

QRodSystems

0.0.1

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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Numerical array class	8
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Manager to create objects of different types: scalars, vectors, matroces and surfaces	9
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File Index

3.1 File List

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Declaration of the View3D class	31

Chapter 4

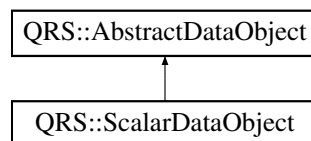
Class Documentation

4.1 QRS::AbstractDataObject Class Reference

Data object which is designed in the way to be represented in a table easily.

```
#include <abstractdataobject.h>
```

Inheritance diagram for QRS::AbstractDataObject:



Public Member Functions

- [AbstractDataObject](#) (DataObjectType type, const QString &name)
Base constructor.
- virtual [AbstractDataObject](#) * **clone** () const =0
- virtual void **addItem** (DataValueType keyParameter)=0
- void [removeItem](#) (DataValueType keyParameter)
Remove an entity with the specified key.
- DataIDType **id** () const
- DataObjectType **type** () const

Static Public Member Functions

- static uint [numberObjects](#) ()
Get a number of created data objects.

Protected Attributes

- const DataObjectType **mType**
- QString **mName**
- DataHolder **mItems**
- DataIDType **mID**

Private Types

- using **DataHolder** = std::unordered_map< DataKeyType, [DataItemType](#) >

Static Private Attributes

- static uint **smNumObjects** = 0

4.1.1 Detailed Description

Data object which is designed in the way to be represented in a table easily.

The documentation for this class was generated from the following files:

- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.cpp](#)

4.2 QRS::Array< T > Class Template Reference

Numerical array class.

```
#include <array.h>
```

Classes

- struct [Row](#)
Proxy class to acquire a row by index.

Public Member Functions

- **Array** (IndexType numRows=1, IndexType numCols=1)
- T * **data** ()
- void [resize](#) (IndexType numRows, IndexType numCols)
Resize and copy previous values if possible.
- IndexType **rows** () const
- IndexType **cols** () const
- IndexType **size** () const
- [Row](#)< T > **operator[]** (IndexType iRow)

Private Attributes

- IndexType **mNumRows**
- IndexType **mNumCols**
- T * **mpData**

Friends

- `template<typename K >`
`QDebug operator<< (QDebug stream, Array< K > &array)`
Print all the values as well as their indices.

4.2.1 Detailed Description

```
template<typename T>
class QRS::Array< T >
```

Numerical array class.

The documentation for this class was generated from the following files:

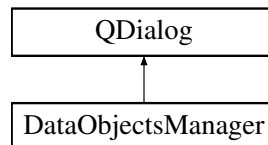
- `/home/qinterfly/Library/Projects/QRodSystems/src/core/array.h`
- `/home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp`

4.3 DataObjectsManager Class Reference

Manager to create objects of different types: scalars, vectors, matroces and surfaces.

```
#include <dataobjectsmanager.h>
```

Inheritance diagram for DataObjectsManager:



Public Slots

- `void apply ()`
Apply all the changes made by a user.
- `void addScalar ()`
Add a scalar object.
- `void addVector ()`
Add a vector object.
- `void addMatrix ()`
Add a matrix object.
- `void addSurface ()`
Add a surface object.

Public Member Functions

- **DataObjectsManager** ([QRS::Project](#) &project, QSettings &settings, QWidget *parent=nullptr)
- void [closeEvent](#) (QCloseEvent *) override
Save settings and delete handling widgets before closing the window.
- void [selectDataObject](#) (int index)
Select a data object from the list.

Private Slots

- void [representSelectedDataObject](#) ()
Represent a selected data object according to its type.

Private Member Functions

- void [createContent](#) ()
Create all the widgets.
- ads::CDockWidget * [createDataTableWidget](#) ()
Create a tabbed widget to interact with data tables.
- ads::CDockWidget * [createDataObjectsWidget](#) ()
Create an object to present all data objects.
- ads::CDockWidget * [createCodeWidget](#) ()
Create a widget enables to code data objects.
- QLayout * [createDialogControls](#) ()
Create dialog controls.
- void [retrieveDataObjects](#) ()
Make a copy of existed data objects.
- void [restoreSettings](#) ()
Restore settings from a file.
- void [saveSettings](#) ()
Save settings to a file.

Private Attributes

- Ui::DataObjectsManager * **mpUi**
- ads::CDockManager * **mpDockManager**
- ads::CDockWidget * **mpDockDataTable**
- QListWidget * **mpListObjects**
- QTreeView * **mpDataTable**
- [QRS::Project](#) & **mProject**
- QSettings & **mSettings**
- std::unordered_map< QRS::DataIDType, [QRS::AbstractDataObject](#) * > **mDataObjects**

4.3.1 Detailed Description

Manager to create objects of different types: scalars, vectors, matroces and surfaces.

The documentation for this class was generated from the following files:

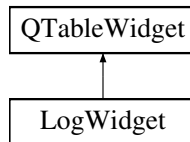
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[dataobjectsmanager.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[dataobjectsmanager.cpp](#)

4.4 LogWidget Class Reference

Log all the messages sent.

```
#include <logwidget.h>
```

Inheritance diagram for LogWidget:



Public Member Functions

- **LogWidget** (QWidget *parent=nullptr)
- void **log** (QtMsgType messageType, const QString &message)
Represent a message sent.

4.4.1 Detailed Description

Log all the messages sent.

The documentation for this class was generated from the following files:

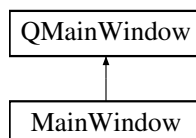
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[logwidget.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[logwidget.cpp](#)

4.5 MainWindow Class Reference

The main window of the program.

```
#include <mainwindow.h>
```

Inheritance diagram for MainWindow:



Public Member Functions

- **MainWindow** (QWidget *parent=nullptr)

Static Public Attributes

- static [LogWidget](#) * **pLogger** = nullptr

Private Slots

- void [aboutProgram](#) ()
Show information about a program.
- void [saveSettings](#) ()
Save the current view state.
- void [restoreSettings](#) ()
Restore a view state from a file.
- void [createDataObjectsManager](#) ()
Show a manager for designing data objects.
- void [createRodPropertiesManager](#) ()
Show a manager to set rod properties based on the created data objects.
- void [createRodConstructorManager](#) ()
Show a manager to create a rod with assigned data properties.

Private Member Functions

- void [initializeWindow](#) ()
Set a state and geometry of [MainWindow](#).
- void [createContent](#) ()
Create all the widgets and corresponding actions.
- ads::CDockWidget * [createProjectHierarchyWidget](#) ()
Create a widget to represent a project hierarchy.
- ads::CDockWidget * [createGLWidget](#) ()
Create an OpenGL widget to render rods.
- ads::CDockWidget * [createLogWidget](#) ()
Create a window for logging.
- ads::CDockWidget * [createPropertiesWidget](#) ()
Create a window to modify properies of selected oberjects.
- void [specifyMenuConnections](#) ()
Set signals and slots for menu actions.

Private Attributes

- Ui::MainWindow * **mpUi**
- ads::CDockManager * **mpDockManager**
- QSharedPointer< QSettings > **mpSettings**
- [DataObjectsManager](#) * **mpDataObjectsManager** = nullptr
- [QRS::Project](#) * **mpProject**
- QString **mLastPath**

4.5.1 Detailed Description

The main window of the program.

The documentation for this class was generated from the following files:

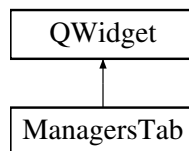
- </home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp>

4.6 ManagersTab Class Reference

A toolbar consisted of object designers.

```
#include <controltabs.h>
```

Inheritance diagram for ManagersTab:



Signals

- void **actionDataObjectsTriggered** ()
- void **actionRodPropertiesTriggered** ()
- void **actionRodConstructorTriggered** ()

Public Member Functions

- [ManagersTab](#) (QWidget *parent=nullptr)
Managers tab constructor.

4.6.1 Detailed Description

A toolbar consisted of object designers.

The documentation for this class was generated from the following files:

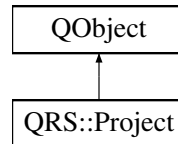
- </home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.cpp>

4.7 QRS::Project Class Reference

[Project](#) class to interact with a created system of rods.

```
#include <project.h>
```

Inheritance diagram for QRS::Project:



Public Slots

- void [addDataObject](#) (DataObjectType type)
Create a data object with the specified type.

Signals

- void **dataObjectAdded** ()

Public Member Functions

- [Project](#) (QString name)
Construct a clean project with the user specified name.
- DataObjects const & **getDataObject** () const
- std::unordered_map< DataIDType, [AbstractDataObject](#) * > [getDataObjects](#) ()
Copy data objects.

Private Attributes

- const QUuid [mID](#)
Unique project identifier.
- QString [mName](#)
Project name.
- QString [mFilePath](#)
Path to a file where a project is stored.
- uint [mNumModified](#) = 0
Number of modifications since last saving.
- DataObjects [mDataObjects](#)
Data objects.

4.7.1 Detailed Description

[Project](#) class to interact with a created system of rods.

The documentation for this class was generated from the following files:

- [/home/qinterfly/Library/Projects/QRodSystems/src/core/project.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/project.cpp](#)

4.8 QRS::Array< T >::Row< U > Struct Template Reference

Proxy class to acquire a row by index.

Public Member Functions

- **Row** (T *pData)
- T & **operator[]** (IndexType iCol)

Public Attributes

- T * **pRow**

4.8.1 Detailed Description

```
template<typename T>
template<typename U>
struct QRS::Array< T >::Row< U >
```

Proxy class to acquire a row by index.

The documentation for this struct was generated from the following file:

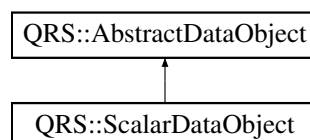
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/array.h](#)

4.9 QRS::ScalarDataObject Class Reference

Scalar data object.

```
#include <scalardataobject.h>
```

Inheritance diagram for QRS::ScalarDataObject:



Public Member Functions

- [ScalarDataObject](#) (const QString &name)
Construct a scalar data object.
- [AbstractDataObject](#) * [clone](#) () const override
Clone a scalar data object.
- void [addItem](#) (DataValueType keyParameter) override
Insert a new item into [ScalarDataObject](#).

Static Public Member Functions

- static uint [numberScalars](#) ()
Get a number of created scalars.

Static Private Attributes

- static uint **smNumScalars** = 0

Additional Inherited Members

4.9.1 Detailed Description

Scalar data object.

The documentation for this class was generated from the following files:

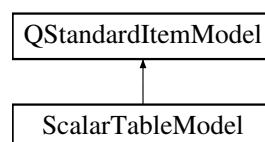
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.cpp](#)

4.10 ScalarTableModel Class Reference

Table model to represent a scalar data object.

```
#include <scalartablemodel.h>
```

Inheritance diagram for ScalarTableModel:



Public Member Functions

- **ScalarTableModel** ([QRS::ScalarDataObject](#) *pScalarDataObject, QWidget *parent=nullptr)

Private Member Functions

- void [updateContent](#) ()
Represent all items contained in a scalar data object.

Private Attributes

- [QRS::ScalarDataObject](#) * **mpScalarDataObject**

4.10.1 Detailed Description

Table model to represent a scalar data object.

The documentation for this class was generated from the following files:

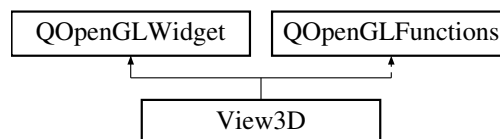
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[scalartablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[scalartablemodel.cpp](#)

4.11 View3D Class Reference

A widget to represent the resulted rod system.

```
#include <view3d.h>
```

Inheritance diagram for View3D:



Public Member Functions

- **View3D** (QWidget *parent=nullptr)

Protected Member Functions

- void [initializeGL](#) () override
Initialize a graphical scene.
- void [paintGL](#) () override
Render its content.

Private Attributes

- bool **mCore**

4.11.1 Detailed Description

A widget to represent the resulted rod system.

The documentation for this class was generated from the following files:

- /home/qinterfly/Library/Projects/QRodSystems/src/render/[view3d.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/render/[view3d.cpp](#)

Chapter 5

File Documentation

5.1 /home/qinterfly/Library/Projects/QRod↔ Systems/src/central/controltabs.cpp File Reference

Implementation of the ControlTabs class.

```
#include <QLayout>
#include <QToolBar>
#include <QIcon>
#include "controltabs.h"
```

5.1.1 Detailed Description

Implementation of the ControlTabs class.

Author

Pavel Lakiza

Date

March 2021

5.2 /home/qinterfly/Library/Projects/QRod↔ Systems/src/central/controltabs.h File Reference

Declaration of the ControlTabs class.

```
#include <QWidget>
```

Classes

- class [ManagersTab](#)

A toolbar consisted of object designers.

5.2.1 Detailed Description

Declaration of the ControlTabs class.

Author

Pavel Lakiza

Date

March 2021

5.3 [/home/qinterfly/Library/Projects/QRod↔](#) Systems/src/central/logwidget.cpp File Reference

Implementation of the [LogWidget](#) class.

```
#include <QHeaderView>
#include <QTime>
#include <QTimer>
#include "logwidget.h"
```

Enumerations

- enum **ColumnType** { kTime , kType , kMessage }

5.3.1 Detailed Description

Implementation of the [LogWidget](#) class.

Author

Pavel Lakiza

Date

March 2021

5.4 /home/qinterfly/Library/Projects/QRod↵ Systems/src/central/logwidget.h File Reference

Declaration of the [LogWidget](#) class.

```
#include <QTableWidget>
```

Classes

- class [LogWidget](#)
Log all the messages sent.

5.4.1 Detailed Description

Declaration of the [LogWidget](#) class.

Author

Pavel Lakiza

Date

March 2021

5.5 /home/qinterfly/Library/Projects/QRod↵ Systems/src/central/mainwindow.cpp File Reference

Implementation of the [MainWindow](#) class.

```
#include <QDesktopWidget>
#include <QToolBar>
#include <QTableWidget>
#include <QTreeView>
#include <QFileSystemModel>
#include <QTextEdit>
#include <QVBoxLayout>
#include <QSettings>
#include <QMessageBox>
#include "DockManager.h"
#include "DockWidget.h"
#include "ads_globals.h"
#include "mainwindow.h"
#include "ui_mainwindow.h"
#include "controltabs.h"
#include "view3d.h"
#include "logwidget.h"
#include "../managers/dataobjectsmanager.h"
```

Functions

- void [moveToCenter](#) (QWidget *pWidget)

Helper function to situate widgets at the center of their parent widgets.

5.5.1 Detailed Description

Implementation of the [MainWindow](#) class.

Author

Pavel Lakiza

Date

March 2021

5.6 [/home/qinterfly/Library/Projects/QRod](#)↔ Systems/src/central/mainwindow.h File Reference

Declaration of the [MainWindow](#) class.

```
#include <QMainWindow>
#include "logwidget.h"
#include "../core/project.h"
```

Classes

- class [MainWindow](#)

The main window of the program.

5.6.1 Detailed Description

Declaration of the [MainWindow](#) class.

Author

Pavel Lakiza

Date

March 2021

5.7 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractdataobject.cpp File Reference

Implementation of the AbstractDataObject class.

```
#include "abstractdataobject.h"
```

5.7.1 Detailed Description

Implementation of the AbstractDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.8 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractdataobject.h File Reference

Declaration of the AbstractDataObject class.

```
#include <QString>
#include <unordered_map>
#include "array.h"
#include "datatypes.h"
```

Classes

- class [QRS::AbstractDataObject](#)

Data object which is designed in the way to be represented in a table easily.

Typedefs

- using **QRS::DataItemType** = Array< DataValueType >

5.8.1 Detailed Description

Declaration of the AbstractDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.9 /home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp File Reference

Implementation of the Array class.

```
#include "array.h"
```

5.9.1 Detailed Description

Implementation of the Array class.

Author

Pavel Lakiza

Date

March 2021

5.10 /home/qinterfly/Library/Projects/QRodSystems/src/core/array.h File Reference

Declaration of the Array class.

```
#include <QDebug>
```

Classes

- class [QRS::Array< T >](#)
Numerical array class.
- struct [QRS::Array< T >::Row< U >](#)
Proxy class to acquire a row by index.

Typedefs

- using [QRS::IndexType](#) = unsigned int

Functions

- template<typename K >
[QDebug QRS::operator<<](#) (QDebug stream, Array< K > &array)
Print all the values as well as their indices.

5.10.1 Detailed Description

Declaration of the Array class.

Author

Pavel Lakiza

Date

March 2021

5.11 /home/qinterfly/Library/Projects/QRodSystems/src/core/datatypes.h File Reference

Specification of data types used in a project.

Typedefs

- using **QRS::DataValueType** = double
- using **QRS::DataKeyType** = double
- using **QRS::DataIDType** = unsigned int

Enumerations

- enum **DataObjectType** { **kScalar** , **kVector** , **kMatrix** , **kSurface** }

5.11.1 Detailed Description

Specification of data types used in a project.

Author

Pavel Lakiza

Date

March 2021

5.12 /home/qinterfly/Library/Projects/QRodSystems/src/core/project.cpp File Reference

Implementation of the [QRS::Project](#) class.

```
#include <QDebug>
#include "project.h"
#include "scalardataobject.h"
```

Functions

- [AbstractDataObject](#) * [createDataObject](#) (DataObjectType type, QString const &name)
Helper function to create DataObject instance by a type and name.

5.12.1 Detailed Description

Implementation of the [QRS::Project](#) class.

Author

Pavel Lakiza

Date

March 2021

5.13 /home/qinterfly/Library/Projects/QRodSystems/src/core/project.h File Reference

Declaration of the [QRS::Project](#) class.

```
#include <QObject>
#include <QUuid>
#include <unordered_map>
#include <memory>
#include "abstractdataobject.h"
#include "array.h"
```

Classes

- class [QRS::Project](#)
Project class to interact with a created system of rods.

Typedefs

- using [QRS::DataObjects](#) = std::unordered_map< DataIDType, std::shared_ptr< AbstractDataObject > >

5.13.1 Detailed Description

Declaration of the [QRS::Project](#) class.

Author

Pavel Lakiza

Date

March 2021

5.14 /home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.cpp File Reference

Implementation of the ScalarDataObject class.

```
#include "scalardataobject.h"
```

5.14.1 Detailed Description

Implementation of the ScalarDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.15 /home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.h File Reference

Declaration of the ScalarDataObject class.

```
#include "abstractdataobject.h"
```

Classes

- class [QRS::ScalarDataObject](#)
Scalar data object.

5.15.1 Detailed Description

Declaration of the ScalarDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.16 /home/qinterfly/Library/Projects/QRodSystems/src/main/main.cpp File Reference

The startup function.

```
#include <QApplication>
#include "mainwindow.h"
```

Functions

- void [throwMessage](#) (QtMsgType type, const QMessageLogContext &, const QString &message)
Log all the messages.
- int [main](#) (int argc, char *argv[])
Entry point.

5.16.1 Detailed Description

The startup function.

Author

Pavel Lakiza

Date

March 2021

5.17 /home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp File Reference

Implementation of the [DataObjectsManager](#) class.

```
#include <QTreeView>
#include <QSettings>
#include <QHBoxLayout>
#include <QToolBar>
#include <QListWidget>
#include <QTextEdit>
#include <QPushButton>
#include <QSpacerItem>
#include "DockManager.h"
#include "DockWidget.h"
#include "dataobjectsmanager.h"
#include "ui_dataobjectsmanager.h"
#include "../core/project.h"
#include "../core/scalardataobject.h"
#include "scalartablemodel.h"
```


5.17.1 Detailed Description

Implementation of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

5.18 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/dataobjectsmanager.h File Reference

Declaration of the [DataObjectsManager](#) class.

```
#include <QSignalMapper>
#include <QDialog>
#include <unordered_map>
#include "../core/datatypes.h"
```

Classes

- class [DataObjectsManager](#)

Manager to create objects of different types: scalars, vectors, matroces and surfaces.

5.18.1 Detailed Description

Declaration of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

5.19 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/scalartablemodel.cpp File Reference

Implementation of the [ScalarTableModel](#) class.

```
#include "scalartablemodel.h"
#include "scalardataobject.h"
#include <QTreeView>
```

5.19.1 Detailed Description

Implementation of the [ScalarTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.20 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/managers/scalartablemodel.h File Reference

Declaration of the [ScalarTableModel](#) class.

```
#include <QStandardItemModel>
```

Classes

- class [ScalarTableModel](#)
Table model to represent a scalar data object.

5.20.1 Detailed Description

Declaration of the [ScalarTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.21 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/render/view3d.cpp File Reference

Implementation of the [View3D](#) class.

```
#include <QOpenGLContext>  
#include <QOpenGLPaintDevice>  
#include <QPainter>  
#include "view3d.h"
```

5.21.1 Detailed Description

Implementation of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

5.22 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.h File Reference

Declaration of the [View3D](#) class.

```
#include <QOpenGLWidget>
#include <QOpenGLFunctions>
```

Classes

- class [View3D](#)
A widget to represent the resulted rod system.

5.22.1 Detailed Description

Declaration of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

