See also

[drawBackbone\(\)](#), [drawLabel\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.106.3.4 extent()

```
double QwtRoundScaleDraw::extent (
    const QFont & font ) const [virtual]
```

Calculate the extent of the scale

The extent is the distance between the baseline to the outermost pixel of the scale draw. [radius\(\)](#) + [extent\(\)](#) is an upper limit for the radius of the bounding circle.

Parameters

<i>font</i>	Font used for painting the labels
-------------	-----------------------------------

Returns

Calculated extent

See also

[setMinimumExtent\(\)](#), [minimumExtent\(\)](#)

Warning

The implemented algorithm is not too smart and calculates only an upper limit, that might be a few pixels too large

Implements [QwtAbstractScaleDraw](#).

12.106.3.5 moveCenter()

```
void QwtRoundScaleDraw::moveCenter (
    const QPointF & center )
```

Move the center of the scale draw, leaving the radius unchanged

Parameters

<i>center</i>	New center
---------------	------------

See also

[setRadius\(\)](#)

12.106.3.6 radius()

```
double QwtRoundScaleDraw::radius ( ) const
```

Get the radius

Radius is the radius of the backbone without ticks and labels.

Returns

Radius of the scale

See also

[setRadius\(\)](#), [extent\(\)](#)

12.106.3.7 setAngleRange()

```
void QwtRoundScaleDraw::setAngleRange (
    double angle1,
    double angle2 )
```

Adjust the baseline circle segment for round scales.

The baseline will be drawn from min(angle1,angle2) to max(angle1, angle2). The default setting is [-135, 135]. An angle of 0 degrees corresponds to the 12 o'clock position, and positive angles count in a clockwise direction.

Parameters

<i>angle1</i>	
<i>angle2</i>	boundaries of the angle interval in degrees.

Warning

- The angle range is limited to [-360, 360] degrees. Angles exceeding this range will be clipped.
- For angles more or equal than 360 degrees above or below min(angle1, angle2), scale marks will not be drawn.
- If you need a counterclockwise scale, use [QwtScaleDiv::setInterval\(\)](#)

12.106.3.8 setRadius()

```
void QwtRoundScaleDraw::setRadius (
    double radius )
```

Change of radius the scale

Radius is the radius of the backbone without ticks and labels.

Parameters

<i>radius</i>	New Radius
---------------	------------

See also

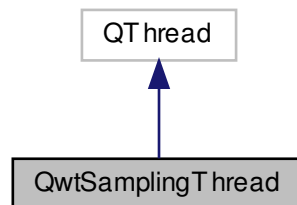
[moveCenter\(\)](#)

12.107 QwtSamplingThread Class Reference

A thread collecting samples at regular intervals.

```
#include <qwt_sampling_thread.h>
```

Inheritance diagram for QwtSamplingThread:



Public Slots

- void [setInterval](#) (double [interval](#))
- void [stop](#) ()

Public Member Functions

- virtual [~QwtSamplingThread](#) ()
Destructor.
- double [interval](#) () const
- double [elapsed](#) () const

Protected Member Functions

- [QwtSamplingThread](#) (QObject *parent=NULL)
Constructor.
- virtual void [run](#) ()
- virtual void [sample](#) (double [elapsed](#))=0

12.107.1 Detailed Description

A thread collecting samples at regular intervals.

Continuous signals are converted into a discrete signal by collecting samples at regular intervals. A discrete signal can be displayed by a [QwtPlotSeriesItem](#) on a [QwtPlot](#) widget.

[QwtSamplingThread](#) starts a thread calling periodically [sample\(\)](#), to collect and store (or emit) a single sample.

See also

[QwtPlotCurve](#), [QwtPlotSeriesItem](#)

12.107.2 Member Function Documentation

12.107.2.1 [elapsed\(\)](#)

```
double QwtSamplingThread::elapsed ( ) const
```

Returns

Time (in ms) since the thread was started

See also

[QThread::start\(\)](#), [run\(\)](#)

12.107.2.2 [interval\(\)](#)

```
double QwtSamplingThread::interval ( ) const
```

Returns

Interval (in ms), between 2 calls of [sample\(\)](#)

See also

[setInterval\(\)](#)

12.107.2.3 run()

```
void QwtSamplingThread::run ( ) [protected], [virtual]
```

Loop collecting samples started from QThread::start()

See also

[stop\(\)](#)

12.107.2.4 sample()

```
virtual void QwtSamplingThread::sample (
    double elapsed ) [protected], [pure virtual]
```

Collect a sample

Parameters

<i>elapsed</i>	Time since the thread was started in milliseconds
----------------	---

12.107.2.5 setInterval

```
void QwtSamplingThread::setInterval (
    double interval ) [slot]
```

Change the interval (in ms), when [sample\(\)](#) is called. The default interval is 1000.0 (= 1s)

Parameters

<i>interval</i>	Interval
-----------------	----------

See also

[interval\(\)](#)

12.107.2.6 stop

```
void QwtSamplingThread::stop ( ) [slot]
```

Terminate the collecting thread

See also

QThread::start(), [run\(\)](#)

12.108 QwtScaleArithmetic Class Reference

Arithmetic including a tolerance.

```
#include <qwt_scale_engine.h>
```

Static Public Member Functions

- static double [ceilEps](#) (double value, double intervalSize)
- static double [floorEps](#) (double value, double intervalSize)
- static double [divideEps](#) (double intervalSize, double numSteps)
Divide an interval into steps.
- static double [divideInterval](#) (double intervalSize, int numSteps, uint base)

12.108.1 Detailed Description

Arithmetic including a tolerance.

12.108.2 Member Function Documentation

12.108.2.1 [ceilEps\(\)](#)

```
double QwtScaleArithmetic::ceilEps (  
    double value,  
    double intervalSize ) [static]
```

Ceil a value, relative to an interval

Parameters

<i>value</i>	Value to be ceiled
<i>intervalSize</i>	Interval size

Returns

Rounded value

See also

[floorEps\(\)](#)

12.108.2.2 divideEps()

```
double QwtScaleArithmetic::divideEps (
    double intervalSize,
    double numSteps ) [static]
```

Divide an interval into steps.

$$stepSize = (intervalSize - intervalSize * 10e^{-6}) / numSteps$$

Parameters

<i>intervalSize</i>	Interval size
<i>numSteps</i>	Number of steps

Returns

Step size

12.108.2.3 divideInterval()

```
double QwtScaleArithmetic::divideInterval (
    double intervalSize,
    int numSteps,
    uint base ) [static]
```

Calculate a step size for a given interval

Parameters

<i>intervalSize</i>	Interval size
<i>numSteps</i>	Number of steps
<i>base</i>	Base for the division (usually 10)

Returns

Calculated step size

12.108.2.4 floorEps()

```
double QwtScaleArithmetic::floorEps (
    double value,
    double intervalSize ) [static]
```

Floor a value, relative to an interval

Parameters

<i>value</i>	Value to be floored
<i>intervalSize</i>	Interval size

Returns

Rounded value

See also

[floorEps\(\)](#)

12.109 QwtScaleDiv Class Reference

A class representing a scale division.

```
#include <qwt_scale_div.h>
```

Public Types

- enum [TickType](#) {
[NoTick](#) = -1, [MinorTick](#), [MediumTick](#), [MajorTick](#),
[NTickTypes](#) }

Scale tick types.

Public Member Functions

- [QwtScaleDiv](#) (double [lowerBound](#)=0.0, double [upperBound](#)=0.0)
- [QwtScaleDiv](#) (const [QwtInterval](#) &, [QList](#)< double >[[NTickTypes](#)])
- [QwtScaleDiv](#) (double [lowerBound](#), double [upperBound](#), [QList](#)< double >[[NTickTypes](#)])
- [QwtScaleDiv](#) (double [lowerBound](#), double [upperBound](#), const [QList](#)< double > &minorTicks, const [QList](#)< double > &mediumTicks, const [QList](#)< double > &majorTicks)
- bool [operator==](#) (const [QwtScaleDiv](#) &) const
Equality operator.
- bool [operator!=](#) (const [QwtScaleDiv](#) &) const
Inequality.
- void [setInterval](#) (double [lowerBound](#), double [upperBound](#))
- void [setInterval](#) (const [QwtInterval](#) &)
- [QwtInterval](#) [interval](#) () const
- void [setLowerBound](#) (double)
- double [lowerBound](#) () const
- void [setUpperBound](#) (double)
- double [upperBound](#) () const
- double [range](#) () const
- bool [contains](#) (double value) const
- void [setTicks](#) (int tickType, const [QList](#)< double > &)
- [QList](#)< double > [ticks](#) (int tickType) const
- bool [isEmpty](#) () const
Check if the scale division is empty([lowerBound\(\)](#) == [upperBound\(\)](#))
- bool [isIncreasing](#) () const
Check if the scale division is increasing([lowerBound\(\)](#) <= [upperBound\(\)](#))
- void [invert](#) ()
- [QwtScaleDiv](#) [inverted](#) () const
- [QwtScaleDiv](#) [bounded](#) (double [lowerBound](#), double [upperBound](#)) const

12.109.1 Detailed Description

A class representing a scale division.

A Qwt scale is defined by its boundaries and 3 list for the positions of the major, medium and minor ticks.

The [upperBound\(\)](#) might be smaller than the [lowerBound\(\)](#) to indicate inverted scales.

Scale divisions can be calculated from a [QwtScaleEngine](#).

See also

[QwtScaleEngine::divideScale\(\)](#), [QwtPlot::setAxisScaleDiv\(\)](#), [QwtAbstractSlider::setScaleDiv\(\)](#)

12.109.2 Member Enumeration Documentation

12.109.2.1 TickType

```
enum QwtScaleDiv::TickType
```

Scale tick types.

Enumerator

NoTick	No ticks.
MinorTick	Minor ticks.
MediumTick	Medium ticks.
MajorTick	Major ticks.
NTickTypes	Number of valid tick types.

12.109.3 Constructor & Destructor Documentation

12.109.3.1 QwtScaleDiv() [1/4]

```
QwtScaleDiv::QwtScaleDiv (
    double lowerBound = 0.0,
    double upperBound = 0.0 ) [explicit]
```

Construct a division without ticks

Parameters

<i>lowerBound</i>	First boundary
<i>upperBound</i>	Second boundary

Note

lowerBound might be greater than upperBound for inverted scales

12.109.3.2 QwtScaleDiv() [2/4]

```
QwtScaleDiv::QwtScaleDiv (
    const QwtInterval & interval,
    QList< double > ticks[NTickTypes] ) [explicit]
```

Construct a scale division

Parameters

<i>interval</i>	Interval
<i>ticks</i>	List of major, medium and minor ticks

12.109.3.3 QwtScaleDiv() [3/4]

```
QwtScaleDiv::QwtScaleDiv (
    double lowerBound,
    double upperBound,
    QList< double > ticks[NTickTypes] ) [explicit]
```

Construct a scale division

Parameters

<i>lowerBound</i>	First boundary
<i>upperBound</i>	Second boundary
<i>ticks</i>	List of major, medium and minor ticks

Note

lowerBound might be greater than upperBound for inverted scales

12.109.3.4 QwtScaleDiv() [4/4]

```
QwtScaleDiv::QwtScaleDiv (
    double lowerBound,
    double upperBound,
    const QList< double > & minorTicks,
    const QList< double > & mediumTicks,
    const QList< double > & majorTicks ) [explicit]
```

Construct a scale division

Parameters

<i>lowerBound</i>	First boundary
<i>upperBound</i>	Second boundary
<i>minorTicks</i>	List of minor ticks
<i>mediumTicks</i>	List medium ticks
<i>majorTicks</i>	List of major ticks

Note

lowerBound might be greater than upperBound for inverted scales

12.109.4 Member Function Documentation

12.109.4.1 bounded()

```
QwtScaleDiv QwtScaleDiv::bounded (
    double lowerBound,
    double upperBound ) const
```

Return a scale division with an interval [lowerBound, upperBound] where all ticks outside this interval are removed

Parameters

<i>lowerBound</i>	Lower bound
<i>upperBound</i>	Upper bound

Returns

Scale division with all ticks inside of the given interval

Note

lowerBound might be greater than upperBound for inverted scales

12.109.4.2 contains()

```
bool QwtScaleDiv::contains (
    double value ) const
```

Return if a value is between [lowerBound\(\)](#) and [upperBound\(\)](#)

Parameters

<i>value</i>	Value
--------------	-------

Returns

true/false

12.109.4.3 interval()

```
QwtInterval QwtScaleDiv::interval ( ) const
```

Returns

lowerBound -> upperBound

12.109.4.4 invert()

```
void QwtScaleDiv::invert ( )
```

Invert the scale division

See also

[inverted\(\)](#)

12.109.4.5 inverted()

```
QwtScaleDiv QwtScaleDiv::inverted ( ) const
```

Returns

A scale division with inverted boundaries and ticks

See also

[invert\(\)](#)

12.109.4.6 lowerBound()

```
double QwtScaleDiv::lowerBound ( ) const
```

Returns

First boundary

See also

[upperBound\(\)](#)

12.109.4.7 operator!=(())

```
bool QwtScaleDiv::operator!= (
    const QwtScaleDiv & other ) const
```

Inequality.

Returns

true if this instance is not equal to other

12.109.4.8 operator==(())

```
bool QwtScaleDiv::operator==(
    const QwtScaleDiv & other ) const
```

Equality operator.

Returns

true if this instance is equal to other

12.109.4.9 range()

```
double QwtScaleDiv::range ( ) const
```

Returns

[upperBound\(\)](#) - [lowerBound\(\)](#)

12.109.4.10 setInterval() [1/2]

```
void QwtScaleDiv::setInterval (
    double lowerBound,
    double upperBound )
```

Change the interval

Parameters

<i>lowerBound</i>	First boundary
<i>upperBound</i>	Second boundary

Note

lowerBound might be greater than upperBound for inverted scales

12.109.4.11 setInterval() [2/2]

```
void QwtScaleDiv::setInterval (
    const QwtInterval & interval )
```

Change the interval

Parameters

<i>interval</i>	Interval
-----------------	----------

12.109.4.12 setLowerBound()

```
void QwtScaleDiv::setLowerBound (
    double lowerBound )
```

Set the first boundary

Parameters

<i>lowerBound</i>	First boundary
-------------------	----------------

See also

lowerBiound(), [setUpperBound\(\)](#)

12.109.4.13 setTicks()

```
void QwtScaleDiv::setTicks (
    int type,
    const QList< double > & ticks )
```

Assign ticks

Parameters

<i>type</i>	MinorTick, MediumTick or MajorTick
<i>ticks</i>	Values of the tick positions

12.109.4.14 setUpperBound()

```
void QwtScaleDiv::setUpperBound (
    double upperBound )
```

Set the second boundary

Parameters

<i>upperBound</i>	Second boundary
-------------------	-----------------

See also

[upperBound\(\)](#), [setLowerBound\(\)](#)

12.109.4.15 ticks()

```
QList< double > QwtScaleDiv::ticks (
    int type ) const
```

Return a list of ticks

Parameters

<i>type</i>	MinorTick, MediumTick or MajorTick
-------------	------------------------------------

Returns

Tick list

12.109.4.16 upperBound()

```
double QwtScaleDiv::upperBound ( ) const
```

Returns

upper bound

See also

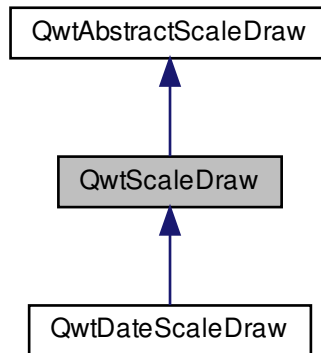
[lowerBound\(\)](#)

12.110 QwtScaleDraw Class Reference

A class for drawing scales.

```
#include <qwt_scale_draw.h>
```

Inheritance diagram for QwtScaleDraw:



Public Types

- enum [Alignment](#) { [BottomScale](#), [TopScale](#), [LeftScale](#), [RightScale](#) }

Public Member Functions

- [QwtScaleDraw](#) ()
Constructor.
- virtual [~QwtScaleDraw](#) ()
Destructor.
- void [getBorderDistHint](#) (const QFont &, int &start, int &end) const
Determine the minimum border distance.
- int [minLabelDist](#) (const QFont &) const
- int [minLength](#) (const QFont &) const
- virtual double [extent](#) (const QFont &) const
- void [move](#) (double x, double y)
- void [move](#) (const QPointF &)
Move the position of the scale.
- void [setLength](#) (double [length](#))
- [Alignment](#) [alignment](#) () const
- void [setAlignment](#) ([Alignment](#))
- Qt::Orientation [orientation](#) () const
- QPointF [pos](#) () const
- double [length](#) () const
- void [setLabelAlignment](#) (Qt::Alignment)
Change the label flags.

- Qt::Alignment [labelAlignment](#) () const
- void [setLabelRotation](#) (double rotation)
- double [labelRotation](#) () const
- int [maxLabelHeight](#) (const QFont &) const
- int [maxLabelWidth](#) (const QFont &) const
- QPointF [labelPosition](#) (double value) const
- QRectF [labelRect](#) (const QFont &, double value) const
- QSizeF [labelSize](#) (const QFont &, double value) const
- QRect [boundingLabelRect](#) (const QFont &, double value) const

Find the bounding rectangle for the label.

Protected Member Functions

- QTransform [labelTransformation](#) (const QPointF &, const QSizeF &) const
- virtual void [drawTick](#) (QPainter *, double value, double len) const
- virtual void [drawBackbone](#) (QPainter *) const
- virtual void [drawLabel](#) (QPainter *, double value) const

12.110.1 Detailed Description

A class for drawing scales.

[QwtScaleDraw](#) can be used to draw linear or logarithmic scales. A scale has a position, an alignment and a length, which can be specified. The labels can be rotated and aligned to the ticks using [setLabelRotation\(\)](#) and [setLabelAlignment\(\)](#).

After a scale division has been specified as a [QwtScaleDiv](#) object using [QwtAbstractScaleDraw::setScaleDiv\(const QwtScaleDiv &s\)](#), the scale can be drawn with the [QwtAbstractScaleDraw::draw\(\)](#) member.

12.110.2 Member Enumeration Documentation

12.110.2.1 Alignment

```
enum QwtScaleDraw::Alignment
```

Alignment of the scale draw

See also

[setAlignment\(\)](#), [alignment\(\)](#)

Enumerator

BottomScale	The scale is below.
TopScale	The scale is above.
LeftScale	The scale is left.
RightScale	The scale is right.

12.110.3 Constructor & Destructor Documentation

12.110.3.1 QwtScaleDraw()

```
QwtScaleDraw::QwtScaleDraw ( )
```

Constructor.

The range of the scale is initialized to [0, 100], The position is at (0, 0) with a length of 100. The orientation is QwtAbstractScaleDraw::Bottom.

12.110.4 Member Function Documentation

12.110.4.1 alignment()

```
QwtScaleDraw::Alignment QwtScaleDraw::alignment ( ) const
```

Return alignment of the scale

See also

[setAlignment\(\)](#)

Returns

Alignment of the scale

12.110.4.2 boundingLabelRect()

```
QRect QwtScaleDraw::boundingLabelRect (
    const QFont & font,
    double value ) const
```

Find the bounding rectangle for the label.

The coordinates of the rectangle are absolute (calculated from [pos\(\)](#)). in direction of the tick.

Parameters

<i>font</i>	Font used for painting
<i>value</i>	Value

Returns

Bounding rectangle

See also

[labelRect\(\)](#)

12.110.4.3 drawBackbone()

```
void QwtScaleDraw::drawBackbone (
    QPainter * painter ) const    [protected], [virtual]
```

Draws the baseline of the scale

Parameters

<i>painter</i>	Painter
----------------	---------

See also

[drawTick\(\)](#), [drawLabel\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.110.4.4 drawLabel()

```
void QwtScaleDraw::drawLabel (
    QPainter * painter,
    double value ) const    [protected], [virtual]
```

Draws the label for a major scale tick

Parameters

<i>painter</i>	Painter
<i>value</i>	Value

See also

[drawTick\(\)](#), [drawBackbone\(\)](#), [boundingLabelRect\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.110.4.5 drawTick()

```
void QwtScaleDraw::drawTick (
    QPainter * painter,
    double value,
    double len ) const [protected], [virtual]
```

Draw a tick

Parameters

<i>painter</i>	Painter
<i>value</i>	Value of the tick
<i>len</i>	Length of the tick

See also

[drawBackbone\(\)](#), [drawLabel\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.110.4.6 extent()

```
double QwtScaleDraw::extent (
    const QFont & font ) const [virtual]
```

Calculate the width/height that is needed for a vertical/horizontal scale.

The extent is calculated from the pen width of the backbone, the major tick length, the spacing and the maximum width/height of the labels.

Parameters

<i>font</i>	Font used for painting the labels
-------------	-----------------------------------

Returns

Extent

See also

[minLength\(\)](#)

Implements [QwtAbstractScaleDraw](#).

12.110.4.7 getBorderDistHint()

```
void QwtScaleDraw::getBorderDistHint (
    const QFont & font,
    int & start,
    int & end ) const
```

Determine the minimum border distance.

This member function returns the minimum space needed to draw the mark labels at the scale's endpoints.

Parameters

<i>font</i>	Font
<i>start</i>	Start border distance
<i>end</i>	End border distance

12.110.4.8 labelAlignment()

```
Qt::Alignment QwtScaleDraw::labelAlignment ( ) const
```

Returns

the label flags

See also

[setLabelAlignment\(\)](#), [labelRotation\(\)](#)

12.110.4.9 labelPosition()

```
QPointF QwtScaleDraw::labelPosition (
    double value ) const
```

Find the position, where to paint a label

The position has a distance that depends on the length of the ticks in direction of the [alignment\(\)](#).

Parameters

<i>value</i>	Value
--------------	-------

Returns

Position, where to paint a label

12.110.4.10 labelRect()

```
QRectF QwtScaleDraw::labelRect (
    const QFont & font,
    double value ) const
```

Find the bounding rectangle for the label. The coordinates of the rectangle are relative to spacing + tick length from the backbone in direction of the tick.

Parameters

<i>font</i>	Font used for painting
<i>value</i>	Value

Returns

Bounding rectangle that is needed to draw a label

12.110.4.11 labelRotation()

```
double QwtScaleDraw::labelRotation ( ) const
```

Returns

the label rotation

See also

[setLabelRotation\(\)](#), [labelAlignment\(\)](#)

12.110.4.12 labelSize()

```
QSizeF QwtScaleDraw::labelSize (
    const QFont & font,
    double value ) const
```

Calculate the size that is needed to draw a label

Parameters

<i>font</i>	Label font
<i>value</i>	Value

Returns

Size that is needed to draw a label

12.110.4.13 labelTransformation()

```
QTransform QwtScaleDraw::labelTransformation (
    const QPointF & pos,
    const QSizeF & size ) const [protected]
```

Calculate the transformation that is needed to paint a label depending on its alignment and rotation.

Parameters

<i>pos</i>	Position where to paint the label
<i>size</i>	Size of the label

Returns

Transformation matrix

See also

[setLabelAlignment\(\)](#), [setLabelRotation\(\)](#)

12.110.4.14 length()

```
double QwtScaleDraw::length ( ) const
```

Returns

the length of the backbone

See also

[setLength\(\)](#), [pos\(\)](#)

12.110.4.15 maxLabelHeight()

```
int QwtScaleDraw::maxLabelHeight (
    const QFont & font ) const
```

Parameters

<i>font</i>	Font
-------------	------

Returns

the maximum height of a label

12.110.4.16 maxLabelWidth()

```
int QwtScaleDraw::maxLabelWidth (
    const QFont & font ) const
```

Parameters

<i>font</i>	Font
-------------	------

Returns

the maximum width of a label

12.110.4.17 minLabelDist()

```
int QwtScaleDraw::minLabelDist (
    const QFont & font ) const
```

Determine the minimum distance between two labels, that is necessary that the texts don't overlap.

Parameters

<i>font</i>	Font
-------------	------

Returns

The maximum width of a label

See also

[getBorderDistHint\(\)](#)

12.110.4.18 minLength()

```
int QwtScaleDraw::minLength (
    const QFont & font ) const
```

Calculate the minimum length that is needed to draw the scale

Parameters

<i>font</i>	Font used for painting the labels
-------------	-----------------------------------

Returns

Minimum length that is needed to draw the scale

See also

[extent\(\)](#)

12.110.4.19 move() [1/2]

```
void QwtScaleDraw::move (
    double x,
    double y ) [inline]
```

Move the position of the scale

Parameters

<i>x</i>	X coordinate
<i>y</i>	Y coordinate

See also

[move\(const QPointF &\)](#)

12.110.4.20 move() [2/2]

```
void QwtScaleDraw::move (
    const QPointF & pos )
```

Move the position of the scale.

The meaning of the parameter *pos* depends on the alignment:

QwtScaleDraw::LeftScale The origin is the topmost point of the backbone. The backbone is a vertical line. Scale marks and labels are drawn at the left of the backbone.

QwtScaleDraw::RightScale The origin is the topmost point of the backbone. The backbone is a vertical line. Scale marks and labels are drawn at the right of the backbone.

QwtScaleDraw::TopScale The origin is the leftmost point of the backbone. The backbone is a horizontal line. Scale marks and labels are drawn above the backbone.

QwtScaleDraw::BottomScale The origin is the leftmost point of the backbone. The backbone is a horizontal line. Scale marks and labels are drawn below the backbone.

Parameters

<i>pos</i>	Origin of the scale
------------	---------------------

See also

[pos\(\)](#), [setLength\(\)](#)

12.110.4.21 [orientation\(\)](#)

```
Qt::Orientation QwtScaleDraw::orientation ( ) const
```

Return the orientation

TopScale, BottomScale are horizontal (Qt::Horizontal) scales, LeftScale, RightScale are vertical (Qt::Vertical) scales.

Returns

Orientation of the scale

See also

[alignment\(\)](#)

12.110.4.22 [pos\(\)](#)

```
QPointF QwtScaleDraw::pos ( ) const
```

Returns

Origin of the scale

See also

[move\(\)](#), [length\(\)](#)

12.110.4.23 [setAlignment\(\)](#)

```
void QwtScaleDraw::setAlignment (
    Alignment align )
```

Set the alignment of the scale

Parameters

<i>align</i>	Alignment of the scale
--------------	------------------------

The default alignment is [QwtScaleDraw::BottomScale](#)

See also

[alignment\(\)](#)

12.110.4.24 setLabelAlignment()

```
void QwtScaleDraw::setLabelAlignment (
    Qt::Alignment alignment )
```

Change the label flags.

Labels are aligned to the point tick length + spacing away from the backbone.

The alignment is relative to the orientation of the label text. In case of an flags of 0 the label will be aligned depending on the orientation of the scale:

```
QwtScaleDraw::TopScale: Qt::AlignHCenter | Qt::AlignTop\n
QwtScaleDraw::BottomScale: Qt::AlignHCenter | Qt::AlignBottom\n
QwtScaleDraw::LeftScale: Qt::AlignLeft | Qt::AlignVCenter\n
QwtScaleDraw::RightScale: Qt::AlignRight | Qt::AlignVCenter\n
```

Changing the alignment is often necessary for rotated labels.

Parameters

<i>alignment</i>	Or'd Qt::AlignmentFlags see <qnamespace.h>
------------------	--

See also

[setLabelRotation\(\)](#), [labelRotation\(\)](#), [labelAlignment\(\)](#)

Warning

The various alignments might be confusing. The alignment of the label is not the alignment of the scale and is not the alignment of the flags (`QwtText::flags()`) returned from [QwtAbstractScaleDraw::label\(\)](#).

12.110.4.25 setLabelRotation()

```
void QwtScaleDraw::setLabelRotation (
    double rotation )
```

Rotate all labels.

When changing the rotation, it might be necessary to adjust the label flags too. Finding a useful combination is often the result of try and error.

Parameters

<i>rotation</i>	Angle in degrees. When changing the label rotation, the label flags often needs to be adjusted too.
-----------------	---

See also

[setLabelAlignment\(\)](#), [labelRotation\(\)](#), [labelAlignment\(\)](#).

12.110.4.26 `setLength()`

```
void QwtScaleDraw::setLength (
    double length )
```

Set the length of the backbone.

The length doesn't include the space needed for overlapping labels.

Parameters

<i>length</i>	Length of the backbone
---------------	------------------------

See also

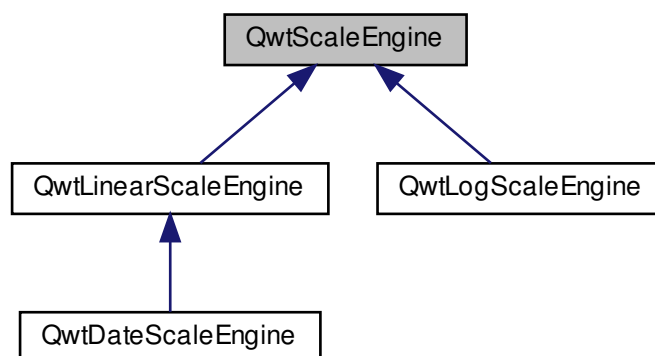
[move\(\)](#), [minLabelDist\(\)](#)

12.111 QwtScaleEngine Class Reference

Base class for scale engines.

```
#include <qwt_scale_engine.h>
```

Inheritance diagram for QwtScaleEngine:



Public Types

- enum `Attribute` {
`NoAttribute` = 0x00, `IncludeReference` = 0x01, `Symmetric` = 0x02, `Floating` = 0x04,
`Inverted` = 0x08 }
- typedef `QFlags< Attribute >` `Attributes`
Layout attributes.

Public Member Functions

- `QwtScaleEngine` (uint `base`=10)
- virtual `~QwtScaleEngine` ()
Destructor.
- void `setBase` (uint `base`)
- uint `base` () const
- void `setAttribute` (`Attribute`, bool `on`=true)
- bool `testAttribute` (`Attribute`) const
- void `setAttributes` (`Attributes`)
- `Attributes` `attributes` () const
- void `setReference` (double)
Specify a reference point.
- double `reference` () const
- void `setMargins` (double `lower`, double `upper`)
Specify margins at the scale's endpoints.
- double `lowerMargin` () const
- double `upperMargin` () const
- virtual void `autoScale` (int `maxNumSteps`, double &`x1`, double &`x2`, double &`stepSize`) const =0
- virtual `QwtScaleDiv` `divideScale` (double `x1`, double `x2`, int `maxMajorSteps`, int `maxMinorSteps`, double `stepSize`=0.0) const =0
Calculate a scale division.
- void `setTransformation` (`QwtTransform` *)
- `QwtTransform` * `transformation` () const

Protected Member Functions

- bool `contains` (const `QwtInterval` &, double `value`) const
- `QList< double >` `strip` (const `QList< double >` &, const `QwtInterval` &) const
- double `divideInterval` (double `intervalSize`, int `numSteps`) const
- `QwtInterval` `buildInterval` (double `value`) const
Build an interval around a value.

12.111.1 Detailed Description

Base class for scale engines.

A scale engine tries to find "reasonable" ranges and step sizes for scales.

The layout of the scale can be varied with `setAttribute()`.

Qwt offers implementations for logarithmic and linear scales.

12.111.2 Member Enumeration Documentation

12.111.2.1 Attribute

enum `QwtScaleEngine::Attribute`

Layout attributes

See also

[setAttribute\(\)](#), [testAttribute\(\)](#), [reference\(\)](#), [lowerMargin\(\)](#), [upperMargin\(\)](#)

Enumerator

NoAttribute	No attributes.
IncludeReference	Build a scale which includes the reference() value.
Symmetric	Build a scale which is symmetric to the reference() value.
Floating	The endpoints of the scale are supposed to be equal the outmost included values plus the specified margins (see setMargins()). If this attribute is <i>not</i> set, the endpoints of the scale will be integer multiples of the step size.
Inverted	Turn the scale upside down.

12.111.3 Constructor & Destructor Documentation

12.111.3.1 QwtScaleEngine()

```
QwtScaleEngine::QwtScaleEngine (
    uint base = 10 ) [explicit]
```

Constructor

Parameters

<i>base</i>	Base of the scale engine
-------------	--------------------------

See also

[setBase\(\)](#)

12.111.4 Member Function Documentation

12.111.4.1 attributes()

```
QwtScaleEngine::Attributes QwtScaleEngine::attributes ( ) const
```

Returns

Scale attributes

See also

[Attribute](#), [setAttributes\(\)](#), [testAttribute\(\)](#)

12.111.4.2 autoScale()

```
virtual void QwtScaleEngine::autoScale (
    int maxNumSteps,
    double & x1,
    double & x2,
    double & stepSize ) const [pure virtual]
```

Align and divide an interval

Parameters

<i>maxNumSteps</i>	Max. number of steps
<i>x1</i>	First limit of the interval (In/Out)
<i>x2</i>	Second limit of the interval (In/Out)
<i>stepSize</i>	Step size (Return value)

Implemented in [QwtLogScaleEngine](#), [QwtLinearScaleEngine](#), and [QwtDateScaleEngine](#).

12.111.4.3 base()

```
uint QwtScaleEngine::base ( ) const
```

Returns

base Base of the scale engine

See also

[setBase\(\)](#)

12.111.4.4 buildInterval()

```
QwtInterval QwtScaleEngine::buildInterval (
    double value ) const [protected]
```

Build an interval around a value.

In case of $v == 0.0$ the interval is $[-0.5, 0.5]$, otherwise it is $[0.5 * v, 1.5 * v]$

Parameters

<i>value</i>	Initial value
--------------	---------------

Returns

Calculated interval

12.111.4.5 contains()

```
bool QwtScaleEngine::contains (
    const QwtInterval & interval,
    double value ) const [protected]
```

Check if an interval "contains" a value

Parameters

<i>interval</i>	Interval
<i>value</i>	Value

Returns

True, when the value is inside the interval

12.111.4.6 divideInterval()

```
double QwtScaleEngine::divideInterval (
    double intervalSize,
    int numSteps ) const [protected]
```

Calculate a step size for an interval size

Parameters

<i>intervalSize</i>	Interval size
<i>numSteps</i>	Number of steps

Returns

Step size

12.111.4.7 divideScale()

```
virtual QwtScaleDiv QwtScaleEngine::divideScale (
    double x1,
    double x2,
    int maxMajorSteps,
    int maxMinorSteps,
    double stepSize = 0.0 ) const [pure virtual]
```

Calculate a scale division.

Parameters

<i>x1</i>	First interval limit
<i>x2</i>	Second interval limit
<i>maxMajorSteps</i>	Maximum for the number of major steps
<i>maxMinorSteps</i>	Maximum number of minor steps
<i>stepSize</i>	Step size. If stepSize == 0.0, the scaleEngine calculates one.

Returns

Calculated scale division

Implemented in [QwtLogScaleEngine](#), [QwtLinearScaleEngine](#), and [QwtDateScaleEngine](#).

12.111.4.8 lowerMargin()

```
double QwtScaleEngine::lowerMargin ( ) const
```

Returns

the margin at the lower end of the scale The default margin is 0.

See also

[setMargins\(\)](#)

12.111.4.9 reference()

```
double QwtScaleEngine::reference ( ) const
```

Returns

the reference value

See also

[setReference\(\)](#), [setAttribute\(\)](#)

12.111.4.10 setAttribute()

```
void QwtScaleEngine::setAttribute (
    Attribute attribute,
    bool on = true )
```

Change a scale attribute

Parameters

<i>attribute</i>	Attribute to change
<i>on</i>	On/Off

See also

[Attribute](#), [testAttribute\(\)](#)

12.111.4.11 setAttributes()

```
void QwtScaleEngine::setAttributes (
    Attributes attributes )
```

Change the scale attribute

Parameters

<i>attributes</i>	Set scale attributes
-------------------	----------------------

See also

[Attribute](#), [attributes\(\)](#)

12.111.4.12 setBase()

```
void QwtScaleEngine::setBase (
    uint base )
```

Set the base of the scale engine

While a base of 10 is what 99.9% of all applications need certain scales might need a different base: f.e 2

The default setting is 10

Parameters

<i>base</i>	Base of the engine
-------------	--------------------

See also

[base\(\)](#)

12.111.4.13 setMargins()

```
void QwtScaleEngine::setMargins (
    double lower,
    double upper )
```

Specify margins at the scale's endpoints.

Parameters

<i>lower</i>	minimum distance between the scale's lower boundary and the smallest enclosed value
<i>upper</i>	minimum distance between the scale's upper boundary and the greatest enclosed value

Margins can be used to leave a minimum amount of space between the enclosed intervals and the boundaries of the scale.

Warning

- [QwtLogScaleEngine](#) measures the margins in decades.

See also

[upperMargin\(\)](#), [lowerMargin\(\)](#)

12.111.4.14 setReference()

```
void QwtScaleEngine::setReference (
    double reference )
```

Specify a reference point.

Parameters

<i>reference</i>	New reference value
------------------	---------------------

The reference point is needed if options IncludeReference or Symmetric are active. Its default value is 0.0.

See also

[Attribute](#)

12.111.4.15 setTransformation()

```
void QwtScaleEngine::setTransformation (
    QwtTransform * transform )
```

Assign a transformation

Parameters

<i>transform</i>	Transformation
------------------	----------------

The transformation object is used as factory for clones that are returned by [transformation\(\)](#)

The scale engine takes ownership of the transformation.

See also

[QwtTransform::copy\(\)](#), [transformation\(\)](#)

12.111.4.16 strip()

```
QList< double > QwtScaleEngine::strip (
    const QList< double > & ticks,
    const QwtInterval & interval ) const [protected]
```

Remove ticks from a list, that are not inside an interval

Parameters

<i>ticks</i>	Tick list
<i>interval</i>	Interval

Returns

Stripped tick list

12.111.4.17 testAttribute()

```
bool QwtScaleEngine::testAttribute (
    Attribute attribute ) const
```

Returns

True, if attribute is enabled.

Parameters

<i>attribute</i>	Attribute to be tested
------------------	------------------------

See also

[Attribute](#), [setAttribute\(\)](#)

12.111.4.18 transformation()

```
QwtTransform * QwtScaleEngine::transformation ( ) const
```

Create and return a clone of the transformation of the engine. When the engine has no special transformation NULL is returned, indicating no transformation.

Returns

A clone of the transformation

See also

[setTransformation\(\)](#)

12.111.4.19 upperMargin()

```
double QwtScaleEngine::upperMargin ( ) const
```

Returns

the margin at the upper end of the scale The default margin is 0.

See also

[setMargins\(\)](#)

12.112 QwtScaleMap Class Reference

A scale map.

```
#include <qwt_scale_map.h>
```

Public Member Functions

- [QwtScaleMap](#) ()
Constructor.
- [QwtScaleMap](#) (const [QwtScaleMap](#) &)
Copy constructor.
- [~QwtScaleMap](#) ()
- [QwtScaleMap](#) & [operator=](#) (const [QwtScaleMap](#) &)
Assignment operator.
- void [setTransformation](#) ([QwtTransform](#) *)
- const [QwtTransform](#) * [transformation](#) () const
Get the transformation.
- void [setPaintInterval](#) (double [p1](#), double [p2](#))
Specify the borders of the paint device interval.
- void [setScaleInterval](#) (double [s1](#), double [s2](#))
Specify the borders of the scale interval.
- double [transform](#) (double s) const
- double [invTransform](#) (double p) const
- double [p1](#) () const
- double [p2](#) () const
- double [s1](#) () const
- double [s2](#) () const
- double [pDist](#) () const
- double [sDist](#) () const
- bool [isInverting](#) () const

Static Public Member Functions

- static QRectF [transform](#) (const [QwtScaleMap](#) &, const [QwtScaleMap](#) &, const QRectF &)
- static QRectF [invTransform](#) (const [QwtScaleMap](#) &, const [QwtScaleMap](#) &, const QRectF &)
- static QPointF [transform](#) (const [QwtScaleMap](#) &, const [QwtScaleMap](#) &, const QPointF &)
- static QPointF [invTransform](#) (const [QwtScaleMap](#) &, const [QwtScaleMap](#) &, const QPointF &)

12.112.1 Detailed Description

A scale map.

[QwtScaleMap](#) offers transformations from the coordinate system of a scale into the linear coordinate system of a paint device and vice versa.

12.112.2 Constructor & Destructor Documentation

12.112.2.1 QwtScaleMap()

```
QwtScaleMap::QwtScaleMap ( )
```

Constructor.

The scale and paint device intervals are both set to [0,1].

12.112.2.2 ~QwtScaleMap()

```
QwtScaleMap::~~QwtScaleMap ( )
```

Destructor

12.112.3 Member Function Documentation

12.112.3.1 invTransform() [1/3]

```
double QwtScaleMap::invTransform (
    double p ) const [inline]
```

Transform an paint device value into a value in the interval of the scale.

Parameters

<i>p</i>	Value relative to the coordinates of the paint device
----------	---

Returns

Transformed value

See also

[transform\(\)](#)

12.112.3.2 invTransform() [2/3]

```
QRectF QwtScaleMap::invTransform (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & rect ) [static]
```

Transform a rectangle from paint to scale coordinates

Parameters

<i>xMap</i>	X map
<i>yMap</i>	Y map
<i>rect</i>	Rectangle in paint coordinates

Returns

Rectangle in scale coordinates

See also

[transform\(\)](#)

12.112.3.3 invTransform() [3/3]

```
QPointF QwtScaleMap::invTransform (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QPointF & pos ) [static]
```

Transform a rectangle from paint to scale coordinates

Parameters

<i>xMap</i>	X map
<i>yMap</i>	Y map
<i>pos</i>	Position in paint coordinates

Returns

Position in scale coordinates

See also

[transform\(\)](#)

12.112.3.4 isInverting()

```
bool QwtScaleMap::isInverting ( ) const [inline]
```

Returns

True, when ([p1\(\)](#) < [p2\(\)](#)) != ([s1\(\)](#) < [s2\(\)](#))

12.112.3.5 p1()

```
double QwtScaleMap::p1 ( ) const [inline]
```

Returns

First border of the paint interval

12.112.3.6 p2()

```
double QwtScaleMap::p2 ( ) const [inline]
```

Returns

Second border of the paint interval

12.112.3.7 pDist()

```
double QwtScaleMap::pDist ( ) const [inline]
```

Returns

[qwtAbs](#)([p2\(\)](#) - [p1\(\)](#))

12.112.3.8 s1()

```
double QwtScaleMap::s1 ( ) const [inline]
```

Returns

First border of the scale interval

12.112.3.9 s2()

```
double QwtScaleMap::s2 ( ) const [inline]
```

Returns

Second border of the scale interval

12.112.3.10 sDist()

```
double QwtScaleMap::sDist ( ) const [inline]
```

Returns

`qwtAbs(s2() - s1())`

12.112.3.11 setPaintInterval()

```
void QwtScaleMap::setPaintInterval (
    double p1,
    double p2 )
```

Specify the borders of the paint device interval.

Parameters

<i>p1</i>	first border
<i>p2</i>	second border

12.112.3.12 setScaleInterval()

```
void QwtScaleMap::setScaleInterval (
    double s1,
    double s2 )
```

Specify the borders of the scale interval.

Parameters

<i>s1</i>	first border
<i>s2</i>	second border

Warning

scales might be aligned to transformation depending boundaries

12.112.3.13 setTransformation()

```
void QwtScaleMap::setTransformation (
    QwtTransform * transform )
```

Initialize the map with a transformation

12.112.3.14 transform() [1/3]

```
double QwtScaleMap::transform (
    double s ) const [inline]
```

Transform a point related to the scale interval into an point related to the interval of the paint device

Parameters

<i>s</i>	Value relative to the coordinates of the scale
----------	--

Returns

Transformed value

See also

[invTransform\(\)](#)

12.112.3.15 transform() [2/3]

```
QRectF QwtScaleMap::transform (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QRectF & rect ) [static]
```

Transform a rectangle from scale to paint coordinates

Parameters

<i>xMap</i>	X map
<i>yMap</i>	Y map
<i>rect</i>	Rectangle in scale coordinates

Returns

Rectangle in paint coordinates

See also

[invTransform\(\)](#)

12.112.3.16 transform() [3/3]

```
QPointF QwtScaleMap::transform (
    const QwtScaleMap & xMap,
    const QwtScaleMap & yMap,
    const QPointF & pos ) [static]
```

Transform a point from scale to paint coordinates

Parameters

<i>xMap</i>	X map
<i>yMap</i>	Y map
<i>pos</i>	Position in scale coordinates

Returns

Position in paint coordinates

See also

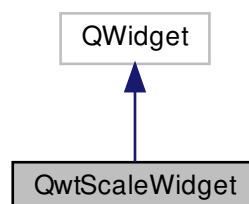
[invTransform\(\)](#)

12.113 QwtScaleWidget Class Reference

A Widget which contains a scale.

```
#include <qwt_scale_widget.h>
```

Inheritance diagram for QwtScaleWidget:



Public Types

- enum [LayoutFlag](#) { [TitleInverted](#) = 1 }
Layout flags of the title.
- typedef QFlags< [LayoutFlag](#) > [LayoutFlags](#)
Layout flags of the title.

Signals

- void [scaleDivChanged](#) ()
Signal emitted, whenever the scale division changes.

Public Member Functions

- [QwtScaleWidget](#) (QWidget *parent=NULL)
Create a scale with the position [QwtScaleWidget::Left](#).
- [QwtScaleWidget](#) ([QwtScaleDraw::Alignment](#), QWidget *parent=NULL)
Constructor.
- virtual ~[QwtScaleWidget](#) ()
Destructor.
- void [setTitle](#) (const QString &title)
- void [setTitle](#) (const [QwtText](#) &title)
- [QwtText](#) title () const
- void [setLayoutFlag](#) ([LayoutFlag](#), bool on)
- bool [testLayoutFlag](#) ([LayoutFlag](#)) const
- void [setBorderDist](#) (int dist1, int dist2)
- int [startBorderDist](#) () const
- int [endBorderDist](#) () const
- void [getBorderDistHint](#) (int &start, int &end) const
Calculate a hint for the border distances.
- void [getMinBorderDist](#) (int &start, int &end) const
- void [setMinBorderDist](#) (int start, int end)
- void [setMargin](#) (int)
Specify the margin to the colorBar/base line.
- int [margin](#) () const
- void [setSpacing](#) (int)
Specify the distance between color bar, scale and title.
- int [spacing](#) () const
- void [setScaleDiv](#) (const [QwtScaleDiv](#) &)
Assign a scale division.
- void [setTransformation](#) ([QwtTransform](#) *)
- void [setScaleDraw](#) ([QwtScaleDraw](#) *)
- const [QwtScaleDraw](#) * [scaleDraw](#) () const
- [QwtScaleDraw](#) * [scaleDraw](#) ()
- void [setLabelAlignment](#) (Qt::Alignment)
Change the alignment for the labels.
- void [setLabelRotation](#) (double rotation)
Change the rotation for the labels. See [QwtScaleDraw::setLabelRotation\(\)](#).
- void [setColorBarEnabled](#) (bool)
- bool [isColorBarEnabled](#) () const
- void [setColorBarWidth](#) (int)

- int `colorBarWidth` () const
- void `setColorMap` (const `QwtInterval` &, `QwtColorMap` *)
- `QwtInterval` `colorBarInterval` () const
- const `QwtColorMap` * `colorMap` () const
- virtual QSize `sizeHint` () const
- virtual QSize `minimumSizeHint` () const
- int `titleHeightForWidth` (int width) const
Find the height of the title for a given width.
- int `dimForLength` (int length, const QFont &scaleFont) const
Find the minimum dimension for a given length. dim is the height, length the width seen in direction of the title.
- void `drawColorBar` (QPainter *painter, const QRectF &) const
- void `drawTitle` (QPainter *painter, `QwtScaleDraw::Alignment`, const QRectF &rect) const
- void `setAlignment` (`QwtScaleDraw::Alignment`)
- `QwtScaleDraw::Alignment` `alignment` () const
- QRectF `colorBarRect` (const QRectF &) const

Protected Member Functions

- virtual void `paintEvent` (QPaintEvent *)
paintEvent
- virtual void `resizeEvent` (QResizeEvent *)
- void `draw` (QPainter *) const
draw the scale
- void `scaleChange` ()
Notify a change of the scale.
- void `layoutScale` (bool update_geometry=true)

12.113.1 Detailed Description

A Widget which contains a scale.

This Widget can be used to decorate composite widgets with a scale.

12.113.2 Member Enumeration Documentation

12.113.2.1 LayoutFlag

```
enum QwtScaleWidget::LayoutFlag
```

Layout flags of the title.

Enumerator

TitleInverted	The title of vertical scales is painted from top to bottom. Otherwise it is painted from bottom to top.
---------------	---

12.113.3 Constructor & Destructor Documentation

12.113.3.1 QwtScaleWidget() [1/2]

```
QwtScaleWidget::QwtScaleWidget (
    QWidget * parent = NULL ) [explicit]
```

Create a scale with the position QwtScaleWidget::Left.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.113.3.2 QwtScaleWidget() [2/2]

```
QwtScaleWidget::QwtScaleWidget (
    QwtScaleDraw::Alignment align,
    QWidget * parent = NULL ) [explicit]
```

Constructor.

Parameters

<i>align</i>	Alignment.
<i>parent</i>	Parent widget

12.113.4 Member Function Documentation

12.113.4.1 alignment()

```
QwtScaleDraw::Alignment QwtScaleWidget::alignment ( ) const
```

Returns

position

See also

setPosition()

12.113.4.2 colorBarInterval()

```
QwtInterval QwtScaleWidget::colorBarInterval ( ) const
```

Returns

Value interval for the color bar

See also

[setColorMap\(\)](#), [colorMap\(\)](#)

12.113.4.3 colorBarRect()

```
QRectF QwtScaleWidget::colorBarRect (
    const QRectF & rect ) const
```

Calculate the the rectangle for the color bar

Parameters

<i>rect</i>	Bounding rectangle for all components of the scale
-------------	--

Returns

Rectangle for the color bar

12.113.4.4 colorBarWidth()

```
int QwtScaleWidget::colorBarWidth ( ) const
```

Returns

Width of the color bar

See also

[setColorBarEnabled\(\)](#), [setColorBarEnabled\(\)](#)

12.113.4.5 colorMap()

```
const QwtColorMap * QwtScaleWidget::colorMap ( ) const
```

Returns

Color map

See also

[setColorMap\(\)](#), [colorBarInterval\(\)](#)

12.113.4.6 dimForLength()

```
int QwtScaleWidget::dimForLength (
    int length,
    const QFont & scaleFont ) const
```

Find the minimum dimension for a given length. dim is the height, length the width seen in direction of the title.

Parameters

<i>length</i>	width for horizontal, height for vertical scales
<i>scaleFont</i>	Font of the scale

Returns

height for horizontal, width for vertical scales

12.113.4.7 drawColorBar()

```
void QwtScaleWidget::drawColorBar (
    QPainter * painter,
    const QRectF & rect ) const
```

Draw the color bar of the scale widget

Parameters

<i>painter</i>	Painter
<i>rect</i>	Bounding rectangle for the color bar

See also

[setColorBarEnabled\(\)](#)

12.113.4.8 drawTitle()

```
void QwtScaleWidget::drawTitle (
    QPainter * painter,
    QwtScaleDraw::Alignment align,
    const QRectF & rect ) const
```

Rotate and paint a title according to its position into a given rectangle.

Parameters

<i>painter</i>	Painter
<i>align</i>	Alignment
<i>rect</i>	Bounding rectangle

12.113.4.9 `endBorderDist()`

```
int QwtScaleWidget::endBorderDist ( ) const
```

Returns

end border distance

See also

[setBorderDist\(\)](#)

12.113.4.10 `getBorderDistHint()`

```
void QwtScaleWidget::getBorderDistHint (
    int & start,
    int & end ) const
```

Calculate a hint for the border distances.

This member function calculates the distance of the scale's endpoints from the widget borders which is required for the mark labels to fit into the widget. The maximum of this distance and the minimum border distance is returned.

Parameters

<i>start</i>	Return parameter for the border width at the beginning of the scale
<i>end</i>	Return parameter for the border width at the end of the scale

Warning

- The minimum border distance depends on the font.

See also

[setMinBorderDist\(\)](#), [getMinBorderDist\(\)](#), [setBorderDist\(\)](#)

12.113.4.11 `getMinBorderDist()`

```
void QwtScaleWidget::getMinBorderDist (
    int & start,
    int & end ) const
```

Get the minimum value for the distances of the scale's endpoints from the widget borders.

Parameters

<i>start</i>	Return parameter for the border width at the beginning of the scale
<i>end</i>	Return parameter for the border width at the end of the scale

See also

[setMinBorderDist\(\)](#), [getBorderDistHint\(\)](#)

12.113.4.12 isColorBarEnabled()

```
bool QwtScaleWidget::isColorBarEnabled ( ) const
```

Returns

true, when the color bar is enabled

See also

[setColorBarEnabled\(\)](#), [setColorBarWidth\(\)](#)

12.113.4.13 layoutScale()

```
void QwtScaleWidget::layoutScale (
    bool update_geometry = true ) [protected]
```

Recalculate the scale's geometry and layout based on the current geometry and fonts.

Parameters

<i>update_geometry</i>	Notify the layout system and call update to redraw the scale
------------------------	--

12.113.4.14 margin()

```
int QwtScaleWidget::margin ( ) const
```

Returns

margin

See also

[setMargin\(\)](#)

12.113.4.15 `minimumSizeHint()`

```
QSize QwtScaleWidget::minimumSizeHint ( ) const [virtual]
```

Returns

a minimum size hint

12.113.4.16 `resizeEvent()`

```
void QwtScaleWidget::resizeEvent (
    QResizeEvent * event ) [protected], [virtual]
```

Event handler for resize events

Parameters

<i>event</i>	Resize event
--------------	--------------

12.113.4.17 `scaleChange()`

```
void QwtScaleWidget::scaleChange ( ) [protected]
```

Notify a change of the scale.

This virtual function can be overloaded by derived classes. The default implementation updates the geometry and repaints the widget.

12.113.4.18 `scaleDraw()` [1/2]

```
const QwtScaleDraw * QwtScaleWidget::scaleDraw ( ) const
```

Returns

scaleDraw of this scale

See also

[setScaleDraw\(\)](#), [QwtScaleDraw::setScaleDraw\(\)](#)

12.113.4.19 scaleDraw() [2/2]

```
QwtScaleDraw * QwtScaleWidget::scaleDraw ( )
```

Returns

scaleDraw of this scale

See also

[QwtScaleDraw::setScaleDraw\(\)](#)

12.113.4.20 setAlignment()

```
void QwtScaleWidget::setAlignment (
    QwtScaleDraw::Alignment alignment )
```

Change the alignment

Parameters

<i>alignment</i>	New alignment
------------------	---------------

See also

[alignment\(\)](#)

12.113.4.21 setBorderDist()

```
void QwtScaleWidget::setBorderDist (
    int dist1,
    int dist2 )
```

Specify distances of the scale's endpoints from the widget's borders. The actual borders will never be less than minimum border distance.

Parameters

<i>dist1</i>	Left or top Distance
<i>dist2</i>	Right or bottom distance

See also

[borderDist\(\)](#)

12.113.4.22 setColorBarEnabled()

```
void QwtScaleWidget::setColorBarEnabled (
    bool on )
```

En/disable a color bar associated to the scale

See also

[isColorBarEnabled\(\)](#), [setColorBarWidth\(\)](#)

12.113.4.23 setColorBarWidth()

```
void QwtScaleWidget::setColorBarWidth (
    int width )
```

Set the width of the color bar

Parameters

<i>width</i>	Width
--------------	-------

See also

[colorBarWidth\(\)](#), [setColorBarEnabled\(\)](#)

12.113.4.24 setColorMap()

```
void QwtScaleWidget::setColorMap (
    const QwtInterval & interval,
    QwtColorMap * colorMap )
```

Set the color map and value interval, that are used for displaying the color bar.

Parameters

<i>interval</i>	Value interval
<i>colorMap</i>	Color map

See also

[colorMap\(\)](#), [colorBarInterval\(\)](#)

12.113.4.25 setLabelAlignment()

```
void QwtScaleWidget::setLabelAlignment (
    Qt::Alignment alignment )
```

Change the alignment for the labels.

See also

[QwtScaleDraw::setLabelAlignment\(\)](#), [setLabelRotation\(\)](#)

12.113.4.26 setLabelRotation()

```
void QwtScaleWidget::setLabelRotation (
    double rotation )
```

Change the rotation for the labels. See [QwtScaleDraw::setLabelRotation\(\)](#).

Parameters

<i>rotation</i>	Rotation
-----------------	----------

See also

[QwtScaleDraw::setLabelRotation\(\)](#), [setLabelFlags\(\)](#)

12.113.4.27 setLayoutFlag()

```
void QwtScaleWidget::setLayoutFlag (
    LayoutFlag flag,
    bool on )
```

Toggle an layout flag

Parameters

<i>flag</i>	Layout flag
<i>on</i>	true/false

See also

[testLayoutFlag\(\)](#), [LayoutFlag](#)

12.113.4.28 setMargin()

```
void QwtScaleWidget::setMargin (
    int margin )
```

Specify the margin to the colorBar/base line.

Parameters

<i>margin</i>	Margin
---------------	--------

See also

[margin\(\)](#)

12.113.4.29 setMinBorderDist()

```
void QwtScaleWidget::setMinBorderDist (
    int start,
    int end )
```

Set a minimum value for the distances of the scale's endpoints from the widget borders. This is useful to avoid that the scales are "jumping", when the tick labels or their positions change often.

Parameters

<i>start</i>	Minimum for the start border
<i>end</i>	Minimum for the end border

See also

[getMinBorderDist\(\)](#), [getBorderDistHint\(\)](#)

12.113.4.30 setScaleDiv()

```
void QwtScaleWidget::setScaleDiv (
    const QwtScaleDiv & scaleDiv )
```

Assign a scale division.

The scale division determines where to set the tick marks.

Parameters

<i>scaleDiv</i>	Scale Division
-----------------	----------------

See also

For more information about scale divisions, see [QwtScaleDiv](#).

12.113.4.31 setScaleDraw()

```
void QwtScaleWidget::setScaleDraw (
    QwtScaleDraw * scaleDraw )
```

Set a scale draw

scaleDraw has to be created with `new` and will be deleted in `~QwtScaleWidget()` or the next call of `setScaleDraw()`. *scaleDraw* will be initialized with the attributes of the previous *scaleDraw* object.

Parameters

<i>scaleDraw</i>	ScaleDraw object
------------------	------------------

See also

[scaleDraw\(\)](#)

12.113.4.32 setSpacing()

```
void QwtScaleWidget::setSpacing (
    int spacing )
```

Specify the distance between color bar, scale and title.

Parameters

<i>spacing</i>	Spacing
----------------	---------

See also

[spacing\(\)](#)

12.113.4.33 setTitle() [1/2]

```
void QwtScaleWidget::setTitle (
    const QString & title )
```

Give title new text contents

Parameters

<i>title</i>	New title
--------------	-----------

See also

[title\(\)](#), [setTitle\(const QwtText &\);](#)

12.113.4.34 setTitle() [2/2]

```
void QwtScaleWidget::setTitle (
    const QwtText & title )
```

Give title new text contents

Parameters

<i>title</i>	New title
--------------	-----------

See also

[title\(\)](#)

Warning

The title flags are interpreted in direction of the label, AlignTop, AlignBottom can't be set as the title will always be aligned to the scale.

12.113.4.35 setTransformation()

```
void QwtScaleWidget::setTransformation (
    QwtTransform * transformation )
```

Set the transformation

Parameters

<i>transformation</i>	Transformation
-----------------------	----------------

See also

[QwtAbstractScaleDraw::scaleDraw\(\)](#), [QwtScaleMap](#)

12.113.4.36 sizeHint()

```
QSize QwtScaleWidget::sizeHint ( ) const [virtual]
```

Returns

a size hint

12.113.4.37 spacing()

```
int QwtScaleWidget::spacing ( ) const
```

Returns

distance between scale and title

See also

[setMargin\(\)](#)

12.113.4.38 startBorderDist()

```
int QwtScaleWidget::startBorderDist ( ) const
```

Returns

start border distance

See also

[setBorderDist\(\)](#)

12.113.4.39 testLayoutFlag()

```
bool QwtScaleWidget::testLayoutFlag (
    LayoutFlag flag ) const
```

Test a layout flag

Parameters

<i>flag</i>	Layout flag
-------------	-------------

Returns

true/false

See also

[setLayoutFlag\(\)](#), [LayoutFlag](#)

12.113.4.40 title()

```
QwtText QwtScaleWidget::title ( ) const
```

Returns

title

See also

[setTitle\(\)](#)

12.113.4.41 titleHeightForWidth()

```
int QwtScaleWidget::titleHeightForWidth (
    int width ) const
```

Find the height of the title for a given width.

Parameters

<i>width</i>	Width
--------------	-------

Returns

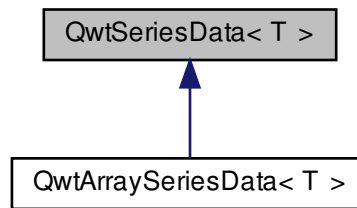
height Height

12.114 QwtSeriesData< T > Class Template Reference

Abstract interface for iterating over samples.

```
#include <qwt_series_data.h>
```


Inheritance diagram for QwtSeriesData< T >:



Public Member Functions

- [QwtSeriesData](#) ()
Constructor.
- virtual [~QwtSeriesData](#) ()
Destructor.
- virtual `size_t` [size](#) () const =0
- virtual `T` [sample](#) (size_t i) const =0
- virtual `QRectF` [boundingRect](#) () const =0
- virtual void [setRectOfInterest](#) (const `QRectF` &rect)

Protected Attributes

- `QRectF` [d_boundingRect](#)
Can be used to cache a calculated bounding rectangle.

12.114.1 Detailed Description

```
template<typename T>
class QwtSeriesData< T >
```

Abstract interface for iterating over samples.

Qwt offers several implementations of the [QwtSeriesData](#) API, but in situations, where data of an application specific format needs to be displayed, without having to copy it, it is recommended to implement an individual data access.

A subclass of [QwtSeriesData<QPointF>](#) must implement:

- [size\(\)](#)
Should return number of data points.
- [sample\(\)](#)
Should return values x and y values of the sample at specific position as `QPointF` object.
- [boundingRect\(\)](#)
Should return the bounding rectangle of the data series. It is used for autoscaling and might help certain algorithms for displaying the data. You can use `qwtBoundingRect()` for an implementation but often it is possible to implement a more efficient algorithm depending on the characteristics of the series. The member `d_boundingRect` is intended for caching the calculated rectangle.

12.114.2 Member Function Documentation

12.114.2.1 boundingRect()

```
template<typename T>
virtual QRectF QwtSeriesData< T >::boundingRect ( ) const [pure virtual]
```

Calculate the bounding rect of all samples

The bounding rect is necessary for autoscaling and can be used for a couple of painting optimizations.

`qwtBoundingRect(...)` offers slow implementations iterating over the samples. For large sets it is recommended to implement something faster f.e. by caching the bounding rectangle.

Returns

Bounding rectangle

Implemented in [QwtTradingChartData](#), [QwtSetSeriesData](#), [QwtIntervalSeriesData](#), [QwtPoint3DSeriesData](#), [QwtPointSeriesData](#), [QwtSyntheticPointData](#), [QwtCPointerData](#), and [QwtPointArrayData](#).

12.114.2.2 sample()

```
template<typename T>
virtual T QwtSeriesData< T >::sample (
    size_t i ) const [pure virtual]
```

Return a sample

Parameters

<i>i</i>	Index
----------	-------

Returns

Sample at position *i*

Implemented in [QwtArraySeriesData](#)< T >, [QwtArraySeriesData](#)< [QwtIntervalSample](#) >, [QwtArraySeriesData](#)< [QwtOHLCSample](#) >, [QwtArraySeriesData](#)< [QPointF](#) >, [QwtArraySeriesData](#)< [QwtPoint3D](#) >, [QwtArraySeriesData](#)< [QwtSetSample](#) >, [QwtSyntheticPointData](#), [QwtCPointerData](#), and [QwtPointArrayData](#).

12.114.2.3 setRectOfInterest()

```
template<typename T >
void QwtSeriesData< T >::setRectOfInterest (
    const QRectF & rect ) [virtual]
```

Set a the "rect of interest"

[QwtPlotSeriesItem](#) defines the current area of the plot canvas as "rectangle of interest" ([QwtPlotSeriesItem::updateScaleDiv\(\)](#)). It can be used to implement different levels of details.

The default implementation does nothing.

Parameters

<i>rect</i>	Rectangle of interest
-------------	-----------------------

Reimplemented in [QwtSyntheticPointData](#).

12.114.2.4 size()

```
template<typename T>
virtual size_t QwtSeriesData< T >::size ( ) const [pure virtual]
```

Returns

Number of samples

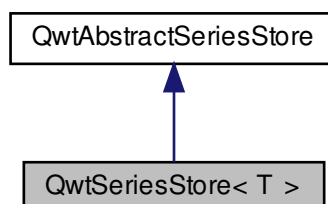
Implemented in [QwtArraySeriesData< T >](#), [QwtArraySeriesData< QwtIntervalSample >](#), [QwtArraySeriesData< QwtOHLCSample >](#), [QwtArraySeriesData< QPointF >](#), [QwtArraySeriesData< QwtPoint3D >](#), [QwtArraySeriesData< QwtSetSample >](#), [QwtSyntheticPointData](#), [QwtCPointerData](#), and [QwtPointArrayData](#).

12.115 QwtSeriesStore< T > Class Template Reference

Class storing a [QwtSeriesData](#) object.

```
#include <qwt_series_store.h>
```

Inheritance diagram for QwtSeriesStore< T >:



Public Member Functions

- [QwtSeriesStore](#) ()
Constructor The store contains no series.
- [~QwtSeriesStore](#) ()
Destructor.
- void [setData](#) ([QwtSeriesData](#)< T > *series)
- [QwtSeriesData](#)< T > * [data](#) ()
- const [QwtSeriesData](#)< T > * [data](#) () const
- T [sample](#) (int index) const
- virtual size_t [dataSize](#) () const
- virtual QRectF [dataRect](#) () const
- virtual void [setRectOfInterest](#) (const QRectF &rect)
- [QwtSeriesData](#)< T > * [swapData](#) ([QwtSeriesData](#)< T > *series)

Additional Inherited Members

12.115.1 Detailed Description

```
template<typename T>
class QwtSeriesStore< T >
```

Class storing a [QwtSeriesData](#) object.

[QwtSeriesStore](#) and [QwtPlotSeriesItem](#) are intended as base classes for all plot items iterating over a series of samples. Both classes share a virtual base class ([QwtAbstractSeriesStore](#)) to bridge between them.

[QwtSeriesStore](#) offers the template based part for the plot item API, so that [QwtPlotSeriesItem](#) can be derived without any hassle with templates.

12.115.2 Member Function Documentation

12.115.2.1 [data\(\)](#) [1/2]

```
template<typename T >
QwtSeriesData< T > * QwtSeriesStore< T >::data ( ) [inline]
```

Returns

the the series data

12.115.2.2 [data\(\)](#) [2/2]

```
template<typename T >
const QwtSeriesData< T > * QwtSeriesStore< T >::data ( ) const [inline]
```

Returns

the the series data

12.115.2.3 dataRect()

```
template<typename T >
QRectF QwtSeriesStore< T >::dataRect ( ) const [virtual]
```

Returns

Bounding rectangle of the series or an invalid rectangle, when no series is stored

See also

[QwtSeriesData<T>::boundingRect\(\)](#)

Implements [QwtAbstractSeriesStore](#).

12.115.2.4 dataSize()

```
template<typename T >
size_t QwtSeriesStore< T >::dataSize ( ) const [virtual]
```

Returns

Number of samples of the series

See also

[setData\(\)](#), [QwtSeriesData<T>::size\(\)](#)

Implements [QwtAbstractSeriesStore](#).

12.115.2.5 sample()

```
template<typename T >
T QwtSeriesStore< T >::sample (
    int index ) const [inline]
```

Parameters

<i>index</i>	Index
--------------	-------

Returns

Sample at position index

12.115.2.6 setData()

```
template<typename T>
void QwtSeriesStore< T >::setData (
    QwtSeriesData< T > * series )
```

Assign a series of samples

Parameters

<i>series</i>	Data
---------------	------

Warning

The item takes ownership of the data object, deleting it when its not used anymore.

12.115.2.7 setRectOfInterest()

```
template<typename T >
void QwtSeriesStore< T >::setRectOfInterest (
    const QRectF & rect ) [virtual]
```

Set a the "rect of interest" for the series

Parameters

<i>rect</i>	Rectangle of interest
-------------	-----------------------

See also

[QwtSeriesData<T>::setRectOfInterest\(\)](#)

Implements [QwtAbstractSeriesStore](#).

12.115.2.8 swapData()

```
template<typename T>
QwtSeriesData< T > * QwtSeriesStore< T >::swapData (
    QwtSeriesData< T > * series )
```

Replace a series without deleting the previous one

Parameters

<i>series</i>	New series
---------------	------------

Returns

Previously assigned series

12.116 QwtSetSample Class Reference

A sample of the types (x1...xn, y) or (x, y1..yn)

```
#include <qwt_samples.h>
```

Public Member Functions

- [QwtSetSample](#) ()
- [QwtSetSample](#) (double, const QVector< double > &=QVector< double >())
- bool [operator==](#) (const [QwtSetSample](#) &other) const
Compare operator.
- bool [operator!=](#) (const [QwtSetSample](#) &other) const
Compare operator.
- double [added](#) () const

Public Attributes

- double [value](#)
value
- QVector< double > [set](#)
Vector of values associated to value.

12.116.1 Detailed Description

A sample of the types (x1...xn, y) or (x, y1..yn)

12.116.2 Constructor & Destructor Documentation**12.116.2.1 QwtSetSample() [1/2]**

```
QwtSetSample::QwtSetSample ( ) [inline]
```

Constructor The value is set to 0.0

12.116.2.2 QwtSetSample() [2/2]

```
QwtSetSample::QwtSetSample (
    double v,
    const QVector< double > & s = QVector<double>() ) [inline]
```

Constructor

Parameters

<i>v</i>	Value
<i>s</i>	Set of values

12.116.3 Member Function Documentation**12.116.3.1 added()**

```
double QwtSetSample::added ( ) const [inline]
```

Returns

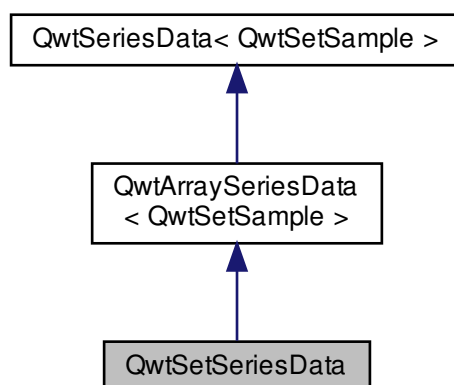
All values of the set added

12.117 QwtSetSeriesData Class Reference

Interface for iterating over an array of samples.

```
#include <qwt_series_data.h>
```

Inheritance diagram for QwtSetSeriesData:

**Public Member Functions**

- [QwtSetSeriesData](#) (const QVector< [QwtSetSample](#) > &=QVector< [QwtSetSample](#) >())
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.

Additional Inherited Members

12.117.1 Detailed Description

Interface for iterating over an array of samples.

12.117.2 Constructor & Destructor Documentation

12.117.2.1 QwtSetSeriesData()

```
QwtSetSeriesData::QwtSetSeriesData (
    const QVector< QwtSetSample > & samples = QVector<QwtSetSample>() )
```

Constructor

Parameters

<i>samples</i>	Samples
----------------	---------

12.117.3 Member Function Documentation

12.117.3.1 boundingRect()

```
QRectF QwtSetSeriesData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

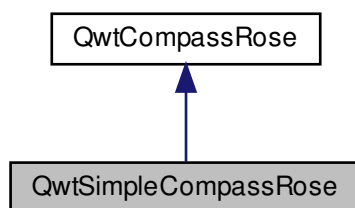
Implements [QwtSeriesData< QwtSetSample >](#).

12.118 QwtSimpleCompassRose Class Reference

A simple rose for [QwtCompass](#).

```
#include <qwt_compass_rose.h>
```

Inheritance diagram for QwtSimpleCompassRose:



Public Member Functions

- `QwtSimpleCompassRose` (int `numThorns`=8, int `numThornLevels`=-1)
- virtual `~QwtSimpleCompassRose` ()
- *Destructor.*
- void `setWidth` (double)
- double `width` () const
- void `setNumThorns` (int)
- int `numThorns` () const
- void `setNumThornLevels` (int)
- int `numThornLevels` () const
- void `setShrinkFactor` (double factor)
- double `shrinkFactor` () const
- virtual void `draw` (QPainter *, const QPointF ¢er, double radius, double north, QPalette::ColorGroup=QPalette::Active) const

Static Public Member Functions

- static void `drawRose` (QPainter *, const QPalette &, const QPointF ¢er, double radius, double north, double `width`, int `numThorns`, int `numThornLevels`, double `shrinkFactor`)

12.118.1 Detailed Description

A simple rose for `QwtCompass`.

12.118.2 Constructor & Destructor Documentation

12.118.2.1 QwtSimpleCompassRose()

```

QwtSimpleCompassRose::QwtSimpleCompassRose (
    int numThorns = 8,
    int numThornLevels = -1 )

```

Constructor

Parameters

<i>numThorns</i>	Number of thorns
<i>numThornLevels</i>	Number of thorn levels

12.118.3 Member Function Documentation

12.118.3.1 draw()

```
void QwtSimpleCompassRose::draw (
    QPainter * painter,
    const QPointF & center,
    double radius,
    double north,
    QPalette::ColorGroup cg = QPalette::Active ) const [virtual]
```

Draw the rose

Parameters

<i>painter</i>	Painter
<i>center</i>	Center point
<i>radius</i>	Radius of the rose
<i>north</i>	Position
<i>cg</i>	Color group

Implements [QwtCompassRose](#).

12.118.3.2 drawRose()

```
void QwtSimpleCompassRose::drawRose (
    QPainter * painter,
    const QPalette & palette,
    const QPointF & center,
    double radius,
    double north,
    double width,
    int numThorns,
    int numThornLevels,
    double shrinkFactor ) [static]
```

Draw the rose

Parameters

<i>painter</i>	Painter
<i>palette</i>	Palette

Parameters

<i>center</i>	Center of the rose
<i>radius</i>	Radius of the rose
<i>north</i>	Position pointing to north
<i>width</i>	Width of the rose
<i>numThorns</i>	Number of thorns
<i>numThornLevels</i>	Number of thorn levels
<i>shrinkFactor</i>	Factor to shrink the thorns with each level

12.118.3.3 numThornLevels()

```
int QwtSimpleCompassRose::numThornLevels ( ) const
```

Returns

Number of thorn levels

See also

[setNumThorns\(\)](#), [setNumThornLevels\(\)](#)

12.118.3.4 numThorns()

```
int QwtSimpleCompassRose::numThorns ( ) const
```

Returns

Number of thorns

See also

[setNumThorns\(\)](#), [setNumThornLevels\(\)](#)

12.118.3.5 setNumThornLevels()

```
void QwtSimpleCompassRose::setNumThornLevels (
    int numThornLevels )
```

Set the of thorns levels

Parameters

<i>numThornLevels</i>	Number of thorns levels
-----------------------	-------------------------

See also

[setNumThorns\(\)](#), [numThornLevels\(\)](#)

12.118.3.6 setNumThorns()

```
void QwtSimpleCompassRose::setNumThorns (
    int numThorns )
```

Set the number of thorns on one level The number is aligned to a multiple of 4, with a minimum of 4

Parameters

<i>numThorns</i>	Number of thorns
------------------	------------------

See also

[numThorns\(\)](#), [setNumThornLevels\(\)](#)

12.118.3.7 setShrinkFactor()

```
void QwtSimpleCompassRose::setShrinkFactor (
    double factor )
```

Set the Factor how to shrink the thorns with each level The default value is 0.9.

Parameters

<i>factor</i>	Shrink factor
---------------	---------------

See also

[shrinkFactor\(\)](#)

12.118.3.8 setWidth()

```
void QwtSimpleCompassRose::setWidth (
    double width )
```

Set the width of the rose heads. Lower value make thinner heads. The range is limited from 0.03 to 0.4.

Parameters

<i>width</i>	Width
--------------	-------

12.118.3.9 shrinkFactor()

```
double QwtSimpleCompassRose::shrinkFactor ( ) const
```

Returns

Factor how to shrink the thorns with each level

See also

[setShrinkFactor\(\)](#)

12.118.3.10 width()

```
double QwtSimpleCompassRose::width ( ) const
```

Returns

Width of the rose

See also

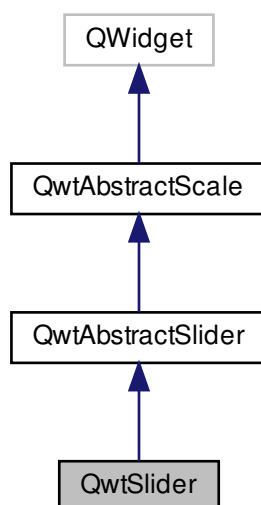
[setWidth\(\)](#)

12.119 QwtSlider Class Reference

The Slider Widget.

```
#include <qwt_slider.h>
```

Inheritance diagram for QwtSlider:



Public Types

- enum [ScalePosition](#) { [NoScale](#), [LeadingScale](#), [TrailingScale](#) }

Public Member Functions

- [QwtSlider](#) (QWidget *parent=NULL)
- [QwtSlider](#) (Qt::Orientation, QWidget *parent=NULL)
- virtual [~QwtSlider](#) ()

Destructor.

- void [setOrientation](#) (Qt::Orientation)
- Qt::Orientation [orientation](#) () const
- void [setScalePosition](#) ([ScalePosition](#))

Change the position of the scale.

- [ScalePosition](#) [scalePosition](#) () const
- void [setTrough](#) (bool)
- bool [hasTrough](#) () const
- void [setGroove](#) (bool)
- bool [hasGroove](#) () const
- void [setHandleSize](#) (const QSize &)

Set the slider's handle size.

- QSize [handleSize](#) () const
- void [setBorderWidth](#) (int)

Change the slider's border width.

- int [borderWidth](#) () const
- void [setSpacing](#) (int)

Change the spacing between trough and scale.

- int [spacing](#) () const
- virtual QSize [sizeHint](#) () const
- virtual QSize [minimumSizeHint](#) () const
- void [setScaleDraw](#) ([QwtScaleDraw](#) *)

Set a scale draw.

- const [QwtScaleDraw](#) * [scaleDraw](#) () const
- void [setUpdateInterval](#) (int)

Specify the update interval for automatic scrolling.

- int [updateInterval](#) () const

Protected Member Functions

- virtual double [scrolledTo](#) (const QPoint &) const
- virtual bool [isScrollPosition](#) (const QPoint &) const
- virtual void [drawSlider](#) (QPainter *, const QRect &) const
- virtual void [drawHandle](#) (QPainter *, const QRect &, int pos) const
- virtual void [mousePressEvent](#) (QMouseEvent *)
- virtual void [mouseReleaseEvent](#) (QMouseEvent *)
- virtual void [resizeEvent](#) (QResizeEvent *)
- virtual void [paintEvent](#) (QPaintEvent *)
- virtual void [changeEvent](#) (QEvent *)
- virtual void [timerEvent](#) (QTimerEvent *)
- virtual void [scaleChange](#) ()

Notify changed scale.

- QRect [sliderRect](#) () const
- QRect [handleRect](#) () const

Additional Inherited Members

12.119.1 Detailed Description

The Slider Widget.

[QwtSlider](#) is a slider widget which operates on an interval of type double. Its position is related to a scale showing the current value.

The slider can be customized by having a through, a groove - or both.

12.119.2 Member Enumeration Documentation

12.119.2.1 ScalePosition

```
enum QwtSlider::ScalePosition
```

Position of the scale

See also

[QwtSlider\(\)](#), [setScalePosition\(\)](#), [setOrientation\(\)](#)

Enumerator

NoScale	The slider has no scale.
LeadingScale	The scale is right of a vertical or below a horizontal slider.
TrailingScale	The scale is left of a vertical or above a horizontal slider.

12.119.3 Constructor & Destructor Documentation

12.119.3.1 QwtSlider() [1/2]

```
QwtSlider::QwtSlider (
    QWidget * parent = NULL ) [explicit]
```

Construct vertical slider in [QwtSlider::Trough](#) style with a scale to the left.

The scale is initialized to [0.0, 100.0] and the value set to 0.0.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

See also

[setOrientation\(\)](#), [setScalePosition\(\)](#), [setBackgroundStyle\(\)](#)

12.119.3.2 QwtSlider() [2/2]

```
QwtSlider::QwtSlider (
    Qt::Orientation orientation,
    QWidget * parent = NULL ) [explicit]
```

Construct a slider in QwtSlider::Trough style

When orientation is Qt::Vertical the scale will be aligned to the left - otherwise at the the top of the slider.

The scale is initialized to [0.0, 100.0] and the value set to 0.0.

Parameters

<i>parent</i>	Parent widget
<i>orientation</i>	Orientation of the slider.

12.119.4 Member Function Documentation

12.119.4.1 borderWidth()

```
int QwtSlider::borderWidth ( ) const
```

Returns

the border width.

See also

[setBorderWidth\(\)](#)

12.119.4.2 changeEvent()

```
void QwtSlider::changeEvent (
    QEvent * event ) [protected], [virtual]
```

Handles QEvent::StyleChange and QEvent::FontChange events

Parameters

<i>event</i>	Change event
--------------	--------------

12.119.4.3 drawHandle()

```
void QwtSlider::drawHandle (
    QPainter * painter,
    const QRect & handleRect,
    int pos ) const [protected], [virtual]
```

Draw the thumb at a position

Parameters

<i>painter</i>	Painter
<i>handleRect</i>	Bounding rectangle of the handle
<i>pos</i>	Position of the handle marker in widget coordinates

12.119.4.4 drawSlider()

```
void QwtSlider::drawSlider (
    QPainter * painter,
    const QRect & sliderRect ) const [protected], [virtual]
```

Draw the slider into the specified rectangle.

Parameters

<i>painter</i>	Painter
<i>sliderRect</i>	Bounding rectangle of the slider

12.119.4.5 handleRect()

```
QRect QwtSlider::handleRect ( ) const [protected]
```

Returns

Bounding rectangle of the slider handle

12.119.4.6 handleSize()

```
QSize QwtSlider::handleSize ( ) const
```

Returns

Size of the handle.

See also

[setHandleSize\(\)](#)

12.119.4.7 hasGroove()

```
bool QwtSlider::hasGroove ( ) const
```

Returns

True, when the groove is visisble

See also

[setGroove\(\)](#), [hasTrough\(\)](#)

12.119.4.8 hasTrough()

```
bool QwtSlider::hasTrough ( ) const
```

Returns

True, when the trough is visisble

See also

[setTrough\(\)](#), [hasGroove\(\)](#)

12.119.4.9 isScrollPosition()

```
bool QwtSlider::isScrollPosition (
    const QPoint & pos ) const [protected], [virtual]
```

Determine what to do when the user presses a mouse button.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Return values

<i>True, when</i>	handleRect() contains pos
-------------------	---

See also

[scrolledTo\(\)](#)

Implements [QwtAbstractSlider](#).

12.119.4.10 `minimumSizeHint()`

```
QSize QwtSlider::minimumSizeHint ( ) const [virtual]
```

Returns

Minimum size hint

See also

[sizeHint\(\)](#)

12.119.4.11 `mousePressEvent()`

```
void QwtSlider::mousePressEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse press event handler

Parameters

<i>event</i>	Mouse event
--------------	-------------

Reimplemented from [QwtAbstractSlider](#).

12.119.4.12 `mouseReleaseEvent()`

```
void QwtSlider::mouseReleaseEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse release event handler

Parameters

<i>event</i>	Mouse event
--------------	-------------

Reimplemented from [QwtAbstractSlider](#).

12.119.4.13 `orientation()`

```
Qt::Orientation QwtSlider::orientation ( ) const
```

Returns

Orientation

See also

[setOrientation\(\)](#)

12.119.4.14 `paintEvent()`

```
void QwtSlider::paintEvent (
    QPainter * event ) [protected], [virtual]
```

Qt paint event handler

Parameters

<i>event</i>	Paint event
--------------	-------------

12.119.4.15 `resizeEvent()`

```
void QwtSlider::resizeEvent (
    QResizeEvent * event ) [protected], [virtual]
```

Qt resize event handler

Parameters

<i>event</i>	Resize event
--------------	--------------

12.119.4.16 `scaleDraw()`

```
const QwtScaleDraw * QwtSlider::scaleDraw ( ) const
```

Returns

the scale draw of the slider

See also

[setScaleDraw\(\)](#)

12.119.4.17 `scalePosition()`

```
QwtSlider::ScalePosition QwtSlider::scalePosition ( ) const
```

Returns

Position of the scale

See also

[setScalePosition\(\)](#)

12.119.4.18 scrolledTo()

```
double QwtSlider::scrolledTo (
    const QPoint & pos ) const    [protected], [virtual]
```

Determine the value for a new position of the slider handle.

Parameters

<i>pos</i>	Mouse position
------------	----------------

Returns

Value for the mouse position

See also

[isScrollPosition\(\)](#)

Implements [QwtAbstractSlider](#).

12.119.4.19 setBorderWidth()

```
void QwtSlider::setBorderWidth (
    int width )
```

Change the slider's border width.

The border width is used for drawing the slider handle and the trough.

Parameters

<i>width</i>	Border width
--------------	--------------

See also

[borderWidth\(\)](#)

12.119.4.20 setGroove()

```
void QwtSlider::setGroove (
    bool on )
```

En/Disable the groove

The slider can be customized by showing a groove for the handle.

Parameters

<i>on</i>	When true, the groove is visible
-----------	----------------------------------

See also

[hasGroove\(\)](#), [setThrough\(\)](#)

12.119.4.21 `setHandleSize()`

```
void QwtSlider::setHandleSize (
    const QSize & size )
```

Set the slider's handle size.

When the size is empty the slider handle will be painted with a default size depending on its [orientation\(\)](#) and [backgroundStyle\(\)](#).

Parameters

<i>size</i>	New size
-------------	----------

See also

[handleSize\(\)](#)

12.119.4.22 `setOrientation()`

```
void QwtSlider::setOrientation (
    Qt::Orientation orientation )
```

Set the orientation.

Parameters

<i>orientation</i>	Allowed values are Qt::Horizontal and Qt::Vertical.
--------------------	---

See also

[orientation\(\)](#), [scalePosition\(\)](#)

12.119.4.23 `setScaleDraw()`

```
void QwtSlider::setScaleDraw (
    QwtScaleDraw * scaleDraw )
```

Set a scale draw.

For changing the labels of the scales, it is necessary to derive from [QwtScaleDraw](#) and overload [QwtScaleDraw::label\(\)](#).

Parameters

<i>scaleDraw</i>	ScaleDraw object, that has to be created with new and will be deleted in ~QwtSlider() or the next call of setScaleDraw() .
------------------	--

See also

[scaleDraw\(\)](#)

12.119.4.24 [setScalePosition\(\)](#)

```
void QwtSlider::setScalePosition (
    ScalePosition scalePosition )
```

Change the position of the scale.

Parameters

<i>scalePosition</i>	Position of the scale.
----------------------	------------------------

See also

[ScalePosition](#), [scalePosition\(\)](#)

12.119.4.25 [setSpacing\(\)](#)

```
void QwtSlider::setSpacing (
    int spacing )
```

Change the spacing between trough and scale.

A spacing of 0 means, that the backbone of the scale is covered by the trough.

The default setting is 4 pixels.

Parameters

<i>spacing</i>	Number of pixels
----------------	------------------

See also

[spacing\(\)](#);

12.119.4.26 setTrough()

```
void QwtSlider::setTrough (
    bool on )
```

En/Disable the trough

The slider can be customized by showing a trough for the handle.

Parameters

<i>on</i>	When true, the groove is visible
-----------	----------------------------------

See also

[hasTrough\(\)](#), [setGroove\(\)](#)

12.119.4.27 setUpdateInterval()

```
void QwtSlider::setUpdateInterval (
    int interval )
```

Specify the update interval for automatic scrolling.

The minimal accepted value is 50 ms.

Parameters

<i>interval</i>	Update interval in milliseconds
-----------------	---------------------------------

See also

[setUpdateInterval\(\)](#)

12.119.4.28 sizeHint()

```
QSize QwtSlider::sizeHint ( ) const [virtual]
```

Returns

[minimumSizeHint\(\)](#)

12.119.4.29 sliderRect()

```
QRect QwtSlider::sliderRect ( ) const [protected]
```

Returns

Bounding rectangle of the slider - without the scale

12.119.4.30 spacing()

```
int QwtSlider::spacing ( ) const
```

Returns

Number of pixels between slider and scale

See also

[setSpacing\(\)](#)

12.119.4.31 timerEvent()

```
void QwtSlider::timerEvent (
    QTimerEvent * event ) [protected], [virtual]
```

Timer event handler

Handles the timer, when the mouse stays pressed inside the [sliderRect\(\)](#).

Parameters

<i>event</i>	Mouse event
--------------	-------------

12.119.4.32 updateInterval()

```
int QwtSlider::updateInterval ( ) const
```

Returns

Update interval in milliseconds for automatic scrolling

See also

[setUpdateInterval\(\)](#)

12.120 QwtSpline Class Reference

A class for spline interpolation.

```
#include <qwt_spline.h>
```

Public Types

- enum [SplineType](#) { [Natural](#), [Periodic](#) }
Spline type.

Public Member Functions

- [QwtSpline](#) ()
Constructor.
- [QwtSpline](#) (const [QwtSpline](#) &)
- [~QwtSpline](#) ()
Destructor.
- [QwtSpline](#) & [operator=](#) (const [QwtSpline](#) &)
- void [setSplineType](#) ([SplineType](#))
- [SplineType](#) [splineType](#) () const
- bool [setPoints](#) (const [QPolygonF](#) &[points](#))
Calculate the spline coefficients.
- [QPolygonF](#) [points](#) () const
- void [reset](#) ()
Free allocated memory and set size to 0.
- bool [isValid](#) () const
True if valid.
- double [value](#) (double x) const
- const [QVector](#)< double > & [coefficientsA](#) () const
- const [QVector](#)< double > & [coefficientsB](#) () const
- const [QVector](#)< double > & [coefficientsC](#) () const

Protected Member Functions

- bool [buildNaturalSpline](#) (const [QPolygonF](#) &)
Determines the coefficients for a natural spline.
- bool [buildPeriodicSpline](#) (const [QPolygonF](#) &)
Determines the coefficients for a periodic spline.

12.120.1 Detailed Description

A class for spline interpolation.

The [QwtSpline](#) class is used for cubical spline interpolation. Two types of splines, natural and periodic, are supported.

Usage:

1. First call [setPoints\(\)](#) to determine the spline coefficients for a tabulated function $y(x)$.
2. After the coefficients have been set up, the interpolated function value for an argument x can be determined by calling [QwtSpline::value\(\)](#).

Example:

```
#include <qwt_spline.h>

QPolygonF interpolate(const QPolygonF& points, int numValues)
{
    QwtSpline spline;
    if ( !spline.setPoints(points) )
        return points;

    QPolygonF interpolatedPoints(numValues);

    const double delta =
        (points[numPoints - 1].x() - points[0].x()) / (points.size() - 1);
    for(i = 0; i < points.size(); i++) / interpolate
    {
        const double x = points[0].x() + i * delta;
        interpolatedPoints[i].setX(x);
        interpolatedPoints[i].setY(spline.value(x));
    }
    return interpolatedPoints;
}
```

12.120.2 Member Enumeration Documentation

12.120.2.1 SplineType

enum [QwtSpline::SplineType](#)

Spline type.

Enumerator

Natural	A natural spline.
Periodic	A periodic spline.

12.120.3 Constructor & Destructor Documentation

12.120.3.1 QwtSpline()

```
QwtSpline::QwtSpline (
    const QwtSpline & other )
```

Copy constructor

Parameters

<i>other</i>	Spline used for initialization
--------------	--------------------------------

12.120.4 Member Function Documentation

12.120.4.1 buildNaturalSpline()

```
bool QwtSpline::buildNaturalSpline (
    const QPolygonF & points ) [protected]
```

Determines the coefficients for a natural spline.

Returns

true if successful

12.120.4.2 buildPeriodicSpline()

```
bool QwtSpline::buildPeriodicSpline (
    const QPolygonF & points ) [protected]
```

Determines the coefficients for a periodic spline.

Returns

true if successful

12.120.4.3 coefficientsA()

```
const QVector< double > & QwtSpline::coefficientsA ( ) const
```

Returns

A coefficients

12.120.4.4 coefficientsB()

```
const QVector< double > & QwtSpline::coefficientsB ( ) const
```

Returns

B coefficients

12.120.4.5 coefficientsC()

```
const QVector< double > & QwtSpline::coefficientsC ( ) const
```

Returns

C coefficients

12.120.4.6 operator=()

```
QwtSpline & QwtSpline::operator= (
    const QwtSpline & other )
```

Assignment operator

Parameters

<i>other</i>	Spline used for initialization
--------------	--------------------------------

Returns

*this

12.120.4.7 points()

```
QPolygonF QwtSpline::points ( ) const
```

Returns

Points, that have been by [setPoints\(\)](#)

12.120.4.8 setPoints()

```
bool QwtSpline::setPoints (
    const QPolygonF & points )
```

Calculate the spline coefficients.

Depending on the value of *periodic*, this function will determine the coefficients for a natural or a periodic spline and store them internally.

Parameters

<i>points</i>	Points
---------------	--------

Returns

true if successful

Warning

The sequence of x (but not y) values has to be strictly monotone increasing, which means `points[i].x() < points[i+1].x()`. If this is not the case, the function will return false

12.120.4.9 setSplineType()

```
void QwtSpline::setSplineType (
    SplineType splineType )
```

Select the algorithm used for calculating the spline

Parameters

<i>splineType</i>	Spline type
-------------------	-------------

See also

[splineType\(\)](#)

12.120.4.10 splineType()

```
QwtSpline::SplineType QwtSpline::splineType ( ) const
```

Returns

the spline type

See also

[setSplineType\(\)](#)

12.120.4.11 value()

```
double QwtSpline::value (
    double x ) const
```

Calculate the interpolated function value corresponding to a given argument x.

Parameters

<code>x</code>	Coordinate
----------------	------------

Returns

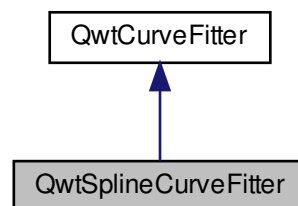
Interpolated coordinate

12.121 QwtSplineCurveFitter Class Reference

A curve fitter using cubic splines.

```
#include <qwt_curve_fitter.h>
```

Inheritance diagram for QwtSplineCurveFitter:

**Public Types**

- enum `FitMode` { `Auto`, `Spline`, `ParametricSpline` }

Public Member Functions

- `QwtSplineCurveFitter ()`
Constructor.
- `virtual ~QwtSplineCurveFitter ()`
Destructor.
- `void setFitMode (FitMode)`
- `FitMode fitMode () const`
- `void setSpline (const QwtSpline &)`
- `const QwtSpline & spline () const`
- `QwtSpline & spline ()`
- `void setSplineSize (int)`
- `int splineSize () const`
- `virtual QPolygonF fitCurve (const QPolygonF &) const`

Additional Inherited Members

12.121.1 Detailed Description

A curve fitter using cubic splines.

12.121.2 Member Enumeration Documentation

12.121.2.1 FitMode

```
enum QwtSplineCurveFitter::FitMode
```

Spline type The default setting is Auto

See also

[setFitMode\(\)](#), [FitMode\(\)](#)

Enumerator

Auto	Use the default spline algorithm for polygons with increasing x values ($p[i-1] < p[i]$), otherwise use a parametric spline algorithm.
Spline	Use a default spline algorithm.
ParametricSpline	Use a parametric spline algorithm.

12.121.3 Member Function Documentation

12.121.3.1 fitCurve()

```
QPolygonF QwtSplineCurveFitter::fitCurve (
    const QPolygonF & points ) const [virtual]
```

Find a curve which has the best fit to a series of data points

Parameters

<i>points</i>	Series of data points
---------------	-----------------------

Returns

Curve points

Implements [QwtCurveFitter](#).

12.121.3.2 `fitMode()`

```
QwtSplineCurveFitter::FitMode QwtSplineCurveFitter::fitMode ( ) const
```

Returns

Mode representing a spline algorithm

See also

[setFitMode\(\)](#)

12.121.3.3 `setFitMode()`

```
void QwtSplineCurveFitter::setFitMode (
    FitMode mode )
```

Select the algorithm used for building the spline

Parameters

<i>mode</i>	Mode representing a spline algorithm
-------------	--------------------------------------

See also

[fitMode\(\)](#)

12.121.3.4 `setSpline()`

```
void QwtSplineCurveFitter::setSpline (
    const QwtSpline & spline )
```

Assign a spline

Parameters

<i>spline</i>	Spline
---------------	--------

See also

[spline\(\)](#)

12.121.3.5 setSplineSize()

```
void QwtSplineCurveFitter::setSplineSize (
    int splineSize )
```

Assign a spline size (has to be at least 10 points)

Parameters

<i>splineSize</i>	Spline size
-------------------	-------------

See also

[splineSize\(\)](#)

12.121.3.6 spline() [1/2]

```
const QwtSpline & QwtSplineCurveFitter::spline ( ) const
```

Returns

Spline

See also

[setSpline\(\)](#)

12.121.3.7 spline() [2/2]

```
QwtSpline & QwtSplineCurveFitter::spline ( )
```

Returns

Spline

See also

[setSpline\(\)](#)

12.121.3.8 splineSize()

```
int QwtSplineCurveFitter::splineSize ( ) const
```

Returns

Spline size

See also

[setSplineSize\(\)](#)

12.122 QwtSymbol Class Reference

A class for drawing symbols.

```
#include <qwt_symbol.h>
```

Public Types

- enum [Style](#) {
[NoSymbol](#) = -1, [Ellipse](#), [Rect](#), [Diamond](#),
[Triangle](#), [DTriangle](#), [UTriangle](#), [LTriangle](#),
[RTriangle](#), [Cross](#), [XCross](#), [HLine](#),
[VLine](#), [Star1](#), [Star2](#), [Hexagon](#),
[Path](#), [Pixmap](#), [Graphic](#), [SvgDocument](#),
[UserStyle](#) = 1000 }
- enum [CachePolicy](#) { [NoCache](#), [Cache](#), [AutoCache](#) }

Public Member Functions

- [QwtSymbol](#) ([Style](#)=[NoSymbol](#))
- [QwtSymbol](#) ([Style](#), const [QBrush](#) &, const [QPen](#) &, const [QSize](#) &)
Constructor.
- [QwtSymbol](#) (const [QPainterPath](#) &, const [QBrush](#) &, const [QPen](#) &)
Constructor.
- virtual [~QwtSymbol](#) ()
Destructor.
- void [setCachePolicy](#) ([CachePolicy](#))
- [CachePolicy](#) [cachePolicy](#) () const
- void [setSize](#) (const [QSize](#) &)
- void [setSize](#) (int width, int height=-1)
Specify the symbol's size.
- const [QSize](#) & [size](#) () const
- void [setPinPoint](#) (const [QPointF](#) &pos, bool enable=true)
Set and enable a pin point.
- [QPointF](#) [pinPoint](#) () const
- void [setPinPointEnabled](#) (bool)
- bool [isPinPointEnabled](#) () const
- virtual void [setColor](#) (const [QColor](#) &)
Set the color of the symbol.
- void [setBrush](#) (const [QBrush](#) &)
Assign a brush.
- const [QBrush](#) & [brush](#) () const
- void [setPen](#) (const [QColor](#) &, qreal width=0.0, [Qt::PenStyle](#)=[Qt::SolidLine](#))
- void [setPen](#) (const [QPen](#) &)
- const [QPen](#) & [pen](#) () const
- void [setStyle](#) ([Style](#))
- [Style](#) [style](#) () const
- void [setPath](#) (const [QPainterPath](#) &)
Set a painter path as symbol.
- const [QPainterPath](#) & [path](#) () const
- void [setPixmap](#) (const [QPixmap](#) &)
- const [QPixmap](#) & [pixmap](#) () const

- void [setGraphic](#) (const [QwtGraphic](#) &)
- const [QwtGraphic](#) & [graphic](#) () const
- void [setSvgDocument](#) (const QByteArray &)
- void [drawSymbol](#) (QPainter *, const QRectF &) const
Draw the symbol into a rectangle.
- void [drawSymbol](#) (QPainter *, const QPointF &) const
Draw the symbol at a specified position.
- void [drawSymbols](#) (QPainter *, const QPolygonF &) const
Draw symbols at the specified points.
- void [drawSymbols](#) (QPainter *, const QPointF *, int numPoints) const
- virtual QRect [boundingRect](#) () const
- void [invalidateCache](#) ()

Protected Member Functions

- virtual void [renderSymbols](#) (QPainter *, const QPointF *, int numPoints) const

12.122.1 Detailed Description

A class for drawing symbols.

12.122.2 Member Enumeration Documentation

12.122.2.1 CachePolicy

enum [QwtSymbol::CachePolicy](#)

Depending on the render engine and the complexity of the symbol shape it might be faster to render the symbol to a pixmap and to paint this pixmap.

F.e. the raster paint engine is a pure software renderer where in cache mode a draw operation usually ends in raster operation with the the backing store, that are usually faster, than the algorithms for rendering polygons. But the opposite can be expected for graphic pipelines that can make use of hardware acceleration.

The default setting is AutoCache

See also

[setCachePolicy\(\)](#), [cachePolicy\(\)](#)

Note

The policy has no effect, when the symbol is painted to a vector graphics format (PDF, SVG).

Warning

Since Qt 4.8 raster is the default backend on X11

Enumerator

NoCache	Don't use a pixmap cache.
Cache	Always use a pixmap cache.
AutoCache	Use a cache when one of the following conditions is true: <ul style="list-style-type: none"> • The symbol is rendered with the software renderer (QPainterEngine::Raster)

12.122.2.2 Style

```
enum QwtSymbol::Style
```

Symbol Style

See also

[setStyle\(\)](#), [style\(\)](#)

Enumerator

NoSymbol	No Style. The symbol cannot be drawn.
Ellipse	Ellipse or circle.
Rect	Rectangle.
Diamond	Diamond.
Triangle	Triangle pointing upwards.
DTriangle	Triangle pointing downwards.
UTriangle	Triangle pointing upwards.
LTriangle	Triangle pointing left.
RTriangle	Triangle pointing right.
Cross	Cross (+)
XCross	Diagonal cross (X)
HLine	Horizontal line.
VLine	Vertical line.
Star1	X combined with +.
Star2	Six-pointed star.
Hexagon	Hexagon.
Path	<p>The symbol is represented by a painter path, where the origin (0, 0) of the path coordinate system is mapped to the position of the symbol.</p> <p>See also</p> <p>setPath(), path()</p>
Pixmap	<p>The symbol is represented by a pixmap. The pixmap is centered or aligned to its pin point.</p> <p>See also</p> <p>setPinPoint()</p>
Graphic	<p>The symbol is represented by a graphic. The graphic is centered or aligned to its pin point.</p> <p>See also</p> <p>setPinPoint()</p>

Enumerator

SvgDocument	The symbol is represented by a SVG graphic. The graphic is centered or aligned to its pin point. See also setPinPoint()
UserStyle	Styles \geq QwtSymbol::UserSymbol are reserved for derived classes of QwtSymbol that overload drawSymbols() with additional application specific symbol types.

12.122.3 Constructor & Destructor Documentation

12.122.3.1 QwtSymbol() [1/3]

```
QwtSymbol::QwtSymbol (
    Style style = NoSymbol )
```

Default Constructor

Parameters

<i>style</i>	Symbol Style
--------------	--------------

The symbol is constructed with gray interior, black outline with zero width, no size and style 'NoSymbol'.

12.122.3.2 QwtSymbol() [2/3]

```
QwtSymbol::QwtSymbol (
    QwtSymbol::Style style,
    const QBrush & brush,
    const QPen & pen,
    const QSize & size )
```

Constructor.

Parameters

<i>style</i>	Symbol Style
<i>brush</i>	brush to fill the interior
<i>pen</i>	outline pen
<i>size</i>	size

See also

[setStyle\(\)](#), [setBrush\(\)](#), [setPen\(\)](#), [setSize\(\)](#)

12.122.3.3 QwtSymbol() [3/3]

```
QwtSymbol::QwtSymbol (
    const QPainterPath & path,
    const QBrush & brush,
    const QPen & pen )
```

Constructor.

The symbol gets initialized by a painter path. The style is set to [QwtSymbol::Path](#), the size is set to empty (the path is displayed unscaled).

Parameters

<i>path</i>	painter path
<i>brush</i>	brush to fill the interior
<i>pen</i>	outline pen

See also

[setPath\(\)](#), [setBrush\(\)](#), [setPen\(\)](#), [setSize\(\)](#)

12.122.4 Member Function Documentation

12.122.4.1 boundingRect()

```
QRect QwtSymbol::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle for a symbol at position (0,0).

Returns

Bounding rectangle

12.122.4.2 brush()

```
const QBrush & QwtSymbol::brush ( ) const
```

Returns

Brush

See also

[setBrush\(\)](#)

12.122.4.3 cachePolicy()

```
QwtSymbol::CachePolicy QwtSymbol::cachePolicy ( ) const
```

Returns

Cache policy

See also

[CachePolicy](#), [setCachePolicy\(\)](#)

12.122.4.4 drawSymbol() [1/2]

```
void QwtSymbol::drawSymbol (
    QPainter * painter,
    const QRectF & rect ) const
```

Draw the symbol into a rectangle.

The symbol is painted centered and scaled into the target rectangle. It is always painted uncached and the pin point is ignored.

This method is primarily intended for drawing a symbol to the legend.

Parameters

<i>painter</i>	Painter
<i>rect</i>	Target rectangle for the symbol

12.122.4.5 drawSymbol() [2/2]

```
void QwtSymbol::drawSymbol (
    QPainter * painter,
    const QPointF & pos ) const [inline]
```

Draw the symbol at a specified position.

Parameters

<i>painter</i>	Painter
<i>pos</i>	Position of the symbol in screen coordinates

12.122.4.6 drawSymbols() [1/2]

```
void QwtSymbol::drawSymbols (
```

```
QPainter * painter,
const QPolygonF & points ) const [inline]
```

Draw symbols at the specified points.

Parameters

<i>painter</i>	Painter
<i>points</i>	Positions of the symbols in screen coordinates

12.122.4.7 drawSymbols() [2/2]

```
void QwtSymbol::drawSymbols (
    QPainter * painter,
    const QPointF * points,
    int numPoints ) const
```

Render an array of symbols

Painting several symbols is more effective than drawing symbols one by one, as a couple of layout calculations and setting of pen/brush can be done once for the complete array.

Parameters

<i>painter</i>	Painter
<i>points</i>	Array of points
<i>numPoints</i>	Number of points

12.122.4.8 graphic()

```
const QwtGraphic & QwtSymbol::graphic ( ) const
```

Returns

Assigned graphic

See also

[setGraphic\(\)](#)

12.122.4.9 invalidateCache()

```
void QwtSymbol::invalidateCache ( )
```

Invalidate the cached symbol pixmap

The symbol invalidates its cache, whenever an attribute is changed that has an effect on how to display a symbol. In case of derived classes with individual styles (`>= QwtSymbol::UserStyle`) it might be necessary to call [invalidateCache\(\)](#) for attributes that are relevant for this style.

See also

[CachePolicy](#), [setCachePolicy\(\)](#), [drawSymbols\(\)](#)

12.122.4.10 isPinPointEnabled()

```
bool QwtSymbol::isPinPointEnabled ( ) const
```

Returns

True, when the pin point translation is enabled

See also

[setPinPoint\(\)](#), [setPinPointEnabled\(\)](#)

12.122.4.11 path()

```
const QPainterPath & QwtSymbol::path ( ) const
```

Returns

Painter path for displaying the symbol

See also

[setPath\(\)](#)

12.122.4.12 pen()

```
const QPen & QwtSymbol::pen ( ) const
```

Returns

Pen

See also

[setPen\(\)](#), [brush\(\)](#)

12.122.4.13 `pinPoint()`

```
QPointF QwtSymbol::pinPoint ( ) const
```

Returns

Pin point

See also

[setPinPoint\(\)](#), [setPinPointEnabled\(\)](#)

12.122.4.14 `pixmap()`

```
const QPixmap & QwtSymbol::pixmap ( ) const
```

Returns

Assigned pixmap

See also

[setPixmap\(\)](#)

12.122.4.15 `renderSymbols()`

```
void QwtSymbol::renderSymbols (
    QPainter * painter,
    const QPointF * points,
    int numPoints ) const [protected], [virtual]
```

Render the symbol to series of points

Parameters

<i>painter</i>	Qt painter
<i>points</i>	Positions of the symbols
<i>numPoints</i>	Number of points

12.122.4.16 `setBrush()`

```
void QwtSymbol::setBrush (
    const QBrush & brush )
```

Assign a brush.

The brush is used to draw the interior of the symbol.

Parameters

<i>brush</i>	Brush
--------------	-------

See also[brush\(\)](#)**12.122.4.17 setCachePolicy()**

```
void QwtSymbol::setCachePolicy (
    QwtSymbol::CachePolicy policy )
```

Change the cache policy

The default policy is AutoCache

Parameters

<i>policy</i>	Cache policy
---------------	--------------

See also[CachePolicy](#), [cachePolicy\(\)](#)**12.122.4.18 setColor()**

```
void QwtSymbol::setColor (
    const QColor & color ) [virtual]
```

Set the color of the symbol.

Change the color of the brush for symbol types with a filled area. For all other symbol types the color will be assigned to the pen.

Parameters

<i>color</i>	Color
--------------	-------

See also[setBrush\(\)](#), [setPen\(\)](#), [brush\(\)](#), [pen\(\)](#)

12.122.4.19 setGraphic()

```
void QwtSymbol::setGraphic (
    const QwtGraphic & graphic )
```

Set a graphic as symbol

Parameters

<i>graphic</i>	Graphic
----------------	---------

See also

[graphic\(\)](#), [setPixmap\(\)](#)

Note

the [style\(\)](#) is set to [QwtSymbol::Graphic](#)
[brush\(\)](#) and [pen\(\)](#) have no effect

12.122.4.20 setPath()

```
void QwtSymbol::setPath (
    const QPainterPath & path )
```

Set a painter path as symbol.

The symbol is represented by a painter path, where the origin (0, 0) of the path coordinate system is mapped to the position of the symbol.

When the symbol has valid size the painter path gets scaled to fit into the size. Otherwise the symbol size depends on the bounding rectangle of the path.

Example

The following code defines a symbol drawing an arrow:

```
#include <qwt_symbol.h>

QwtSymbol *symbol = new QwtSymbol();

QPen pen( Qt::black, 2 );
pen.setJoinStyle( Qt::MiterJoin );

symbol->setPen( pen );
symbol->setBrush( Qt::red );

QPainterPath path;
path.moveTo( 0, 8 );
path.lineTo( 0, 5 );
path.lineTo( -3, 5 );
path.lineTo( 0, 0 );
path.lineTo( 3, 5 );
path.lineTo( 0, 5 );

QTransform transform;
transform.rotate( -30.0 );
path = transform.map( path );

symbol->setPath( path );
symbol->setPinPoint( QPointF( 0.0, 0.0 ) );

setSize( 10, 14 );
```

Parameters

<i>path</i>	Painter path
-------------	--------------

Note

The style is implicitly set to [QwtSymbol::Path](#).

See also

[path\(\)](#), [setSize\(\)](#)

12.122.4.21 **setPen()** [1/2]

```
void QwtSymbol::setPen (
    const QColor & color,
    qreal width = 0.0,
    Qt::PenStyle style = Qt::SolidLine )
```

Build and assign a pen

In Qt5 the default pen width is 1.0 (0.0 in Qt4) what makes it non cosmetic (see [QPen::isCosmetic\(\)](#)). This method has been introduced to hide this incompatibility.

Parameters

<i>color</i>	Pen color
<i>width</i>	Pen width
<i>style</i>	Pen style

See also

[pen\(\)](#), [brush\(\)](#)

12.122.4.22 **setPen()** [2/2]

```
void QwtSymbol::setPen (
    const QPen & pen )
```

Assign a pen

The pen is used to draw the symbol's outline.

Parameters

<i>pen</i>	Pen
------------	-----

See also

[pen\(\)](#), [setBrush\(\)](#)

12.122.4.23 setPinPoint()

```
void QwtSymbol::setPinPoint (
    const QPointF & pos,
    bool enable = true )
```

Set and enable a pin point.

The position of a complex symbol is not always aligned to its center (f.e an arrow, where the peak points to a position). The pin point defines the position inside of a QPixmap, Graphic, SvgDocument or PainterPath symbol where the represented point has to be aligned to.

Parameters

<i>pos</i>	Position
<i>enable</i>	En/Disable the pin point alignment

See also

[pinPoint\(\)](#), [setPinPointEnabled\(\)](#)

12.122.4.24 setPinPointEnabled()

```
void QwtSymbol::setPinPointEnabled (
    bool on )
```

En/Disable the pin point alignment

Parameters

<i>on</i>	Enabled, when on is true
-----------	--------------------------

See also

[setPinPoint\(\)](#), [isPinPointEnabled\(\)](#)

12.122.4.25 setPixmap()

```
void QwtSymbol::setPixmap (
    const QPixmap & pixmap )
```

Set a pixmap as symbol

Parameters

<i>pixmap</i>	Pixmap
---------------	--------

See also

[pixmap\(\)](#), [setGraphic\(\)](#)

Note

the [style\(\)](#) is set to [QwtSymbol::Pixmap](#)
[brush\(\)](#) and [pen\(\)](#) have no effect

12.122.4.26 setSize() [1/2]

```
void QwtSymbol::setSize (
    const QSize & size )
```

Set the symbol's size

Parameters

<i>size</i>	Size
-------------	------

See also

[size\(\)](#)

12.122.4.27 setSize() [2/2]

```
void QwtSymbol::setSize (
    int width,
    int height = -1 )
```

Specify the symbol's size.

If the 'h' parameter is left out or less than 0, and the 'w' parameter is greater than or equal to 0, the symbol size will be set to (w,w).

Parameters

<i>width</i>	Width
<i>height</i>	Height (defaults to -1)

See also

[size\(\)](#)

12.122.4.28 `setStyle()`

```
void QwtSymbol::setStyle (
    QwtSymbol::Style style )
```

Specify the symbol style

Parameters

<i>style</i>	Style
--------------	-------

See also

[style\(\)](#)

12.122.4.29 `setSvgDocument()`

```
void QwtSymbol::setSvgDocument (
    const QByteArray & svgDocument )
```

Set a SVG icon as symbol

Parameters

<i>svgDocument</i>	SVG icon
--------------------	----------

See also

[setGraphic\(\)](#), [setPixmap\(\)](#)

Note

the [style\(\)](#) is set to [QwtSymbol::SvgDocument](#)
[brush\(\)](#) and [pen\(\)](#) have no effect

12.122.4.30 `size()`

```
const QSize & QwtSymbol::size ( ) const
```

Returns

Size

See also[setSize\(\)](#)**12.122.4.31 style()**`QwtSymbol::Style QwtSymbol::style () const`**Returns**

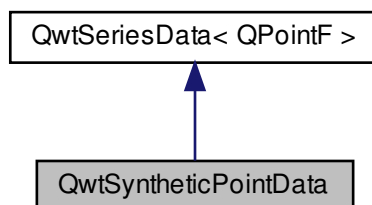
Current symbol style

See also[setStyle\(\)](#)**12.123 QwtSyntheticPointData Class Reference**

Synthetic point data.

`#include <qwt_point_data.h>`

Inheritance diagram for QwtSyntheticPointData:

**Public Member Functions**

- [QwtSyntheticPointData](#) (size_t [size](#), const [QwtInterval](#) &=[QwtInterval](#)())
- void [setSize](#) (size_t [size](#))
- virtual size_t [size](#) () const
- void [setInterval](#) (const [QwtInterval](#) &)
- [QwtInterval](#) [interval](#) () const
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.
- virtual QPointF [sample](#) (size_t index) const
- virtual double [y](#) (double [x](#)) const =0
- virtual double [x](#) (uint index) const
- virtual void [setRectOfInterest](#) (const QRectF &)
- QRectF [rectOfInterest](#) () const

Additional Inherited Members

12.123.1 Detailed Description

Synthetic point data.

[QwtSyntheticPointData](#) provides a fixed number of points for an interval. The points are calculated in equidistant steps in x-direction.

If the interval is invalid, the points are calculated for the "rectangle of interest", what normally is the displayed area on the plot canvas. In this mode you get different levels of detail, when zooming in/out.

Example

The following example shows how to implement a sinus curve.

```
#include <cmath>
#include <qwt_series_data.h>
#include <qwt_plot_curve.h>
#include <qwt_plot.h>
#include <qapplication.h>

class SinusData: public QwtSyntheticPointData
{
public:
    SinusData():
        QwtSyntheticPointData( 100 )
    {
    }

    virtual double y( double x ) const
    {
        return qSin( x );
    }
};

int main(int argc, char **argv)
{
    QApplication a( argc, argv );

    QwtPlot plot;
    plot.setAxisScale( QwtPlot::xBottom, 0.0, 10.0 );
    plot.setAxisScale( QwtPlot::yLeft, -1.0, 1.0 );

    QwtPlotCurve *curve = new QwtPlotCurve( "y = sin(x)" );
    curve->setData( new SinusData() );
    curve->attach( &plot );

    plot.show();
    return a.exec();
}
```

12.123.2 Constructor & Destructor Documentation

12.123.2.1 QwtSyntheticPointData()

```
QwtSyntheticPointData::QwtSyntheticPointData (
    size_t size,
    const QwtInterval & interval = QwtInterval() )
```

Constructor

Parameters

<i>size</i>	Number of points
<i>interval</i>	Bounding interval for the points

See also

[setInterval\(\)](#), [setSize\(\)](#)

12.123.3 Member Function Documentation**12.123.3.1 boundingRect()**

```
QRectF QwtSyntheticPointData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

This implementation iterates over all points, what could often be implemented much faster using the characteristics of the series. When there are many points it is recommended to overload and reimplement this method using the characteristics of the series (if possible).

Returns

Bounding rectangle

Implements [QwtSeriesData< QPointF >](#).

12.123.3.2 interval()

```
QwtInterval QwtSyntheticPointData::interval ( ) const
```

Returns

Bounding interval

See also

[setInterval\(\)](#), [size\(\)](#)

12.123.3.3 rectOfInterest()

```
QRectF QwtSyntheticPointData::rectOfInterest ( ) const
```

Returns

"rectangle of interest"

See also

[setRectOfInterest\(\)](#)

12.123.3.4 sample()

```
QPointF QwtSyntheticPointData::sample (
    size_t index ) const [virtual]
```

Calculate the point from an index

Parameters

<i>index</i>	Index
--------------	-------

Returns

QPointF(x(index), y(x(index)));

Warning

For invalid indices (`index < 0 || index >= size()`) (0, 0) is returned.

Implements [QwtSeriesData< QPointF >](#).

12.123.3.5 `setInterval()`

```
void QwtSyntheticPointData::setInterval (
    const QwtInterval & interval )
```

Set the bounding interval

Parameters

<i>interval</i>	Interval
-----------------	----------

See also

[interval\(\)](#), [setSize\(\)](#)

12.123.3.6 `setRectOfInterest()`

```
void QwtSyntheticPointData::setRectOfInterest (
    const QRectF & rect ) [virtual]
```

Set a the "rectangle of interest"

[QwtPlotSeriesItem](#) defines the current area of the plot canvas as "rect of interest" ([QwtPlotSeriesItem::updateScaleDiv\(\)](#)).

If [interval\(\).isValid\(\)](#) == false the x values are calculated in the interval `rect.left() -> rect.right()`.

See also

[rectOfInterest\(\)](#)

Reimplemented from [QwtSeriesData< QPointF >](#).

12.123.3.7 `setSize()`

```
void QwtSyntheticPointData::setSize (
    size_t size )
```

Change the number of points

Parameters

<i>size</i>	Number of points
-------------	------------------

See also[size\(\)](#), [setInterval\(\)](#)**12.123.3.8 size()**

```
size_t QwtSyntheticPointData::size ( ) const [virtual]
```

Returns

Number of points

See also[setSize\(\)](#), [interval\(\)](#)Implements [QwtSeriesData< QPointF >](#).**12.123.3.9 x()**

```
double QwtSyntheticPointData::x (
    uint index ) const [virtual]
```

Calculate a x-value from an index

x values are calculated by dividing an interval into equidistant steps. If `!interval().isValid()` the interval is calculated from the "rectangle of interest".

Parameters

<i>index</i>	Index of the requested point
--------------	------------------------------

Returns

Calculated x coordinate

See also[interval\(\)](#), [rectOfInterest\(\)](#), [y\(\)](#)

12.123.3.10 y()

```
virtual double QwtSyntheticPointData::y (
    double x ) const [pure virtual]
```

Calculate a y value for a x value

Parameters

x	x value
---	---------

Returns

Corresponding y value

12.124 QwtSystemClock Class Reference

[QwtSystemClock](#) provides high resolution clock time functions.

```
#include <qwt_system_clock.h>
```

Public Member Functions

- [QwtSystemClock](#) ()
Constructs a null clock object.
- virtual [~QwtSystemClock](#) ()
Destructor.
- bool [isNull](#) () const
- void [start](#) ()
- double [restart](#) ()
- double [elapsed](#) () const

12.124.1 Detailed Description

[QwtSystemClock](#) provides high resolution clock time functions.

Sometimes the resolution offered by `QTime` (`millisecond`) is not accurate enough for implementing time measurements (f.e. sampling). [QwtSystemClock](#) offers a subset of the `QTime` functionality using higher resolution timers (if possible).

Precision and time intervals are multiples of milliseconds (ms).

([QwtSystemClock](#) is obsolete since Qt 4.8 as `QElapsedTimer` offers the same precision)

Note

The implementation uses high-resolution performance counter on Windows, `mach_absolute_time()` on the Mac or POSIX timers on other systems. If none is available it falls back on `QTimer`.

12.124.2 Member Function Documentation

12.124.2.1 elapsed()

```
double QwtSystemClock::elapsed ( ) const
```

Returns

Number of milliseconds that have elapsed since the last time [start\(\)](#) or [restart\(\)](#) was called or 0.0 for null clocks.

12.124.2.2 isNull()

```
bool QwtSystemClock::isNull ( ) const
```

Returns

true if the clock has never been started.

12.124.2.3 restart()

```
double QwtSystemClock::restart ( )
```

Set the start time to the current time

Returns

Time, that is elapsed since the previous start time.

12.124.2.4 start()

```
void QwtSystemClock::start ( )
```

Sets the start time to the current time.

12.125 QwtText Class Reference

A class representing a text.

```
#include <qwt_text.h>
```

Public Types

- enum `TextFormat` {
`AutoText` = 0, `PlainText`, `RichText`, `MathMLText`,
`TeXText`, `OtherFormat` = 100 }
Text format.
- enum `PaintAttribute` { `PaintUsingTextFont` = 0x01, `PaintUsingTextColor` = 0x02, `PaintBackground` = 0x04 }
Paint Attributes.
- enum `LayoutAttribute` { `MinimumLayout` = 0x01 }
Layout Attributes The layout attributes affects some aspects of the layout of the text.
- typedef `QFlags< PaintAttribute > PaintAttributes`
Paint attributes.
- typedef `QFlags< LayoutAttribute > LayoutAttributes`
Layout attributes.

Public Member Functions

- `QwtText` (const `QString` &=QString(), `TextFormat` textFormat=`AutoText`)
- `QwtText` (const `QwtText` &)
Copy constructor.
- `~QwtText` ()
Destructor.
- `QwtText` & `operator=` (const `QwtText` &)
Assignment operator.
- bool `operator==` (const `QwtText` &) const
Relational operator.
- bool `operator!=` (const `QwtText` &) const
Relational operator.
- void `setText` (const `QString` &, `QwtText::TextFormat` textFormat=`AutoText`)
- `QString` `text` () const
- bool `isNull` () const
- bool `isEmpty` () const
- void `setFont` (const `QFont` &)
- `QFont` `font` () const
Return the font.
- `QFont` `usedFont` (const `QFont` &) const
- void `setRenderFlags` (int)
Change the render flags.
- int `renderFlags` () const
- void `setColor` (const `QColor` &)
- `QColor` `color` () const
Return the pen color, used for painting the text.
- `QColor` `usedColor` (const `QColor` &) const
- void `setBorderRadius` (double)
- double `borderRadius` () const
- void `setBorderPen` (const `QPen` &)
- `QPen` `borderPen` () const
- void `setBackgroundBrush` (const `QBrush` &)
- `QBrush` `backgroundBrush` () const
- void `setPaintAttribute` (`PaintAttribute`, bool on=true)
- bool `testPaintAttribute` (`PaintAttribute`) const
- void `setLayoutAttribute` (`LayoutAttribute`, bool on=true)
- bool `testLayoutAttribute` (`LayoutAttribute`) const
- double `heightForWidth` (double width, const `QFont` &=QFont()) const
- `QSizeF` `textSize` (const `QFont` &=QFont()) const
- void `draw` (`QPainter` *painter, const `QRectF` &rect) const

Static Public Member Functions

- static const [QwtTextEngine](#) * [textEngine](#) (const QString &[text](#), [QwtText::TextFormat=AutoText](#))
- static const [QwtTextEngine](#) * [textEngine](#) ([QwtText::TextFormat](#))
Find the text engine for a text format.
- static void [setTextEngine](#) ([QwtText::TextFormat](#), [QwtTextEngine](#) *)

12.125.1 Detailed Description

A class representing a text.

A [QwtText](#) is a text including a set of attributes how to render it.

- Format
A text might include control sequences (f.e tags) describing how to render it. Each format (f.e MathML, TeX, Qt Rich Text) has its own set of control sequences, that can be handles by a special [QwtTextEngine](#) for this format.
- Background
A text might have a background, defined by a QPen and QBrush to improve its visibility. The corners of the background might be rounded.
- Font
A text might have an individual font.
- Color
A text might have an individual color.
- Render Flags
Flags from Qt::AlignmentFlag and Qt::TextFlag used like in QPainter::drawText().

See also

[QwtTextEngine](#), [QwtTextLabel](#)

12.125.2 Member Enumeration Documentation

12.125.2.1 LayoutAttribute

enum [QwtText::LayoutAttribute](#)

Layout Attributes The layout attributes affects some aspects of the layout of the text.

Enumerator

MinimumLayout	Layout the text without its margins. This mode is useful if a text needs to be aligned accurately, like the tick labels of a scale. If QwtTextEngine::textMargins is not implemented for the format of the text, MinimumLayout has no effect.
---------------	---

12.125.2.2 PaintAttribute

```
enum QwtText::PaintAttribute
```

Paint Attributes.

Font and color and background are optional attributes of a [QwtText](#). The paint attributes hold the information, if they are set.

Enumerator

PaintUsingTextFont	The text has an individual font.
PaintUsingTextColor	The text has an individual color.
PaintBackground	The text has an individual background.

12.125.2.3 TextFormat

```
enum QwtText::TextFormat
```

Text format.

The text format defines the [QwtTextEngine](#), that is used to render the text.

See also

[QwtTextEngine](#), [setTextEngine\(\)](#)

Enumerator

AutoText	The text format is determined using QwtTextEngine::mightRender() for all available text engines in increasing order > PlainText. If none of the text engines can render the text is rendered like QwtText::PlainText .
PlainText	Draw the text as it is, using a QwtPlainTextEngine .
RichText	Use the Scribe framework (Qt Rich Text) to render the text.
MathMLText	Use a MathML (http://en.wikipedia.org/wiki/MathML) render engine to display the text. The Qwt MathML extension offers such an engine based on the MathML renderer of the former Qt solutions package. To enable MathML support the following code needs to be added to the application: <pre>QwtText::setTextEngine(QwtText::MathMLText, new QwtMathMLTextEngine());</pre>
TeXText	Use a TeX (http://en.wikipedia.org/wiki/TeX) render engine to display the text (not implemented yet).
OtherFormat	The number of text formats can be extended using setTextEngine . Formats >= QwtText::OtherFormat are not used by Qwt.

12.125.3 Constructor & Destructor Documentation

12.125.3.1 QwtText()

```
QwtText::QwtText (
    const QString & text = QString(),
    QwtText::TextFormat textFormat = AutoText )
```

Constructor

Parameters

<i>text</i>	Text content
<i>textFormat</i>	Text format

12.125.4 Member Function Documentation

12.125.4.1 backgroundBrush()

```
QBrush QwtText::backgroundBrush ( ) const
```

Returns

Background brush

See also

[setBackgroundBrush\(\)](#), [borderPen\(\)](#)

12.125.4.2 borderPen()

```
QPen QwtText::borderPen ( ) const
```

Returns

Background pen

See also

[setBorderPen\(\)](#), [backgroundBrush\(\)](#)

12.125.4.3 borderRadius()

```
double QwtText::borderRadius ( ) const
```

Returns

Radius for the corners of the border frame

See also

[setBorderRadius\(\)](#), [borderPen\(\)](#), [backgroundBrush\(\)](#)

12.125.4.4 draw()

```
void QwtText::draw (
    QPainter * painter,
    const QRectF & rect ) const
```

Draw a text into a rectangle

Parameters

<i>painter</i>	Painter
<i>rect</i>	Rectangle

12.125.4.5 heightForWidth()

```
double QwtText::heightForWidth (
    double width,
    const QFont & defaultFont = QFont() ) const
```

Find the height for a given width

Parameters

<i>defaultFont</i>	Font, used for the calculation if the text has no font
<i>width</i>	Width

Returns

Calculated height

12.125.4.6 isEmpty()

```
bool QwtText::isEmpty ( ) const [inline]
```

Returns

[text\(\).isEmpty\(\)](#)

12.125.4.7 isNull()

```
bool QwtText::isNull ( ) const [inline]
```

Returns

[text\(\).isNull\(\)](#)

12.125.4.8 renderFlags()

```
int QwtText::renderFlags ( ) const
```

Returns

Render flags

See also

[setRenderFlags\(\)](#)

12.125.4.9 setBackgroundBrush()

```
void QwtText::setBackgroundBrush (
    const QBrush & brush )
```

Set the background brush

Parameters

<i>brush</i>	Background brush
--------------	------------------

See also

[backgroundBrush\(\)](#), [setBorderPen\(\)](#)

12.125.4.10 setBorderPen()

```
void QwtText::setBorderPen (
    const QPen & pen )
```

Set the background pen

Parameters

<i>pen</i>	Background pen
------------	----------------

See also

[borderPen\(\)](#), [setBackgroundBrush\(\)](#)

12.125.4.11 `setBorderRadius()`

```
void QwtText::setBorderRadius (
    double radius )
```

Set the radius for the corners of the border frame

Parameters

<i>radius</i>	Radius of a rounded corner
---------------	----------------------------

See also

[borderRadius\(\)](#), [setBorderPen\(\)](#), [setBackgroundBrush\(\)](#)

12.125.4.12 `setColor()`

```
void QwtText::setColor (
    const QColor & color )
```

Set the pen color used for drawing the text.

Parameters

<i>color</i>	Color
--------------	-------

Note

Setting the color might have no effect, when the text contains control sequences for setting colors.

12.125.4.13 `setFont()`

```
void QwtText::setFont (
    const QFont & font )
```

Set the font.

Parameters

<i>font</i>	Font
-------------	------

Note

Setting the font might have no effect, when the text contains control sequences for setting fonts.

12.125.4.14 `setLayoutAttribute()`

```
void QText::setLayoutAttribute (
    LayoutAttribute attribute,
    bool on = true )
```

Change a layout attribute

Parameters

<i>attribute</i>	Layout attribute
<i>on</i>	On/Off

See also

[testLayoutAttribute\(\)](#)

12.125.4.15 `setPaintAttribute()`

```
void QText::setPaintAttribute (
    PaintAttribute attribute,
    bool on = true )
```

Change a paint attribute

Parameters

<i>attribute</i>	Paint attribute
<i>on</i>	On/Off

Note

Used by [setFont\(\)](#), [setColor\(\)](#), [setBorderPen\(\)](#) and [setBackgroundBrush\(\)](#)

See also

[testPaintAttribute\(\)](#)

12.125.4.16 setRenderFlags()

```
void QwtText::setRenderFlags (
    int renderFlags )
```

Change the render flags.

The default setting is Qt::AlignCenter

Parameters

<i>renderFlags</i>	Bitwise OR of the flags used like in QPainter::drawText()
--------------------	---

See also

[renderFlags\(\)](#), [QwtTextEngine::draw\(\)](#)

Note

Some renderFlags might have no effect, depending on the text format.

12.125.4.17 setText()

```
void QwtText::setText (
    const QString & text,
    QwtText::TextFormat textFormat = AutoText )
```

Assign a new text content

Parameters

<i>text</i>	Text content
<i>textFormat</i>	Text format

See also

[text\(\)](#)

12.125.4.18 setTextEngine()

```
void QwtText::setTextEngine (
    QwtText::TextFormat format,
    QwtTextEngine * engine ) [static]
```

Assign/Replace a text engine for a text format

With setTextEngine it is possible to extend Qwt with other types of text formats.

For [QwtText::PlainText](#) it is not allowed to assign a engine == NULL.

Parameters

<i>format</i>	Text format
<i>engine</i>	Text engine

See also

[QwtMathMLTextEngine](#)

Warning

Using [QwtText::AutoText](#) does nothing.

12.125.4.19 testLayoutAttribute()

```
bool QwtText::testLayoutAttribute (
    LayoutAttribute attribute ) const
```

Test a layout attribute

Parameters

<i>attribute</i>	Layout attribute
------------------	------------------

Returns

true, if attribute is enabled

See also

[setLayoutAttribute\(\)](#)

12.125.4.20 testPaintAttribute()

```
bool QwtText::testPaintAttribute (
    PaintAttribute attribute ) const
```

Test a paint attribute

Parameters

<i>attribute</i>	Paint attribute
------------------	-----------------

Returns

true, if attribute is enabled

See also

[setPaintAttribute\(\)](#)

12.125.4.21 text()

```
QString QwtText::text ( ) const
```

Returns

Text as QString.

See also

[setText\(\)](#)

12.125.4.22 textEngine() [1/2]

```
const QwtTextEngine * QwtText::textEngine (
    const QString & text,
    QwtText::TextFormat format = AutoText ) [static]
```

Find the text engine for a text format

In case of [QwtText::AutoText](#) the first text engine (beside [QwtPlainTextEngine](#)) is returned, where [QwtTextEngine::mightRender](#) returns true. If there is none [QwtPlainTextEngine](#) is returned.

If no text engine is registered for the format [QwtPlainTextEngine](#) is returned.

Parameters

<i>text</i>	Text, needed in case of AutoText
<i>format</i>	Text format

Returns

Corresponding text engine

12.125.4.23 textEngine() [2/2]

```
const QwtTextEngine * QwtText::textEngine (
    QwtText::TextFormat format ) [static]
```

Find the text engine for a text format.

textEngine can be used to find out if a text format is supported.

Parameters

<i>format</i>	Text format
---------------	-------------

Returns

The text engine, or NULL if no engine is available.

12.125.4.24 textSize()

```
QSizeF QwtText::textSize (
    const QFont & defaultFont = QFont() ) const
```

Returns the size, that is needed to render text

Parameters

<i>defaultFont</i>	Font of the text
--------------------	------------------

Returns

Calculated size

12.125.4.25 usedColor()

```
QColor QwtText::usedColor (
    const QColor & defaultColor ) const
```

Return the color of the text, if it has one. Otherwise return defaultColor.

Parameters

<i>defaultColor</i>	Default color
---------------------	---------------

Returns

Color used for drawing the text

See also

[setColor\(\)](#), [color\(\)](#), [PaintAttributes](#)

12.125.4.26 usedFont()

```
QFont QwtText::usedFont (
    const QFont & defaultFont ) const
```

Return the font of the text, if it has one. Otherwise return defaultFont.

Parameters

<i>defaultFont</i>	Default font
--------------------	--------------

Returns

Font used for drawing the text

See also

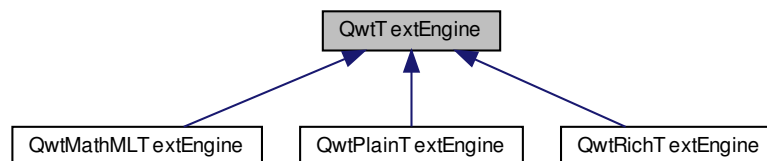
[setFont\(\)](#), [font\(\)](#), [PaintAttributes](#)

12.126 QwtTextEngine Class Reference

Abstract base class for rendering text strings.

```
#include <qwt_text_engine.h>
```

Inheritance diagram for QwtTextEngine:



Public Member Functions

- virtual [~QwtTextEngine](#) ()
Destructor.
- virtual double [heightForWidth](#) (const QFont &font, int flags, const QString &text, double width) const =0
- virtual QSizeF [textSize](#) (const QFont &font, int flags, const QString &text) const =0
- virtual bool [mightRender](#) (const QString &text) const =0
- virtual void [textMargins](#) (const QFont &font, const QString &text, double &left, double &right, double &top, double &bottom) const =0
- virtual void [draw](#) (QPainter *painter, const QRectF &rect, int flags, const QString &text) const =0

Protected Member Functions

- [QwtTextEngine \(\)](#)
Constructor.

12.126.1 Detailed Description

Abstract base class for rendering text strings.

A text engine is responsible for rendering texts for a specific text format. They are used by [QwtText](#) to render a text.

[QwtPlainTextEngine](#) and [QwtRichTextEngine](#) are part of the Qwt library. The implementation of [QwtMathMLTextEngine](#) uses code from the Qt solution package. Because of license implications it is built into a separate library.

See also

[QwtText::setTextEngine\(\)](#)

12.126.2 Member Function Documentation

12.126.2.1 draw()

```
virtual void QwtTextEngine::draw (
    QPainter * painter,
    const QRectF & rect,
    int flags,
    const QString & text ) const [pure virtual]
```

Draw the text in a clipping rectangle

Parameters

<i>painter</i>	Painter
<i>rect</i>	Clipping rectangle
<i>flags</i>	Bitwise OR of the flags like in for QPainter::drawText()
<i>text</i>	Text to be rendered

Implemented in [QwtRichTextEngine](#), [QwtPlainTextEngine](#), and [QwtMathMLTextEngine](#).

12.126.2.2 heightForWidth()

```
virtual double QwtTextEngine::heightForWidth (
    const QFont & font,
    int flags,
    const QString & text,
    double width ) const [pure virtual]
```

Find the height for a given width

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags used like in QPainter::drawText
<i>text</i>	Text to be rendered
<i>width</i>	Width

Returns

Calculated height

Implemented in [QwtRichTextEngine](#), [QwtPlainTextEngine](#), and [QwtMathMLTextEngine](#).

12.126.2.3 mightRender()

```
virtual bool QwtTextEngine::mightRender (
    const QString & text ) const [pure virtual]
```

Test if a string can be rendered by this text engine

Parameters

<i>text</i>	Text to be tested
-------------	-------------------

Returns

true, if it can be rendered

Implemented in [QwtRichTextEngine](#), [QwtPlainTextEngine](#), and [QwtMathMLTextEngine](#).

12.126.2.4 textMargins()

```
virtual void QwtTextEngine::textMargins (
    const QFont & font,
    const QString & text,
    double & left,
    double & right,
    double & top,
    double & bottom ) const [pure virtual]
```

Return margins around the texts

The textSize might include margins around the text, like QFontMetrics::descent(). In situations where texts need to be aligned in detail, knowing these margins might improve the layout calculations.

Parameters

<i>font</i>	Font of the text
<i>text</i>	Text to be rendered
<i>left</i>	Return value for the left margin
<i>right</i>	Return value for the right margin
<i>top</i>	Return value for the top margin
<i>bottom</i>	Return value for the bottom margin

Implemented in [QwtRichTextEngine](#), [QwtPlainTextEngine](#), and [QwtMathMLTextEngine](#).

12.126.2.5 `textSize()`

```
virtual QSizeF QwtTextEngine::textSize (
    const QFont & font,
    int flags,
    const QString & text ) const [pure virtual]
```

Returns the size, that is needed to render text

Parameters

<i>font</i>	Font of the text
<i>flags</i>	Bitwise OR of the flags like in for QPainter::drawText
<i>text</i>	Text to be rendered

Returns

Calculated size

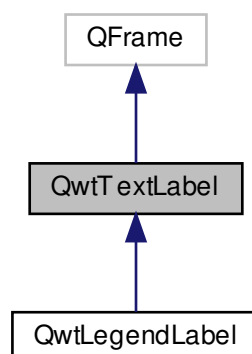
Implemented in [QwtRichTextEngine](#), [QwtPlainTextEngine](#), and [QwtMathMLTextEngine](#).

12.127 QwtTextLabel Class Reference

A Widget which displays a [QwtText](#).

```
#include <qwt_text_label.h>
```

Inheritance diagram for QwtTextLabel:



Public Slots

- void [setText](#) (const QString &, [QwtText::TextFormat](#) textFormat=[QwtText::AutoText](#))
- virtual void [setText](#) (const [QwtText](#) &)
- void [clear](#) ()

Clear the text and all [QwtText](#) attributes.

Public Member Functions

- [QwtTextLabel](#) (QWidget *parent=NULL)
- [QwtTextLabel](#) (const [QwtText](#) &, QWidget *parent=NULL)
- virtual [~QwtTextLabel](#) ()

Destructor.

- void [setPlainText](#) (const QString &)
- QString [plainText](#) () const
- const [QwtText](#) & [text](#) () const

Return the text.

- int [indent](#) () const

Return label's text indent in pixels.

- void [setIndent](#) (int)

- int [margin](#) () const

Return label's text margin in pixels.

- void [setMargin](#) (int)

- virtual QSize [sizeHint](#) () const

Return a size hint.

- virtual QSize [minimumSizeHint](#) () const

Return a minimum size hint.

- virtual int [heightForWidth](#) (int) const

- QRect [textRect](#) () const

- virtual void [drawText](#) (QPainter *, const QRectF &)

Redraw the text.

Protected Member Functions

- virtual void [paintEvent](#) (QPaintEvent *)
- virtual void [drawContents](#) (QPainter *)

Redraw the text and focus indicator.

12.127.1 Detailed Description

A Widget which displays a [QwtText](#).

12.127.2 Constructor & Destructor Documentation

12.127.2.1 QwtTextLabel() [1/2]

```
QwtTextLabel::QwtTextLabel (
    QWidget * parent = NULL ) [explicit]
```

Constructs an empty label.

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.127.2.2 QwtTextLabel() [2/2]

```
QwtTextLabel::QwtTextLabel (
    const QwtText & text,
    QWidget * parent = NULL ) [explicit]
```

Constructs a label that displays the text, text

Parameters

<i>parent</i>	Parent widget
<i>text</i>	Text

12.127.3 Member Function Documentation**12.127.3.1 heightForWidth()**

```
int QwtTextLabel::heightForWidth (
    int width ) const [virtual]
```

Parameters

<i>width</i>	Width
--------------	-------

Returns

Preferred height for this widget, given the width.

12.127.3.2 paintEvent()

```
void QwtTextLabel::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Qt paint event

Parameters

<i>event</i>	Paint event
--------------	-------------

Reimplemented in [QwtLegendLabel](#).

12.127.3.3 `plainText()`

```
QString QwtTextLabel::plainText ( ) const
```

Interface for the designer plugin

Returns

Text as plain text

See also

[setPlainText\(\)](#), [text\(\)](#)

12.127.3.4 `setIndent()`

```
void QwtTextLabel::setIndent (
    int indent )
```

Set label's text indent in pixels

Parameters

<i>indent</i>	Indentation in pixels
---------------	-----------------------

12.127.3.5 `setMargin()`

```
void QwtTextLabel::setMargin (
    int margin )
```

Set label's margin in pixels

Parameters

<i>margin</i>	Margin in pixels
---------------	------------------

12.127.3.6 `setPlainText()`

```
void QwtTextLabel::setPlainText (
    const QString & text )
```

Interface for the designer plugin - does the same as [setText\(\)](#)

See also

[plainText\(\)](#)

12.127.3.7 `setText` [1/2]

```
void QwtTextLabel::setText (
    const QString & text,
    QwtText::TextFormat textFormat = QwtText::AutoText ) [slot]
```

Change the label's text, keeping all other [QwtText](#) attributes

Parameters

<i>text</i>	New text
<i>textFormat</i>	Format of text

See also

[QwtText](#)

12.127.3.8 `setText` [2/2]

```
void QwtTextLabel::setText (
    const QwtText & text ) [virtual], [slot]
```

Change the label's text

Parameters

<i>text</i>	New text
-------------	----------

Reimplemented in [QwtLegendLabel](#).

12.127.3.9 `textRect()`

```
QRect QwtTextLabel::textRect ( ) const
```

Calculate geometry for the text in widget coordinates

Returns

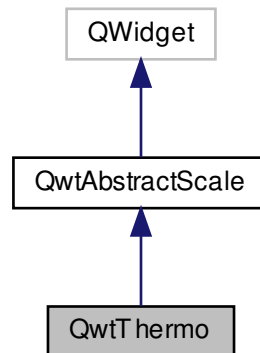
Geometry for the text

12.128 QwtThermo Class Reference

The Thermometer Widget.

```
#include <qwt_thermo.h>
```

Inheritance diagram for QwtThermo:



Public Types

- enum [ScalePosition](#) { [NoScale](#), [LeadingScale](#), [TrailingScale](#) }
- enum [OriginMode](#) { [OriginMinimum](#), [OriginMaximum](#), [OriginCustom](#) }

Public Slots

- virtual void [setValue](#) (double)

Public Member Functions

- [QwtThermo](#) (QWidget *parent=NULL)
- virtual [~QwtThermo](#) ()
Destructor.
- void [setOrientation](#) (Qt::Orientation)
Set the orientation.
- Qt::Orientation [orientation](#) () const
- void [setScalePosition](#) ([ScalePosition](#))
Change the position of the scale.
- [ScalePosition](#) [scalePosition](#) () const
- void [setSpacing](#) (int)
Change the spacing between pipe and scale.
- int [spacing](#) () const
- void [setBorderWidth](#) (int)
- int [borderWidth](#) () const

- void `setOriginMode` (`OriginMode`)
Change how the origin is determined.
- `OriginMode` `originMode` () const
- void `setOrigin` (double)
Specifies the custom origin.
- double `origin` () const
- void `setFillBrush` (const `QBrush` &)
Change the brush of the liquid.
- `QBrush` `fillBrush` () const
- void `setAlarmBrush` (const `QBrush` &)
Specify the liquid brush above the alarm threshold.
- `QBrush` `alarmBrush` () const
- void `setAlarmLevel` (double)
- double `alarmLevel` () const
- void `setAlarmEnabled` (bool)
Enable or disable the alarm threshold.
- bool `alarmEnabled` () const
- void `setColorMap` (`QwtColorMap` *)
Assign a color map for the fill color.
- `QwtColorMap` * `colorMap` ()
- const `QwtColorMap` * `colorMap` () const
- void `setPipeWidth` (int)
- int `pipeWidth` () const
- void `setRangeFlags` (`QwtInterval::BorderFlags`)
Exclude/Include min/max values.
- `QwtInterval::BorderFlags` `rangeFlags` () const
- double `value` () const
Return the value.
- virtual `QSize` `sizeHint` () const
- virtual `QSize` `minimumSizeHint` () const
- void `setScaleDraw` (`QwtScaleDraw` *)
Set a scale draw.
- const `QwtScaleDraw` * `scaleDraw` () const

Protected Member Functions

- virtual void `drawLiquid` (`QPainter` *, const `QRect` &) const
- virtual void `scaleChange` ()
Notify a scale change.
- virtual void `paintEvent` (`QPaintEvent` *)
- virtual void `resizeEvent` (`QResizeEvent` *)
- virtual void `changeEvent` (`QEvent` *)
- `QwtScaleDraw` * `scaleDraw` ()
- `QRect` `pipeRect` () const
- `QRect` `fillRect` (const `QRect` &) const
Calculate the filled rectangle of the pipe.
- `QRect` `alarmRect` (const `QRect` &) const
Calculate the alarm rectangle of the pipe.

12.128.1 Detailed Description

The Thermometer Widget.

[QwtThermo](#) is a widget which displays a value in an interval. It supports:

- a horizontal or vertical layout;
- a range;
- a scale;
- an alarm level.

The fill colors might be calculated from an optional color map. If no color map has been assigned [QwtThermo](#) uses the following colors/brushes from the widget palette:

- `QPalette::Base` Background of the pipe
- `QPalette::ButtonText` Fill brush below the alarm level
- `QPalette::Highlight` Fill brush for the values above the alarm level
- `QPalette::WindowText` For the axis of the scale
- `QPalette::Text` For the labels of the scale

12.128.2 Member Enumeration Documentation

12.128.2.1 OriginMode

enum [QwtThermo::OriginMode](#)

Origin mode. This property specifies where the beginning of the liquid is placed.

See also

[setOriginMode\(\)](#), [setOrigin\(\)](#)

Enumerator

OriginMinimum	The origin is the minimum of the scale.
OriginMaximum	The origin is the maximum of the scale.
OriginCustom	The origin is specified using the origin() property.

12.128.2.2 ScalePosition

enum [QwtThermo::ScalePosition](#)

Position of the scale

See also

[setScalePosition\(\)](#), [setOrientation\(\)](#)

Enumerator

NoScale	The slider has no scale.
LeadingScale	The scale is right of a vertical or below of a horizontal slider.
TrailingScale	The scale is left of a vertical or above of a horizontal slider.

12.128.3 Constructor & Destructor Documentation

12.128.3.1 QwtThermo()

```
QwtThermo::QwtThermo (
    QWidget * parent = NULL ) [explicit]
```

Constructor

Parameters

<i>parent</i>	Parent widget
---------------	---------------

12.128.4 Member Function Documentation

12.128.4.1 alarmBrush()

```
QBrush QwtThermo::alarmBrush ( ) const
```

Returns

Liquid brush (QPalette::Highlight) above the alarm threshold.

See also

[setAlarmBrush\(\)](#), [QWidget::palette\(\)](#)

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.2 alarmEnabled()

```
bool QwtThermo::alarmEnabled ( ) const
```

Returns

True, when the alarm threshold is enabled.

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.3 alarmLevel()

```
double QwtThermo::alarmLevel ( ) const
```

Returns

Alarm threshold.

See also

[setAlarmLevel\(\)](#)

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.4 alarmRect()

```
QRect QwtThermo::alarmRect (
    const QRect & fillRect ) const [protected]
```

Calculate the alarm rectangle of the pipe.

Parameters

<i>fillRect</i>	Filled rectangle in the pipe
-----------------	------------------------------

Returns

Rectangle to be filled with the alarm brush

See also

[pipeRect\(\)](#), [fillRect\(\)](#), [alarmLevel\(\)](#), [alarmBrush\(\)](#)

12.128.4.5 borderWidth()

```
int QwtThermo::borderWidth ( ) const
```

Returns

Border width of the thermometer pipe.

See also

[setBorderWidth\(\)](#)

12.128.4.6 changeEvent()

```
void QwtThermo::changeEvent (
    QEvent * event ) [protected], [virtual]
```

Qt change event handler

Parameters

<i>event</i>	Event
--------------	-------

12.128.4.7 colorMap() [1/2]

```
QwtColorMap * QwtThermo::colorMap ( )
```

Returns

Color map for the fill color

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.8 colorMap() [2/2]

```
const QwtColorMap * QwtThermo::colorMap ( ) const
```

Returns

Color map for the fill color

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.9 drawLiquid()

```
void QwtThermo::drawLiquid (
    QPainter * painter,
    const QRect & pipeRect ) const [protected], [virtual]
```

Redraw the liquid in thermometer pipe.

Parameters

<i>painter</i>	Painter
<i>pipeRect</i>	Bounding rectangle of the pipe without borders

12.128.4.10 fillBrush()

```
QBrush QwtThermo::fillBrush ( ) const
```

Returns

Liquid (QPalette::ButtonText) brush.

See also

[setFillBrush\(\)](#), [QWidget::palette\(\)](#)

12.128.4.11 fillRect()

```
QRect QwtThermo::fillRect (
    const QRect & pipeRect ) const [protected]
```

Calculate the filled rectangle of the pipe.

Parameters

<i>pipeRect</i>	Rectangle of the pipe
-----------------	-----------------------

Returns

Rectangle to be filled (fill and alarm brush)

See also

[pipeRect\(\)](#), [alarmRect\(\)](#)

12.128.4.12 minimumSizeHint()

```
QSize QwtThermo::minimumSizeHint ( ) const [virtual]
```

Returns

Minimum size hint

Warning

The return value depends on the font and the scale.

See also

[sizeHint\(\)](#)

12.128.4.13 orientation()

```
Qt::Orientation QwtThermo::orientation ( ) const
```

Returns

Orientation

See also

[setOrientation\(\)](#)

12.128.4.14 origin()

```
double QwtThermo::origin ( ) const
```

Returns

Origin of the thermo, when OriginCustom is enabled

See also

[setOrigin\(\)](#), [setOriginMode\(\)](#), [originMode\(\)](#)

12.128.4.15 originMode()

```
QwtThermo::OriginMode QwtThermo::originMode ( ) const
```

Returns

Mode, how the origin is determined.

See also

[setOriginMode\(\)](#), [serOrigin\(\)](#), [origin\(\)](#)

12.128.4.16 paintEvent()

```
void QwtThermo::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Paint event handler

Parameters

<i>event</i>	Paint event
--------------	-------------

12.128.4.17 pipeRect()

```
QRect QwtThermo::pipeRect ( ) const [protected]
```

Returns

Bounding rectangle of the pipe (without borders) in widget coordinates

12.128.4.18 pipeWidth()

```
int QwtThermo::pipeWidth ( ) const
```

Returns

Width of the pipe.

See also

[setPipeWidth\(\)](#)

12.128.4.19 rangeFlags()

```
QwtInterval::BorderFlags QwtThermo::rangeFlags ( ) const
```

Returns

Range flags

See also

[setRangeFlags\(\)](#)

12.128.4.20 resizeEvent()

```
void QwtThermo::resizeEvent (
    QResizeEvent * event ) [protected], [virtual]
```

Resize event handler

Parameters

<i>event</i>	Resize event
--------------	--------------

12.128.4.21 scaleDraw() [1/2]

```
const QwtScaleDraw * QwtThermo::scaleDraw ( ) const
```

Returns

the scale draw of the thermo

See also

[setScaleDraw\(\)](#)

12.128.4.22 scaleDraw() [2/2]

```
QwtScaleDraw * QwtThermo::scaleDraw ( ) [protected]
```

Returns

the scale draw of the thermo

See also

[setScaleDraw\(\)](#)

12.128.4.23 scalePosition()

```
QwtThermo::ScalePosition QwtThermo::scalePosition ( ) const
```

Returns

Scale position.

See also

[setScalePosition\(\)](#)

12.128.4.24 setAlarmBrush()

```
void QwtThermo::setAlarmBrush (
    const QBrush & brush )
```

Specify the liquid brush above the alarm threshold.

Changes the QPalette::Highlight brush of the palette.

Parameters

<i>brush</i>	New brush.
--------------	------------

See also

[alarmBrush\(\)](#), [QWidget::setPalette\(\)](#)

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.25 setAlarmEnabled()

```
void QwtThermo::setAlarmEnabled (
    bool on )
```

Enable or disable the alarm threshold.

Parameters

<i>on</i>	true (disabled) or false (enabled)
-----------	------------------------------------

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.26 setAlarmLevel()

```
void QwtThermo::setAlarmLevel (
    double level )
```

Specify the alarm threshold.

Parameters

<i>level</i>	Alarm threshold
--------------	-----------------

See also

[alarmLevel\(\)](#)

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.27 setBorderWidth()

```
void QwtThermo::setBorderWidth (
    int width )
```

Set the border width of the pipe.

Parameters

<i>width</i>	Border width
--------------	--------------

See also

[borderWidth\(\)](#)

12.128.4.28 setColorMap()

```
void QwtThermo::setColorMap (
    QwtColorMap * colorMap )
```

Assign a color map for the fill color.

Parameters

<i>colorMap</i>	Color map
-----------------	-----------

Warning

The alarm threshold has no effect, when a color map has been assigned

12.128.4.29 setFillBrush()

```
void QwtThermo::setFillBrush (
    const QBrush & brush )
```

Change the brush of the liquid.

Changes the QPalette::ButtonText brush of the palette.

Parameters

<i>brush</i>	New brush.
--------------	------------

See also

[fillBrush\(\)](#), [QWidget::setPalette\(\)](#)

12.128.4.30 setOrientation()

```
void QwtThermo::setOrientation (
    Qt::Orientation orientation )
```

Set the orientation.

Parameters

<i>orientation</i>	Allowed values are Qt::Horizontal and Qt::Vertical.
--------------------	---

See also

[orientation\(\)](#), [scalePosition\(\)](#)

12.128.4.31 setOrigin()

```
void QwtThermo::setOrigin (
    double origin )
```

Specifies the custom origin.

If `originMode` is set to `OriginCustom` this property controls where the liquid starts.

Parameters

<i>origin</i>	New origin level
---------------	------------------

See also

[setOriginMode\(\)](#), [originMode\(\)](#), [origin\(\)](#)

12.128.4.32 setOriginMode()

```
void QwtThermo::setOriginMode (
    OriginMode m )
```

Change how the origin is determined.

See also

[originMode\(\)](#), [serOrigin\(\)](#), [origin\(\)](#)

12.128.4.33 setPipeWidth()

```
void QwtThermo::setPipeWidth (
    int width )
```

Change the width of the pipe.

Parameters

<i>width</i>	Width of the pipe
--------------	-------------------

See also

[pipeWidth\(\)](#)12.128.4.34 `setRangeFlags()`

```
void QwtThermo::setRangeFlags (
    QwtInterval::BorderFlags flags )
```

Exclude/Include min/max values.

According to the flags `minValue()` and `maxValue()` are included/excluded from the pipe. In case of an excluded value the corresponding tick is painted 1 pixel off of the [pipeRect\(\)](#).

F.e. when a minimum of 0.0 has to be displayed as an empty pipe the `minValue()` needs to be excluded.

Parameters

<i>flags</i>	Range flags
--------------	-------------

See also

[rangeFlags\(\)](#)12.128.4.35 `setScaleDraw()`

```
void QwtThermo::setScaleDraw (
    QwtScaleDraw * scaleDraw )
```

Set a scale draw.

For changing the labels of the scales, it is necessary to derive from [QwtScaleDraw](#) and overload [QwtScaleDraw::label\(\)](#).

Parameters

<i>scaleDraw</i>	ScaleDraw object, that has to be created with <code>new</code> and will be deleted in <code>~QwtThermo()</code> or the next call of setScaleDraw() .
------------------	--

12.128.4.36 setScalePosition()

```
void QwtThermo::setScalePosition (
    ScalePosition scalePosition )
```

Change the position of the scale.

Parameters

<i>scalePosition</i>	Position of the scale.
----------------------	------------------------

See also

[ScalePosition](#), [scalePosition\(\)](#)

12.128.4.37 setSpacing()

```
void QwtThermo::setSpacing (
    int spacing )
```

Change the spacing between pipe and scale.

A spacing of 0 means, that the backbone of the scale is below the pipe.

The default setting is 3 pixels.

Parameters

<i>spacing</i>	Number of pixels
----------------	------------------

See also

[spacing\(\)](#);

12.128.4.38 setValue

```
void QwtThermo::setValue (
    double value ) [virtual], [slot]
```

Set the current value.

Parameters

<i>value</i>	New Value
--------------	-----------

See also

[value\(\)](#)

12.128.4.39 sizeHint()

```
QSize QwtThermo::sizeHint ( ) const [virtual]
```

Returns

the minimum size hint

See also

[minimumSizeHint\(\)](#)

12.128.4.40 spacing()

```
int QwtThermo::spacing ( ) const
```

Returns

Number of pixels between pipe and scale

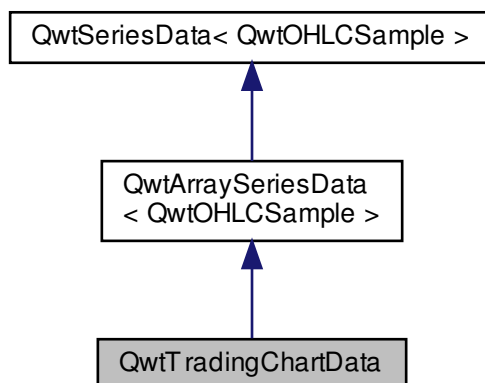
See also

[setSpacing\(\)](#)

12.129 QwtTradingChartData Class Reference

```
#include <qwt_series_data.h>
```

Inheritance diagram for QwtTradingChartData:



Public Member Functions

- [QwtTradingChartData](#) (const QVector< [QwtOHLCSample](#) > &=QVector< [QwtOHLCSample](#) >())
- virtual QRectF [boundingRect](#) () const
Calculate the bounding rectangle.

Additional Inherited Members

12.129.1 Detailed Description

Interface for iterating over an array of OHLC samples

12.129.2 Constructor & Destructor Documentation

12.129.2.1 QwtTradingChartData()

```
QwtTradingChartData::QwtTradingChartData (
    const QVector< QwtOHLCSample > & samples = QVector<QwtOHLCSample>() )
```

Constructor

Parameters

<i>samples</i>	Samples
----------------	---------

12.129.3 Member Function Documentation

12.129.3.1 boundingRect()

```
QRectF QwtTradingChartData::boundingRect ( ) const [virtual]
```

Calculate the bounding rectangle.

The bounding rectangle is calculated once by iterating over all points and is stored for all following requests.

Returns

Bounding rectangle

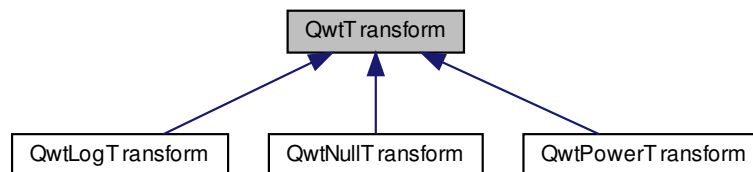
Implements [QwtSeriesData< QwtOHLCSample >](#).

12.130 QwtTransform Class Reference

A transformation between coordinate systems.

```
#include <qwt_transform.h>
```

Inheritance diagram for QwtTransform:



Public Member Functions

- [QwtTransform](#) ()
Constructor.
- virtual [~QwtTransform](#) ()
Destructor.
- virtual double [bounded](#) (double value) const
- virtual double [transform](#) (double value) const =0
- virtual double [invTransform](#) (double value) const =0
- virtual [QwtTransform * copy](#) () const =0
Virtualized copy operation.

12.130.1 Detailed Description

A transformation between coordinate systems.

[QwtTransform](#) manipulates values, when being mapped between the scale and the paint device coordinate system.

A transformation consists of 2 methods:

- transform
- invTransform

where one is the inverse function of the other.

When p1, p2 are the boundaries of the paint device coordinates and s1, s2 the boundaries of the scale, [QwtScaleMap](#) uses the following calculations:

- $p = p1 + (p2 - p1) * (T(s) - T(s1)) / (T(s2) - T(s1));$
- $s = \text{invT} (T(s1) + (T(s2) - T(s1)) * (p - p1) / (p2 - p1));$

12.130.2 Member Function Documentation

12.130.2.1 `bounded()`

```
double QwtTransform::bounded (
    double value ) const [virtual]
```

Modify value to be a valid value for the transformation. The default implementation does nothing.

Parameters

<i>value</i>	Value to be bounded
--------------	---------------------

Returns

value unmodified

Reimplemented in [QwtLogTransform](#).

12.130.2.2 `invTransform()`

```
virtual double QwtTransform::invTransform (
    double value ) const [pure virtual]
```

Inverse transformation function

Parameters

<i>value</i>	Value
--------------	-------

Returns

Modified value

See also

[transform\(\)](#)

Implemented in [QwtPowerTransform](#), [QwtLogTransform](#), and [QwtNullTransform](#).

12.130.2.3 `transform()`

```
virtual double QwtTransform::transform (
    double value ) const [pure virtual]
```

Transformation function

Parameters

<i>value</i>	Value
--------------	-------

Returns

Modified value

See also

[invTransform\(\)](#)

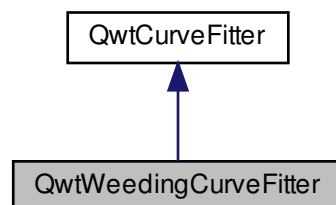
Implemented in [QwtPowerTransform](#), [QwtLogTransform](#), and [QwtNullTransform](#).

12.131 QwtWeedingCurveFitter Class Reference

A curve fitter implementing Douglas and Peucker algorithm.

```
#include <qwt_curve_fitter.h>
```

Inheritance diagram for QwtWeedingCurveFitter:



Public Member Functions

- [QwtWeedingCurveFitter](#) (double [tolerance](#)=1.0)
- virtual [~QwtWeedingCurveFitter](#) ()
Destructor.
- void [setTolerance](#) (double)
- double [tolerance](#) () const
- void [setChunkSize](#) (uint)
- uint [chunkSize](#) () const
- virtual QPolygonF [fitCurve](#) (const QPolygonF &) const

Additional Inherited Members

12.131.1 Detailed Description

A curve fitter implementing Douglas and Peucker algorithm.

The purpose of the Douglas and Peucker algorithm is that given a 'curve' composed of line segments to find a curve not too dissimilar but that has fewer points. The algorithm defines 'too dissimilar' based on the maximum distance (tolerance) between the original curve and the smoothed curve.

The runtime of the algorithm increases non linear (worst case $O(n \cdot n)$) and might be very slow for huge polygons. To avoid performance issues it might be useful to split the polygon ([setChunkSize\(\)](#)) and to run the algorithm for these smaller parts. The disadvantage of having no interpolation at the borders is for most use cases irrelevant.

The smoothed curve consists of a subset of the points that defined the original curve.

In opposite to [QwtSplineCurveFitter](#) the Douglas and Peucker algorithm reduces the number of points. By adjusting the tolerance parameter according to the axis scales [QwtSplineCurveFitter](#) can be used to implement different level of details to speed up painting of curves of many points.

12.131.2 Constructor & Destructor Documentation

12.131.2.1 QwtWeedingCurveFitter()

```
QwtWeedingCurveFitter::QwtWeedingCurveFitter (
    double tolerance = 1.0 )
```

Constructor

Parameters

<i>tolerance</i>	Tolerance
------------------	-----------

See also

[setTolerance\(\)](#), [tolerance\(\)](#)

12.131.3 Member Function Documentation

12.131.3.1 chunkSize()

```
uint QwtWeedingCurveFitter::chunkSize ( ) const
```

Returns

Maximum for the number of points passed to a run of the algorithm - or 0, when unlimited

See also

[setChunkSize\(\)](#)

12.131.3.2 fitCurve()

```
QPolygonF QwtWeedingCurveFitter::fitCurve (
    const QPolygonF & points ) const [virtual]
```

Parameters

<i>points</i>	Series of data points
---------------	-----------------------

Returns

Curve points

Implements [QwtCurveFitter](#).

12.131.3.3 setChunkSize()

```
void QwtWeedingCurveFitter::setChunkSize (
    uint numPoints )
```

Limit the number of points passed to a run of the algorithm

The runtime of the Douglas Peucker algorithm increases non linear with the number of points. For a chunk size > 0 the polygon is split into pieces passed to the algorithm one by one.

Parameters

<i>numPoints</i>	Maximum for the number of points passed to the algorithm
------------------	--

See also

[chunkSize\(\)](#)

12.131.3.4 setTolerance()

```
void QwtWeedingCurveFitter::setTolerance (
    double tolerance )
```

Assign the tolerance

The tolerance is the maximum distance, that is acceptable between the original curve and the smoothed curve.

Increasing the tolerance will reduce the number of the resulting points.

Parameters

<i>tolerance</i>	Tolerance
------------------	-----------

See also

[tolerance\(\)](#)

12.131.3.5 tolerance()

```
double QwtWeedingCurveFitter::tolerance ( ) const
```

Returns

Tolerance

See also

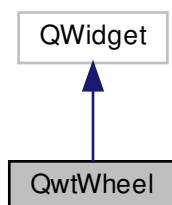
[setTolerance\(\)](#)

12.132 QwtWheel Class Reference

The Wheel Widget.

```
#include <qwt_wheel.h>
```

Inheritance diagram for QwtWheel:



Public Slots

- void [setValue](#) (double)
Set a new value without adjusting to the step raster.
- void [setTotalAngle](#) (double)
Set the total angle which the wheel can be turned.
- void [setViewAngle](#) (double)
Specify the visible portion of the wheel.
- void [setMass](#) (double)
Set the slider's mass for flywheel effect.

Signals

- void `valueChanged` (double `value`)
Notify a change of value.
- void `wheelPressed` ()
- void `wheelReleased` ()
- void `wheelMoved` (double `value`)

Public Member Functions

- `QwtWheel` (QWidget *parent=NULL)
Constructor.
- virtual `~QwtWheel` ()
Destructor.
- double `value` () const
- void `setOrientation` (Qt::Orientation)
Set the wheel's orientation.
- Qt::Orientation `orientation` () const
- double `totalAngle` () const
- double `viewAngle` () const
- void `setTickCount` (int)
Adjust the number of grooves in the wheel's surface.
- int `tickCount` () const
- void `setWheelWidth` (int)
Set the width of the wheel.
- int `wheelWidth` () const
- void `setWheelBorderWidth` (int)
Set the wheel border width of the wheel.
- int `wheelBorderWidth` () const
- void `setBorderWidth` (int)
Set the border width.
- int `borderWidth` () const
- void `setInverted` (bool)
En/Disable inverted appearance.
- bool `isInverted` () const
- void `setWrapping` (bool)
En/Disable wrapping.
- bool `wrapping` () const
- void `setSingleStep` (double)
Set the step size of the counter.
- double `singleStep` () const
- void `setPageStepCount` (int)
Set the page step count.
- int `pageStepCount` () const
- void `setStepAlignment` (bool on)
En/Disable step alignment.
- bool `stepAlignment` () const
- void `setRange` (double min, double max)
Set the minimum and maximum values.
- void `setMinimum` (double)
- double `minimum` () const
- void `setMaximum` (double)

- double `maximum` () const
- void `setUpdateInterval` (int)
Specify the update interval when the wheel is flying.
- int `updateInterval` () const
- void `setTracking` (bool)
En/Disable tracking.
- bool `isTracking` () const
- double `mass` () const

Protected Member Functions

- virtual void `paintEvent` (QPaintEvent *)
Qt Paint Event.
- virtual void `mousePressEvent` (QMouseEvent *)
Mouse press event handler.
- virtual void `mouseReleaseEvent` (QMouseEvent *)
Mouse Release Event handler.
- virtual void `mouseMoveEvent` (QMouseEvent *)
Mouse Move Event handler.
- virtual void `keyPressEvent` (QKeyEvent *)
- virtual void `wheelEvent` (QWheelEvent *)
Handle wheel events.
- virtual void `timerEvent` (QTimerEvent *)
Qt timer event.
- void `stopFlying` ()
Stop the flying movement of the wheel.
- QRect `wheelRect` () const
- virtual QSize `sizeHint` () const
- virtual QSize `minimumSizeHint` () const
- virtual void `drawTicks` (QPainter *, const QRectF &)
- virtual void `drawWheelBackground` (QPainter *, const QRectF &)
- virtual double `valueAt` (const QPoint &) const

12.132.1 Detailed Description

The Wheel Widget.

The wheel widget can be used to change values over a very large range in very small steps. Using the `setMass()` member, it can be configured as a flying wheel.

The default range of the wheel is [0.0, 100.0]

See also

The radio example.

12.132.2 Member Function Documentation

12.132.2.1 borderWidth()

```
int QwtWheel::borderWidth ( ) const
```

Returns

Border width

See also

[setBorderWidth\(\)](#)

12.132.2.2 drawTicks()

```
void QwtWheel::drawTicks (
    QPainter * painter,
    const QRectF & rect ) [protected], [virtual]
```

Draw the Wheel's ticks

Parameters

<i>painter</i>	Painter
<i>rect</i>	Geometry for the wheel

12.132.2.3 drawWheelBackground()

```
void QwtWheel::drawWheelBackground (
    QPainter * painter,
    const QRectF & rect ) [protected], [virtual]
```

Draw the Wheel's background gradient

Parameters

<i>painter</i>	Painter
<i>rect</i>	Geometry for the wheel

12.132.2.4 isInverted()

```
bool QwtWheel::isInverted ( ) const
```

Returns

True, when the wheel is inverted

See also

[setInverted\(\)](#)

12.132.2.5 isTracking()

```
bool QwtWheel::isTracking ( ) const
```

Returns

True, when tracking is enabled

See also

[setTracking\(\)](#), [valueChanged\(\)](#), [wheelMoved\(\)](#)

12.132.2.6 keyPressEvent()

```
void QwtWheel::keyPressEvent (
    QKeyEvent * event ) [protected], [virtual]
```

Handle key events

- Qt::Key_Home
Step to [minimum\(\)](#)
- Qt::Key_End
Step to [maximum\(\)](#)
- Qt::Key_Up
In case of a horizontal or not inverted vertical wheel the value will be incremented by the step size. For an inverted vertical wheel the value will be decremented by the step size.
- Qt::Key_Down
In case of a horizontal or not inverted vertical wheel the value will be decremented by the step size. For an inverted vertical wheel the value will be incremented by the step size.
- Qt::Key_PageUp
The value will be incremented by `pageStepSize() * singleStepSize()`.
- Qt::Key_PageDown
The value will be decremented by `pageStepSize() * singleStepSize()`.

Parameters

<i>event</i>	Key event
--------------	-----------

12.132.2.7 mass()

```
double QwtWheel::mass ( ) const
```

Returns

mass

See also

[setMass\(\)](#)

12.132.2.8 maximum()

```
double QwtWheel::maximum ( ) const
```

Returns

The maximum of the range

See also

[setRange\(\)](#), [setMaximum\(\)](#), [minimum\(\)](#)

12.132.2.9 minimum()

```
double QwtWheel::minimum ( ) const
```

Returns

The minimum of the range

See also

[setRange\(\)](#), [setMinimum\(\)](#), [maximum\(\)](#)

12.132.2.10 minimumSizeHint()

```
QSize QwtWheel::minimumSizeHint ( ) const [protected], [virtual]
```

Returns

Minimum size hint

Warning

The return value is based on the wheel width.

12.132.2.11 mouseMoveEvent()

```
void QwtWheel::mouseMoveEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse Move Event handler.

Turn the wheel according to the mouse position

Parameters

<i>event</i>	Mouse event
--------------	-------------

12.132.2.12 mousePressEvent()

```
void QwtWheel::mousePressEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse press event handler.

Start movement of the wheel.

Parameters

<i>event</i>	Mouse event
--------------	-------------

12.132.2.13 mouseReleaseEvent()

```
void QwtWheel::mouseReleaseEvent (
    QMouseEvent * event ) [protected], [virtual]
```

Mouse Release Event handler.

When the wheel has no mass the movement of the wheel stops, otherwise it starts flying.

Parameters

<i>event</i>	Mouse event
--------------	-------------

12.132.2.14 orientation()

```
Qt::Orientation QwtWheel::orientation ( ) const
```

Returns

Orientation

See also

[setOrientation\(\)](#)

12.132.2.15 pageStepCount()

```
int QwtWheel::pageStepCount ( ) const
```

Returns

Page step count

See also

[setPageStepCount\(\)](#), [singleStep\(\)](#)

12.132.2.16 paintEvent()

```
void QwtWheel::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Qt Paint Event.

Parameters

<i>event</i>	Paint event
--------------	-------------

12.132.2.17 setBorderWidth()

```
void QwtWheel::setBorderWidth (
    int width )
```

Set the border width.

The border defaults to 2.

Parameters

<i>width</i>	Border width
--------------	--------------

See also

[borderWidth\(\)](#)

12.132.2.18 setInverted()

```
void QwtWheel::setInverted (
    bool on )
```

En/Disable inverted appearance.

An inverted wheel increases its values in the opposite direction. The direction of an inverted horizontal wheel will be from right to left an inverted vertical wheel will increase from bottom to top.

Parameters

<i>on</i>	En/Disable inverted appearance
-----------	--------------------------------

See also

[isInverted\(\)](#)

12.132.2.19 setMass

```
void QwtWheel::setMass (
    double mass ) [slot]
```

Set the slider's mass for flywheel effect.

If the slider's mass is greater than 0, it will continue to move after the mouse button has been released. Its speed decreases with time at a rate depending on the slider's mass. A large mass means that it will continue to move for a long time.

Derived widgets may overload this function to make it public.

Parameters

<i>mass</i>	New mass in kg
-------------	----------------

See also

[mass\(\)](#)

12.132.2.20 setMaximum()

```
void QwtWheel::setMaximum (
    double value )
```

Set the maximum value of the range

Parameters

<i>value</i>	Maximum value
--------------	---------------

See also

[setRange\(\)](#), [setMinimum\(\)](#), [maximum\(\)](#)

12.132.2.21 setMinimum()

```
void QwtWheel::setMinimum (
    double value )
```

Set the minimum value of the range

Parameters

<i>value</i>	Minimum value
--------------	---------------

See also

[setRange\(\)](#), [setMaximum\(\)](#), [minimum\(\)](#)

Note

The maximum is adjusted if necessary to ensure that the range remains valid.

12.132.2.22 setOrientation()

```
void QwtWheel::setOrientation (
    Qt::Orientation orientation )
```

Set the wheel's orientation.

The default orientation is Qt::Horizontal.

Parameters

<i>orientation</i>	Qt::Horizontal or Qt::Vertical.
--------------------	---------------------------------

See also

[orientation\(\)](#)

12.132.2.23 setPageStepCount()

```
void QwtWheel::setPageStepCount (
    int count )
```

Set the page step count.

pageStepCount is a multiplier for the single step size that typically corresponds to the user pressing PageUp or PageDown.

A value of 0 disables page stepping.

The default value is 1.

Parameters

<i>count</i>	Multiplicator for the single step size
--------------	--

See also

[pageStepCount\(\)](#), [setSingleStep\(\)](#)

12.132.2.24 `setRange()`

```
void QwtWheel::setRange (
    double min,
    double max )
```

Set the minimum and maximum values.

The maximum is adjusted if necessary to ensure that the range remains valid. The value might be modified to be inside of the range.

Parameters

<i>min</i>	Minimum value
<i>max</i>	Maximum value

See also

[minimum\(\)](#), [maximum\(\)](#)

12.132.2.25 `setSingleStep()`

```
void QwtWheel::setSingleStep (
    double stepSize )
```

Set the step size of the counter.

A value ≤ 0.0 disables stepping

Parameters

<i>stepSize</i>	Single step size
-----------------	------------------

See also

[singleStep\(\)](#), [setPageStepCount\(\)](#)

12.132.2.26 `setStepAlignment()`

```
void QwtWheel::setStepAlignment (
    bool on )
```

En/Disable step alignment.

When step alignment is enabled value changes initiated by user input (mouse, keyboard, wheel) are aligned to the multiples of the single step.

Parameters

<i>on</i>	On/Off
-----------	--------

See also

[stepAlignment\(\)](#), [setSingleStep\(\)](#)

12.132.2.27 `setTickCount()`

```
void QwtWheel::setTickCount (
    int count )
```

Adjust the number of grooves in the wheel's surface.

The number of grooves is limited to $6 \leq \text{count} \leq 50$. Values outside this range will be clipped. The default value is 10.

Parameters

<i>count</i>	Number of grooves per 360 degrees
--------------	-----------------------------------

See also

[tickCount\(\)](#)

12.132.2.28 `setTotalAngle`

```
void QwtWheel::setTotalAngle (
    double angle ) [slot]
```

Set the total angle which the wheel can be turned.

One full turn of the wheel corresponds to an angle of 360 degrees. A total angle of $n \cdot 360$ degrees means that the wheel has to be turned n times around its axis to get from the minimum value to the maximum value.

The default setting of the total angle is 360 degrees.

Parameters

<i>angle</i>	total angle in degrees
--------------	------------------------

See also

[totalAngle\(\)](#)12.132.2.29 `setTracking()`

```
void QwtWheel::setTracking (
    bool enable )
```

En/Disable tracking.

If tracking is enabled (the default), the wheel emits the [valueChanged\(\)](#) signal while the wheel is moving. If tracking is disabled, the wheel emits the [valueChanged\(\)](#) signal only when the wheel movement is terminated.

The [wheelMoved\(\)](#) signal is emitted regardless id tracking is enabled or not.

Parameters

<i>enable</i>	On/Off
---------------	--------

See also

[isTracking\(\)](#)12.132.2.30 `setUpdateInterval()`

```
void QwtWheel::setUpdateInterval (
    int interval )
```

Specify the update interval when the wheel is flying.

Default and minimum value is 50 ms.

Parameters

<i>interval</i>	Interval in milliseconds
-----------------	--------------------------

See also

[updateInterval\(\)](#), [setMass\(\)](#), [setTracking\(\)](#)

12.132.2.31 setValue

```
void QwtWheel::setValue (
    double value ) [slot]
```

Set a new value without adjusting to the step raster.

Parameters

<i>value</i>	New value
--------------	-----------

See also

[value\(\)](#), [valueChanged\(\)](#)

Warning

The value is clipped when it lies outside the range.

12.132.2.32 setViewAngle

```
void QwtWheel::setViewAngle (
    double angle ) [slot]
```

Specify the visible portion of the wheel.

You may use this function for fine-tuning the appearance of the wheel. The default value is 175 degrees. The value is limited from 10 to 175 degrees.

Parameters

<i>angle</i>	Visible angle in degrees
--------------	--------------------------

See also

[viewAngle\(\)](#), [setTotalAngle\(\)](#)

12.132.2.33 setWheelBorderWidth()

```
void QwtWheel::setWheelBorderWidth (
    int borderWidth )
```

Set the wheel border width of the wheel.

The wheel border must not be smaller than 1 and is limited in dependence on the wheel's size. Values outside the allowed range will be clipped.

The wheel border defaults to 2.

Parameters

<i>borderWidth</i>	Border width
--------------------	--------------

See also

`internalBorder()`

12.132.2.34 `setWheelWidth()`

```
void QwtWheel::setWheelWidth (
    int width )
```

Set the width of the wheel.

Corresponds to the wheel height for horizontal orientation, and the wheel width for vertical orientation.

Parameters

<i>width</i>	the wheel's width
--------------	-------------------

See also

[wheelWidth\(\)](#)

12.132.2.35 `setWrapping()`

```
void QwtWheel::setWrapping (
    bool on )
```

En/Disable wrapping.

If wrapping is true stepping up from [maximum\(\)](#) value will take you to the [minimum\(\)](#) value and vice versa.

Parameters

<i>on</i>	En/Disable wrapping
-----------	---------------------

See also

[wrapping\(\)](#)

12.132.2.36 singleStep()

```
double QwtWheel::singleStep ( ) const
```

Returns

Single step size

See also

[setSingleStep\(\)](#)

12.132.2.37 sizeHint()

```
QSize QwtWheel::sizeHint ( ) const [protected], [virtual]
```

Returns

a size hint

12.132.2.38 stepAlignment()

```
bool QwtWheel::stepAlignment ( ) const
```

Returns

True, when the step alignment is enabled

See also

[setStepAlignment\(\)](#), [singleStep\(\)](#)

12.132.2.39 tickCount()

```
int QwtWheel::tickCount ( ) const
```

Returns

Number of grooves in the wheel's surface.

See also

[setTickCnt\(\)](#)

12.132.2.40 timerEvent()

```
void QwtWheel::timerEvent (
    QTimerEvent * event ) [protected], [virtual]
```

Qt timer event.

The flying wheel effect is implemented using a timer

Parameters

<i>event</i>	Timer event
--------------	-------------

See also

[updateInterval\(\)](#)

12.132.2.41 totalAngle()

```
double QwtWheel::totalAngle ( ) const
```

Returns

Total angle which the wheel can be turned.

See also

[setTotalAngle\(\)](#)

12.132.2.42 updateInterval()

```
int QwtWheel::updateInterval ( ) const
```

Returns

Update interval when the wheel is flying

See also

[setUpdateInterval\(\)](#), [mass\(\)](#), [isTracking\(\)](#)

12.132.2.43 value()

```
double QwtWheel::value ( ) const
```

Returns

Current value of the wheel

See also

[setValue\(\)](#), [valueChanged\(\)](#)

12.132.2.44 valueAt()

```
double QwtWheel::valueAt (
    const QPoint & pos ) const [protected], [virtual]
```

Determine the value corresponding to a specified point

Parameters

<i>pos</i>	Position
------------	----------

Returns

Value corresponding to *pos*

12.132.2.45 valueChanged

```
void QwtWheel::valueChanged (
    double value ) [signal]
```

Notify a change of value.

When tracking is enabled this signal will be emitted every time the value changes.

Parameters

<i>value</i>	new value
--------------	-----------

See also

[setTracking\(\)](#)

12.132.2.46 viewAngle()

```
double QwtWheel::viewAngle ( ) const
```

Returns

Visible portion of the wheel

See also

[setViewAngle\(\)](#), [totalAngle\(\)](#)

12.132.2.47 wheelBorderWidth()

```
int QwtWheel::wheelBorderWidth ( ) const
```

Returns

Wheel border width

See also

[setWheelBorderWidth\(\)](#)

12.132.2.48 wheelEvent()

```
void QwtWheel::wheelEvent (
    QWheelEvent * event ) [protected], [virtual]
```

Handle wheel events.

In/Decrement the value

Parameters

<i>event</i>	Wheel event
--------------	-------------

12.132.2.49 wheelMoved

```
void QwtWheel::wheelMoved (
    double value ) [signal]
```

This signal is emitted when the user moves the wheel with the mouse.

Parameters

<i>value</i>	new value
--------------	-----------

12.132.2.50 wheelPressed

```
void QwtWheel::wheelPressed ( ) [signal]
```

This signal is emitted when the user presses the the wheel with the mouse

12.132.2.51 wheelRect()

```
QRect QwtWheel::wheelRect ( ) const [protected]
```

Returns

Rectangle of the wheel without the outer border

12.132.2.52 wheelReleased

```
void QwtWheel::wheelReleased ( ) [signal]
```

This signal is emitted when the user releases the mouse

12.132.2.53 wheelWidth()

```
int QwtWheel::wheelWidth ( ) const
```

Returns

Width of the wheel

See also

[setWidth\(\)](#)

12.132.2.54 wrapping()

```
bool QwtWheel::wrapping ( ) const
```

Returns

True, when wrapping is set

See also

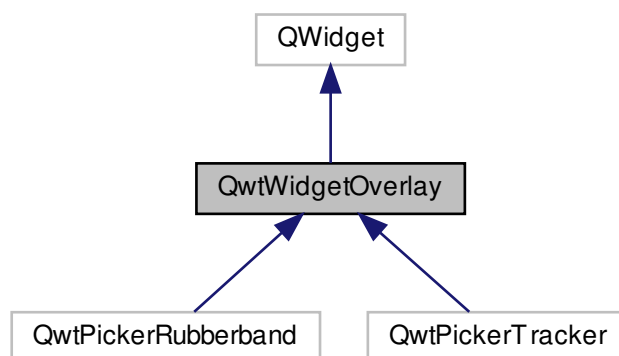
[setWrapping\(\)](#)

12.133 QwtWidgetOverlay Class Reference

An overlay for a widget.

```
#include <qwt_widget_overlay.h>
```

Inheritance diagram for QwtWidgetOverlay:



Public Types

- enum [MaskMode](#) { [NoMask](#), [MaskHint](#), [AlphaMask](#) }
Mask mode.
- enum [RenderMode](#) { [AutoRenderMode](#), [CopyAlphaMask](#), [DrawOverlay](#) }
Render mode.

Public Member Functions

- [QwtWidgetOverlay](#) (QWidget *)
Constructor.
- virtual [~QwtWidgetOverlay](#) ()
Destructor.
- void [setMaskMode](#) ([MaskMode](#))
Specify how to find the mask for the overlay.
- [MaskMode](#) [maskMode](#) () const
- void [setRenderMode](#) ([RenderMode](#))
- [RenderMode](#) [renderMode](#) () const
- void [updateOverlay](#) ()
- virtual bool [eventFilter](#) (QObject *, QEvent *)
Event filter.

Protected Member Functions

- virtual void [paintEvent](#) (QPaintEvent *event)
- virtual void [resizeEvent](#) (QResizeEvent *event)
- virtual QRegion [maskHint](#) () const
Calculate an approximation for the mask.
- virtual void [drawOverlay](#) (QPainter *painter) const =0

12.133.1 Detailed Description

An overlay for a widget.

The main use case of an widget overlay is to avoid heavy repaint operation of the widget below.

F.e. in combination with the plot canvas an overlay avoid replots as the content of the canvas can be restored from its backing store.

[QwtWidgetOverlay](#) is an abstract base class. Deriving classes are supposed to reimplement the following methods:

- [drawOverlay\(\)](#)
- [maskHint\(\)](#)

Internally [QwtPlotPicker](#) uses overlays for displaying the rubber band and the tracker text.

See also

[QwtPlotCanvas::BackingStore](#)

12.133.2 Member Enumeration Documentation

12.133.2.1 MaskMode

```
enum QwtWidgetOverlay::MaskMode
```

Mask mode.

When using masks the widget below gets paint events for the masked regions of the overlay only. Otherwise Qt triggers full repaints. On less powerful hardware (f.e embedded systems) - or when using the raster paint engine on a remote desktop - bit blitting is a noticeable operation, that needs to be avoided.

If and how to mask depends on how expensive the calculation of the mask is and how many pixels can be excluded by the mask.

The default setting is MaskHint.

See also

[setMaskMode\(\)](#), [maskMode\(\)](#)

Enumerator

NoMask	Don't use a mask.
MaskHint	Use maskHint() as mask. For many situations a fast approximation is good enough and it is not necessary to build a more detailed mask (f.e the bounding rectangle of a text).
AlphaMask	Calculate a mask by checking the alpha values. Sometimes it is not possible to give a fast approximation and the mask needs to be calculated by drawing the overlay and testing the result. When a valid maskHint() is available only pixels inside this approximation are checked.

12.133.2.2 RenderMode

```
enum QwtWidgetOverlay::RenderMode
```

Render mode.

For calculating the alpha mask the overlay has already been painted to a temporary QImage. Instead of rendering the overlay twice this buffer can be copied for drawing the overlay.

On graphic systems using the raster paint engine (QWS, Windows) it means usually copying some memory only. On X11 it results in an expensive operation building a pixmap and for simple overlays it might not be recommended.

Note

The render mode has no effect, when [maskMode\(\)](#) != AlphaMask.

Enumerator

AutoRenderMode	Copy the buffer, when using the raster paint engine.
CopyAlphaMask	Always copy the buffer.
DrawOverlay	Never copy the buffer.

12.133.3 Constructor & Destructor Documentation

12.133.3.1 QwtWidgetOverlay()

```
QwtWidgetOverlay::QwtWidgetOverlay (
    QWidget * widget )
```

Constructor.

Parameters

<i>widget</i>	Parent widget, where the overlay is aligned to
---------------	--

12.133.4 Member Function Documentation

12.133.4.1 drawOverlay()

```
virtual void QwtWidgetOverlay::drawOverlay (
    QPainter * painter ) const [protected], [pure virtual]
```

Draw the widget overlay

Parameters

<i>painter</i>	Painter
----------------	---------

12.133.4.2 eventFilter()

```
bool QwtWidgetOverlay::eventFilter (
    QObject * object,
    QEvent * event ) [virtual]
```

Event filter.

Resize the overlay according to the size of the parent widget.

Parameters

<i>object</i>	Object to be filtered
<i>event</i>	Event

Returns

See `QObject::eventFilter()`

12.133.4.3 maskHint()

```
QRegion QwtWidgetOverlay::maskHint ( ) const [protected], [virtual]
```

Calculate an approximation for the mask.

- **MaskHint** The hint is used as mask.
- **AlphaMask** The hint is used to speed up the algorithm for calculating a mask from non transparent pixels
- **NoMask** The hint is unused.

The default implementation returns an invalid region indicating no hint.

Returns

Hint for the mask

12.133.4.4 maskMode()

```
QwtWidgetOverlay::MaskMode QwtWidgetOverlay::maskMode ( ) const
```

Returns

Mode how to find the mask for the overlay

See also

[setMaskMode\(\)](#)

12.133.4.5 paintEvent()

```
void QwtWidgetOverlay::paintEvent (
    QPaintEvent * event ) [protected], [virtual]
```

Paint event

Parameters

<i>event</i>	Paint event
--------------	-------------

See also[drawOverlay\(\)](#)**12.133.4.6 renderMode()**

```
QwtWidgetOverlay::RenderMode QwtWidgetOverlay::renderMode ( ) const
```

Returns

Render mode

See also[RenderMode](#), [setRenderMode\(\)](#)**12.133.4.7 resizeEvent()**

```
void QwtWidgetOverlay::resizeEvent (
    QResizeEvent * event ) [protected], [virtual]
```

Resize event**Parameters**

<i>event</i>	Resize event
--------------	--------------

12.133.4.8 setMaskMode()

```
void QwtWidgetOverlay::setMaskMode (
    MaskMode mode )
```

Specify how to find the mask for the overlay.

Parameters

<i>mode</i>	New mode
-------------	----------

See also

[maskMode\(\)](#)

12.133.4.9 `setRenderMode()`

```
void QwtWidgetOverlay::setRenderMode (
    RenderMode mode )
```

Set the render mode

Parameters

<i>mode</i>	Render mode
-------------	-------------

See also

[RenderMode](#), [renderMode\(\)](#)

12.133.4.10 `updateOverlay()`

```
void QwtWidgetOverlay::updateOverlay ( )
```

Recalculate the mask and repaint the overlay

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