

QRodSystems

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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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QRS::ScalarDataObject . . . . .	??
QRS::SurfaceDataObject . . . . .	??
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## Chapter 2

# Class Index

### 2.1 Class List

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

<a href="#">QRS::AbstractDataObject</a>	Data object which is designed in the way to be represented in a table easily . . . . .	??
<a href="#">QRS::Array&lt; T &gt;</a>	Numerical matrix . . . . .	??
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<a href="#">LogWidget</a>	Log all the messages sent . . . . .	9
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<a href="#">ManagersTab</a>	A toolbar consisted of object designers . . . . .	11
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<a href="#">QRS::SurfaceDataObject</a>	Surface data object . . . . .	??
<a href="#">QRS::VectorDataObject</a>	Vector data object . . . . .	??
<a href="#">View3D</a>	A widget to represent the resulted rod system . . . . .	??





## Chapter 3

# File Index

### 3.1 File List

Here is a list of all documented files with brief descriptions:

/home/qinterfly/Library/Projects/QRodSystems/src/core/ <a href="#">abstractdataobject.cpp</a>	
Implementation of AbstractDataObject class . . . . .	??
/home/qinterfly/Library/Projects/QRodSystems/src/core/ <a href="#">abstractdataobject.h</a>	
Declaration of AbstractDataObject class . . . . .	??
/home/qinterfly/Library/Projects/QRodSystems/src/core/ <a href="#">array.cpp</a>	
Implementation of Matrix class . . . . .	??
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/home/qinterfly/Library/Projects/QRodSystems/src/main/ <a href="#">view3d.h</a>	
Declaration of <a href="#">View3D</a> class . . . . .	??
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## Chapter 4

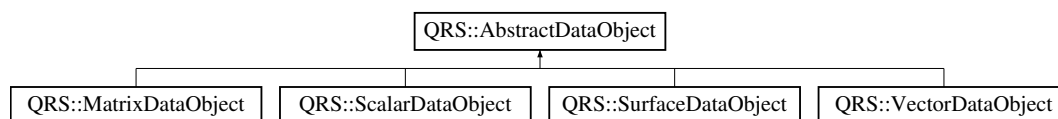
# Class Documentation

### 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.*
- uint **getID** () const
- virtual void **addItem** (DataValueType keyParameter)=0
- void [removeItem](#) (DataValueType keyParameter)  
*Remove an entity with the specified key.*

#### Static Public Member Functions

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

#### Protected Attributes

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

## Private Types

- using **DataHolder** = std::unordered\_map< DataKeyType, [DataItem](#)Type >

## 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 matrix.

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

## Public Types

- using **IndexType** = unsigned int

## Public Member Functions

- **Array** (IndexType numRows=1, IndexType numCols=1)

## Private Attributes

- std::vector< T > **mValues**
- IndexType **mNumRows**
- IndexType **mNumCols**

### 4.2.1 Detailed Description

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

Numerical matrix.

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

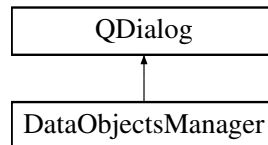
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[array.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[array.cpp](#)

## 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 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.*

### Private Slots

- void [apply](#) ()  
*Apply all the changes made by a user.*
- void [addScalar](#) ()

### Private Member Functions

- void [createContent](#) ()  
*Create all the widgets.*
- ads::CDockWidget \* [createDataTablesWidget](#) ()  
*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 [restoreSettings](#) ()  
*Restore settings from a file.*
- void [saveSettings](#) ()  
*Save settings to a file.*

### Private Attributes

- Ui::DataObjectsManager \* **mpUi**
- ads::CDockManager \* **mpDockManager**
- QTabWidget \* **mpDataTables**
- [QRS::Project](#) & **mProject**
- QSettings & **mSettings**

### 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:

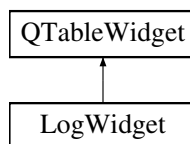
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp>

## 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:

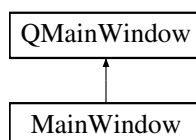
- </home/qinterfly/Library/Projects/QRodSystems/src/main/logwidget.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/main/logwidget.cpp>

## 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 [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 properties of selected objects.*
- 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](#) **mProject**
- QString **mLastPath**

### 4.5.1 Detailed Description

The main window of the program.

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

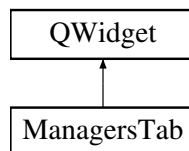
- [/home/qinterfly/Library/Projects/QRodSystems/src/main/mainwindow.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/main/mainwindow.cpp](#)

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

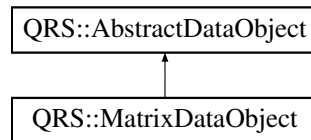


## 4.7 QRS::MatrixDataObject Class Reference

Matrix data object.

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

Inheritance diagram for QRS::MatrixDataObject:



### Public Member Functions

- [MatrixDataObject](#) (const QString &name)  
*Construct a matrix data object.*
- void [addItem](#) (DataValueType keyParameter) override  
*Insert a new item into [MatrixDataObject](#).*

### Additional Inherited Members

#### 4.7.1 Detailed Description

Matrix data object.

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

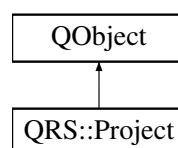
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.cpp](#)

## 4.8 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.*

## Public Member Functions

- [Project](#) (QString name)  
*Construct a clean project with the user specified name.*
- DataObjects & [getDataObjects](#) ()

## 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.*

### 4.8.1 Detailed Description

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

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

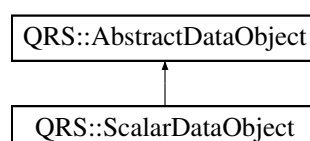
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[project.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[project.cpp](#)

## 4.9 QRS::ScalarDataObject Class Reference

Scalar data object.

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

Inheritance diagram for QRS::ScalarDataObject:



## Public Member Functions

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

## Additional Inherited Members

### 4.9.1 Detailed Description

Scalar data object.

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

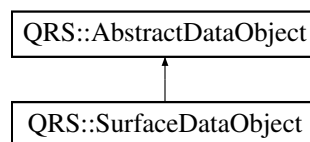
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.cpp](#)

## 4.10 QRS::SurfaceDataObject Class Reference

Surface data object.

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

Inheritance diagram for QRS::SurfaceDataObject:



## Public Member Functions

- [SurfaceDataObject](#) (const QString &name)  
*Construct a surface data object.*
- void [addItem](#) (DataValueType keyParameter) override  
*Insert a new item into [SurfaceDataObject](#).*

## Additional Inherited Members

### 4.10.1 Detailed Description

Surface data object.

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

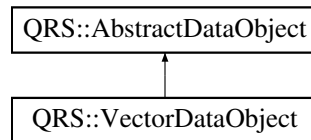
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.cpp](#)

## 4.11 QRS::VectorDataObject Class Reference

Vector data object.

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

Inheritance diagram for QRS::VectorDataObject:



### Public Member Functions

- [VectorDataObject](#) (const QString &name)  
*Construct a vector data object.*
- void [addItem](#) (DataValueType keyParameter) override  
*Insert a new item into [VectorDataObject](#).*

### Additional Inherited Members

#### 4.11.1 Detailed Description

Vector data object.

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

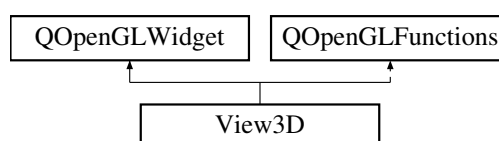
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.cpp](#)

## 4.12 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**

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



## Chapter 5

# File Documentation

### 5.1 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/core/abstractdataobject.cpp File Reference

Implementation of AbstractDataObject class.

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

#### 5.1.1 Detailed Description

Implementation of AbstractDataObject class.

Author

Pavel Lakiza

Date

March 2021

### 5.2 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/core/abstractdataobject.h File Reference

Declaration of AbstractDataObject class.

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

## Classes

- class [QRS::AbstractDataObject](#)  
*Data object which is designed in the way to be represented in a table easily.*
- class [QRS::ScalarDataObject](#)  
*Scalar data object.*
- class [QRS::VectorDataObject](#)  
*Vector data object.*
- class [QRS::MatrixDataObject](#)  
*Matrix data object.*
- class [QRS::SurfaceDataObject](#)  
*Surface data object.*

## Typedefs

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

## Enumerations

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

### 5.2.1 Detailed Description

Declaration of AbstractDataObject class.

#### Author

Pavel Lakiza

#### Date

March 2021

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

Implementation of Matrix class.

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



### 5.3.1 Detailed Description

Implementation of Matrix class.

Author

Pavel Lakiza

Date

March 2021

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

Declaration of Matrix class.

```
#include <vector>
```

### Classes

- class [QRS::Array< T >](#)  
*Numerical matrix.*

### 5.4.1 Detailed Description

Declaration of Matrix class.

Author

Pavel Lakiza

Date

March 2021

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

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

```
#include "project.h"
```

### 5.5.1 Detailed Description

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

Author

Pavel Lakiza

Date

March 2021

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

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

```
#include <QObject>
#include <QUuid>
#include <memory>
#include <list>
#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::list< std::shared\_ptr< AbstractDataObject > >

### 5.6.1 Detailed Description

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

Author

Pavel Lakiza

Date

March 2021

## 5.7 /home/qinterfly/Library/Projects/QRod↵ Systems/src/main/controltabs.cpp File Reference

Implementation of ControlTabs class.

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

### 5.7.1 Detailed Description

Implementation of ControlTabs class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.8 /home/qinterfly/Library/Projects/QRod↵ Systems/src/main/controltabs.h File Reference

Declaration of ControlTabs class.

```
#include <QWidget>
```

### Classes

- class [ManagersTab](#)  
*A toolbar consisted of object designers.*

### 5.8.1 Detailed Description

Declaration of ControlTabs class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.9 /home/qinterfly/Library/Projects/QRod↵ Systems/src/main/logwidget.cpp File Reference

Implementation of [LogWidget](#) class.

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

### Enumerations

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

#### 5.9.1 Detailed Description

Implementation of [LogWidget](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.10 /home/qinterfly/Library/Projects/QRod↵ Systems/src/main/logwidget.h File Reference

Declaration of [LogWidget](#) class.

```
#include <QTableWidget>
```

### Classes

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

#### 5.10.1 Detailed Description

Declaration of [LogWidget](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.11 /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.*

#### 5.11.1 Detailed Description

The startup function.

##### Author

Pavel Lakiza

##### Date

March 2021

## 5.12 /home/qinterfly/Library/Projects/QRodSystems/src/main/mainwindow.cpp File Reference

Implementation of [MainWindow](#) class.

```
#include <QDesktopWidget>
#include <QToolBar>
#include <QTableWidget>
#include <QTreeView>
#include <QFileSystemModel>
#include <QTextEdit>
#include <QVBoxLayout>
#include <QSettings>
#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.*

### 5.12.1 Detailed Description

Implementation of [MainWindow](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.13 /home/qinterfly/Library/Projects/QRod↵ Systems/src/main/mainwindow.h File Reference

Declaration of [MainWindow](#) class.

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

## Classes

- class [MainWindow](#)

*The main window of the program.*

### 5.13.1 Detailed Description

Declaration of [MainWindow](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.14 /home/qinterfly/Library/Projects/QRodSystems/src/main/view3d.cpp File Reference

Implementation of [View3D](#) class.

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

### 5.14.1 Detailed Description

Implementation of [View3D](#) class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.15 /home/qinterfly/Library/Projects/QRodSystems/src/main/view3d.h File Reference

Declaration of [View3D](#) class.

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

### Classes

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

### 5.15.1 Detailed Description

Declaration of [View3D](#) class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.16 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/dataobjectsmanager.cpp File Reference

Implementation of [DataObjectsManager](#) class.

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

### 5.16.1 Detailed Description

Implementation of [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

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

Declaration of [DataObjectsManager](#) class.

```
#include <QDialog>
```

### Classes

- class [DataObjectsManager](#)

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

### 5.17.1 Detailed Description

Declaration of [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021