

QRodSystems

0.0.1

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1 Hierarchical Index	1
1.1 Class Hierarchy	1
2 Class Index	3
2.1 Class List	3
3 File Index	5
3.1 File List	5
4 Class Documentation	7
4.1 QRS::AbstractDataObject Class Reference	7
4.1.1 Detailed Description	8
4.1.2 Member Function Documentation	8
4.1.2.1 deserialize()	8
4.1.2.2 getAvailableItemKey()	9
4.2 QRS::Array< T > Class Template Reference	9
4.2.1 Detailed Description	10
4.3 BaseTableModel Class Reference	10
4.3.1 Detailed Description	11
4.4 DataObjectsManager Class Reference	11
4.4.1 Detailed Description	13
4.5 DoubleSpinBoxItemDelegate Class Reference	14
4.5.1 Detailed Description	14
4.6 InterfaceTableModel Class Reference	14
4.6.1 Detailed Description	15
4.7 LogWidget Class Reference	15
4.7.1 Detailed Description	16
4.8 MainWindow Class Reference	16
4.8.1 Detailed Description	17
4.9 ManagersTab Class Reference	18
4.9.1 Detailed Description	18
4.10 QRS::MatrixDataObject Class Reference	18
4.10.1 Detailed Description	19
4.11 MatrixTableModel Class Reference	19
4.11.1 Detailed Description	20
4.12 QRS::Project Class Reference	20
4.12.1 Detailed Description	22
4.13 QRS::Array< T >::Row< U > Struct Template Reference	22
4.13.1 Detailed Description	22
4.14 QRS::ScalarDataObject Class Reference	23
4.14.1 Detailed Description	23
4.15 QRS::SurfaceDataObject Class Reference	24
4.15.1 Detailed Description	25

4.16 SurfaceTableModel Class Reference	25
4.16.1 Detailed Description	26
4.17 QRS::VectorDataObject Class Reference	26
4.17.1 Detailed Description	27
4.18 View3D Class Reference	27
4.18.1 Detailed Description	27
5 File Documentation	29
5.1 /home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.cpp File Reference	29
5.1.1 Detailed Description	29
5.2 /home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.h File Reference	29
5.2.1 Detailed Description	30
5.3 /home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.cpp File Reference	30
5.3.1 Detailed Description	30
5.4 /home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.h File Reference	31
5.4.1 Detailed Description	31
5.5 /home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp File Reference	31
5.5.1 Detailed Description	32
5.6 /home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.h File Reference	32
5.6.1 Detailed Description	32
5.7 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractdataobject.cpp File Reference	33
5.7.1 Detailed Description	33
5.8 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractdataobject.h File Reference	33
5.8.1 Detailed Description	34
5.9 /home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp File Reference	34
5.9.1 Detailed Description	34
5.10 /home/qinterfly/Library/Projects/QRodSystems/src/core/array.h File Reference	34
5.10.1 Detailed Description	35
5.11 /home/qinterfly/Library/Projects/QRodSystems/src/core/datatypes.h File Reference	35
5.11.1 Detailed Description	36
5.12 /home/qinterfly/Library/Projects/QRodSystems/src/core/matrixdataobject.cpp File Reference	36
5.12.1 Detailed Description	36
5.13 /home/qinterfly/Library/Projects/QRodSystems/src/core/matrixdataobject.h File Reference	36
5.13.1 Detailed Description	37
5.14 /home/qinterfly/Library/Projects/QRodSystems/src/core/project.cpp File Reference	37
5.14.1 Detailed Description	37
5.15 /home/qinterfly/Library/Projects/QRodSystems/src/core/project.h File Reference	38
5.15.1 Detailed Description	38
5.16 /home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.cpp File Reference	38
5.16.1 Detailed Description	38
5.17 /home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.h File Reference	39
5.17.1 Detailed Description	39

5.18 /home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.cpp File Reference . . .	39
5.18.1 Detailed Description	39
5.19 /home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.h File Reference	40
5.19.1 Detailed Description	40
5.20 /home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp File Reference	40
5.20.1 Detailed Description	40
5.21 /home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h File Reference	41
5.21.1 Detailed Description	41
5.22 /home/qinterfly/Library/Projects/QRodSystems/src/main/main.cpp File Reference	41
5.22.1 Detailed Description	42
5.23 /home/qinterfly/Library/Projects/QRodSystems/src/managers/basetablemodel.cpp File Reference	42
5.23.1 Detailed Description	42
5.24 /home/qinterfly/Library/Projects/QRodSystems/src/managers/basetablemodel.h File Reference	42
5.24.1 Detailed Description	43
5.25 /home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp File Reference	43
5.25.1 Detailed Description	44
5.26 /home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h File Reference	44
5.26.1 Detailed Description	44
5.27 /home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.cpp File Reference	44
5.27.1 Detailed Description	45
5.28 /home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.h File Reference	45
5.28.1 Detailed Description	45
5.29 /home/qinterfly/Library/Projects/QRodSystems/src/managers/interfacetablemodel.cpp File Reference	45
5.29.1 Detailed Description	46
5.30 /home/qinterfly/Library/Projects/QRodSystems/src/managers/interfacetablemodel.h File Reference	46
5.30.1 Detailed Description	46
5.31 /home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.cpp File Reference	46
5.31.1 Detailed Description	47
5.32 /home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.h File Reference	47
5.32.1 Detailed Description	47
5.33 /home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.cpp File Reference	47
5.33.1 Detailed Description	48
5.34 /home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.h File Reference	48
5.34.1 Detailed Description	48
5.35 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.cpp File Reference	48
5.35.1 Detailed Description	49
5.36 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.h File Reference	49
5.36.1 Detailed Description	49

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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

QRS::AbstractDataObject	7
QRS::MatrixDataObject	18
QRS::ScalarDataObject	23
QRS::SurfaceDataObject	24
QRS::VectorDataObject	26
QRS::Array< T >	9
InterfaceTableModel	14
BaseTableModel	10
MatrixTableModel	19
SurfaceTableModel	25
QDialog	
DataObjectsManager	11
QMainWindow	
MainWindow	16
QObject	
QRS::Project	20
QOpenGLFunctions	
View3D	27
QOpenGLWidget	
View3D	27
QStandardItemModel	
BaseTableModel	10
MatrixTableModel	19
SurfaceTableModel	25
QStyledItemDelegate	
DoubleSpinBoxItemDelegate	14
QTableWidget	
LogWidget	15
QWidget	
ManagersTab	18
QRS::Array< T >::Row< U >	22

Chapter 2

Class Index

2.1 Class List

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

QRS::AbstractDataObject	
Data object which is designed in the way to be represented in a table easily	7
QRS::Array< T >	
Numerical array class	9
BaseTableModel	
Table model to represent either a scalar or vector data object	10
DataObjectsManager	
Manager to create objects of different types: scalars, vectors, matroces and surfaces	11
DoubleSpinBoxItemDelegate	
Class to set how table values can be edited	14
InterfaceTableModel	
User interface to add and remove items	14
LogWidget	
Log all the messages sent	15
MainWindow	
The main window of the program	16
ManagersTab	
A toolbar consisted of object designers	18
QRS::MatrixDataObject	
Matrix data object	18
MatrixTableModel	
Table model to represent a matrix data object	19
QRS::Project	
Project class to interact with a created system of rods	20
QRS::Array< T >::Row< U >	
Proxy class to acquire a row by index	22
QRS::ScalarDataObject	
Scalar data object	23
QRS::SurfaceDataObject	
Surface data object	24
SurfaceTableModel	
Table model to represent a surface data object	25
QRS::VectorDataObject	
Vector data object	26
View3D	
A widget to represent the resulted rod system	27

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/central/ controltabs.cpp	
Implementation of the ControlTabs class	29
/home/qinterfly/Library/Projects/QRodSystems/src/central/ controltabs.h	
Declaration of the ControlTabs class	29
/home/qinterfly/Library/Projects/QRodSystems/src/central/ logwidget.cpp	
Implementation of the LogWidget class	30
/home/qinterfly/Library/Projects/QRodSystems/src/central/ logwidget.h	
Declaration of the LogWidget class	31
/home/qinterfly/Library/Projects/QRodSystems/src/central/ mainwindow.cpp	
Implementation of the MainWindow class	31
/home/qinterfly/Library/Projects/QRodSystems/src/central/ mainwindow.h	
Declaration of the MainWindow class	32
/home/qinterfly/Library/Projects/QRodSystems/src/central/ uiconstants.h	
Common graphical constants shared between several windows	??
/home/qinterfly/Library/Projects/QRodSystems/src/core/ abstractdataobject.cpp	
Implementation of the AbstractDataObject class	33
/home/qinterfly/Library/Projects/QRodSystems/src/core/ abstractdataobject.h	
Declaration of the AbstractDataObject class	33
/home/qinterfly/Library/Projects/QRodSystems/src/core/ array.cpp	
Implementation of the Array class	34
/home/qinterfly/Library/Projects/QRodSystems/src/core/ array.h	
Declaration of the Array class	34
/home/qinterfly/Library/Projects/QRodSystems/src/core/ datatypes.h	
Specification of data types used in a project	35
/home/qinterfly/Library/Projects/QRodSystems/src/core/ matrixdataobject.cpp	
Implementation of the MatrixDataObject class	36
/home/qinterfly/Library/Projects/QRodSystems/src/core/ matrixdataobject.h	
Declaration of the MatrixDataObject class	36
/home/qinterfly/Library/Projects/QRodSystems/src/core/ project.cpp	
Implementation of the QRS::Project class	37
/home/qinterfly/Library/Projects/QRodSystems/src/core/ project.h	
Declaration of the QRS::Project class	38
/home/qinterfly/Library/Projects/QRodSystems/src/core/ scalardataobject.cpp	
Implementation of the ScalarDataObject class	38
/home/qinterfly/Library/Projects/QRodSystems/src/core/ scalardataobject.h	
Declaration of the ScalarDataObject class	39

/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.cpp	
Implementation of the SurfaceDataObject class	39
/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.h	
Declaration of the SurfaceDataObject class	40
/home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp	
Implementation of the VectorDataObject class	40
/home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h	
Declaration of the VectorDataObject class	41
/home/qinterfly/Library/Projects/QRodSystems/src/main/main.cpp	
The startup function	41
/home/qinterfly/Library/Projects/QRodSystems/src/managers/basetablemodel.cpp	
Implementation of the BaseTableModel class	42
/home/qinterfly/Library/Projects/QRodSystems/src/managers/basetablemodel.h	
Declaration of the BaseTableModel class	42
/home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp	
Implementation of the DataObjectsManager class	43
/home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h	
Declaration of the DataObjectsManager class	44
/home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.cpp	
Implementation of the DoubleSpinBoxItemDelegate class	44
/home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.h	
Declaration of the DoubleSpinBoxItemDelegate class	45
/home/qinterfly/Library/Projects/QRodSystems/src/managers/interfacetablemodel.cpp	
Implementation of static functions of InterfaceTableModel	45
/home/qinterfly/Library/Projects/QRodSystems/src/managers/interfacetablemodel.h	
Interface of a table model	46
/home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.cpp	
Implementation of the MatrixTableModel class	46
/home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.h	
Declaration of the MatrixTableModel class	47
/home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.cpp	
Implementation of the SurfaceTableModel class	47
/home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.h	
Declaration of the SurfaceTableModel class	48
/home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.cpp	
Implementation of the View3D class	48
/home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.h	
Declaration of the View3D class	49

Chapter 4

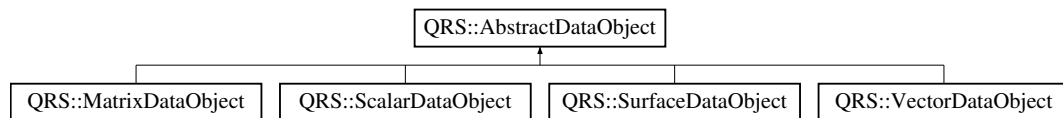
Class Documentation

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 [DataItem](#) & **addItem** (DataKeyType key)=0
- void [removeItem](#) (DataValueType key)
Remove an entity with the specified key.
- bool [changeItemKey](#) (DataKeyType oldKey, DataKeyType newKey, DataHolder *items=nullptr)
Modify a key existed.
- DataValueType [getAvailableItemKey](#) (DataValueType key, DataHolder const *items=nullptr) const
- bool [setArrayValue](#) (DataKeyType key, DataValueType newValue, uint iRow=0, uint iColumn=0)
Set an array value with the specified indices.
- DataHolder & **getItems** ()
- [DataItem](#) & **getItem** (DataValueType keyParameter)
- DataIDType **id** () const
- DataObjectType **type** () const
- QString const & **name** () const
- void **setName** (QString const &name)
- virtual void [serialize](#) (QDataStream &stream) const
Serialize an abstract data object.
- virtual void [deserialize](#) (QDataStream &stream)
Partly deserialize an abstract data object.

Static Public Member Functions

- static uint **numberObjects** ()
- static void **setNumberObjects** (uint numObjects)

Protected Attributes

- const DataObjectType **mType**
Object type.
- QString **mName**
Name of an object.
- DataIDType **mID**
Unique object identificator.
- DataHolder **mItems**
Map contains all created entities.

Static Private Attributes

- static uint **smNumObjects** = 0
Number of all objects created.

Friends

- QDataStream & **operator<<** (QDataStream &stream, [AbstractDataObject](#) const &obj)
Print a data object to a stream.
- QDataStream & **operator>>** (QDataStream &stream, [AbstractDataObject](#) &obj)
Read a data object from a stream.

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 deserialize()

```
void AbstractDataObject::deserialize (
    QDataStream & stream ) [virtual]
```

Partly deserialize an abstract data object.

It is assumed that a type and name have already been assigned. So, only an identifier and items need to be set.

Reimplemented in [QRS::SurfaceDataObject](#).

4.1.2.2 getAvailableItemKey()

```
DataValueType AbstractDataObject::getAvailableItemKey (
    DataValueType key,
    DataHolder const * items = nullptr ) 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=0, IndexType numCols=0)
- [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.
- void [removeColumn](#) (IndexType iRemoveColumn)
Remove a column by index.
- void [swapColumns](#) (IndexType iFirstColumn, IndexType iSecondColumn)
Swap two columns.
- IndexType **rows** () const
- IndexType **cols** () const
- IndexType **size** () const
- [Row](#)< T > **operator[]** (IndexType iRow)

Private Attributes

- IndexType `mNumRows`
Number of rows.
- IndexType `mNumCols`
Number of columns.
- T * `mpData` = nullptr
Pointer to the data stored.

Friends

- template<typename K >
QDebug `operator<<` (QDebug stream, `Array< K > &array`)
Print all array values using the matrix format.
- template<typename K >
QDataStream & `operator<<` (QDataStream &stream, `Array< K > const &array`)
Write an array to a stream.
- template<typename K >
QDataStream & `operator>>` (QDataStream &stream, `Array< K > &array`)
Read an array from a stream.

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:

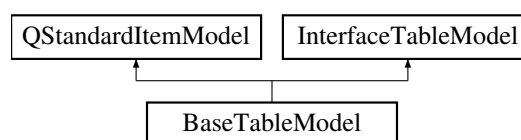
- /home/qinterfly/Library/Projects/QRodSystems/src/core/array.h
- /home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp

4.3 BaseTableModel Class Reference

Table model to represent either a scalar or vector data object.

```
#include <basetablemodel.h>
```

Inheritance diagram for BaseTableModel:



Public Member Functions

- **BaseTableModel** (QWidget *parent=nullptr)
- void **setDataObject** (QRS::AbstractDataObject *pDataObject)
Set a 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 **insertLeadingItemAfterSelected** (QItemSelectionModel *) override
- void **removeSelectedItem** (QItemSelectionModel *selectionModel) override
Remove an array under selection.
- void **removeSelectedLeadingItem** (QItemSelectionModel *) override

Private Member Functions

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

Private Attributes

- QRS::AbstractDataObject * **mpDataObject** = nullptr

Additional Inherited Members

4.3.1 Detailed Description

Table model to represent either a scalar or vector data object.

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

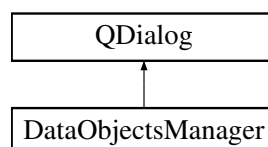
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[basetablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[basetablemodel.cpp](#)

4.4 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 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 [insertLeadingItemAfterSelected](#) ()
Insert a new leading item into the data object.
- void [removeSelectedItem](#) ()
Remove a selected item.
- void [removeSelectedLeadingItem](#) ()
Remove a selected leading item.
- void [removeSelectedDataObject](#) ()
Remove a selected data object.

Public Member Functions

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

Private Types

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

Private Slots

- void [representSelectedDataObject](#) ()
Represent a selected data object according to its type.
- void [renameDataObject](#) (QListWidgetItem *item)
Rename a data object.

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)
Helper function to insert data objects into the manager.
- void [addListDataObjects](#) (QRS::AbstractDataObject *dataObject)
Add a data object to the list.
- bool [isDataTableModifiable](#) ()
Helper function to check if it is possible to interact with data object content.

Private Attributes

- Ui::DataObjectsManager * **mpUi**
- ads::CDockManager * **mpDockManager**
- QListWidget * **mpListDataObjects**
- QTreeView * **mpDataTable**
- [QRS::Project](#) & **mProject**
- QSettings & **mSettings**
- QMapDataObjects **mDataObjects**
- [InterfaceTableModel](#) * **mpInterfaceTableModel** = nullptr
- [BaseTableModel](#) * **mpBaseTableModel**
- [MatrixTableModel](#) * **mpMatrixTableModel**
- [SurfaceTableModel](#) * **mpSurfaceTableModel**

4.4.1 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:

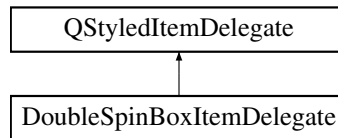
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp>

4.5 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.

4.5.1 Detailed Description

Class to set how table values can be edited.

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

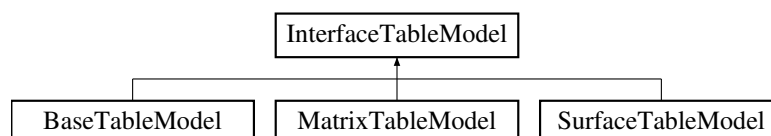
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[doublespinboxitemdelegate.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[doublespinboxitemdelegate.cpp](#)

4.6 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 **insertLeadingItemAfterSelected** (QItemSelectionModel *selectionModel)=0
- virtual void **removeSelectedItem** (QItemSelectionModel *selectionModel)=0
- virtual void **removeSelectedLeadingItem** (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** (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 an key.
- static QList< QStandardItem * > **prepareRow** (QString const &name, QRS::Array< double > &array, uint iRow)
Helper function to copy a row from an array and associate it with a name.
- static QStandardItem * **makeLabelItem** (QString const &name)
Helper function to create an item which holds a string and cannot be modified.

4.6.1 Detailed Description

User interface to add and remove items.

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

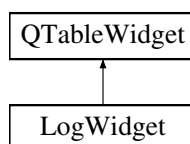
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[interfacetablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[interfacetablemodel.cpp](#)

4.7 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.

4.7.1 Detailed Description

Log all the messages sent.

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

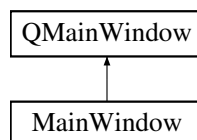
- </home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.cpp>

4.8 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 [createProject](#) ()
Create a project and substitute the current one with it.
- void [openProject](#) ()
Open a project.
- void [openRecentProject](#) ()
Open the project which was selected from the Recent Projects menu.
- bool [saveProject](#) ()
Save the current project.
- bool [saveAsProject](#) ()
Save the current project under a new name.
- void [projectModified](#) ()
Whenever a project has been modified.
- void [saveSettings](#) ()
Save the current window settings.
- void [restoreSettings](#) ()

- *Restore window settings 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.
- void [aboutProgram](#) ()
Show information about a program.

Private Member Functions

- void [initializeWindow](#) ()
Set a state and geometry of [MainWindow](#).
- void [createContent](#) ()
Create all the widgets and corresponding actions.
- void [closeEvent](#) (QCloseEvent *event) override
Save project and settings before exit.
- 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 [setProjectTitle](#) ()
Show information a name of a project.
- void [retrieveRecentProjects](#) ()
Retrieve recent projects from the settings file.
- void [addToRecentProjects](#) ()
Add the current project to the recent ones.
- void [specifyMenuConnections](#) ()
Set signals and slots for menu actions.
- bool [saveProjectChangesDialog](#) ()
Save project changes.
- bool [saveProjectHelper](#) (QString const &filePath)
Helper method to perform saving of the current project.
- void [openProjectHelper](#) (QString const &filePath)
Helper method to perform opening of the specified project.

Private Attributes

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

4.8.1 Detailed Description

The main window of the program.

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

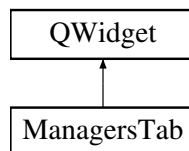
- </home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp>

4.9 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.

4.9.1 Detailed Description

A toolbar consisted of object designers.

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

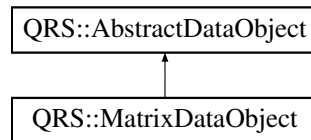
- </home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.cpp>

4.10 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 **numberInstances** ()
- static void **setNumberInstances** (uint numInstances)

Static Private Attributes

- static uint **smNumInstances** = 0

Additional Inherited Members

4.10.1 Detailed Description

Matrix data object.

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

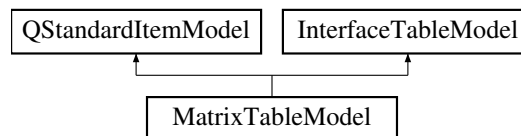
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.cpp](#)

4.11 MatrixTableModel Class Reference

Table model to represent a matrix data object.

```
#include <matrixtablemodel.h>
```

Inheritance diagram for MatrixTableModel:



Public Member Functions

- **MatrixTableModel** (QWidget *parent=nullptr)
- void **setDataObject** (QRS::AbstractDataObject *pDataObject)
Set a 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 **insertLeadingItemAfterSelected** (QItemSelectionModel *) override
- void **removeSelectedItem** (QItemSelectionModel *selectionModel) override
Remove an array under selection.
- void **removeSelectedLeadingItem** (QItemSelectionModel *) override

Private Member Functions

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

Private Attributes

- QRS::AbstractDataObject * **mpDataObject** = nullptr

Additional Inherited Members

4.11.1 Detailed Description

Table model to represent a matrix data object.

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

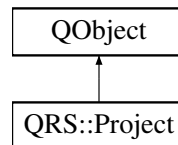
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.h
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.cpp

4.12 QRS::Project Class Reference

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

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

Inheritance diagram for QRS::Project:



Public Slots

- bool [save](#) (QString const &dir, QString const &fileName)
Save a project to a file.

Signals

- void **dataObjectAdded** (QRS::DataIDType id)
- void **dataObjectRemoved** (QRS::DataIDType id)
- void **allDataObjectsChanged** ()
- void **modified** (bool modifiedState)

Public Member Functions

- [Project](#) (QString const &name)
Construct a clean project with the user specified name.
- [Project](#) (QString const &path, QString const &fileName)
Read a project from a file.
- bool **isModified** () const
- std::shared_ptr< [AbstractDataObject](#) > [getDataObject](#) (DataIDType id)
Retrieve a data object by identifier.
- std::unordered_map< DataIDType, [AbstractDataObject](#) * > [getDataObjects](#) ()
Copy data objects.
- void [addDataObject](#) (DataObjectType type)
Create a data object with the specified type.
- void [removeDataObject](#) (DataIDType id)
Remove a data object by id.
- void [setDataObjects](#) (std::unordered_map< DataIDType, [AbstractDataObject](#) * > dataObjects)
Substitute current data objects with new ones.
- QString const & **name** () const
- QString const & **filePath** () const

Static Public Member Functions

- static QString const & **getFileExtension** ()

Private Slots

- void [setModified](#) (bool modifiedState=true)
Set a modification state.

Private Attributes

- quint32 [mID](#)
Unique project identifier.
- QString [mName](#)
Project name.
- QString [mFilePath](#)
Path to a file where a project is stored.
- bool [mIsModified](#)
Flag whether a project has been modified since last saving.
- DataObjects [mDataObjects](#)
Data objects.

Static Private Attributes

- static const QString [skProjectExtension](#) = ".qrs"
File extensionn.

4.12.1 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](#)

4.13 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**

4.13.1 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:

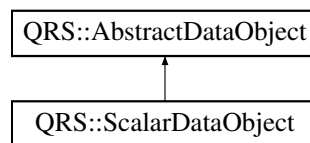
- </home/qinterfly/Library/Projects/QRodSystems/src/core/array.h>

4.14 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 **numberInstances** ()
- static void **setNumberInstances** (uint numInstances)

Static Private Attributes

- static uint **smNumInstances** = 0

Additional Inherited Members

4.14.1 Detailed Description

Scalar data object.

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

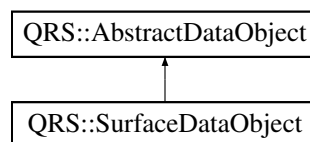
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.cpp](#)

4.15 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](#).
- DataKeyType [addLeadingItem](#) (DataValueType key)
Add a leading item.
- void [removeLeadingItem](#) (DataValueType key)
Remove a leading item.
- bool [changeLeadingItemKey](#) (DataKeyType oldKey, DataKeyType newKey)
Modify a leading item key.
- DataHolder & [getLeadingItems](#) ()
- void [serialize](#) (QDataStream &stream) const override
Serialize additional data of a surface object.
- virtual void [deserialize](#) (QDataStream &stream) override
Deserialize additional data of a surface object.

Static Public Member Functions

- static uint [numberInstances](#) ()
- static void [setNumberInstances](#) (uint numInstances)

Private Attributes

- DataHolder **mLeadingItems**

Static Private Attributes

- static uint **smNumInstances** = 0

Additional Inherited Members

4.15.1 Detailed Description

Surface data object.

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

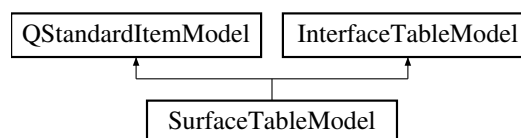
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.cpp](#)

4.16 SurfaceTableModel Class Reference

Table model to represent a surface data object.

```
#include <surfacetablemodel.h>
```

Inheritance diagram for SurfaceTableModel:



Public Member Functions

- **SurfaceTableModel** (QWidget *parent=nullptr)
- void **setDataObject** (QRS::SurfaceDataObject *pDataObject)
Set a surface 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.
- void **insertLeadingItemAfterSelected** (QItemSelectionModel *selectionModel) override
Add a new leading item after selected one.
- void **removeSelectedLeadingItem** (QItemSelectionModel *selectionModel) override
Remove a selected leading item.

Private Member Functions

- void [updateContent](#) ()
Represent all items which a data object contains.
- void [clearContent](#) ()
Clear previously created items.

Private Attributes

- [QRS::SurfaceDataObject](#) * [mpDataObject](#) = nullptr

Additional Inherited Members

4.16.1 Detailed Description

Table model to represent a surface data object.

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

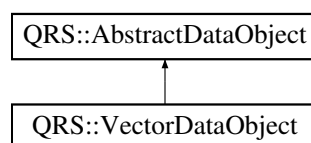
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.cpp>

4.17 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 **numberInstances** ()
- static void **setNumberInstances** (uint numInstances)

Static Private Attributes

- static uint **smNumInstances** = 0

Additional Inherited Members

4.17.1 Detailed Description

Vector data object.

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

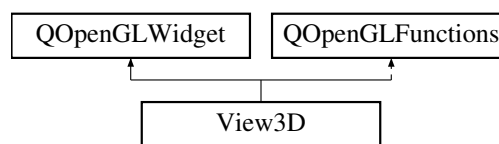
- </home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp>

4.18 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**

4.18.1 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/QRodSystems/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/QRodSystems/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 <QFileDialog>
#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"
#include "uiconstants.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

April 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/QRod↵ Systems/src/central/uiconstants.h File Reference

Common graphical constants shared between several windows.

```
#include <QString>
```

Variables

- const QString **UiConstants::Settings::skGeometry** = "geometry"
- const QString **UiConstants::Settings::skState** = "state"
- const QString **UiConstants::Settings::skDockingState** = "dockingState"

5.7.1 Detailed Description

Common graphical constants shared between several windows.

Author

Pavel Lakiza

Date

April 2021

5.8 /home/qinterfly/Library/Projects/QRod↵ Systems/src/core/abstractdataobject.cpp File Reference

Implementation of the AbstractDataObject class.

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

5.8.1 Detailed Description

Implementation of the AbstractDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.9 /home/qinterfly/Library/Projects/QRod↵ Systems/src/core/abstractdataobject.h File Reference

Declaration of the AbstractDataObject class.

```
#include <QString>
#include <QDataStream>
#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 >
- using **QRS::DataHolder** = std::map< DataKeyType, DataItemType >

Functions

- QDataStream & [QRS::operator<<](#) (QDataStream &stream, AbstractDataObject const &obj)
Print a data object to a stream.
- QDataStream & [QRS::operator>>](#) (QDataStream &stream, AbstractDataObject &obj)
Read a data object from a stream.

5.9.1 Detailed Description

Declaration of the AbstractDataObject class.

Author

Pavel Lakiza

Date

March 2021

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

Implementation of the Array class.

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


5.10.1 Detailed Description

Implementation of the Array class.

Author

Pavel Lakiza

Date

March 2021

5.11 /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 array values using the matrix format.
- template<typename K >
[QDataStream & QRS::operator<<](#) (QDataStream &stream, Array< K > const &array)
Write an array to a stream.
- template<typename K >
[QDataStream & QRS::operator>>](#) (QDataStream &stream, Array< K > &array)
Read an array from a stream.

5.11.1 Detailed Description

Declaration of the Array class.

Author

Pavel Lakiza

Date

March 2021

5.12 /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** }

5.12.1 Detailed Description

Specification of data types used in a project.

Author

Pavel Lakiza

Date

March 2021

5.13 /home/qinterfly/Library/Projects/QRod↵ Systems/src/core/matrixdataobject.cpp File Reference

Implementation of the MatrixDataObject class.

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

5.13.1 Detailed Description

Implementation of the MatrixDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.14 /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.

5.14.1 Detailed Description

Declaration of the MatrixDataObject class.

Author

Pavel Lakiza

Date

March 2021

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

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

```
#include <QDebug>
#include <QRandomGenerator>
#include <QFileInfo>
#include <QDir>
#include <QDataStream>
#include <QDateTime>
#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.

5.15.1 Detailed Description

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

Author

Pavel Lakiza

Date

March 2021

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

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

```
#include <QObject>
#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 > >

5.16.1 Detailed Description

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

Author

Pavel Lakiza

Date

March 2021

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

Implementation of the ScalarDataObject class.

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

5.17.1 Detailed Description

Implementation of the ScalarDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.18 /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.

5.18.1 Detailed Description

Declaration of the ScalarDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.19 [/home/qinterfly/Library/Projects/QRod↵](#) Systems/src/core/surfacedataobject.cpp File Reference

Implementation of the SurfaceDataObject class.

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

5.19.1 Detailed Description

Implementation of the SurfaceDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.20 [/home/qinterfly/Library/Projects/QRod↵](#) Systems/src/core/surfacedataobject.h File Reference

Declaration of the SurfaceDataObject class.

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

Classes

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

5.20.1 Detailed Description

Declaration of the SurfaceDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.21 /home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp File Reference

Implementation of the VectorDataObject class.

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

5.21.1 Detailed Description

Implementation of the VectorDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.22 /home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h File Reference

Declaration of the VectorDataObject class.

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

Classes

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

5.22.1 Detailed Description

Declaration of the VectorDataObject class.

Author

Pavel Lakiza

Date

March 2021

5.23 /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.

5.23.1 Detailed Description

The startup function.

Author

Pavel Lakiza

Date

March 2021

5.24 /home/qinterfly/Library/Projects/QRodSystems/src/managers/basetablemodel.cpp File Reference

Implementation of the [BaseTableModel](#) class.

```
#include <QTreeView>
#include "basetablemodel.h"
#include "abstractdataobject.h"
```

5.24.1 Detailed Description

Implementation of the [BaseTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.25 /home/qinterfly/Library/Projects/QRodSystems/src/managers/basetablemodel.h File Reference

Declaration of the [BaseTableModel](#) class.

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

Classes

- class [BaseTableModel](#)
Table model to represent either a scalar or vector data object.

5.25.1 Detailed Description

Declaration of the [BaseTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.26 /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 <QMessageBox>
#include <QShortcut>
#include "DockManager.h"
#include "DockWidget.h"
#include "dataobjectsmanager.h"
#include "ui_dataobjectsmanager.h"
#include "../central/uiconstants.h"
#include "../core/project.h"
#include "../core/scalardataobject.h"
#include "../core/vectordataobject.h"
#include "../core/matrixdataobject.h"
#include "../core/surfacedataobject.h"
#include "basetablemodel.h"
#include "matrixtablemodel.h"
#include "surfacetablemodel.h"
#include "doublespinboxitemdelegate.h"
```

Functions

- void [setToolBarShortcutHints](#) (QToolBar *pToolBar)
Helper function to add a shortcut hint to all actions which a toolbar contains.
- QIcon [getDataObjectIcon](#) (DataObjectType type)
Helper function to assign appropriate data object icon.

Variables

- const QString **skDataObjectsWindow** = "DataObjectsManager"

5.26.1 Detailed Description

Implementation of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

5.27 /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.

5.27.1 Detailed Description

Declaration of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

5.28 /home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.cpp File Reference

Implementation of the [DoubleSpinBoxItemDelegate](#) class.

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

5.28.1 Detailed Description

Implementation of the [DoubleSpinBoxItemDelegate](#) class.

Author

Pavel Lakiza

Date

March 2021

5.29 /home/qinterfly/Library/Projects/QRodSystems/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.

5.29.1 Detailed Description

Declaration of the [DoubleSpinBoxItemDelegate](#) class.

Author

Pavel Lakiza

Date

March 2021

5.30 /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"
```

5.30.1 Detailed Description

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

Author

Pavel Lakiza

Date

March 2021

5.31 /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.

5.31.1 Detailed Description

Interface of a table model.

Author

Pavel Lakiza

Date

March 2021

5.32 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/matrixtablemodel.cpp File Reference

Implementation of the [MatrixTableModel](#) class.

```
#include <QTreeView>
#include "matrixtablemodel.h"
#include "abstractdataobject.h"
```

5.32.1 Detailed Description

Implementation of the [MatrixTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.33 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/matrixtablemodel.h File Reference

Declaration of the [MatrixTableModel](#) class.

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

Classes

- class [MatrixTableModel](#)
Table model to represent a matrix data object.

5.33.1 Detailed Description

Declaration of the [MatrixTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.34 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/surfacetablemodel.cpp File Reference

Implementation of the [SurfaceTableModel](#) class.

```
#include <QTreeView>
#include "surfacedataobject.h"
#include "surfacetablemodel.h"
```

5.34.1 Detailed Description

Implementation of the [SurfaceTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.35 /home/qinterfly/Library/Projects/QRod↵ Systems/src/managers/surfacetablemodel.h File Reference

Declaration of the [SurfaceTableModel](#) class.

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

Classes

- class [SurfaceTableModel](#)
Table model to represent a surface data object.

5.35.1 Detailed Description

Declaration of the [SurfaceTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.36 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.cpp File Reference

Implementation of the [View3D](#) class.

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

5.36.1 Detailed Description

Implementation of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

5.37 /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.

5.37.1 Detailed Description

Declaration of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

