

QRodSystems

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Chapter 1

Hierarchical Index

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Class Index

2.1 Class List

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Chapter 4

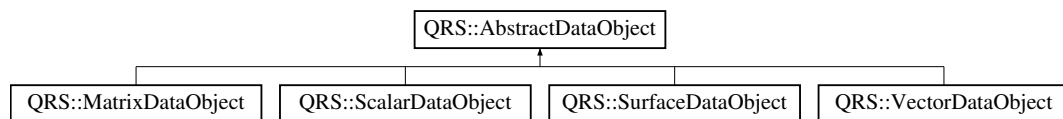
Class Documentation

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 [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.
- virtual void **import** (QTextStream &stream)=0

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:

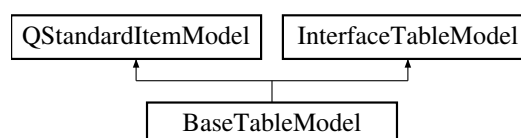
- /home/qinterfly/Library/Projects/QRodSystems/src/core/array.h
- /home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp

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:

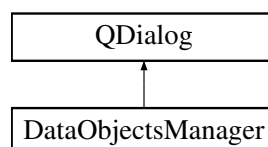
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[basetablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[basetablemodel.cpp](#)

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.
- QRS::DataIDType [addScalar](#) ()
Add a scalar object.
- QRS::DataIDType [addVector](#) ()
Add a vector object.
- QRS::DataIDType [addMatrix](#) ()
Add a matrix object.
- QRS::DataIDType [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.
- void [importDataObjects](#) ()
Import data objects from a file.

Public Member Functions

- **DataObjectsManager** ([QRS::Project](#) &project, QSettings &settings, QString &lastPath, 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.
- void [importDataObject](#) (QString const &path, QString const &fileName)
Import a data object from a file.

Private Attributes

- Ui::DataObjectsManager * **mpUi**
- ads::CDockManager * **mpDockManager**
- QListWidget * **mpListDataObjects**
- QTreeView * **mpDataTable**
- [QRS::Project](#) & **mProject**
- QSettings & **mSettings**
- mapDataObjects **mDataObjects**
- QString & **mLastPath**
- [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:

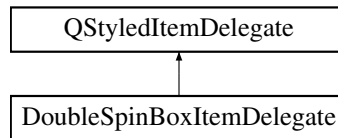
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[dataobjectsmanager.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[dataobjectsmanager.cpp](#)

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:

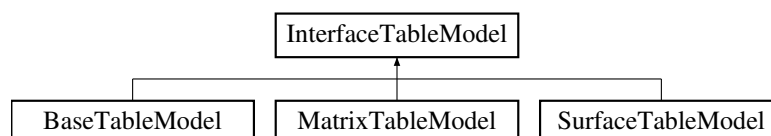
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[doublespinboxitemdelegate.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[doublespinboxitemdelegate.cpp](#)

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:

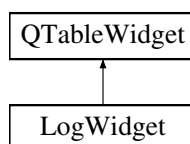
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[interfacetablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/[interfacetablemodel.cpp](#)

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:

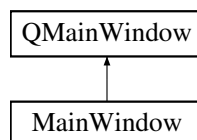
- </home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.cpp>

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)
- void [openProject](#) (QString const &filePath)
Open the specific project.
- bool [saveProject](#) ()
Save the current project.

Static Public Attributes

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

Private Slots

- void [createProject](#) ()
Create a project and substitute the current one with it.
- void [openProjectDialog](#) ()
Open a project by using a dialog.
- void [openRecentProject](#) ()
Open the project which was selected from the Recent Projects menu.
- 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.*

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:

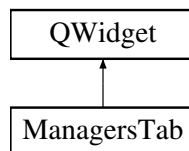
- </home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp>

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:

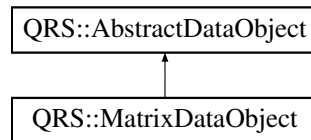
- </home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.cpp>

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](#).
- virtual void [import](#) (QTextStream &stream) override
Import a matrix data object from a file.

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:

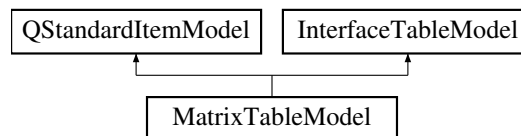
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.cpp](#)

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:

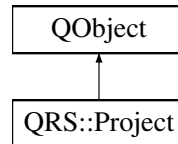
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.h
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/matrixtablemodel.cpp

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.
- DataIDType [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
- void [importDataObjects](#) (QString const &path, QString const &fileName)
Import several data objects from a file.

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 **mlsModified**
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:

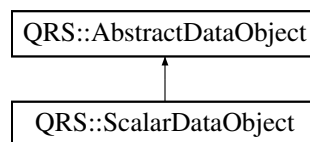
- `/home/qinterfly/Library/Projects/QRodSystems/src/core/array.h`

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`.
- virtual void `import` (QTextStream &stream) override
Import a scalar data object from a file.

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:

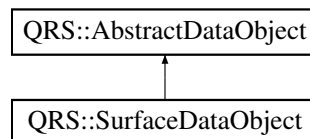
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.cpp](#)

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.
- virtual void [import](#) (QTextStream &stream) override
Import a surface data object from a file.

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:

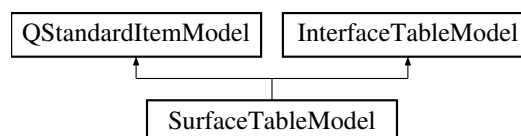
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[surfacedataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[surfacedataobject.cpp](#)

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:

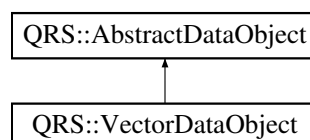
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.cpp>

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](#).
- virtual void [import](#) (QTextStream &stream) override
Import a vector data object from a file.

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:

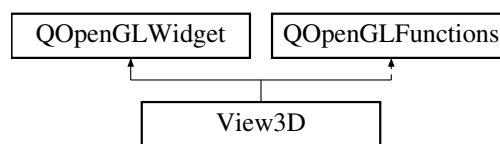
- </home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp>

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

April 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

April 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"
```

Variables

- const IndexType **skNumElements** = 3

5.13.1 Detailed Description

Implementation of the MatrixDataObject class.

Author

Pavel Lakiza

Date

April 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

April 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"
#include "utilities.h"
```

Functions

- [AbstractDataObject * createDataObject](#) (DataObjectType type)
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

April 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/QRod↵ Systems/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

April 2021

5.18 /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.

5.18.1 Detailed Description

Declaration of the ScalarDataObject class.

Author

Pavel Lakiza

Date

April 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

April 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

April 2021

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

Implementation of utilities.

```
#include <QDebug>
#include <QString>
#include <QFile>
#include <QDir>
#include <QPair>
#include "utilities.h"
```

5.21.1 Detailed Description

Implementation of utilities.

Author

Pavel Lakiza

Date

April 2021

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

Declaration of utilities.

```
#include <QSharedPointer>
#include "datatypes.h"
```

Functions

- `QPair< QRS::DataObjectType, QSharedPointer< QFile > > Utilities::File::getDataObjectFile` (QString const &path, QString const &fileName)

Retrieve a pair consisted of a data object file and its type.

5.22.1 Detailed Description

Declaration of utilities.

Author

Pavel Lakiza

Date

April 2021

5.23 `/home/qinterfly/Library/Projects/QRod↵ Systems/src/core/vectordataobject.cpp` File Reference

Implementation of the VectorDataObject class.

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

Variables

- `const IndexType skNumElements = 3`

5.23.1 Detailed Description

Implementation of the VectorDataObject class.

Author

Pavel Lakiza

Date

April 2021

5.24 `/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.

5.24.1 Detailed Description

Declaration of the VectorDataObject class.

Author

Pavel Lakiza

Date

April 2021

5.25 /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.

5.25.1 Detailed Description

The startup function.

Author

Pavel Lakiza

Date

March 2021

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

Implementation of the [BaseTableModel](#) class.

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

5.26.1 Detailed Description

Implementation of the [BaseTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.27 [/home/qinterfly/Library/Projects/QRod](#) Systems/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.

5.27.1 Detailed Description

Declaration of the [BaseTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.28 /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 <QFileDialog>
#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 "../core/utilities.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"

5.28.1 Detailed Description

Implementation of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

5.29 [/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.

5.29.1 Detailed Description

Declaration of the [DataObjectsManager](#) class.

Author

Pavel Lakiza

Date

March 2021

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

Implementation of the [DoubleSpinBoxItemDelegate](#) class.

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

5.30.1 Detailed Description

Implementation of the [DoubleSpinBoxItemDelegate](#) class.

Author

Pavel Lakiza

Date

March 2021

5.31 /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.

5.31.1 Detailed Description

Declaration of the [DoubleSpinBoxItemDelegate](#) class.

Author

Pavel Lakiza

Date

March 2021

5.32 /home/qinterfly/Library/Projects/QRodSystems/src/managers/interfacetablemodel.cpp File Reference

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

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

5.32.1 Detailed Description

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

Author

Pavel Lakiza

Date

March 2021

5.33 /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.

5.33.1 Detailed Description

Interface of a table model.

Author

Pavel Lakiza

Date

March 2021

5.34 /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"
```

5.34.1 Detailed Description

Implementation of the [MatrixTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.35 /home/qinterfly/Library/Projects/QRodSystems/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.

5.35.1 Detailed Description

Declaration of the [MatrixTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.36 /home/qinterfly/Library/Projects/QRodSystems/src/managers/surfacetablemodel.cpp File Reference

Implementation of the [SurfaceTableModel](#) class.

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

5.36.1 Detailed Description

Implementation of the [SurfaceTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.37 /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.

5.37.1 Detailed Description

Declaration of the [SurfaceTableModel](#) class.

Author

Pavel Lakiza

Date

March 2021

5.38 /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"
```

5.38.1 Detailed Description

Implementation of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

5.39 /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.

5.39.1 Detailed Description

Declaration of the [View3D](#) class.

Author

Pavel Lakiza

Date

March 2021

