

QRodSystems

0.0.12

Generated by Doxygen 1.9.1

1 Hierarchical Index	1
1.1 Class Hierarchy	1
2 Class Index	3
2.1 Class List	3
3 File Index	5
3.1 File List	5
4 Class Documentation	9
4.1 QRS::Core::AbstractDataObject Class Reference	9
4.1.1 Detailed Description	10
4.1.2 Member Function Documentation	10
4.1.2.1 deserialize()	10
4.1.2.2 getAvailableItemKey()	11
4.2 QRS::HierarchyModels::AbstractHierarchyItem Class Reference	11
4.2.1 Detailed Description	12
4.3 QRS::HierarchyModels::AbstractHierarchyModel Class Reference	12
4.3.1 Detailed Description	13
4.3.2 Member Function Documentation	13
4.3.2.1 updateContentExpanded()	13
4.4 QRS::Managers::AbstractProjectManager Class Reference	13
4.4.1 Detailed Description	14
4.5 QRS::Core::AbstractRodComponent Class Reference	15
4.5.1 Detailed Description	16
4.5.2 Member Function Documentation	16
4.5.2.1 deserialize()	16
4.6 QRS::Core::Array< T > Class Template Reference	16
4.6.1 Detailed Description	18
4.7 QRS::TableModels::BaseTableModel Class Reference	18
4.7.1 Detailed Description	19
4.8 QRS::HierarchyModels::DataObjectsHierarchyItem Class Reference	19
4.8.1 Detailed Description	20
4.9 QRS::HierarchyModels::DataObjectsHierarchyModel Class Reference	20
4.9.1 Detailed Description	21
4.10 QRS::Managers::DataObjectsManager Class Reference	21
4.10.1 Detailed Description	23
4.11 QRS::PropertiesModels::DataObjectsPropertiesModel Class Reference	23
4.11.1 Detailed Description	24
4.12 QRS::Managers::DoubleSpinBoxItemDelegate Class Reference	24
4.12.1 Detailed Description	25
4.13 QRS::Managers::GeometryComponentWidget Class Reference	25
4.13.1 Detailed Description	26

4.14 QRS::Core::GeometryRodComponent Class Reference	26
4.14.1 Detailed Description	27
4.15 QRS::Core::HierarchyNode Class Reference	27
4.15.1 Detailed Description	28
4.16 QRS::Core::HierarchyTree Class Reference	28
4.16.1 Detailed Description	30
4.17 QRS::App::LogWidget Class Reference	30
4.17.1 Detailed Description	30
4.18 QRS::App::MainWindow Class Reference	31
4.18.1 Detailed Description	32
4.19 QRS::Managers::ManagersFactory Class Reference	33
4.19.1 Detailed Description	33
4.20 QRS::App::ManagersTab Class Reference	33
4.20.1 Detailed Description	34
4.21 QRS::Core::MatrixDataObject Class Reference	34
4.21.1 Detailed Description	35
4.22 QRS::TableModels::MatrixTableModel Class Reference	35
4.22.1 Detailed Description	36
4.23 QRS::Core::Project Class Reference	36
4.23.1 Detailed Description	38
4.24 QRS::HierarchyModels::ProjectHierarchyModel Class Reference	38
4.24.1 Detailed Description	39
4.25 QRS::Managers::RodComponentsManager Class Reference	39
4.25.1 Detailed Description	40
4.26 QRS::Core::Array< T >::Row< U > Struct Template Reference	40
4.26.1 Detailed Description	41
4.27 QRS::Core::ScalarDataObject Class Reference	41
4.27.1 Detailed Description	42
4.28 QRS::Core::SurfaceDataObject Class Reference	42
4.28.1 Detailed Description	43
4.29 QRS::TableModels::SurfaceTableModel Class Reference	43
4.29.1 Detailed Description	44
4.30 QRS::TableModels::TableModelInterface Class Reference	44
4.30.1 Detailed Description	45
4.31 QRS::Core::VectorDataObject Class Reference	45
4.31.1 Detailed Description	46
4.32 QRS::Graph::View3D Class Reference	46
4.32.1 Detailed Description	46
5 File Documentation	47
5.1 /home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.cpp File Reference	47
5.1.1 Detailed Description	47

5.2 /home/qinterfly/Library/Projects/QRodSystems/src/central/controltabs.h File Reference	47
5.2.1 Detailed Description	48
5.3 /home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.cpp File Reference	48
5.3.1 Detailed Description	48
5.4 /home/qinterfly/Library/Projects/QRodSystems/src/central/logwidget.h File Reference	49
5.4.1 Detailed Description	49
5.5 /home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.cpp File Reference	49
5.5.1 Detailed Description	50
5.6 /home/qinterfly/Library/Projects/QRodSystems/src/central/mainwindow.h File Reference	50
5.6.1 Detailed Description	50
5.7 /home/qinterfly/Library/Projects/QRodSystems/src/central/uiconstants.h File Reference	51
5.7.1 Detailed Description	51
5.8 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractdataobject.cpp File Reference	51
5.8.1 Detailed Description	51
5.9 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractdataobject.h File Reference	52
5.9.1 Detailed Description	52
5.10 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractrodcomponent.cpp File Reference	52
5.10.1 Detailed Description	53
5.11 /home/qinterfly/Library/Projects/QRodSystems/src/core/abstractrodcomponent.h File Reference	53
5.11.1 Detailed Description	53
5.12 /home/qinterfly/Library/Projects/QRodSystems/src/core/aliasdata.h File Reference	54
5.12.1 Detailed Description	54
5.13 /home/qinterfly/Library/Projects/QRodSystems/src/core/aliasdataset.h File Reference	54
5.13.1 Detailed Description	54
5.14 /home/qinterfly/Library/Projects/QRodSystems/src/core/array.cpp File Reference	55
5.14.1 Detailed Description	55
5.15 /home/qinterfly/Library/Projects/QRodSystems/src/core/array.h File Reference	55
5.15.1 Detailed Description	56
5.16 /home/qinterfly/Library/Projects/QRodSystems/src/core/geometryrodcomponent.cpp File Reference	56
5.16.1 Detailed Description	56
5.17 /home/qinterfly/Library/Projects/QRodSystems/src/core/geometryrodcomponent.h File Reference	56
5.17.1 Detailed Description	57
5.18 /home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchyndnode.cpp File Reference	57
5.18.1 Detailed Description	57
5.19 /home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchyndnode.h File Reference	57
5.19.1 Detailed Description	58
5.20 /home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchytree.cpp File Reference	58
5.20.1 Detailed Description	58
5.21 /home/qinterfly/Library/Projects/QRodSystems/src/core/hierarchytree.h File Reference	58
5.21.1 Detailed Description	59
5.22 /home/qinterfly/Library/Projects/QRodSystems/src/core/matrixdataobject.cpp File Reference	59
5.22.1 Detailed Description	59

5.23	/home/qinterfly/Library/Projects/QRodSystems/src/core/matrixdataobject.h File Reference	60
5.23.1	Detailed Description	60
5.24	/home/qinterfly/Library/Projects/QRodSystems/src/core/project-base.cpp File Reference	60
5.24.1	Detailed Description	61
5.25	/home/qinterfly/Library/Projects/QRodSystems/src/core/project-io.cpp File Reference	61
5.25.1	Detailed Description	61
5.26	/home/qinterfly/Library/Projects/QRodSystems/src/core/project.h File Reference	62
5.26.1	Detailed Description	62
5.27	/home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.cpp File Reference	62
5.27.1	Detailed Description	62
5.28	/home/qinterfly/Library/Projects/QRodSystems/src/core/scalardataobject.h File Reference	63
5.28.1	Detailed Description	63
5.29	/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.cpp File Reference	63
5.29.1	Detailed Description	63
5.30	/home/qinterfly/Library/Projects/QRodSystems/src/core/surfacedataobject.h File Reference	64
5.30.1	Detailed Description	64
5.31	/home/qinterfly/Library/Projects/QRodSystems/src/core/utilities.cpp File Reference	64
5.31.1	Detailed Description	64
5.32	/home/qinterfly/Library/Projects/QRodSystems/src/core/utilities.h File Reference	65
5.32.1	Detailed Description	65
5.33	/home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.cpp File Reference	65
5.33.1	Detailed Description	65
5.34	/home/qinterfly/Library/Projects/QRodSystems/src/core/vectordataobject.h File Reference	66
5.34.1	Detailed Description	66
5.35	/home/qinterfly/Library/Projects/QRodSystems/src/main/main.cpp File Reference	66
5.35.1	Detailed Description	67
5.36	/home/qinterfly/Library/Projects/QRodSystems/src/managers/abstractprojectmanager.cpp File Reference	67
5.36.1	Detailed Description	67
5.37	/home/qinterfly/Library/Projects/QRodSystems/src/managers/abstractprojectmanager.h File Reference	67
5.37.1	Detailed Description	68
5.38	/home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.cpp File Reference	68
5.38.1	Detailed Description	69
5.39	/home/qinterfly/Library/Projects/QRodSystems/src/managers/dataobjectsmanager.h File Reference	69
5.39.1	Detailed Description	69
5.40	/home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.cpp File Reference	70
5.40.1	Detailed Description	70
5.41	/home/qinterfly/Library/Projects/QRodSystems/src/managers/doublespinboxitemdelegate.h File Reference	70
5.41.1	Detailed Description	70
5.42	/home/qinterfly/Library/Projects/QRodSystems/src/managers/geometrycomponentwidget.cpp File Reference	71

5.42.1 Detailed Description	71
5.43 /home/qinterfly/Library/Projects/QRodSystems/src/managers/geometrycomponentwidget.h File Reference	71
5.43.1 Detailed Description	71
5.44 /home/qinterfly/Library/Projects/QRodSystems/src/managers/managersfactory.cpp File Reference	72
5.44.1 Detailed Description	72
5.45 /home/qinterfly/Library/Projects/QRodSystems/src/managers/managersfactory.h File Reference	72
5.45.1 Detailed Description	73
5.46 /home/qinterfly/Library/Projects/QRodSystems/src/managers/rodcomponentsmanager.cpp File Reference	73
5.46.1 Detailed Description	73
5.47 /home/qinterfly/Library/Projects/QRodSystems/src/managers/rodcomponentsmanager.h File Reference	73
5.47.1 Detailed Description	74
5.48 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/abstracthierarchyitem.cpp File Reference	74
5.48.1 Detailed Description	74
5.49 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/abstracthierarchyitem.h File Reference	74
5.49.1 Detailed Description	75
5.50 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/abstracthierarchymodel.cpp File Reference	75
5.50.1 Detailed Description	75
5.51 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/abstracthierarchymodel.h File Reference	75
5.51.1 Detailed Description	76
5.52 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.cpp File Reference	76
5.52.1 Detailed Description	76
5.53 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.h File Reference	77
5.53.1 Detailed Description	77
5.54 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/dataobjectshierarchymodel.cpp File Reference	77
5.54.1 Detailed Description	77
5.55 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/dataobjectshierarchymodel.h File Reference	78
5.55.1 Detailed Description	78
5.56 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/projecthierarchymodel.cpp File Reference	78
5.56.1 Detailed Description	78
5.57 /home/qinterfly/Library/Projects/QRodSystems/src/models/hierarchy/projecthierarchymodel.h File Reference	79
5.57.1 Detailed Description	79
5.58 /home/qinterfly/Library/Projects/QRodSystems/src/models/properties/dataobjectspropertiesmodel.cpp File Reference	79

5.58.1 Detailed Description	80
5.59 /home/qinterfly/Library/Projects/QRodSystems/src/models/properties/dataobjectspropertiesmodel.h File Reference	80
5.59.1 Detailed Description	80
5.60 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/basetablemodel.cpp File Reference	80
5.60.1 Detailed Description	81
5.61 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/basetablemodel.h File Reference	81
5.61.1 Detailed Description	81
5.62 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/matrixtablemodel.cpp File Reference	81
5.62.1 Detailed Description	82
5.63 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/matrixtablemodel.h File Reference	82
5.63.1 Detailed Description	82
5.64 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/surfacetablemodel.cpp File Reference	82
5.64.1 Detailed Description	83
5.65 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/surfacetablemodel.h File Reference	83
5.65.1 Detailed Description	83
5.66 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/tablemodelinterface.cpp File Reference	83
5.66.1 Detailed Description	84
5.67 /home/qinterfly/Library/Projects/QRodSystems/src/models/table/tablemodelinterface.h File Reference	84
5.67.1 Detailed Description	84
5.68 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.cpp File Reference	84
5.68.1 Detailed Description	85
5.69 /home/qinterfly/Library/Projects/QRodSystems/src/render/view3d.h File Reference	85
5.69.1 Detailed Description	85

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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

QRS::Core::Array< T >	16
QRS::Core::HierarchyNode	27
QRS::Core::HierarchyTree	28
QDialog	
QRS::Managers::AbstractProjectManager	13
QRS::Managers::DataObjectsManager	21
QRS::Managers::RodComponentsManager	39
QMainWindow	
QRS::App::MainWindow	31
QObject	
QRS::Core::AbstractDataObject	9
QRS::Core::MatrixDataObject	34
QRS::Core::ScalarDataObject	41
QRS::Core::SurfaceDataObject	42
QRS::Core::VectorDataObject	45
QRS::Core::AbstractRodComponent	15
QRS::Core::GeometryRodComponent	26
QRS::Core::Project	36
QRS::Managers::ManagersFactory	33
QOpenGLFunctions	
QRS::Graph::View3D	46
QOpenGLWidget	
QRS::Graph::View3D	46
QStandardItem	
QRS::HierarchyModels::AbstractHierarchyItem	11
QRS::HierarchyModels::DataObjectsHierarchyItem	19
QStandardItemModel	
QRS::HierarchyModels::AbstractHierarchyModel	12
QRS::HierarchyModels::DataObjectsHierarchyModel	20
QRS::HierarchyModels::ProjectHierarchyModel	38
QRS::PropertiesModels::DataObjectsPropertiesModel	23
QRS::TableModels::BaseTableModel	18
QRS::TableModels::MatrixTableModel	35
QRS::TableModels::SurfaceTableModel	43
QStyledItemDelegate	

QRS::Managers::DoubleSpinBoxItemDelegate	24
QTableWidget	
QRS::App::LogWidget	30
QWidget	
QRS::App::ManagersTab	33
QRS::Managers::GeometryComponentWidget	25
QRS::Core::Array< T >::Row< U >	40
QRS::TableModels::TableModelInterface	44
QRS::TableModels::BaseTableModel	18
QRS::TableModels::MatrixTableModel	35
QRS::TableModels::SurfaceTableModel	43

Chapter 2

Class Index

2.1 Class List

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

QRS::Core::AbstractDataObject	9
Data object which is designed in the way to be represented in a table easily	
QRS::HierarchyModels::AbstractHierarchyItem	11
Item to represent a hierarchy of elements of the same type	
QRS::HierarchyModels::AbstractHierarchyModel	12
Hierarchy model which enables one to drag and drop elements of the same type	
QRS::Managers::AbstractProjectManager	13
Abstract manager to create objects of different types	
QRS::Core::AbstractRodComponent	15
Component of the rod structure which characterizes one of its properties	
QRS::Core::Array< T >	16
Numerical array class	
QRS::TableModels::BaseTableModel	18
Table model to represent either a scalar or vector data object	
QRS::HierarchyModels::DataObjectsHierarchyItem	19
Item to represent a hierarchy of data objects	
QRS::HierarchyModels::DataObjectsHierarchyModel	20
Tree model to represent and modify a hierarchy of data objects	
QRS::Managers::DataObjectsManager	21
Manager to create objects of different types: scalars, vectors, matroces and surfaces	
QRS::PropertiesModels::DataObjectsPropertiesModel	23
Model to represent properties of selected data objects	
QRS::Managers::DoubleSpinBoxItemDelegate	24
Class to specify how table values can be edited	
QRS::Managers::GeometryComponentWidget	25
Widget to construct a geometrical component of a rod	
QRS::Core::GeometryRodComponent	26
Geometrical configuration of a rod	
QRS::Core::HierarchyNode	27
Hierarchy representative	
QRS::Core::HierarchyTree	28
Hierarchy of data objects (n-ary tree)	
QRS::App::LogWidget	30
Log all the messages sent	
QRS::App::MainWindow	31
The main window of the program	

QRS::Managers::ManagersFactory	
Factory to create managers which utilize and modify project data	33
QRS::App::ManagersTab	
A toolbar consisted of object designers	33
QRS::Core::MatrixDataObject	
Matrix data object	34
QRS::TableModels::MatrixTableModel	
Table model to represent a matrix data object	35
QRS::Core::Project	
Project class to interact with a created system of rods	36
QRS::HierarchyModels::ProjectHierarchyModel	
Project hierarchy representative	38
QRS::Managers::RodComponentsManager	
Manager to create rod components, such as a geometry, cross section and force	39
QRS::Core::Array< T >::Row< U >	
Proxy class to acquire a row by index	40
QRS::Core::ScalarDataObject	
Scalar data object	41
QRS::Core::SurfaceDataObject	
Surface data object	42
QRS::TableModels::SurfaceTableModel	
Table model to represent a surface data object	43
QRS::TableModels::TableModelInterface	
User interface to add and remove items	44
QRS::Core::VectorDataObject	
Vector data object	45
QRS::Graph::View3D	
A widget to represent the resulted rod system	46

Chapter 3

File Index

3.1 File List

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

/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ controltabs.cpp	
Implementation of the ControlTabs class	47
/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ controltabs.h	
Declaration of the ControlTabs class	47
/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ logwidget.cpp	
Implementation of the LogWidget class	48
/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ logwidget.h	
Declaration of the LogWidget class	49
/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ mainwindow.cpp	
Implementation of the MainWindow class	49
/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ mainwindow.h	
Declaration of the MainWindow class	50
/home/qinterfly/Library/Projects/Current/QRodSystems/src/central/ uiconstants.h	
Common graphical constants shared between several windows	51
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ abstractdataobject.cpp	
Implementation of the AbstractDataObject class	51
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ abstractdataobject.h	
Declaration of the AbstractDataObject class	52
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ abstractrodcomponent.cpp	
Definition of the AbstractRodComponent class	52
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ abstractrodcomponent.h	
Declaration of the AbstractRodComponent class	53
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ aliasdata.h	
Specification of data types used in a project	54
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ aliasdataset.h	
Specification of types of datasets used in a project	54
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ array.cpp	
Implementation of the Array class	55
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ array.h	
Declaration of the Array class	55
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ geometryrodcomponent.cpp	
Definition of the GeometryRodComponent class	56
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ geometryrodcomponent.h	
Declaration of the GeometryRodComponent class	56
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/ hierarchynode.cpp	
Implementation of the HierarchyNode class	57

/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/hierarchynode.h	
Declaration of the HierarchyNode class	57
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/hierarchytree.cpp	
Implementation of the HierarchyTree class	58
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/hierarchytree.h	
Declaration of the HierarchyTree class	58
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/matrixdataobject.cpp	
Implementation of the MatrixDataObject class	59
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/matrixdataobject.h	
Declaration of the MatrixDataObject class	60
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/project-base.cpp	
Implementation of the Project class	60
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/project-io.cpp	
Implementation of the Project class	61
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/project.h	
Declaration of the Project class	62
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/scalardataobject.cpp	
Implementation of the ScalarDataObject class	62
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/scalardataobject.h	
Declaration of the ScalarDataObject class	63
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/surfacedataobject.cpp	
Implementation of the SurfaceDataObject class	63
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/surfacedataobject.h	
Declaration of the SurfaceDataObject class	64
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/utilities.cpp	
Implementation of utilities	64
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/utilities.h	
Declaration of utilities	65
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/vectordataobject.cpp	
Implementation of the VectorDataObject class	65
/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/vectordataobject.h	
Declaration of the VectorDataObject class	66
/home/qinterfly/Library/Projects/Current/QRodSystems/src/main/main.cpp	
The startup function	66
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/abstractprojectmanager.cpp	
Definition of the AbstractProjectManager class	67
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/abstractprojectmanager.h	
Declaration of the AbstractProjectManager class	67
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/dataobjectsmanager.cpp	
Implementation of the DataObjectsManager class	68
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/dataobjectsmanager.h	
Declaration of the DataObjectsManager class	69
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/doublespinboxitemdelegate.cpp	
Implementation of the DoubleSpinBoxItemDelegate class	70
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/doublespinboxitemdelegate.h	
Declaration of the DoubleSpinBoxItemDelegate class	70
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/geometrycomponentwidget.cpp	
Definiton of the GeometryComponentWidget class	71
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/geometrycomponentwidget.h	
Declaration of the GeometryComponentWidget class	71
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/managersfactory.cpp	
Definition of the ManagersFactory class	72
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/managersfactory.h	
Declaration of the ManagersFactory class	72
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/rodcomponentsmanager.cpp	
Definition of the RodComponentsManager class	73
/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/rodcomponentsmanager.h	
Declaration of the RodComponentsManager class	73

/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/abstracthierarchyitem.cpp	
Definition of the AbstractHierarchyItem class	74
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/abstracthierarchyitem.h	
Declaration of the AbstractHierarchyItem class	74
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/abstracthierarchymodel.cpp	
Definition of the AbstractHierarchyModel class	75
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/abstracthierarchymodel.h	
Declaration of the AbstractHierarchyModel class	75
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.cpp	
Definition of the DataObjectsHierarchyItem class	76
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.h	
Declaration of the DataObjectsHierarchyItem class	77
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchymodel.cpp	
Definition of the DataObjectsHierarchyModel class	77
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchymodel.h	
Declaration of the DataObjectsHierarchyModel class	78
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/projecthierarchymodel.cpp	
Definition of the ProjectHierarchyModel class	78
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/projecthierarchymodel.h	
Declaration of the ProjectHierarchyModel class	79
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/properties/dataobjectspropertiesmodel.cpp	
Definition of the DataObjectsPropertiesModel class	79
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/properties/dataobjectspropertiesmodel.h	
Declaration of the DataObjectsPropertiesModel class	80
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/basetablemodel.cpp	
Implementation of the BaseTableModel class	80
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/basetablemodel.h	
Declaration of the BaseTableModel class	81
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/matrixtablemodel.cpp	
Implementation of the MatrixTableModel class	81
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/matrixtablemodel.h	
Declaration of the MatrixTableModel class	82
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/surfacetablemodel.cpp	
Implementation of the SurfaceTableModel class	82
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/surfacetablemodel.h	
Declaration of the SurfaceTableModel class	83
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/tablemodelinterface.cpp	
Implementation of static functions of TableModelInterface	83
/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/tablemodelinterface.h	
Declaration of the TableModelInterface	84
/home/qinterfly/Library/Projects/Current/QRodSystems/src/render/view3d.cpp	
Implementation of the View3D class	84
/home/qinterfly/Library/Projects/Current/QRodSystems/src/render/view3d.h	
Declaration of the View3D class	85

Chapter 4

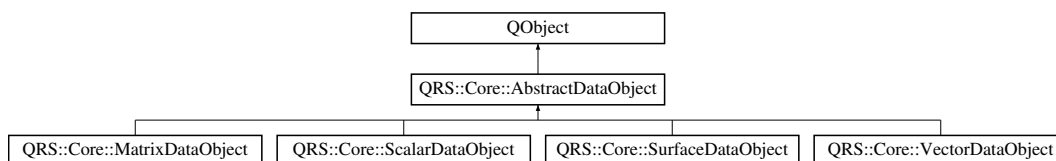
Class Documentation

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 Types

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

Public Member Functions

- [AbstractDataObject](#) (ObjectType 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, IndexType iRow=0, IndexType iColumn=0)
Set an array value with the specified indices.
- quint32 **numberOfItems** () const
- DataHolder const & **getItems** ()
- DataIDType **id** () const

- ObjectType **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 DataIDType **maxObjectID** ()
- static void **setMaxObjectID** (DataIDType iMaxObjectID)

Protected Attributes

- const ObjectType **mType**
- QString **mName**
- DataIDType **mID**
- DataHolder **mItems**

Static Private Attributes

- static DataIDType **smMaxObjectID** = 0

Friends

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

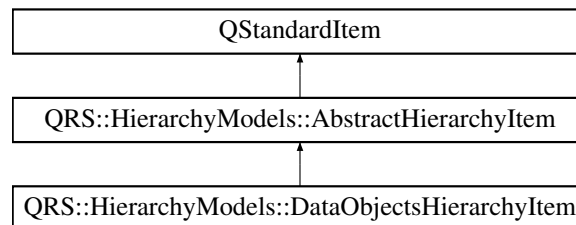
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/abstractdataobject.h](#)
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/abstractdataobject.cpp](#)

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 Types

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

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:

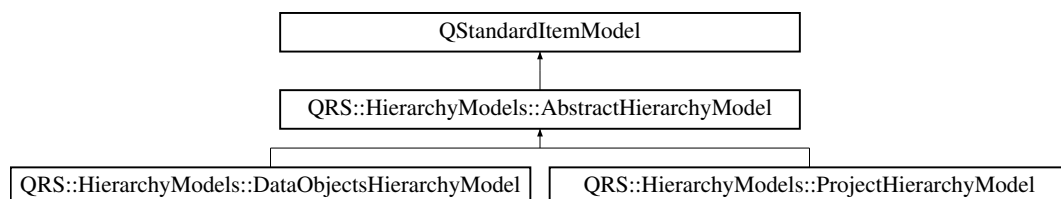
- `/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/abstracthierarchyitem.h`
- `/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/abstracthierarchyitem.cpp`

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 **mimeType** () const override
Retrieve the mime types.
- QMimeData * **mimeType** (const QModelIndexList &indices) const override
Encode each item according to a given list of indices.
- bool **dropMimeType** (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.
- void [updateContentExpanded](#) ()

4.3.1 Detailed Description

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

4.3.2 Member Function Documentation

4.3.2.1 updateContentExpanded()

```
void AbstractHierarchyModel::updateContentExpanded ( ) [private]
```

Since items are destroyed whenever the content is updated, an expanded state of each directory is saved and then set again.

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

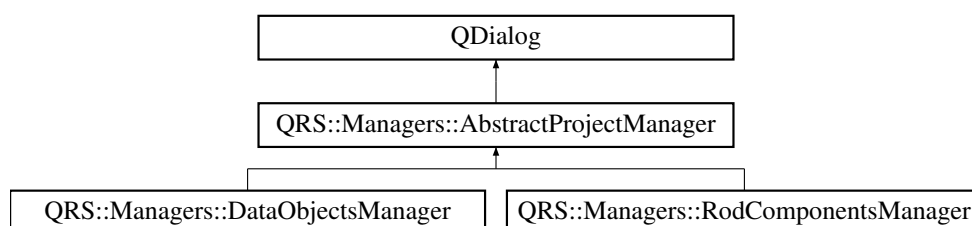
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/[abstracthierarchymodel.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/[abstracthierarchymodel.cpp](#)

4.4 QRS::Managers::AbstractProjectManager Class Reference

Abstract manager to create objects of different types.

```
#include <abstractprojectmanager.h>
```

Inheritance diagram for QRS::Managers::AbstractProjectManager:



Public Types

- enum **ManagerType** { **kDataObjects** , **kRodComponents** , **kRodConstructor** }

Public Slots

- virtual void **apply** ()=0

Signals

- void **closed** (QRS::Managers::AbstractProjectManager::ManagerType type)

Public Member Functions

- **AbstractProjectManager** ([Core::Project](#) &project, QString &lastPath, QSettings &settings, ManagerType type, QString groupName, QWidget *parent=nullptr)
- void [saveSettings](#) ()
Save settings to a file.
- void [restoreSettings](#) ()
Restore settings from a file.

Protected Member Functions

- void [closeEvent](#) (QCloseEvent *pEvent) override
Save settings and delete handling widgets before closing the window.
- void [setToolBarShortcutHints](#) (QToolBar *pToolBar)
Helper function to add a shortcut hint to all actions which a toolbar contains.

Protected Attributes

- ads::CDockManager * **mpDockManager** = nullptr
- [Core::Project](#) & **mProject**
- QString & **mLastPath**

Private Attributes

- QSettings & **mSettings**
- ManagerType const **mType**
- QString const **mGroupName**

4.4.1 Detailed Description

Abstract manager to create objects of different types.

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

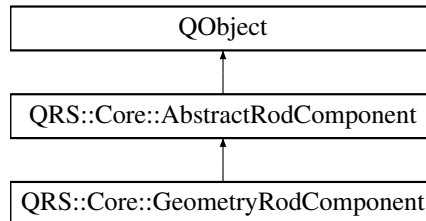
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/[abstractprojectmanager.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/[abstractprojectmanager.cpp](#)

4.5 QRS::Core::AbstractRodComponent Class Reference

Component of the rod structure which characterizes one of its properties.

```
#include <abstractrodcomponent.h>
```

Inheritance diagram for QRS::Core::AbstractRodComponent:



Public Types

- enum **ComponentType** { **kGeometry** }

Public Member Functions

- **AbstractRodComponent** (ComponentType componentType, QString name)
- virtual [AbstractRodComponent](#) * **clone** () const =0
- virtual bool **isDataComplete** () const =0
- DataIDType **id** () const
- ComponentType **componentType** () const
- virtual void [serialize](#) (QDataStream &stream) const
Serialize only a header data of a rod component.
- virtual void **deserialize** (QDataStream &stream, DataObjectGetter const &getDataObject)=0

Static Public Member Functions

- static DataIDType **maxComponentID** ()
- static void **setMaxComponentID** (DataIDType iMaxComponentID)

Protected Member Functions

- void [writeDataObjectPointer](#) (QDataStream &stream, [AbstractDataObject](#) const *pDataObject) const
Helper function to write the identifier of a data object.
- [AbstractDataObject](#) const * [readDataObjectPointer](#) (QDataStream &stream, DataObjectGetter const &get↔DataObject) const
Helper function to retrieve the pointer to the data object by its identifier.
- void [deserialize](#) (QDataStream &stream)
Partly deserialize an abstract rod component.

Protected Attributes

- const ComponentType **mComponentType**
- QString **mName**
- DataIDType **mID**

Static Private Attributes

- static DataIDType **smMaxComponentID** = 0

Friends

- QDataStream & [operator<<](#) (QDataStream &stream, [AbstractRodComponent](#) const &component)
Print a rod component to a stream.

4.5.1 Detailed Description

Component of the rod structure which characterizes one of its properties.

4.5.2 Member Function Documentation

4.5.2.1 deserialize()

```
void AbstractRodComponent::deserialize (
    QDataStream & stream ) [protected]
```

Partly deserialize an abstract rod component.

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

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

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

4.6 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)
- [Row](#)< T > **operator[]** (IndexType iRow) const
- [Array](#) & **operator=** ([Array](#)< T > const &another)
Assignment operator.

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.

4.6.1 Detailed Description

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

Numerical array class.

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

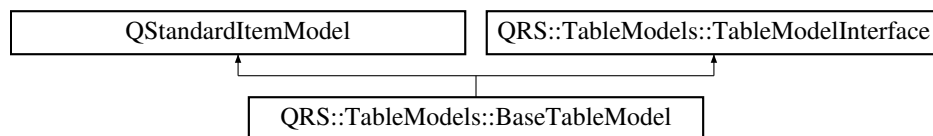
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/array.h](#)
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/core/array.cpp](#)

4.7 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

4.7.1 Detailed Description

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

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

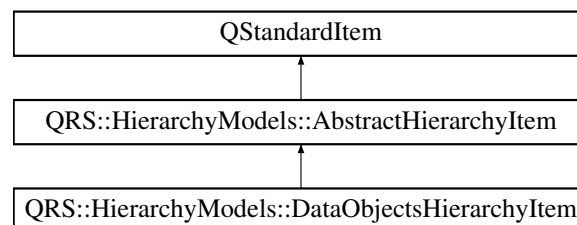
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/[basetablemodel.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/[basetablemodel.cpp](#)

4.8 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](#) ([Core::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** ([Core::DataObjects](#) &dataObjects, [Core::HierarchyNode](#) *pNode)

Private Attributes

- `Core::AbstractDataObject * mpDataObject = nullptr`

Friends

- class `DataObjectsHierarchyModel`
- class `ProjectHierarchyModel`
- class `PropertiesModels::DataObjectsPropertiesModel`

Additional Inherited Members

4.8.1 Detailed Description

Item to represent a hierarchy of data objects.

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

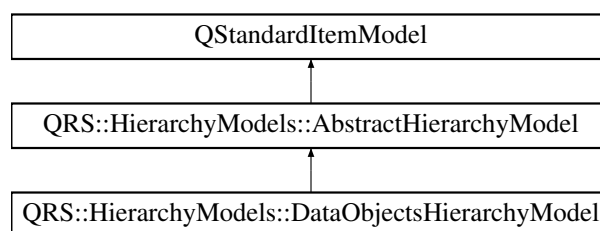
- </home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.h>
- </home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.cpp>

4.9 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** (Core::DataObjects &dataObjects, [Core::HierarchyTree](#) &hierarchyData↔ Objects, 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

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

Additional Inherited Members

4.9.1 Detailed Description

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

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

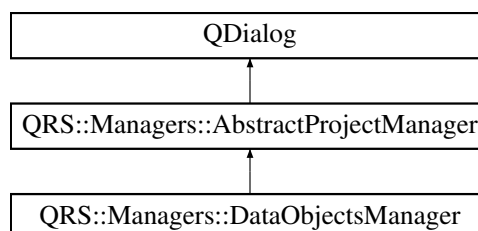
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/[dataobjectshierarchymodel.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/[dataobjectshierarchymodel.cpp](#)

4.10 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](#) () override
Apply all the changes made by user.
- [Core::AbstractDataObject](#) * [addScalar](#) ()
Add a scalar object.
- [Core::AbstractDataObject](#) * [addVector](#) ()
Add a vector object.
- [Core::AbstractDataObject](#) * [addMatrix](#) ()
Add a matrix object.
- [Core::AbstractDataObject](#) * [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.

Public Member Functions

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

Private Member Functions

- void [createContent](#) ()
Create all the widgets.
- ads::CDockWidget * [createDataTableWidget](#) ()
Create a tabbed widget to interact with data tables.
- ads::CDockWidget * [createHierarchyWidget](#) ()
Create an object to represent a hierarchy of data objects.
- QLayout * [createDialogControls](#) ()
Create dialog controls.
- void [retrieveDataObjects](#) ()
Make a copy of existed data objects.
- 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

- QTreeView * **mpTreeDataObjects**
- QTreeView * **mpDataTable**
- [DoubleSpinBoxItemDelegate](#) * **mplItemDelegate** = nullptr
- Core::DataObjects **mDataObjects**
- [Core::HierarchyTree](#) **mHierarchyDataObjects**
- [TableModels::TableModelInterface](#) * **mpTableModelInterface** = nullptr
- [TableModels::BaseTableModel](#) * **mpBaseTableModel**
- [TableModels::MatrixTableModel](#) * **mpMatrixTableModel**
- [TableModels::SurfaceTableModel](#) * **mpSurfaceTableModel**
- [HierarchyModels::DataObjectsHierarchyModel](#) * **mpTreeDataObjectsModel**

Additional Inherited Members

4.10.1 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:

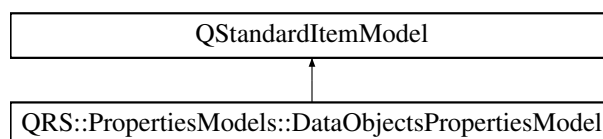
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/dataobjectsmanager.h](#)
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/dataobjectsmanager.cpp](#)

4.11 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**

4.11.1 Detailed Description

Model to represent properties of selected data objects.

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

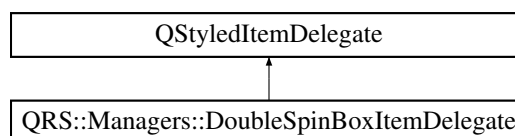
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/properties/[dataobjectspropertiesmodel.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/properties/[dataobjectspropertiesmodel.cpp](#)

4.12 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.

4.12.1 Detailed Description

Class to specify how table values can be edited.

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

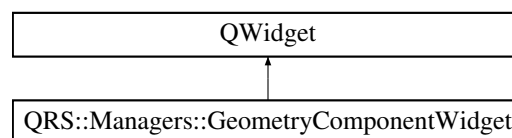
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/doublespinboxitemdelegate.h
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/doublespinboxitemdelegate.cpp

4.13 QRS::Managers::GeometryComponentWidget Class Reference

Widget to construct a geometrical component of a rod.

```
#include <geometrycomponentwidget.h>
```

Inheritance diagram for QRS::Managers::GeometryComponentWidget:



Public Member Functions

- **GeometryComponentWidget** (QWidget *parent=nullptr)

Private Member Functions

- void **createContent** ()
Construct all the widgets.

4.13.1 Detailed Description

Widget to construct a geometrical component of a rod.

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

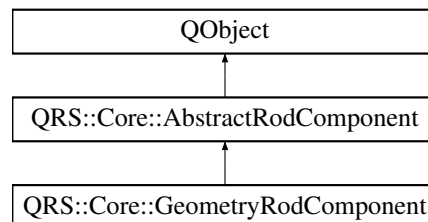
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/geometrycomponentwidget.h](#)
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/geometrycomponentwidget.cpp](#)

4.14 QRS::Core::GeometryRodComponent Class Reference

Geometrical configuration of a rod.

```
#include <geometryrodcomponent.h>
```

Inheritance diagram for QRS::Core::GeometryRodComponent:



Public Member Functions

- **GeometryRodComponent** (QString const &name)
- **~GeometryRodComponent** ()
Decrease a number of instances while being destroyed.
- **AbstractRodComponent * clone** () const override
Clone a geometrical component.
- bool **isDataComplete** () const override
- void **setRadiusVector** (VectorDataObject const *pRadiusVector)
- void **setRotationMatrix** (MatrixDataObject const *pRotationMatrix)
- VectorDataObject const * **radiusVector** () const
- MatrixDataObject const * **rotationMatrix** () const
- void **serialize** (QDataStream &stream) const override
Serialize all properties of a geometrical component.
- void **deserialize** (QDataStream &stream, DataObjectGetter const &getDataObject) override
Deserialize a geometrical component.

Static Public Member Functions

- static quint32 **numberInstances** ()

Private Attributes

- QPointer< [VectorDataObject](#) const > **mpRadiusVector**
- QPointer< [MatrixDataObject](#) const > **mpRotationMatrix**

Static Private Attributes

- static quint32 **smNumInstances** = 0

Additional Inherited Members

4.14.1 Detailed Description

Geometrical configuration of a rod.

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

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

4.15 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.
- quint32 [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.
- quint32 `countNodes` (`HierarchyNode` *pNode, quint32 &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`

4.15.1 Detailed Description

Hierarchy representative.

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

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

4.16 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.
- quint32 [size](#) () const
Get a number of nodes.

Private Member Functions

- [HierarchyNode](#) * [copyNode](#) ([HierarchyNode](#) *pBaseNode, quint32 relativeLevel) const
Copy a node.
- void [removeNodeSiblings](#) ([HierarchyNode](#) *pNode)
Remove all subnodes.
- void [printNode](#) (quint32 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.

4.16.1 Detailed Description

Hierarchy of data objects (n-array tree)

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

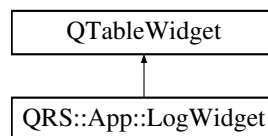
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[hierarchytree.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[hierarchytree.cpp](#)

4.17 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.

4.17.1 Detailed Description

Log all the messages sent.

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

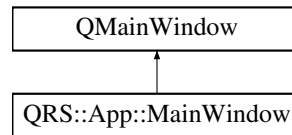
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/central/[logwidget.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/central/[logwidget.cpp](#)

4.18 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 [createRodComponentsManager](#) ()
Show a manager to set rod components based on the created data objects.
- void [createRodConstructorManager](#) ()
Show a manager to assemble a rod by using rod components.
- 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 obercts.
- 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::ManagersFactory](#) * **mpManagersFactory** = nullptr
- [Core::Project](#) * **mpProject**
- QSharedPointer< QSettings > **mpSettings**
- QString **mLastPath**
- QList< QString > **mPathRecentProjects**

4.18.1 Detailed Description

The main window of the program.

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

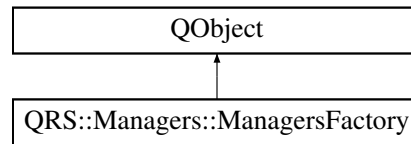
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/central/[mainwindow.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/central/[mainwindow.cpp](#)

4.19 QRS::Managers::ManagersFactory Class Reference

Factory to create managers which utilize and modify project data.

```
#include <managersfactory.h>
```

Inheritance diagram for QRS::Managers::ManagersFactory:



Public Member Functions

- **ManagersFactory** ([Core::Project](#) &project, QString &lastPath, QSettings &settings, QWidget *parent)
- bool [createManager](#) (AbstractProjectManager::ManagerType type)
Create a manager according to a given type.
- bool [deleteManager](#) (AbstractProjectManager::ManagerType type)
Destroy a manager by given type.

Private Attributes

- [Core::Project](#) & **mProject**
- QString & **mLastPath**
- QSettings & **mSettings**
- QWidget * **mpParent**
- std::unordered_map< AbstractProjectManager::ManagerType, [AbstractProjectManager](#) * > **mManagers**

4.19.1 Detailed Description

Factory to create managers which utilize and modify project data.

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

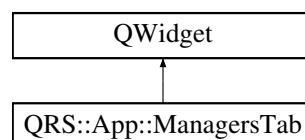
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/[managersfactory.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/[managersfactory.cpp](#)

4.20 QRS::App::ManagersTab Class Reference

A toolbar consisted of object designers.

```
#include <controltabs.h>
```

Inheritance diagram for QRS::App::ManagersTab:



Signals

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

Public Member Functions

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

4.20.1 Detailed Description

A toolbar consisted of object designers.

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

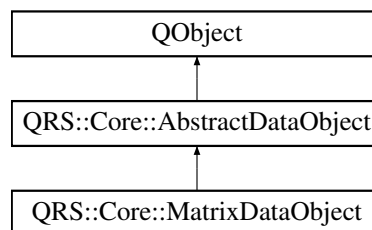
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/central/[controltabs.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/central/[controltabs.cpp](#)

4.21 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.
- [~MatrixDataObject](#) ()
Decrease a number of instances while being destroyed.
- [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 quint32 **numberInstances** ()

Static Private Attributes

- static quint32 **smNumInstances** = 0

Additional Inherited Members

4.21.1 Detailed Description

Matrix data object.

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

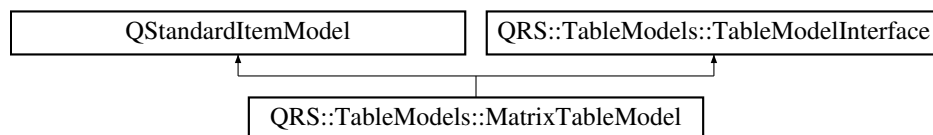
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[matrixdataobject.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[matrixdataobject.cpp](#)

4.22 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

4.22.1 Detailed Description

Table model to represent a matrix data object.

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

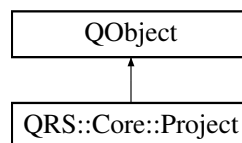
- `/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/matrixtablemodel.h`
- `/home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/matrixtablemodel.cpp`

4.23 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 `dataChanged` ()
- 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
- [AbstractDataObject](#) * **addDataObject** (AbstractDataObject::ObjectType type)
Create a data object with the specified type.
- void **setDataObjects** (DataObjects const &dataObjects, [HierarchyTree](#) const &hierarchyDataObjects)
Substitute current data objects with new ones.
- DataObjects **cloneDataObjects** () const
Clone data objects.
- [HierarchyTree](#) **cloneHierarchyDataObjects** () const
- DataObjects const & **getDataObjects** () const
- DataIDType **numberRodComponents** () const
- [AbstractRodComponent](#) * **addRodComponent** (AbstractRodComponent::ComponentType type)
Create a rod component of a given type.
- void **setRodComponents** (RodComponents const &rodComponents, [HierarchyTree](#) const &hierarchyRodComponents)
Substitute current rod components with new ones.
- RodComponents **cloneRodComponents** () const
Clone rod components.
- [HierarchyTree](#) **cloneHierarchyRodComponents** () const
- 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 Member Functions

- template<typename T >
void **clearDataMap** (std::unordered_map< DataIDType, T * > &dataMap)
Helper function to clear a map consisted of data pointers.

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.
- RodComponents [mRodComponents](#)
Rod components.
- [HierarchyTree](#) [mHierarchyRodComponents](#)
Hierarchy of rod components.

Static Private Attributes

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

Friends

- class [QRS::HierarchyModels::ProjectHierarchyModel](#)

4.23.1 Detailed Description

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

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

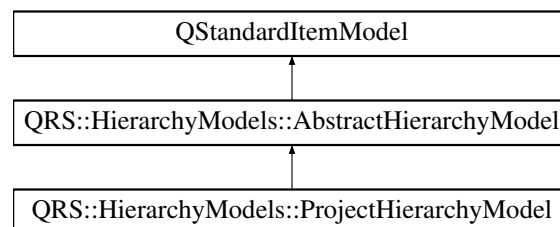
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[project.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[project-base.cpp](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[project-io.cpp](#)

4.24 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 Attributes

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

Additional Inherited Members

4.24.1 Detailed Description

Project hierarchy representative.

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

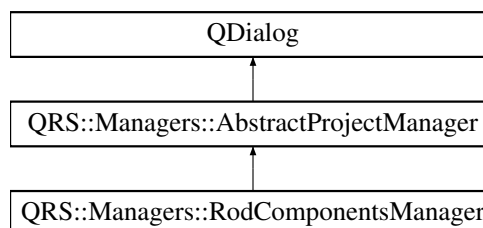
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/[projecthierarchymodel.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/[projecthierarchymodel.cpp](#)

4.25 QRS::Managers::RodComponentsManager Class Reference

Manager to create rod components, such as a geometry, cross section and force.

```
#include <rodcomponentsmanager.h>
```

Inheritance diagram for QRS::Managers::RodComponentsManager:



Public Slots

- void [apply](#) () override
Apply all the changes made by user.
- [Core::AbstractRodComponent](#) * **addGeometry** ()

Public Member Functions

- **RodComponentsManager** ([Core::Project](#) &project, QString &lastPath, QSettings &settings, QWidget *parent=nullptr)

Private Member Functions

- void [createContent](#) ()
Create all the widgets.
- QLayout * [createDialogControls](#) ()
Create dialog controls.
- void [retrieveRodComponents](#) ()
Make a copy of existed rod components.
- ads::CDockWidget * [createHierarchyWidget](#) ()
Create a widget to show a hierarchy of rod components.
- ads::CDockWidget * [createComponentsDockWidget](#) ()
Create a dock widget to contain constructors of rod components.
- void [emplaceRodComponent](#) ([Core::AbstractRodComponent](#) *pComponent)
Helper function to insert a rod component into the manager.

Private Attributes

- ads::CDockWidget * **mpComponentDockWidget**
- QTreeView * **mpTreeRodComponents**
- [Core::HierarchyTree](#) **mHierarchyRodComponents**
- [Core::RodComponents](#) **mRodComponents**
- [Core::DataObjects](#) const & **mDataObjects**

Additional Inherited Members

4.25.1 Detailed Description

Manager to create rod components, such as a geometry, cross section and force.

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

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

4.26 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)
- T const & **operator[]** (IndexType iCol) const

Public Attributes

- T * **pRow**

4.26.1 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:

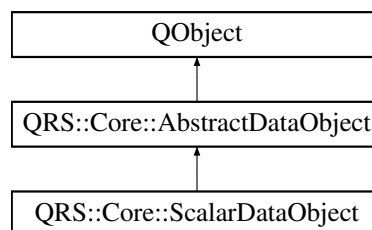
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/array.h

4.27 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.
- [~ScalarDataObject](#) ()
Decrease a number of instances while being destroyed.
- [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 quint32 **numberInstances** ()

Static Private Attributes

- static quint32 **smNumInstances** = 0

Additional Inherited Members

4.27.1 Detailed Description

Scalar data object.

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

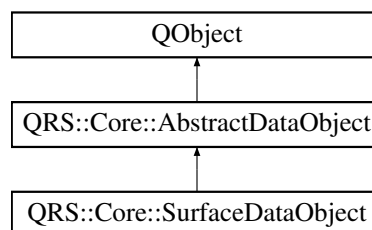
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[scalardataobject.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[scalardataobject.cpp](#)

4.28 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.
- [~SurfaceDataObject](#) ()
Decrease a number of instances while being destroyed.
- [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.
- quint32 **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 quint32 **numberInstances** ()

Private Attributes

- DataHolder **mLeadingItems**

Static Private Attributes

- static quint32 **smNumInstances** = 0

Additional Inherited Members

4.28.1 Detailed Description

Surface data object.

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

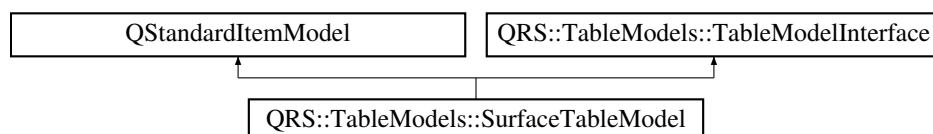
- </home/qinterfly/Library/Projects/Current/QRodSystems/src/core/surfacedataobject.h>
- </home/qinterfly/Library/Projects/Current/QRodSystems/src/core/surfacedataobject.cpp>

4.29 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

4.29.1 Detailed Description

Table model to represent a surface data object.

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

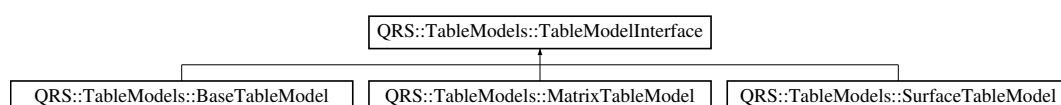
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/[surfacetablemodel.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/[surfacetablemodel.cpp](#)

4.30 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 **removeSelectedLeadingItem** (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 > const &array, quint32 iRow)
Helper function to copy a row from an array.
- static QList< QStandardItem * > **prepareRow** (double const &key, Core::Array< double > const &array, quint32 iRow)
Helper function to copy a row from an array and associate it with a key.
- static QList< QStandardItem * > **prepareRow** (QString const &name, Core::Array< double > const &array, quint32 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.

4.30.1 Detailed Description

User interface to add and remove items.

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

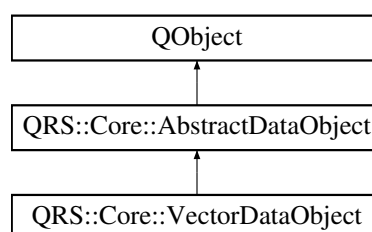
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/[tablemodelinterface.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/[tablemodelinterface.cpp](#)

4.31 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.
- [~VectorDataObject](#) ()
Decrease a number of instances while being destroyed.
- [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 quint32 [numberInstances](#) ()

Static Private Attributes

- static quint32 [smNumInstances](#) = 0

Additional Inherited Members

4.31.1 Detailed Description

Vector data object.

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

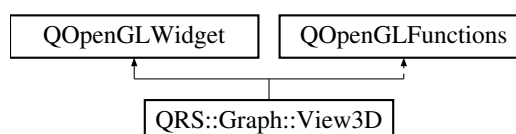
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[vectordataobject.h](#)
- /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/[vectordataobject.cpp](#)

4.32 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**

4.32.1 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/Current/QRodSystems/src/render/view3d.h](#)
- [/home/qinterfly/Library/Projects/Current/QRodSystems/src/render/view3d.cpp](#)

Chapter 5

File Documentation

5.1 /home/qinterfly/Library/Projects/Current/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/Current/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/Current/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/Current/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/Current/QRodSystems/src/central/mainwindow.cpp File Reference

Implementation of the MainWindow class.

```
#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/managersfactory.h"
#include "render/view3d.h"
```

5.5.1 Detailed Description

Implementation of the MainWindow class.

Author

Pavel Lakiza

Date

May 2021

5.6 /home/qinterfly/Library/Projects/Current/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/Current/QRodSystems/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/Current/QRodSystems/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/Current/QRod↵ Systems/src/core/abstractdataobject.h File Reference

Declaration of the AbstractDataObject class.

```
#include <QObject>
#include <QString>
#include <QDataStream>
#include <unordered_map>
#include "array.h"
#include "aliasdata.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::DataItemType** = Array< DataValueType >
- using **QRS::Core::DataHolder** = std::map< DataKeyType, DataItemType >

Functions

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

5.9.1 Detailed Description

Declaration of the AbstractDataObject class.

Author

Pavel Lakiza

Date

June 2021

5.10 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/core/abstractrodcomponent.cpp File Reference

Definition of the AbstractRodComponent class.

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

5.10.1 Detailed Description

Definition of the AbstractRodComponent class.

Author

Pavel Lakiza

Date

June 2021

5.11 /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/abstractrodcomponent.h File Reference

Declaration of the AbstractRodComponent class.

```
#include <QObject>
#include <QString>
#include <QDataStream>
#include "aliasdata.h"
```

Classes

- class [QRS::Core::AbstractRodComponent](#)
Component of the rod structure which characterizes one of its properties.

Typedefs

- using **QRS::Core::DataObjectGetter** = std::function< AbstractDataObject const *(DataIDType id)>

Functions

- QDataStream & [QRS::Core::operator<<](#) (QDataStream &stream, AbstractRodComponent const &component)
Print a rod component to a stream.

5.11.1 Detailed Description

Declaration of the AbstractRodComponent class.

Author

Pavel Lakiza

Date

June 2021

5.12 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/core/aliasdata.h File Reference

Specification of data types used in a project.

```
#include <QtGlobal>
```

Typedefs

- using **QRS::Core::DataValueType** = double
- using **QRS::Core::DataKeyType** = double
- using **QRS::Core::DataIDType** = quint64

5.12.1 Detailed Description

Specification of data types used in a project.

Author

Pavel Lakiza

Date

May 2021

5.13 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/core/aliasdataset.h File Reference

Specification of types of datasets used in a project.

```
#include <unordered_map>  
#include "aliasdata.h"
```

Typedefs

- using **QRS::Core::DataObjects** = std::unordered_map< DataIDType, AbstractDataObject * >
- using **QRS::Core::RodComponents** = std::unordered_map< DataIDType, AbstractRodComponent * >

5.13.1 Detailed Description

Specification of types of datasets used in a project.

Author

Pavel Lakiza

Date

June 2021

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

Implementation of the Array class.

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

5.14.1 Detailed Description

Implementation of the Array class.

Author

Pavel Lakiza

Date

March 2021

5.15 /home/qinterfly/Library/Projects/Current/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](#) = quint32

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.

5.15.1 Detailed Description

Declaration of the Array class.

Author

Pavel Lakiza

Date

June 2021

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

Definition of the GeometryRodComponent class.

```
#include "geometryrodcomponent.h"  
#include "vectordataobject.h"  
#include "matrixdataobject.h"
```

5.16.1 Detailed Description

Definition of the GeometryRodComponent class.

Author

Pavel Lakiza

Date

June 2021

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

Declaration of the GeometryRodComponent class.

```
#include <QPointer>  
#include "abstractrodcomponent.h"
```

Classes

- class [QRS::Core::GeometryRodComponent](#)
Geometrical configuration of a rod.

5.17.1 Detailed Description

Declaration of the GeometryRodComponent class.

Author

Pavel Lakiza

Date

June 2021

5.18 /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/hierarchynode.cpp File Reference

Implementation of the HierarchyNode class.

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

5.18.1 Detailed Description

Implementation of the HierarchyNode class.

Author

Pavel Lakiza

Date

May 2021

5.19 /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/hierarchynode.h File Reference

Declaration of the HierarchyNode class.

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

Classes

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

5.19.1 Detailed Description

Declaration of the HierarchyNode class.

Author

Pavel Lakiza

Date

May 2021

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

Implementation of the HierarchyTree class.

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

5.20.1 Detailed Description

Implementation of the HierarchyTree class.

Author

Pavel Lakiza

Date

May 2021

5.21 [/home/qinterfly/Library/Projects/Current/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.

5.21.1 Detailed Description

Declaration of the HierarchyTree class.

Author

Pavel Lakiza

Date

April 2021

5.22 /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/matrixdataobject.cpp File Reference

Implementation of the MatrixDataObject class.

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

Variables

- const IndexType **skNumElements** = 3

5.22.1 Detailed Description

Implementation of the MatrixDataObject class.

Author

Pavel Lakiza

Date

June 2021

5.23 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/core/matrixdataobject.h File Reference

Declaration of the MatrixDataObject class.

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

Classes

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

5.23.1 Detailed Description

Declaration of the MatrixDataObject class.

Author

Pavel Lakiza

Date

April 2021

5.24 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/core/project-base.cpp File Reference

Implementation of the Project class.

```
#include <QRandomGenerator>
#include "project.h"
#include "scalardataobject.h"
#include "vectordataobject.h"
#include "matrixdataobject.h"
#include "surfacedataobject.h"
#include "geometryrodcomponent.h"
```

Functions

- [AbstractDataObject](#) * [createDataObject](#) (AbstractDataObject::ObjectType type)
Helper function to create DataObject instance by a type and name.
- [AbstractRodComponent](#) * [createRodComponent](#) (AbstractRodComponent::ComponentType type)
Helper function to create RodComponent by a type and name.
- [AbstractDataObject](#) const * [substituteDataObject](#) (DataObjects const &dataObjects, [AbstractDataObject](#) const *pDataObject)
Substitute a data object with its updated version.

5.24.1 Detailed Description

Implementation of the Project class.

Author

Pavel Lakiza

Date

June 2021

Implementation of the methods to operate with data objects, components and rods

5.25 /home/qinterfly/Library/Projects/Current/QRodSystems/src/core/project-io.cpp File Reference

Implementation of the Project class.

```
#include <QFileInfo>
#include <QDir>
#include <QDataStream>
#include <QDateTime>
#include "project.h"
#include "scalarsdataobject.h"
#include "vectorsdataobject.h"
#include "matrixdataobject.h"
#include "surfacedataobject.h"
#include "geometryrodcomponent.h"
#include "utilities.h"
```

Functions

- void [readDataObjects](#) (QDataStream &inputStream, DataObjects &dataObjects)
Helper function to read a set of data objects from a stream.
- void [readRodComponents](#) (QDataStream &inputStream, DataObjects const &dataObjects, RodComponents &rodComponents)
Helper function to read rod components from a stream.
- void [readHierarchyTree](#) (QDataStream &inputStream, [HierarchyTree](#) &hierarchy)
Helper function to read a hierarchial tree from a stream.

5.25.1 Detailed Description

Implementation of the Project class.

Author

Pavel Lakiza

Date

June 2021

Implementation of the methods to operate with input/output streams

5.26 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/core/project.h File Reference

Declaration of the Project class.

```
#include <QObject>
#include "aliasdataset.h"
#include "array.h"
#include "hierarchytree.h"
#include "abstractdataobject.h"
#include "abstractrodcomponent.h"
```

Classes

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

5.26.1 Detailed Description

Declaration of the Project class.

Author

Pavel Lakiza

Date

June 2021

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

Implementation of the ScalarDataObject class.

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

5.27.1 Detailed Description

Implementation of the ScalarDataObject class.

Author

Pavel Lakiza

Date

June 2021

5.28 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/core/scalardataobject.h File Reference

Declaration of the ScalarDataObject class.

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

Classes

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

5.28.1 Detailed Description

Declaration of the ScalarDataObject class.

Author

Pavel Lakiza

Date

April 2021

5.29 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/core/surfacedataobject.cpp File Reference

Implementation of the SurfaceDataObject class.

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

5.29.1 Detailed Description

Implementation of the SurfaceDataObject class.

Author

Pavel Lakiza

Date

June 2021

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

Declaration of the SurfaceDataObject class.

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

Classes

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

5.30.1 Detailed Description

Declaration of the SurfaceDataObject class.

Author

Pavel Lakiza

Date

April 2021

5.31 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/core/utilities.cpp File Reference

Implementation of utilities.

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

5.31.1 Detailed Description

Implementation of utilities.

Author

Pavel Lakiza

Date

May 2021

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

Declaration of utilities.

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

Functions

- QPair< Core::AbstractDataObject::ObjectType, 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.

5.32.1 Detailed Description

Declaration of utilities.

Author

Pavel Lakiza

Date

May 2021

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

Implementation of the VectorDataObject class.

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

Variables

- const IndexType **skNumElements** = 3

5.33.1 Detailed Description

Implementation of the VectorDataObject class.

Author

Pavel Lakiza

Date

June 2021

5.34 /home/qinterfly/Library/Projects/Current/QRod↔ Systems/src/core/vectordataobject.h File Reference

Declaration of the VectorDataObject class.

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

Classes

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

5.34.1 Detailed Description

Declaration of the VectorDataObject class.

Author

Pavel Lakiza

Date

April 2021

5.35 /home/qinterfly/Library/Projects/Current/QRod↔ Systems/src/main/main.cpp File Reference

The startup function.

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

Functions

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

5.35.1 Detailed Description

The startup function.

Author

Pavel Lakiza

Date

May 2021

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

Definition of the AbstractProjectManager class.

```
#include <QMessageBox>
#include <QSettings>
#include <QToolBar>
#include "abstractprojectmanager.h"
#include "central/uiconstants.h"
#include "core/project.h"
#include "DockManager.h"
```

5.36.1 Detailed Description

Definition of the AbstractProjectManager class.

Author

Pavel Lakiza

Date

May 2021

5.37 /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/abstractprojectmanager.h File Reference

Declaration of the AbstractProjectManager class.

```
#include <QDialog>
```

Classes

- class [QRS::Managers::AbstractProjectManager](#)
Abstract manager to create objects of different types.

5.37.1 Detailed Description

Declaration of the AbstractProjectManager class.

Author

Pavel Lakiza

Date

May 2021

5.38 /home/qinterfly/Library/Projects/Current/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 <QShortcut>
#include <QFileDialog>
#include "DockManager.h"
#include "DockWidget.h"
#include "DockAreaWidget.h"
#include "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)
- QIcon **getDataObjectIcon** (AbstractDataObject::ObjectType type)

Helper function to assign appropriate data object icon.

5.38.1 Detailed Description

Implementation of the DataObjectsManager class.

Author

Pavel Lakiza

Date

June 2021

5.39 /home/qinterfly/Library/Projects/Current/QRodSystems/src/managers/dataobjectsmanager.h File Reference

Declaration of the DataObjectsManager class.

```
#include <unordered_map>
#include "abstractprojectmanager.h"
#include "core/aliasdata.h"
#include "core/aliasdataset.h"
#include "core/hierarchytree.h"
```

Classes

- class **QRS::Managers::DataObjectsManager**

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

5.39.1 Detailed Description

Declaration of the DataObjectsManager class.

Author

Pavel Lakiza

Date

June 2021

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

Implementation of the DoubleSpinBoxItemDelegate class.

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

5.40.1 Detailed Description

Implementation of the DoubleSpinBoxItemDelegate class.

Author

Pavel Lakiza

Date

March 2021

5.41 [/home/qinterfly/Library/Projects/Current/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.

5.41.1 Detailed Description

Declaration of the DoubleSpinBoxItemDelegate class.

Author

Pavel Lakiza

Date

March 2021

5.42 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/managers/geometrycomponentwidget.cpp File Reference

Definiton of the GeometryComponentWidget class.

```
#include "geometrycomponentwidget.h"
```

5.42.1 Detailed Description

Definiton of the GeometryComponentWidget class.

Author

Pavel Lakiza

Date

May 2021

5.43 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/managers/geometrycomponentwidget.h File Reference

Declaration of the GeometryComponentWidget class.

```
#include <QWidget>
```

Classes

- class [QRS::Managers::GeometryComponentWidget](#)
Widget to construct a geometrical component of a rod.

5.43.1 Detailed Description

Declaration of the GeometryComponentWidget class.

Author

Pavel Lakiza

Date

May 2021

5.44 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/managers/managersfactory.cpp File Reference

Definition of the ManagersFactory class.

```
#include <QApplication>
#include <QDesktopWidget>
#include "managersfactory.h"
#include "managers/dataobjectsmanager.h"
#include "managers/rodcomponentsmanager.h"
```

Functions

- void [moveToCenter](#) (QWidget *pWidget)
Helper function to situate widgets at the center of their parent widgets.

5.44.1 Detailed Description

Definition of the ManagersFactory class.

Author

Pavel Lakiza

Date

May 2021

5.45 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/managers/managersfactory.h File Reference

Declaration of the ManagersFactory class.

```
#include <QObject>
#include "abstractprojectmanager.h"
```

Classes

- class [QRS::Managers::ManagersFactory](#)
Factory to create managers which utilize and modify project data.

5.45.1 Detailed Description

Declaration of the ManagersFactory class.

Author

Pavel Lakiza

Date

May 2021

5.46 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/managers/rodcomponentsmanager.cpp File Reference

Definition of the RodComponentsManager class.

```
#include <QVBoxLayout>
#include <QPushButton>
#include <QTreeView>
#include <QToolBar>
#include "DockManager.h"
#include "DockWidget.h"
#include "DockAreaWidget.h"
#include "rodcomponentsmanager.h"
#include "core/project.h"
#include "core/vectordataobject.h"
#include "core/matrixdataobject.h"
#include "core/geometryrodcomponent.h"
#include "managers/geometrycomponentwidget.h"
```

5.46.1 Detailed Description

Definition of the RodComponentsManager class.

Author

Pavel Lakiza

Date

May 2021

5.47 /home/qinterfly/Library/Projects/Current/QRod↵ Systems/src/managers/rodcomponentsmanager.h File Reference

Declaration of the RodComponentsManager class.

```
#include "managers/abstractprojectmanager.h"
#include "core/aliasdataset.h"
#include "core/hierarchytree.h"
```

Classes

- class [QRS::Managers::RodComponentsManager](#)
Manager to create rod components, such as a geometry, cross section and force.

5.47.1 Detailed Description

Declaration of the RodComponentsManager class.

Author

Pavel Lakiza

Date

March 2021

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

Definition of the AbstractHierarchyItem class.

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

5.48.1 Detailed Description

Definition of the AbstractHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

5.49 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/models/hierarchy/abstrachierarchyitem.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.

5.49.1 Detailed Description

Declaration of the AbstractHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

5.50 /home/qinterfly/Library/Projects/Current/QRod↔ Systems/src/models/hierarchy/abstracthierarchymodel.cpp File Reference

Definition of the AbstractHierarchyModel class.

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

5.50.1 Detailed Description

Definition of the AbstractHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

5.51 /home/qinterfly/Library/Projects/Current/QRod↔ Systems/src/models/hierarchy/abstracthierarchymodel.h File Reference

Declaration of the AbstractHierarchyModel class.

```
#include <QStandardItemModel>
#include "abstracthierarchyitem.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 >

5.51.1 Detailed Description

Declaration of the AbstractHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

5.52 [/home/qinterfly/Library/Projects/Current/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](#) (AbstractDataObject::ObjectType type)
Helper function to assign appropriate data object icon.

5.52.1 Detailed Description

Definition of the DataObjectsHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

5.53 /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/dataobjectshierarchyitem.h File Reference

Declaration of the DataObjectsHierarchyItem class.

```
#include "core/aliasdataset.h"
#include "models/hierarchy/abstrachierarchyitem.h"
```

Classes

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

5.53.1 Detailed Description

Declaration of the DataObjectsHierarchyItem class.

Author

Pavel Lakiza

Date

May 2021

5.54 /home/qinterfly/Library/Projects/Current/QRodSystems/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"
```

5.54.1 Detailed Description

Definition of the DataObjectsHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

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

5.55.1 Detailed Description

Declaration of the DataObjectsHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

5.56 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/models/hierarchy/projecthierarchymodel.cpp File Reference

Definition of the ProjectHierarchyModel class.

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

5.56.1 Detailed Description

Definition of the ProjectHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

5.57 /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/hierarchy/projecthierarchymodel.h File Reference

Declaration of the ProjectHierarchyModel class.

```
#include "models/hierarchy/abstrachhierarchymodel.h"
#include "core/aliasdata.h"
#include "core/project.h"
```

Classes

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

5.57.1 Detailed Description

Declaration of the ProjectHierarchyModel class.

Author

Pavel Lakiza

Date

May 2021

5.58 /home/qinterfly/Library/Projects/Current/QRodSystems/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/hierarchy/hierarchyitem.h"
#include "models/hierarchy/abstrachhierarchymodel.h"
#include "models/hierarchy/dataobjectshierarchyitem.h"
```

5.58.1 Detailed Description

Definition of the DataObjectsPropertiesModel class.

Author

Pavel Lakiza

Date

May 2021

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

5.59.1 Detailed Description

Declaration of the DataObjectsPropertiesModel class.

Author

Pavel Lakiza

Date

May 2021

5.60 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/models/table/basetablemodel.cpp File Reference

Implementation of the BaseTableModel class.

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

5.60.1 Detailed Description

Implementation of the BaseTableModel class.

Author

Pavel Lakiza

Date

June 2021

5.61 /home/qinterfly/Library/Projects/Current/QRodSystems/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.

5.61.1 Detailed Description

Declaration of the BaseTableModel class.

Author

Pavel Lakiza

Date

March 2021

5.62 /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/matrixtablemodel.cpp File Reference

Implementation of the MatrixTableModel class.

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

5.62.1 Detailed Description

Implementation of the MatrixTableModel class.

Author

Pavel Lakiza

Date

June 2021

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

5.63.1 Detailed Description

Declaration of the MatrixTableModel class.

Author

Pavel Lakiza

Date

March 2021

5.64 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/models/table/surfacetablemodel.cpp File Reference

Implementation of the SurfaceTableModel class.

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

5.64.1 Detailed Description

Implementation of the SurfaceTableModel class.

Author

Pavel Lakiza

Date

June 2021

5.65 /home/qinterfly/Library/Projects/Current/QRodSystems/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.

5.65.1 Detailed Description

Declaration of the SurfaceTableModel class.

Author

Pavel Lakiza

Date

March 2021

5.66 /home/qinterfly/Library/Projects/Current/QRodSystems/src/models/table/tablemodelinterface.cpp File Reference

Implementation of static functions of TableModelInterface.

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

5.66.1 Detailed Description

Implementation of static functions of TableModelInterface.

Author

Pavel Lakiza

Date

June 2021

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

5.67.1 Detailed Description

Declaration of the TableModelInterface.

Author

Pavel Lakiza

Date

June 2021

5.68 [/home/qinterfly/Library/Projects/Current/QRod](#) Systems/src/render/view3d.cpp File Reference

Implementation of the View3D class.

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

5.68.1 Detailed Description

Implementation of the View3D class.

Author

Pavel Lakiza

Date

March 2021

5.69 /home/qinterfly/Library/Projects/Current/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.

5.69.1 Detailed Description

Declaration of the View3D class.

Author

Pavel Lakiza

Date

March 2021

