

QRodSystems

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# Chapter 1

## Hierarchical Index

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# Class Index

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## Chapter 4

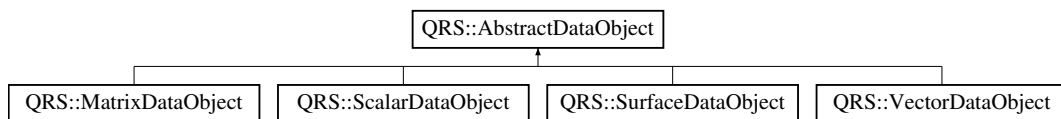
# Class Documentation

### 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, QString const &name)  
*Base constructor.*
- virtual [AbstractDataObject](#) \* **clone** () const =0
- virtual [DataItemType](#) & **addItem** (DataKeyType key)=0
- void [removeItem](#) (DataValueType key)  
*Remove an entity with the specified key.*
- bool [changeItemKey](#) (DataKeyType oldKey, DataKeyType newKey)  
*Modify a key existed.*
- DataValueType [getAvailableItemKey](#) (DataValueType key) const
- bool [setArrayValue](#) (DataKeyType key, DataValueType newValue, uint iRow=0, uint iColumn=0)  
*Set an array value with the specified indices.*
- DataHolder & **getItems** ()
- [DataItemType](#) & **getItem** (DataValueType keyParameter)
- 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::map< DataKeyType, [DataItem](#) >

## 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.

### 4.1.2 Member Function Documentation

#### 4.1.2.1 `getAvailableItemKey()`

```
DataValueType AbstractDataObject::getAvailableItemKey (
    DataValueType key ) const
```

Check if a given key is unique

#### Returns

Returns the input value of the key if it is unique, otherwise – a first available key

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)
- [Array](#) ([Array](#)< T > const &another)  
*Copy constructor.*
- [Array](#) ([Array](#)< T > &&another)  
*Move constructor.*
- 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** = nullptr

## 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:

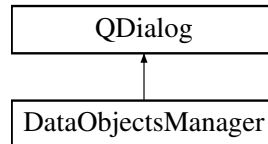
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[array.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[array.cpp](#)

## 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.*
- void [insertItemAfterSelected](#) ()  
*Insert a new array into the data object.*
- void [removeSelectedItem](#) ()  
*Remove a selected item.*
- const mapDataObjects & [getDataObjects](#) ()

### 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 Types

- using **mapDataObjects** = std::unordered\_map< QRS::DataIDType, [QRS::AbstractDataObject](#) \* >

### 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.*
- void [emplaceDataObject](#) (QRS::AbstractDataObject \*dataObject, QIcon const &icon, QString const &name)  
*Helper function to insert data objects into the manager.*

## Private Attributes

- Ui::DataObjectsManager \* **mpUi**
- ads::CDockManager \* **mpDockManager**
- QListWidget \* **mpListObjects**
- QTreeView \* **mpDataTable**
- [QRS::Project](#) & **mProject**
- QSettings & **mSettings**
- QMapDataObjects **mDataObjects**
- [InterfaceTableModel](#) \* **mpInterfaceTableModel** = nullptr
- [ScalarTableModel](#) \* **mpScalarTableModel**
- [VectorTableModel](#) \* **mpVectorTableModel**

### 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:

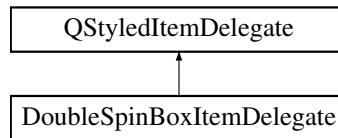
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[dataobjectsmanager.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[dataobjectsmanager.cpp](#)

## 4.4 DoubleSpinBoxItemDelegate Class Reference

Class to set how table values can be edited.

```
#include <doublespinboxitemdelegate.h>
```

Inheritance diagram for DoubleSpinBoxItemDelegate:



### Public Member Functions

- **DoubleSpinBoxItemDelegate** (QObject \*parent=nullptr)
- QWidget \* [createEditor](#) (QWidget \*parent, const QStyleOptionViewItem &option, const QModelIndex &index) const override  
*Create a double value editor.*
- void [setEditorData](#) (QWidget \*editor, const QModelIndex &index) const override  
*Specify data to show.*
- void [setModelData](#) (QWidget \*editor, QAbstractItemModel \*model, const QModelIndex &index) const override  
*Set data to a model.*
- void [updateEditorGeometry](#) (QWidget \*editor, const QStyleOptionViewItem &option, const QModelIndex &index) const override  
*Set a geometry to render.*

### 4.4.1 Detailed Description

Class to set how table values can be edited.

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

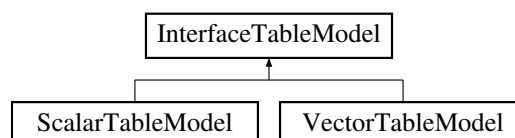
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[doublespinboxitemdelegate.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[doublespinboxitemdelegate.cpp](#)

## 4.5 InterfaceTableModel Class Reference

User interface to add and remove items.

```
#include <interfacetablemodel.h>
```

Inheritance diagram for InterfaceTableModel:



## Public Member Functions

- virtual void **insertItemAfterSelected** (QItemSelectionModel \*selectionModel)=0
- virtual void **removeSelectedItem** (QItemSelectionModel \*selectionModel)=0

## Static Public Member Functions

- static QStandardItem \* **makeDoubleItem** (double value)  
*Helper function to make an item which holds a double value.*
- static QList< QStandardItem \* > **prepareRow** (double const &key, double const &value)  
*Helper function to prepare a row base on a key and value associated with it.*
- static QList< QStandardItem \* > **prepareRow** (QRS::Array< double > &array, uint iRow)  
*Helper function to copy a row from an array.*
- static QList< QStandardItem \* > **prepareRow** (double const &key, QRS::Array< double > &array, uint iRow)  
*Helper function to copy a row from an array and associate it with a key.*

### 4.5.1 Detailed Description

User interface to add and remove items.

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

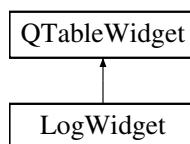
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[interfacetablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[interfacetablemodel.cpp](#)

## 4.6 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.*

### 4.6.1 Detailed Description

Log all the messages sent.

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

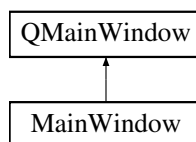
- [/home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.cpp](#)

## 4.7 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 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` \* `mpProject`
- `QString` `mLastPath`

### 4.7.1 Detailed Description

The main window of the program.

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

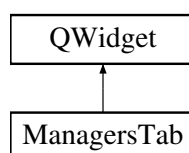
- `/home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.h`
- `/home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp`

## 4.8 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.*

### 4.8.1 Detailed Description

A toolbar consisted of object designers.

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

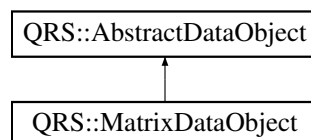
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[controltabs.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[controltabs.cpp](#)

## 4.9 QRS::MatrixDataObject Class Reference

Matrix data object.

```
#include <matrixdataobject.h>
```

Inheritance diagram for QRS::MatrixDataObject:



## Public Member Functions

- [MatrixDataObject](#) (QString const &name)  
*Construct a matrix data object.*
- [AbstractDataObject](#) \* [clone](#) () const override  
*Clone a matrix data object.*
- [DataItemType](#) & [addItem](#) (DataValueType key) override  
*Insert a new item into [MatrixDataObject](#).*

## Static Public Member Functions

- static uint [numberMatrices](#) ()  
*Get a number of created matrices.*

## Static Private Attributes

- static uint **smNumMatrices** = 0

## Additional Inherited Members

### 4.9.1 Detailed Description

Matrix data object.

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

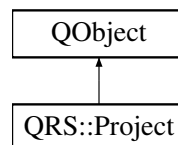
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.cpp](#)

## 4.10 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 const &name)  
*Construct a clean project with the user specified name.*
- std::shared\_ptr< [AbstractDataObject](#) > [getDataObject](#) (DataIDType id)  
*Retrieve a data object by identifier.*
- 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.*

### 4.10.1 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](#)

## 4.11 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**

#### 4.11.1 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](#)

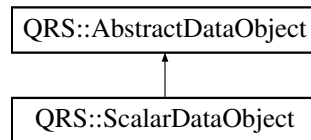


## 4.12 QRS::ScalarDataObject Class Reference

Scalar data object.

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

Inheritance diagram for QRS::ScalarDataObject:



### Public Member Functions

- [ScalarDataObject](#) (QString const &name)  
*Construct a scalar data object.*
- [AbstractDataObject \\* clone](#) () const override  
*Clone a scalar data object.*
- [DataItemType](#) & [addItem](#) (DataValueType key) 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

#### 4.12.1 Detailed Description

Scalar data object.

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

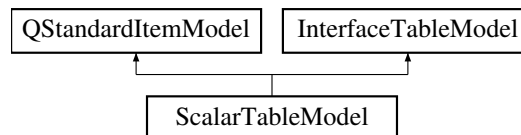
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.cpp](#)

## 4.13 ScalarTableModel Class Reference

Table model to represent a scalar data object.

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

Inheritance diagram for ScalarTableModel:



### Public Member Functions

- **ScalarTableModel** (QWidget \*parent=nullptr)
- void **setDataObject** (QRS::ScalarDataObject \*pDataObject)  
*Set a scalar data object to represent.*
- bool **setData** (const QModelIndex &indexEdit, const QVariant &value, int role=Qt::EditRole) override  
*Set the data acquired from a delegate.*
- void **insertItemAfterSelected** (QItemSelectionModel \*selectionModel) override  
*Insert a new item after selected one.*
- void **removeSelectedItem** (QItemSelectionModel \*selectionModel) override  
*Remove an array under selection.*

### Private Member Functions

- void **updateContent** ()  
*Represent all items which a scalar data object contains.*
- void **clearContent** ()  
*Clear previously created items.*

### Private Attributes

- QRS::ScalarDataObject \* **mpDataObject** = nullptr

### Additional Inherited Members

#### 4.13.1 Detailed Description

Table model to represent a scalar data object.

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

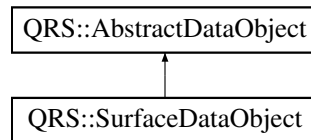
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/scalartablemodel.h
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/scalartablemodel.cpp

## 4.14 QRS::SurfaceDataObject Class Reference

Surface data object.

```
#include <surfacedataobject.h>
```

Inheritance diagram for QRS::SurfaceDataObject:



### Public Member Functions

- [SurfaceDataObject](#) (QString const &name)  
*Construct a surface data object.*
- [AbstractDataObject \\* clone](#) () const override  
*Clone a surface data object.*
- [DataItemType](#) & [addItem](#) (DataValueType key) override  
*Insert a new item into [SurfaceDataObject](#).*

### Static Public Member Functions

- static uint [numberSurfaces](#) ()  
*Get a number of created surfaces.*

### Static Private Attributes

- static uint **smNumSurfaces** = 0

### Additional Inherited Members

#### 4.14.1 Detailed Description

Surface data object.

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

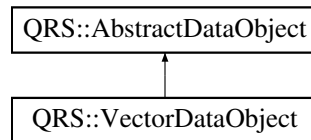
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[surfacedataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[surfacedataobject.cpp](#)

## 4.15 QRS::VectorDataObject Class Reference

Vector data object.

```
#include <vectordataobject.h>
```

Inheritance diagram for QRS::VectorDataObject:



### Public Member Functions

- [VectorDataObject](#) (QString const &name)  
*Construct a vector data object.*
- [AbstractDataObject \\* clone](#) () const override  
*Clone a vector data object.*
- [DataItemType](#) & [addItem](#) (DataValueType key) override  
*Insert a new item into [VectorDataObject](#).*

### Static Public Member Functions

- static uint [numberVectors](#) ()  
*Get a number of created vectors.*

### Static Private Attributes

- static uint **smNumVectors** = 0

### Additional Inherited Members

#### 4.15.1 Detailed Description

Vector data object.

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

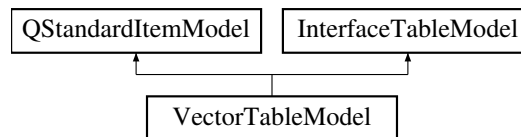
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[vectordataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[vectordataobject.cpp](#)

## 4.16 VectorTableModel Class Reference

Table model to represent a vector data object.

```
#include <vectortablemodel.h>
```

Inheritance diagram for VectorTableModel:



### Public Member Functions

- **VectorTableModel** (QWidget \*parent=nullptr)
- void **setDataObject** (QRS::VectorDataObject \*pDataObject)  
*Set a vector data object to represent.*
- bool **setData** (const QModelIndex &indexEdit, const QVariant &value, int role=Qt::EditRole) override  
*Set the data acquired from a delegate.*
- void **insertItemAfterSelected** (QItemSelectionModel \*selectionModel) override  
*Insert a new item after selected one.*
- void **removeSelectedItem** (QItemSelectionModel \*selectionModel) override  
*Remove an array under selection.*

### Private Member Functions

- void **updateContent** ()  
*Represent all items which a vector data object contains.*
- void **clearContent** ()  
*Clear previously created items.*

### Private Attributes

- QRS::VectorDataObject \* **mpDataObject** = nullptr

### Additional Inherited Members

#### 4.16.1 Detailed Description

Table model to represent a vector data object.

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

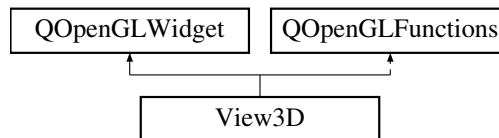
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[vectortablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[vectortablemodel.cpp](#)

## 4.17 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**

#### 4.17.1 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/matrixdataobject.cpp File Reference

Implementation of the MatrixDataObject class.

```
#include "matrixdataobject.h"
```

### 5.12.1 Detailed Description

Implementation of the MatrixDataObject class.

#### Author

Pavel Lakiza

#### Date

March 2021

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

Declaration of the MatrixDataObject class.

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

### Classes

- class [QRS::MatrixDataObject](#)  
*Matrix data object.*

### 5.13.1 Detailed Description

Declaration of the MatrixDataObject class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.14 /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"
#include "vectordataobject.h"
#include "matrixdataobject.h"
#include "surfacedataobject.h"
```

## Functions

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

### 5.14.1 Detailed Description

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

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.15 /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 > >

### 5.15.1 Detailed Description

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

#### Author

Pavel Lakiza

#### Date

March 2021

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

Implementation of the ScalarDataObject class.

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

### 5.16.1 Detailed Description

Implementation of the ScalarDataObject class.

Author

Pavel Lakiza

Date

March 2021

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

Declaration of the ScalarDataObject class.

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

### Classes

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

### 5.17.1 Detailed Description

Declaration of the ScalarDataObject class.

Author

Pavel Lakiza

Date

March 2021



## 5.18 /home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.cpp File Reference

Implementation of the SurfaceDataObject class.

```
#include "surfacedataobject.h"
```

### 5.18.1 Detailed Description

Implementation of the SurfaceDataObject class.

Author

Pavel Lakiza

Date

March 2021

## 5.19 /home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.h File Reference

Declaration of the SurfaceDataObject class.

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

### Classes

- class [QRS::SurfaceDataObject](#)  
*Surface data object.*

### 5.19.1 Detailed Description

Declaration of the SurfaceDataObject class.

Author

Pavel Lakiza

Date

March 2021

## 5.20 [/home/qinterfly/Library/Projects/QRod↔](#) Systems/src/core/vectordataobject.cpp File Reference

Implementation of the VectorDataObject class.

```
#include "vectordataobject.h"
```

### 5.20.1 Detailed Description

Implementation of the VectorDataObject class.

Author

Pavel Lakiza

Date

March 2021

## 5.21 [/home/qinterfly/Library/Projects/QRod↔](#) Systems/src/core/vectordataobject.h File Reference

Declaration of the VectorDataObject class.

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

### Classes

- class [QRS::VectorDataObject](#)  
*Vector data object.*

### 5.21.1 Detailed Description

Declaration of the VectorDataObject class.

Author

Pavel Lakiza

Date

March 2021

## 5.22 /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.*

#### 5.22.1 Detailed Description

The startup function.

##### Author

Pavel Lakiza

##### Date

March 2021

## 5.23 /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 "../core/vectordataobject.h"
#include "../core/matrixdataobject.h"
#include "../core/surfacedataobject.h"
#include "scalartablemodel.h"
#include "vectortablemodel.h"
#include "doublespinboxitemdelegate.h"
```

### 5.23.1 Detailed Description

Implementation of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.24 [/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.*

### 5.24.1 Detailed Description

Declaration of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.25 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/managers/doublespinboxitemdelegate.cpp File Reference

Implementation of the [DoubleSpinBoxItemDelegate](#) class.

```
#include "doublespinboxitemdelegate.h"
#include <QDoubleSpinBox>
```

### 5.25.1 Detailed Description

Implementation of the [DoubleSpinBoxItemDelegate](#) class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.26 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/doublespinboxitemdelegate.h File Reference

Declaration of the [DoubleSpinBoxItemDelegate](#) class.

```
#include <QStyledItemDelegate>
```

### Classes

- class [DoubleSpinBoxItemDelegate](#)  
*Class to set how table values can be edited.*

### 5.26.1 Detailed Description

Declaration of the [DoubleSpinBoxItemDelegate](#) class.

#### Author

Pavel Lakiza

#### Date

March 2021

## 5.27 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/interfacetablemodel.cpp File Reference

Implementation of static functions of [InterfaceTableModel](#).

```
#include <QStandardItem>  
#include "interfacetablemodel.h"  
#include "array.h"
```

### 5.27.1 Detailed Description

Implementation of static functions of [InterfaceTableModel](#).

Author

Pavel Lakiza

Date

March 2021

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

Interface of a table model.

```
#include <QItemSelection>
```

### Classes

- class [InterfaceTableModel](#)  
*User interface to add and remove items.*

### 5.28.1 Detailed Description

Interface of a table model.

Author

Pavel Lakiza

Date

March 2021

## 5.29 [/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>
```

### 5.29.1 Detailed Description

Implementation of the [ScalarTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.30 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/scalartablemodel.h File Reference

Declaration of the [ScalarTableModel](#) class.

```
#include <QStandardItemModel>
#include "interfacetablemodel.h"
```

### Classes

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

### 5.30.1 Detailed Description

Declaration of the [ScalarTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.31 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/vectortablemodel.cpp File Reference

Implementation of the [VectorTableModel](#) class.

```
#include "vectortablemodel.h"
#include "vectordataobject.h"
#include <QTreeView>
```

### 5.31.1 Detailed Description

Implementation of the [VectorTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

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

Declaration of the [VectorTableModel](#) class.

```
#include <QStandardItemModel>
#include "interfacetablemodel.h"
```

### Classes

- class [VectorTableModel](#)  
*Table model to represent a vector data object.*

### 5.32.1 Detailed Description

Declaration of the [VectorTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.33 [/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"
```



### 5.33.1 Detailed Description

Implementation of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

## 5.34 /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.*

### 5.34.1 Detailed Description

Declaration of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

