

QRodSystems

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# Chapter 1

## Hierarchical Index

### 1.1 Class Hierarchy

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

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## Chapter 2

# Class Index

### 2.1 Class List

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## Chapter 4

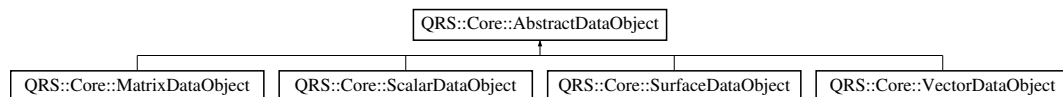
# Class Documentation

### 4.1 QRS::Core::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::Core::AbstractDataObject:



#### Public Member Functions

- [AbstractDataObject](#) (DataObjectType type, QString const &name)  
*Base constructor.*
- virtual [AbstractDataObject](#) \* **clone** () const =0
- virtual [DataItemType](#) & **addItem** (DataKeyType key)=0
- void [removeItem](#) (DataValueType key)  
*Remove an entity with the specified key.*
- bool [changeItemKey](#) (DataKeyType oldKey, DataKeyType newKey, 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.*
- uint **numberItems** () const
- DataHolder & **getItems** ()
- [DataItemType](#) & **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 **numberOfObjects** ()
- static void **setNumberOfObjects** (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::Core::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:

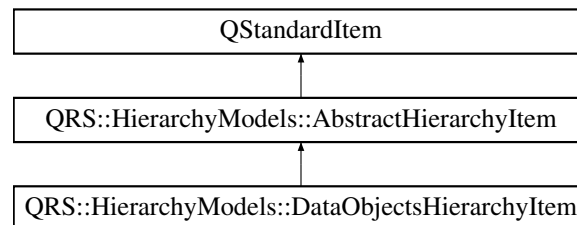
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[abstractdataobject.cpp](#)

## 4.2 QRS::HierarchyModels::AbstractHierarchyItem Class Reference

Item to represent a hierarchy of elements of the same type.

```
#include <abstrachierarchyitem.h>
```

Inheritance diagram for QRS::HierarchyModels::AbstractHierarchyItem:



## Public Member Functions

- **AbstractHierarchyItem** (QIcon const &icon, QString const &text, [Core::HierarchyNode](#) \*pNode)
- void [writePointer](#) (QDataStream &out) const  
*Write the pointer to the current item to a stream.*
- virtual int **type** () const =0

## Static Public Member Functions

- static [AbstractHierarchyItem](#) \* [readPointer](#) (QDataStream &in)  
*Retrieve a pointer to an item from a stream.*

## Protected Attributes

- [Core::HierarchyNode](#) \* **mpNode** = nullptr

## Friends

- class **AbstractHierarchyModel**

### 4.2.1 Detailed Description

Item to represent a hierarchy of elements of the same type.

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

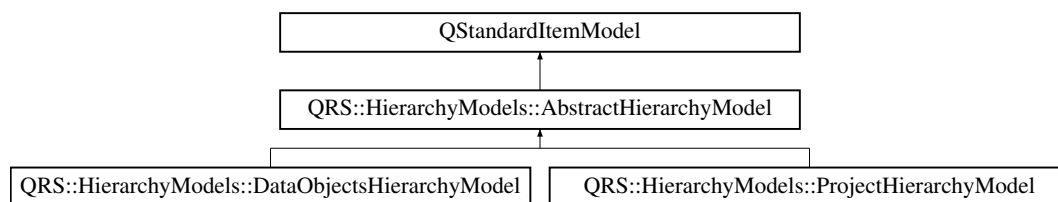
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[abstracthierarchyitem.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[abstracthierarchyitem.cpp](#)

## 4.3 QRS::HierarchyModels::AbstractHierarchyModel Class Reference

Hierarchy model which enables one to drag and drop elements of the same type.

```
#include <abstracthierarchymodel.h>
```

Inheritance diagram for QRS::HierarchyModels::AbstractHierarchyModel:



## Signals

- void **dataModified** (bool flag)

## Public Member Functions

- **AbstractHierarchyModel** (QString const &mimeType, QTreeView \*pView=nullptr)
- virtual void **updateContent** ()=0
- virtual void **clearContent** ()=0
- Qt::DropActions **supportedDragActions** () const override  
*Specify allowed drag actions.*
- Qt::DropActions **supportedDropActions** () const override  
*Specify allowed drop actions.*
- QStringList **mimeTypes** () const override  
*Retrieve the mime types.*
- QMimeData \* **mimeTypeData** (const QModelIndexList &indices) const override  
*Encode each item according to a given list of indices.*
- bool **dropMimeTypeData** (QMimeData const \*pMimeData, Qt::DropAction action, int row, int column, const QModelIndex &parent) override  
*Process the drop action.*

## Protected Attributes

- QString const **kMimeType**

## Private Member Functions

- bool [processDropOnItem](#) (QDataStream &stream, int &numItems, QModelIndex const &indexParent)  
*Merge several items into one entity.*
- bool [processDropBetweenItems](#) (QDataStream &stream, int &numItems, QModelIndex const &indexParent, int row)  
*Change the order of items.*
- void [retrieveExpandedState](#) (NodesState &nodesState, QModelIndex const &indexParent, QTreeView const \*pView)  
*Retrieve information about whether each directory is expanded.*
- void [setExpandedState](#) (NodesState &nodesState, QModelIndex const &indexParent, QTreeView \*pView)  
*Set an expanded state of each directory.*

### 4.3.1 Detailed Description

Hierarchy model which enables one to drag and drop elements of the same type.

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

- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[abstracthierarchymodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[abstracthierarchymodel.cpp](#)

## 4.4 QRS::Core::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.*

### 4.4.1 Detailed Description

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

Numerical array class.

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

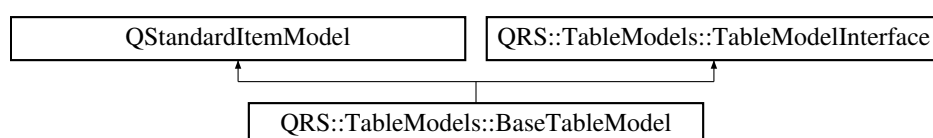
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/array.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp](#)

## 4.5 QRS::TableModels::BaseTableModel Class Reference

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

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

Inheritance diagram for QRS::TableModels::BaseTableModel:



## Public Member Functions

- **BaseTableModel** (QWidget \*parent=nullptr)
- void **setDataObject** (Core::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 \*pSelectionModel) override  
*Insert a new item after selected one.*
- void **insertLeadingItemAfterSelected** (QItemSelectionModel \*) override
- void **removeSelectedItem** (QItemSelectionModel \*pSelectionModel) 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

- Core::AbstractDataObject \* **mpDataObject** = nullptr

## Additional Inherited Members

### 4.5.1 Detailed Description

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

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

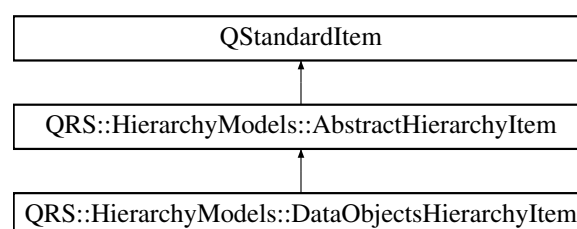
- /home/qinterfly/Library/Projects/QRodSystems/src/models/table/basetablemodel.h
- /home/qinterfly/Library/Projects/QRodSystems/src/models/table/basetablemodel.cpp

## 4.6 QRS::HierarchyModels::DataObjectsHierarchyItem Class Reference

Item to represent a hierarchy of data objects.

```
#include <dataobjectshierarchyitem.h>
```

Inheritance diagram for QRS::HierarchyModels::DataObjectsHierarchyItem:



## Public Member Functions

- [DataObjectsHierarchyItem](#) (DataObjects &dataObjects, [Core::HierarchyTree](#) &hierarchyDataObjects, QString const &text="Root", QIcon const &icon=QIcon())  
*Create the representer of the structure of data objects.*
- [DataObjectsHierarchyItem](#) ([Core::HierarchyNode](#) \*pNode, [Core::AbstractDataObject](#) \*pDataObject)  
*Construct an item to represent a data object.*
- [DataObjectsHierarchyItem](#) ([Core::HierarchyNode](#) \*pNode)  
*Construct an item to represent a directory.*
- int **type** () const override

## Private Member Functions

- void **appendItems** (DataObjects &dataObjects, [Core::HierarchyNode](#) \*pNode)

## Private Attributes

- [Core::AbstractDataObject](#) \* **mpDataObject** = nullptr

## Friends

- class **DataObjectsHierarchyModel**
- class **ProjectHierarchyModel**
- class **PropertiesModels::DataObjectsPropertiesModel**

## Additional Inherited Members

### 4.6.1 Detailed Description

Item to represent a hierarchy of data objects.

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

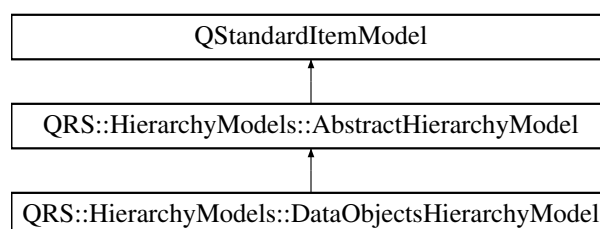
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[dataobjectshierarchyitem.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[dataobjectshierarchyitem.cpp](#)

## 4.7 QRS::HierarchyModels::DataObjectsHierarchyModel Class Reference

Tree model to represent and modify a hierarchy of data objects.

```
#include <dataobjectshierarchymodel.h>
```

Inheritance diagram for QRS::HierarchyModels::DataObjectsHierarchyModel:





## Public Slots

- void [retrieveSelectedDataObject](#) ()  
*Retrieve a selected data object.*
- void [removeSelectedItems](#) ()  
*Remove data objects under selection.*

## Signals

- void **dataObjectSelected** (Core::DataIDType id)
- void **selectionCleared** ()

## Public Member Functions

- **DataObjectsHierarchyModel** (DataObjects &dataObjects, [Core::HierarchyTree](#) &hierarchyDataObjects, QTreeView \*pView=nullptr)
- void [updateContent](#) () override  
*Update all the content.*
- void [clearContent](#) () override  
*Clear all the items.*
- bool [isEmpty](#) () const  
*Check if there are data objects to represent.*
- void [selectItem](#) (int iRow)  
*Select an item by row index.*

## Private Slots

- void [renameDataObject](#) (QStandardItem \*pStandardItem)  
*Rename a data object after editing.*

## Private Attributes

- DataObjects & **mDataObjects**
- [Core::HierarchyTree](#) & **mHierarchyDataObjects**

## Additional Inherited Members

### 4.7.1 Detailed Description

Tree model to represent and modify a hierarchy of data objects.

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

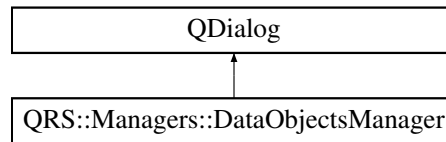
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[dataobjectshierarchymodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[dataobjectshierarchymodel.cpp](#)

## 4.8 QRS::Managers::DataObjectsManager Class Reference

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

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

Inheritance diagram for QRS::Managers::DataObjectsManager:



### Public Slots

- void [apply](#) ()  
*Apply all the changes made by user.*
- Core::DataIDType [addScalar](#) ()  
*Add a scalar object.*
- Core::DataIDType [addVector](#) ()  
*Add a vector object.*
- Core::DataIDType [addMatrix](#) ()  
*Add a matrix object.*
- Core::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 [importDataObjects](#) ()  
*Import data objects from a file.*
- void [representDataObject](#) (Core::DataIDType id)  
*Represent a selected data object according to its type.*
- void [clearDataObjectRepresentation](#) ()  
*Clear a visual data of a data object.*

### Signals

- void [closed](#) ()

### Public Member Functions

- **DataObjectsManager** ([Core::Project](#) &project, [QSettings](#) &settings, [QString](#) &lastPath, [QWidget](#) \*parent=nullptr)
- void [selectDataObject](#) (int iRow)  
*Select a data object by row index.*
- [mapDataObjects](#) const & **getDataObjects** ()

## Private Member Functions

- void `closeEvent` (QCloseEvent \*pEvent) override  
*Save settings and delete handling widgets before closing the window.*
- 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.*
- 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` (Core::AbstractDataObject \*pDataObject)  
*Helper function to insert data objects into the manager.*
- 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`
- QTreeView \* `mpTreeDataObjects`
- QTreeView \* `mpDataTable`
- `DoubleSpinBoxItemDelegate` \* `mplItemDelegate` = nullptr
- `Core::Project` & `mProject`
- QSettings & `mSettings`
- mapDataObjects `mDataObjects`
- `Core::HierarchyTree` `mHierarchyDataObjects`
- QString & `mLastPath`
- `TableModels::TableModelInterface` \* `mpTableModelInterface` = nullptr
- `TableModels::BaseTableModel` \* `mpBaseTableModel`
- `TableModels::MatrixTableModel` \* `mpMatrixTableModel`
- `TableModels::SurfaceTableModel` \* `mpSurfaceTableModel`
- `HierarchyModels::DataObjectsHierarchyModel` \* `mpTreeDataObjectsModel`

### 4.8.1 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:

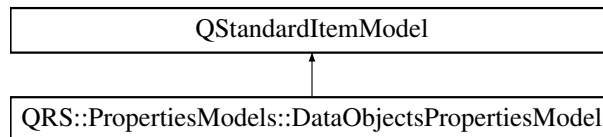
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h
- /home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp

## 4.9 QRS::PropertiesModels::DataObjectsPropertiesModel Class Reference

Model to represent properties of selected data objects.

```
#include <dataobjectspropertiesmodel.h>
```

Inheritance diagram for QRS::PropertiesModels::DataObjectsPropertiesModel:



### Public Types

- enum **PropertyType** {  
**kName** , **kType** , **kNumberItems** , **kNumberEntities** ,  
**kID** , **kNumberChildren** }

### Signals

- void **propertyChanged** (bool flag)

### Public Member Functions

- DataObjectsPropertiesModel** (QTableView \*pView, QVector< [HierarchyModels::AbstractHierarchyItem](#) \* > items)

### Private Slots

- void [modifyProperty](#) (QStandardItem \*pChangedProperty)  
*Modify the selected property of all items.*

### Private Member Functions

- void [setDirectoryAttributes](#) ()  
*Set directory characteristic attributes.*
- void [setObjectAttributes](#) ()  
*Set objects characteristic attributes.*
- QList< QStandardItem \* > [preparePropertyRow](#) (PropertyType type, QString const &title, QVariant const &value, bool isValueEditable) const  
*Prepare a row to insert into the table.*

### Private Attributes

- QVector< [HierarchyModels::DataObjectsHierarchyItem](#) \* > **mItems**

### 4.9.1 Detailed Description

Model to represent properties of selected data objects.

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

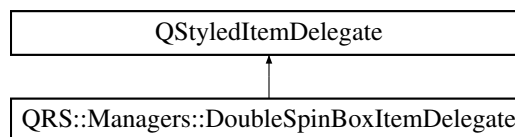
- </home/qinterfly/Library/Projects/QRodSystems/src/models/properties/dataobjectspropertiesmodel.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/models/properties/dataobjectspropertiesmodel.cpp>

## 4.10 QRS::Managers::DoubleSpinBoxItemDelegate Class Reference

Class to specify how table values can be edited.

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

Inheritance diagram for QRS::Managers::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 \*pEditor, const QModelIndex &index) const override  
*Specify data to show.*
- void [setModelData](#) (QWidget \*pEditor, QAbstractItemModel \*pModel, const QModelIndex &index) const override  
*Set data to a model.*
- void [updateEditorGeometry](#) (QWidget \*pEditor, const QStyleOptionViewItem &option, const QModelIndex &index) const override  
*Set a geometry to render.*

### 4.10.1 Detailed Description

Class to specify 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>

## 4.11 QRS::Core::HierarchyNode Class Reference

Hierarchy representative.

```
#include <hierarchynode.h>
```

### Public Types

- enum **NodeType** { **kObject** , **kDirectory** }

### Public Member Functions

- [HierarchyNode](#) (NodeType type, QVariant value)  
*Node constructor.*
- void [appendChild](#) ([HierarchyNode](#) \*node)  
*Add a child node.*
- bool **hasParent** () const
- bool **hasChild** () const
- bool **hasNextSibling** () const
- [HierarchyNode](#) \* **parent** ()
- [HierarchyNode](#) \* **firstChild** ()
- [HierarchyNode](#) \* **nextSibling** ()
- NodeType **type** () const
- QVariant & **value** ()
- [HierarchyNode](#) \* **groupNodes** ([HierarchyNode](#) \*pChildNode)  
*Merge two nodes into one entity.*
- bool **setBefore** ([HierarchyNode](#) \*pSetNode)  
*Set a given node before the current one.*
- bool **setAfter** ([HierarchyNode](#) \*pSetNode)  
*Set a given node after the current one.*
- uint **numberChildren** () const  
*Retrieve a number of children of the current node.*

### Private Member Functions

- void [excludeNodeFromHierarchy](#) ()  
*Remove all links to the node.*
- bool **isSetAllowed** ([HierarchyNode](#) const \*pNode) const  
*Check whether it is possible to place a given item before or after the current one.*
- bool **isParentOf** ([HierarchyNode](#) const \*pNode) const  
*Check whether the current item contains a given node as a child.*
- uint **countNodes** ([HierarchyNode](#) \*pNode, uint &numNodes) const  
*Count all children and siblings of a given node.*

### Private Attributes

- [HierarchyNode](#) \* **mpParent** = nullptr
- [HierarchyNode](#) \* **mpFirstChild** = nullptr
- [HierarchyNode](#) \* **mpNextSibling** = nullptr
- [HierarchyNode](#) \* **mpPreviousSibling** = nullptr
- NodeType **mType**
- QVariant **mValue**

## Friends

- class **HierarchyTree**

### 4.11.1 Detailed Description

Hierarchy representative.

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

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

## 4.12 QRS::Core::HierarchyTree Class Reference

Hierarchy of data objects (n-array tree)

```
#include <hierarchytree.h>
```

### Public Member Functions

- **HierarchyTree** ()  
*Base tree constructor.*
- **HierarchyTree** (**HierarchyNode** \*pRootNode)  
*Take the user defined node as the root.*
- **HierarchyTree** (QDataStream &stream, int numNodes)  
*Read a tree from a stream.*
- **HierarchyTree** & **operator=** (**HierarchyTree** const &another)  
*Copy assignment operator.*
- **HierarchyTree** & **operator=** (**HierarchyTree** &&another)  
*Move assignment operator.*
- **~HierarchyTree** ()  
*Tree destructor.*
- void **clear** ()  
*Delete all nodes except the root node.*
- void **appendNode** (**HierarchyNode** \*pNode)  
*Append a node to the root node.*
- bool **removeNode** (**HierarchyNode::NodeType** type, QVariant const &value)  
*Remove a node by type and value.*
- void **removeNode** (**HierarchyNode** \*pNode)  
*Remove a node and all its subnodes.*
- void **changeNodeValue** (**HierarchyNode::NodeType** type, QVariant const &oldValue, QVariant const &newValue)  
*Change the value of a node.*
- **HierarchyNode** \* **root** ()
- **HierarchyTree** **clone** () const  
*Clone a tree.*
- **HierarchyNode** \* **findNode** (**HierarchyNode** \*pBaseNode, **HierarchyNode::NodeType** type, QVariant const &value) const  
*Find a node by type and value.*
- uint **size** () const  
*Get a number of nodes.*

## Private Member Functions

- `HierarchyNode * copyNode (HierarchyNode *pBaseNode, uint relativeLevel) const`  
*Copy a node.*
- `void removeNodeSiblings (HierarchyNode *pNode)`  
*Remove all subnodes.*
- `void printNode (uint level, HierarchyNode *pNode, QDebug stream) const`  
*Print a current node and all its subnodes.*
- `void writeNode (HierarchyNode *pNode, QDataStream &stream) const`  
*Print a current node and all its subnodes.*

## Private Attributes

- `HierarchyNode * mpRootNode = nullptr`

## Friends

- `QDebug operator<< (QDebug stream, HierarchyTree &tree)`  
*Print a tree structure.*
- `QDataStream & operator<< (QDataStream &stream, HierarchyTree const &tree)`  
*Write a tree structure to a stream.*

### 4.12.1 Detailed Description

Hierarchy of data objects (n-array tree)

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

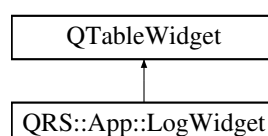
- `/home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchytree.h`
- `/home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchytree.cpp`

## 4.13 QRS::App::LogWidget Class Reference

Log all the messages sent.

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

Inheritance diagram for QRS::App::LogWidget:





## Public Member Functions

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

### 4.13.1 Detailed Description

Log all the messages sent.

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

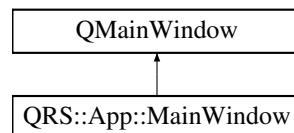
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[logwidget.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[logwidget.cpp](#)

## 4.14 QRS::App::MainWindow Class Reference

The main window of the program.

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

Inheritance diagram for QRS::App::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 [representHierarchyProperties](#) (QVector< [HierarchyModels::AbstractHierarchyItem](#) \* > items)  
*Show information about the selected project items.*
- 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 [deleteDataObjectsManager](#) ()  
*Delete a manager of data objects after being used.*
- 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 \*pEvent) 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 \* [createCodeWidget](#) ()  
*Create a widget enables to code.*
- ads::CDockWidget \* [createLogWidget](#) ()  
*Create a window for logging.*
- ads::CDockWidget \* [createPropertiesWidget](#) ()  
*Create a window to modify properies of selected oberjects.*
- 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.
- void [specifyProjectConnections](#) ()
- Set signals and slots for a project.
- 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**
- QLabel \* **mpStatusLabel**
- QTableView \* **mpPropertiesWidget**
- [HierarchyModels::ProjectHierarchyModel](#) \* **mpProjectHierarchyModel** = nullptr
- [Managers::DataObjectsManager](#) \* **mpDataObjectsManager** = nullptr
- [Core::Project](#) \* **mpProject**
- QSharedPointer< QSettings > **mpSettings**
- QString **mLastPath**
- QList< QString > **mPathRecentProjects**

### 4.14.1 Detailed Description

The main window of the program.

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

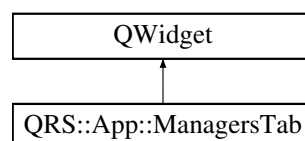
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[mainwindow.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[mainwindow.cpp](#)

## 4.15 QRS::App::ManagersTab Class Reference

A toolbar consisted of object designers.

```
#include <controlltabs.h>
```

Inheritance diagram for QRS::App::ManagersTab:



## Signals

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

## Public Member Functions

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

### 4.15.1 Detailed Description

A toolbar consisted of object designers.

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

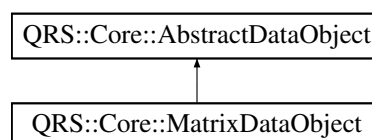
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[controltabs.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/central/[controltabs.cpp](#)

## 4.16 QRS::Core::MatrixDataObject Class Reference

Matrix data object.

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

Inheritance diagram for QRS::Core::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

### 4.16.1 Detailed Description

Matrix data object.

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

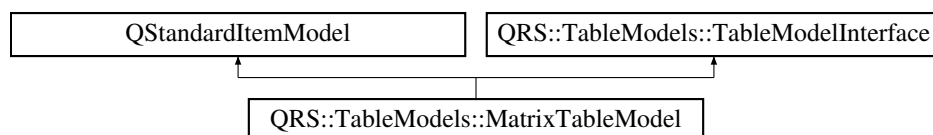
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[matrixdataobject.cpp](#)

## 4.17 QRS::TableModels::MatrixTableModel Class Reference

Table model to represent a matrix data object.

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

Inheritance diagram for QRS::TableModels::MatrixTableModel:



## Public Member Functions

- **MatrixTableModel** (QWidget \*parent=nullptr)
- void **setDataObject** ([Core::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 \*pSelectionModel) override  
*Insert a new item after selected one.*
- void **insertLeadingItemAfterSelected** (QItemSelectionModel \*) override
- void **removeSelectedItem** (QItemSelectionModel \*pSelectionModel) 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

- [Core::AbstractDataObject](#) \* **mpDataObject** = nullptr

## Additional Inherited Members

### 4.17.1 Detailed Description

Table model to represent a matrix data object.

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

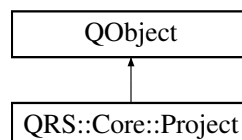
- /home/qinterfly/Library/Projects/QRodSystems/src/models/table/[matrixtablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/table/[matrixtablemodel.cpp](#)

## 4.18 QRS::Core::Project Class Reference

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

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

Inheritance diagram for QRS::Core::Project:



## Public Slots

- bool [save](#) (QString const &dir, QString const &fileName)  
*Save a project to a file.*
- void [setModified](#) (bool modifiedState=true)  
*Set a modification state.*

## Signals

- void **dataObjectAdded** (QRS::Core::DataIDType id)
- void **dataObjectRemoved** (QRS::Core::DataIDType id)
- void **dataObjectsChanged** ()
- 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
- DataIDType **numberDataObjects** () const
- std::unordered\_map< DataIDType, [AbstractDataObject](#) \* > [cloneDataObjects](#) () const  
*Clone 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, [HierarchyTree](#) const &hierarchyDataObjects)  
*Substitute current data objects with new ones.*
- [HierarchyTree](#) [cloneHierarchyDataObjects](#) () const  
*Clone a hierarchy of data objects.*
- 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 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.*
- [HierarchyTree](#) [mHierarchyDataObjects](#)  
*Hierarchy of data objects.*

## Static Private Attributes

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

## Friends

- class **QRS::HierarchyModels::ProjectHierarchyModel**

### 4.18.1 Detailed Description

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

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

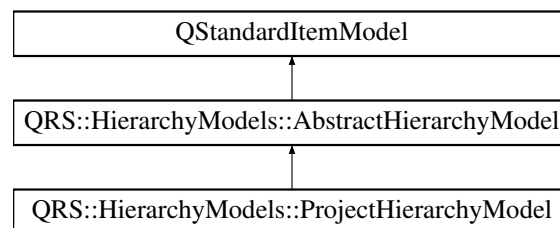
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[project.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[project.cpp](#)

## 4.19 QRS::HierarchyModels::ProjectHierarchyModel Class Reference

Project hierarchy representative.

```
#include <projecthierarchymodel.h>
```

Inheritance diagram for QRS::HierarchyModels::ProjectHierarchyModel:



## Public Slots

- void [validateItemSelection](#) ()  
*Check if an item selection is correct and if it is not – correct it.*

## Signals

- void **selectionValidated** (QVector< [QRS::HierarchyModels::AbstractHierarchyItem](#) \* > validatedItems)

## Public Member Functions

- **ProjectHierarchyModel** (QTreeView \*pView=nullptr)
- void [updateContent](#) () override  
*Update all the content.*
- void [clearContent](#) () override  
*Clear all the items.*
- void [setProject](#) ([Core::Project](#) \*pProject)  
*Set a project to represent.*



## Private Slots

- void [renameltem](#) (QStandardItem \*pStandardItem)  
*Rename an item.*

## Private Attributes

- [Core::Project](#) \* **mpProject** = nullptr

## Additional Inherited Members

### 4.19.1 Detailed Description

Project hierarchy representative.

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

- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[projecthierarchymodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/[projecthierarchymodel.cpp](#)

## 4.20 QRS::Core::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**

### 4.20.1 Detailed Description

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

Proxy class to acquire a row by index.

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

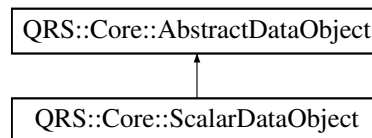
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[array.h](#)

## 4.21 QRS::Core::ScalarDataObject Class Reference

Scalar data object.

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

Inheritance diagram for QRS::Core::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

#### 4.21.1 Detailed Description

Scalar data object.

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

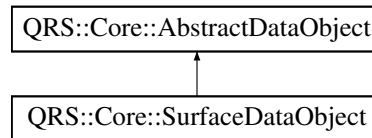
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/core/[scalardataobject.cpp](#)

## 4.22 QRS::Core::SurfaceDataObject Class Reference

Surface data object.

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

Inheritance diagram for QRS::Core::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.*
- uint **numberLeadingItems** () const
- 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

### 4.22.1 Detailed Description

Surface data object.

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

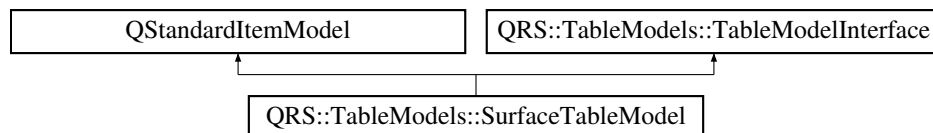
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.cpp](#)

## 4.23 QRS::TableModels::SurfaceTableModel Class Reference

Table model to represent a surface data object.

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

Inheritance diagram for QRS::TableModels::SurfaceTableModel:



## Public Member Functions

- **SurfaceTableModel** (QWidget \*parent=nullptr)
- void **setDataObject** ([Core::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 \*pSelectionModel) override  
*Insert a new item after selected one.*
- void **removeSelectedItem** (QItemSelectionModel \*pSelectionModel) override  
*Remove an array under selection.*
- void **insertLeadingItemAfterSelected** (QItemSelectionModel \*pSelectionModel) override  
*Add a new leading item after selected one.*
- void **removeSelectedLeadingItem** (QItemSelectionModel \*pSelectionModel) 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

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

## Additional Inherited Members

### 4.23.1 Detailed Description

Table model to represent a surface data object.

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

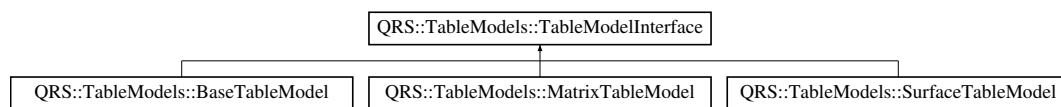
- /home/qinterfly/Library/Projects/QRodSystems/src/models/table/[surfacetablemodel.h](#)
- /home/qinterfly/Library/Projects/QRodSystems/src/models/table/[surfacetablemodel.cpp](#)

## 4.24 QRS::TableModels::TableModelInterface Class Reference

User interface to add and remove items.

```
#include <tablemodelinterface.h>
```

Inheritance diagram for QRS::TableModels::TableModelInterface:



## Public Member Functions

- virtual void **insertItemAfterSelected** (QItemSelectionModel \*pSelectionModel)=0
- virtual void **insertLeadingItemAfterSelected** (QItemSelectionModel \*pSelectionModel)=0
- virtual void **removeSelectedItem** (QItemSelectionModel \*pSelectionModel)=0
- virtual void **removeSelectedItemLeadingItem** (QItemSelectionModel \*pSelectionModel)=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** ([Core::Array](#)< double > &array, uint iRow)  
*Helper function to copy a row from an array.*
- static QList< QStandardItem \* > **prepareRow** (double const &key, [Core::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, [Core::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.*

### 4.24.1 Detailed Description

User interface to add and remove items.

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

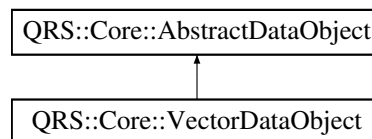
- </home/qinterfly/Library/Projects/QRodSystems/src/models/table/tablemodelinterface.h>
- </home/qinterfly/Library/Projects/QRodSystems/src/models/table/tablemodelinterface.cpp>

## 4.25 QRS::Core::VectorDataObject Class Reference

Vector data object.

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

Inheritance diagram for QRS::Core::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

### 4.25.1 Detailed Description

Vector data object.

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

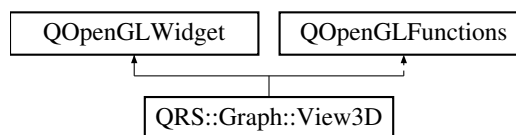
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h](#)
- [/home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp](#)

## 4.26 QRS::Graph::View3D Class Reference

A widget to represent the resulted rod system.

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

Inheritance diagram for QRS::Graph::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**

### 4.26.1 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 [QRS::App::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

May 2021

## 5.4 /home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.h File Reference

Declaration of the LogWidget class.

```
#include <QTableWidget>
```

### Classes

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

### 5.4.1 Detailed Description

Declaration of the LogWidget class.

#### Author

Pavel Lakiza

#### Date

May 2021

## 5.5 /home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp File Reference

Implementation of the MainWindow class.

```
#include <QDesktopWidget>
#include <QToolBar>
#include <QTreeView>
#include <QTableView>
#include <QHeaderView>
#include <QTextEdit>
#include <QVBoxLayout>
#include <QSettings>
#include <QMessageBox>
#include <QFileDialog>
#include <QLabel>
#include "DockManager.h"
#include "DockWidget.h"
#include "DockAreaWidget.h"
#include "ads_globals.h"
#include "mainwindow.h"
#include "ui_mainwindow.h"
#include "controltabs.h"
#include "logwidget.h"
#include "uiconstants.h"
#include "models/hierarchy/projecthierarchymodel.h"
#include "models/properties/dataobjectspropertiesmodel.h"
#include "managers/dataobjectsmanager.h"
#include "render/view3d.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

May 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 [QRS::App::MainWindow](#)  
*The main window of the program.*

## Functions

- void [QRS::App::throwMessage](#) (QtMsgType type, const QMessageLogContext &, const QString &message)  
*Log all the messages.*

### 5.6.1 Detailed Description

Declaration of the MainWindow class.

#### Author

Pavel Lakiza

#### Date

May 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 **QRS::UiConstants::Settings::skGeometry** = "geometry"
- const QString **QRS::UiConstants::Settings::skState** = "state"
- const QString **QRS::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::Core::AbstractDataObject](#)  
*Data object which is designed in the way to be represented in a table easily.*

### Typedefs

- using [QRS::Core::DataItem](#) = Array< DataValueType >
- using [QRS::Core::DataHolder](#) = std::map< DataKeyType, DataItem >

### Functions

- QDataStream & [QRS::Core::operator<<](#) (QDataStream &stream, AbstractDataObject const &obj)  
*Print a data object to a stream.*
- QDataStream & [QRS::Core::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::Core::Array< T >](#)  
*Numerical array class.*
- struct [QRS::Core::Array< T >::Row< U >](#)  
*Proxy class to acquire a row by index.*

### Typedefs

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

### Functions

- template<typename K >  
[QDebug QRS::Core::operator<<](#) (QDebug stream, Array< K > &array)  
*Print all array values using the matrix format.*
- template<typename K >  
[QDataStream & QRS::Core::operator<<](#) (QDataStream &stream, Array< K > const &array)  
*Write an array to a stream.*
- template<typename K >  
[QDataStream & QRS::Core::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::Core::DataValueType** = double
- using **QRS::Core::DataKeyType** = double
- using **QRS::Core::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/hierarchynode.cpp File Reference

Implementation of the HierarchyNode class.

```
#include "hierarchynode.h"
```



### 5.13.1 Detailed Description

Implementation of the HierarchyNode class.

Author

Pavel Lakiza

Date

May 2021

## 5.14 /home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchynode.h File Reference

Declaration of the HierarchyNode class.

```
#include <QVariant>
#include <QDataStream>
#include <QSharedPointer>
```

### Classes

- class [QRS::Core::HierarchyNode](#)  
*Hierarchy representative.*

### 5.14.1 Detailed Description

Declaration of the HierarchyNode class.

Author

Pavel Lakiza

Date

May 2021

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

Implementation of the HierarchyTree class.

```
#include "hierarchytree.h"
```

### 5.15.1 Detailed Description

Implementation of the HierarchyTree class.

Author

Pavel Lakiza

Date

May 2021

## 5.16 /home/qinterfly/Library/Projects/QRod↵ Systems/src/core/hierarchytree.h File Reference

Declaration of the HierarchyTree class.

```
#include <QDebug>
#include "hierarchynode.h"
```

### Classes

- class [QRS::Core::HierarchyTree](#)  
*Hierarchy of data objects (n-array tree)*

### Functions

- QDebug [QRS::Core::operator<<](#) (QDebug stream, HierarchyTree &tree)  
*Print a tree structure.*
- QDataStream & [QRS::Core::operator<<](#) (QDataStream &stream, HierarchyTree const &tree)  
*Write a tree structure to a stream.*

### 5.16.1 Detailed Description

Declaration of the HierarchyTree class.

Author

Pavel Lakiza

Date

April 2021

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

Implementation of the MatrixDataObject class.

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

### Variables

- const IndexType **skNumElements** = 3

#### 5.17.1 Detailed Description

Implementation of the MatrixDataObject class.

##### Author

Pavel Lakiza

##### Date

April 2021

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

Declaration of the MatrixDataObject class.

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

### Classes

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

#### 5.18.1 Detailed Description

Declaration of the MatrixDataObject class.

##### Author

Pavel Lakiza

##### Date

April 2021

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

Implementation of the 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.*

#### 5.19.1 Detailed Description

Implementation of the Project class.

##### Author

Pavel Lakiza

##### Date

May 2021

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

Declaration of the Project class.

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

## Classes

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

## Typedefs

- using **QRS::Core::DataObjects** = std::unordered\_map< DataIDType, AbstractDataObject \* >

### 5.20.1 Detailed Description

Declaration of the Project class.

Author

Pavel Lakiza

Date

May 2021

## 5.21 /home/qinterfly/Library/Projects/QRod↵ Systems/src/core/scalardataobject.cpp File Reference

Implementation of the ScalarDataObject class.

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

### 5.21.1 Detailed Description

Implementation of the ScalarDataObject class.

Author

Pavel Lakiza

Date

April 2021

## 5.22 /home/qinterfly/Library/Projects/QRod↵ Systems/src/core/scalardataobject.h File Reference

Declaration of the ScalarDataObject class.

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

## Classes

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

### 5.22.1 Detailed Description

Declaration of the ScalarDataObject class.

#### Author

Pavel Lakiza

#### Date

April 2021

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

Implementation of the SurfaceDataObject class.

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

### 5.23.1 Detailed Description

Implementation of the SurfaceDataObject class.

#### Author

Pavel Lakiza

#### Date

April 2021

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

Declaration of the SurfaceDataObject class.

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

## Classes

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

### 5.24.1 Detailed Description

Declaration of the SurfaceDataObject class.

#### Author

Pavel Lakiza

#### Date

April 2021

## 5.25 /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"
```

### 5.25.1 Detailed Description

Implementation of utilities.

#### Author

Pavel Lakiza

#### Date

May 2021

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

Declaration of utilities.

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

## Functions

- `QPair< Core::DataObjectType, QSharedPointer< QFile > >` [QRS::Utilities::File::getDataObjectFile](#) (`QString const &path`, `QString const &fileName`)  
*Retrieve a pair consisted of a data object file and its type.*
- `QString` [QRS::Utilities::File::loadFileContent](#) (`QString const &path`)  
*Load a style sheet.*

### 5.26.1 Detailed Description

Declaration of utilities.

Author

Pavel Lakiza

Date

May 2021

## 5.27 `/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

### 5.27.1 Detailed Description

Implementation of the `VectorDataObject` class.

Author

Pavel Lakiza

Date

April 2021



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

Declaration of the VectorDataObject class.

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

### Classes

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

#### 5.28.1 Detailed Description

Declaration of the VectorDataObject class.

##### Author

Pavel Lakiza

##### Date

April 2021

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

The startup function.

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

### Functions

- int [main](#) (int argc, char \*argv[])  
*Entry point.*

#### 5.29.1 Detailed Description

The startup function.

##### Author

Pavel Lakiza

##### Date

May 2021

## 5.30 /home/qinterfly/Library/Projects/QRod↵ Systems/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 "DockAreaWidget.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 "models/table/basetablemodel.h"
#include "models/table/matrixtablemodel.h"
#include "models/table/surfacetablemodel.h"
#include "models/hierarchy/dataobjectshierarchy.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"

#### 5.30.1 Detailed Description

Implementation of the DataObjectsManager class.

##### Author

Pavel Lakiza

##### Date

March 2021

## 5.31 /home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h File Reference

Declaration of the DataObjectsManager class.

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

### Classes

- class [QRS::Managers::DataObjectsManager](#)  
*Manager to create objects of different types: scalars, vectors, matroces and surfaces.*

### Typedefs

- using **QRS::Managers::mapDataObjects** = std::unordered\_map< Core::DataIDType, Core::AbstractDataObject \* >

#### 5.31.1 Detailed Description

Declaration of the DataObjectsManager class.

#### Author

Pavel Lakiza

#### Date

March 2021

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

Implementation of the DoubleSpinBoxItemDelegate class.

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

### 5.32.1 Detailed Description

Implementation of the DoubleSpinBoxItemDelegate class.

Author

Pavel Lakiza

Date

March 2021

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

Declaration of the DoubleSpinBoxItemDelegate class.

```
#include <QStyledItemDelegate>
```

### Classes

- class [QRS::Managers::DoubleSpinBoxItemDelegate](#)  
*Class to specify how table values can be edited.*

### 5.33.1 Detailed Description

Declaration of the DoubleSpinBoxItemDelegate class.

Author

Pavel Lakiza

Date

March 2021

## 5.34 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/models/hierarchy/abstrachierarchyitem.cpp File Reference

Definition of the AbstractHierarchyItem class.

```
#include "abstrachierarchyitem.h"
#include "core/hierarchy/hierarchyitem.h"
```

### 5.34.1 Detailed Description

Definition of the AbstractHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

## 5.35 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/abstracthierarchyitem.h File Reference

Declaration of the AbstractHierarchyItem class.

```
#include <QStandardItem>
```

### Classes

- class [QRS::HierarchyModels::AbstractHierarchyItem](#)  
*Item to represent a hierarchy of elements of the same type.*

### Enumerations

- enum **HierarchyItemType** { **kDataObjects** = QStandardItem::UserType }

### 5.35.1 Detailed Description

Declaration of the AbstractHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

## 5.36 /home/qinterfly/Library/Projects/QRod↵ Systems/src/models/hierarchy/abstrachierarchymodel.cpp File Reference

Definition of the AbstractHierarchyModel class.

```
#include <QTreeView>
#include <QMimeData>
#include <unordered_map>
#include "abstrachierarchymodel.h"
#include "core/hierarchynode.h"
```

### 5.36.1 Detailed Description

Definition of the AbstractHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

## 5.37 /home/qinterfly/Library/Projects/QRod↵ Systems/src/models/hierarchy/abstrachierarchymodel.h File Reference

Declaration of the AbstractHierarchyModel class.

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

### Classes

- class [QRS::HierarchyModels::AbstractHierarchyModel](#)  
*Hierarchy model which enables one to drag and drop elements of the same type.*

### Typedefs

- using **QRS::HierarchyModels::NodesState** = std::unordered\_map< Core::HierarchyNode \*, bool >

### 5.37.1 Detailed Description

Declaration of the AbstractHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

## 5.38 /home/qinterfly/Library/Projects/QRod↵ Systems/src/models/hierarchy/dataobjectshierarchyitem.cpp File Reference

Definition of the DataObjectsHierarchyItem class.

```
#include "dataobjectshierarchyitem.h"  
#include "core/abstractdataobject.h"  
#include "core/hierarchytree.h"
```

### Functions

- QIcon [getDataObjectIcon](#) (DataObjectType type)  
*Helper function to assign appropriate data object icon.*

### 5.38.1 Detailed Description

Definition of the DataObjectsHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

## 5.39 /home/qinterfly/Library/Projects/QRod↵ Systems/src/models/hierarchy/dataobjectshierarchyitem.h File Reference

Declaration of the DataObjectsHierarchyItem class.

```
#include <unordered_map>  
#include "models/hierarchy/abstracthierarchyitem.h"  
#include "core/datatypes.h"
```

## Classes

- class [QRS::HierarchyModels::DataObjectsHierarchyItem](#)  
*Item to represent a hierarchy of data objects.*

## Typedefs

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

### 5.39.1 Detailed Description

Declaration of the DataObjectsHierarchyItem class.

#### Author

Pavel Lakiza

#### Date

May 2021

## 5.40 /home/qinterfly/Library/Projects/QRod Systems/src/models/hierarchy/dataobjectshierarchymodel.cpp File Reference

Definition of the DataObjectsHierarchyModel class.

```
#include <QTreeView>
#include <QMimeData>
#include "dataobjectshierarchymodel.h"
#include "dataobjectshierarchyitem.h"
#include "core/abstractdataobject.h"
#include "core/hierarchytree.h"
```

### 5.40.1 Detailed Description

Definition of the DataObjectsHierarchyModel class.

#### Author

Pavel Lakiza

#### Date

May 2021



## 5.41 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/dataobjectshierarchymodel.h File Reference

Declaration of the DataObjectsHierarchyModel class.

```
#include "models/hierarchy/abstrachierarchymodel.h"
#include "dataobjectshierarchyitem.h"
```

### Classes

- class [QRS::HierarchyModels::DataObjectsHierarchyModel](#)  
*Tree model to represent and modify a hierarchy of data objects.*

#### 5.41.1 Detailed Description

Declaration of the DataObjectsHierarchyModel class.

##### Author

Pavel Lakiza

##### Date

May 2021

## 5.42 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/projecthierarchymodel.cpp File Reference

Definition of the ProjectHierarchyModel class.

```
#include <QTreeView>
#include "projecthierarchymodel.h"
#include "dataobjectshierarchyitem.h"
```

#### 5.42.1 Detailed Description

Definition of the ProjectHierarchyModel class.

##### Author

Pavel Lakiza

##### Date

May 2021

## 5.43 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/models/hierarchy/projecthierarchymodel.h File Reference

Declaration of the ProjectHierarchyModel class.

```
#include "models/hierarchy/abstracthierarchymodel.h"  
#include "core/datatypes.h"  
#include "core/project.h"
```

### Classes

- class [QRS::HierarchyModels::ProjectHierarchyModel](#)  
*Project hierarchy representative.*

#### 5.43.1 Detailed Description

Declaration of the ProjectHierarchyModel class.

##### Author

Pavel Lakiza

##### Date

May 2021

## 5.44 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/models/properties/dataobjectspropertiesmodel.cpp File Reference

Definition of the DataObjectsPropertiesModel class.

```
#include <QTableView>  
#include "dataobjectspropertiesmodel.h"  
#include "core/abstractdataobject.h"  
#include "core/surfacedataobject.h"  
#include "core/hierarchynode.h"  
#include "models/hierarchy/dataobjectshierarchyitem.h"
```

#### 5.44.1 Detailed Description

Definition of the DataObjectsPropertiesModel class.

##### Author

Pavel Lakiza

##### Date

May 2021

## 5.45 /home/qinterfly/Library/Projects/QRodSystems/src/models/properties/dataobjectspropertiesmodel.h File Reference

Declaration of the DataObjectsPropertiesModel class.

```
#include <QStandardItemModel>
```

### Classes

- class [QRS::PropertiesModels::DataObjectsPropertiesModel](#)  
*Model to represent properties of selected data objects.*

#### 5.45.1 Detailed Description

Declaration of the DataObjectsPropertiesModel class.

##### Author

Pavel Lakiza

##### Date

May 2021

## 5.46 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/basetablemodel.cpp File Reference

Implementation of the BaseTableModel class.

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

#### 5.46.1 Detailed Description

Implementation of the BaseTableModel class.

##### Author

Pavel Lakiza

##### Date

March 2021

## 5.47 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/models/table/basetablemodel.h File Reference

Declaration of the BaseTableModel class.

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

### Classes

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

#### 5.47.1 Detailed Description

Declaration of the BaseTableModel class.

Author

Pavel Lakiza

Date

March 2021

## 5.48 [/home/qinterfly/Library/Projects/QRod](#) Systems/src/models/table/matrixtablemodel.cpp File Reference

Implementation of the MatrixTableModel class.

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

#### 5.48.1 Detailed Description

Implementation of the MatrixTableModel class.

Author

Pavel Lakiza

Date

March 2021

## 5.49 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/matrixtablemodel.h File Reference

Declaration of the MatrixTableModel class.

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

### Classes

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

#### 5.49.1 Detailed Description

Declaration of the MatrixTableModel class.

Author

Pavel Lakiza

Date

March 2021

## 5.50 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/surfacetablemodel.cpp File Reference

Implementation of the SurfaceTableModel class.

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

#### 5.50.1 Detailed Description

Implementation of the SurfaceTableModel class.

Author

Pavel Lakiza

Date

March 2021

## 5.51 /home/qinterfly/Library/Projects/QRod↵ Systems/src/models/table/surfacetablemodel.h File Reference

Declaration of the SurfaceTableModel class.

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

### Classes

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

#### 5.51.1 Detailed Description

Declaration of the SurfaceTableModel class.

Author

Pavel Lakiza

Date

March 2021

## 5.52 /home/qinterfly/Library/Projects/QRod↵ Systems/src/models/table/tablemodelinterface.cpp File Reference

Implementation of static functions of TableModelInterface.

```
#include <QStandardItem>
#include "tablemodelinterface.h"
#include "core/array.h"
```

#### 5.52.1 Detailed Description

Implementation of static functions of TableModelInterface.

Author

Pavel Lakiza

Date

May 2021

## 5.53 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/tablemodelinterface.h File Reference

Declaration of the TableModelInterface.

```
#include <QItemSelection>
```

### Classes

- class [QRS::TableModels::TableModelInterface](#)  
*User interface to add and remove items.*

#### 5.53.1 Detailed Description

Declaration of the TableModelInterface.

Author

Pavel Lakiza

Date

May 2021

## 5.54 /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"
```

#### 5.54.1 Detailed Description

Implementation of the View3D class.

Author

Pavel Lakiza

Date

March 2021

## 5.55 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.h

### File Reference

Declaration of the View3D class.

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

### Classes

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

#### 5.55.1 Detailed Description

Declaration of the View3D class.

#### Author

Pavel Lakiza

#### Date

March 2021