

DIFFRAC.SUITE

- User Manual

DIFFRAC.MEASUREMENT SUITE

Original Instructions

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights reserved.

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections are included in subsequent editions. Suggestions for improvement are welcome.

All configurations and specifications are subject to change without notice.

Order no. DOC-M88-EXX191 V7 Updated: October 11, 2017.

© 2009 - 2017 Bruker AXS GmbH, Karlsruhe, Germany.

All trademarks and registered trademarks are the sole property of their respective owners.

Printed in the Federal Republic of Germany.

Bruker AXS GmbH
Östliche Rheinbrückenstr. 49
76187 Karlsruhe, Germany
Tel. +49 721 50997-0
Fax +49 721 50997-5654
info.baxs@bruker.com
www.bruker.com

Contents

1	Introduction to Bruker AXS MEASUREMENT CENTER	11
2	System Configuration	13
2.1	Standard Configuration	13
2.2	Extended Configuration	13
3	Emergency Operation	15
4	The Measurement Server	17
4.1	General	17
4.2	Setting Up the System with the Measurement Server	17
4.2.1	Making Preliminary Settings for Measurement Server.....	17
4.2.1.1	Common Options	18
4.2.1.2	Logging Options.....	18
4.2.1.3	Select Database.....	19
4.2.2	Selecting the Instruments	20
4.2.3	Getting and Releasing Control of and Reconnecting to Instruments	22
4.2.4	Other Options of the Start Menu	26
5	The Measurement Client	29
5.1	General	29
5.2	The Plug-in Concept	29
5.2.1	Logging In and Out	29
5.2.2	Shell Interface	30
5.2.3	Menus of Shell Interface	30
5.2.3.1	The File Menu	31
5.2.3.1.1	General Settings	32
5.2.3.2	The Help Menu	33
5.3	Getting a Connection to an Instrument with the Measurement Client.....	34
6	COMMANDER	37
6.1	General	37
6.2	COMMANDER Page.....	37
6.2.1	Screen Layout and Operation	39
6.2.2	Instrument Components Panel	40
6.2.2.1	Sample Changer Control	42
6.2.2.2	Drive Control	42
6.2.2.3	Rotary Absorber Control	45
6.2.2.4	Motorized Slit Controls.....	45
6.2.2.5	Special Optic Controls	46
6.2.2.6	Non-ambient Chamber Control	48
6.2.2.7	X-Ray Generator Control	49
6.2.2.8	Detector Control.....	50
6.2.3	Scan Setup Panel	51
6.2.4	Measurement Display Panel	54
6.2.5	Video Panel.....	57
6.3	Toolbar and Menu Options	58
6.3.1	Speed Buttons	58

6.3.2	File Menu	59
6.3.3	View Menu	60
6.3.4	Commander Menu	61
6.4	User Script Editor	66
7	START JOBS	67
7.1	General	67
7.2	Screen Layout and Operation	67
7.2.1	The Start Jobs Tab	68
7.2.1.1	Editing the Measurement Information	70
7.2.1.2	The Start Jobs Context Menu	71
7.2.1.3	The Column Editor	71
7.2.1.4	The Start Jobs Menu	73
7.2.2	User Right Restrictions	74
7.2.3	The Start Jobtemplates Tab	74
7.2.3.1	Creating a New Template	75
7.2.3.2	Working with Optional Parameters	76
7.2.3.3	Ordering the Buttons on the Screen	78
7.2.3.4	Jobtemplate Overview	78
7.2.3.5	Export and Import Templates	78
7.2.3.6	Auto 2D Integration	79
7.2.4	The Well Plate Tab	80
7.2.4.1	The Wellplate Control Context Menu	81
7.2.4.2	Camera Control Context Menu	81
7.2.5	The Aluminum Bath Tab	82
7.2.5.1	The Aluminum Bath Configuration Dialog	83
8	JOBLIST	87
8.1	General	87
8.2	Screen Layout and Operation	87
8.2.1	Joblist and Job Details Windows	87
8.2.2	Job History Window	89
8.2.3	Scheduled Job Window	89
8.2.4	Scheduling of Jobs	90
8.2.5	Speed Buttons	92
8.2.6	Joblist Menu and Job List Context Menu	92
9	DAVINCI	95
9.1	General	95
9.2	Screen Layout and Operation	96
10	RESULTS MANAGER	99
10.1	Introduction	99
10.2	General	99
10.2.1	Screen Layout	99
10.2.1.1	RESULTS MANAGER Kinds of View	100
10.2.2	Saving View Formatting/Specification to Database	102
10.2.3	Results Manager Menu	102
10.2.4	Customizing Tables	104
10.2.5	Copying Values from a Table to the Clipboard	105

10.2.6	Label Editor	106
10.3	Creating a Results Format	106
10.3.1	Changing the Display Name	107
10.3.2	Setting the Visibility	107
10.3.3	Selecting the Unit	107
10.3.4	Setting the Format	109
10.3.5	Setting the Number of Digits	109
10.3.6	Changing the Sequence	109
10.3.7	Detected Compounds	109
10.3.8	Editing Defaults	110
10.4	How to Define the Parameters to be Shown	110
10.4.1	Defining Shown Parameters	111
10.4.2	Defining Shown Compounds	113
10.4.3	Defining Shown Modules	114
10.5	Monitoring Mode: Viewing Results	115
10.6	Query Mode: Searching for Results in the Database	118
10.6.1	Setting the Search Criteria	119
10.6.1.1	General Search Criteria	120
10.6.1.2	Applying Filters	123
10.6.1.2.1	Application Filter	124
10.6.1.2.2	File Filter	124
10.6.1.2.3	Script File Filter	125
10.6.1.2.4	Task File Filter	125
10.6.1.2.5	Measurement Method Filter	125
10.6.1.2.6	Experiment Filter	126
10.6.1.2.7	Formatting Method Filter	126
10.6.1.2.8	Sample ID Filter	127
10.6.1.2.9	Time Spans Filter	127
10.6.1.2.10	User Filter	128
10.6.1.2.11	Comment Field Filter	129
10.6.1.2.12	Compound Filter	129
10.6.1.2.13	Instrument Filter	130
10.6.2	Displaying the Search Results	130
10.7	Edit (Configure) Mode: Customizing the Results Layout	131
10.7.1	Defining the General Appearance of the Results View	131
10.7.1.1	Defining a Detail View	133
10.7.1.1.1	Compound statistics view	133
10.7.1.1.2	Charts View	135
10.7.1.1.3	Compound List View	137
10.7.1.1.4	Show Measurements View	137
10.7.1.1.5	Show Comment View	139
10.7.1.1.6	View Pictures View	139
10.7.1.2	Selecting the Action buttons	139
10.7.2	Defining the Limits Highlighting in the Results	140
10.7.3	Defining the Appearance of Texts in the Results	141
10.8	How to Print Results	143
10.8.1	Defining the Type of Printout	143

10.8.1.1	Result Rows Report.....	144
10.8.1.2	Result Columns Report.....	145
10.8.1.3	RTF Reports	146
10.8.1.4	View based Report.....	147
10.8.2	Defining Another Results Format for Printing	149
10.8.3	Previewing the Printout and Printing.....	150
10.8.3.1	Report Layout Tab	151
10.8.3.2	Header/Footer Tab.....	152
10.8.3.3	Parts Tab	154
10.8.3.4	Watermark Tab	155
11	DATABASE MANAGEMENT	157
11.1	General	157
11.2	Screen Layout and Operation	157
11.2.1	Instrument Configuration.....	157
11.2.1.1	Controlled Devices Window	158
11.2.1.1.1	Deleting Devices from the Database	159
11.2.1.2	Instrument Configurations Window	159
11.2.2	User Management	160
11.2.2.1	User and Group Rights Concept.....	160
11.2.2.2	Users Table.....	160
11.2.2.3	Groups Table	163
11.2.3	Audit Trail.....	165
11.2.3.1	File Menu and Audit Trail Context Menu.....	166
11.2.4	General Settings	166
11.2.4.1	General Settings Window	168
11.2.4.2	Database Backup/Restore Window	169
11.2.5	Database Maintenance Window	170
12	CONFIG.....	175
12.1	General	175
12.1.1	Getting Control of the Instrument.....	175
12.2	Screen Layout and Operation	176
12.2.1	Config Tree Window	176
12.2.1.1	Component Status	177
12.2.2	Properties Window	177
12.2.2.1	Editing Control	178
12.2.2.2	Plugs and Sockets	179
12.2.2.3	Resource Providers	181
12.2.2.4	Resource Consumers	181
12.2.3	The File Menu	182
12.2.4	The Offline Mode Menu	183
12.2.4.1	Open Firmware Definition from File	183
12.2.4.2	Open Firmware Definition from Database.....	183
12.2.5	The Config Menu	184
12.2.5.1	Open Configuration From	184
12.2.5.2	Save Configuration To File	186
12.2.5.3	Save Configuration to Database.....	187

12.2.5.4	Import Templates (from File).....	188
12.2.5.5	Export Templates (to File).....	189
12.2.5.6	Activate Configuration.....	190
12.2.6	The View Menu.....	191
12.2.7	The Tools Menu.....	195
12.2.7.1	Instrument Setup.....	195
12.2.7.2	Shutdown Script.....	196
12.2.8	Speed Buttons.....	196
12.2.9	The Config Tree Context Menu.....	197
12.2.9.1	Add Components.....	198
12.2.9.2	Add Components: Show Details.....	199
12.2.9.3	Add Components: Modify Names.....	199
12.2.9.4	Register new components.....	200
12.2.9.5	Clone Component.....	201
12.2.9.6	Create Component from Scratch.....	202
12.2.9.7	Cut.....	203
12.2.9.8	Copy.....	203
12.2.9.9	Paste Component.....	203
12.2.9.10	Paste Values.....	203
12.2.9.11	Apply Values from Section.....	203
12.2.9.12	Rename Component.....	204
12.2.9.13	Delete Component.....	204
12.2.10	The Edit Menu.....	205
13	TOOLS.....	207
13.1	General.....	207
13.2	Screen Layout and Operation.....	208
13.2.1	Component Tree Window.....	209
13.3	Component State Window.....	209
13.3.1	Changing the Value of Properties.....	212
13.3.2	TOOLS-Specific Menus.....	213
13.3.2.1	The Utilities Menu.....	213
13.3.2.2	Dialog Boxes for Commands.....	215
13.3.3	Speed Buttons.....	216
13.3.4	Diagnosing Faults and Malfunctions and Taking Remedial Action.....	217
13.3.5	The Settings Menu.....	218
13.4	Remote Control.....	220
13.5	Measurement.....	221
14	DETECTOR.....	223
14.1	General.....	223
14.2	Detector Menu.....	223
14.3	1D Detector Calibration.....	224
14.3.1	Resolution and Zero Offset.....	225
14.3.1.1	Calibration by Theoretical Calculation.....	225
14.3.1.2	Calibration by Measurement.....	227
14.3.1.3	Calibrate by Existing Data.....	228
14.3.1.4	Results.....	228

14.3.2	LYNXEYE XE.....	229
14.3.2.1	Load and Save The Detector State.....	229
14.3.2.2	Low and High Discriminators	230
14.3.2.3	Veto Discriminator.....	231
14.3.2.3.1	Results	232
14.3.2.4	Low and High Discriminators with X-ray	232
14.3.2.4.1	Results	234
14.3.2.5	Flood Field	235
14.3.2.6	ADC Monitor	236
14.3.2.7	Detector Browse	237
14.3.3	VANTEC-1 on N8 HORIZON.....	237
14.3.3.1	Resolution on Fixed Track	238
14.3.3.2	Flood Field	243
14.3.3.3	Multiplication Voltage.....	244
14.4	2D Detector Calibration.....	244
15	LOG.....	245
15.1	General	245
15.2	Screen Layout and Operation	245
15.2.1	The LOG Context Menu.....	246
16	CAMERA HIGH RESOLUTION	247
16.1	General	247
16.2	Screen Layout and Operation	247
16.2.1	The Camera Menu	248
16.2.2	Camera Properties Dialog.....	249
16.2.3	User Right Restrictions	250
17	LOADER for D8 ENDEAVOR.....	251
17.1	Introduction	251
17.2	How to Start Measurements on the LOADER.....	251
17.3	How to Send Specimens to the Measurement Process.....	253
17.3.1	Display of a Sample Sent to Measurement.....	253
17.3.2	Display of the Results	253
17.3.3	How to Stop a Measurement	254
17.3.4	How to Remove Samples	254
17.4	How to Print Online Specimens and Results	255
17.4.1	How to Print Results	255
17.4.2	How to Configure the Print Settings.....	256
17.4.2.1	Report Layout Tab	256
17.4.2.2	Header/Footer Tab.....	257
17.4.2.3	Parts Tab	258
17.4.2.4	Watermark Tab	259
18	Database Maintenance.....	261
18.1	General	261
18.2	Screen Layout and Operation	261
18.3	Upgrade Database.....	262
18.4	Overwrite Database	263
18.5	Creating an Automatic Database Backup.....	265

19 Database Troubleshooting	269
19.1 Wrong Database Address in the Database Configuration Files.....	269
19.2 Wrong database version	270
19.3 Database Service Not Running.....	270
20 Script Designer	273
20.1 General	273
20.2 Screen Layout and Operation	273
20.2.1 Opening the Script Designer.....	273
20.2.2 The Main Window	273
20.2.2.1 The Menus	274
20.2.2.1.1 The File Menu	274
20.2.2.1.2 The Edit Menu.....	276
20.2.2.1.3 The View Menu	276
20.2.2.1.4 The User Functions Menu.....	277
20.2.2.1.5 The Script Menu.....	278
20.2.2.2 The Toolbars.....	278
20.2.2.3 Script Item Panel.....	279
20.2.2.4 Component Factory	279
20.2.2.5 Item Editor.....	279
20.2.2.6 Output	279
20.2.2.7 Find Results	280
20.2.2.8 Error List	280
20.2.2.9 Breakpoints	280
20.3 Controlling Script Items	281
21 License Notes	285
Index	287

1 Introduction to Bruker AXS MEASUREMENT CENTER

The Bruker AXS MEASUREMENT CENTER is a set of software applications, implemented as a modular system. These are used to accomplish all essential measurement-related tasks with Bruker AXS analytical X-ray instruments. The suite of applications includes, for example, **COMMANDER**, **JOBLIST**, and **START JOBS**.

The application modules are delivered as plug-ins loaded into a shell, which provides convenience and flexibility.

The suite of applications forms the client component of a client-server system. In this manual the Bruker AXS MEASUREMENT CENTER is often referred to as the **Measurement Client** and the server via which the modules communicate with the X-ray instruments is called the "Measurement Server".

The third component of the client-server system is the database into and from which the modules of the Bruker AXS MEASUREMENT CENTER write and read information.

2 System Configuration

The Measurement Server, its related database and the Measurement Client can be used in different configurations depending on the needs of the user.

2.1 Standard Configuration

In the standard configuration, single instances of the Measurement Server and the Measurement Client are run together with the database on a PC. This computer is connected to a single X-ray instrument via **TCP/IP**.

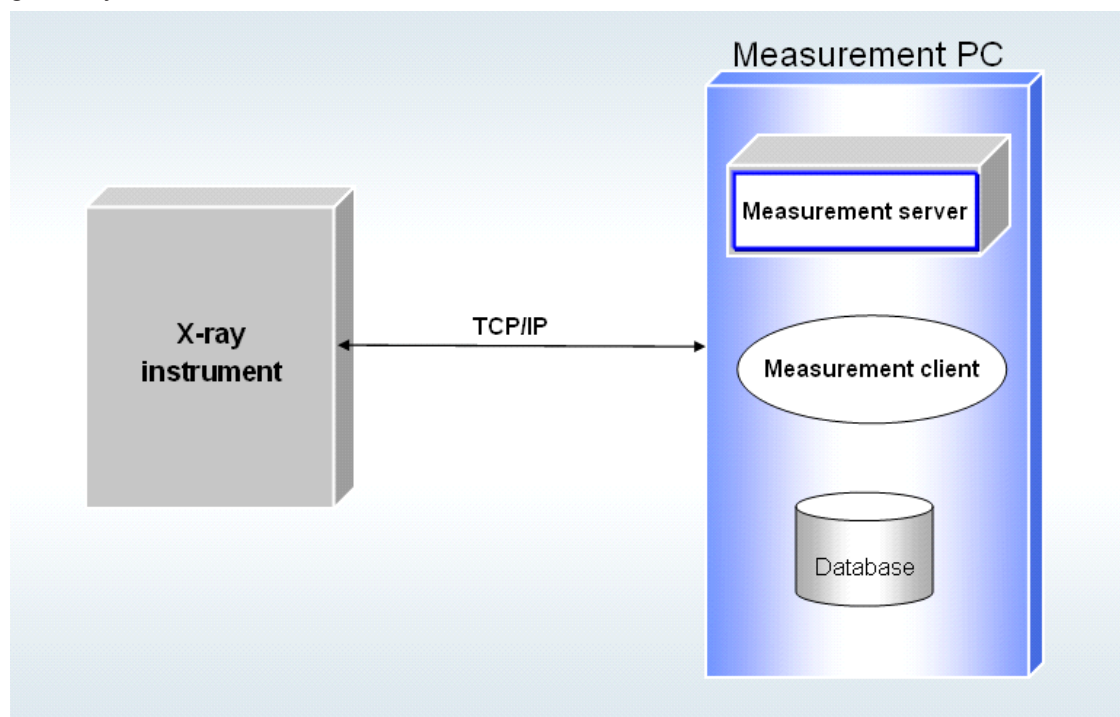


Figure 2.1: Standard configuration

2.2 Extended Configuration

- If the measurement software is running in the extended configuration, one instance of the Measurement Server is linked to several instruments. It can control several instruments at a time.
- The Measurement Server is linked to one or several instances of the Measurement Client via TCP/IP connections, which run on separate PCs.
- The database runs on a separate computer and is accessed directly by the Measurement instances.
- The advantage of this arrangement is that all instruments use the same database for instrument configuration, user management and the storage of measurement results.

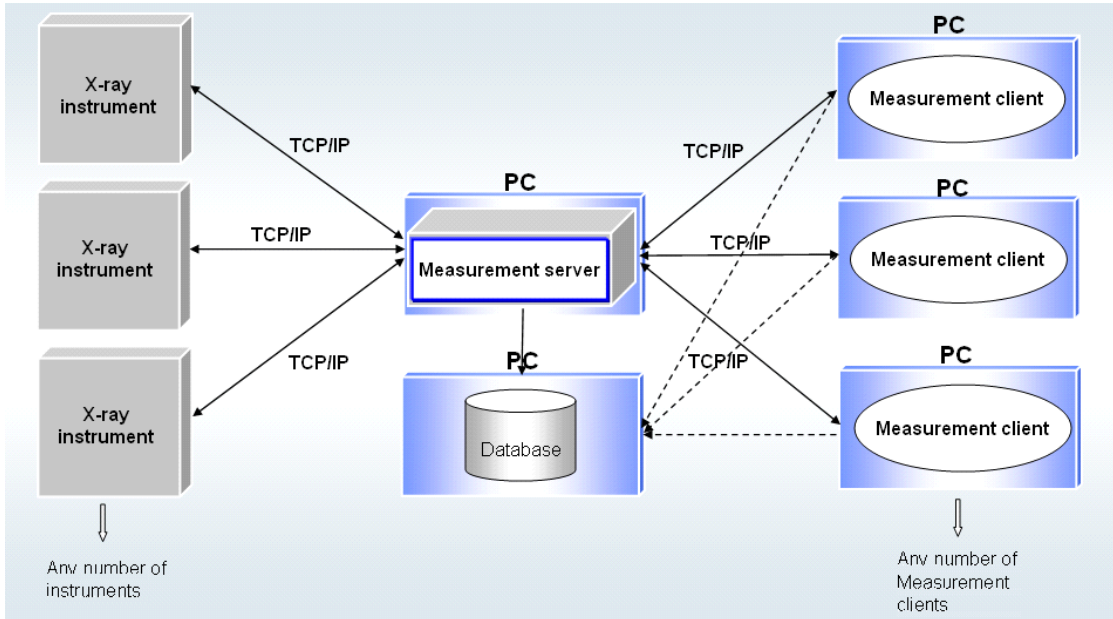


Figure 2.2: Extended configuration

- More complex configurations can include several instances of the Measurement Server. The instances share the same database.

3 Emergency Operation

Users can continue to perform essential tasks with some of the plug-in modules of the Measurement Client if the database connection fails during start-up of the client.

Emergency Operation in the Case of Database Failure

If the connection to the database fails, it will be recognized by the Measurement Server and the Measurement Client. The system then automatically switches to its emergency operation mode. This means that the program will function without a database. Except in the case of the **DATABASE MANAGEMENT** plug-in, which will enable the user to perform all the tasks that can be accomplished with the plug-ins under normal operating conditions. However, the modules suffer a certain reduction in functionality. Data stored in the database, such as that relating to measurement methods or user rights, or the results of measuring operations, are no longer available. Without a connection to the database, such data can only be stored in the file system of the PC hosting the plug-in.

Upon switching to emergency operation, the system assigns the name **RepairUser**, to the user, which is displayed in the login window. The user must use this name to log in and must enter a special password supplied to him by the system administrator.

Emergency Operation in the Case of System Failure

If a working connection cannot be established with an instrument via the Measurement Server, a direct connection can be established and used by the **TOOLS** and **CONFIG** plug-ins. With this direct connection, these modules can be used normally.

4 The Measurement Server

4.1 General

The Measurement Server regulates the data traffic between the Bruker X-ray instruments and instances of the Measurement Client with their plug-ins. It ensures that only one plug-in instance has control of an instrument at any one time. It also performs the scheduling of jobs to be executed on the instruments to which it is connected.

4.2 Setting Up the System with the Measurement Server

Before using the Bruker AXS MEASUREMENT CENTER, certain preliminary system settings must be made in the Measurement Server.

To make these settings,

1. start the Measurement Server and
2. then right-click the **Bruker** symbol, which appears in the system tray at the bottom right of the screen.



⇒ This will cause the start menu to appear.

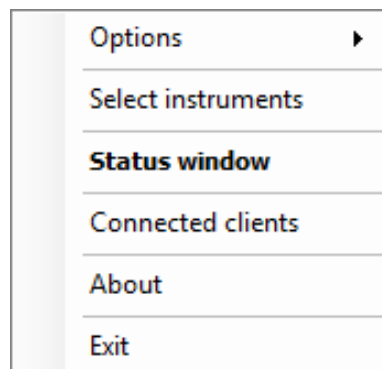


Figure 4.1: Measurement Server start menu

The functions of the start menu are explained in the following sections.

4.2.1 Making Preliminary Settings for Measurement Server

Before making the preliminary system settings in the Measurement Server, some preliminary settings for the Measurement Server itself are required. This is done using the item **Options** and the sub-items **Common Options**, **Logging Options** and **Select database**.

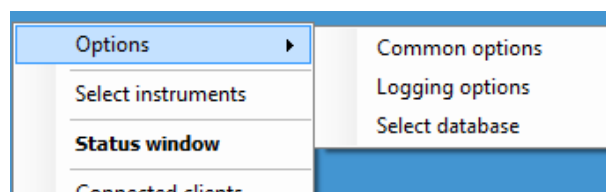


Figure 4.2: Sub items for **Options**

4.2.1.1 Common Options

1. Choose the sub-item **Common Options** to open the dialog box **Common Options**.

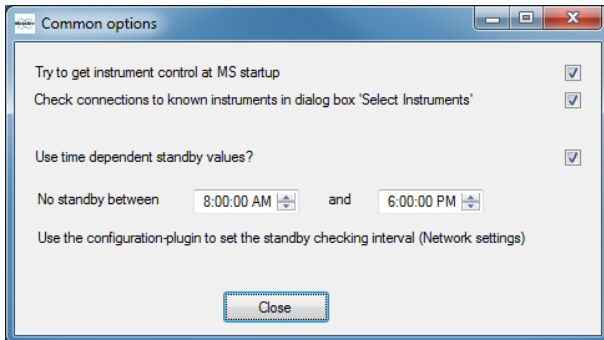


Figure 4.3: Dialog box **Common Options**

Try to get instrument control at MS start-up:

At start-up, the Measurement Server will always try to get control of the instrument(s) that it controlled at the end of the last session (see Section [Getting and Releasing Control of and Reconnecting to Instruments \[22\]](#)).

Check connections to known instruments in Instrument Selection dialog:

Connections to known instruments will be automatically checked by the Measurement Server whenever the dialog box **Select Instruments** is opened (see Section [Selecting the Instruments \[20\]](#)).

Standby settings:

The Measurement Server will call a **StandBy- script** after the last executed measurement and after a period that can be configured using the configuration-plug-in. The script will perform actions like setting the generator voltage and current to standby values. It is possible to disable the calling of the script between a time period, e.g. during working hours. This requires the **Use time dependent standby values** setting to be active. Changed values are immediately recognized.

4.2.1.2 Logging Options

Choosing the sub-item **Logging Options** opens the dialog box **Logging Options**.

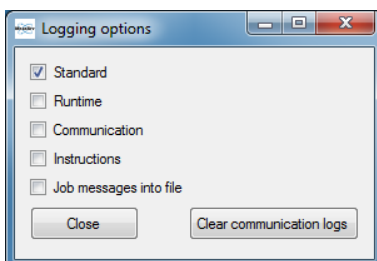


Figure 4.4: Dialog box **Logging Options**

This dialog box contains a series of options for the type of logging information provided in the LOG plug-in.

Standard:	Standard logging information will be provided in the LOG plug-in.
Runtime Instructions and Job messages into file:	Choosing one of these options will cause extra information to be provided. These options should only be activated on request, because many data might be written to log files.
Communication:	Activating this option will log all communication between the ICS, the measurement server and all connected clients to the MeasurementServer.log file in the application log folder. The log files are contained in state files which are sent to Bruker for debugging purpose.
Clear communication logs:	Since the log files can contain huge amount of data if logging is enabled, it is possible to clear the content of the log files. Log files are contained in state files which are often requested by Bruker Service. So it might be useful to clear the log files after investigation of problems has finished keeping the state files small.

4.2.1.3 Select Database

Choose the sub-item **Select database** to change the database configuration of the Measurement Server. The dialog will only be editable if there is no instrument currently connected to the Measurement Server. If you get a message box that tells you that there are currently instruments connected to the Measurement Server, please

1. Go to the **Select instruments** dialog and remove all marked instruments.

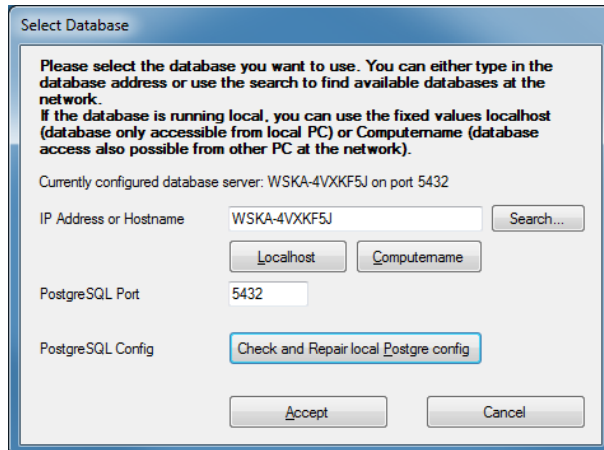


Figure 4.5: Dialog box **Select Database**

2. When the **Select Database** dialog is opened, you can directly type in the IP address or the hostname and the Port on which the database server is listening.
3. The **Localhost** and **Computername** buttons will fill the field above with the text “localhost” or the name of the local computer.
4. If you have problems connecting to the database please try the **Check and Repair local PostgreSQL Config** button. A restart of the database server might be necessary. A message box will be displayed in this case.
5. After you have **Accepted** the settings a new database configuration file will be save. Please exit the Measurement Server and restart it so that the new settings are recognized.

If you do not know the exact connection data of your database server, you can press the **Search...** button that will open the **Database Search** dialog. In this dialog, you can select an IP address range that should be scanned for a running database server, the port of the database server and a timeout how long the Database Search should wait for a reply from each IP address. The first two bytes of the address range must always be the same as the fields for the start of the address range and the end of the address range to prevent very long durations of the search. The first 3 bytes are pre-filled with the first 3 bytes of your own network interface when you open the dialog.

After you have clicked **Start Search**, the Measurement Server will try to connect to a running database on each IP address within the selected range. If the connection is successful, the IP address and hostname are listed in the selection list and you can select it. If you have found and selected the database server you want to connect to, click the **Accept** button and the connection data will get typed in to the **Select Database** dialog.

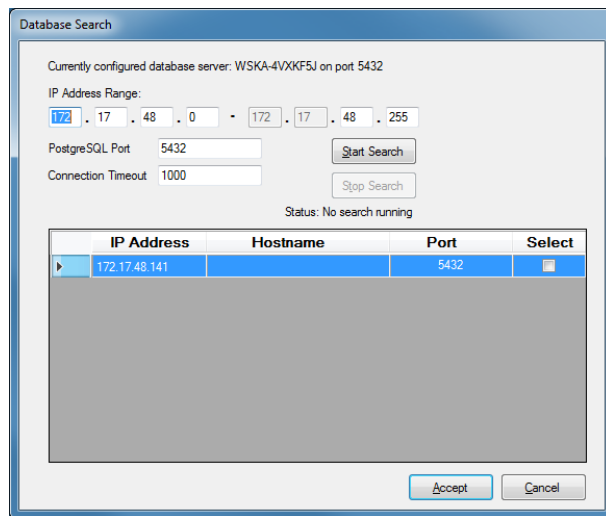


Figure 4.6: Dialog box **Search Database**

4.2.2 Selecting the Instruments

To select the instruments to be used,

1. choose **Select instruments** in the start menu.
- ⇒ This opens the dialog box **Select instruments**.

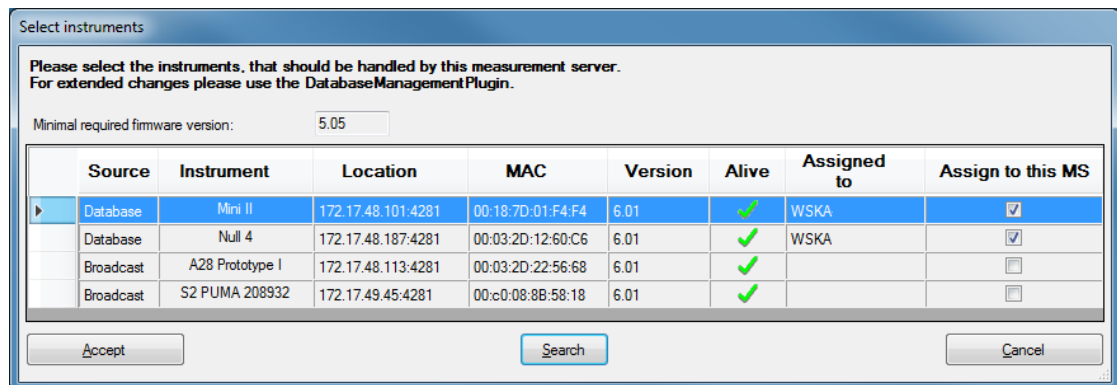


Figure 4.7: Dialog box **Select instruments** – typical appearance when initially opened

This dialog box contains a table with the following columns:

Source:	Indicates whether the listed instruments are only known to the Measurement Server or whether they are known and have been entered in the database as well. Those of the first type are indicated by the word Broadcast and those of the second type by the word Database .
Instrument:	Lists all instruments known to the Measurement Server and found during the automatic search carried out when the dialog box is opened.
Location:	In this column the IP address and the port number of the instrument are displayed.
MAC:	The unique network id provided by the manufacturer of the network card
Version:	The reported firmware version for the instrument.
Alive:	Indicates whether the test connections were successfully established between the instruments and the Measurement Server. If the user has chosen the corresponding option using the item Options of the start menu (see Section Making Preliminary Settings for Measurement Server [17]), an attempt to establish test connections is made automatically when the dialog box is opened.
Assigned to:	If a measurement server controls an instrument, the computer name of the Measurement Server PC is displayed in this column. Normally the entry shows the local PC (since in normal configuration the database, where this entry is stored, is on the PC of the local measurement server).
Assign to this MS:	Allows the user to select an instrument and assign it to the present instance of the Measurement Server.

Assign to this MS:

After checking the appropriate box in this column, click on the **Accept** button (see below) to make the assignment. The network name of the PC hosting the Measurement Server instance is then displayed in the **Assigned to** column.

Assigning an instrument with **Broadcast** status to the Measurement Server instance causes the instrument to be registered in the database (and thus changes its status). At the same time, the particular Measurement Server instance is also entered in the database if it has not already been registered there. Instruments and Measurement Server instances can also be entered in the database directly using the **DATABASE MANAGEMENT** plug-in (see Section [Deleting Devices from the Database \[159\]](#)).

The **Assign to this MS** column can also be used to deselect instruments. To do this, delete the check mark from the appropriate box by clicking it on and then clicking on the **Accept** button. The network name of the PC hosting the instance of the Measurement Server to which the instrument has been assigned will disappear from the **Assigned to** column.

It is only possible to connect to an instrument with a **minimal required firmware version** that is shown above the table. Lines with instruments having a firmware below the needed version are painted with a light red background color.

The buttons below the table have the following functions:

- **Accept** is used in conjunction with the functionality of the “Assign to me” column to assign instruments to the present instance of the Measurement Server. It can also be used to deselect instruments.
When the **Accept** button is activated, an attempt is made to establish a connection be-

tween the selected instrument and the Measurement Server. Whether this attempt is successful or not is shown in the dialog box **Status window** (see following section.)

When an instrument using this button is deselected, the connection between the instrument and the Measurement Server is interrupted.

- **Search** is used to carry out additional searches for known instruments.
- **Cancel** allows the user to exit the dialog box. When the user exits the dialog box, all data entered during the present session, but not saved using the **Accept** button, will be deleted.

The user can also work with this dialog box without using a mouse by scrolling through the rows using the arrow keys ↑ and ↓. The check boxes in the **Assign to me** column can be checked using the space bar. **Accept** can be activated with <Alt><A> keys and **Search** with <Alt><S>keys on the keyboard. The user can exit the dialog box using <Esc>.

4.2.3 Getting and Releasing Control of and Reconnecting to Instruments

Getting control of the instruments the user wants to work with, releasing control of them, and reestablishing faulty connections is done using the dialog box **Status window**. This is done by selecting **Status window** in the start menu. This dialog box also provides information relating to connections and can be used to monitor jobs being executed on the instruments.

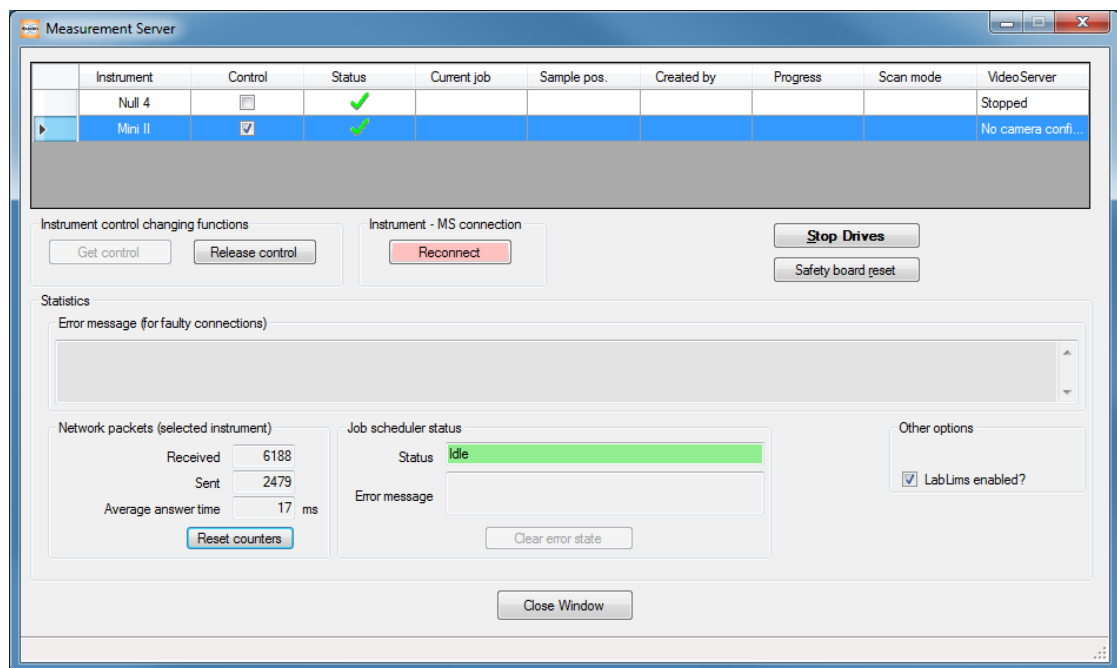


Figure 4.8: Dialog box Status window

The table in the upper part of the dialog box contains the following columns:

- **Instrument:** Contains a list of the selected instruments. There is a **Right Mouse Button-Click** menu which allows to save a state file (see also section Save State in *The File Menu* [182]) to show information about the system (e.g. version of installed software) or to stop a running measurement.

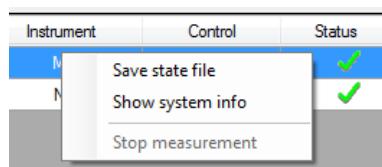


Figure 4.9: Right mouse button menu

Control:	Indicates whether the Measurement Server has control of each selected instrument.
Status:	It is possible to see whether a connection exists between the Measurement Server and the instrument. Connections are established when instruments are assigned to the Measurement Server in the dialog box Select instruments .
Current job:	In this column the ID of the job being currently executed is displayed.
Sample pos.:	Indicates the position of the sample belonging to the current job in the magazine or loading tray. In the case of wafers, the samples are held in cassettes or front-opening unified pods.
Created by:	In this column the name of the client that created the job is displayed.
Progress:	Shows the progress of the measurement from 1 to 100.
Scan mode:	Indicates the scan mode of the scan currently being executed.
Video Server:	Shows the status of the video server build into the Measurement Server. This column is only visible if it is enabled using the General Settings in the Framework and if at least one camera is configured.

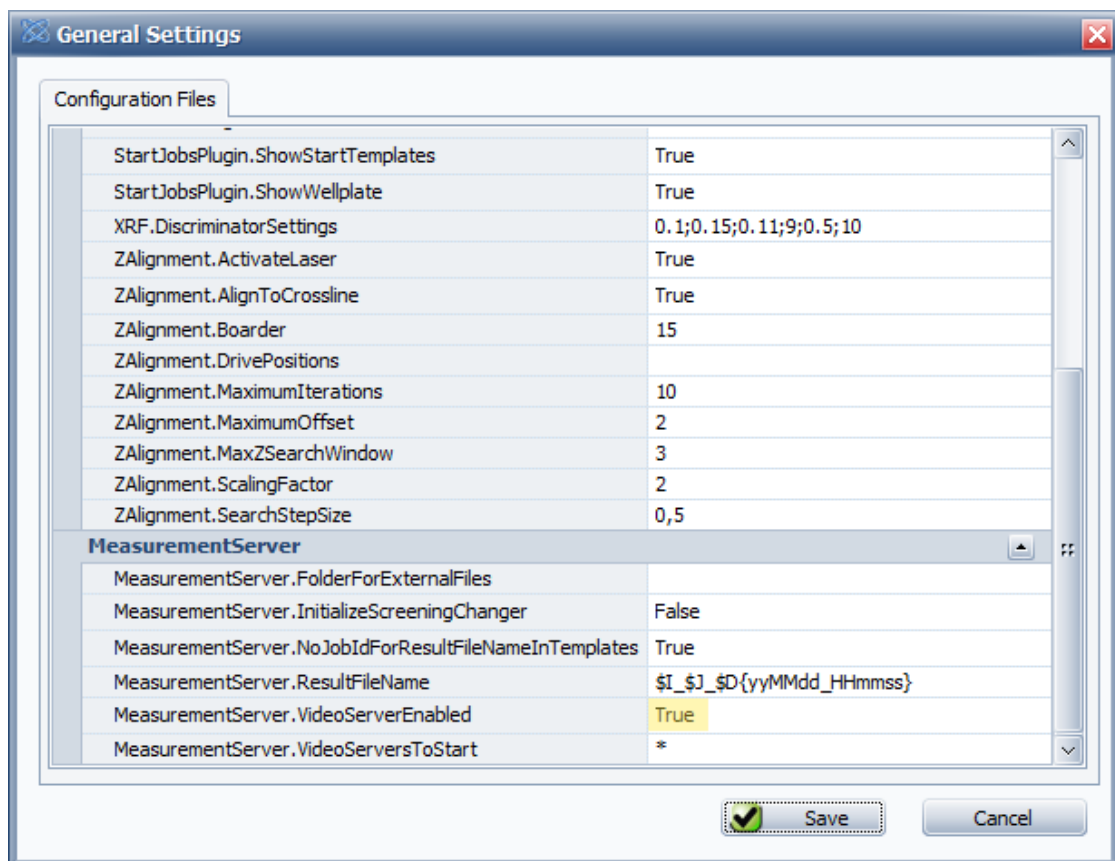


Figure 4.10: Enabling the video server

If the instrument does not have a video camera configured, a dash - is displayed.

If there is a camera, a **Right Mouse Button-Click** menu offers the possibility to start or stop the video server. If there are multiple cameras configured for a single instrument more commands are displayed.

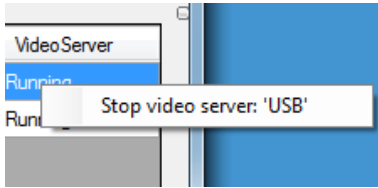


Figure 4.11: **Video Server Menu**

A tooltip on the video server entry shows information about the video configuration and the number of images already received. There might be a problem with the video camera if the number of images is not rising

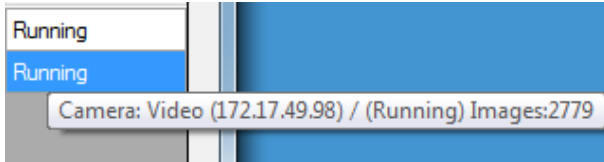


Figure 4.12: **Tooltip on video server**

The buttons below the table have the following functions:

Get control allows the user to get control of an instrument. If the corresponding option has been chosen by the item **Options** of the start menu (see Section [Making Preliminary Settings for Measurement Server \[17\]](#)), an attempt to obtain control of all the selected instruments is automatically made at each start-up of the Measurement Server. If control of one or more instruments has not been obtained, another attempt can be made using this button.

The control state can also be changed by clicking on the **Control** check box which will toggle the state.

An attempt to get control will fail if control has been given to another instance of the Measurement Server or an instance of the **TOOLS** plug-in or **CONFIGURATION** plug-in. These plug-ins are capable of communicating directly with the instruments in emergency operation (see [Emergency Operation \[15\]](#)). Notice of failure and a description of the cause are given in a pop-up window.

Release control allows the user to release control of an instrument. When control of an instrument is released, it is made available for use by another instance of the Measurement Server or by an instance of the **TOOLS** or **CONFIGURATION** plug-in for direct communication with the instrument.

Reconnect allows the user to establish or reestablish a faultless connection between the Measurement Server and the instrument. In the case of existing connections, which are faulty, the connection is broken and then reestablished. In the case of non-existing connections, an attempt is made to establish a working connection.

In **Auto Reconnect** mode (if the Measurement Server loses the connection to the firmware; e.g. because of a changed config written to the instrument by the **CONFIGURATION** plug-in), the color and text of the button changes to:

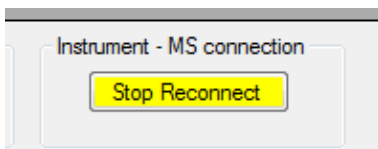


Figure 4.13: **Auto-Reconnect mode**

In this mode the Measurement Server frequently tries to reconnect to the firmware. This action can be stopped with the yellow **Stop Reconnect** button.

- Pressing the **Stop Drives** button will force all drives to stop immediately.
- **Safety board reset** shows a password dialog and allows resetting the safety board.

- The **Statistics** panel which is located in the lower part of the dialog box consists of the following sections:

Error messages

Error messages relating to the connections between the Measurement Server and the instruments are displayed in this section. If, for example, an attempt to reestablish a connection fails, a corresponding error message is displayed in the data field.

Network packets

This section provides information on the number of data packets received or sent by the Measurement Server from or to an instrument from the time the connection was established. In addition, the average time between sending a request and receiving an answer is given.

To get this information, highlight the particular instrument in the table using the selection bar. This information will appear in the data fields.

The **Reset counters** button at the bottom of this section is used to reset the values to zero.

Job scheduler status

This section displays information relating to the job scheduler controlled by the Measurement Server. It contains the following fields:

- **Status** indicates whether the scheduler is idle or active, i.e., whether a job is being executed or not.
- **Error message** displays information relating to a scheduler malfunction.
- **Warning messages** are also displayed here (yellow background color), which do not prevent jobs to be started.
- **Warning messages** that prevent starting of jobs have an orange background color in the Status field.

The button **Clear error state** below these fields is used to try to correct a scheduler malfunction. If possible, the scheduler is restarted. If the error reoccurs, the error message will reappear.

If the measurement server detects a severe error which also prevents starting of jobs, the Status field background will switch to red colour. Additionally a message box is displayed on all PCs connected to this measurement server showing the source of the problem.

If the **OK** button is hit, the same functionality as the **Clear error state** button on the measurement server will take place. If the error is still present, the message box will be displayed again.

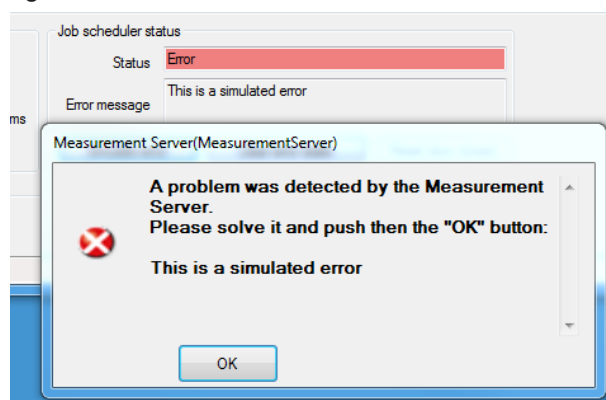


Figure 4.14: Measurement server detected problem

The icon colour of the Measurement Server in the tray will reflect the above state (red, orange, yellow or white).

4.2.4 Other Options of the Start Menu

Except for the options described above, the start menu of the Measurement Server contains the options **Connected Clients** and **About**.

Connected Clients

The option **Connected Clients** opens the dialog box **Connected clients**.

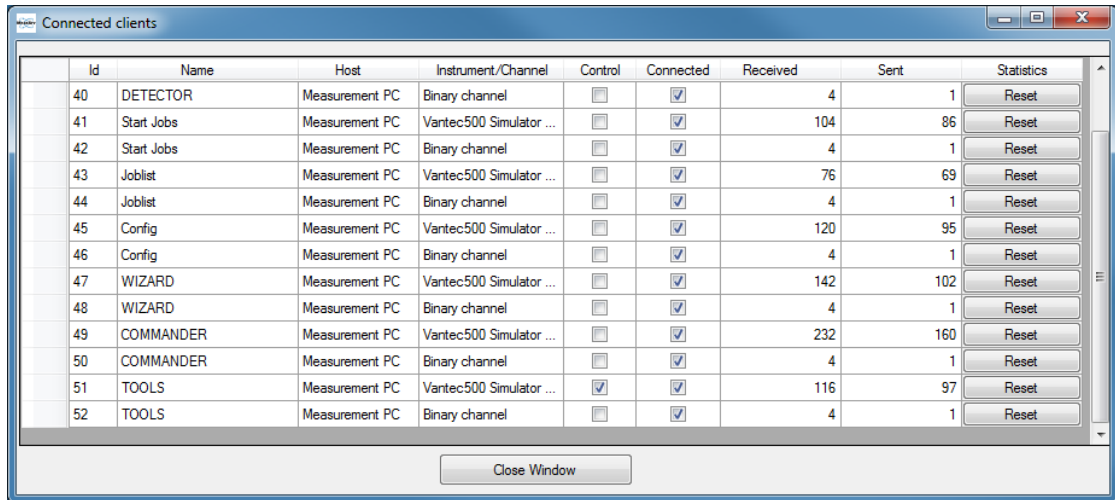


Figure 4.15: Dialog box **Connected clients**

The Measurement Clients in this dialog box are listed in table form. This means that the plug-ins of the Bruker AXS MEASUREMENT CENTER, which are currently connected to a selected instrument are listed. Each plug-in will have two connections to the measurement server.

The columns contain the following information:

Name:	Contains a list of the connected clients.
Host:	Name of computer hosting the client.
Instrument/Channel:	Name of selected instrument or Binary channel for a fast binary connection.
Control:	Indicates which client currently has control of the instrument.
Connected:	Indicates which clients are currently connected to the instrument.
Received and Sent:	Indicates how many data packets have been sent and received by the Measurement Server to and from each client from the time the connection was established.
Reset:	Resets the values shown in the Received and Sent columns to zero.

About

About: The option **About** in the menu opens an information window containing basic Measurement Server data.

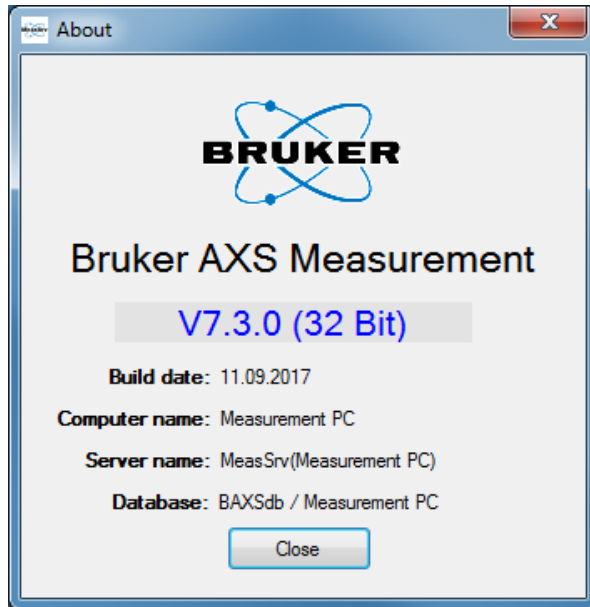


Figure 4.16: **About** window

5 The Measurement Client

5.1 General

The Measurement Client consists of a set of application modules that allows the user to make system settings in the database, configure the components of a Bruker AXS X-ray instrument, perform instrument set-up, create and start jobs, monitor the processing of jobs, view the results of measurements in chart form in real time, diagnose faults and malfunctions and carry out “repairs” on impaired components, and view records of user actions and system events.



The modules which are used depend on the type of Bruker AXS X-ray instrument, its operation and application. Modules for tasks other than those described above may be delivered, as well.

5.2 The Plug-in Concept

The Bruker AXS plug-in technology permits convenient and flexible use of the application modules. These are loaded as plug-ins into a shell, which provides quick and easy access to their user interfaces. The user can switch between the modules freely with a minimum risk of error in the handling of data. The shell facilitates the exchange of data between the modules. Only one connection to the instrument needs to be established. This connection can be shared by other plug-ins.

The shell is extendable and can accommodate any number of plug-ins depending on the user's needs.

5.2.1 Logging In and Out

All users of the Bruker AXS MEASUREMENT CENTER must be entered in the database and assigned to a user group before logging in. These preliminary tasks are performed by the Lab Manager and/or the IT Administrator, who are each given a default password. Passwords can be changed when logging in for the first time.

Once user rights have been assigned, the user can log into the software system by clicking on the **Framework.exe** or a corresponding icon on the desktop. This opens the **Login** window.



Figure 5.1: **Login** window with drop-down list of user groups

1. Click on the button in the **Login Name** data field to open the drop-down list of user groups.
2. Select the **User group** the user belongs to and enter the password that has been assigned by the Lab Manager or the IT Administrator.

5.2.2 Shell Interface

The user interface of the shell is divided into two main parts. On the left side the navigation bar containing icons represents the plug-ins currently loaded in the shell. To the right of the navigation bar there is an area where the interfaces of the loaded plug-ins can be displayed as tab pages. The tabs for the plug-ins are located above this area in a row. To display the interfaces click on these tabs. Alternatively, the interfaces will be displayed by clicking on the plug-in icons in the navigation bar.

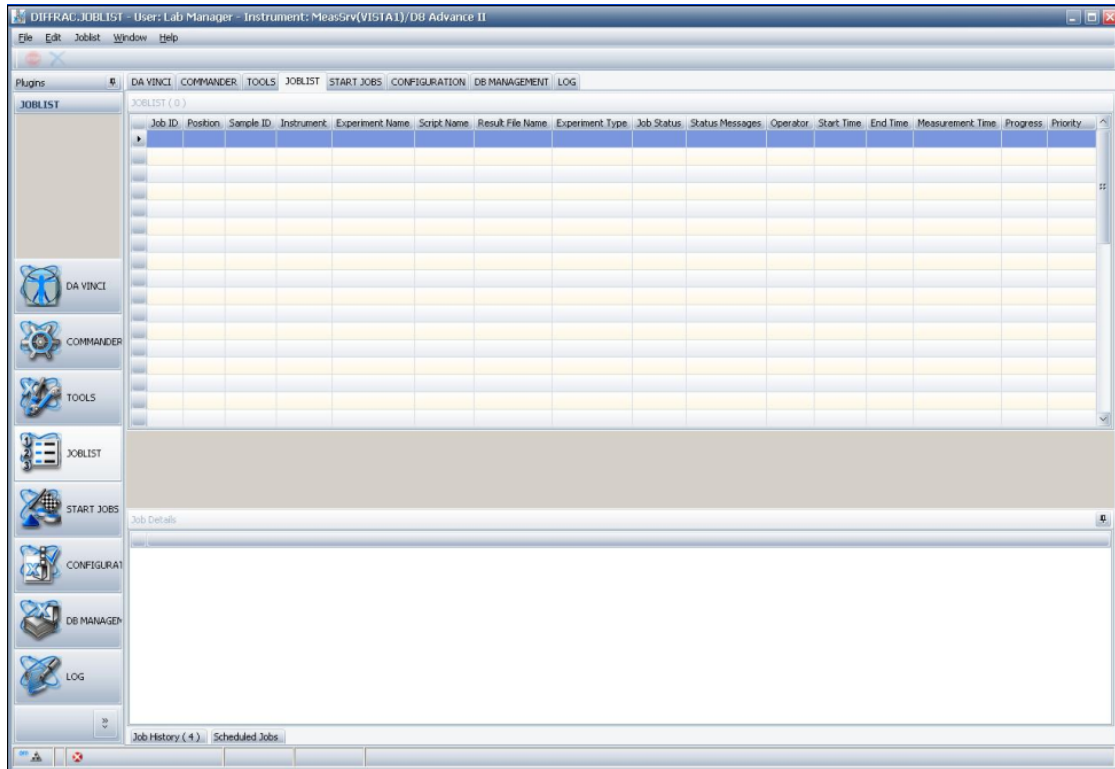


Figure 5.2: User interface of shell

Status Bar

Located at the bottom of the screen a status bar with status information is displayed. This includes, icons indicating the current status of the X-ray tube (**On/Off**) and the tube shutter (**Open/Close**) of the connected instrument at the left end of the status bar. To the right of these icons, system errors and warnings are displayed. Further to the right the current values of the X and Y axes will appear when **COMMANDER** is used (see Chapter [COMMANDER \[▶ 37\]](#)).

5.2.3 Menus of Shell Interface

The menu bar of the shell interface contains a series of menus which varies according to the plug-in currently used. The first four menus **File**, **Edit**, **Help** and **Window** in the menu bar are common to all plug-ins. The other menus are plug-in-specific and appear only when the plug-ins to which they belong are opened.

- The **File** menu can offer, in addition to options available for all plug-ins, additional options for a specific plug-in or plug-ins, depending on the set of modules actually loaded in the shell.
- The **Edit** menu can only be opened from certain plug-ins.

- The **Help** menu provides copyright, license, system and other information relating to the use of Bruker AXS software. The information, with information on the status of the currently connected instrument, can be saved into a file.
- The **Window** menu allows the user to navigate between the plug-ins.

5.2.3.1 The File Menu

The **File** menu is located in the menu bar at the top of the screen and is available for all plug-ins.

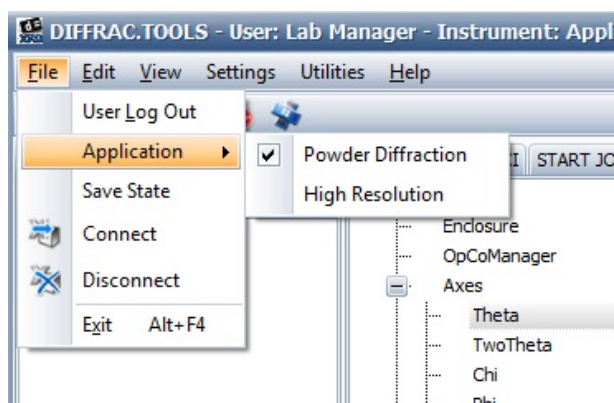


Figure 5.3: **File** menu (without DATABASE MANAGEMENT and COMMANDER-specific items)

The **File** menu contains the following options:

User Log Out	allows the user to transfer the plug-in to another user without having to close down the shell. Choosing this item opens a log-in window. The new user is required to enter his log-in data in this window as usual.
Application	identifies the results of a measurement as belonging to a certain type of measurement when they are saved to a results file. This is taken into account by the evaluation software. In addition, the selection of an application determines the names of drives listed in the Drive Control area of COMMANDER and the component tree of TOOLS since the names of certain drives are application-specific.
Save State	saves the instrument status in addition to general information into a Zip file (see section The Help Menu [▶ 33] for details).
Connect and Disconnect	are used to connect with and disconnect from an instrument (see section Getting a Connection to an Instrument with the Measurement Client [▶ 34]).
General Settings	opens a dialog to configure the system (see section General Settings [▶ 32]). This menu entry is only available when the currently logged in user has the necessary permissions.
Exit	is used to exit the shell.

The **File** menu can be extended to include functions for a specific plug-in or plug-ins.

5.2.3.1.1 General Settings

If the user has the necessary permissions, he can use the **General Settings** dialog to change the configuration of the system.

The **General Settings** dialog shows a list of settings, grouped by the different modules of the measurement software. The user can modify these values, either by selecting possible values from a dropdown box or by typing in a new value. If the user types in an invalid value, e. g. a character for a field where only numbers are allowed, the value turns red and the save button gets disabled until the user has corrected the input.

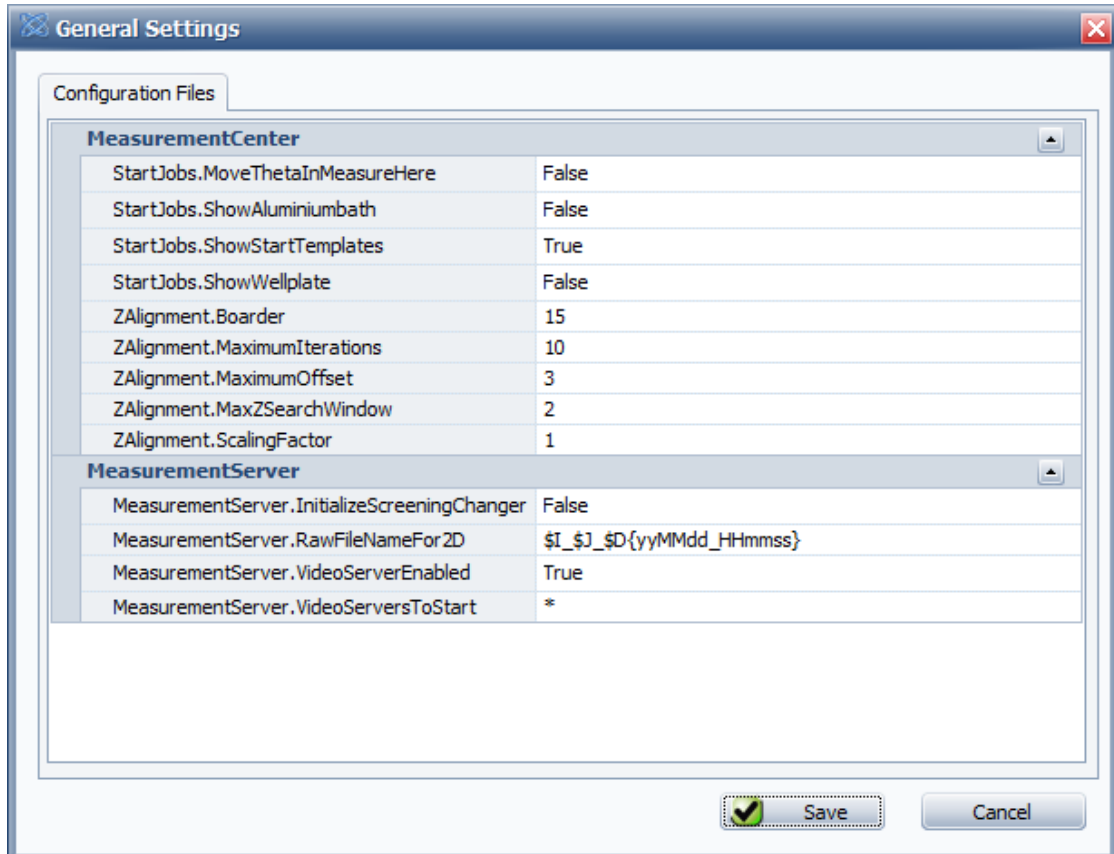


Figure 5.4: Dialog **General Settings**

The user can get additional information or help about the allowed values for a setting if he holds the mouse over the name of the configuration variable.

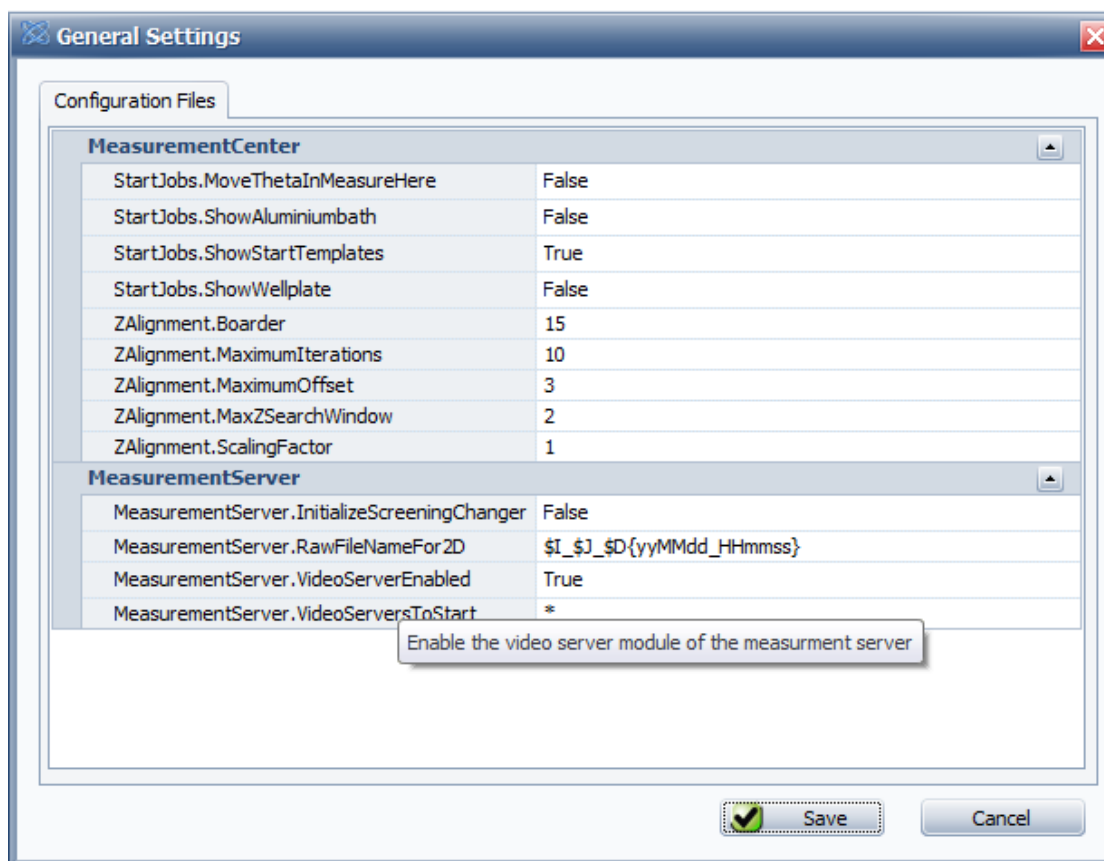


Figure 5.5: Dialog *General Settings* with mouseover on *MeasurementServer.VideoServerEnabled*

5.2.3.2 The Help Menu

The **Help** menu provides copyright, license, system and other information relating to the use of Bruker AXS software. It also allows the user to save this information with details of the status of the currently connected instrument to a **Zip** file. which can be sent to Bruker Service for analysis in the event of a malfunction or the file can be opened later for analytical purposes.

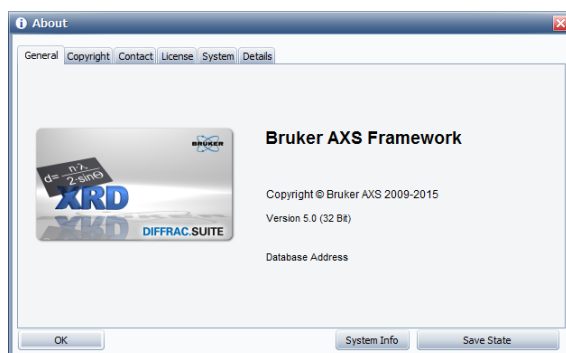


Figure 5.6: Dialog *About*

System Info	This button opens the system information dialog box. The system information can be saved into a NFO file using the Save option of the File menu within this box.
Save	This button saves information relating to the use of Bruker software, as well as an overview of the status of the currently connected instrument. This information can be saved in a Zip file. The overview of the instrument status can be displayed in some plug-ins.

5.3 Getting a Connection to an Instrument with the Measurement Client

Before working with one of the plug-ins of the Measurement Client a connection to the instrument with which the user wants to work must be established if this connection does not already exist. A direct connection with **CONFIG** or **TOOLS** may be preferred, when establishing a direct connection to an instrument.

Getting an Indirect Connection to an Instrument by Browsing the Database

When the shell is opened, the system automatically attempts to establish a connection using the Measurement Server to/with the instrument which was used in the last session. If this attempt fails, or if the user prefers to change the instrument with which he is working, or if he prefers a connection to/with an instrument for the first time, select **File | Connect** to open the dialog box **Connection**.

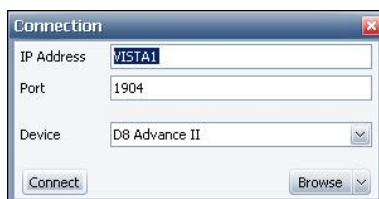


Figure 5.7: Dialog box **Connection**

In this dialog box the IP address and port of a Measurement Server are displayed in the extendable **Device** field, the names of the instrument(s) that has/have been assigned to it are also displayed.

If the instrument to be used is assigned to this Measurement Server,

1. select its name in the **Device** field and
2. click on the **Connect** button to establish a connection.
3. If the instrument to be selected has been assigned to another instance of the Measurement Server, double-click on the **Browse** button in the bottom right corner of the dialog box to browse the database. (Alternatively, click on the **Down** button to the right of the **Browse** button and select **Database** in the resulting drop-down menu.)
 - This opens a pop-up window containing a list of all the Measurement Servers entered in the database.

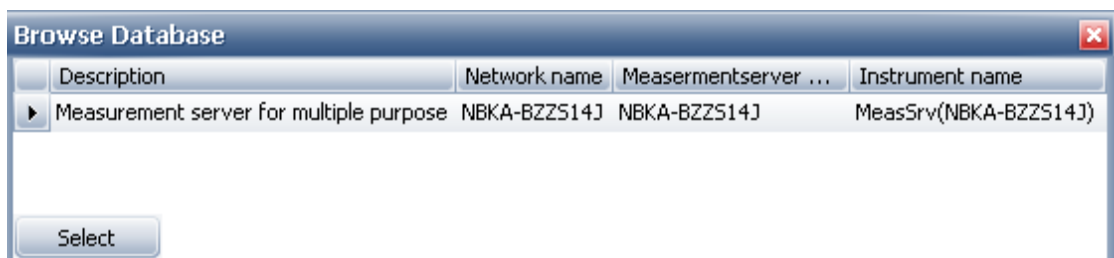


Figure 5.8: Pop-up window **Browse database**

1. Here the Measurement Server can be selected to which the instrument to be used has been assigned (see Section [Selecting the Instruments \[▶ 17\]](#)).
2. Mark the Measurement Server name with a mouse click.
3. Then click on the **Select** button.
 - The pop-up window will disappear and the dialog box **Connection** will reappear.

- In the extendable **Device** field of the dialog box the name(s) of the instrument(s) assigned to the selected instance of the Measurement Server will now be displayed. In the IP address and port fields the address data of the newly selected Measurement Server instance will be displayed, as well.
- 4. Finally, select the instrument to be used from the **Device** field and
- 5. click on the **Connect** button in the dialog box to establish a connection with the selected instrument.

Getting a Direct or Indirect Connection to an Instrument by Browsing the Network

Getting a direct connection to an instrument requires special user rights. If the user does not have these rights, the system will display an error message when the user tries to establish a connection.

To establish a direct connection,

1. select **Network** in the drop-down menu of the dialog box **Connection** as described above.

⇒ Selecting **Network** opens the dialog box **Browse network**.

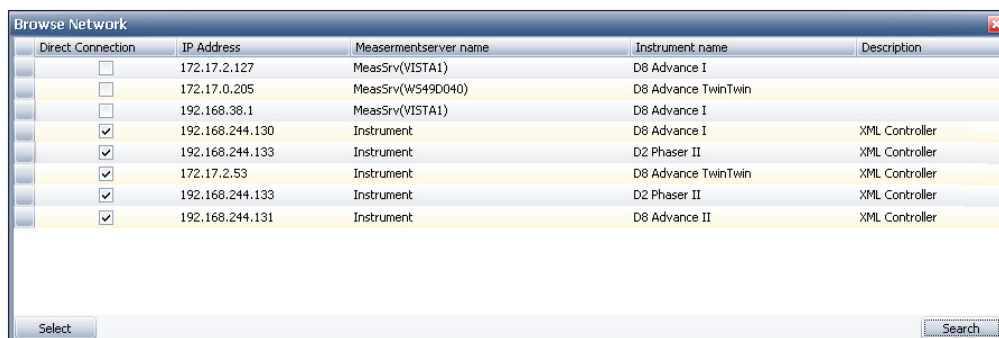


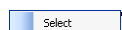
Figure 5.9: Dialog box **Browse network**

All of the instruments which have been contacted directly using the network are listed in the dialog box in table form. The instruments contacted via a Measurement Server are listed. The dialog box contains the following columns:

Direct Connect	Indicates which instruments have been contacted directly over the network. Those contacted directly are marked with a check mark.
IP address	Contains the IP addresses of instruments that have been contacted directly and IP addresses of Measurement Server instances through which instruments have been contacted indirectly.
Measurement Server name	Contains the names of the Measurement Server instances, through which instruments specified in the Instrument name column have been contacted. Instruments, which have been contacted directly, are marked "instrument".
Instrument name	Contains a list of all instruments that have been contacted directly and indirectly over the network.
Description	Contains a description of the instrument or the Measurement Server through which the instrument has been contacted.

To establish a direct connection to one of the instruments which has been contacted directly,

1. mark the specific instrument, using the left mouse button and then
2. press the right mouse button.



- The single-item menu **Select** will appear.

3. Click on this menu to select the instrument.

- The dialog box **Connection** reappears with the name of the instrument in the **Device** field and the IP address and port of the instrument in the upper fields. Click on the connect button to establish a direct connection with the instrument.

Alternatively, the user can select an instrument by marking it and clicking on the **Select** button in the bottom left corner of the dialog box.

To get an indirect connection to an instrument by browsing the network, proceed in the same way as in a direct connection. However, select an instrument with which contact has been made through a Measurement Server instance. This instrument will not be identified by a check mark in the rightmost column.

In this case, the instrument name appears in the dialog box **Connection** with the address data of the related Measurement Server.

1. Click on the **Connect** button to establish the connection with the instrument.

- During the connection to the Measurement Server that controls the selected instrument, the Measurement Client will check if the Measurement Server is running with the same database as the Measurement Client. If the Measurement Server is running on a different database, the Measurement Center will change its configuration to the same database server as the Measurement Server. In such a case, the Measurement Client will have to restart so that the change of the database configuration can get applied. A message box will show up inform you about this.

2. Use the **Search** button in the bottom right-hand corner of the dialog box **Browse network** to initiate new searches via the network for the instruments.

Breaking a Connection with an Instrument

To break an existing connection with an instrument, select **File | Disconnect**.

6 COMMANDER

6.1 General

COMMANDER plug-in is used to create simple measurements and to perform basic operations on the instrument. COMMANDER plug-in has three main functions. First is to display instrument state including current hardware settings, running measurement progress and measurement results. Second task is to perform basic instrument operations like moving instrument components or setting generator power. And the last one is to create and perform simple measurements.

Measurements can be started from COMMANDER plug-in directly. Furthermore, drive settings and measurement conditions defined in COMMANDER can be saved to an experiment file and used to create and execute jobs in START JOBS.

To perform any action on the instrument and to start a measurement COMMANDER plug-in creates and initiates a job corresponding to the action requested. Jobs can be created and started only when COMMANDER plug-in is able to obtain control of the instrument and no other jobs are running. Jobs started successfully will appear in the job list table in JOBLIST plug-in with a running status. If the job could not get started, it will appear with a scheduled status. Jobs started from COMMANDER plug-in have standard priority, meaning that a high priority job can start and interrupt execution of a COMMANDER defined job.

Getting Control of the Instrument

COMMANDER plug-in requires control of the instrument for sending information to the instrument. If the instrument is controlled by another plug-in instance, editable data fields for the instrument settings area and for the scan definition area will be deactivated.

Obtaining control of a connected instrument in COMMANDER plug-in requires Measurement Server to already have control of the instrument. To obtain control in the Measurement Server can be done in the Measurement Server Status Window. For more information please refer to the chapter [Getting and Releasing Control of and Reconnecting to Instruments \[22\]](#).

6.2 COMMANDER Page

The COMMANDER has separate panels for different type of information displayed and different type of tasks to be performed. In total there are four types of panels: **Instrument Components** panel, **Scan Setup** panel, **Info** panel and **Measurement Display** panel. For instrument setups with a camera installed there is an additional panel type - **Video** panel.

- **Instrument Components** panel displays active hardware components and allows to apply changes to component settings.
- **Info** panel displays status messages received from a running job or from an executed action.
- **Scan Setup** panel displays measurement conditions and allows to define and run custom measurement methods.
- **Measurement Display** panel shows live measurement data and allows customizing data presentation.

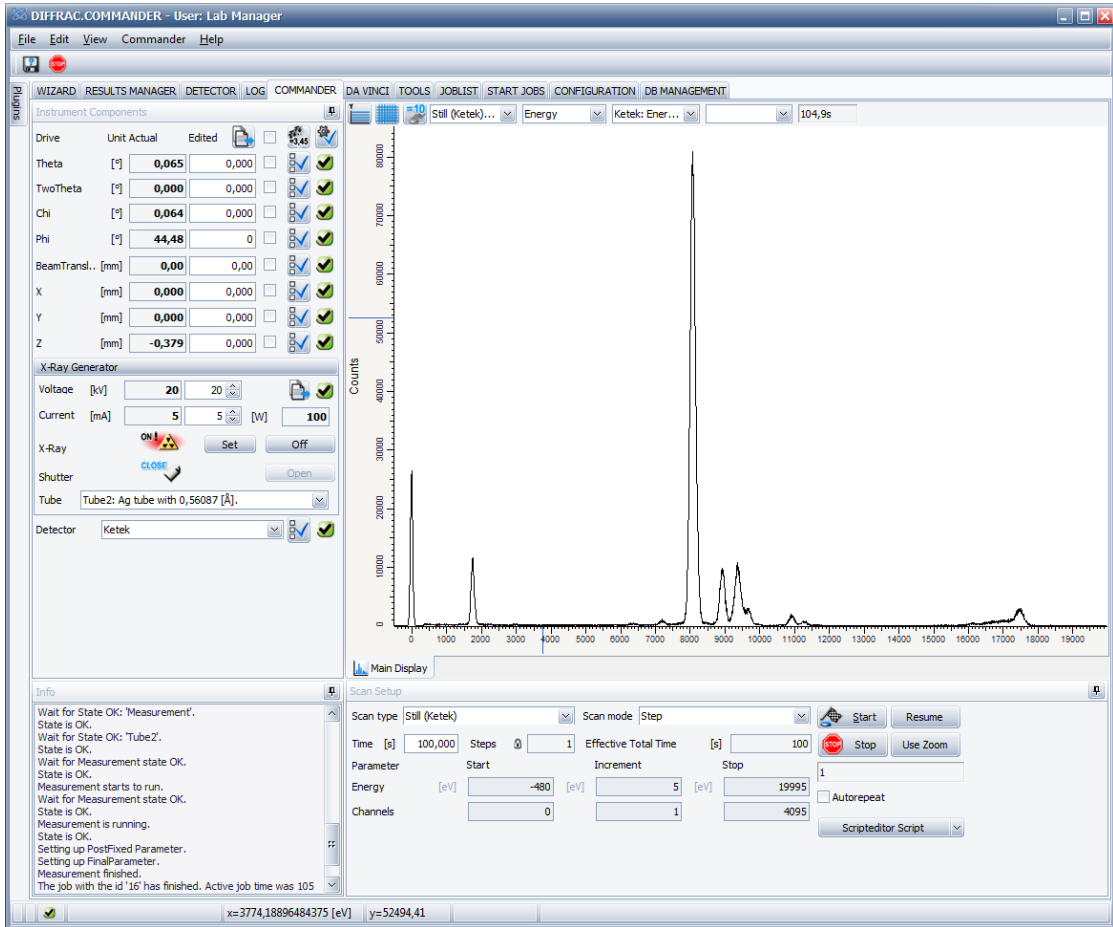


Figure 6.1: **COMMANDER** page

Arrangement of **COMMANDER** panels is flexible, allowing creation of a layout that is optimal for the target system, application type and user preferences.

6.2.1 Screen Layout and Operation

In order to change position of a panel,

1. Place the mouse cursor over the panel title bar or the tab bar.
2. Hold down left mouse button and start dragging the panel.
 - Now the panel will appear in a separate window; additionally a docking guide diamond will appear on top of the application window.

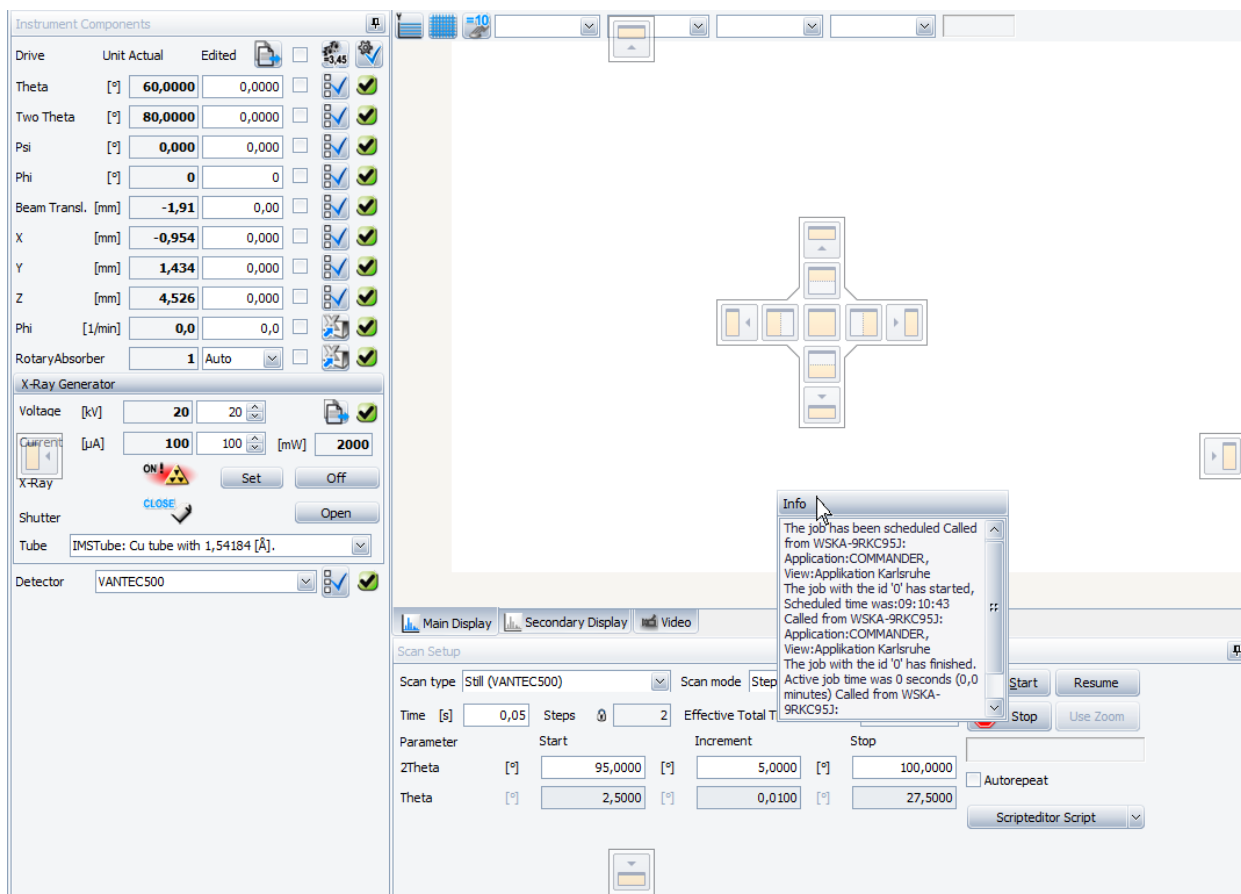


Figure 6.2: **Editing** panel layout – moving Info panel to a new placement inside the application window

3. Without letting go of left mouse button, drag the cursor to one of the **Guide Diamond** buttons.
 - When the cursor is placed over the **Guide Diamond** button, a blue overlay will appear indicating the new placement of the panel.
4. Release left mouse button to place the panel in place of the blue overlay.
5. To keep panel floating in a separate window let go of left mouse button without dragging the cursor to any of the **Guide Diamond** buttons.

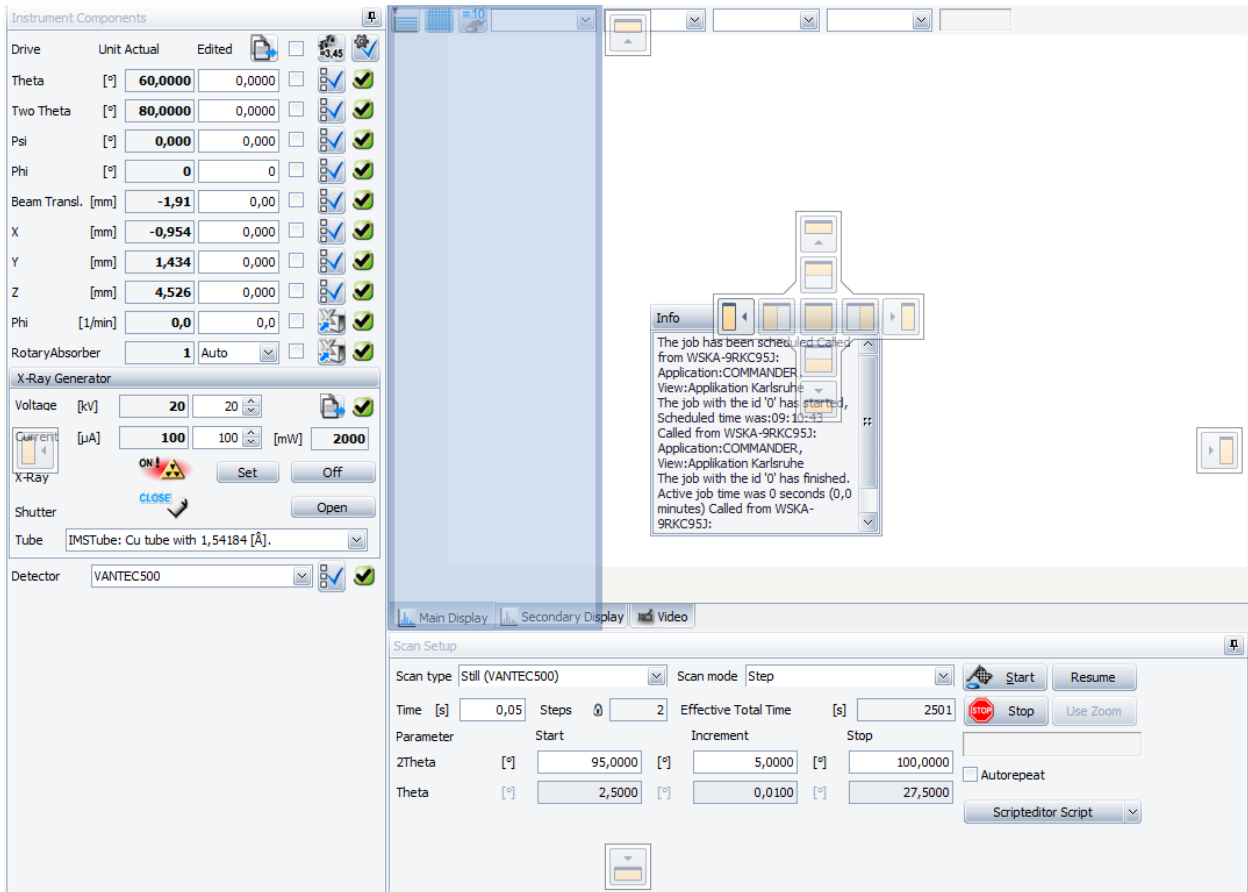


Figure 6.3: Docking option – blue overlay corresponding to the left button of diamond guide cross

Table 6.1: Docking guide diamond

		Outermost docking guide buttons. Panel will be placed as a new outermost window inside the application form
		Outer docking diamond guide buttons. Panel will be placed as a new outer window next to the panel located underneath the guide cross
		Inner docking diamond guide button. Panel will be placed as a new tab on top of the panel located underneath the guide cross

Panel size can be changed by dragging the splitter on the panel border.

1. Hover with the **mouse cursor** over the panel edge and the cursor will change shape.
2. Press **left mouse** button and drag the edge(s) of the panel in a desired direction.

It is possible to set the layout back to default or lock panel arrangement in the **View menu**.

6.2.2 Instrument Components Panel

Instrument Components panel is used to view instrument state and to change hardware settings. Each control area (later referred as component control) inside **Instrument Components** Panel corresponds to a specific part of the instrument hardware.



Controls displayed in the Instrument Components Panel depend on the instrument type and configuration. Some controls described below might not be present in your system.

Data entry field

Component controls can contain two types of data entry fields: actual and edited. Actual data fields show current hardware settings. This type of data field is read-only and has shaded gray background. Edited data fields are used to define new hardware settings. This type of data field has white background and the displayed value can be different from the actual hardware setting. Each control has a special set button to apply new hardware settings entered in the edited data entry field. Placing checkmark to the right of the edited data entry field selects the entered value to be used during measurement operation.

When mouse pointer is placed on a read-only data field, a hint window will appear. This window contains detailed settings information, including data restrictions - allowed and default values. Status icon indicates whether current value falls within the limits of the component restriction.

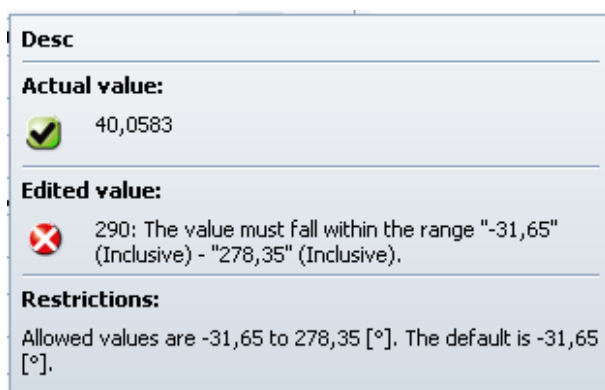



Figure 6.4: **Information** window for read-only data field






Placing the mouse pointer on an editable data field causes a hint with similar information to appear.

For both types of data fields, values that lie outside the limits are displayed in red. In the case of the editable data field, a red symbol  to the left of the data field indicates that the entered value is incorrect.

Component Status

All component controls contain a state image to display current state of the corresponding hardware.

Table 6.2: Possible states of an instrument component

Icon	Meaning	Description
	OK	The component has been initialized.
	Busy	The component is currently in operation.
	Not Initialized	The component has not been initialized.
	Error	The component is faulty and cannot be used in measurements. Hardware dependent on this component cannot be used.
	Unknown	The status has not been received from the firmware.






















Drive	Unit	Actual	Edited		<input type="checkbox"/>		
Theta	[°]	<input type="text" value="18,3241"/>	<input type="text" value="0,0000"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Two Theta	[°]	<input type="text" value="36,6481"/>	<input type="text" value="0,0001"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Detector	[°]	<input type="text" value="18,3240"/>	<input type="text" value="0,0000"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Beam Transl.	[mm]	<input type="text" value="0,00"/>	<input type="text" value="0,00"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Psi	[mm]	<input type="text" value="0,00"/>	<input type="text" value="0,00"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Phi	[mm]	<input type="text" value="0,00"/>	<input type="text" value="0,00"/>	<input type="checkbox"/>	<input type="checkbox"/>		
X	[mm]	<input type="text" value="0,000"/>	<input type="text" value="0,000"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Y	[mm]	<input type="text" value="0,000"/>	<input type="text" value="0,000"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Z	[mm]	<input type="text" value="0,000"/>	<input type="text" value="0,000"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Figure 6.6: Drive control

Each line (excluding header line) in the **Drive Control** corresponds to a specific drive. The information provided for each drive is the name, current position and unit in which placement of the drive is measured.



Only the drives on a connected instrument are listed in the Drive Control area.



Actual values can be copied to the fields for target values by clicking on the **Copy** button at the top of the list of drives.



The **Properties** button opens the dialog box where drive oscillation and offset can be set.

Initializing and Moving Drives



Drives are initialized and moved using the **Initialize** and **Go** buttons located at the top of the **Drive Control** area. The drives must be selected before initializing and moving the drives. Otherwise the commands will have no effect.



The drives can be selected or deselected individually by clicking on the check box provided. To select or deselect all drives

1. Click on the checkbox in the header line on top.

Drives must be initialized before they can be moved or before their properties can be set.

To move a drive to a desired position

1. Enter a value for the target position
2. Check the corresponding check box
3. Click on the **Go** button.



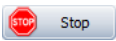
⇒ The drive will move to the target position. Several drives can be moved simultaneously.

Before scans are initiated, their drives can be moved automatically to target positions. After entering the values for the target positions, check the corresponding check boxes. The drives will be moved to these positions when the scan is started.



On start of measurement values entered in the edited data entry fields are used for the selected drives. If a selected drive is used in the scan, in other words appears as a scan axis, then the value in the edited field will be ignored. For the Theta, Two Theta and Rocking scans when any of the goniometer drives are selected, the measurement will run as if the **Go** button was pressed before measurement start.

To stop all moving drives



1. Click on the **Stop** button in the **Scan Setup Panel** area (see below).

NOTICE

Damage to the instrument

Moving drives can result in damage to the instrument. When performing such operations, keep the drive(s) and the instrument under close observation.

When stopping a drive, be aware of the time lag between clicking the **Stop** button and the actual stopping of the drive. This time lag is due to a communication delay.

Changing Drive Properties

To change the values of important drive properties,



1. Click on the **Properties** button provided for the drive.
- ⇒ New **Settings** dialog box will appear for editing property values.

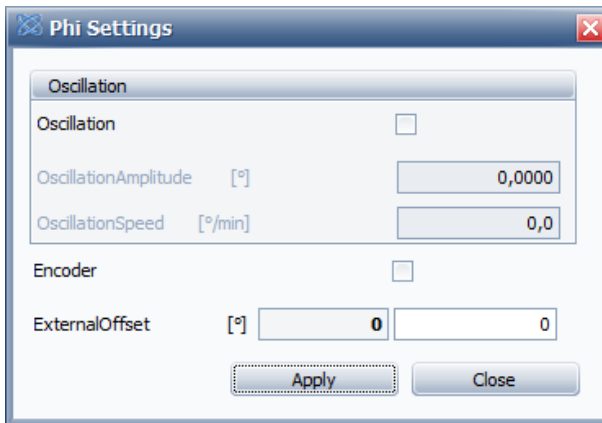


Figure 6.7: Dialog box: **Phi Settings**

Oscillation	Drive oscillation is enabled only when oscillation is activated in the Settings window and the respective drive is selected (check-marked). To activate or deactivate oscillation, toggle the oscillation check box.
Oscillation Amplitude and Speed	To enter new values for speed and amplitude, oscillation needs to be activated. New values can be entered in the data entry fields on the right.
Encoder	When this check box is checked, the positions of the drive will be recorded at each measurement step while the measuring operation is being carried out. These values can be saved with the measurement data in a file using the Save Result command.
Offset	The distance (in degrees or millimeters), in which the drive is to be shifted in order to obtain a theoretical measured value at the point where it is expected.



To save changes press **Apply** button. New values will be applied to the instrument and used in the next measurement operation. Closing the settings dialog box without pressing **Apply** button will lose all values in the editable fields.

Position Control

Position Control is used to save drive positions displayed in the **Drive Control**. It can be activated by selecting **Position Control** in the **View Menu**.

To save or load target positions in edited data entry fields first select the position in the drop down menu and then press corresponding button. Positions in the drop down menu can be renamed.



Figure 6.8: Position control

Position Control only saves and loads values entered in the edited data entry fields, it will not move the drives.

6.2.2.3 Rotary Absorber Control

Rotary Absorber Control is used for setting the absorption factor.

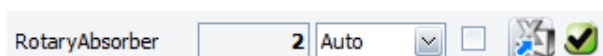


Figure 6.9: Rotary absorber control - setting absorption factor

The read-only field shows the current absorption factor which is applied during the scan or during rate measurement in the **Ratemeter** window.

Auto option will select absorption factor automatically during the measurement depending on the measured intensity.

To keep constant absorption factor during the measurement

1. Select one of the factors in the edit drop down list.
2. Press **Send Changes** button or check the **Use for Measurement** box.



6.2.2.4 Motorized Slit Controls

Depending on the slit installed in the instrument, there are two different types of slit controls – detector slit control and variable slit control.


Detector Slit Control

This control is used to set opening size of the slit.



Figure 6.10: Detector slit control – setting the opening

In the read-only field current opening size is displayed. To change the opening size,

1. Enter the target opening value in the edited data entry field and
2. Press **Send Changes**  button.

Another way to set the slit opening for the measurement is to enter new value and select the control by clicking on the **Use for Measurement** check box. New value will be set on measurement start.

Variable Slit Control

This control allows setting slit mode and slit opening size.

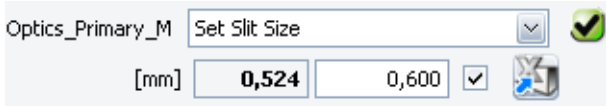


Figure 6.11: Variable slit control - setting opening in millimeters

Drop down box displays current selected mode. Read-only field shows current slit opening.

To change slit mode

1. Select new option from the drop down menu.

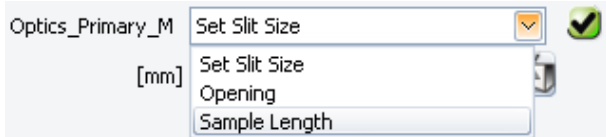


Figure 6.12: Variable slit control - selecting mode

Variable slit provides three operational modes:

Set Slit Size	Slit opening is set in millimeters. Slit opening stays constant during the measurement.
Opening	Slit opening is specified in degrees. Slit opening stays constant during the measurement.
Sample Length	Sample illumination length is set. Slit opening changes during the measurement to keep the length of the illuminated sample area constant.

To change the opening or sample illumination length:

1. First enter the target value in the edited data entry field.
2. Then press **Send Changes** button.



6.2.2.5 Special Optic Controls

Some optics, like pathfinder and twin optic components, includes several optic subcomponents. Included set of optics is some combination of motorized slit, Goebel mirror, sollar, crystal and channel cut.

Pathfinder Control

Pathfinder control is used to select optic to measure with.

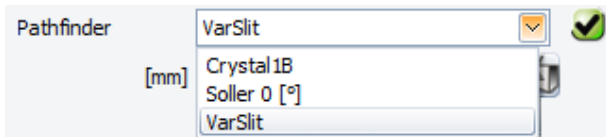


Figure 6.13: Pathfinder control - selecting active optic

Selecting one of the options in the drop-down menu will automatically send a command to the instrument to activate corresponding optic in the pathfinder component.

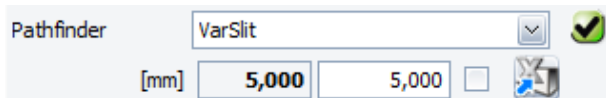


Figure 6.14: **Pathfinder control** - setting slit opening

If motorized slit is selected, extra data entry fields will appear where the size of the slit opening can be set.

To change the slit opening size



1. Enter new value in the edited data entry field and press **Send Changes** button.

Twin Optic Control

Twin- or Combi- optic control displays and allows to change the selected subcomponent and active mode.

Although control appearance differs slightly for primary and secondary twin optics, the operation process is exactly the same.

To activate a subcomponent

1. Select the corresponding option in the drop-down list.

For example, to activate the Goebel mirror, select it in the drop-down menu.

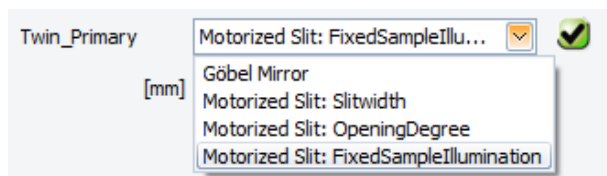


Figure 6.15: Twin-Optic control - selecting active optic on the primary side

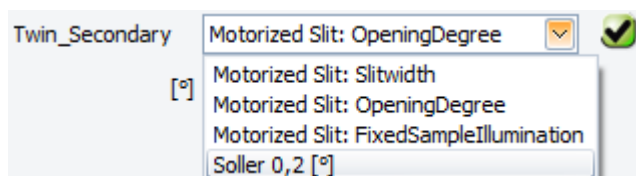


Figure 6.16: Twin-Optic control - selecting active optic on the secondary side

Motorized slit in the twin-optic provides three operational modes:

Slitwidth	Slit opening is specified in millimeters. Slit opening stays constant during measurement.
OpeningDegree	Slit opening is set in degrees. Slit opening stays constant during measurement.
FixedSampleIllumination	Sample illumination length is set. Slit opening changes during the measurement to keep the length of the illuminated sample area constant

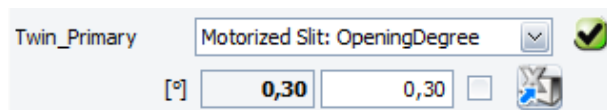


Figure 6.17: Twin optic control - setting slit opening

To change the slit opening size



1. Enter the target value in the edited data field and press **Send Changes** button.

Motorized Air Scatter Screen Control

This control allows to specify the movement mode and the position of the air scatter screen during the measurement.

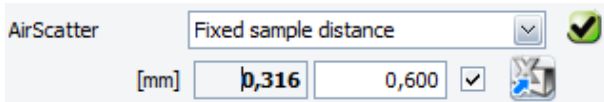


Figure 6.18: Air scatter screen control - setting distance to the sample

Fixed sample distance is the default mode. In this mode the distance between the air scatter screen and the sample can be set.

To set the position

1. Specify the target distance in the edited data field
2. Press **Send Changes** button.

Please note, in the fixed sample distance mode the distance between sample and the screen stays constant during the measurement.

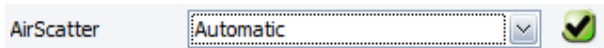


Figure 6.19: Air scatter screen control: automatic mode

Automatic mode synchronizes air scatter screen position with the beam incidence angle and the primary slit opening. This mode is available only if there is a slit present on the primary side. The movement of the air scatter screen is performed automatically and cannot be manually adjusted.

6.2.2.6 Non-ambient Chamber Control

Depending on the instrument configuration **Non-ambient chamber control** is used for setting temperature, humidity or atmosphere in the sample chamber.

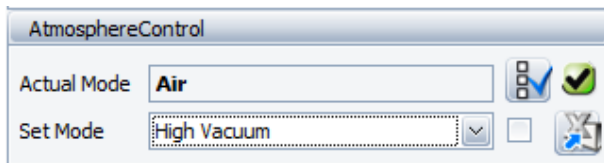


Figure 6.20: Non-ambient chamber control - setting atmosphere

The read-only field on top displays current chamber mode.

To change the mode,

1. Select the target value from the edit field drop-down.
2. Enter appropriate settings in the edited data fields (temperature, heating rate, humidity level, etc.).
3. Press **Send Changes** button.

If the **Use for Measurement** box is checked, then the measurement will not start until the target settings (temperature, humidity) are reached. On the other hand, if the box is not checked, then the measurement will run even if the chamber is in a busy state.

Please note that only properties relevant for the selected mode are displayed.

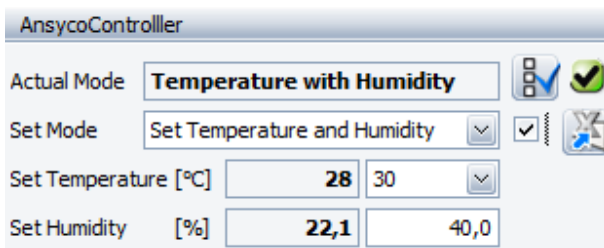


Figure 6.21: Non-ambient chamber -: setting temperature and humidity

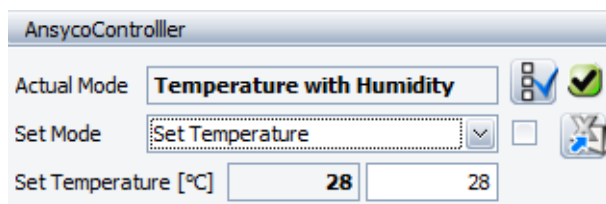


Figure 6.22: Non-ambient chamber - setting temperature

To view current state for all properties:



1. Press **Properties** button
⇒ New dialog will appear with the full set of properties.

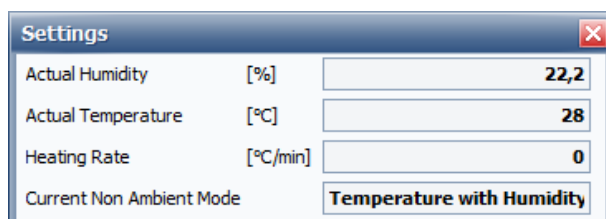


Figure 6.23: Non-ambient chamber - actual values



Experiments saved from COMMANDER plug-in will contain different settings depending on whether the **Use for Measurement** box is checked. If the box is checked, selected set mode and values in the edited data fields will be saved. When the box is not checked, actual mode and actual settings will be saved. In both cases when the saved experiment is executed, settings saved in the experiment will be applied to the non-ambient chamber.

To exclude chamber settings from the experiment follow these steps:

1. Load saved experiment in the WIZARD plug-in
2. Go to the Method DAVINCI.
3. Select **Sample Stage** and remove check from the **Use chamber** box
4. Save experiment.

6.2.2.7 X-Ray Generator Control

The **X-Ray Generator Control** area is used for specifying **generator settings**. For systems with multiple tracks it is also used for selecting active tube.

As in the other control areas of COMMANDER, the read-only data fields of the **X-Ray Generator Control** area contain actual values.

To change generator power:

1. Enter target values for voltage and current in the edible data fields.
 2. Click on the **Set** button to send them to the generator.
- ⇒ A new value for power, (in watts), will be displayed in the data field above the **Set** button. This value is computed automatically from the voltage and current values which were entered. The transfer of the new values for voltage and current requires a few seconds delay.



If a scan is started before having clicked on **Set**, the voltage and current values entered in the **edited data fields** will be used for the measurement.

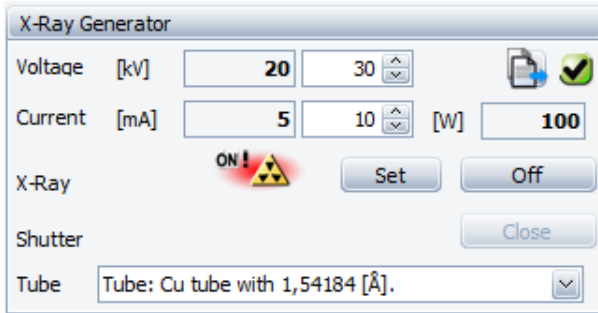


Figure 6.24: X-Ray Generator Control area

To open or close the shutter of the X-ray tube

1. Press **Open/Close** button.
 - ▶ When the shutter is closed, this button is labeled **Open** and vice versa.



If the shutter is closed when a scan starts, the shutter will open automatically.

To turn the X-ray generator on and off

1. Press the **On/Off** button.
 - ▶ When the generator is off, this button is labeled **On** and vice versa.
- ⇒ When the **Open/Close** and **On/Off** buttons are used, the symbols to their left change accordingly.

For the instrument with multiple X-ray tubes, the **Tube** combo-box displays active tube.

To change active tube

1. Select the tube in the tube combo box.
 - ⇒ This automatically activates the track with this tube and the new axis offsets are calculated automatically by the instrument.

6.2.2.8 Detector Control

The **Detector Control** area allows the user to select the type of detector to be used during measurements, as well as to select detector scan mode and to edit properties relevant for the selected detector and detector mode. Available detectors depend on the system configuration and available modes depend on the detector itself.

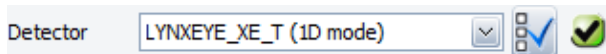


Figure 6.25: Detector control

To change active detector or detector mode

1. Select the new value from the drop-down list in the data entry field.
 - ⇒ List of available scan types and scan modes in the **Scan Setup Panel** will adjust automatically according to the selected detector mode. For the systems with multiple secondary tracks switching active detector may result in change of the displayed optics in the **Instrument Components Panel**.

To edit detector settings



1. Press the **Properties** button
 - ▶ Detector settings dialog box will appear

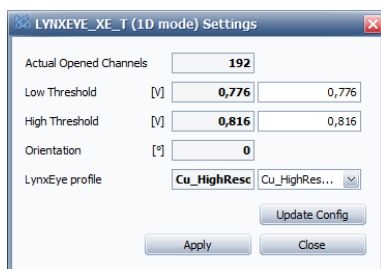


Figure 6.26: **Detector settings** window - properties for Lynxeye 3

2. Enter new values in the edit fields
 3. Press the **Apply** button
- ⇒ New settings will be sent to the instrument and applied to the detector.

Apply	sends the new values to the detector. They will be displayed as current values in the read-only data fields.
Update Config	updates the configuration file with the new settings. These values will be used as default next time the instrument is powered on or restarted.
Close	closes the dialog box. Only applied data will be saved, all other entered data will be lost.

6.2.3 Scan Setup Panel

Scan Setup Panel is used to create and start jobs that are not executed according to a pre-defined measurement method (also called “experiment” in the software), but according to parameters set on individual basis for each job.

One can start a new scan by pressing **Start** button or stop a running scan by pressing **Stop** button. A stopped scan can be continued by clicking the **Resume** button. The scan will be continued from the point where it was interrupted.

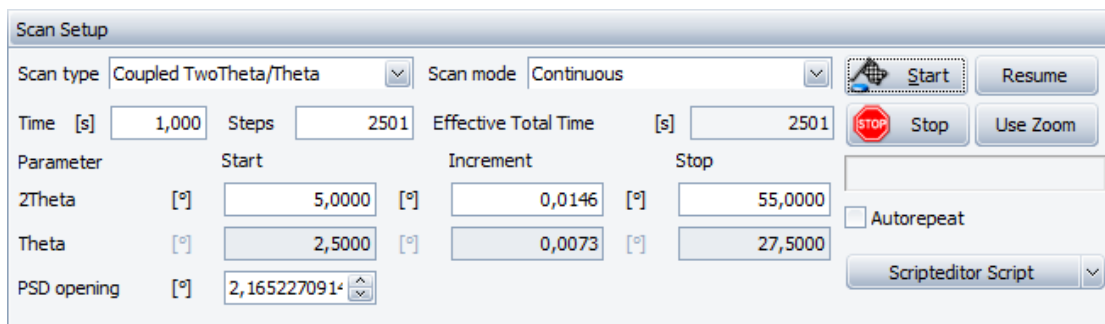


Figure 6.27: **Scan Setup Panel**



Available scan types scan modes and parameter fields are dependent on the instrument configuration and selected detector type. Likewise, they are also dependent on the application type, which can be selected in the **File** menu.

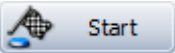
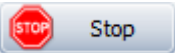
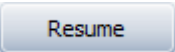
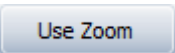
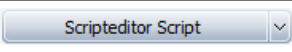
Scan type and Scan mode	Scan type and scan mode from the drop-down list can be chosen individually. Each scan type determines which drives will be used.
Time	Measurement time for a single step.
Steps	Number of steps to be executed in the measurement. This value determines number of measurement points.

Start:	Drive position at the beginning of a scan
Increment	Increment between steps. Increment and time per step together determine drive movement speed.
Stop:	Drive position at the end of a scan.

When the mouse pointer hovers over any of the fields, a tooltip window will appear describing the restrictions applied on the data field.

Some of the data fields are interdependent. Editing a value in one field will adjust values in other fields accordingly. For example, if the number of steps is changed, stop position value will be adjusted automatically.

Table 6.3: Scan Setup Panel - action buttons

Button	Description
 Start	Start the scan. If the scan has been stopped, new scan will be executed beginning at start position.
 Stop	Stop the scan. Only scans started from COMMANDER page can be stopped using this button.
 Resume	Continue the scan from the point at which it was stopped. If resume is not possible, new scan will be started beginning at the start position.
 Use Zoom	Copy current axis bounds displayed on Main Display Panel to the Scan Definition area.
<input type="checkbox"/> Autorepeat	Keep repeating the scan. At the end of the scan range, the scan starts from the beginning again and the counts are increased. Measurement completes once the check is removed from the box and the scan reaches the stop position. Measurement can be interrupted by pressing the Stop button.
 Scripteditor Script	Execute selected script. In the picture the script displayed in the Script Editor is active. Pressing the button would result in the same behavior as pressing Run button in the Script Editor .

Working with scripts

The **Script** button is used to execute active script and to maintain a list of user defined scripts.

To add a new script



1. Press the down arrow on the button
 - ▀ A drop-down list of scripts will be shown

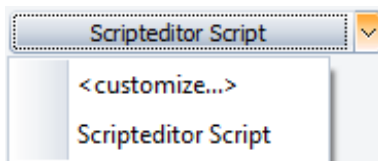


Figure 6.28: Default drop-down options

2. Select the **<customize...>** option

► New dialog box will open

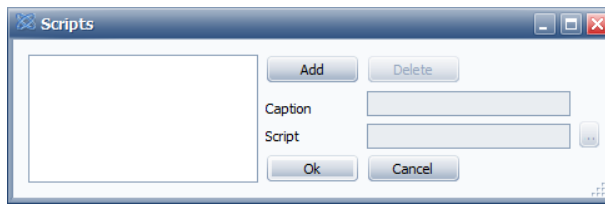


Figure 6.29: Scripts dialog box

3. Press **Add** button
 4. Enter display name for the script in the **Caption** field.
 5. Enter file path or locate the script in the file system by pressing **Browse** button
 6. Press **Ok** button
- ⇒ Added script will be added to the selection list and set as the active script.

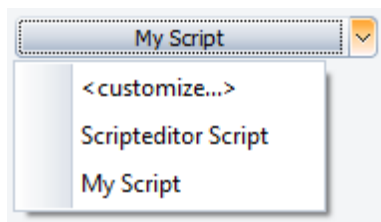


Figure 6.30: Custom script in the drop-down

To change the active script



1. Press the down arrow on the button
 2. Select the script from the drop-down list
- ⇒ Button text will change to the selected script name.

To execute active script

1. Press the button with the script name.

A script can be a measurement or an alignment procedure. See chapter [User Script Editor \[66\]](#) for more detail on how to create, edit and save scripts.

6.2.4 Measurement Display Panel

Measurement results are displayed in plot or chart form in real time as measuring operations (called “scans” in this module). Depending on the detector, scans can be 0D, 1D or 2D. In the picture below you can see an example of a 2D scan.

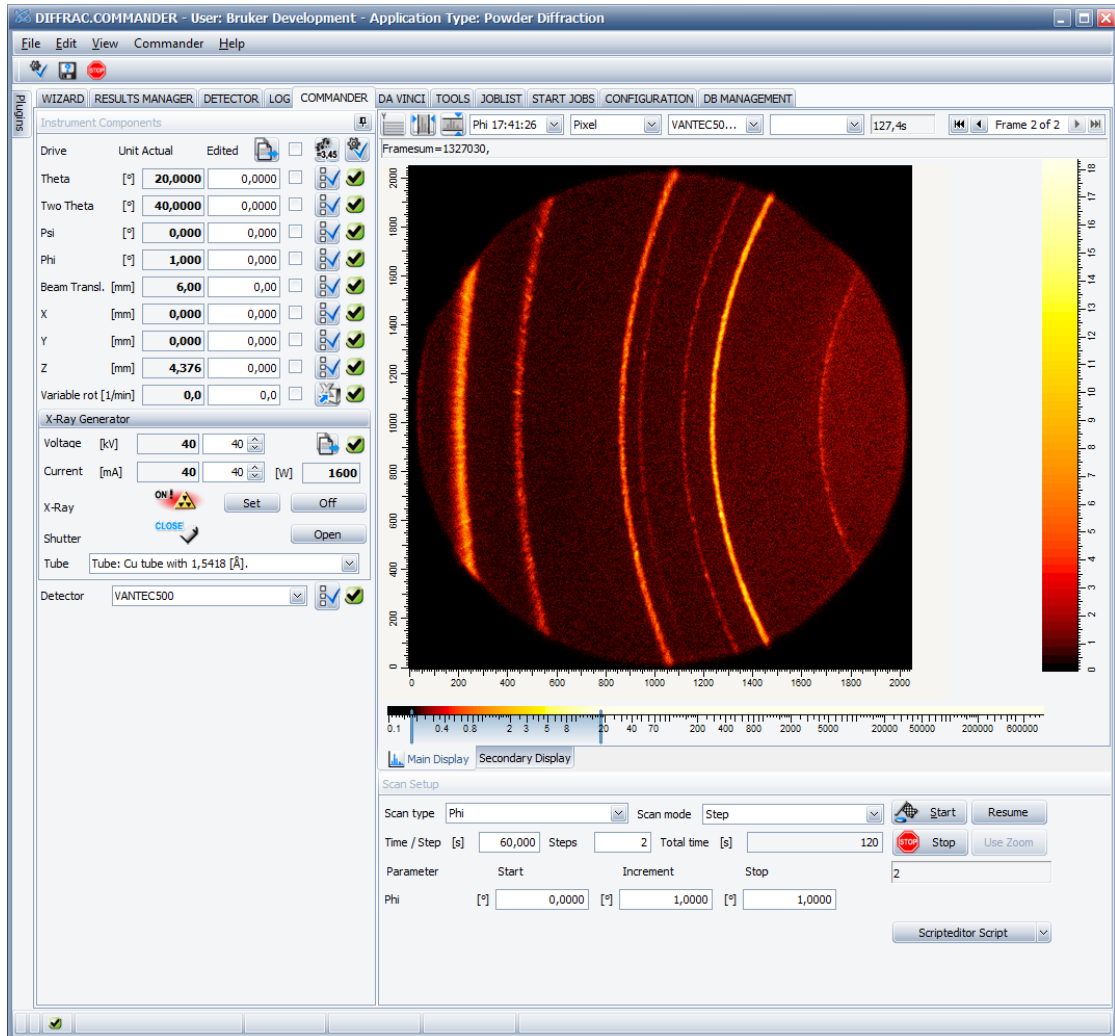


Figure 6.31: COMMANDER plug-in view for 2D measurement result

The scan progress is visualized along the X-axis in the appropriate unit, e.g. in degrees, millimeters, seconds or number of steps.

For example, the number of photons or the temperature is measured along the Y-axis.

There are two windows for measurement display: **Main Display** and **Secondary Display**. To execute any action dependent on measurement display **Main Display** is used. For example, when pressing **Use Zoom** button, axis bounds will be copied from **Main Display** window.







Secondary Display is an aid for displaying extra information from the measurement selected in **Main Display**. The **Secondary Display** offers following functionality:

- Display measurement data over different X-axis or Y scale selection than **Main Display**
- Track live data in a zoomed region
- Display data from an alternative recording source (e.g. temperature chamber)

By default, **Secondary Display** is placed as a tab behind **Main Display**. Please note that **Commander Panel** layout can be arranged in a way that both **Main** and **Secondary Displays** are visible at the same time.



The toolbar located on top of the **Measurement Display** is used to control data presentation on screen. The following buttons control the scaling of the Y-axis:

Table 6.4: 0D and 1D scan toolbar

	Linear scale
	Logarithmic scale
	Square root scale
	Scale based on number of photons (counts) per second
	Scale based on number of photons (counts)
	The scan results are displayed on a grid

For 2D scan display there are two buttons to control zoom window

Table 6.5: 2D scan toolbar

	Change zoom level to fit image to window height
	Change zoom level to fit image to window width

There are four drop-down fields located to the right from the buttons: **History field**, **X-Axis field**, **Recorded data field** and **Comparison data field** (in order from left to right).

- **History field** contains limited selection of previous measurements performed in COMMANDER plug-in and at most one previous measurement started outside the COMMANDER plug-in (i.e. from START JOBS plug-in or LOADER). For each entry measurement conditions and recorded data are stored and will be displayed on selection.
- **X-axis field** lists all available X-axes for the currently displayed scan. For example, it is possible to plot the recorded data against measurement time or step number.
- **Recorded data field** contains a list of counters used during the displayed measurement.
- **Comparison field** is used to compare recorded data from two different measurements. In the drop-down list there are previous measurements comparable with the currently displayed measurement. Selecting a specific measurement in the drop down will display the corresponding recorded data in blue together with the currently displayed data. If a specific measurement is selected in **Comparison field**, then this measurement will be displayed as reference for all later scans. If **Previous Measurement** option is selected, then preceding comparable measurement will be displayed for each later scan. Select blank entry to remove comparison data from display.

Context Menu

Measurement Display Panel context menu is opened by right-clicking on the plot or image area.

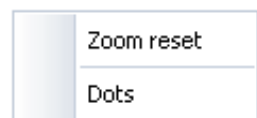


Figure 6.32: Context menu for 0D and 1D scans

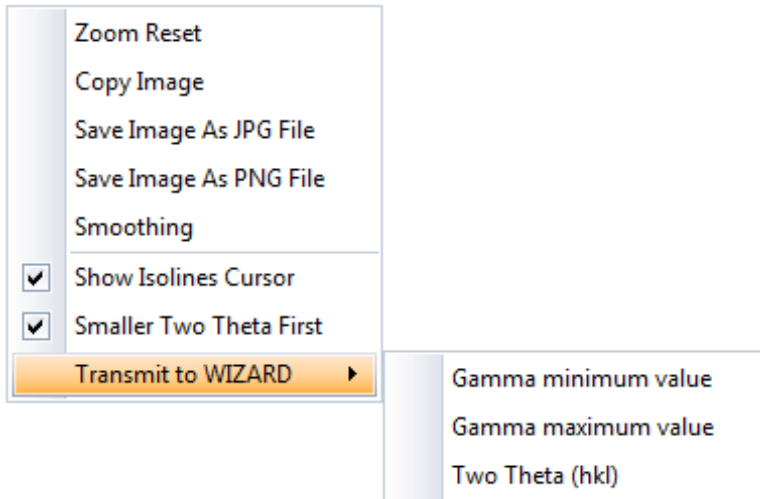


Figure 6.33: Context menu for 2D scans

Table 6.6: Measurement Display Context Menu Options

Context menu option	Description
Zoom Reset	Show scan in full zoom
Dots	Shows the recorded data points as dots
Copy Image	Copy displayed 2D scan picture to clipboard
Save Image As ...	Save displayed 2D scan picture to an image file
Smoothing	Smoothen the displayed 2D scan
Show Isolines Cursor	Show Two Theta – Gamma lines cross
Smaller Two Theta First	Set X axis direction along ascending or descending Two Theta angles
Transmit to WIZARD	Use corresponding pointer value in WIZARD 2D scheme planning

Zooming

The user can zoom into the **Graphical** display by drawing a rectangle around the desired area.

1. Left click on the display to mark the upper or the lower left-hand corner of the zoom rectangle.
 2. Hold down the left mouse button, and draw the rectangle to the right of this starting point.
- ⇒ When the mouse button is released, the area contained within the rectangle is then displayed over the entire **Chart** area.

If zooming is performed during a scan, the zoomed area is automatically adjusted to reflect data updates.

When a 2D experiment is performed, **Measurement Display** Panel contains two additional color scaling controls. **Color scaling control** on the bottom is used to select the lower and upper color intensity

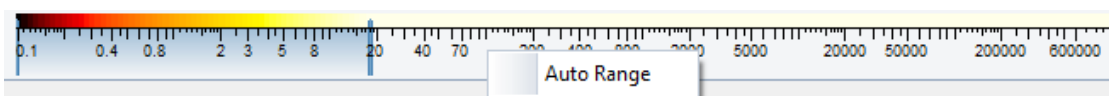


Figure 6.34: Setting colour scaling for 2D measurement result

To scale image coloring:

1. Drag the limiters on the bottom color ruler.

To adjust color scale automatically,

1. Right click on the track bar and select **AutoRange** option

Color scaling control on the right displays the relation between selected color region and counts. It is also used to select different color schemas. Use the right mouse button to select these options.

6.2.5 Video Panel

For the instruments equipped with a camera there is a special panel displaying the images received from the camera

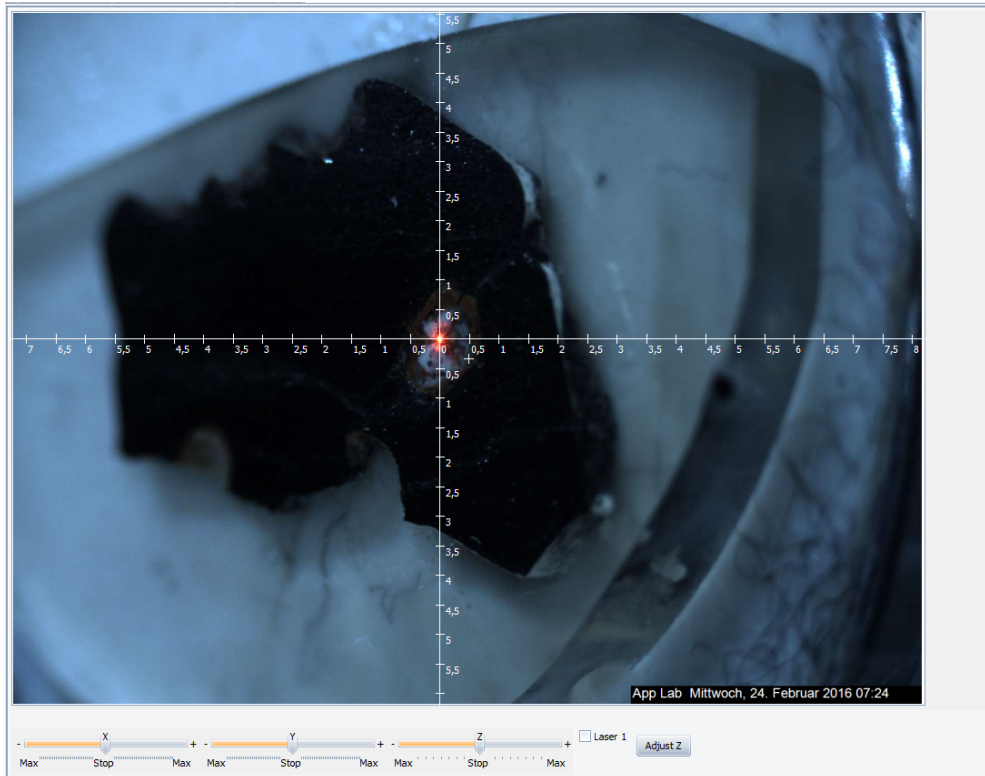


Figure 6.35: Video Panel

1. Right click on the image brings up a video context menu.

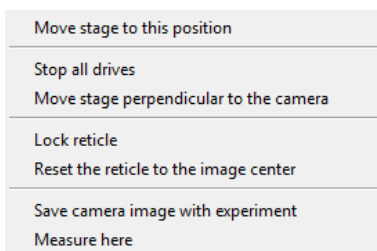
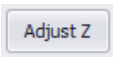


Figure 6.36: Video Panel context menu

Move stage to this position	option will move drives to match the XYZ position selected on the image.
Measure here	option will start a measurement with drive position matching XYZ position displayed on the image.
Stop all drives	Selecting Stop all drives option will terminate drive movement.



- Additional options in the video context menu are covered in the CAMERA plug-in description.
- If the system has a camera, a Laser and a stage with a motorized z axis, the user can perform an automatic alignment of the Z axis so that the sample surface at the current X/Y position will be brought to the goniometer center with the **Adjust Z** button. If the system has a single laser, it will move the Z axis so that the laser hits the sample at the center of the cross line of the camera image. If the system has a double laser system, it will move the stage so that both laser spots come together at one point.

There are several parameters for the algorithm that can be modified through the **Configuration Settings** dialog of the Framework.

ZAlignment.ScalingFactor	Defines a scaling factor with which the camera image will be scaled down before the automatic algorithm is going to identify the laser spot. A higher scaling factor means that the alignment will finish faster but with lower accuracy
ZAlignment.Boarder	Defines a boarder of x pixels around the image where the algorithm does not try to find the laser spots. This is especially necessary if there is a date and time overlay at the boarder of the image.
ZAlignment.MaximumIterations	Maximum number of iterations for the alignment procedure. If the alignment cannot be finished within this number of iterations, the alignment will be aborted.
ZAlignment.MaximumOffset	Maximum allowed offset in pixels on the scaled image that are allowed to qualify an alignment as successful.
ZAlignment.MaxZSearchWindow	Maximum allowed driving range in both directions the Z drive is allowed to be move if the laser spot cannot be identified at the initial Z position and the alignment procedure is searching for the spot.
ZAlignment.SearchStepSize	Step size (mm) for the Z axis during the spot search procedure.
ZAlignment.AlignToCrossline	If set to true, the alignment will be performed to the center of the cross line. If set to false, it will be performed to the center of the camera image. This setting has no effect on a system with two lasers.
ZAlignment.ActivateLaser	If set to true, the laser will be activated after the alignment is finished. Otherwise, it will be set to the state it had before the alignment started.

6.3 Toolbar and Menu Options

6.3.1 Speed Buttons

COMMANDER plug-in has two special speed buttons – save results and stop all jobs

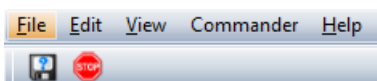




Figure 6.37: Speed buttons

Save Result File	button saves the measurement results displayed on the screen.
Stop All Jobs	button terminates all running and scheduled jobs.

If laser pointer is installed on the instrument, additional laser button will appear in the speed buttons toolbox.

-  will appear when the laser is turned on and
-  will appear when the laser is off.
- Pressing this button will trigger the laser pointer to switch on and off.

6.3.2 File Menu

Options available in the file menu depend on the system configuration and software package.

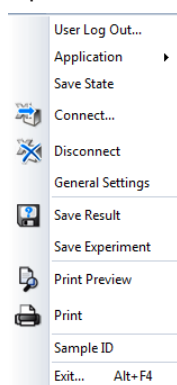


Figure 6.38: File menu for the file-based workflow

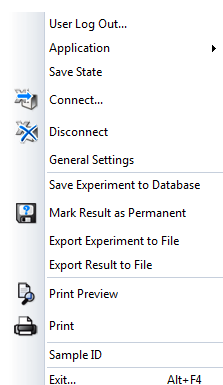


Figure 6.39: File menu for the database based workflow

Table 6.7: File menu options in the COMMANDER plug-in

File Menu Option	Description
Application	Changes application type for the experiment setup. Application type defines available scan types, displayed components and measurement display.
Save Result Export Result to File	Saves measurement data for the displayed scan to a file. This file can be later used for evaluation of the experiment.

File Menu Option	Description
Save Experiment Export Experiment to File	Saves measurement setup parameters to a file. This file can be later viewed in WIZARD plug-in or used to start measurements from START JOBDS plug-in
Print Preview	Displays preview for the printed report of the displayed measurement results
Print	Prints report for the displayed measurement results
Sample ID	Opens a dialog where sample identification string can be specified
Mark Result as Permanent	Marks results with a special flag in the database. All results collected from COMMANDER plug-in measurements are temporary and are deleted during database clean-up procedures. If performed measurement needs to be used as reference for later experiments, mark it as permanent.
Save Experiment to Database	Saves measurement setup parameters for later use.

Saving experiment

Experiments created in COMMANDER plug-in are limited in the set of parameters and consequently inappropriate for certain application types.

COMMANDER plug-in saves measurement parameters (i.e. instrument components settings and scan setup parameters) in such a way that exactly the same experiment is performed whether it is started right away from COMMANDER plug-in or started later from the START JOBS plug-in.

Particularly, saved experiment will contain

1. Values from the edited data fields for the generator settings
2. Values from the edited data for the instrument components marked as **Use for Measurement** (with check-marks)
3. Values from the actual data fields for the instrument components without the check-mark.
4. Currently displayed scan parameters

6.3.3 View Menu

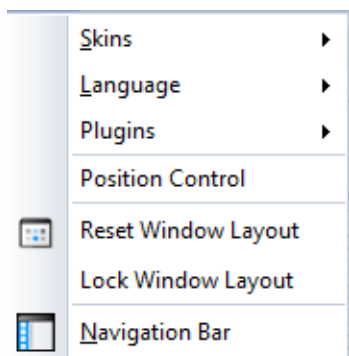


Figure 6.40: View Menu

Position Control	Hide/Display drive position control
Reset Window Layout	Set Commander panel arrangement to default
Lock Window Layout:	Enable/Disable changes to Commander panel layout

6.3.4 Commander Menu

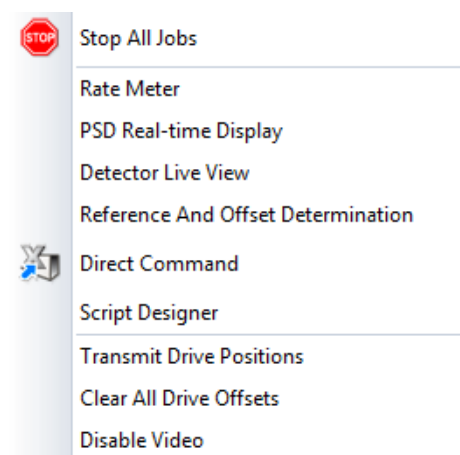


Figure 6.41: Commander menu

Table 6.8: Commander Menu Options

Option	Description
Stop All Jobs	Stops running job and all scheduled jobs. Available also as the speed button in the toolbar.
Clear all drive offsets	Sets offset to zero for each displayed drive.
Enable Video / Disable Video	Shows or hides camera view. Available only for system with video camera configured,.
Transmit Drive Positions	Provides current drive positions to WIZARD plug-in.
Ratometer PSD Realtime Display Detector Live View Direct Command Script Designer	Opens the corresponding dialog box. Each option is described in more detail below. PSD real time display is available only for the PSD detectors.

Ratometer dialog box

The **Ratometer** can be used to adjust the X-ray optics of an instrument.

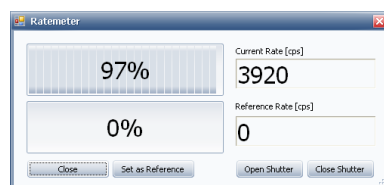


Figure 6.42: The **Ratometer** window

The current count rate registered by the detector is displayed as a bar and a number in the window. When scans are being performed, the **Commander** menu cannot be opened and the **Ratometer** is unavailable.

The current count rate is displayed in the upper right corner of the window. In the upper left corner the current count rate is given as a percentage of the maximum recorded count rate. The recording begins automatically when the rate meter window is opened.

To save a count rate:

Detector Live View dialog box

The live view is currently available for the Eiger2R_500K detector only. This view is designed for system alignment. Readout from the detector is presented live as a 2D image and simultaneously as integrated data along Two Theta and Gamma direction. Count statistics and total integrated counts are presented as well.

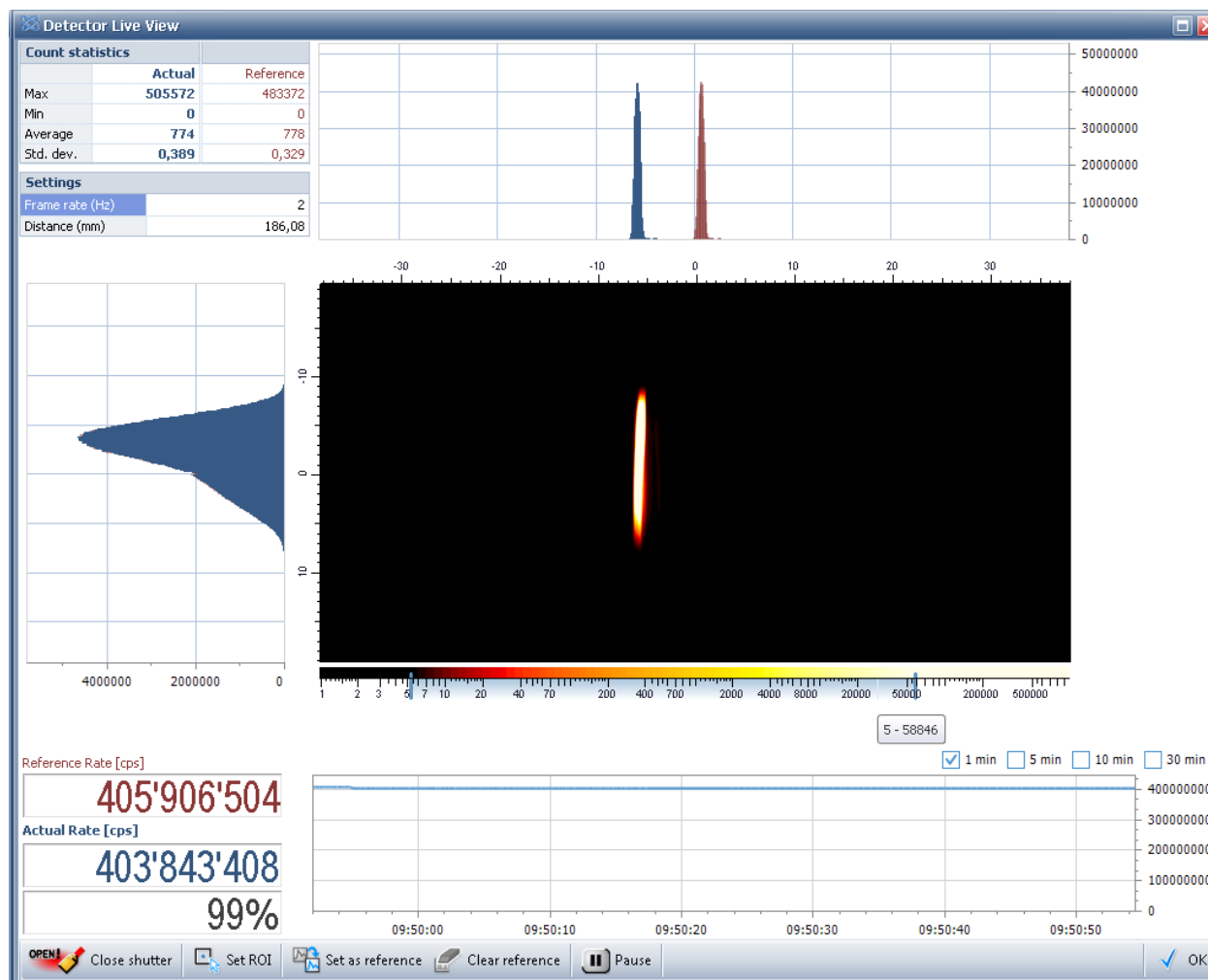


Figure 6.45: Dialog box **Detector Live View** – aligning the system

- The tube shutter must be opened to register counts. Detection window is flexible; the editor can be triggered via the **Set ROI** button.
- Upon exit from the view the shutter will be automatically closed and the detection window set back to how it was before starting the **Detector Live View**.

Direct Command dialog box

Direct command mode window offers a convenient way to repair components and carry out other operations on components. This direct command functionality is also available in TOOLS (see Section [The Settings Menu](#) [218]).

Reference and Offset Determination dialog box

Used for calculating the new **reference** and offset values. Changing reference or changing offset will result in peak shift. These values are adjusted to obtain measured peaks at the theoretical positions.

To enable this option

1. Perform a scan with the drive to be adjusted.

Offset values are temporary and may vary from experiment to experiment. For example, for high resolution application type offset values are adjusted by alignment procedure defined in WIZARD plug-in. Offset values can be quickly cleared using the **Clear all drive offsets** option. All offsets are cleared on system reboot.

Reference values are permanent. This means, when the reference value is set, it is added to the configuration of the instrument and will stay after system reboot. Changing reference value will influence all future experiments.

NOTICE

Damage to the instrument
 Changing reference can result in system misalignment.

Choosing this menu item opens the dialog box.

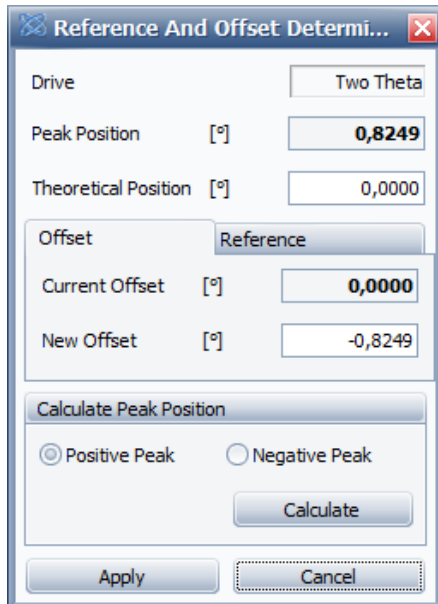


Figure 6.46: Dialog box **Reference and Offset Determination** – determination of a new offset

The initial information displayed in this dialog box relates to the last completed measurement.

To define peak position manually

1. Double click on the scan in the **Main Display Panel**.
 - Reference and offset values will be updated automatically.

For automatic fitting

1. Press **Calculate** button

To set a new offset value

1. Enter a value of the theoretical position
2. Click on the tab **Offset**
 - Current offset and the newly calculated offset value are displayed.
3. Click on **OK** to apply the new offset value.

⇒ Shift of the peak can be noted when performing the same scan again.

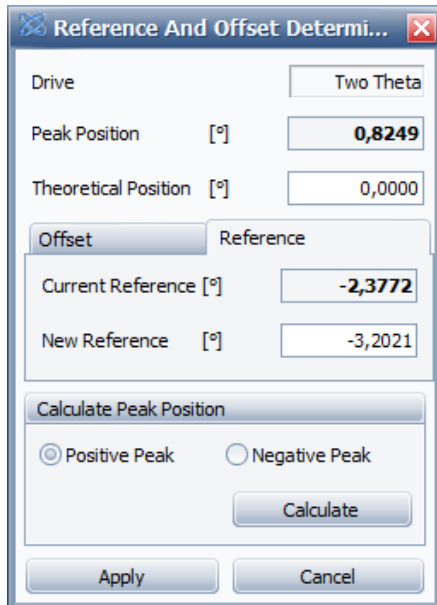


Figure 6.47: Dialog box **Reference and Offset Determination** – determination of a new ZI value

To set a new **reference** value,

1. Enter a value for the theoretical position.
2. Click on the **Reference** tab.
 - The current **reference** value and the newly calculated value are displayed.
3. Click on **OK** to apply the new **reference** value.

⇒ Change to the drive reference will be applied to the system right away; no system reboot is required.

See also

📖 The Settings Menu [▶ 218]

6.4 User Script Editor

This command opens a dialog window for a simplified interactive script development. These scripts are used mainly for high resolution applications, but can also be used to change instrument properties.

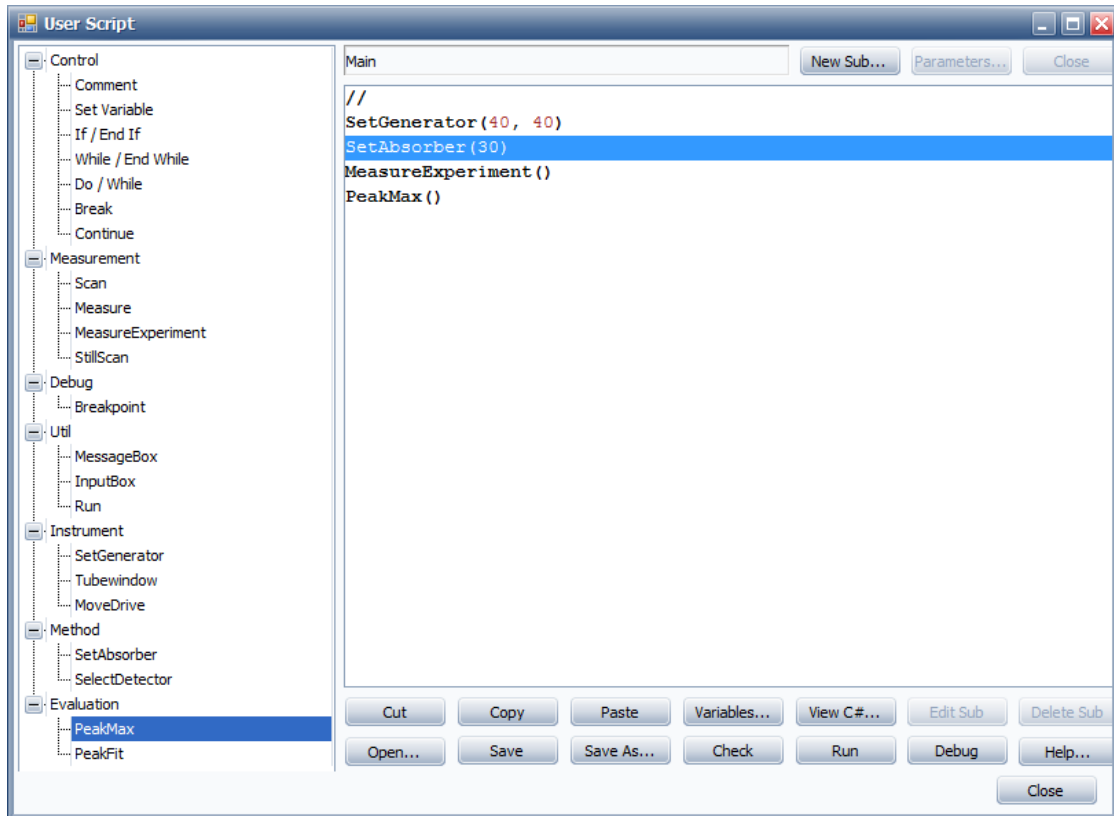


Figure 6.48: The *User Script Editor*

The scripts are developed by drag and drop operations.

1. The user selects an item in the left work item tree, and drags it into the right edit field.
2. By pasting a work item in the edit field, the execution order is defined.
3. A double click on a line in the edit field allows to define function parameters.
4. Select **Run** to save the script and run it.

Use User Script for Measurement: If this menu item is checked, the current script in the **User Script Editor** is being used for the next measurement to be performed with the COMMANDER.

For more information about script development, see chapter [Script Designer \[273 \]](#).

7 START JOBS

7.1 General

The **START JOBS** plug-in is used to create and start jobs in which measurements are carried out on samples by the connected instrument according to predefined methods (also called “experiments” in the software). Measurement information for a job is entered in a row of the **START JOBS** table. This information can be copied into other rows and thus, multiple jobs can be easily created for batch processing. After several jobs have been created, they are started together as a group, at which point they are automatically deleted from the table and reappear in the job list of the **JOBLIST** plug-in. This job list contains jobs that are to be carried out (“waiting” or “pending” jobs) and jobs that are currently in progress (“active” or “running” jobs) on instruments assigned to the Measurement Server with which the Measurement Client is connected.

START JOBS can also combine single jobs into a group or batch of jobs. Those groups can then easily be started by just pressing one button. Additionally variable job parameters that are not known during the creation of a batch job are also supported.

Jobs are normally executed in the order in which they have been created. However, high-priority jobs take precedence over standard jobs.



Jobs can also be created and started using **COMMANDER**. In this case, however, the measuring operations are carried out not according to a predefined method but according to parameters that are set on an individual basis for the jobs using the functionality provided by the plug-in. This measuring information can be saved as a method to a file and later used to create jobs in **START JOBS**.



The term “start” in relation to the processing of jobs with **START JOBS** refers to the initiation of a process that may include a waiting period - the length of which depends on the number of pending jobs with a higher priority on the waiting list and on the duration of their execution - before the actual measuring operation begins.

NOTICE

Before measurements can be carried out on an instrument, its drives and sample changer must be initialized. The user can initialize the drives by using the Drive Control in the **COMMANDER** plug-in

7.2 Screen Layout and Operation

The user interface of the **START JOBS** plug-in consists of several tabs at the bottom of the plug-in. The **Start Jobs** tab is a table in which measurement information is entered for the creation of jobs.

In the **Start Jobtemplates** tab the user can create user defined batch jobs that later can simply be started by just pressing a single button.

The **Well Plate** tab shows a well plate where the user can add jobs by just clicking a measurement position on the well. All jobs on the plate will be measured with the same experiment and script file. In the optional camera control, the user can additionally identify structures and create experiments that are measured at the selected position.



The **Well Plate** tab is only available, if a **Component/Samplechanger/Screening** unit is configured in the instrument configuration.

The **Camera Control** in the **Well Plate** tab is only available, if a **Component/Video** unit is configured in the instrument configuration.

7.2.1 The Start Jobs Tab

The **Start Jobs** tab contains a table to add necessary experiment information. Each row of the table contains a separate job with its measurement information.

User-defined columns can be added to the table. The standard built-in columns with which the table is provided can be set to hidden if not needed.

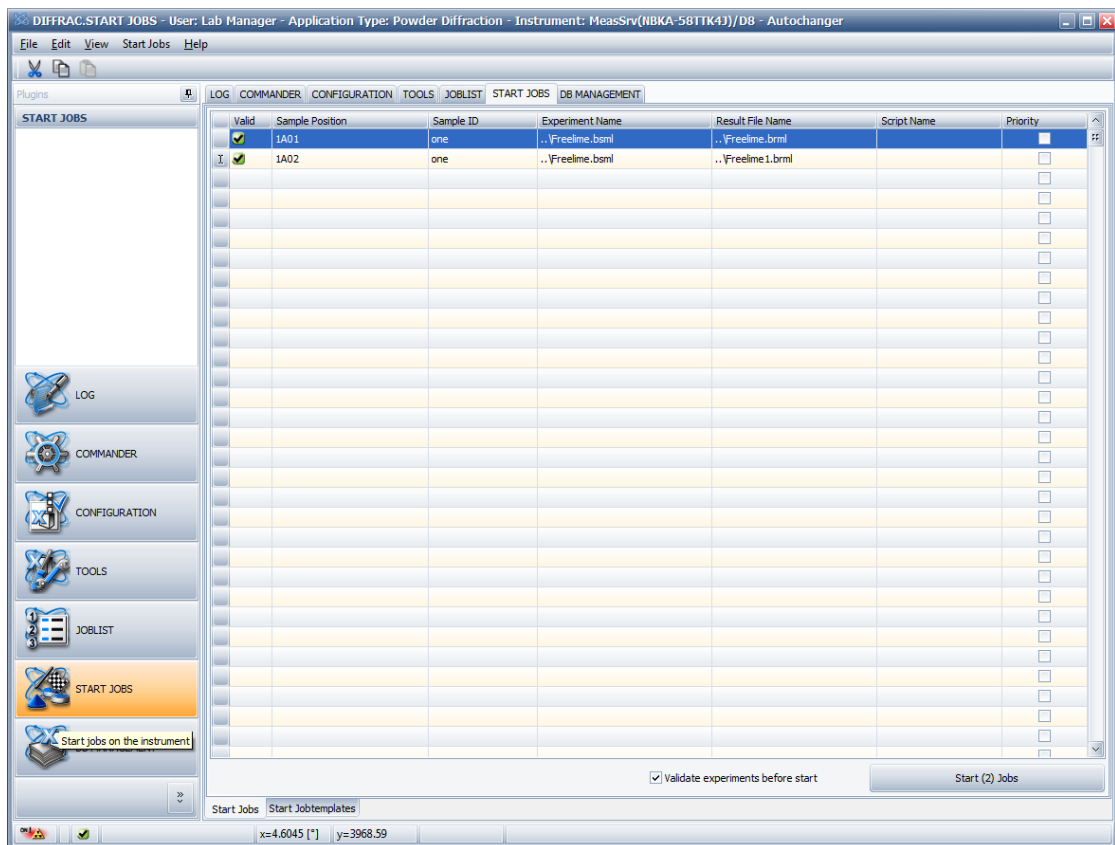


Figure 7.1: User interface of START JOBS plug-in



The standard columns are:


- **Valid:** This shows the status of the experiment validation. If the checkbox Validate experiment before start is checked, every new experiment is validated against the actual instrument configuration. If the instrument settings allow a measurement of the experiment, the column shows a green OK item. If not, a red error item is shown and a hint is shown as an indication of the change needed in the instrument to measure this experiment.
- **Sample Position:** The sample position column contains a combo box for each job in which the user can select one of the available sample positions for the instrument. For information on the sample positions that can be selected for different types of a sample changer. If an instrument has only one sample position, the column is hidden. The default position (1A01) is used automatically.
- **Sample ID:** An arbitrary ID given to a sample by the user for identification.

- **Experiment Name:** The name of an existing measurement method (called “experiment” here) file (*bsml* file). Type the name of this file into the text field without the filename extension. If a user-specific path to the experiments directory has been defined (see subsection [Users Table \[▶ 162\]](#)), it will be added automatically to the filename to form the pathname with the file extension *bsml*. If no user-specific path has been defined, the default path to the directory (see Section [General Settings Window \[▶ 168\]](#)) will be added to the filename. Both the user-specific path and the default path to the experiments directory can be changed in **DATABASE MANAGEMENT**.
Alternatively, the browse button in the right-hand corner of the text field can be clicked on and the experiments file can be selected. The pathname will be displayed automatically in the field.
- **Result File Name:** The name of a result file (*brml* file) in which the measurement result is to be stored. Type the name of this file without the filename extension into the text field. The default path to the results directory (see Section [General Settings Window \[▶ 168\]](#)) and the filename extension will be added automatically to the filename. However, if a user-specific path has been defined (see subsection [Users Table \[▶ 162\]](#)), this path will be added to the file name as well as the file extension to the filename. Both the user-specific path and the default path to the results directory can be changed in **DATABASE MANAGEMENT**.
Alternatively, the browse button in the right-hand corner of the text field can be clicked and the result file can be selected. The pathname will be displayed automatically in the field.
- **Script Name:** The name of a file (*cs* file) containing a measurement script used for the measurement. Type the name of this file without the filename extension into the text field and the path to the directory and the filename extension will be added to the filename. All scripts are located in the predefined **\Scripts** subdirectory within the Bruker AXS directory. If this text field remains empty, a default script is used.
- **Mode:** The measurement mode used for this measurement. The available measurement modes are:
 - QL - Qualitative
 - RE - Reference sample for quantitative measurements
 - RA – Reference sample for absorption measurements
 - UN - Unknown sample for quantitative measurements
 - TT - Texture measurement in transmission
 - TR - Texture measurement in reflection
- **Time Scale:** The value entered for this parameter is used as a multiplication factor for multiplication of the measurement time defined in the measurement method. For example, a value of 2 multiplies the measurement time by a factor of two.
- **Priority:** If the priority check box is checked, the job has a high priority. High-priority jobs interrupt standard jobs, which are running. In this case, the sample belonging to the job that is interrupted is removed from the measurement position and returned to its position in the magazine or tray. When the high-priority job is finished, the standard job will only be resumed if no other high-priority jobs have been initiated.
If the standard job is interrupted during the measuring operation, the measuring operation will be resumed from the point of interruption.
- **Validate experiment before start:** If marked this checks an experiment against the actual instrument configuration. See the description of the **Valid** column above. If at least one experiment validation has failed at the initiation of the experiments, a warning will be shown and only valid experiments can be started. If the checkbox is unmarked, all experiments can be started. However, they may fail later in the **JOBLIST** plug-in.
Newly created jobs are started by clicking on:
- **Start () Jobs:** This button indicates the number of jobs for which sufficient measurement information has been entered to allow a start. If only one sample position (the default position 1A01) is available for the instrument, entering a measurement method is sufficient for a start. In this case, the column **Sample Position** does not appear in the table.

7.2.1.1 Editing the Measurement Information




The measurement information in the rows of the table can be edited as a row of information or as the contents of a single cell.

In the first case, the row must be selected by clicking on the button  at the left end of the row. A pointer  appears on the button, indicating that the row is ready for editing.

In the second case, the cell must be selected with a mouse click. A pen  appears on the button at the left end of the row containing the cell, indicating that the cell is ready for editing.

Editing a Row of Information

A row of information can be edited with the help of three speed buttons located below the menu bar.

Button	Description
	Cuts the selected measurement information and saves it to the clipboard.
	Copies the selected measurement information to the clipboard.
	Pastes the measurement information into the row. Any existing information is overwritten.

- Multiple rows for cutting, copying and pasting can be selected by scrolling up or down through the rows while holding down the shift key. Alternatively, a cell in a row can be clicked on (the pointer on the button at the end of the row then becomes a pen), the **Return** or **Escape** key should be pressed. Scroll through the rows while holding down the shift key.
- The contents of rows can also be copied using **Ctrl-C** and pasted using **Ctrl-V**.
- The contents of the bottom row of the table can be copied repeatedly into the lower rows by simply pressing the return key after selecting the row.
- The first three options in the **Start Jobs context** menu can also be used, namely **Copy**, **Paste** and **Clear Row**, which is obtained by right-clicking anywhere in a row. For a description of the functions of this menu, see Section [The Start Jobs Context Menu \[71\]](#). With the fourth option **Clear All** the measurement information of all rows can be deleted.
- The functions **Clear Row** and **Clear All** are also available in the **Start Jobs** menu, which is described in Section [The Start Jobs Menu \[73\]](#).

Editing the Contents of a Single Cell

The information in a single cell can be edited by first selecting the cell with the left mouse button and then right-clicking to it to open the **editing context** menu.

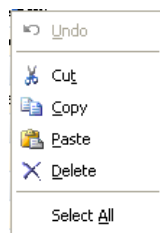


Figure 7.2: Editing context menu

Before selecting any of the options of this menu, first mark the contents of the cell using **Select All**.

7.2.1.2 The Start Jobs Context Menu

A right click on any part of the table opens the **Start Jobs** context menu.

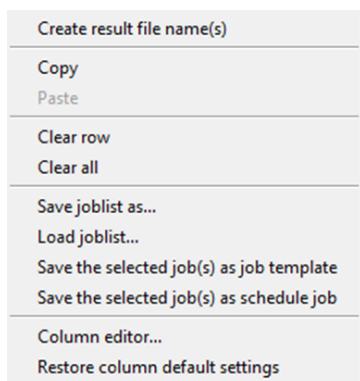


Figure 7.3: Start Jobs context menu

This context menu contains the following items:

Item	Description
Create result file names(s)	This automatically creates valid result file names from the actual experiment file name.
Copy	Copies the selected row or rows onto the clipboard.
Paste	Pastes the selected row or rows into the table.
Clear row	Clears the selected row.
Clear all	Clears the complete table.
Save job list as ...	Opens a dialog box that can be used to save the job settings as a job list file. A job list file can be reloaded during a later session. Thus, the batch processing is facilitated using a pre-defined job list.
Load job list ...	Opens a dialog box that can be used to load an existing job list file.
Save the selected job(s) as job template	The job is stored as job template, without being executed.
Save the selected job(s) as schedule job	The job is stored as schedule job, without being executed.
Column Editor...	Opens the dialog box Column Editor (see following section).
Restore column default settings	Removes all non-standard columns and restores the built-in default columns.

7.2.1.3 The Column Editor

The **Column Editor** is available in the **Start Jobs** menu and **Start Jobs** context menu and enables the user to define and add new columns to the **START JOBS** table if required. Thus, additional measurement information can be entered in the table during the creation of jobs. The built-in standard columns can be hidden, thus making room for new columns.

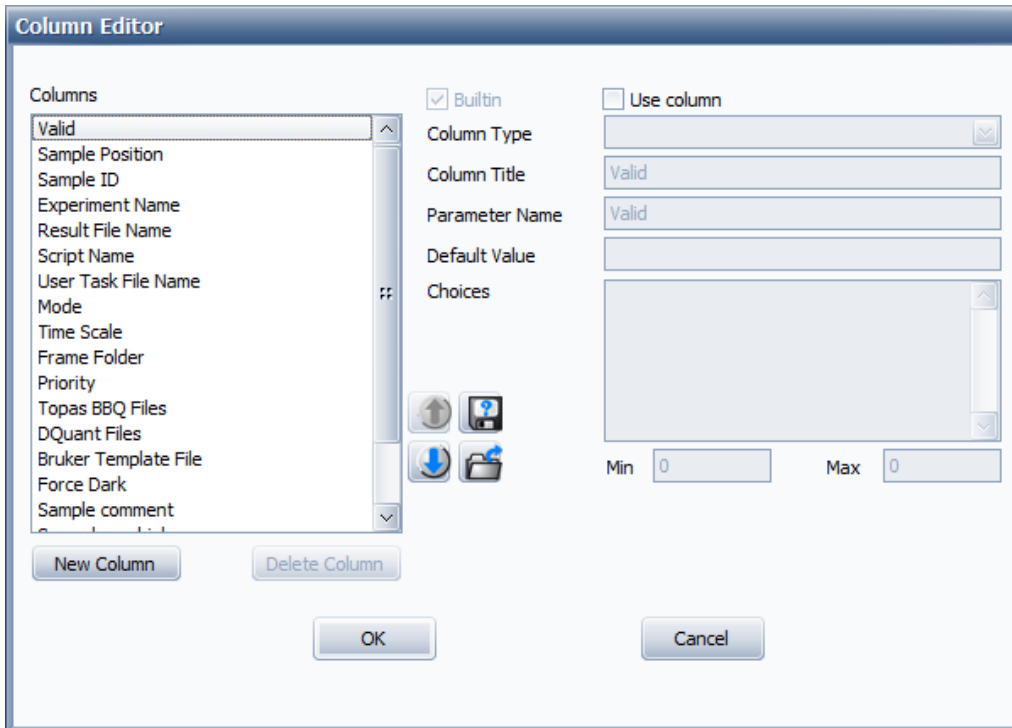


Figure 7.4: Dialog box **Column editor** showing standard columns

- Clicking on **Column Editor** in one of the above-mentioned menus opens the dialog box **Column Editor**. The columns are listed in the left window of this dialog box.
- Selecting a column displays properties of the column in the data fields on the right side of the dialog box. These fields can be used to define new columns. In the case of built-in standard properties these fields are deactivated and their information cannot be changed.

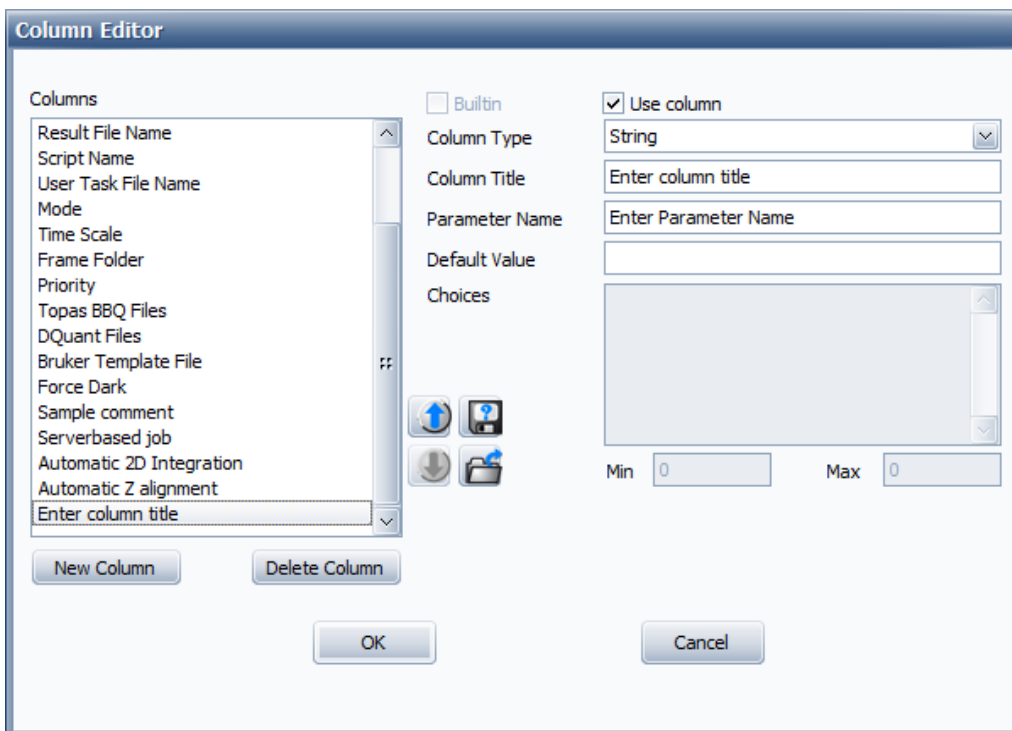






Figure 7.5: Dialog box **Column editor** showing data fields in which a new column can be defined

The buttons beneath the window on the left have the following functions:

Buttons and Parameters	Description
New Column:	Creates a non-standard column.
Delete Column:	Deletes a selected non-standard column.
Column Type:	A column can be one of the following types: string, file name, numeric, choice, and checkbox.
Column Title:	The title of the new column. This title appears in the table.
Parameter Name:	Name of the parameter that is sent to the Measurement Server. For example, the parameter name can be used by an evaluation plug-in for additional calculations.
Default Value:	The default value that is used if the field in the table remains empty.
Choices:	If the column type is choice, the user can enter the values that are later available in the table in this field.
Min :	Minimum value that can be entered in the table if the column type is numeric.
Max :	Maximum value that can be entered in the table if the column type is numeric.
	Moves a selected column up in the column list and thus to the left in the table.
	Moves a selected column down in the column list and thus to the right in the table.
	Exports column settings to an xcol file in the Bruker ASX directory or another directory.
	Imports column settings from an xcol file.

To create a new column,

- click on the **New Column** button.
 - The words **Enter column title** appear at the bottom of the column list.
- Select these words to activate the property fields on the right.
- After entering the properties, click on **OK** to create the new column.

7.2.1.4 The Start Jobs Menu

The **Start Jobs** menu in the menu bar provides functions that are also available in the **Start Jobs** context menu. For a description of these functions, see Section [The Start Jobs Context Menu \[▶ 71\]](#).

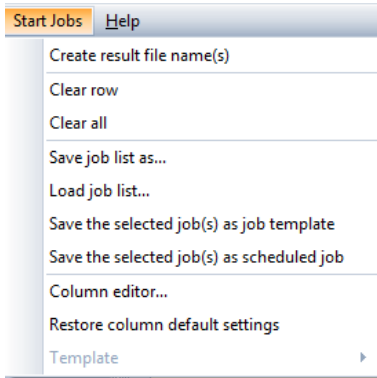


Figure 7.6: **Start Jobs Menu**

7.2.2 User Right Restrictions

The logged-in user can start jobs only if he has been assigned the user right **Start Job**. For information on user rights, see Section [Users Table \[160\]](#).

7.2.3 The Start Jobtemplates Tab

The Start Jobtemplates tab

In the **Start Jobtemplates** tab, the user can very easy create its own batch jobs that consist on one or more single jobs. Additionally variable parameters are allowed, e.g. a sample ID that is undefined during setting up the actual batch job can be defined as variable. If the batch job is started later, a dialog comes up where the user must add the missing sample ID.

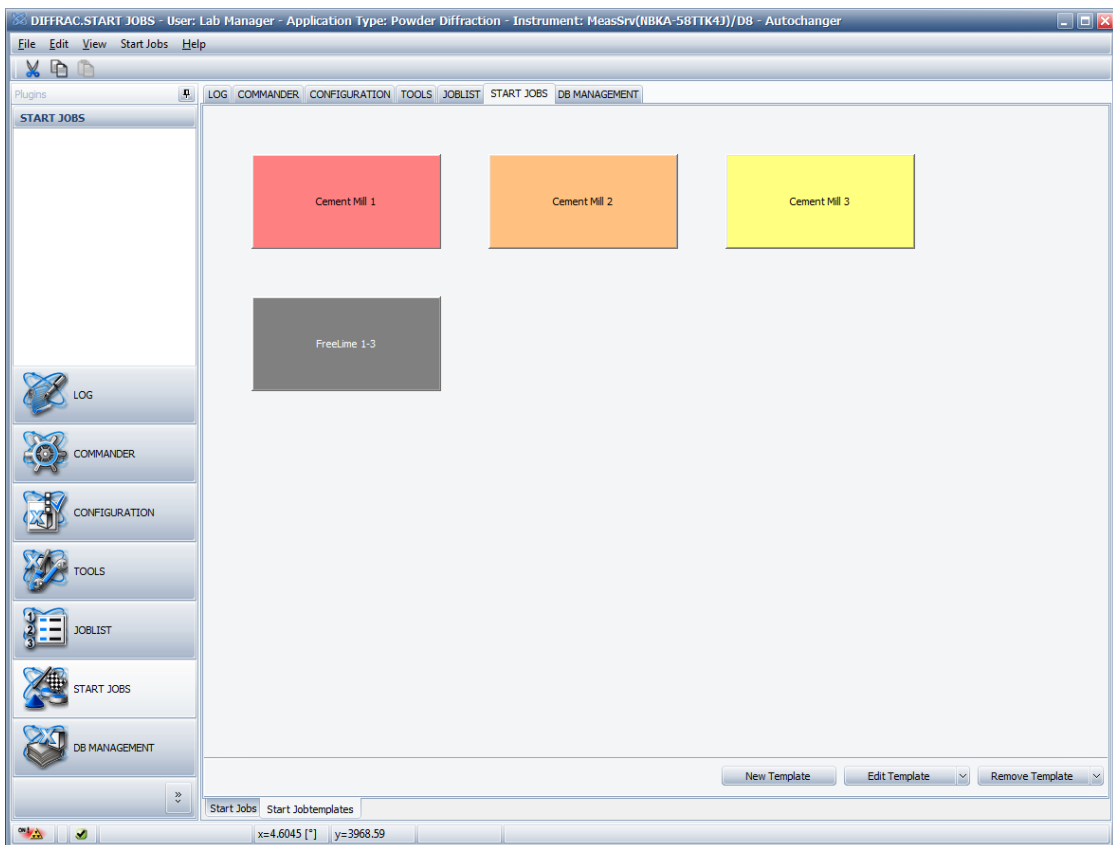


Figure 7.7: **Start Jobtemplates screen**

In order to start a batch job, the user must simply click one of the buttons on the screen. All jobs that are defined in the batch are sent to the measurement server and executed on the connected instrument.

7.2.3.1 Creating a New Template

To create a new batch job,

1. press the **New Template** button.

- The **Batch Template** Dialog is displayed with the measured experiments on the left side:

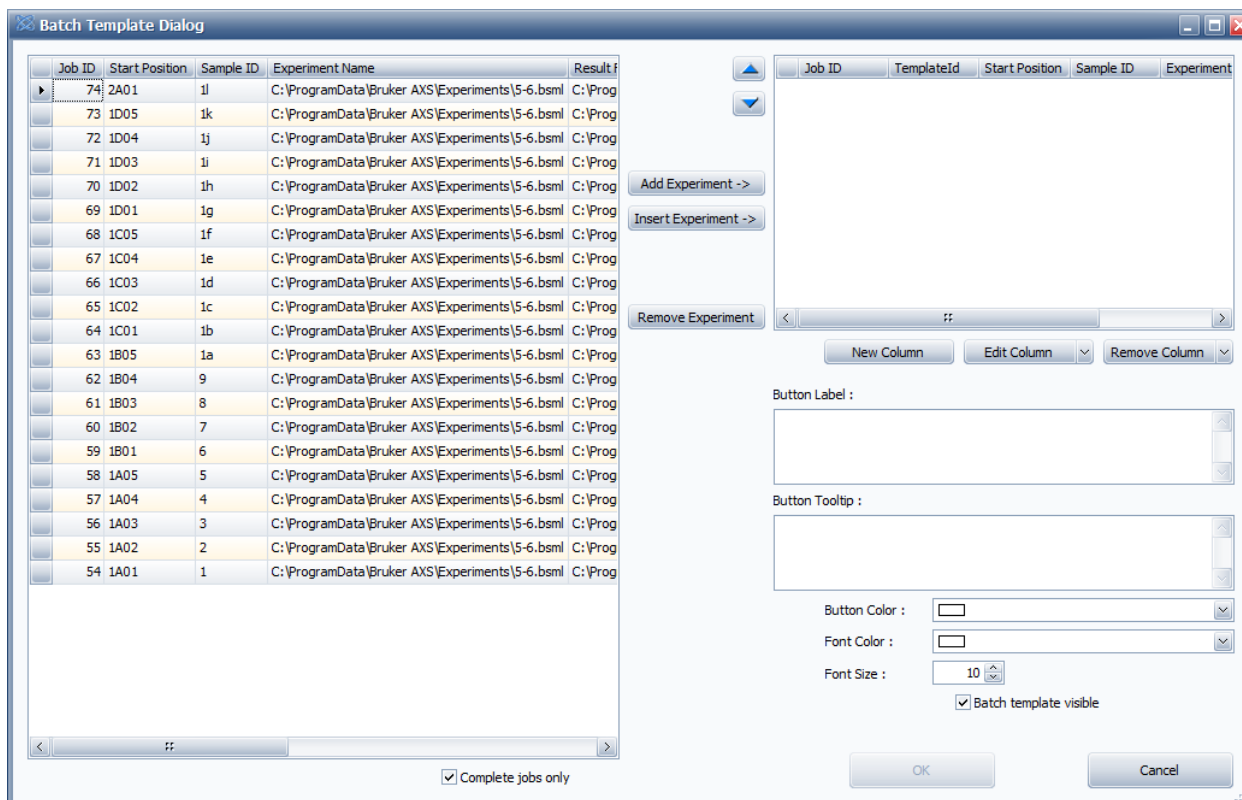


Figure 7.8: The Batch Template Dialog

To add a new experiment to the template,

1. select it in the left table and
2. press **Add Experiment**.
 - The experiments are copied to the top right table.

To insert an experiment,

1. select the experiment in the left table, and the row in the right table and press **Insert Experiment**.
 - The new experiment is inserted above the selected row.
- **Remove Experiment** removes the selected experiment from the right table.
- **Complete jobs only** displays in the left list only successfully finished experiments. If unchecked, also unfinished jobs are displayed.



The experiment order in the right table defines the order in which the experiments are executed later on the instrument. The order can be changed with the **Up** and **Down** buttons.

- **New Column:** Opens a dialog to create user defined parameters for an experiment.

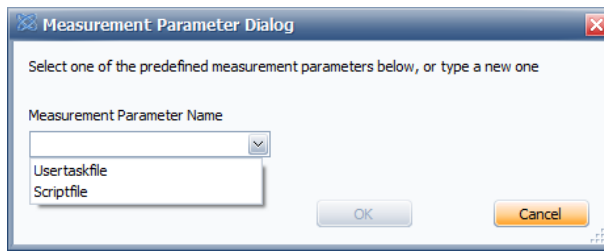


Figure 7.9: **Measurement Parameter Dialog**

Predefined parameters are **Usertaskfile** and **Scriptfile**.

1. To add a parameter, just type the parameter name and press **OK**.

A new column in the right table is created with the name of the given parameter. In case of **Usertask** or **Scriptfile**, a file can be selected that is executed together with the experiment.

In case of a user defined parameter e.g. LOI, the parameter is send to the evaluation software together with the value the user added. E.g. LOI=3.14 .

Edit Column	Allows to change the name of a parameter. Use the dropdown button to select the parameter to change.
Remove Column	Allows to remove a parameter from the table.
Button Label	The text that is displayed on the button. Note: Without a button label, the OK button is not available, and thus the template cannot be saved.
Button Tooltip	An optional label for the button that can be used to give the user an additional hint about the purpose of the template.
Button Color and Font Color:	Allows to change the button background and the button font color.

7.2.3.2 Working with Optional Parameters

Optional parameters allow the user to define placeholders at the creation time of a template. At the execution time, a dialog is shown, where the user replaces the placeholders by actual values. For example the sample ID might not be known at design time.

To add an optional parameter,

1. type an ? in the field

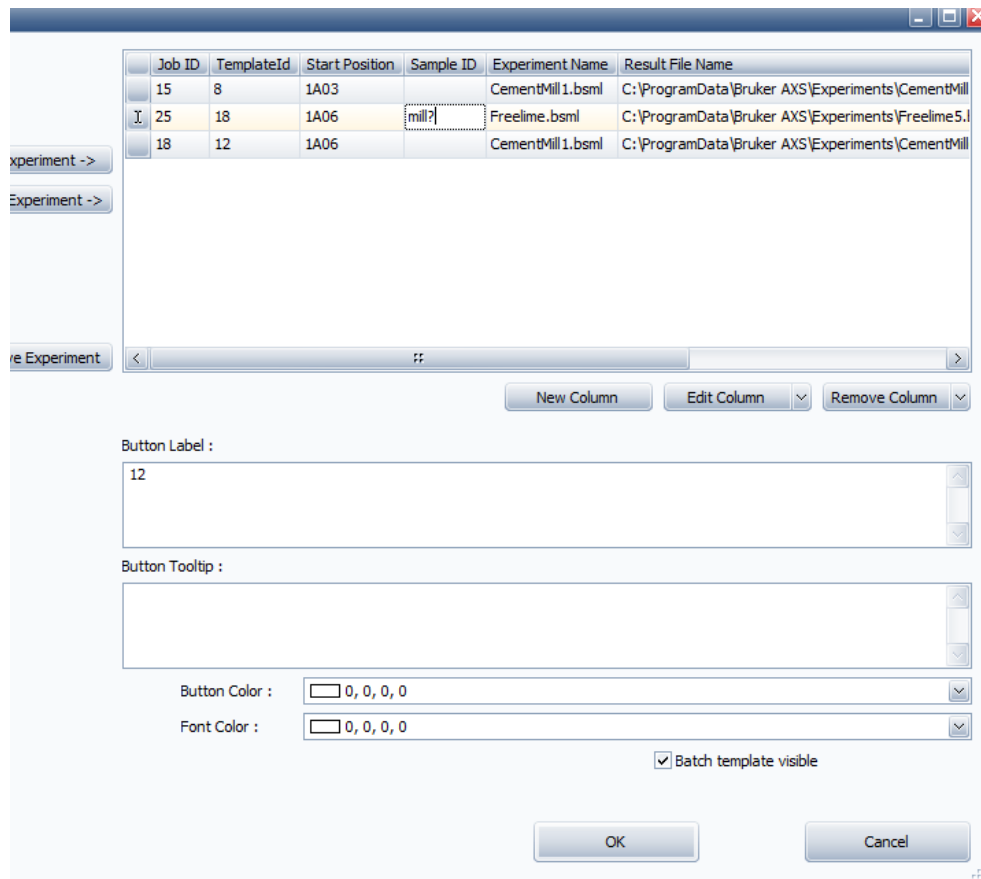


Figure 7.10: Optional Parameter example

In the example above the only optional parameter is the sample ID. If the user executes the job, an additional dialog comes up and forces the user to add all missing parameters. After all missing parameters are added, the **OK** button becomes enabled, and the jobs are queued into the Measurement Server.

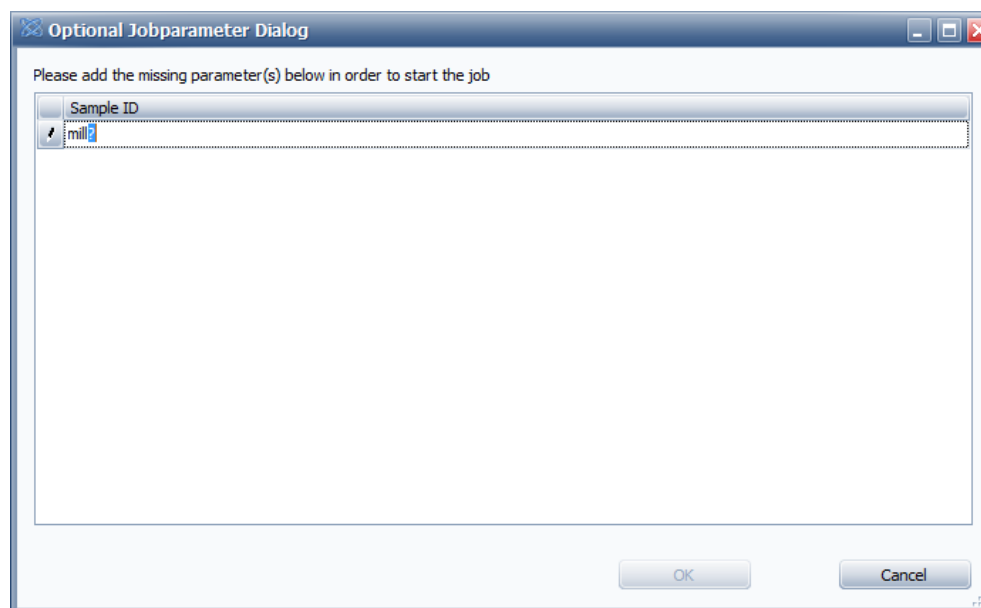


Figure 7.11: Missing parameter example

- **Batch template visible:** This hides the button at the user interface e.g. if the user want to measure the template with the help of the AXSCOM interface only.

7.2.3.3 Ordering the Buttons on the Screen

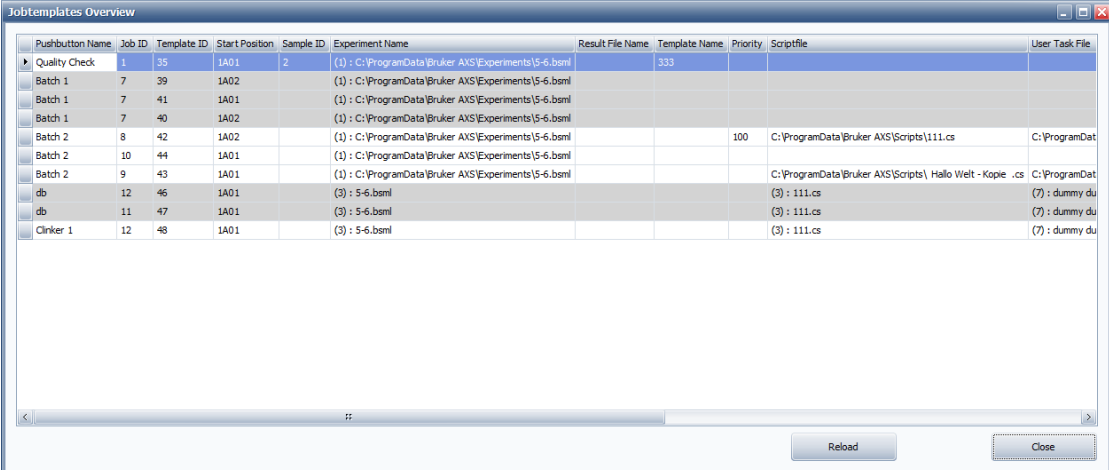
The pushbuttons can easily be rearranged on the screen.

1. Simply click the left mouse button on a pushbutton and
2. drag the button over an existing button.

To indicate the drag operation, the cursor changes to a cross cursor. Both, the **start** and the **end** button flip the positions.

7.2.3.4 Jobtemplate Overview

This shows a form with all job templates and all parameters defined for this instrument.



Pushbutton Name	Job ID	Template ID	Start Position	Sample ID	Experiment Name	Result File Name	Template Name	Priority	Scriptfile	User Task File
Quality Check	1	35	1A01	2	(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml		333			
Batch 1	7	39	1A02		(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml					
Batch 1	7	41	1A01		(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml					
Batch 1	7	40	1A02		(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml					
Batch 2	8	42	1A02		(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml			100	C:\ProgramData\Bruker AXS\Scripts\111.cs	C:\ProgramDat
Batch 2	10	44	1A01		(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml					
Batch 2	9	43	1A01		(1) : C:\ProgramData\Bruker AXS\Experiments\5-6.bsml				C:\ProgramData\Bruker AXS\Scripts\ Hallo Welt - Kopie .cs	C:\ProgramDat
db	12	46	1A01		(3) : 5-6.bsml				(3) : 111.cs	(7) : dummy du
db	11	47	1A01		(3) : 5-6.bsml				(3) : 111.cs	(7) : dummy du
Clinker 1	12	48	1A01		(3) : 5-6.bsml				(3) : 111.cs	(7) : dummy du

The parameters cannot be modified here. To change parameters, open the job template in the **Batch Template** dialog.

7.2.3.5 Export and Import Templates

The user can export and import templates. These actions can be triggered through the according items at the menu of the START JOBS plug-in. The export menu item has a sub-menu where the user can select the template he wants to export. After clicking the template that should get exported, the user can select the location where the template will be stored. The template will be stored at the selected location with the template button text as the filename and **.templateExport** as file extension.

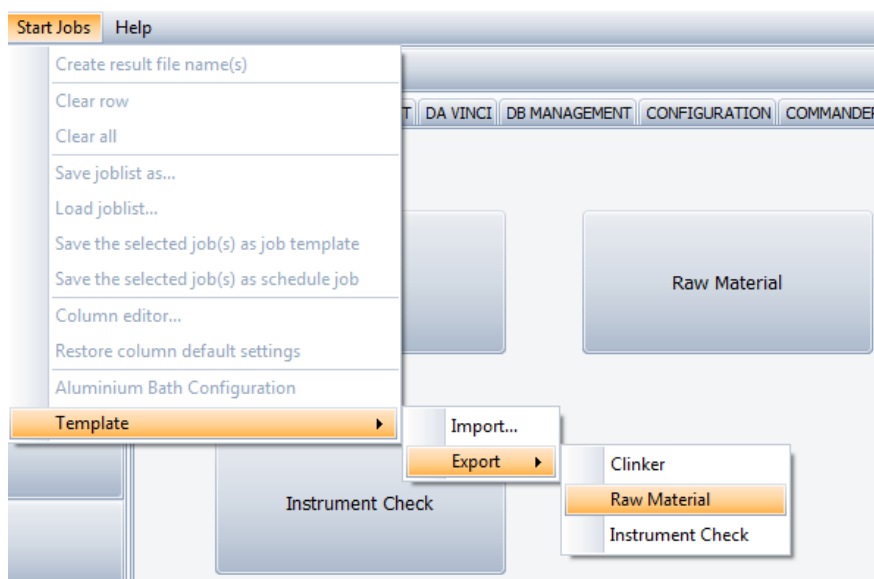
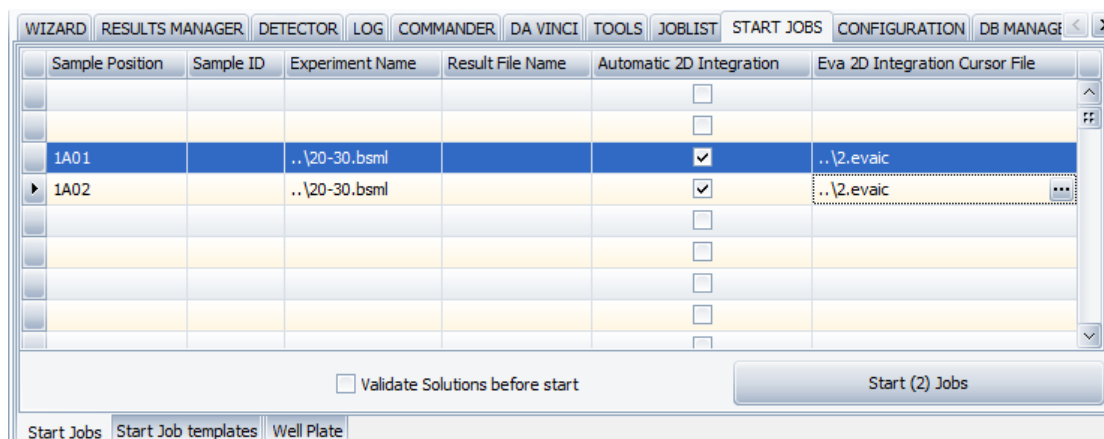


Figure 7.12: Template Export and Import menu items

7.2.3.6 Auto 2D Integration

In the **Start Jobs** tab, the user can configure automatic 2D integration for experiments.



Make sure that the columns **Automatic 2D Integration** and optionally the **Eva 2D Integration Cursor File** are visible.

1. Start a 2D experiment in COMMANDER
2. Open the **.brml** or **.gfrm** file in EVA and create a **FullFrame** cursor for integration of this frame. If the column **Eva 2D Integration Cursor File** is not visible in START JOBS, the cursor file name must be **Auto2DIntegrationCursor.evaic** and be saved in the **BrukerAXIS\CONFIG** folder. The file name cannot be changed, and the measurement script uses the name and the path as default. If the column **Eva 2D Integration Cursor File** is active in START JOBS, the path name and the location of the integration cursor file can be changed for every experiment. Thus you can have more than one integration cursor file.
3. Create an analogous experiment (i.e. same angle range) in WIZARD and export it into **.bsml** file
4. Check the column **Auto2DIntegration** in START JOBS and execute the job. After measuring you will find **.XY** files with integrated 1D scan.

Note for 21 CFR Part 11 mode:

In 21 CFR Part 11, the EVA cursor file, and the resulting **.XY** file are stored into the database and thus protected against modification. Additionally, the cursor files can be signed,

7.2.4 The Well Plate Tab

In the **Well Plate** tab, the user can start experiments on a well plate control, or start experiments with the help of an (optional) video camera. All jobs entered on the tab will be executed with the same experiment- and script file. Additionally, all experiments will get the same plate id.



The **Well Plate** tab is only visible, if an appropriate stage is mounted on the instrument.

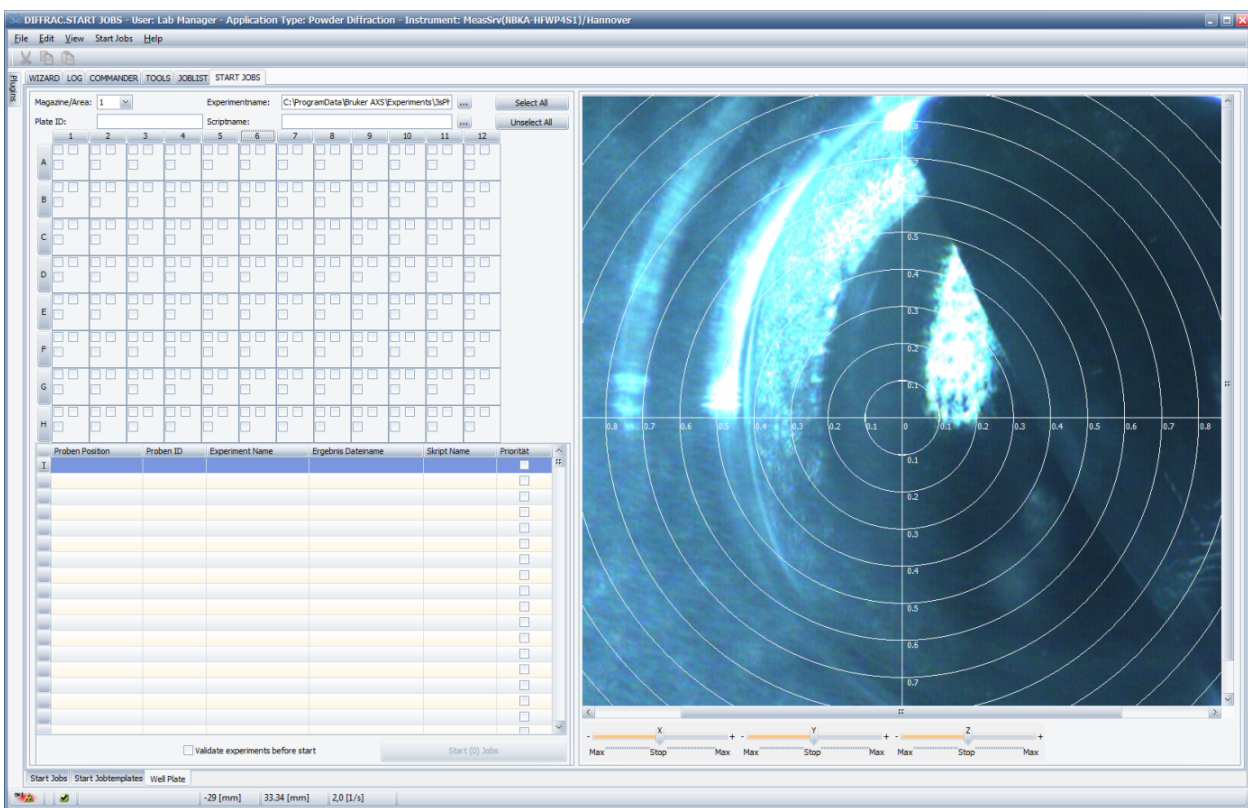


Figure 7.13: **The Well Plate** tab

In the **Magazine/Area** control, the user can switch between different types of well plates if they are configured in the **CONFIG** plug-in.

Experiment name	This defines the experiment used for all jobs on the well
Script name	This defines the optional script file used for all jobs on the well
Plate ID	This defines a plate identifier for all jobs on the well



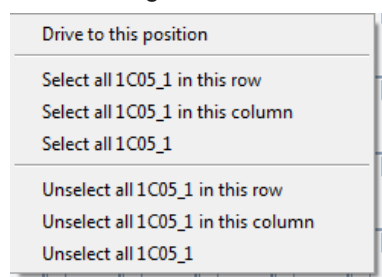
Depending on the configured well plates, the number of columns and rows can vary, also the number and location of checkboxes within a well position.

Once an experiment position is selected in the **Well Plate** control, it occurs in the **Start Jobs** control below. Here the experiment parameters can be modified as well. Once all required information's for an experiment are available, you can start the experiments with the help of the **Start Jobs** button.

The jobs are scheduled into the **JOBLIST** plug-in.

7.2.4.1 The Wellplate Control Context Menu

Press the right mouse on the **Well Plate** control, and a context menu appears:



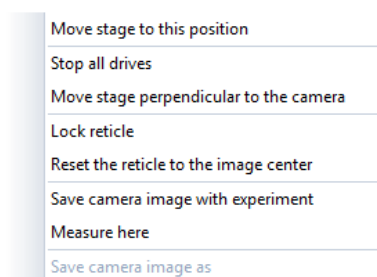
Drive to this position	This can be used to quickly drive the stage between the wells of a plate. This function drives the stage to the selected position.
Select all xxx in this row	Selects all items in the row of the well.
Select all xxx in this column	Selects all items in the column of the well.
Select all xxx	This selects all similar sub items in the entire well.

The unselect functions deselect the items selected with the functions above.

If a **/Component/Video** unit is installed in the instrument, the camera control is available. With the help of the **CAMERA** plug-in, a XYZ stage can be calibrated. If stage and camera are calibrated, the camera control displays mouse positions in [mm].

7.2.4.2 Camera Control Context Menu

1. Press the right mouse on the **Optional Camera** control, and a context menu appears:



Move stage to this position	Moves the stage to the current mouse position
Stop all drives	Stops the movement of all drives
Move stage perpendicular to the camera	If you work with the well plate, the camera and the well must be perpendicular to each other. This drives the stage to the value configured in the Camera: Horizontal Angle
Lock reticle	Prevents the reticle to be moved on the screen
Reset the reticle to the image center	Moves the reticle to the middle of the image

Save camera image with experiment	Saves an image with every experiment. The image is made when you select Measure here (see below)
Measure here	Creates an experiment at the actual mouse position, recalculated in stage x,y,z coordinates. This adds the experiment into the Start Jobs control on the left.
Save camera image as	Creates a image and saves it under a user defined name.

7.2.5 The Aluminum Bath Tab

With the **Aluminum Bath** tab, the user can start batches of aluminum bath samples. All jobs entered on the tab will be executed with the same measurement template as defined on the **Start Jobtemplates** tab. All samples will get individual IDs. The creation of the sample IDs can get configured.

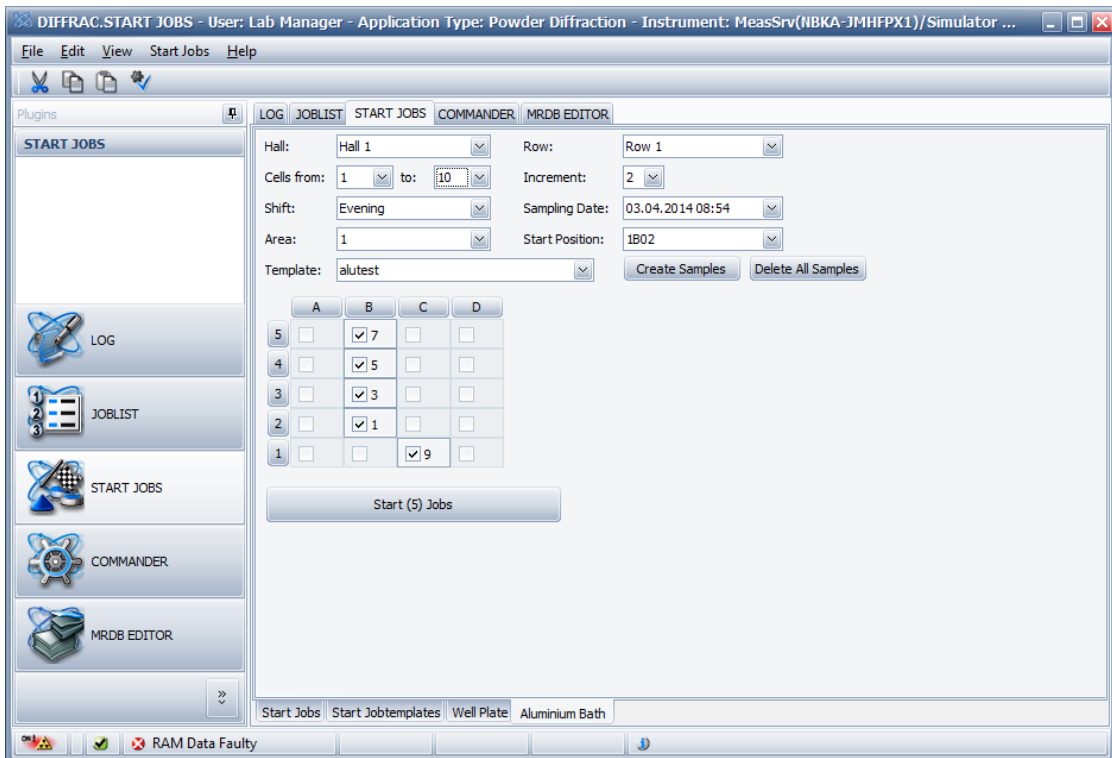
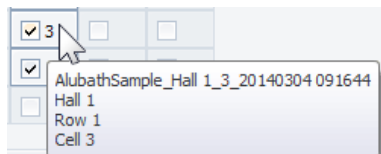


Figure 7.14: The Aluminum Bath tab

The user can select the hall and the row where the samples have been taken. He can select the first cell a sample has been taken from and the last cell a sample has been taken from as well as the increment (e. g. samples have been taken from every cell between the first and the last cell or from every second cell). He can optionally also add information about the shift and the sampling date which will be stored in the database and can be used for the creation of the sample ID.

After the user has selected all information about the samples, he can select the sample changer Area of the instrument where he has placed the samples and the Start Position where he has placed the sample that has been taken from the first cell. He finally has to select the Template which he wants to use for the measurement of all samples and can then press the button Create Samples to create the samples.

As soon as samples are created, the according positions at the sample changer control of the Aluminum Bath tab will get active. At each active position, the user can directly see the ID of the cell where the sample has been taken from. When the user hovers with the mouse over the positions, he will see a pop-up that gives him additional information about the sample containing the sample ID and the three values for hall, row and cell.



If some single samples of the batch are missing, e. g. cause the according cell is currently not active, the user can uncheck the sample in the sample changer overview so that this sample will not be send to the instrument and this not measured.



After the user has pressed the button **Create Samples**, the **Aluminum Bath** tab will automatically adapt changes in the combo boxes. Information about manually unselected samples will get lost during such an automatic adaption.

By pressing the **Start Jobs** button, all selected samples will get started.

7.2.5.1 The Aluminum Bath Configuration Dialog

The user can open the **Aluminum Bath Configuration** dialog through the according entry at the **Start Jobs** menu.

On the first tab of the **Aluminum Bath Configuration** dialog, the user can configure the configuration of his cells. He can type in any strings for hall and row, e. g. the name of the row, name of the potline or any other name that helps him do identify the cells. The values for **First Cell** and **Last Cell** have to be numeric values. After the user has typed in the information that describes a row of cells, he has to press the button **Add** to add the entry to the configuration.

With the button **Edit Selected Row**, the user can load the values for the selected row of the configuration entry table to the textboxes above and edit the values. After he has edited the values, he has again to press the button **Add** to add the row again. To delete a row, he has to select the row at the table and press the button **Delete Selected Row**.

There is no limitation in the number of configuration entries.



After the user has changed the configuration of the **Aluminum Bath** tab, all samples that have not yet been started will be deleted.

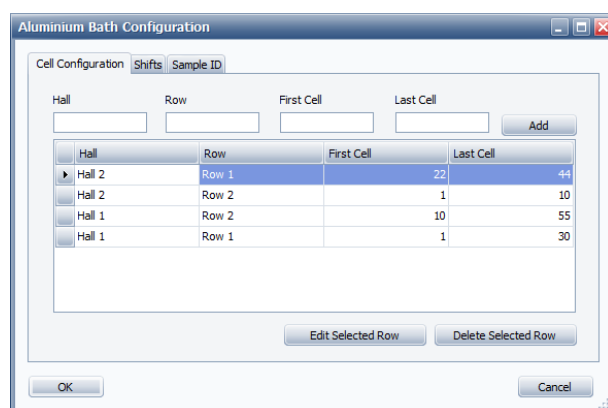


Figure 7.15: The **Cell Configuration** tab of the **Aluminum Bath Configuration** dialog

The second tab can be used to define values for the optional parameter **Shift**. The user can type in any string to identify a shift. The behavior of the buttons is exactly the same as on the first tab.

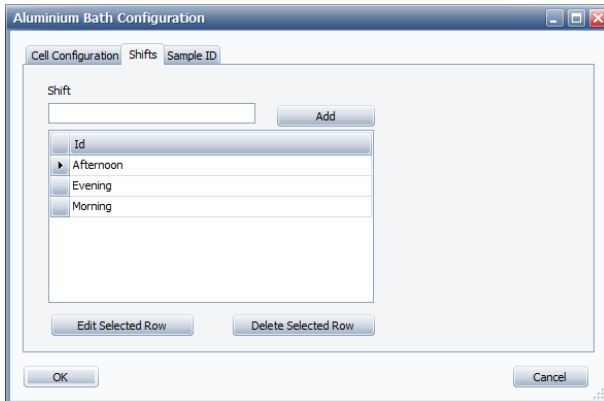


Figure 7.16: The **Shifts** tab of the **Aluminum Bath Configuration** dialog

On the third tab, the user can configure the **Sample ID** that will be used for creation the aluminum bath samples. The **Sample ID** can contain fixed string parts as well as some variables that will automatically get replaced with the according value during the creation of the sample.

The following variables can be used:

Hall	Selected value of the combo box Hall.
Row	Selected value of the combo box Row.
Cell	The cell where this sample comes from.
Shift	Selected value of the combo box Shift.
User	The user that has created the sample.
Job Creation Date	The current system time when the user creates the samples.
Sampling Date	The time selected at the Sampling Date input.

When the user wants to use a variable, he can place the cursor at **Sample ID** input field to the position of the string where he wants to have the variable, select the variable at the combo box and press the button **Add**.



Figure 7.17: The **Sample ID** tab of the **Aluminum Bath Configuration** dialog

Job Creation Date and **Sampling date** variables will later be replaced with the according timestamp in system default formatting. If the user wants to format the timestamps in another format, he can add a format string to the variable. To use a custom formatting for date values, the user has first to add the variable, e. g. **%SAMPLINGDATE%** for the sampling date, then go to the end of the variable and put in a double point followed by the format string before the

closing % of the variable. If the user types in **%SAMPLINGDATE:yyyy-dd-MM%**, the sampling date will be added as a sortable date (**2014-04-02** for the 2nd of April 2014). All **C#** date and time formatting strings can be used. The most important are:

Table 7.1: C# date and time formatting strings

yy	Year, two digits
yyyy	Year, four digits
MM	Month, two digits
MMMM	Month, name of the month
d	Day of month, one or two digits
dd	Day of month, always two digits
hh	Hour, always two digits
mm	Minute, always two digits
ss	Second, always two digits

8 JOBLIST

8.1 General

The **JOBLIST** plug-in enables the user to monitor the processing of jobs that have been started using **START JOBS** or another plug-in of the measurement software. It shows experiments that are to be executed (“waiting” or “pending” jobs) or are currently in progress (“active” or “running” jobs) on the currently connected instrument. The jobs are listed in table form. On completion the jobs are automatically deleted from the job list and reappear in a list of completed jobs.

The user can stop pending and running jobs, and later resume (This means that an attempt is made to resume suspended jobs) or delete them. Jobs stopped in this way are called “suspended” jobs.

Jobs that cannot be executed are automatically stopped and assigned the status “suspended” by the software.

The measurement information for suspended jobs can be modified in the job list before they are resumed. Therefore, a suspended job must not be newly created.

JOBLIST also allows the user to create scheduled jobs. These jobs are generated automatically from a template that is created using the measurement information of a completed job. They can be started at a specific time and repeated a defined number of times at a specific time interval.

Scheduled jobs are displayed in a Scheduled Jobs list before being executed. Upon initiation of the measuring operation, scheduled jobs are automatically deleted from the Scheduled Jobs list and appear as active jobs in the job list.

Job Priority Levels

There are three priority levels for jobs – high, normal, and low. Jobs can be assigned a high or a normal priority in **START JOBS**, as scheduled jobs can be prioritized in **JOBLIST**. Suspended jobs in **JOBLIST** can be assigned one of the three priorities before they are resumed.

In general, jobs are listed in the job list and executed in the order in which they have been created. However, if jobs with different priority levels have been started, those of a higher priority are executed before those of a lower priority level. Moreover, running jobs of a lower priority are interrupted to accommodate those of a higher priority level.

8.2 Screen Layout and Operation

8.2.1 Joblist and Job Details Windows

The **JOBLIST** page contains two movable windows. The **Joblist** window in the upper part of the page contains the actual job list. This is a list in table form of pending and active jobs and their related measurement information.

In the **Job Details** window in the lower part of the page the processing information for the jobs that appear in the job list is displayed. The events that occur from initiation of a job start are shown in table form. The latest event is reported in a message text in the top row.

To obtain the details of a job,

1. select the job in the job list by clicking on any table cell in the row containing its measurement information.

⇒ Details of the job will appear in the **Job Details** window.

Repositioning the Joblist and Job Details Windows

Both the **Joblist** window and the **Job Details** window can be repositioned on the screen.

To do this,

1. place the mouse pointer on the title bar of the window.
2. Hold down the left mouse button and start dragging the window.

⇒ While the window is being dragged, a set of blue docking points will become visible on the screen. If the title bar is dropped during this time at any point, the window will become docked in this position. The position information is stored in the current user's profile. This means that the next time the Measurement Client is started, any window that has been repositioned in this way will be found in its newly docked position

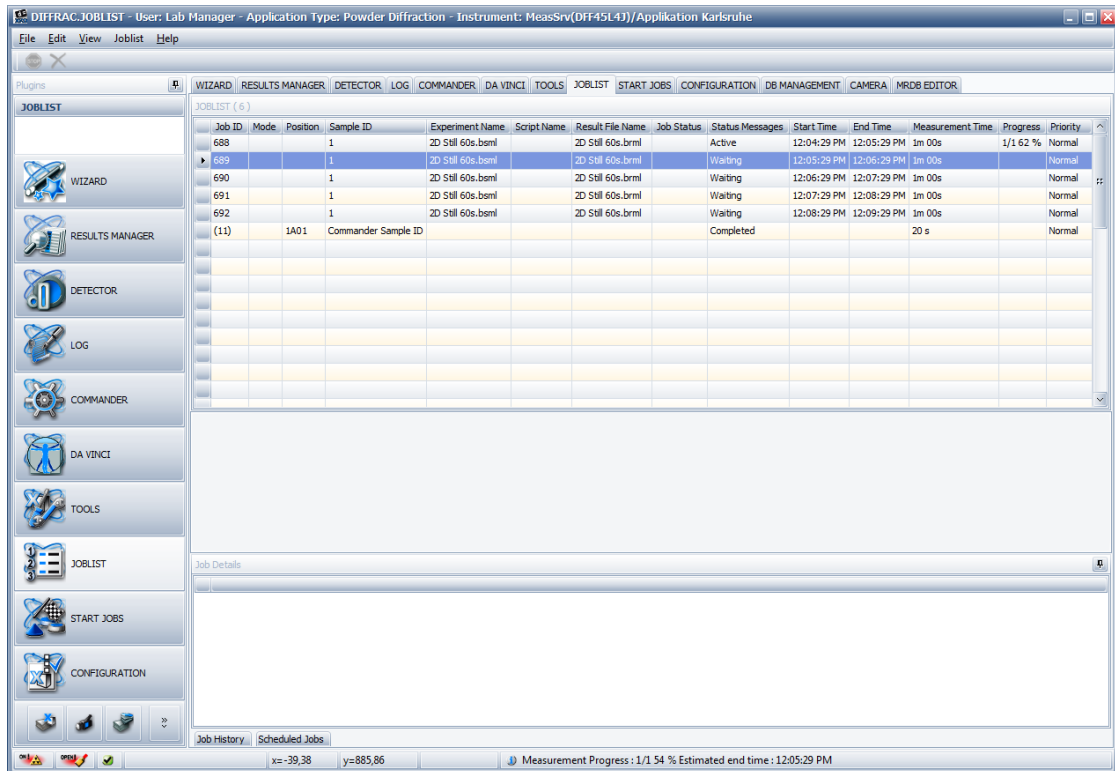




Figure 8.1: The Joblist and Job Details windows

The table in the **Joblist** window contains the following columns:

Job ID	Every job has a unique job ID. This ID number is assigned by the database.
Result file name	Name of the result file.
Position	The position of the sample in the magazine or tray.
Sample ID	An arbitrary ID number assigned to a sample by an operator.
Instrument:	The instrument with which the sample is to be measured.
Experiment name	The name of the measurement method (called “experiment” here) used to measure the sample.
Script name	The name of the measurement script used.
Measurement type	The type of mea
Job status	The status of the job, for example, Error, Warning, Waiting and Stopped.

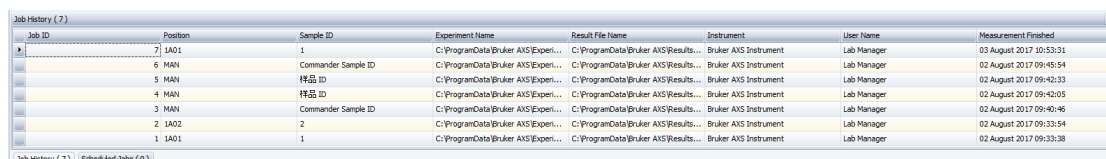
Status messages	Detailed status messages, if available.
Operator	Login name of the operator who started the job.
Start time	Estimated starting time of the job. If the job has already been initiated, the actual start time will be displayed.
End time	Estimated time at which the job is to be completed.
Measurement time	Estimated duration of the job measurement.
Progress	The progress of the measuring operation from 1% to 100%.
Priority	The priority (low, normal or high) of the sample.

Editing the Measurement Information of Suspended Jobs in the Joblist Window

The measurement information of suspended jobs can be changed in the Joblist window by first clicking on that specific job in the table cell. The  symbol changes to the  symbol at the left end of the row of information, indicating a switch to editing mode. The information can be altered as required.

8.2.2 Job History Window

The **Job History** window, accessed by the tab located in the bottom left-hand corner of the **JOBLIST** page, contains a list in table form of all the jobs executed in the last seven days. Their measurement information and completion time is included.



Job ID	Position	Sample ID	Experiment Name	Result File Name	Instrument	User Name	Measurement Finished
7	IA01	1	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	03 August 2017 10:53:31
6	MAN	Commander Sample ID	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	02 August 2017 09:45:54
5	MAN	样品 ID	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	02 August 2017 09:42:33
4	MAN	样品 ID	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	02 August 2017 09:40:05
3	MAN	Commander Sample ID	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	02 August 2017 09:40:46
2	IA02	2	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	02 August 2017 09:33:54
1	IA01	1	C:\ProgramData\Bruker\AXS\Exper...	C:\ProgramData\Bruker\AXS\Results...	Bruker AXS Instrument	Lab Manager	02 August 2017 09:33:38

Figure 8.2: **Job History** window

A completed job in the **Job History** window can be restarted by right-clicking on any table cell in the row of related measurement information

The **Job History** context menu will appear:

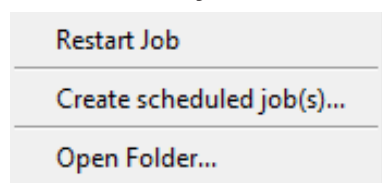


Figure 8.3: **Job History** context menu

The measurement information of a completed job can be used to create templates from which scheduled jobs can automatically be generated (see Section [Scheduling of Jobs \[90\]](#) below). This is done using the **Job History** context menu described above or with the **Joblist** menu (see Section [Joblist Menu and Job List Context Menu \[92\]](#)).

8.2.3 Scheduled Job Window

The **Scheduled Job** window, similar to the Job History window, is opened using a tab in the bottom left-hand corner of the **JOBLIST** page. It is divided into two panes whose width can be increased or reduced by seizing and dragging the splitter line that separates them.

The left-hand window pane contains a schedule of jobs generated by templates that are listed in the right-hand pane. The jobs move up the schedule as preceding jobs are executed one by one.

For information on the creation of templates for the automatic generation of scheduled jobs, see the following section.

8.2.4 Scheduling of Jobs

Jobs can be scheduled using functionality provided in the Job History and Scheduled Job windows.

A schedule template is created using the measurement information of a job that has already been executed. This template is used to generate a job that is started at a defined point in time and is automatically repeated a defined number of times at a defined time interval. Each repetition of the job is treated as a separate job and assigned its own job ID by the software.

To create scheduled jobs, select the job whose measurement information is to be reused from among the list of completed jobs in the Job History window. This can be done by right-clicking on any table cell in the row containing the job's measurement information.

The **Job History** context menu shown in the figure below will appear.

In this menu, select **Create scheduled job(s)** to open the dialog box **Scheduled job**.

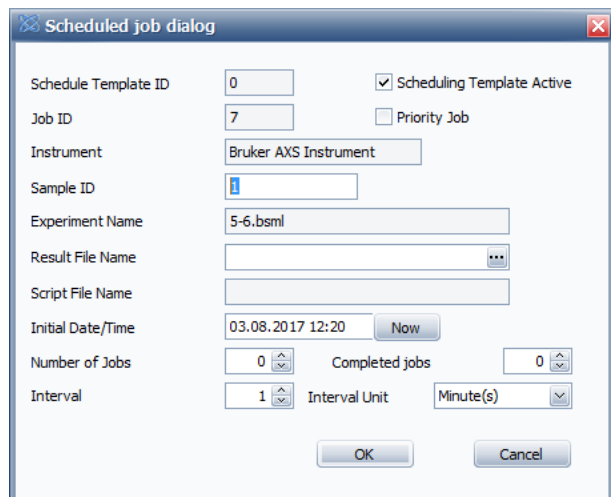


Figure 8.4: Dialog box **Scheduled job**

This dialog box contains the following data fields:

Schedule Template ID	An ID number assigned by the database to the new schedule template.
Job ID	The ID number of the job whose measurement information will be used to create the new template. When the scheduled jobs are generated from the template, they will be automatically assigned their own job ID number.
Schedule Template ID	An ID number assigned by the database to the new schedule template.
Instrument:	The name of the instrument on which the scheduled job(s) is/ are to be performed.
Sample ID	An arbitrary ID given to the sample by the user for identification.
Experiment Name	Name of the measurement method (called "experiment" here) to be used in the measuring operation(s).

Result File Name	Enter here the name of the result file in which the results of the measuring operation(s) are to be saved.
Script File Name:	The optional name of the script that is used together with the experiment file.
Initial Date/Time	Select a date and time for execution of the first scheduled job from the drop-down calendar in the data field or modify an existing date and time. If Now has been clicked on, the present date and time will be entered.
Number of Jobs	The number of scheduled jobs to be generated from the schedule template. However, this value is equivalent to the number of jobs actually generated only when the number selected for Completed Jobs (see below) is 0. The number of jobs actually generated is equivalent to the difference between the value selected for Number of Jobs and the value for Completed Jobs . For example, if Number of Jobs is 10 and Completed Jobs is 6, then 4 jobs will be carried out. This arrangement allows the user to reuse schedule templates from which jobs have already been generated. For example, if the user has used a template to create 10 jobs, he can reuse the same template to create 5 more jobs by selecting 15 for Number of Jobs and 10 for Completed Jobs . If the user selects 0 for Number of Jobs , the jobs will be repeated endlessly. In this case, he can only stop them by deactivating the scheduling or deleting the template in the right-hand pane of the Scheduled Jobs window (see below).
Completed Jobs	The number of completed jobs. The value selected here, together with that for Number of Jobs, determines the number of jobs actually carried out (see Number of Jobs above). As each job is completed, the value for Completed Jobs is automatically augmented by 1. If 0 is selected for Number of Jobs, the value for Completed Jobs will not be augmented.
Interval and Interval Unit:	Select the time interval between the repeated jobs.
Scheduling template active	Check this checkbox to activate the scheduling. If the scheduling is not activated, no scheduled jobs will be executed. However, once the template is created the user can activate the scheduling in the Schedule jobs window at a later point in time (see below).
Priority Job	By checking this check box scheduled job(s) can be assigned as a high priority.

After the scheduling data have been entered in the dialog box, click **OK**.

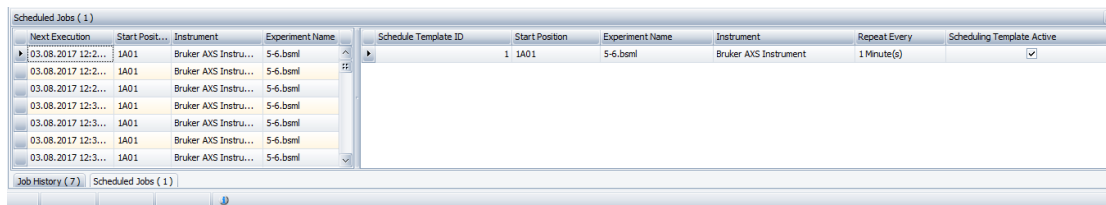


Figure 8.5: **Scheduled Jobs** window

The newly created template with its measurement and scheduling information will appear in the list of templates in table form in the right-hand pane of the **Scheduled Jobs** window. The left-hand pane contains the schedule of the jobs that have been generated from the templates. This schedule is limited to the jobs that are planned for execution within the next 24 hours.

The planned jobs move to the top of the schedule as preceding jobs are carried out. When the measurement begins, the job disappears from the schedule and reappears as a running job in the **job** list.

Templates whose job scheduling has not been activated during their creation appear in the list of templates. However, no jobs are generated from these templates. The scheduling can be activated at any time by checking the corresponding check box in the active column of the table. The scheduling information of an inactive template can be modified before the template is activated, if necessary. To do this,

1. right-click on any table cell in the row containing the template’s measurement and scheduling information.
 - A context menu appears.

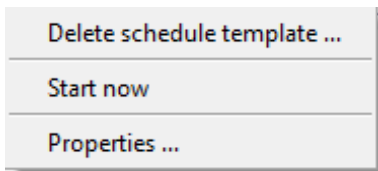


Figure 8.6: *Schedule template context menu*



2. Click on **Properties** to obtain the dialog box **Scheduled job** and modify the scheduling information as required.
3. Then click **OK** and the changes will be adopted in the template.

Templates and the jobs generated from them can be deleted using the same context menu. Running jobs will continue to be executed until they are completed.

If you press **Start now**, the job is scheduled immediately.

8.2.5 Speed Buttons

Speed buttons are provided in the speed bar beneath the menu bar for two frequently used **JOBLIST** functions. These are:

	Stop all jobs
	Delete all jobs

These functions are also available using the **Joblist** menu. They are described in detail in the following section.

8.2.6 Joblist Menu and Job List Context Menu

The **Joblist** menu in the menu bar contains commands for managing jobs as well as creating and managing schedule templates. These commands are also available using the context menus. The first eight items of the menu are available in the **Job list** context menu described in this section. **Restart Job** and **Create scheduled jobs** are available in the **Job History** context menu (see Section [Job History Window \[89\]](#)). **Delete schedule template** and **Properties** are available in the **Schedule template** context menu (see Section [Scheduling of Jobs \[90\]](#)).

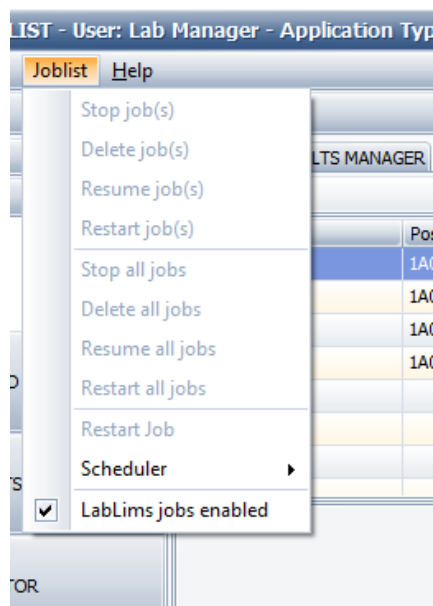


Figure 8.7: **Joblist** menu

The items of the Joblist menu provide the following functions:

Stop job(s):	Stops all selected jobs. Stopped jobs are assigned the status suspended .
Delete job(s):	Deletes jobs with a suspended status. The job(s) must first be selected.
Resume job(s):	Resumes jobs with a suspended status. The job(s) must first be selected. When jobs are resumed, an attempt is made to start their execution. If this fails, the jobs become pending jobs.
Restart Job(s):	Restarts the selected job(s) in the list of completed jobs in the Job History window.
Stop all jobs:	Stops the jobs running on all controlled instruments as well as all pending jobs. Stopped jobs are assigned the status suspended .
Delete all jobs:	Deletes all jobs with a suspended status.
Resume all jobs:	Resumes all jobs with a suspended status. An attempt is made to start execution of the jobs. If this fails, the jobs become pending jobs.
Restart all jobs:	Restarts all jobs in the list of completed jobs in the Job History window.
Restart Job :	Restarts a selected job from the Job History window:
Scheduler:	Opens the scheduler sub-menu.
Create Scheduled Job(s):	Opens the dialog box Scheduled job . A completed job must be selected. Its measurement information will be used for the creation of a schedule template.
Delete schedule template:	Deletes the selected schedule template in the list of schedule templates in the right-hand pane of the Scheduled Jobs window.
Start now:	The selected job is scheduled immediately:

Properties:	Opens the dialog box Scheduled job containing the parameters for the selected schedule template in the list of schedule templates in the right-hand pane of the Scheduled Jobs window.
--------------------	--

- **LabLims jobs enabled:** This enables or disables the use of **LabLims jobs** in the Measurement Server. The Measurement Server scans the **\LabLims** subdirectory periodically for new **LabLims** files in order to start new experiments on the instrument. If the start of new experiments shall be stopped, uncheck this menu item.
In addition to the first eight items of the **Joblist** menu, the **Job list** context menu obtained by clicking on the job list contains the items **Visible Columns** and **Reset to column defaults**.

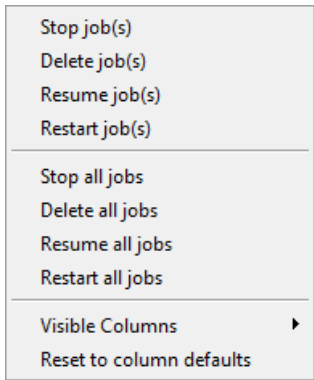


Figure 8.8: Job list context menu

Visible Columns	Displays a list of all columns that are visible in the Joblist window. Columns not required can be unchecked by the user. The information is stored in the active user profile of the user. This means that, only the checked columns will appear in the window at the next start of the Measurement Client .
Reset to column defaults	Removes all previous column settings from the user profile and shows the standard columns described in Section Joblist and Job Details Windows [87] above.

9 DAVINCI

9.1 General

The DAVINCI plug-in provides an overview of the components currently mounted on the tracks and at the center of the goniometer of the connected instrument, as well as their properties. For example, these components include, the X-ray tube, optical systems including slits and absorbers, a rotating stage or Eulerian cradle, and the detector.

DAVINCI can be used to perform set-up operations. For example, if a rotary absorber is mounted on the goniometer, the user can choose between absorbers of different absorption factors. In the case of TWIN-optic, the user can choose between alternative optical systems. Settings for motorized slits can also be defined.

The component positions, their location on the primary and secondary tracks and the list of available components, that can be mounted in each of these positions, are defined in the instrument configuration. For example, the component **Tube mount** and the lower-level components **Tube Cu** and **Tube Mo** can be defined in the configuration. These components are assigned to position 1 on the primary track.

A component recognition system checks whether the components currently mounted in their positions on the goniometer actually belong to those positions as defined in the instrument configuration. If a component is incorrectly positioned, a component status error icon appears at the position in the overview.

Getting Control of the Instrument

Control of the instrument by DAVINCI is required to send information to the instrument. For example, this would apply to new parameter values for a motorized slit. Therefore, the DAVINCI plug-in requests control to change a parameter value automatically. If the instrument is already controlled by another plug-in instance, an error message will appear if an attempt is made to send the information.

Similar to other plug-ins, obtaining control of a connected instrument requires that control of the instrument has already been obtained by the Measurement Server. This is done by the item **Status window** of the Measurement Server's start menu (see Section [Getting and Releasing Control of and Reconnecting to Instruments \[▶ 22\]](#)).

9.2 Screen Layout and Operation

A graphical representation of a goniometer and its tracks is shown on the **DAVINCI tab** page. Panels providing information about the current state of the component positions are displayed on top of the tracks and at the center of the goniometer.

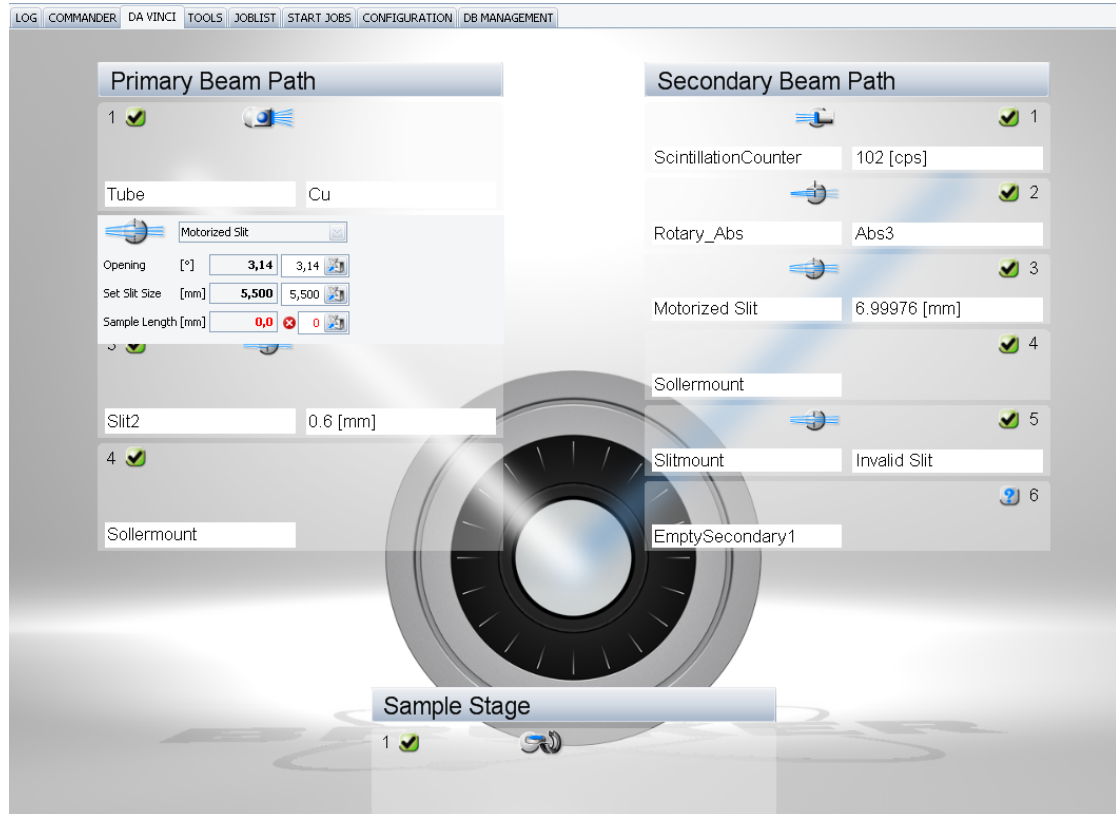


Figure 9.1: Interface of DAVINCI - Overview of tracks and center of goniometer of connected instrument

Component positions can be occupied by a single component. For example, a detector or a component that accommodates another lower-level component, a slit mount and a slit.

When the positions are completely filled with components, each of the information panels contains a **Component status icon**, a **Component type icon** and left and right information windows with a white background.

The **Component status icon** serves as a general status icon for all components belonging to a position. For example, if a Soller mount is located at its position, an **OK status icon** appears indicating that the Soller mount is correctly positioned. If both a Soller mount and a Soller slit are located at the position, but the Soller slit is incorrectly positioned, an **Error status icon** appears. If a position is empty, an “unmounted” status icon is displayed.

The component status icons used in DAVINCI are the same as those used in CONFIG and TOOLS. For a description of the icons and their meanings, see Section [Component Tree Window](#) [209].


The gray and blue component type icon represents the most principle component in the position. If the principle component is absent, the icon will not appear. If the position is taken by a rotary absorber and its different absorbers the component type icon represents the rotary absorber. If the position is taken by a Soller mount and a Soller slit, the icon represents the Soller slit. However, if the position is taken by a TWIN optics, two component type icons appear, which represent the two alternative optical systems, such as a Goebel mirror and a motorized slit. Both icons are displayed on the information panel regardless of the optical system that has been chosen.

Component type icons are also imprinted on the hardware components. This enables the user to locate the required component quickly during manual instrument setup.

When a position is occupied by a single component, the name of the component appears in the left information window. When it is occupied by two or more components, the name of the principle component is shown. However, when the position is occupied by a TWIN-optic, the name of the TWIN-optic will be displayed. The name of the chosen optical system will not be shown. If no components are present, **Empty Position** will be displayed in the left information window.

To summarize, the most important property of the mounted component is displayed in the right information window. When two components are present, the principle component is displayed. If a rotary absorber is mounted, the type of absorber that has been chosen will be displayed. Likewise, if a TWIN-optic is mounted, the chosen optical system will be displayed.

When the mouse pointer is placed over one of the various elements of an information panel, a window providing information about the element will be opened. When the pointer is placed over a component type icon, an information window with the name and a description of the component type will be displayed. Similarly, if the pointer is placed over a position number a window will be opened containing information about the position as defined in the instrument configuration.

If the user clicks on an information panel a window will be opened that shows the properties of components mounted in the position. In some cases, data entry fields are provided that can be used for making settings, as with a motorized slit, or choosing between alternative components, as with a TWIN-optic or rotary absorber. Buttons  are provided in the data fields for sending the new settings to the instrument.

Similar to other plug-ins, DAVINCI contains an edit control. If the mouse pointer is placed over a parameter name, a unit, or a data field, a window will be opened. This window provides a description of the parameter and the restrictions applying to its value. If the field contains a value that has already been set, this will be indicated. For a full description of the edit control, see Section [Editing Control](#) [▶ 178].

10 RESULTS MANAGER

10.1 Introduction

Jobs that have been successfully started with the START JOBS or with the COMMANDER plugin are stored in the database.

The RESULTS MANAGER allows the results to be searched for, shown, monitored, formatted, printed and exported. The three main modes available are the:

- **Configure (Edit) mode:** defines the filters for searching results and the formatting parameters for displaying and printing the results.
- **Monitor mode:** automatically displays on the screen the evaluation results at completion of the measurement of a sample
- **Show/Results mode (query):** displays the results found in the database using the filters defined in the **Edit** mode (date, sample name, measurement method...).

10.2 General

10.2.1 Screen Layout

The main screen of the RESULTS MANAGER consists of one or several views that are arranged in tab pages. All available kinds of view will be described in the following sections.

If the application is closed or if a different user logs in, the views that are currently displayed, will be stored automatically. These settings are retrieved automatically during the user's next log-in.

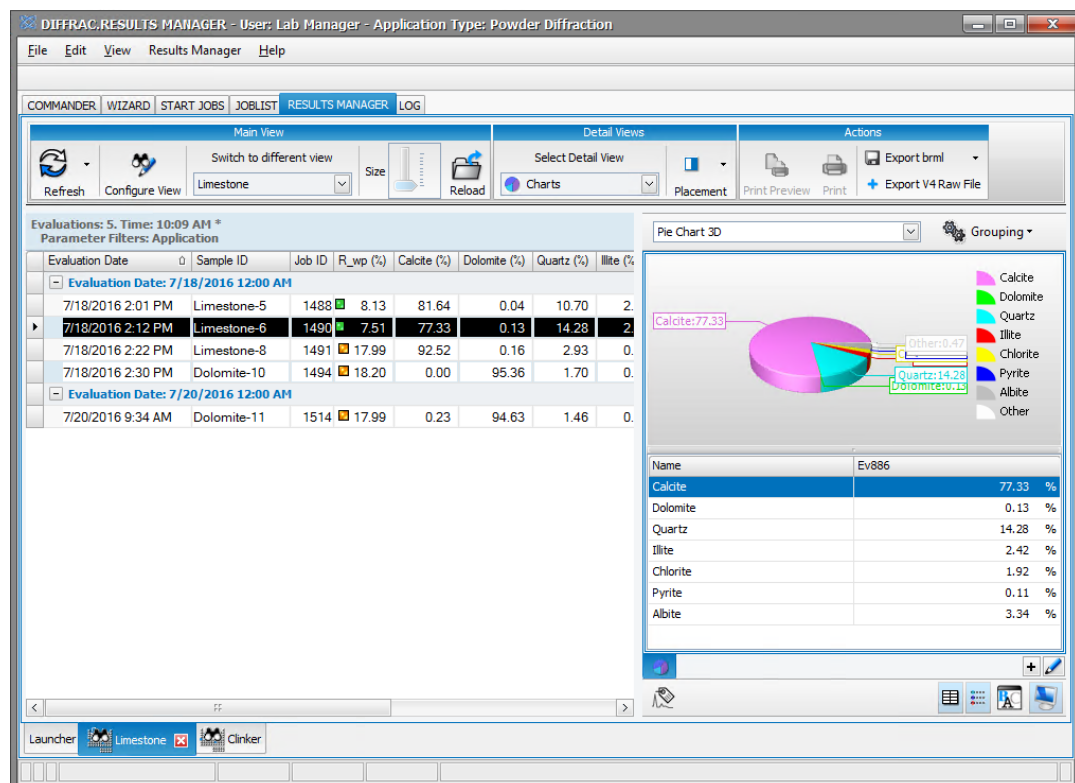


Figure 10.1: RESULTS MANAGER screen

10.2.1.1 RESULTS MANAGER Kinds of View

LAUNCHER view

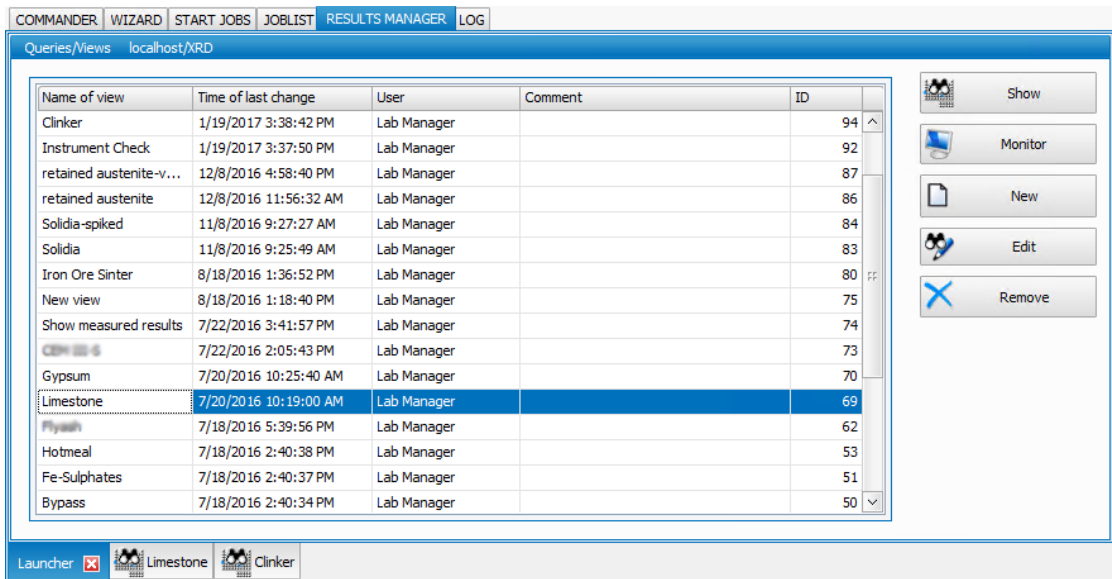







Figure 10.2: LAUNCHER screen

The **LAUNCHER** view allows easy access to basic functionalities like opening views and monitors. It can be opened from the **Results Manager** menu.

The **LAUNCHER** view shows all the available views. Buttons on the right can be used to perform actions on a selected view.

Button	Description
 Show	Opens the Results view
 Monitor	Opens the Monitoring view
 New	Opens a new view with default settings
 Edit	Opens the Specification/Formatting view
 Remove	Deletes the selected view

Results view

The **Results** view displays results gained by a query. The results found and their layout depend on the settings defined in the **Specification/Formatting** view. Results are not automatically updated.

Evaluations: 2. Time: 10:36 AM
Parameter Filters: Application

Evaluation Date	Sample...	Job ID	R_wp ...	Gypsum (%)	Hemi-Hydrat...	Anhydrite (%)	Calcite
7/18/2016 ...	Gypsum-9	1509	9.94	88.76	0.10	4.22	4
7/18/2016 ...	Gypsum-7	1500	9.70	84.86	0.00	0.30	2


Measurement	
Specimen	Gypsum-9
Name	8-65-5min5s
Time	7/18/2016

Compounds	
R_wp	9.94 %
Gypsum	88.76 %
Hemi-Hydrate	0.10 %
Anhydrite	4.22 %
Calcite	4.83 %
Dolomite	1.13 %
Quartz	0.05 %
Illite	0.48 %
Chlorite	0.00 %
SO3_XRD	43.81 %

Figure 10.3: Results view

Formatting/Specification view

- The **Formatting/Specification** view offers user to set formatting for results display and filters for results search.
- Users can switch between **Results** view and **Formatting/Specification** view via the **Show Results/Configure View** button.

 Determine the order in which the results are displayed and if all or most recent results should be displayed. Apply formatting information.

	Original Name	Display Name	Visibility	Unit	Format	Digits	Type
1	Evaluation Date	Evaluation Date	Yes		Date and time		Parameter
2	Sample ID	Sample ID	Yes		String		Parameter
3	Job ID	Job ID	Yes		Integer		Parameter
	R_wp	R_wp	Yes	Percent	Fixed Decimals	2	Compound
	Calcite	Calcite	Yes	Percent	Fixed Decimals	2	Compound
	Dolomite	Dolomite	Yes	Percent	Fixed Decimals	2	Compound
	Quartz	Quartz	Yes	Percent	Fixed Decimals	2	Compound
	Illite	Illite	Yes	Percent	Fixed Decimals	2	Compound
	Chlorite	Chlorite	Yes	Percent	Fixed Decimals	2	Compound
	Pyrite	Pyrite	Yes	Percent	Fixed Decimals	2	Compound
	Albite	Albite	Yes	Percent	Fixed Decimals	2	Compound
	K-Feldspar	K-Feldspar	Yes	Percent	Fixed Decimals	2	Compound
	CO2_XRD	CO2_XRD	Yes	Percent	Fixed Decimals	2	Compound

Visibility: Yes Unit: Format: Date an... Significant/Decimals: 0

Automatic formatting

Threshold: 0.01 Percent Trace: PPM Fixed Decimals Significant/Decimals: 0

Major: Percent Fixed Decimals Significant/Decimals: 0

Detected Compounds

Sequence: Order of creation Compounds on fixed positions: 0 Sort by Concentration in Detail View Hide zero concentrations

Figure 10.4: Formatting/Specification view

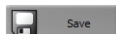
General view



The **General** view allows setting global defaults for new views. It is opened by selecting the **Edit defaults** command on the **Results Manager** menu.

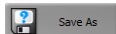
10.2.2 Saving View Formatting/Specification to Database

To save any changes made to **View** settings,



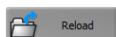
1. click the **Save** button.

If the changes are to be saved to a different specification,



1. use the **Save As** button.
- ⇒ A new **View specification** name will be required.

To reset changes and load the last saved version of the view specification,



1. click the **Reload** button

10.2.3 Results Manager Menu

	Button	Description
	Export View	Save view layout to a file
	Import View	Open a view layout file
	Store workspace	Save screen layout to a file
	Load workspace	Open a screen layout file
	Print Preview Selection	Open print preview for selected results
	Print Selection	Print selected results
	Open View	Open an existing view
	New View	Create a new view from scratch
	Reload View	Reload view as it was last saved
	Save View	Save current view
	Save as view...	Save current view as a new view
	Apply defaults	Apply default settings to the current view
	View File Browser	Browse for a measurement file (BRML file)
	Show Solutions	Open a window with the list of solutions available in the database
	Launcher	Open Launcher view
	Edit Defaults	Open General view for editing defaults for new views
	Define Types/Units...	Create and modify formatting types
	Global visualization settings...	Define the appearance of texts and in particular the way checked results are highlighted
	Connect Applications to Views	Assign views to applications
	Show units in database	Open a window with the list of units available in the database. Add/remove units to/from the database
Show compounds	Open a window with the list of compounds available in the database	

	Button	Description
	User Privileges	Define user rights. See below for more details.
	Preferences	Choose to be warned or not about unsaved changes when closing or switching a modified view
	Toggle basic mode	Toggles the Results Manager menu to basic mode (with only basic commands).

Connect Applications to Views

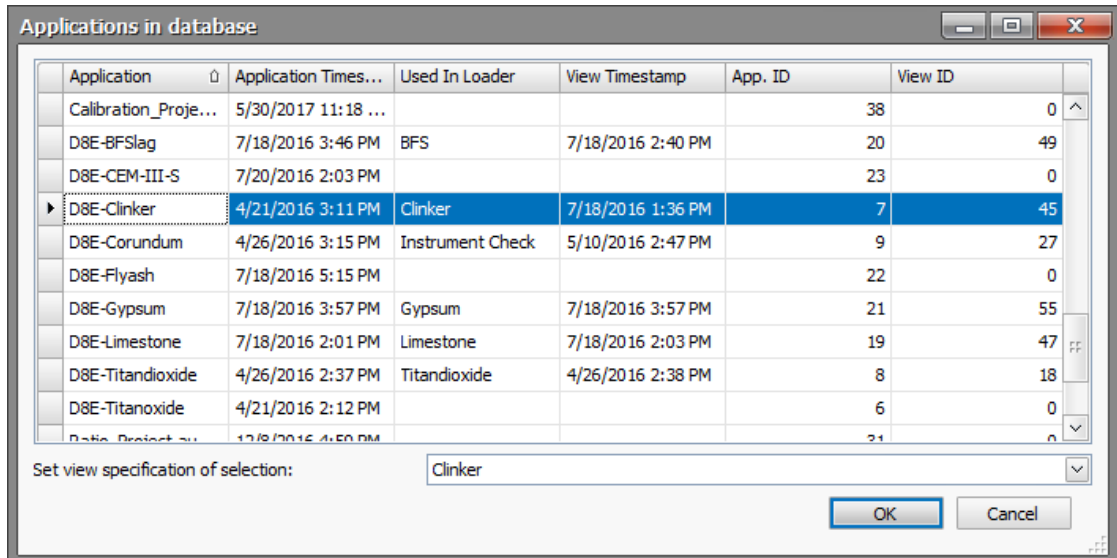


Figure 10.5: Assigning views to applications

The Loader, Touchscreen and Results Gallery can also display results and with a defined formatting as in the Results Manager. The Applications in database dialog box allows the user to define for each application that is stored with the results to the database which view specification is used.

To set a view specification for an application:

1. Select the application in the list.
2. Select the desired view specification in the **Set view specification of selection** drop-down list.
3. Click **OK**.

User privileges

The RESULTS MANAGER has a basic (Interactive Users) and an advanced (Administrators) mode. The user privileges dialog allows assigning privileges for RESULTS MANAGER to these two groups of users. Either a user (Guest, Operators, LabManager, etc) belongs to the Interactive Users group or to the Administrators group is defined in the **Assign group rights for group** dialog of the **User Management** tab of DB Management (see section [Groups Table \[163\]](#)). The right **Display advanced RESULTSMANAGER user** interface should be selected to assign the user to the Administrators group. Else the user will belong to the Interactive users group.

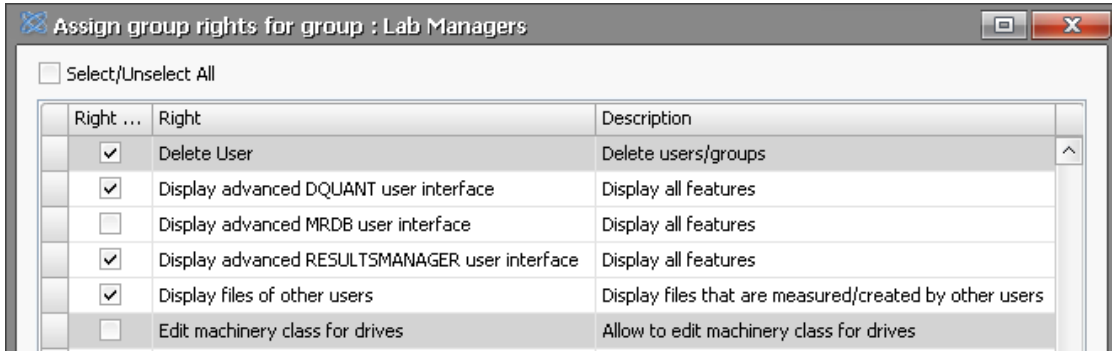


Figure 10.6: Assigning group rights in DB Management

See also

 Groups Table [▶ 163]

10.2.4 Customizing Tables

All tables can be customized. Columns can be moved, removed, sorted, etc.

To change a column position:

1. drag and drop it to another position.

To customize a column:

1. right-click the column header:
 - the related contextual menu will be displayed.

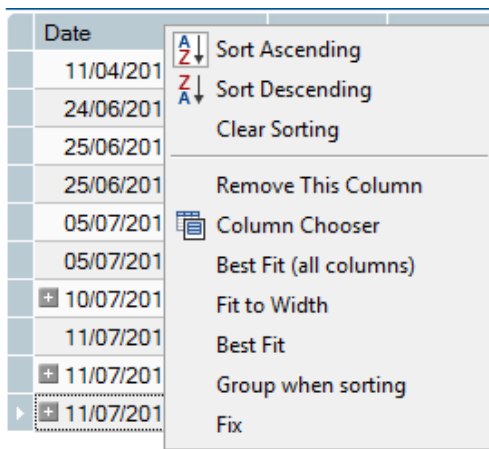


Figure 10.7: Customizing column tab

Available options are described in the following table:

Table 10.1: Options for customizing tables

Command	Description
Sort Ascending	Self-explanatory
Sort Descending	Self-explanatory
Clear Sorting	Cancel the Sort Ascending/Descending operation
Remove This Column	Remove the column from the display
Column Chooser	To choose the columns to be displayed. See below for details

Command	Description
Best Fit (all columns)	Click to make all the columns fit the text
Fit to width	Fit all columns on the display
Best Fit	Click to make the selected column fit the text
Group when sorting	Group column information by value when sorting
Fix	Fix column position on the table

Columns can also be removed from the display using a drag-and-drop operation.

To use the column chooser:

1. Click the **Column Chooser** command to display the **Customization** box.

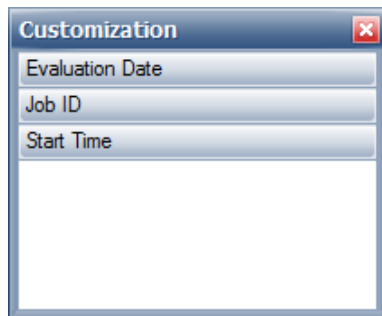


Figure 10.8: Column selector

To remove a column from the table,

1. click the column header and drag it to the **Customization** box.

To add a column to the table,

1. drag it from the **Customization** box to the column header where it is to be inserted.

10.2.5 Copying Values from a Table to the Clipboard

You might want to copy data from a RESULTS MANAGER table to an external spreadsheet program.

To copy data to the clipboard:

1. Select the rows to be copied.
2. Right-click to display the **Copy value** command.
 - All visible columns will be copied with header.
3. Click the **Copy value** command.

⇒ Data can then be pasted to a spread sheet for example.

Evaluation Date	Sample ID	Job ID	R_wp (%)	Calcite (%)	Dolomite (%)	Quartz (%)	Illite (%)	Chlorite (%)	Pyrite (%)	Albite (%)	K-Feldsp
Evaluation Date: 7/18/2016 12:00 AM											
7/18/2016 2:12 PM	Limestone-5	1488	8.13	81.64	0.04	10.70	2.51	1.59	0.19	2.32	
7/18/2016 2:12 PM	Limestone-6	1490	7.51	77.33	0.13	14.28	2.42	1.92	0.11	3.34	
7/18/2016 2:22 PM	Limestone-8	1491	17.99	92.52	0.16	2.93	0.91	1.33	0.55	0.40	
7/18/2016 2:30 PM	Dolomite-10	1494	18.20	0.00	95.36	1.70	0.14	1.74	0.07	0.24	

Figure 10.9: Copying data from a table

10.2.6 Label Editor

At various places in the software, labels that support placeholders can be created.

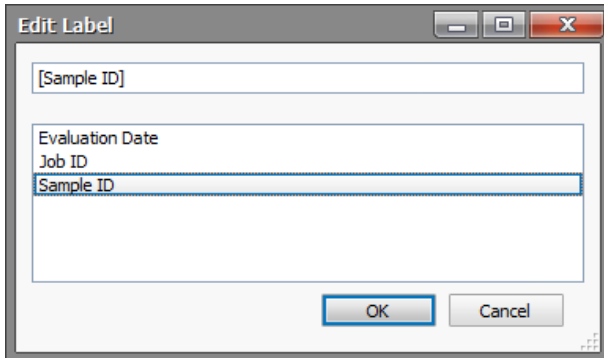


Figure 10.10: Label editor

- These labels work in the following way. A free text can be entered. Placeholders can be inserted into the text. These consist of the identifier of a property enclosed in square brackets, e.g.
[Sample ID]
- Whenever the label is used on a result, the placeholders are replaced by the value in the result.
As an example consider the following label:
[Job ID]__[Sample ID]
- When this is applied to a result of a sample named 'ABC' that has been measured with Job ID 234, the following label is gained:
234__ABC
- The editor allows a free text input. There is also a list of supported properties. Inserting labels into the text is possible by double-clicking on the corresponding entry in the list.

10.3 Creating a Results Format

At completion of the measurement, the sample attributes, concentrations and intensities are stored in the database. RESULTS MANAGER makes it possible to select, rename and format sample attributes.

The formatting editor can be called by selecting **Display | Formatting** on the left navigation bar.

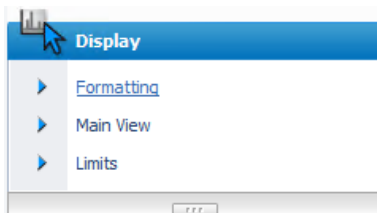


Figure 10.11: Display tab

Determine the order in which the results are displayed and if all or most recent results should be displayed. Apply formatting information.

	Original Name	Display Name	Visibility	Unit	Format	Digits	Type
1	Evaluation Date	Evaluation Date	Yes		Date and time		Parameter
2	Sample ID	Sample ID	Yes		String		Parameter
3	Job ID	Job ID	Yes		Integer		Parameter
	R_wp	R_wp	Yes	Percent	Fixed Decimals		2 Compound
	Calcite	Calcite	Yes	Percent	Fixed Decimals		2 Compound
	Dolomite	Dolomite	Yes	Percent	Fixed Decimals		2 Compound
	Quartz	Quartz	Yes	Percent	Fixed Decimals		2 Compound
	Illite	Illite	Yes	Percent	Fixed Decimals		2 Compound
	Chlorite	Chlorite	Yes	Percent	Fixed Decimals		2 Compound
	Pyrite	Pyrite	Yes	Percent	Fixed Decimals		2 Compound
	Albite	Albite	Yes	Percent	Fixed Decimals		2 Compound
	K-Feldspar	K-Feldspar	Yes	Percent	Fixed Decimals		2 Compound
	CO2_XRD	CO2_XRD	Yes	Percent	Fixed Decimals		2 Compound

Visibility: Yes Unit: Format: Date and time Significant/Decimals: 0

Automatic formatting

Threshold: 0.01 Percent Trace: PPM Fixed Decimals Significant/Decimals: 0
Major: Percent Fixed Decimals Significant/Decimals: 0

Detected Compounds

Sequence: Order of creation Compounds on fixed positions: 0 Sort by Concentration in Detail View Hide zero concentrations

Figure 10.12: Formatting editor

The editor contains a table that lists the columns that are retrieved from the database and are going to be displayed in the main results table.

The shown parameters and compounds can be modified from the **Query** section on the left navigation bar. See section [How to Define the Parameters to be Shown \[110\]](#) for more details. When modifying the shown parameters and compounds, the table columns will be modified accordingly.

10.3.1 Changing the Display Name

The original name is the property/parameter name as retrieved from the database. The user can use a different name for the results display. To do so, enter the desired name in the **Display Name** text box.

10.3.2 Setting the Visibility

1. Click the **Visibility** text box to display the corresponding drop-down and
2. select the desired option.

Four options are available:

- **No**: Column is not visible in main results table.
- **Yes**: Column is always visible in main results table.
- **Fixed**: Column is always visible and stays in the display when the user scrolls large tables horizontally.
- **Auto**: Column is only visible when there is a result in the set of results that displays a value in the corresponding column. If the column is empty for all results it will be removed from view.

10.3.3 Selecting the Unit

1. Click the **Unit** text box to display the corresponding drop-down and
2. select the desired option.

Four options are available:

- **Percent**: the compound concentration will be given in %.
- **PPM**: the compound concentration will be given in PPM.
- **None**: the compound concentration will be given without unit.
- **Auto**: the unit selected will depend on the parameters set in the **Automatic formatting** area below the table.

Figure 10.13: Unit selection, automatic settings

The threshold gives the concentration value to determine if a compound can be considered as a trace or a major compound. Then the units are defined for **Trace** and **Major** compounds.

If you want to use another unit than those presented, or if you want to create your own format (for instance g/m² for Multilayer analysis),

1. click **Define Types/Units...** on the **Tools** menu.
 - The **Type formatting** dialog box will be displayed.
2. Go to the **Units** section.

Name	Unit ...	Factor	Conc.	Inten...	Other
Percent	%	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PPM	PPM	1000000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
kCPS	kCPS	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CPS	CPS	1000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(none)		1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
mm	mm	1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 10.14: Unit selection

Choosing an existing unit

On the desired unit row,

1. select the **Conc.** checkbox and/or **Intensity** checkbox to add this unit for concentrations or intensities or both (**Other** is selected by default). Then
2. click **OK**.

Creating a new unit

1. Click the **Add** button.
 - A new row will be added to the unit table.
2. Enter the unit name in the **Name** column.
3. Enter the **Unit string**.
4. Enter the **Factor** value.
 - The result will be multiplied by this value. For example, the factor is 100 for %, 1,000,000 for PPM.

5. Select the **Conc.** checkbox and/or **Intensity** checkbox to assign to add this unit for concentrations or intensities or both. Other can also be selected.
6. Click **OK**.

10.3.4 Setting the Format

Each kind of result column supports a set of formatting that can be created and modified in the **Formatting Type editor** (called from **Tools** menu). The user does not have to modify it normally.

10.3.5 Setting the Number of Digits

The digits of the floating point numbers can be set. Depending of the formatting this is either interpreted as the number of significant digits or the number of decimal places. This column is greyed out for columns that represent not a floating point number.

If the selected Format is **(auto)**, the number of digits or significant will be taken from the values defined in the **Automatic formatting** area for Trace and Major compounds.



Some settings can be changed for several compounds or parameter at once by multi-selecting them and defining them using the drop-down lists below the table.

10.3.6 Changing the Sequence

The sequence of the columns can be changed using the **arrow** buttons on the right.

Button	Description
	Move selection to the top
	Move selection up
	Move selection down
	Move selection to the bottom
	Sort selection alphabetically or by atomic number

10.3.7 Detected Compounds

Automatic ordering of detected compounds



If in the **Shown compounds** section the **Compound columns mode** is set to **Detect** (see section [Defining Shown Compounds \[113\]](#) for more details), the **Sequence** drop-down list allows selecting the way the compounds will automatically be ordered.

1. Select the desired option in the drop-down list:
 - Order of creation
 - Alphabetically
 - Atomic Number

Sorting compounds by their concentrations

Compounds on fixed positions Sort by Concentration in Detail View

Compounds can be sorted by their concentration. This order is not known beforehand and has to be determined on each result individually. Therefore it is only available in individual result views. It is not available in the main result table.

Sorting by concentration can be activated in the **Detected Compounds** section by selecting the **Sort by concentration in detail view** check box. This by default sorts all compounds by their concentration. If some compounds should not be sorted the number of compounds on fixed positions can be raised.

The information whether a compound is on a fixed position or not can be seen in the editor table. If no index number is shown at the beginning of the row, the compound is sorted by concentration in detail views.

Compounds with zero concentration can also be hidden by selecting the **Hide zero concentrations** check box.

10.3.8 Editing Defaults

The user can edit defaults used for detected concentrations, detected intensities and default values. To do so,



1. Click the **Edit defaults** button.
 - Current default settings will be displayed.
2. Modify them as desired.

10.4 How to Define the Parameters to be Shown

In the **Query** section of the left navigation bar, the user will be able to choose which parameters and compounds will be shown on the display. This step is required only if the user wants to add columns in addition to the default ones. If the user only wants to display the compounds concentrations, this step can be skipped.

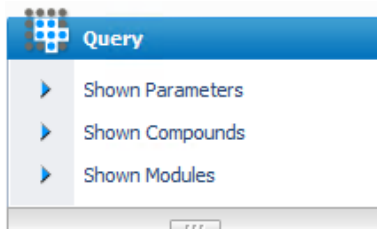


Figure 10.15: Query tab

10.4.1 Defining Shown Parameters

Clicking **Shown Parameters** will show all the properties the user can choose to show on the display.

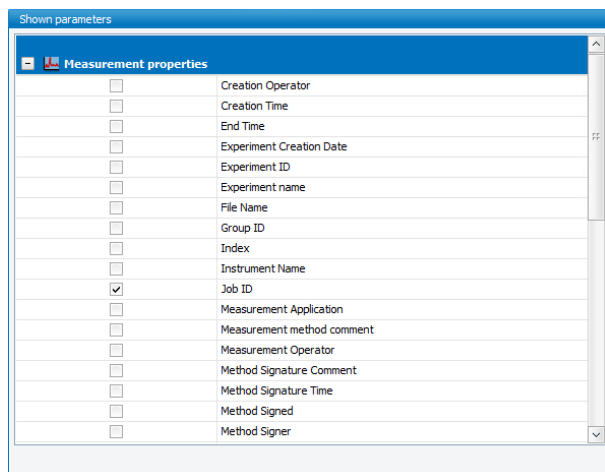


Figure 10.16: Shown parameters

- The **Measurement Properties** list lists the properties common to all measurements such as the **Sample ID**, **Creation time**, the **Measurement operator**, etc.
- The **Evaluation Properties** list lists the properties regarding to the evaluation such as the **Evaluation date** or the **Evaluation operator**.

To select the parameters to be shown on the display:

1. select the corresponding check boxes.

Table 10.2: Measurement properties

Property	Description
Creation Operator	User who created the measurement
Creation Time	Date/time of creation of the sample
End Time	Date/time of the end of measurement
Experiment Creation date	Date/time of creation of the experiment
Experiment ID	ID of the experiment used for the measurement
Experiment Name	Name of the experiment used for the measurement
File Name	Name of the result file (BRML file)
Group ID	Group ID
Index	Measurement index
Instrument name	Name of the instrument used to perform the measurement
Job ID	Job ID
Measurement Application	Application used for the measurement
Measurement method comment	Comment about the measurement method
Measurement Operator	User who started the measurement
Method Signature Comment	Comment about the signature of the method

Property	Description
Method Signature Time	Date/time of the signature of the method
Measurement Finished	End date and time of measurement
Method Sign	Self explanatory
Method Signer	Self explanatory
Permanent	Whether the measurement is marked as permanent. Some measurements (e.g. Commander Measurements) are automatically deleted after a certain amount of time. Measurements that are marked as permanent stay in the database.
Published	Self explanatory
Rawfile ID	ID of measurement
Runtime	Self explanatory
Sample ID	ID of the sample measured
Script file ID	ID of the script file
Script file name	Name of the script file
Start time	Date/time of the start of measurement
Status	Status of the job: Measured, Measuring or Suspended
Task file	Self explanatory
Measurement Started	Starting date and time of measurement

Table 10.3: Evaluation properties

Property	Description
Application	Application used for the evaluation
Application Creation	Time of creation of the application
Application ID	ID of the application
Evaluation Date	Time of evaluation
Evaluation File	Name of the evaluation file if applicable
Evaluation Error state	Self explanatory
Evaluation ID	ID of the evaluation
Evaluation Operator	User who performed the evaluation
Evaluation Type	Type of evaluation
Family	Family evaluation: for example, DQUANT
Formatting Name	Name of the formatting used for the results

10.4.2 Defining Shown Compounds

Clicking **Shown Compounds** will allow the user to choose the compounds to be shown on the display.

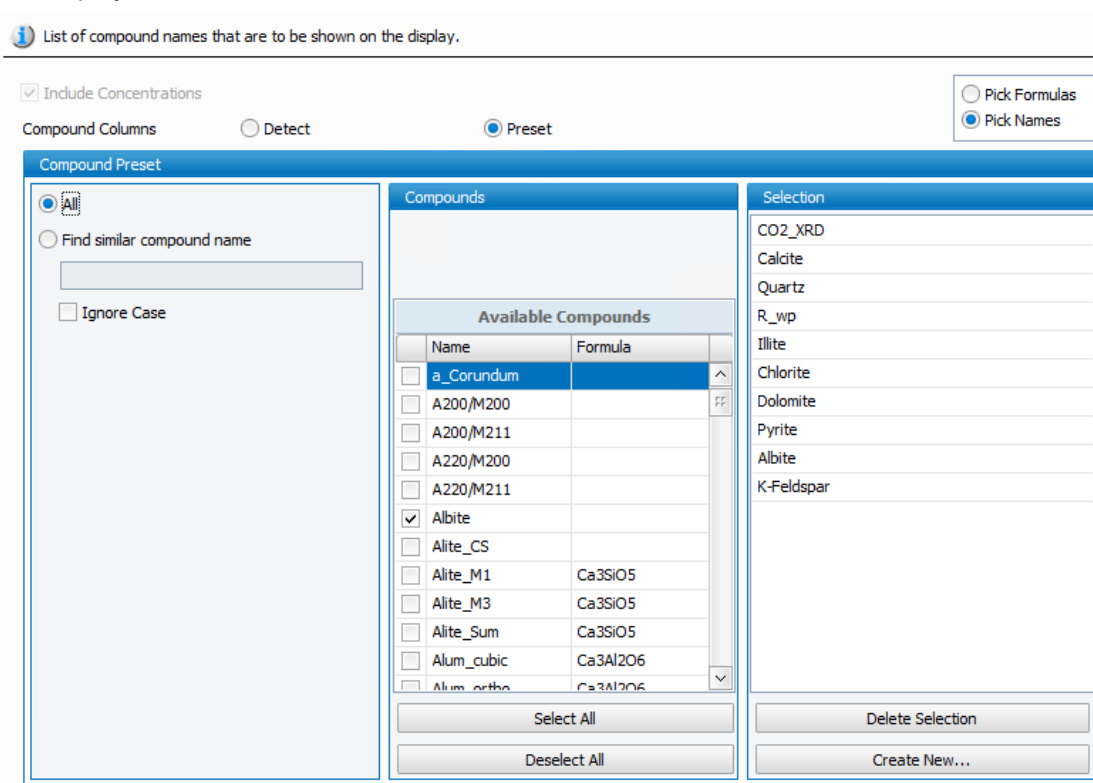


Figure 10.17: Selecting shown compounds

The **Compound columns** mode determines how the RESULTS MANAGER decides which compound columns should be displayed. Two modes are available:

Detect mode

In **Detect** mode the viewed compounds are automatically retrieved. Automatic retrieval means that new compound columns will be added to the results table when necessary. As soon as a result contains a compound it will appear in the table. In that mode users cannot set the sequence of compound columns manually. There can be only set one formatting that applies to all compound columns.

Preset mode

The **Preset** mode allows selecting the compounds individually. This mode is the one generally used.

All compounds available in the database are listed in the **Available Compounds** of the **Compounds** area.

You can also search for a compound by selecting the **Find similar compound name** option and entering a complete or partial name.

Compounds that are checked in the **Available compounds** list will be added to the **Selection** list that is shown at the right side of the editor.

Table 10.4: Selection buttons

Button	Description
Select All/Deselect All	Select/Deselect all available compounds
Delete Selection	Remove all compounds from the Selection list
Create New...	Create and add a new compound to the Selection list

Table 10.5: Other Shown compounds options

Button	Description
Include concentrations	Displays compound concentrations on the results view
Pick Formulas	Displays the compound formulas in the list of compounds
Pick Names	Displays the compound names in the list of compounds

10.4.3 Defining Shown Modules

New columns can be added to the main table whose values are calculated from the ones that have already been added. These are called **Modules**, and they can be defined in the **Modules editor**.

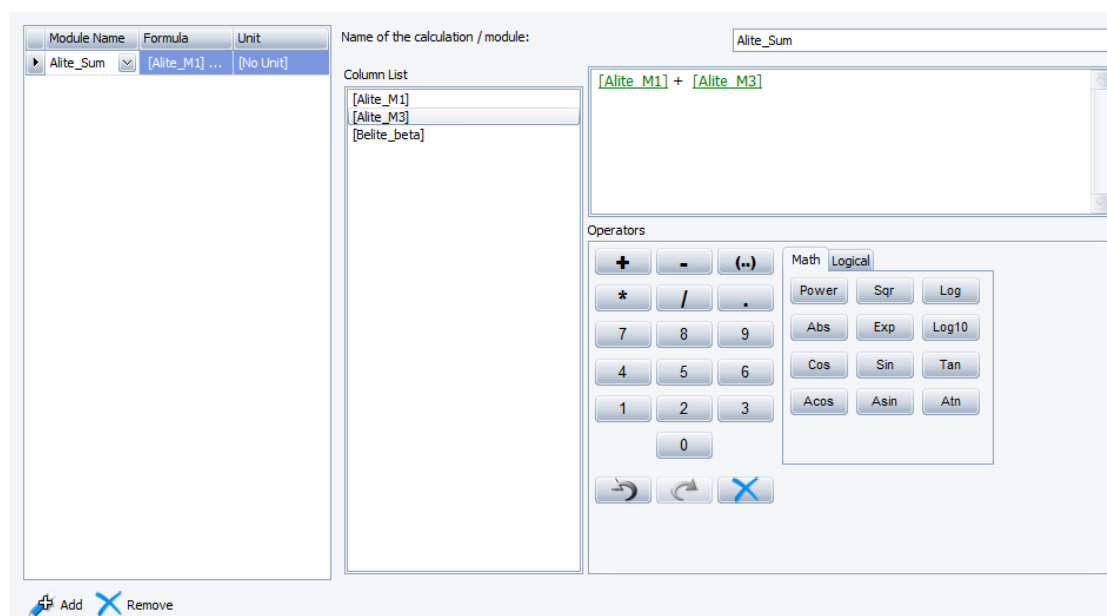


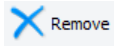
Figure 10.18: Shown modules

To create a new module:

1. Click the **Add** button to the bottom left of the screen.
 - Following properties will be required.

Name	Name of the formula. It has to be unique
Unit	Unit that is used to display the values
Formula	Formula that is used to calculate the value

1. Use the formula editor to the right to create new formulas.



Modules that are no longer needed can be removed with the **Remove** button.

The syntax is as follows:

The name of any known column has to be set in square brackets []. The names are listed in the column list and can be either typed in or added to the formula by double clicking on them. Various operators are available (summing, conditionals...) They can be typed into the formula field or added to the formula by the pushbuttons. Hovering the cursor above the pushbuttons offers a short explanation of each operator. The formula display uses the color green to highlight known column names, and red to highlight unknown column names.

Modules can be reused, but only in modules that are listed afterwards.

Note that a module usually does not evaluate if one of the columns used does not have a value. In that case the module column of the results set stays empty. If you want to use columns that might be empty nevertheless you can use them for example by supplying a value when they are not set. This can be done with the "IIF" operator.

```
Iif([Alite M1], [Alite M1],0 )
```

10.5 Monitoring Mode: Viewing Results

The **Monitoring Mode** is an option for viewing results.

To switch to the **Monitoring** view:

1. Right-click the tab header of a view and select **Monitoring Mode**.

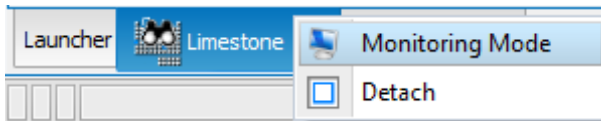


Figure 10.19: View result, **Monitoring** tab

1. Right clicking again switches the view back into **Query Mode**.

It can also be opened from the **LAUNCHER** view by

1. clicking the **Monitor** button.

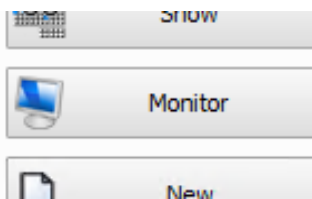


Figure 10.20: **Monitor** button

The screenshot shows the RESULTS MANAGER application window. At the top, there are tabs for COMMANDER, WIZARD, START JOBS, JOBLIST, RESULTS MANAGER (selected), and LOG. Below the tabs is a toolbar with buttons for Show Results, Select Detail View, Compound List, Placement, Print Preview, Print, Export brml, and Export V4 Raw File. The main area displays a table of evaluation results with columns for Evaluation Date, Sample ID, R_wp (%), Calcite (%), Dolomite (%), Quartz (%), Illite (%), Chlorite (%), and Pyrite (%). The table is filtered by Evaluation Date: 7/18/2016 12:00 AM. The sidebar on the right shows Measurement details for Specimen (Limestone-5), Name (8-65-5min5s), and Time (7/18/2016). Below that, the Compounds section lists various minerals and their percentages: R_wp (8.13%), Calcite (81.64%), Dolomite (0.04%), Quartz (10.70%), Illite (2.51%), Chlorite (1.59%), Pyrite (0.19%), Albite (2.32%), K-Feldspar (1.01%), and CO2_XRD (35.92%).

Evaluation Date	Sample ID	R_wp (%)	Calcite (%)	Dolomite (%)	Quartz (%)	Illite (%)	Chlorite (%)	Pyrite (%)
Evaluation Date: 7/18/2016 12:00 AM								
7/18/2016 2:01 PM	Limestone-5	8.13	81.64	0.04	10.70	2.51	1.59	0.19
7/18/2016 2:12 PM	Limestone-6	7.51	77.33	0.13	14.28	2.42	1.92	0.11
7/18/2016 2:22 PM	Limestone-8	17.99	92.52	0.16	2.93	0.91	1.33	0.56
7/18/2016 2:30 PM	Dolomite-10	18.20	0.00	95.36	1.70	0.14	1.74	0.07
Evaluation Date: 7/20/2016 12:00 AM								
7/20/2016 9:34 AM	Dolomite-11	17.99	0.23	94.63	1.46	0.12	2.58	0.07

Figure 10.21: Monitoring view

The results display is affected by all the settings, layout settings or filter settings, defined in the **Configure** mode for the current view.

The **Sign**, **Invalidate** and **Action** buttons are available as in the **Query** view. See section [Displaying the Search Results \[130\]](#) for their description.

Defining the Number of Results Displayed in Monitoring Mode

The user can choose to limit the number of results displayed in monitoring mode. To do so, on the **Main View** screen of the **Configure** mode, select the **Limit by max count** option and enter the maximum number of results displayed in **Monitoring Mode**. The most recent results will be displayed. See section [Defining the General Appearance of the Results View \[131\]](#).

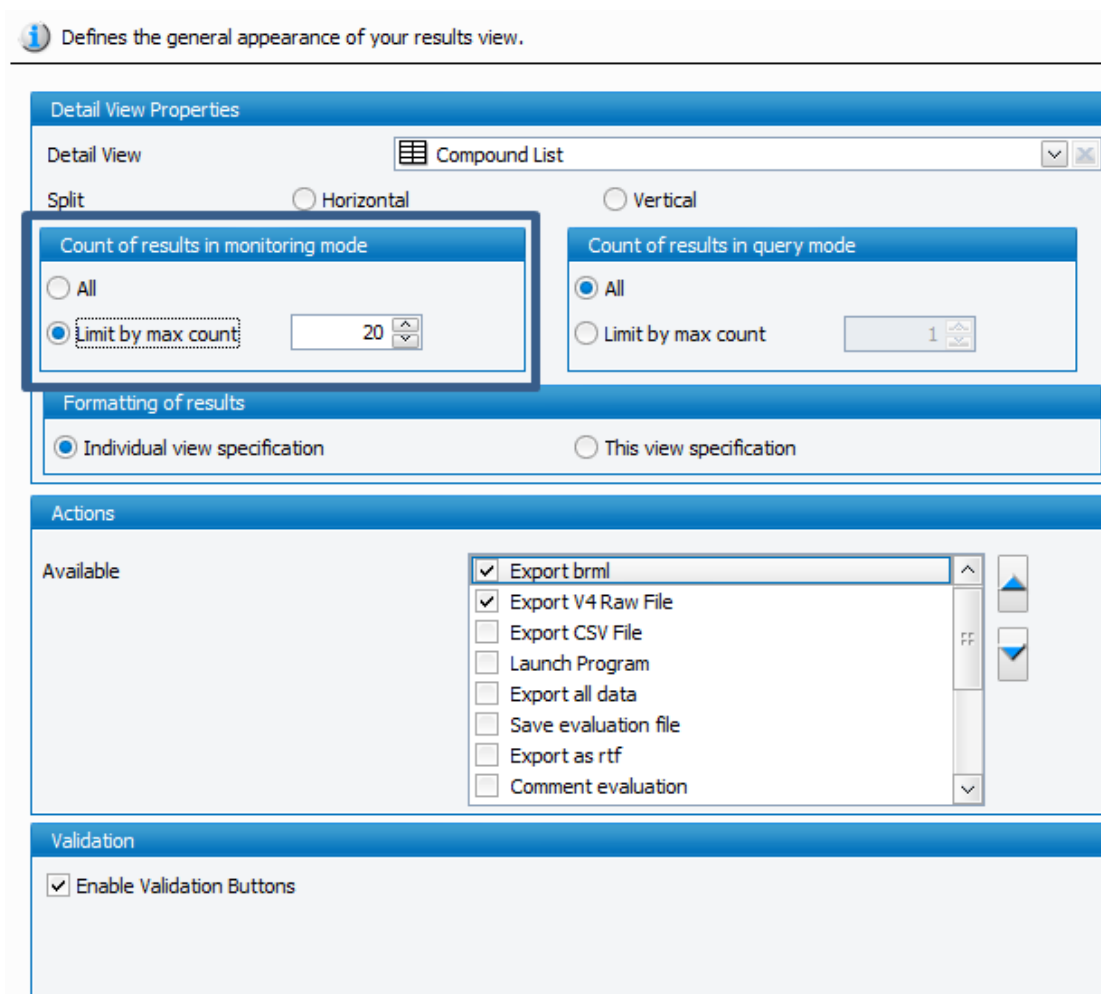


Figure 10.22: Limiting the number of results displayed in **Monitoring mode**

Results update



The **Monitoring Mode** updates its views automatically - querying is disabled in **Monitoring Mode**. Views in **Monitoring Mode** can be identified by the icon on the tab header.

In **Query Mode** the view is only updated when the **Refresh** button is clicked or if users switch to the **View** settings and back.



Use the **Monitoring Mode** when an automatic results display is required.

Use a **Query** view when searching for specific results.

See also

-  Defining the General Appearance of the Results View [▶ 131]

10.6 Query Mode: Searching for Results in the Database

The **Launcher** view displays the list of specification views.

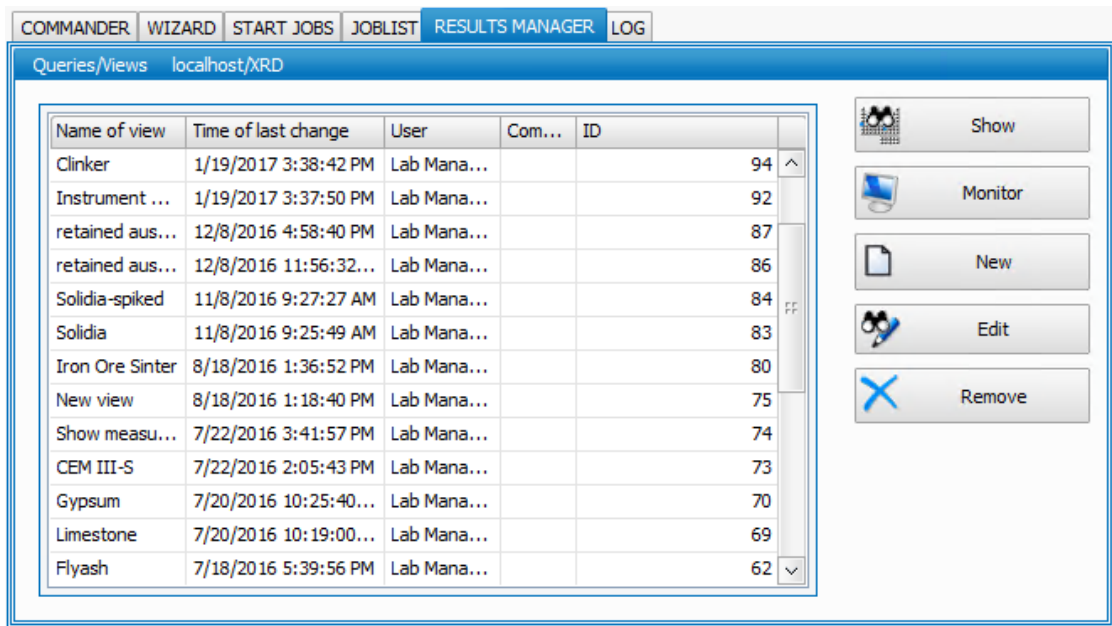


Figure 10.23: List of specification views

The user will first have to choose a view in the list and then set search criteria in the **Edit** mode. The matching results will be shown in the **Results** mode.

The user will be able to choose a Detail view to be displayed and to perform action on selected results.

Note that in **Results (Query)** mode the contents of the view are not updated automatically. The view can be refreshed automatically by clicking the **Refresh** button.



10.6.1 Setting the Search Criteria

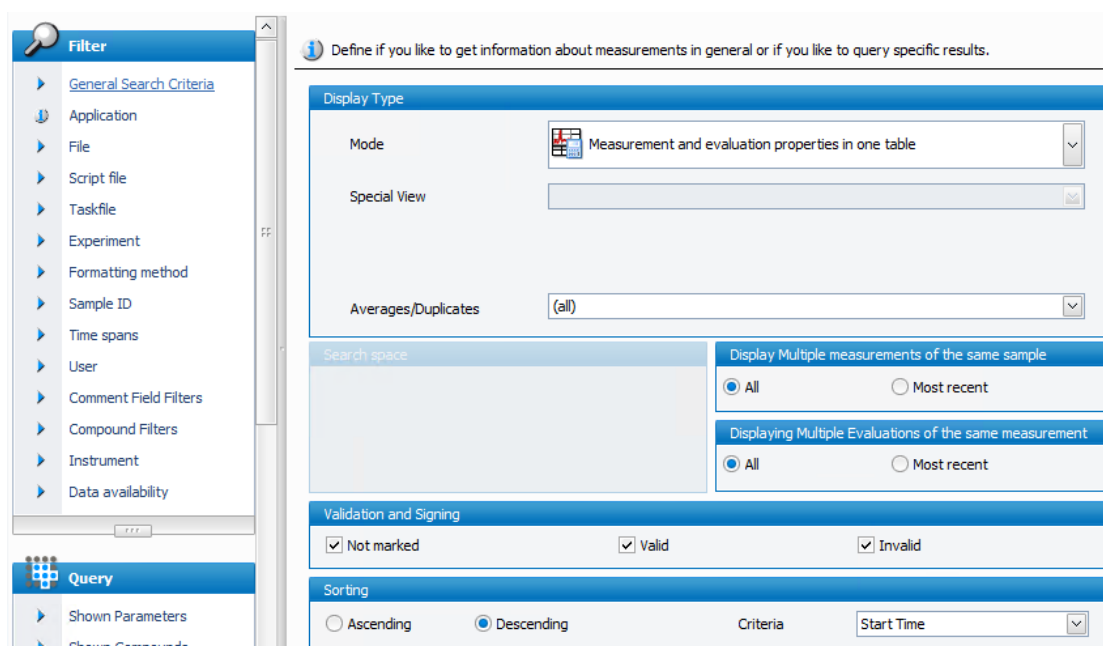


Figure 10.24: Setting the search criteria


The **Filter** section contains all settings that restrict the results by some criteria such as the sample name. The different filters are applied at the same time. The more filter criteria set, the more restrictive the results will become. A small icon reports whether any filter criteria have been set on this page.

Icon	Description
	Filter is set
	Neutral settings


Any changes made in the specification view can be reviewed immediately by returning to the results view. To switch to the results view, click the **Results** button.


10.6.1.1 General Search Criteria


This section allows the user to set general search criteria.

 Define if you like to get information about measurements in general or if you like to query specific results.

Display Type

Mode 
Measurement and evaluation properties in one table

Special View 

Averages/Duplicates 
(all)

Search space

Display Multiple measurements of the same sample

All Most recent

Displaying Multiple Evaluations of the same measurement

All Most recent

Validation and Signing

Not marked Valid Invalid

Sorting

Ascending Descending Criteria Start Time 

Figure 10.25: Setting the general search criteria

The general search criteria are described in the following table.

Table 10.6: General Search Criteria

Criterion	Description
Display Type	Determines which kinds of results are displayed.
Mode	<p>Select the mode used for the display of the results.</p> <ul style="list-style-type: none"> Measurement properties only: When selected, information about the measurement jobs can be queried, such as sample ID, measurement operator, measurement time, etc. See figures below for examples. The measurement data displayed in the results depend on the Measurement properties selected on the Shown Parameters screen. See section Defining Shown Parameters [▶ 111]. Evaluation properties only: Measured results can be evaluated by an evaluation program. When this option is selected, any data stored by the evaluation program can be queried from the database. See figures below for examples. The evaluation data displayed in addition to the concentrations depend on the Evaluation properties selected on the Shown Parameters screen. See section Defining Shown Parameters [▶ 111].

Criterion	Description
	<ul style="list-style-type: none"> • Measurements with expandable evaluation properties: Allows querying and displaying in the results set, both measurement and evaluation data. The measurement data will be displayed by default in the table of results and the corresponding evaluation data will be available below by clicking the Plus button on the left of the row. • Evaluations with expandable measurement properties: Allows querying and displaying in the results set, both measurement and evaluation data. The evaluation data will be displayed by default in the table of results and the corresponding measurement data will be available below by clicking the Plus button on the left of the row. • Measurement and evaluation properties in one table: Allows displaying measurement and evaluation data all together in the table of results. The data displayed depend on the Measurement/Evaluation properties selected on the Shown Parameters screen. • Special view: Allows displaying a special view instead of the table of results, File browser view for instance.
Special view	Displays a special view instead of the table of results, File browser view for instance, if the Special view mode was chosen. See subsection Special view below for more details..
Averages/Duplicates	In the case there exist duplicates, decide whether to: <ul style="list-style-type: none"> • Display the averaged values of duplicates • Display the individual values of duplicates • Display all values: (all)
Search space	Available when the option Measurement properties only or Measurements with expandable evaluation properties is selected.
Measurements	Decide if only the measured specimens, the specimens whose measurements have not been finished (Pending, aborted or erroneous jobs) or both should be queried.
Evaluations	Decide if only the evaluated specimens or the non-evaluated samples or both should be queried.
Display Multiple measurements of the same sample	If the same sample name was used several times decide if all or the most recent result should be displayed.
Display Multiple evaluations of the same sample	If the same sample was evaluated several times decide if all or the most recent result should be displayed.
Validation and signing	When measurements or evaluations are going to be signed or invalidated, certain states can be filtered out.
Not marked, Valid, Invalid	Decide if specimens valid and/or invalid and/or not marked should be queried

Criterion	Description
Sorting	<p>Select in which order the results should be retrieved from the database and thus displayed in the table. The order can be ascending or descending.</p> <p>The sorting criteria offered are:</p> <ul style="list-style-type: none"> • Start time • End time • Creation time • Evaluation date <p>Using the sort in the General criteria section is faster than sorting later by clicking on the column header in the results table.</p>

Measurements: 31. Time: 4:02 PM *
Parameter Filters: Application

Job ID	Sample ID
1684	test
1682	test
1681	test
1671	test 1

Figure 10.26: Results displayed with the mode **Measurement properties only**

Evaluations: 31. Time: 4:06 PM *
Parameter Filters: Application

Evaluation Date	Evaluation Operator	Alum_cubic (%)	Femite (%)	Quartz (%)	Alite_M1 (%)	fCaO_XRD (%)	Arcanite (%)
7/14/2017 ...	Bruker Service	3.7000000000	15.84000...	0.190000...	34.360000...	0.5000000000	0.810000...
7/14/2017 ...	Bruker Service	3.3300000000	16.57000...	0.000000...	32.500000...	0.3600000000	0.890000...
7/14/2017 ...	Bruker Service	4.7600000000	15.22000...	0.000000...	26.770000...	1.6400000000	1.240000...
7/14/2017 ...	Bruker Service	4.5500000000	15.85000...	0.000000...	44.930000...	0.8700000000	0.770000...

Figure 10.27: Results displayed with the mode **Evaluation properties only**

Measurements: 31. Time: 4:08 PM *
Parameter Filters: Application

Job ID	Sample ID
1659	Clinker

Evaluations:1

Evaluation ...	Evaluation ...	Alum_cubic ...	Femite (%)	Quartz (%)	Alite_M1 (%)	fCaO_XRD ...	Arcanite (%)
9/22/2016 1...	Lab Manager	4.8300000000	10.95000000...	0.0000000000	58.49000000...	1.2400000000	0.140000...

Figure 10.28: Results displayed with the mode **Measurements with expandable evaluation properties**

Evaluations: 31. Time: 4:12 PM *
Parameter Filters: Application

Evaluation ...	Evaluation ...	Alum_cubic (%)	Femite (%)	Quartz (%)	Alite_M1 (%)	fCaO_XRD (%)	Arcanite (%)	Periclase
7/14/2017 ...	Bruker Service	3.7000000000	15.84000...	0.190000...	34.360000...	0.5000000000	0.81000000...	0.010000...

Measurements:1

Job ID	Sample ID
3260	Clinker-2

Figure 10.29: Results displayed with the mode **Evaluations with expandable measurement properties**

Evaluations: 31. Time: 4:16 PM *								
Parameter Filters: Application								
Evaluation ...	Evaluation ...	Job ID	Sample ID	Alum_cubic (%)	Femte (%)	Quartz (%)	Alite	
10/11/20...	Lab Manager	1684	test	4.7300000000	11.84000...	0.000000...	5	^
10/11/20...	Lab Manager	1682	test	4.8100000000	11.78000...	0.000000...	5	
10/11/20...	Lab Manager	1681	test	4.8200000000	11.99000...	0.010000...	5	
10/6/201...	Lab Manager	1671	test 1	5.1300000000	11.11000...	0.000000...	5	

Figure 10.30: Results displayed with the mode **Measurement and evaluation properties in one table**

Special view

The **File Browser** view allows retrieving **Measurement Results** files (BRML files). The same detail views and actions are available as for measurements retrieved from the database.

1. Click the **Browse** button on the right of the empty field and locate the desired file.

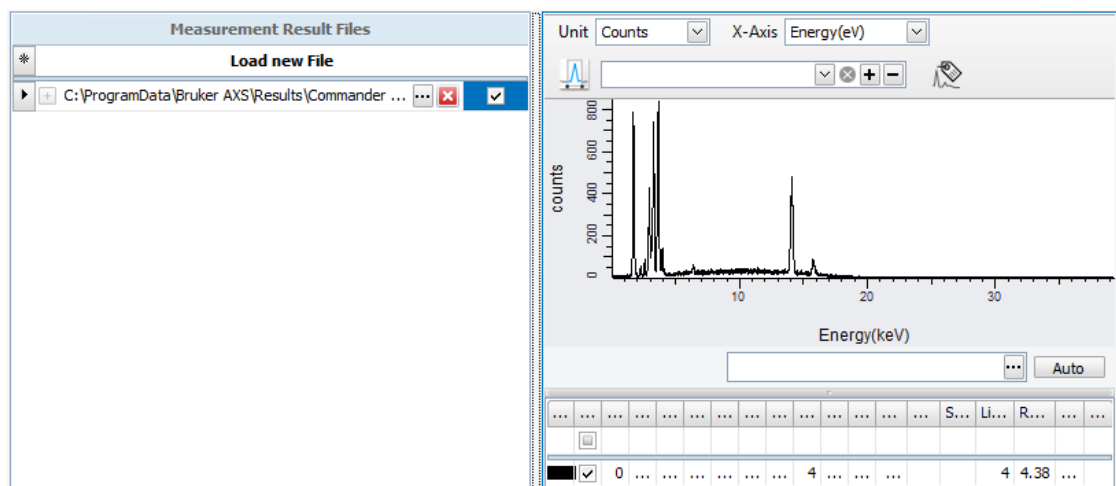


Figure 10.31: Example of File Browser view

See also

- Defining Shown Parameters [▶ 111]

10.6.1.2 Applying Filters

The following sections described all filters that can be applied for filtering results. The result of filter settings can be reviewed immediately by returning to the **Results** view.

10.6.1.2.1 Application Filter

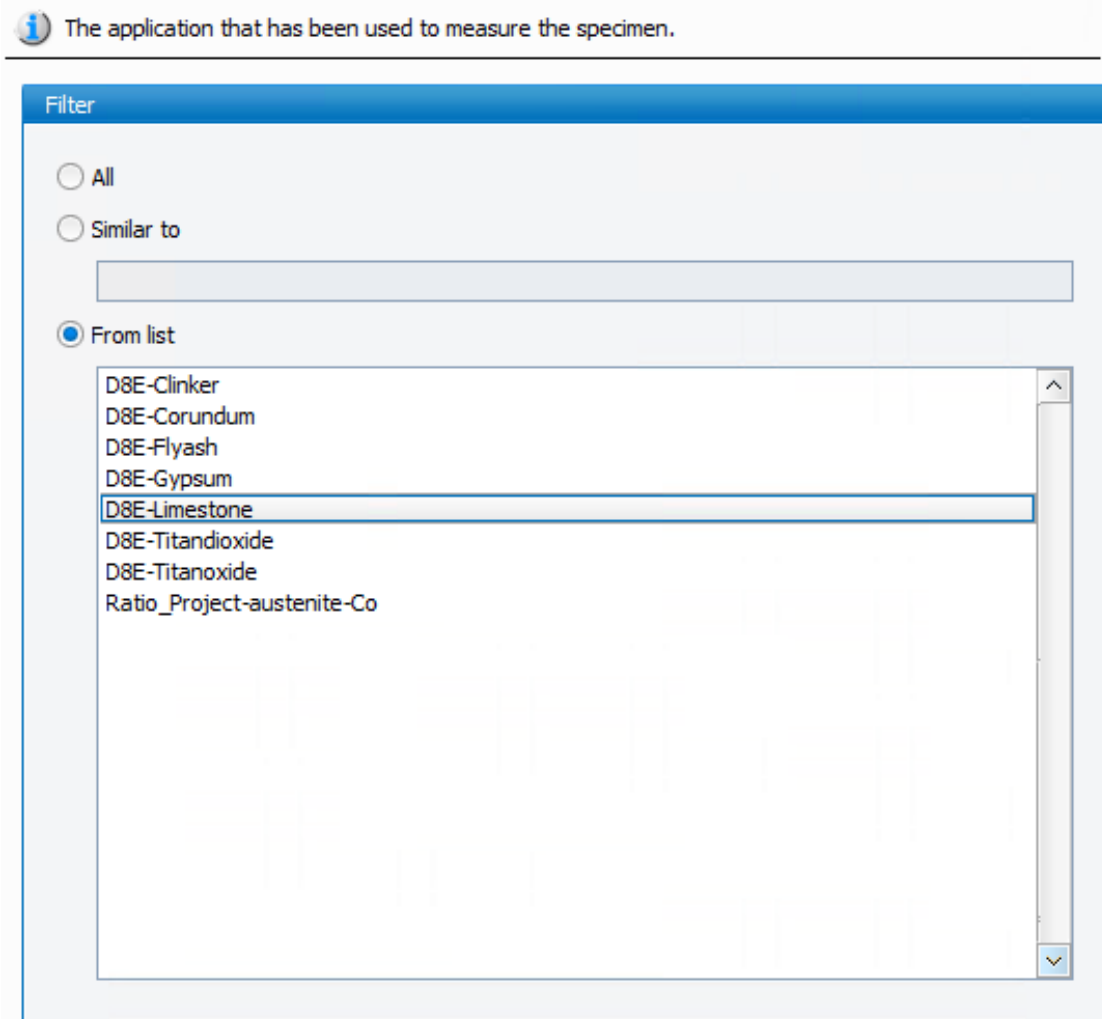


Figure 10.32: Selecting the applications used for filtering

Either all results can be displayed regardless of the Application, or specific applications can be filtered.

With the second option a free text can be entered. This text will be matched with the application entry during the database search. This search uses wildcards. Use * to indicate that there might be optional additional characters, use ? to indicate one unknown additional character.

E.g.: The string APPLICATION_* delivers all applications named **APPLICATION_** but also **APPLICATION_2**, **APPLICATION_CEMENT**

Alternatively, one or several applications can be selected from the list of names that have been detected in the database.

10.6.1.2.2 File Filter

Either all results can be displayed regardless of the measurement file name, or specific measurement file names can be filtered.

The same search options are offered as in the **Application filter settings**. See section [Application Filter](#) [▶ 124].

10.6.1.2.3 Script File Filter

Either all results can be displayed regardless of the script file name, or specific script file names can be filtered.

The same search options are offered as in the **Application filter settings**. See section [Application Filter \[▶ 124\]](#).

10.6.1.2.4 Task File Filter

Either all results can be displayed regardless of the task file name, or specific task file names can be filtered.

The same search options are offered as in the **Application filter settings**. See section [Application Filter \[▶ 124\]](#).

10.6.1.2.5 Measurement Method Filter

Either all results can be displayed regardless of the measurement method, or specific measurement methods can be filtered.

The same search options are offered as in the **Application filter settings**. See section [Application Filter \[▶ 124\]](#).

10.6.1.2.6 Experiment Filter

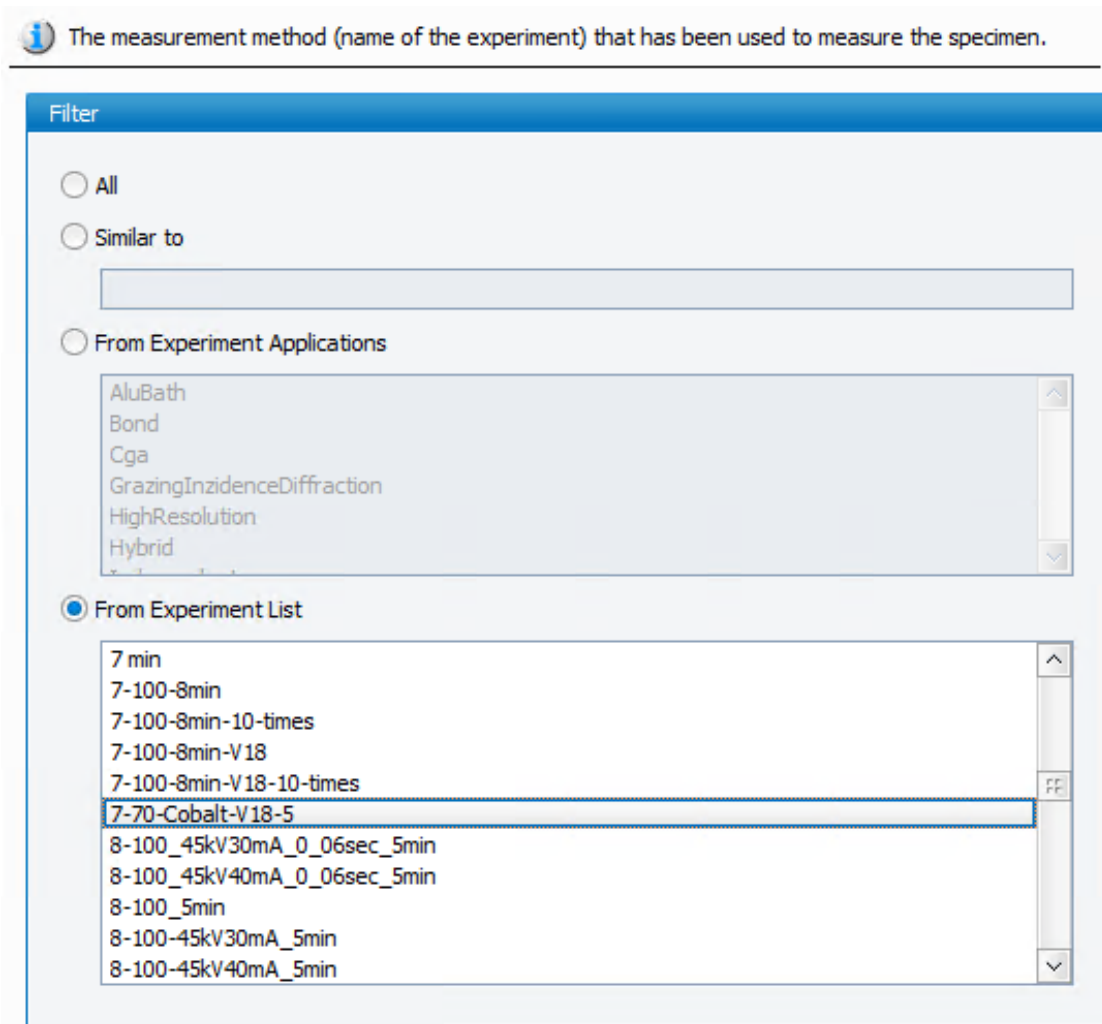


Figure 10.33: Selecting the experiment(s) used for filtering

Either all results can be displayed regardless of the experiment, or specific experiments can be filtered.

With the **Similar to** option a free text can be entered. This text will be matched with the application entry during the database search. This search uses wildcards. Use * to indicate that there might be optional additional characters, use ? to indicate one unknown additional character.

E.g.: The string EXPERIMENT_* delivers all applications named **EXPERIMENT_** but also **EXPERIMENT_2**, **EXPERIMENT_CEMENT**

Alternatively, one or several experiments can be selected from the list of names that have been detected in the database.

With the **From Experiment Applications** options, a type of applications can also be used for filtering.

10.6.1.2.7 Formatting Method Filter

Either all results can be displayed regardless of the **Formatting** method, or **Specific formatting** methods can be filtered.

Option	Description
All view specifications	No view specification restriction.
This view specification	Only show results that should be formatted with the current view specification.
View that matches the following name	Wildcard search for view specification.
Views from the following list	Restriction to the view specification names selected in the list. Multi-selection is available.


10.6.1.2.8 Sample ID Filter

Either all results can be displayed regardless of the sample ID, or specific sample IDs can be filtered.

The same **Search** options are offered as in the **Application filter settings**. See section [Application Filter \[▶ 124\]](#).

10.6.1.2.9 Time Spans Filter

The results can be filtered by the time the measurement was created, the time the measurement has finished or the time it was evaluated.

 Restrict the displayed results to specific time spans.

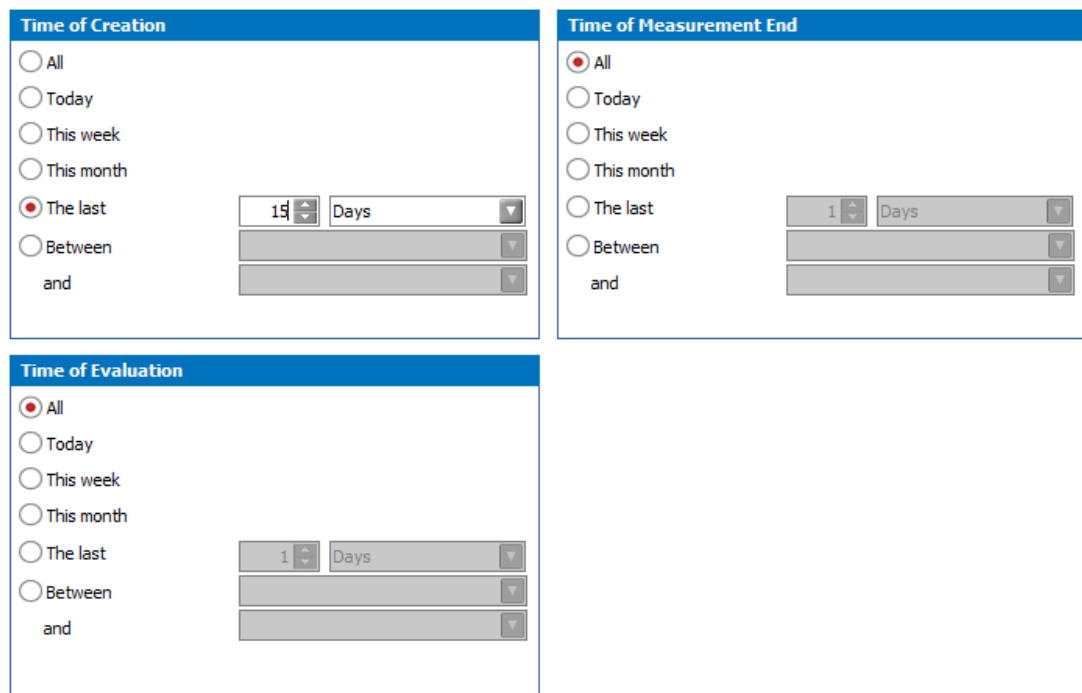


Figure 10.34: Setting the creation/measurement end/evaluation time criteria

The following options are given for the creation/end time of measurement:

Option	Description
All	No time restriction.

Option	Description
Today	Limit search to the measurements that have been created/measured today.
This week	Limit the search to the measurements that have been created/measured/evaluated this week (starting on Monday).
This month	Limit the search to the measurements that have been created/measured/evaluated this week (starting on the first).
The Last...	Limit search to a specified number of hours, days, or years.
Between... and ...	Search to the period between two dates (given dates are included in search).



When a measurement is aborted, no finishing time is supplied to the database. To display these measurements, the filter should be set to the time of measurement creation.

10.6.1.2.10 User Filter

It is possible to filter the **Search results** by the user who has created, started or evaluated the measurement.

Restrict the displayed results to specific operators and users.

Created by

anyone
 user logged in at time of query
 specific user

Measured by

anyone
 user logged in at time of query
 specific user

Evaluated by

anyone
 user logged in at time of query
 specific user

Figure 10.35: Setting the user search criterion

The options are:

Option	Description
Anyone	No user restriction.
User logged in at time of query	Limit results to the ones of the user who is currently logged

Option	Description
Specific user	Limit the results to the ones of the specific user(s) selected in the list. The list contains all names that are registered in the database.

Depending on current user rights the **Operator** filters may be overridden. Users that are not allowed to see other users will always only see their own results regardless of the settings here.

10.6.1.2.11 Comment Field Filter


Not relevant.

See also











- How to Define the Parameters to be Shown [▶ 110]

10.6.1.2.12 Compound Filter

Constraints can be put on compounds that are selected in the **Shown compounds** section for query and display, see section [Defining Shown Compounds \[▶ 113\]](#) for more details. These can be defined in the **compound filter editor**.

 Can be used to put compound specific constraints on the results displayed.

All criteria have to apply to the results
 At least one criteria has to apply to the result

ParameterCaption	Filter Description
 CO2_XRD	Dependant on limits
 Calcite	(show all)
 Quartz	(show all)
 R_wp	(show all)
 Illite	(show all)
 Chlorite	(show all)
 Dolomite	(show all)
 Pyrite	(show all)
 Albite	(show all)
 K-Feldspar	(show all)

Properties

 Ignore!
 Must be included in results
 Use limits

Not checked
 In Tolerance
 Warning Range
 Intervention Range

 Use concentration range

>

<

 Use Intensity range

>

<

Figure 10.36: Compound filter editor

This editor lists the **Shown compounds**. By default they must be included in results. The **Filter** settings can be set for each compound individually. They are described in the following table:

Setting	Description
Ignore	No property restriction.
Must be included in results	RESULTS MANAGER checks whether a result contains the compound. If not the result is omitted.
Use limits	RESULTS MANAGER checks whether a result contains the compound with the selected state(s) regarding the concentrations limits: <ul style="list-style-type: none"> • Not checked • In Tolerance • Warning Range • Intervention Range • If not the result is omitted.
Use concentration range	Checks whether a value is within certain concentration limits. Note that checking against a lower and an upper threshold can be turned on or off individually.
Use intensity range	Not relevant.

If several compound filters are set, a choice is available how to combine these criteria.

- **All criteria have to apply to the results** (Connecting with AND). In this case setting several filters makes a search more restrictive.
- **At least one criteria have to apply to the results** (Connecting with OR). In this case setting several filters makes a search less restrictive.

10.6.1.2.13 Instrument Filter

When several instruments are available, results can be filtered by instrument. Select either **All**, **Current** or the desired instrument(s) from the list.

10.6.2 Displaying the Search Results

In this **Results** view several features are available as described below.

Detail view

The user can choose a detail view to be displayed in addition to the results table in the details drop-down list. See section [Defining a Detail View \[133\]](#) for each detail view description.



The **Placement** button allows the user to choose where the **Detail** view is placed in the window.

Sign/Invalidate

The user can validate or invalidate selected results by clicking the **Sign** or **Invalidate** button.

- **Sign** is generally used for results for which the user considers the analysis was performed normally.
- **Invalidate** is generally used for redundant results (i.e. measurement performed several times to check), false results (problem with the spectrometer, the preparation...).

Action buttons

The **Action** buttons at the top right allow the user to perform actions on selected results such as saving the BRML file on the system. The available actions depend on the action buttons selected at the **Main View** step. See [Selecting the Action buttons \[139\]](#) for their description.

Text Size



The size of the font of displayed results can be changed using the **Size** slider. Move the slider upwards to increase the font size.

10.7 Edit (Configure) Mode: Customizing the Results Layout

The **Edit (Configure)** mode allows the user to customize the display of the results.

This is done from the **Display** menu on the left navigation bar:

- **Main View:** allows the user to set a detail view and other display options.
- **Limits Highlighting:** allows the user to define limits highlighting when using process limits.

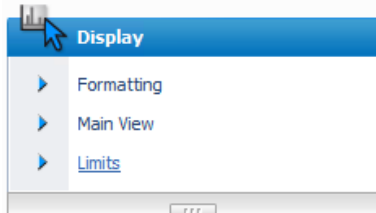


Figure 10.37: Display tab

10.7.1 Defining the General Appearance of the Results View

The user can customize the general appearance of the **Results view**. It is mainly about defining what will be displayed in addition to the results table.

To define the general appearance of the **Results view**:

1. Go to the **Display** menu of the left navigation bar
2. Select **Main View**.

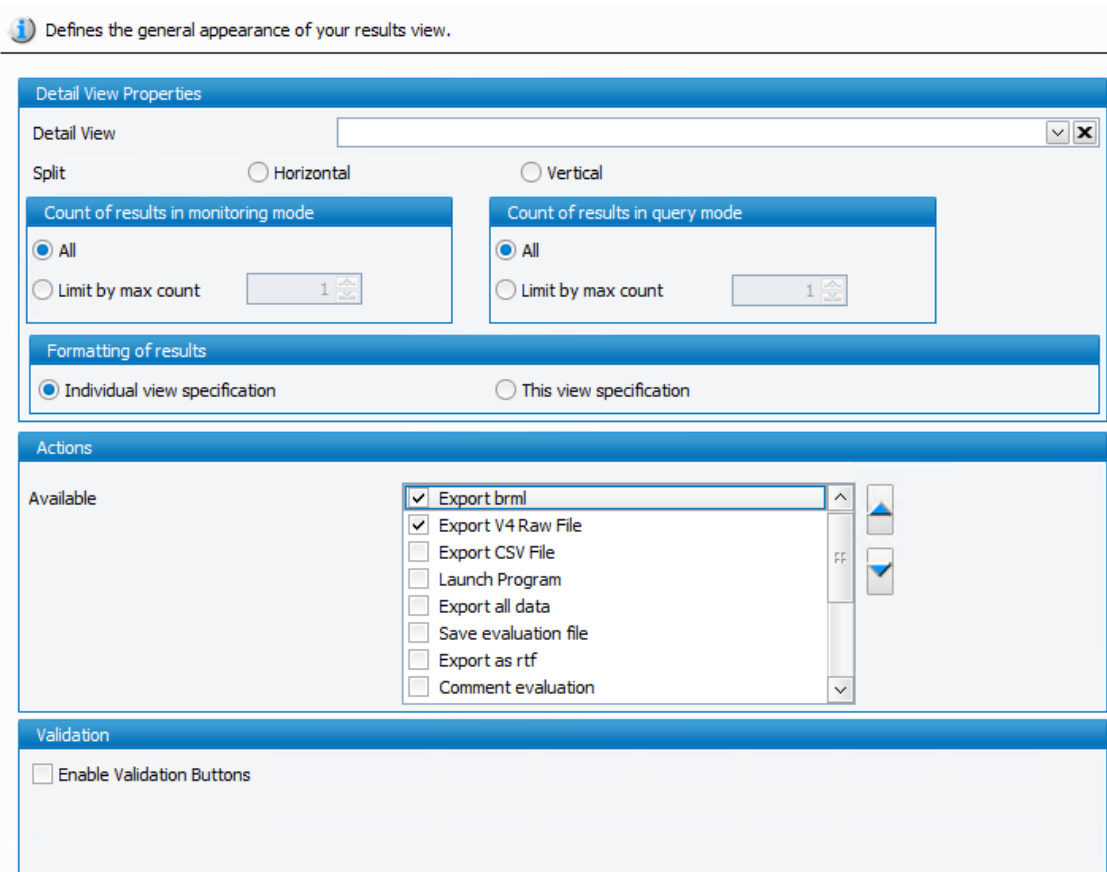


Figure 10.38: Setting the Main view options

Table 10.7: Setting the general appearance of the results view

Setting	Description
Detail View Properties	
Detail View	Choose a detail view to be automatically displayed in addition to the results table in the monitoring view or Query view . See Defining a Detail View [133] for the description of each type of detail view.
Split	Decide whether the Results view should be split horizontally or vertically by selecting the Horizontal or Vertical radio button.
Count of results in monitoring mode / in query mode	The user can choose to limit the number of results displayed in monitoring mode/query mode. See Monitoring Mode: Viewing Results [115] for a detailed description.
Formatting of results	Select whether this individual formatting or the current formatting (the one that is specified in this view) should be used in the Detail view .
Actions	Select the Action buttons that will be displayed by default in the results view. See Selecting the Action buttons [139] .
Validation	If the Enable Validation Buttons check box is selected, two additional actions, Sign and Invalidate will be available in the Results view. They allow the user signing and invalidating measurements or evaluations.

10.7.1.1 Defining a Detail View

The user can choose a detail view to be automatically displayed in addition to the results table in the monitoring view or **Query view**.

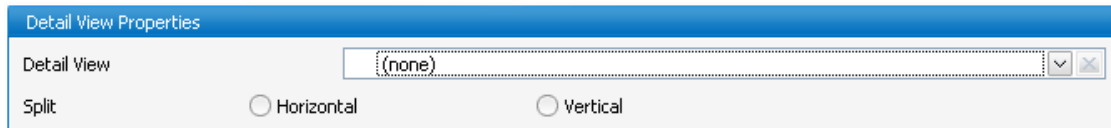


Figure 10.39: Selecting a detail view

By default no **Detail view** is selected: **(none)** is selected in the **Detail view** drop-down list.

1. Select the desired **Detail view** in the drop-down list and then
2. Decide whether the **Results view** should be split horizontally or vertically by selecting the **Horizontal** or **Vertical** radio button.

The user can choose between several detail views. Each one will be described below.

10.7.1.1.1 Compound statistics view

This view is used to display statistics and trends. It can only be displayed if several results or repeated measurement results are selected.

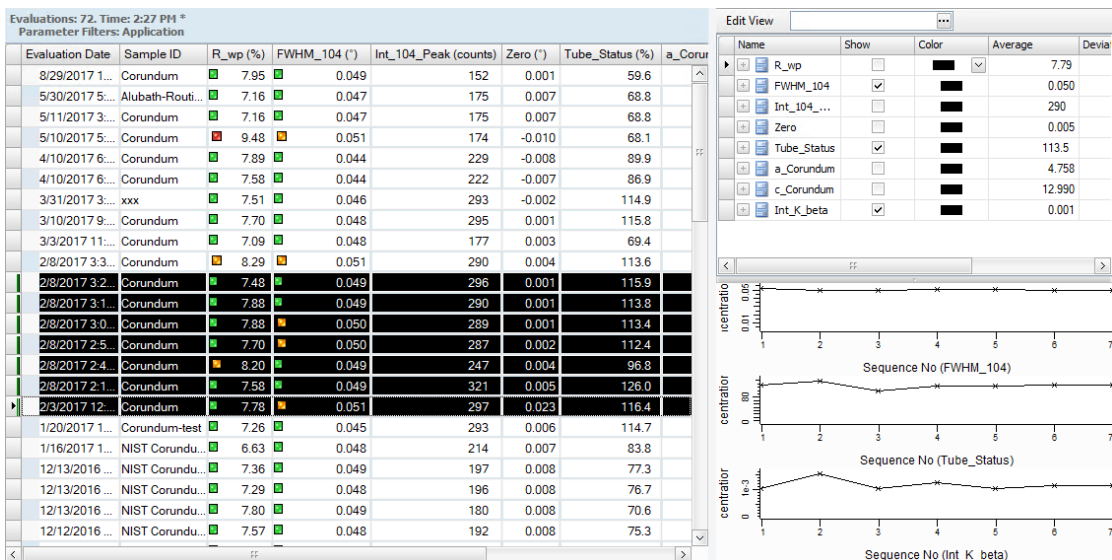


Figure 10.40: Compound statistics view

The following table describes the statistics table columns.

Table 10.8: Compound statistics view

Column	Description
Name	Name of the compound
Show	Show graphics
Color	Color used in graphics
Average	Average value of the selected results
Deviation	Standard deviation of the selected results
Rel.Deviation	Relative deviation of the selected results
Min	Minimum value of the results

Column	Description
Max	Maximum value of the results
View Min	Minimum value shown in the graphical view (only visible when view is set individually)
View Max	Maximum value shown in the graphical view (only visible when view is set individually)

The **Compound statistics view** displays a table with statistics for each compound but it is also possible to display the values graphically by selecting the **Show** checkbox as shown on the figure above.



The table can be copied and pasted to a spread sheet using the **Ctrl+C** (Copy) key combinations to copy it to the clipboard.

The graphics can be configured by opening the **Edit View** menu above the statistics table.

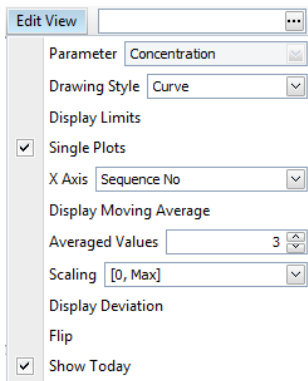


Figure 10.41: **Edit view**

Table 10.9: *Edit view menu*

Command	Description
Parameter	Concentration only.
Drawing Style	Select the kind of graphic displays in the drop-down list: <ul style="list-style-type: none"> • Curve: Continuous Curve • Points: Points only • Lines: Vertical lines
Display Limits	Check to display the limits
Single Plots	Select whether all graphics should be displayed in one diagram or in several ones. If Single plots is not checked, a new diagram is added for each compound which has the Show check box selected.
X Axis	Select the X axis: <ul style="list-style-type: none"> • Sequence No: Counts the results and displays the sequence number of the result. The results are sorted by evaluation time and are displayed equally spaced. • Evaluation Time: The results are sorted by evaluation time and the X axis is representing the time scale. In this mode the space between subsequent results reflects the time passed between the evaluations.

Command	Description
Display Moving Average	Check to display the moving average.
Arranged values	Set the number of subsequent results used for moving average.
Scaling	Select the Y axis scaling: <ul style="list-style-type: none"> • [Min-Max]: Based on minimum and maximum result value • [0-Max]: Between 0 and maximum result value • 3σ: Based on 3σ deviation. • Individual: Can be set for each value individually using the view min and view max columns
Display Deviation	Check to display the deviation lines.
Flip	Toggles between a horizontal and vertical arrangement of the statistics table and the graphics display.
Show Today	If selected, includes Today in the scale when the x-axis displays the Evaluation time.

10.7.1.1.2 Charts View

This view is used to display the compound concentrations as pie, column or bar charts. Select the type of chart to use for the display in the drop-down list.

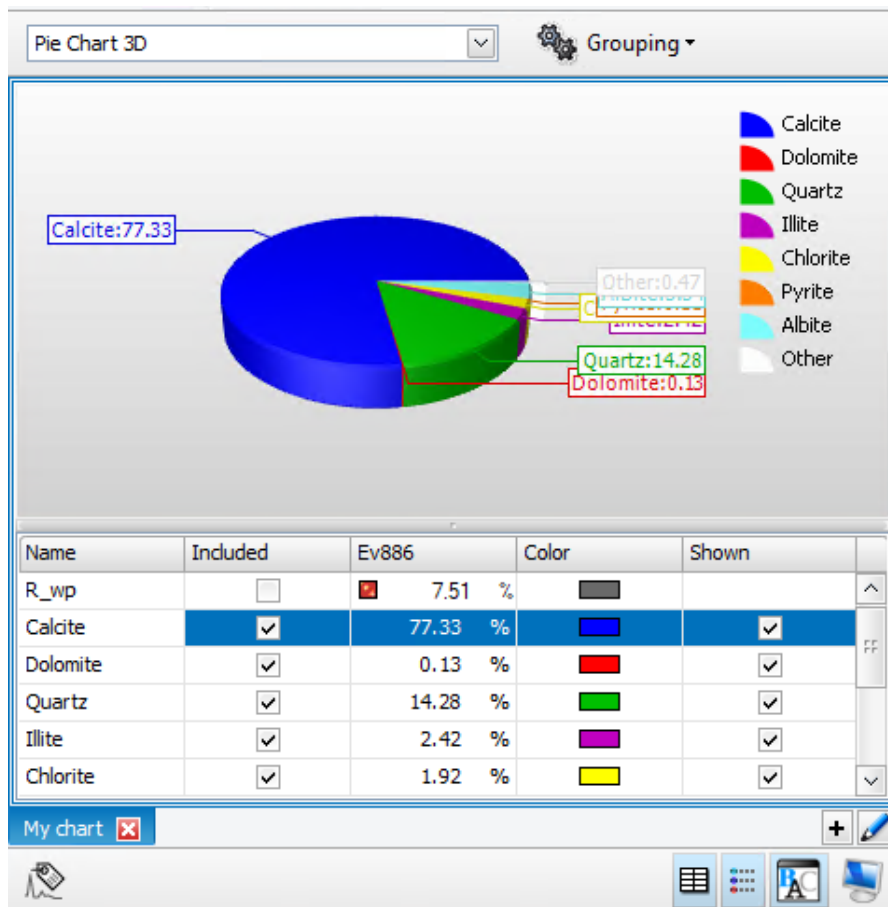


Figure 10.42: Chart view

Table 10.10: Chart view

Column	Description
Name	Name of the compound
Included	If the Included checkbox is cleared, the compound will be removed from the diagram.
Value	Concentration value
Color	Color used in graphics
Shown	If the Shown checkbox is checked, the compound will be colored and displayed individually on the diagram. Else, the compound will be added to the section named Other in the diagram.

It is possible to set a threshold for the compound display. Values that fall below this threshold are automatically no longer listed and go into the **Other** section. To do so:

1. Click **Enable Automatic Grouping** on the **Grouping** menu.
2. Enter a threshold value in the **Max. Threshold** text box.

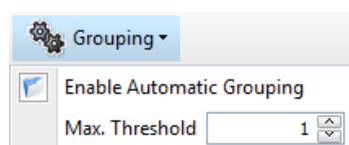
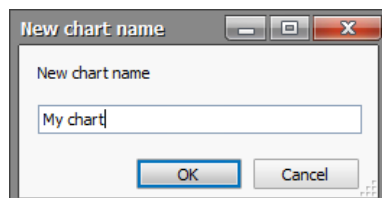


Figure 10.43: Automatic grouping

Several charts can be created.



1. Click the **+** button to add a new chart tab.
 - The New chart name dialog box will open.






2. Enter the desired name and click **OK**.





The chart can be renamed by clicking the **Pencil** button.

Other display options are available as described in the following table.

Table 10.11: Other display options

Button	Icon	Description
Edit Label		Open the label editor. The diagram allows the display of multiple results at the same time. The individual results can be labelled. The labels can be composed of the properties that have been retrieved from the database by the Results Manager. See section Label Editor [106] for more details.
Show Table		Show/Hide Compounds table
Legend		Show/Hide legend in chart

Button	Icon	Description
Show Title		Show/Hide diagram title
Display Mode		Toggle between display and configuration mode (table)

10.7.1.1.3 Compound List View

The Compound List view simply displays the results as a table.

Measurement		
Specimen	Limestone-6	
Name	8-65-5min5s	
Time	7/18/2016	
Compounds		
R_wp	<input checked="" type="checkbox"/>	7.51 %
Calcite		77.33 %
Dolomite		0.13 %
Quartz		14.28 %
Illite		2.42 %
Chlorite		1.92 %
Pyrite		0.11 %
Albite		3.34 %
K-Feldspar		0.48 %
CO2_XRD		34.06 %

Figure 10.44: **Compound list view**

10.7.1.1.4 Show Measurements View

If the database contains scan data of the selected results, the scan will be displayed here. Several measurement results may be selected and displayed at the same time.

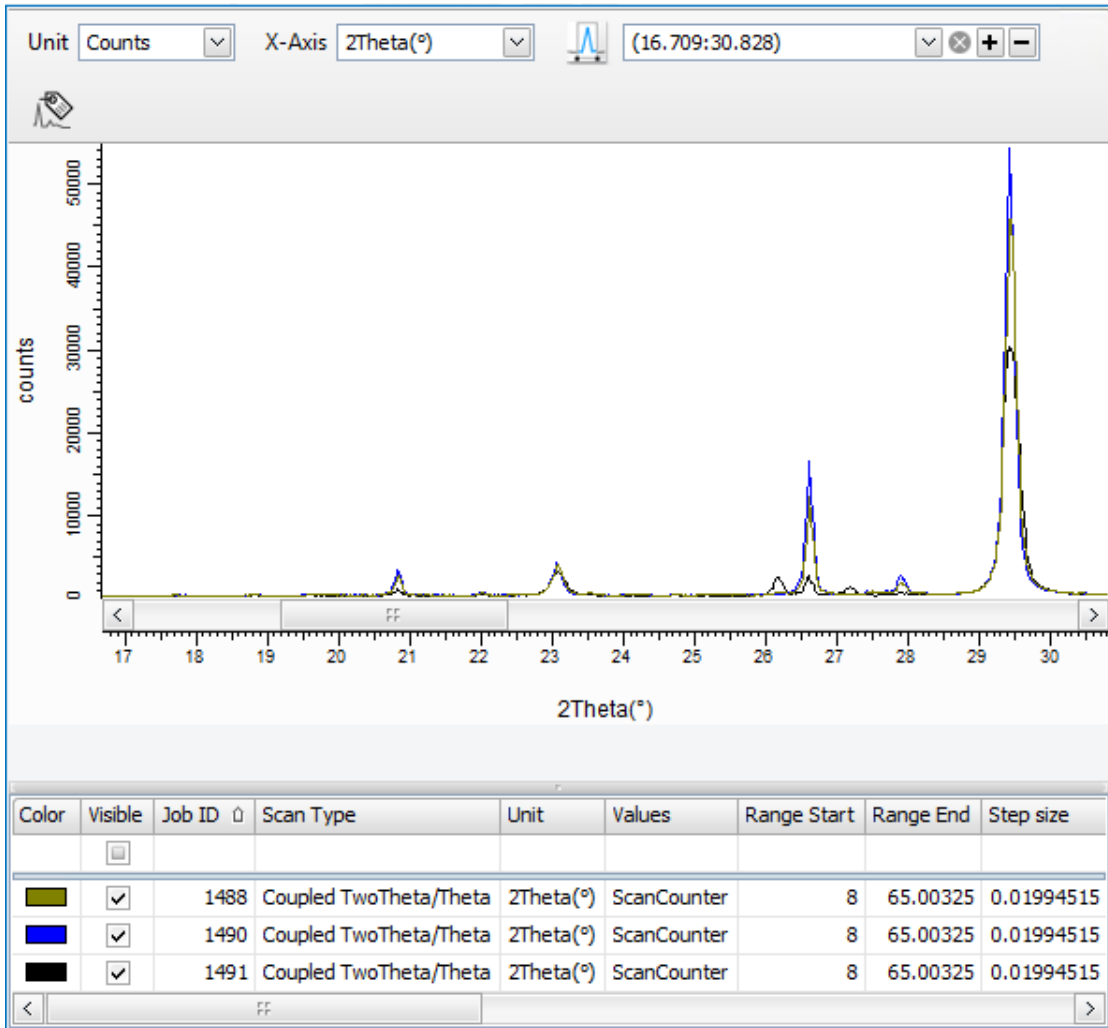



Figure 10.45: The table holds a row for each range of the selected experiment


The following columns are present:

Column	Description
JobID	Job ID of the experiment. This is important when several experiments are selected.
Visible	Graphic is visible.
Color	Color used in graphics.

Depending on the kind of data in the experiment, additional data columns may be available.

Table 10.12: Available options

Option	Description
Unit	Select either cps or counts.
X-Axis	Only 2Theta(°) is available.
Select the visible region	 <p>Allows the user to save the current region by clicking the Add region button (+). The saved regions will be listed in the drop-down list.</p> <p>To delete a region, select it in the list click the Remove region button (-).</p>

Option	Description
	Opens the label editor. Allows each measurement to be given a label. The label will be displayed in the table and as tooltip when hovering above the measurement. See section Label Editor [106] for more details.

10.7.1.1.5 Show Comment View

This view shows the comment that the user might have written for a specific evaluation. A comment is entered using the action **Comment evaluation** (see [Selecting the Action buttons \[139\]](#)) or for printing when the option **Ask for comment before printing** is active in the case of a **View based** detail report (see [View based Report \[147\]](#)).

This view may be interesting when the evaluation comment should be printed together with the quantitative results.

10.7.1.1.6 View Pictures View

This view can be used in the case the system is equipped with a camera. You can setup the measurement server to take a picture of the sample before and after measurement. Pictures are then part of the measurement data and can be displayed with that view.

10.7.1.2 Selecting the Action buttons

Select the **Action** buttons that will be displayed by default in the **Results** view.


Table 10.13: Available actions

Action	Description
Export brml	Retrieves the brml from the database and store it on the file system.
Export V4 Raw File	Retrieves the brml from the database and store it on the file system as a Raw V4 file.
Export CSV File	Fills a CSV file with the contents of the selected results.
Launch Program	Allows an external program to be called.
Export all data	Saves all data into a data container file (*.DCON file).
Save evaluation file	Saves the evaluation into a file.
Export as RTF	Fills a template rtf file with the contents of the selected results.
Comment evaluation	Allows a comment to be entered for the selected evaluation.
Show signatures	Displays signature history of evaluation.
Import TEMP_C	Not relevant.
Create SSD files	Not relevant.
Save Package	Saves the solution file (BSML file) and the standards measurement files (BRML files) into a ZIP file for transfer or support.
Make Permanent	Makes temporary measurements (e.g. the ones that are measured by Commander) permanent and ensures that they are not deleted.

Action	Description
Create Group	Allows grouping the currently selected results and store them in an individually named view for future reference.

10.7.2 Defining the Limits Highlighting in the Results

The RESULTS MANAGER can check whether the compounds that are in the results set are within certain limits and display the results out of defined limits with specific styles (font, color, etc), e.g. display a concentration in red when it is out of the concentration range. For this, go to the **Limits** section via the **Display** menu of the left navigation bar.

 Defines if limit information is determined and if limit states are highlighted in the results.

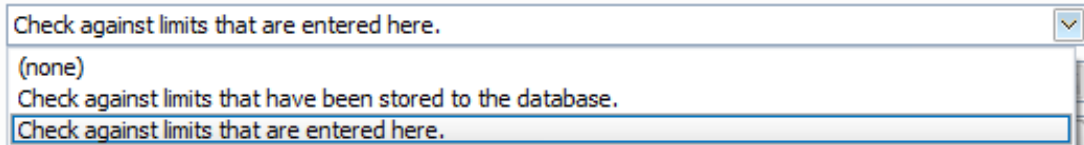


Figure 10.46: Defining limits highlighting

If concentration limits were stored to the database,

1. Select **Check against limits that have been stored to the database** in the drop-down list so that
 - ⇒ RESULTS MANAGER checks if concentrations limits are set and defines if limit states should be highlighted in the results.

Else, the user can define temporary limits for one or several sample IDs.

1. Select **Check against limits that are entered here** in the drop-down list.

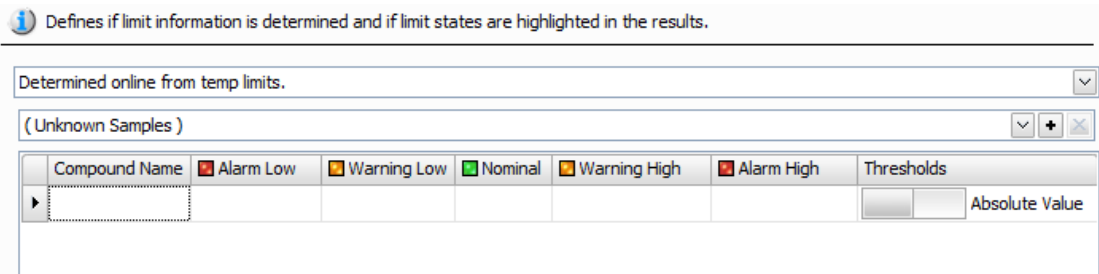


Figure 10.47: Defining limits

- The limit card that is applied to all samples is labelled (**unknown samples**)
 - More limit cards can be defined. The limits are applied when the sample ID matches the name of the card.
1. Click the **Plus** button next to (**Unknown Samples**) to create a new limit card.

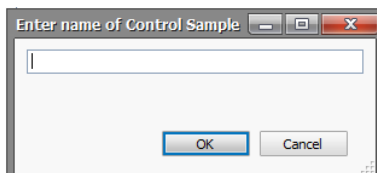


Figure 10.48: Defining a new control sample

2. Enter the limit card name.
3. Click **OK**.

- The list of compounds available in the **Compound Name** drop-down list is retrieved from the selection of compounds made at the **Shown Compounds** step.

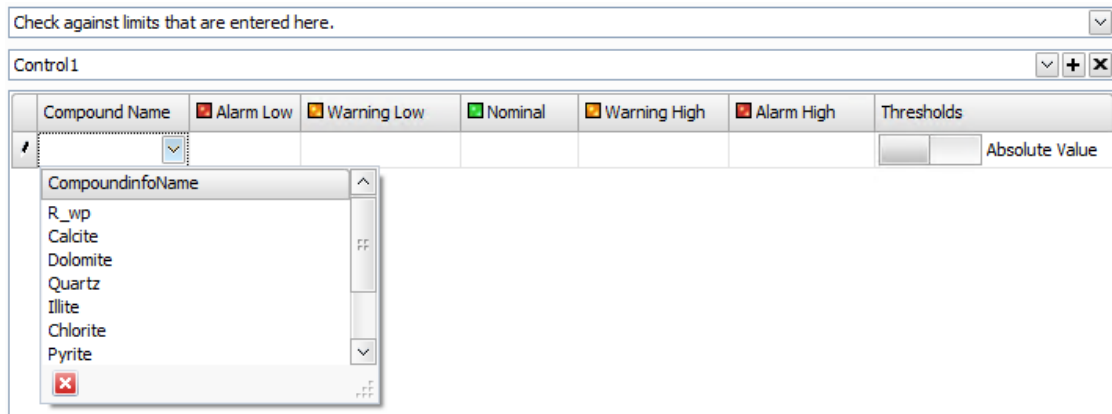


Figure 10.49: List of compounds retrieved from the database

4. Enter limits for each compound.

Table 10.14: Limits table

Column	Description
Compound name	Name of the compound.
Alarm Low Alarm High	Concentrations out of this range will be highlighted in RESULTS MANAGER to alarm the user.
Nominal	Average expected value (indicative).
Warning Low Warning High	Concentrations out of this range will be highlighted in RESULTS MANAGER to warn the user.
Thresholds	The cursor allows selecting between: <ul style="list-style-type: none"> • Absolute Value: the concentration limits are absolute values • Percent of Nominal: the concentration limits are given by a given percentage of the nominal value.

The styles used for highlighting the results are defined in the **Global Visualization Settings**. See section [Defining the Appearance of Texts in the Results \[▶ 141\]](#).

See also

- Defining the Appearance of Texts in the Results [▶ 141]

10.7.3 Defining the Appearance of Texts in the Results

The information about the appearance of text displayed in the results can be configured in the **Global Visualization Settings**. This applies both to standard text and highlighted text. Highlighted text is used to mark errors or limit violations. Note that these settings are global. They are applied automatically to any view that is displayed in the RESULTS MANAGER.

The user can use different settings for viewing, printing, importing and exporting.

To access the **Global Visualization Settings**:

1. Click the **Global Visualization Settings...** command on the **Results Manager** menu.
 - or —
 - click **Modify visual settings for limits** at the bottom of the **Limits** screen.
- ⇒ The **Display settings for limits and error states** dialog box will open.

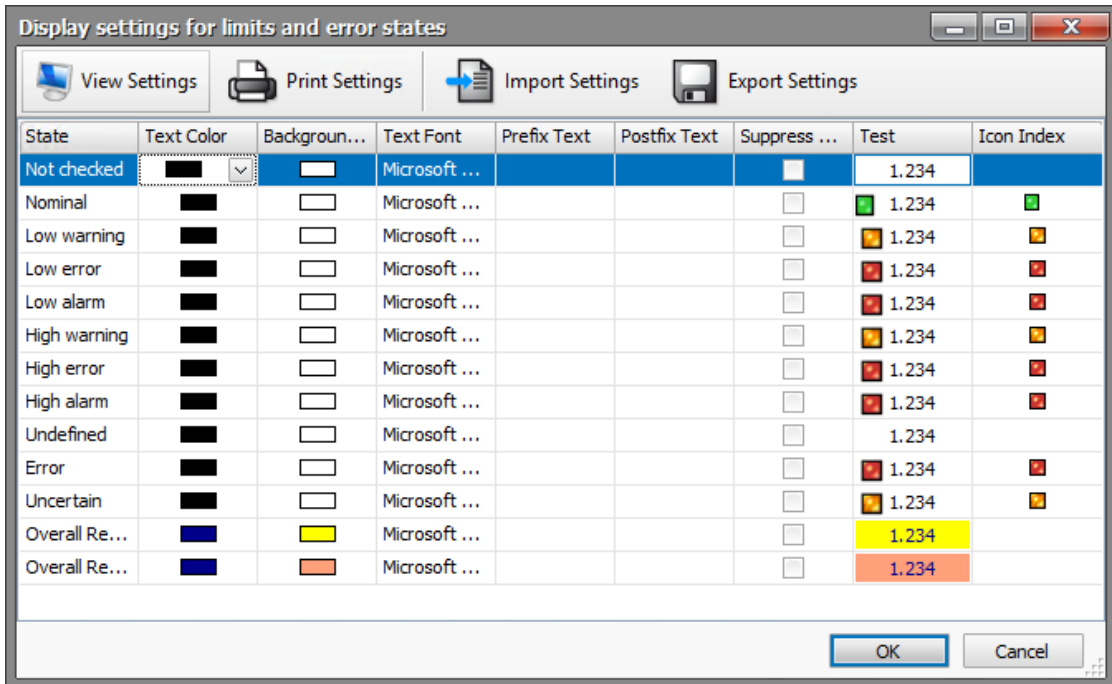


Figure 10.50: Defining the global visualization settings

The **State** defines to which kind of value a display setting should be applied. As long as there is no limit highlighting or error states involved, the **Not checked** state is the only one that is in use.

The **Nominal**, **Low Warning**, **Low Error**, **High Warning**, **High Error** states represent limit check or limit violations. Additional states are used to mark certain error states.

The following describes the configuration options that can be applied to each individual state:

Option	Description
Text Color	Color of the text
Background color	Color of the background.
Text Font	Font used to write text. That includes font name, size and bold and italic styles.
Prefix Text	A text that is written before the value.
Postfix text	A text that is written after the value.
Suppress value	If this is checked the value is hidden
Test	Preview of the text formatting
Icon	Icon to be shown additionally to the text.

10.8 How to Print Results

10.8.1 Defining the Type of Printout

Before printing results the user has to set the **Type of printout**. Else an error message will prompt him/her to set one.

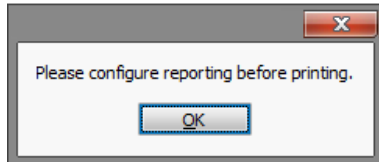


Figure 10.51: Printout information box

To define the **Type of printout** switch to the **Configure** mode.

1. Select **Report Settings** in the **Printing** section of the left navigation bar.
 - ▶ The **Report Settings editor** will be displayed.

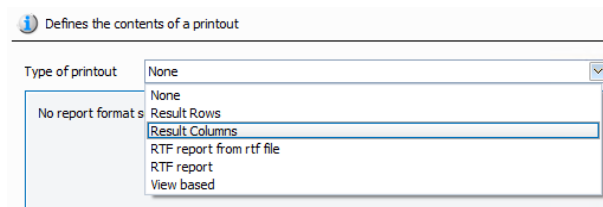


Figure 10.52: Selecting the type of printout

2. Select the desired **Type of printout** in the drop-down list. The following types of reports are supported:
 - Result Rows
 - Result Columns
 - RTF Report
 - RTF Report from rtf file
 - View based

10.8.1.1 Result Rows Report

Results Rows reports print out the contents of the results as rows. This kind of report is very convenient when printing out large sets of results with only a few parameters.

Type of printout Result Rows

Printout view

Maximum number of results used on automatic printout 20

Report template

Ask for comment before printing

Appearance

Vertical lines All

Horizontal lines All

Shaded Headers

Header Font Microsoft Sans Serif;8.25

Cell Font Microsoft Sans Serif;8.25

Word wrapping As Needed

Layout

Fit columns in one row

Distribute columns on several rows.

Header once

Header each row

Header each result

Distribute columns on several tables.

Right bound Tables

Auto size columns

Figure 10.53: Setting the Result Rows printout

Table 10.15: Result Rows printout settings

	Setting	Description
	Maximum number of results used on automatic printout	When printing out automatically the maximum number of results is the number of results that are printed in one printout.
Appearance	Vertical lines	Sets which vertical lines of the table should be printed.
	Horizontal lines	Sets which horizontal lines of the table should be printed.
	Shaded headers	Sets whether headers are shaded or not
	Header font	Sets the font of the header.
	Cell font	Sets the font of the cells.
	Word wrapping	Sets the maximum number of word wraps in a cell.
Layout	Fit columns in one row	Fits each results in one row
	Distribute columns on several rows	When several rows should be used there is the option to display the columns in several rows, or to use several tables to cover all columns.
	Distribute columns on several tables	
	Right-bound tables	If tables are right bound they span the complete width of the page.
	Auto-size columns	If this option is active the column sizes are enlarged to fit the contents of the text.



If you select the **Ask comment before printing** check box, you will be prompted to enter an evaluation comment before printing.

10.8.1.2 Result Columns Report

Result Columns report print out the contents of the results as a column. This report is very convenient when printing out few results on one page with a large number of parameters.

Figure 10.54: Setting the Result Columns printout

The configuration options are the same as in the result rows. The **Column layout** options allow configuration of the column widths. The first column is the parameter name column which can be configured separately from the rest. Sizing can be based on % or on mm.

10.8.1.3 RTF Reports

Two options are available for RTF reports.

RTF report from RTF file

In this case the report is configured from a **RTF template** file. This file is specified using the **Browse** button.

RTF report

Selecting the **RTF report** option shows an embedded editor. All properties that are used in the current view specification can be put into the report as macros. They appear in the macro list. Clicking one macro entry includes it at the current position of the editor cursor.

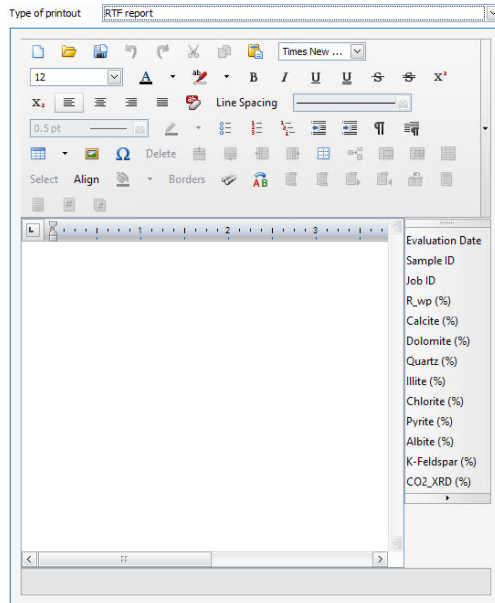


Figure 10.55: RTF editor

10.8.1.4 View based Report

The **View based** printout should be used when any graphics that are shown in the detail views should be printed out.

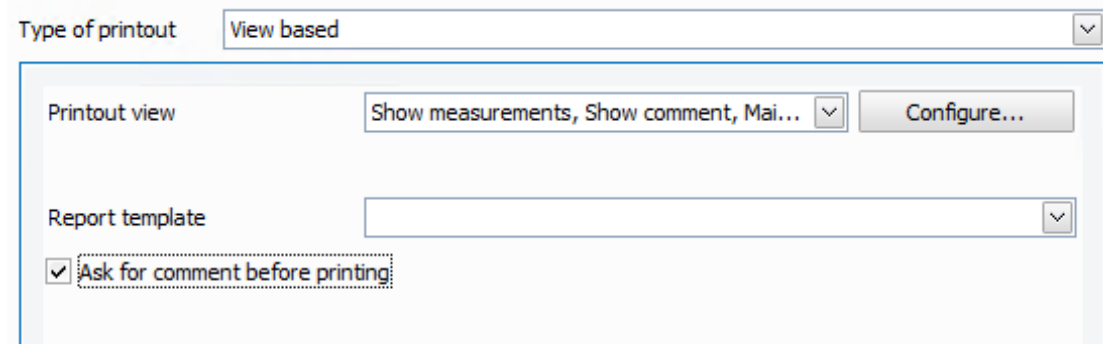


Figure 10.56: View base printout

The **Printout view** selection allows the user to select which of the Result Manager views should be printed out.

When the **Ask for comment before printing** option is selected, the user will be prompted to enter a comment about the evaluation before printing results.

Several detail views can be printed out at the same time. Additionally the main table contents can be printed out as well.

1. Select the desired views in the **Printout view** drop-down list by selecting the corresponding check boxes.
2. To configure details about the printout, click the **Configure...** button.
 - The **Configure print details** dialog box will open. It lists the individual parts that are available for printing.

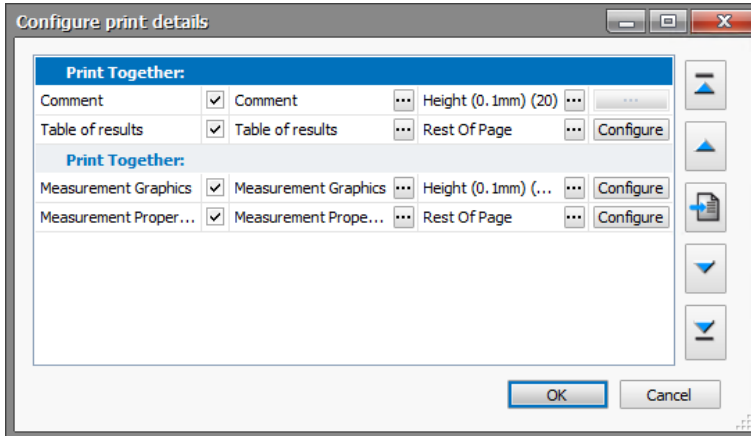


Figure 10.57: **Configure print details** dialog box

The sequence of the report parts can be modified via the arrow buttons on the right. Some detail views come with more than one part. Using the checkbox the individual parts can be turned off or turned on for printing.

Print together feature



The **Print together** button can be applied to a group of selected report parts.

The **Print together** feature is effective when printing out more than one result at the same time. If for example the Measurement Graphics are a single group that is printed together, in the printout the measurement graphics of all results would be printed next to each other. If the group additionally contains the Measurement Properties, for each result graphics and properties would be printed together.

Printed caption

The caption editor allows each part to be given an individual header. The alternative header can be edited directly in the table. Placeholders can be used that are replaced at printing time. When clicking onto the [...] button a label editor pops up that helps to create the headers. The parameter columns that are currently selected in the RESULTS MANAGER main view can be selected and can be combined in the label.

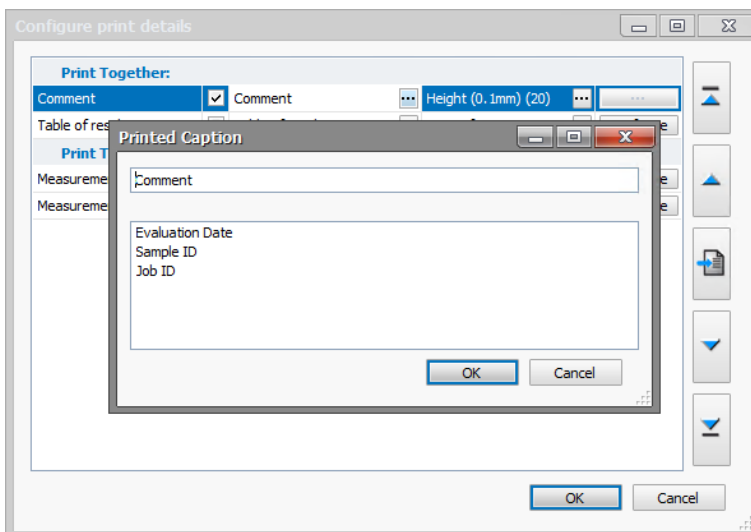


Figure 10.58: **Setting the printed caption**

Size

The **Size** editor allows the height of the individual report parts to be modified.

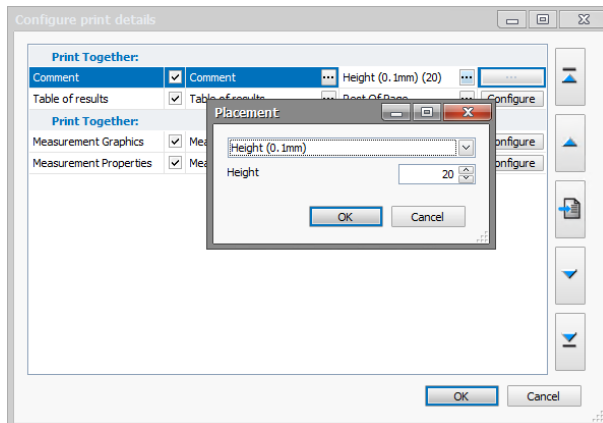


Figure 10.59: Setting the height

They can either cover the full page, the rest of the page or a specific height base on mm.

- **Configure buttons**

The configure buttons allow individual configuration of the report parts. When configuring the **Table of Results**, the configuration of the main table printout offers the same options as the **Result Rows/Result Columns** reports. See sections [Result Rows Report \[▶ 144\]](#) and [Result Columns Report \[▶ 145\]](#) for a detailed description.

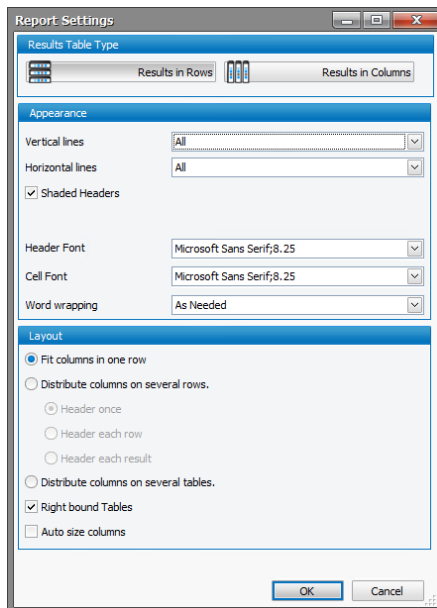


Figure 10.60: Report settings dialog

10.8.2 Defining Another Results Format for Printing

Usually the choice and formatting of printed columns for display and printout are the same. If both should be different this can be configured in the **Printed Parameters** section. If the option **Use different layout for printing and exporting** is checked, individual formatting is allowed. The formatting editor is opened and the results formatting can be set as described in section [Creating a Results Format \[▶ 106\]](#).

10.8.3 Previewing the Printout and Printing

Once the type of printout defined, selected results can be printed by clicking the **Print Preview Selection** command on the **File** menu. The **Print preview** window will be opened.

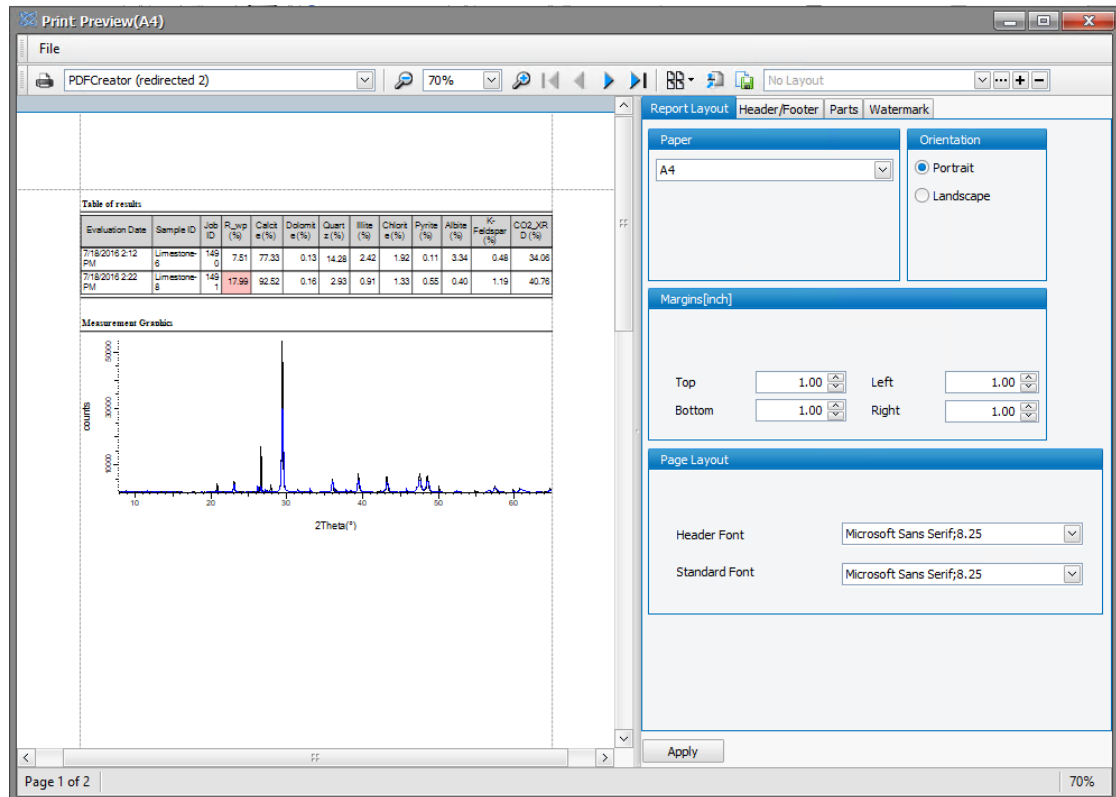


Figure 10.61: Print preview

The window displays a preview of the printed pages. The print settings can be configured in a set of tabs on the right of the preview: **Page Setup**, **Header/footer**, **Parts** and **Watermark**.

1. Select the desired settings and
2. click the **Apply** button to apply them to the current document.

A report layout corresponding to the selected settings can be saved and be applied to another document:

1. Click the **+** button to the right of the Report layout drop down-list on the toolbar.
 - The **New Report Layout** dialog box will be displayed.
2. Enter a name for the **New Report layout**.
3. Click **OK**.

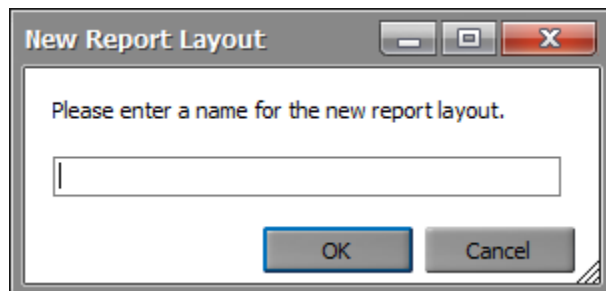


Figure 10.62: Report layout definition

To reuse a layout in future previews the name can be selected in the selection box.

A report layout can be deleted by clicking the – button.

A report layout can be imported by clicking the **Browse** button.

10.8.3.1 Report Layout Tab

The screenshot shows the 'Report Layout' configuration window with the following settings:

- Report Layout Tab:** Active, with sub-tabs for Header/Footer, Parts, and Watermark.
- Paper:** A4
- Orientation:** Portrait (selected), Landscape
- Margins [inch]:**
 - Top: 1.00
 - Left: 1.00
 - Bottom: 1.00
 - Right: 1.00
- Page Layout:**
 - Header Font: Microsoft Sans Serif; 8.25
 - Standard Font: Microsoft Sans Serif; 8.25

Figure 10.63: Setting the report layout

In the **Report Layout** tab the following properties can be set:

Property	Description
Paper	Type of paper
Orientation	Default orientation of all report parts: portrait or landscape
Margins [mm]	Margins for the top, bottom, left and right in mm
Title Font	Font to be used for displaying part titles.
Header Font	Font to be used for displaying headers.
Standard Font	Font to be used for displaying all text that is not configured otherwise.

10.8.3.2 Header/Footer Tab

The **Header/Footer** tab allows setting formatted text as header and footer.

Figure 10.64: Defining a header/footer

To define a header/footer:

1. Select one the following options:

- **Never:** No header/footer will be printed in the document.
- **First Page:** The header/footer will be added only to the first page of the document.
- **Always:** The header/footer will be added to all the pages of the document.

Three list boxes appear below these options. Each list box is associated with a part of the page header/footer. For example, the list box on the left corresponds to the left part of the page header/footer.

To create or modify items in the lists

1. Click the **Edit** button.

- The **Edit** dialog box will be displayed.

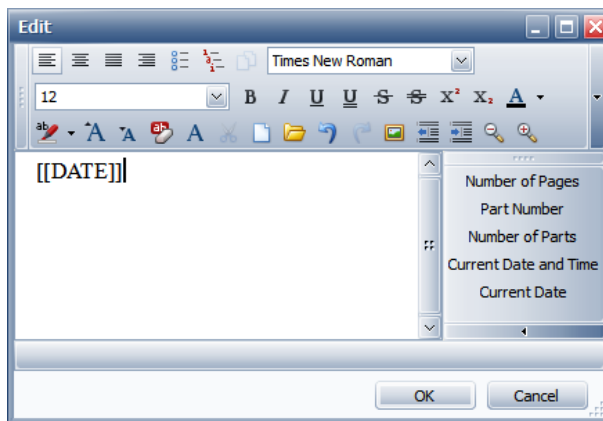


Figure 10.65: Edit tab

2. Select the desired elements to be included into the header and the footer including various font sizes, images, tables.
3. Select the desired macros from the list in the right area. These macros are replaced during printing time. Available macros include **Page Number** and **Current Date**.
4. Click **OK**.

10.8.3.3 Parts Tab

A report can be composed of several parts. In the **Parts** tab the printout of these parts can be changed.

Report Layout	Header/Footer	Parts	Watermark	
Caption	Orientation	Visible	Type	Can share page
Table of results	Default	<input checked="" type="checkbox"/>	Table	<input type="checkbox"/>
Measuremen...	Default	<input checked="" type="checkbox"/>	Graphics	<input type="checkbox"/>
Diagram of	Default	<input checked="" type="checkbox"/>	Graphics	<input type="checkbox"/>

Appearance

Vertical lines:

Horizontal lines:

Shaded Headers

Header Font:

Cell Font:

Word wrapping:

Layout

Fit columns in one row

Distribute columns on several rows.

Header once

Header each row

Header each result

Distribute columns on several tables.

Right bound Tables

Auto size columns

Figure 10.66: Selecting the parts to be printed

The parts overview table contains the following settings:

- **Caption:** Title of the part. This can be changed.
- **Orientation:** This is usually the default orientation of the report that has been set in the **Report Layout** Tab. It can be overridden for an individual part.
- **Visible:** Parts can be made invisible and thus included from the printout.
- **Type:** The type displays information whether the part is a table or image.

Depending on the type of part additional layout properties might be changed. These properties can be set in the **Type of printout** as well. See section [Defining the Type of Printout](#) [p. 143] for more details.

10.8.3.4 Watermark Tab

The **Watermark** tab allows selection of an image and printing it out in the background of the report.

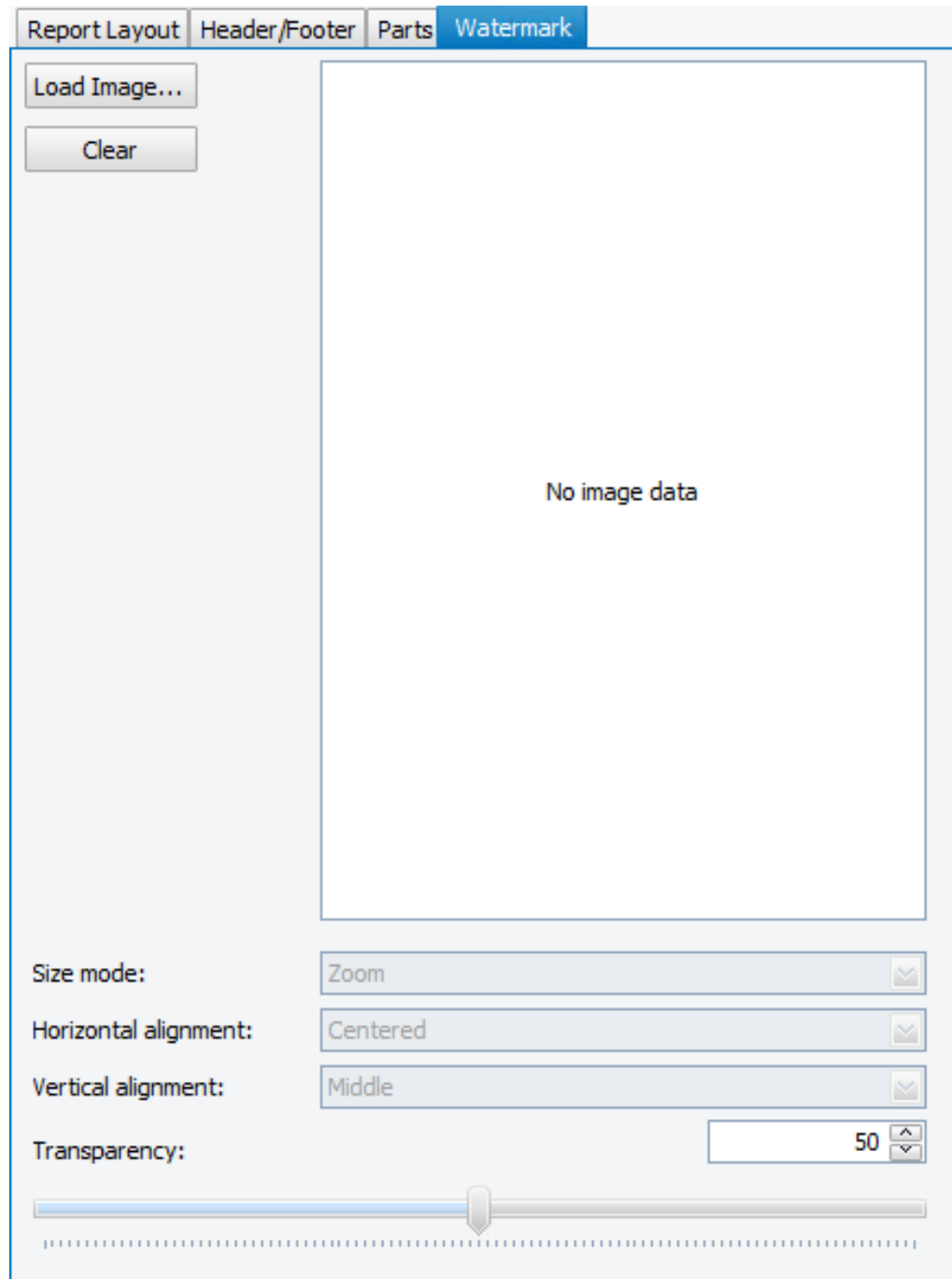


Figure 10.67: Adding a watermark

To add a watermark:

1. Click the **Load Image** button to load the image to be used as a watermark.
2. Select the **Size mode** in the drop-down list.
3. Select the Horizontal and Vertical alignment.
4. Adjust the transparency by entering the desired value or by using the slider.
5. To remove the watermark, click the **Clear** button.

11 DATABASE MANAGEMENT

11.1 General

The **DATABASE MANAGEMENT** plug-in is divided into the sections: **Instrument Configuration**, **User Management**, **Audit Trail**, **General Settings** and **Database Maintenance**.

- **Instrument Configuration** is used to maintain basic settings for X-ray instruments and the Measurement Server instance or instances to which they have been assigned. In this section the user can also manage the configurations that can be applied to instruments and their components.
- **User Management** is used to view and manage user data and user and group rights.
- **Audit Trail** provides a list of user actions that have been logged in the database.
- **General Settings** allows the user to maintain general system settings. This section also provides functionality that allows database backups and, if required, restores the database after such a backup has been made.
- Finally, **Database Maintenance** is used to clean the database. Thus, obsolete data are removed from the working database, to increase the speed of the database operation.

11.2 Screen Layout and Operation

The user interface of the **DATABASE MANAGEMENT** plug-in consists of tab pages corresponding to the different sections of the plug-in. The sections are accessed by tabs located at the bottom of the screen.

11.2.1 Instrument Configuration

The **Instrument Configuration** page contains two windows: **Controlled Devices** and **Instrument Configurations**. In the first of these windows there is a table containing basic settings for the Measurement Server instance or instances and for the assigned instruments in each case. The second window contains a table in which information on the configurations is displayed. This information can be used by each instrument.

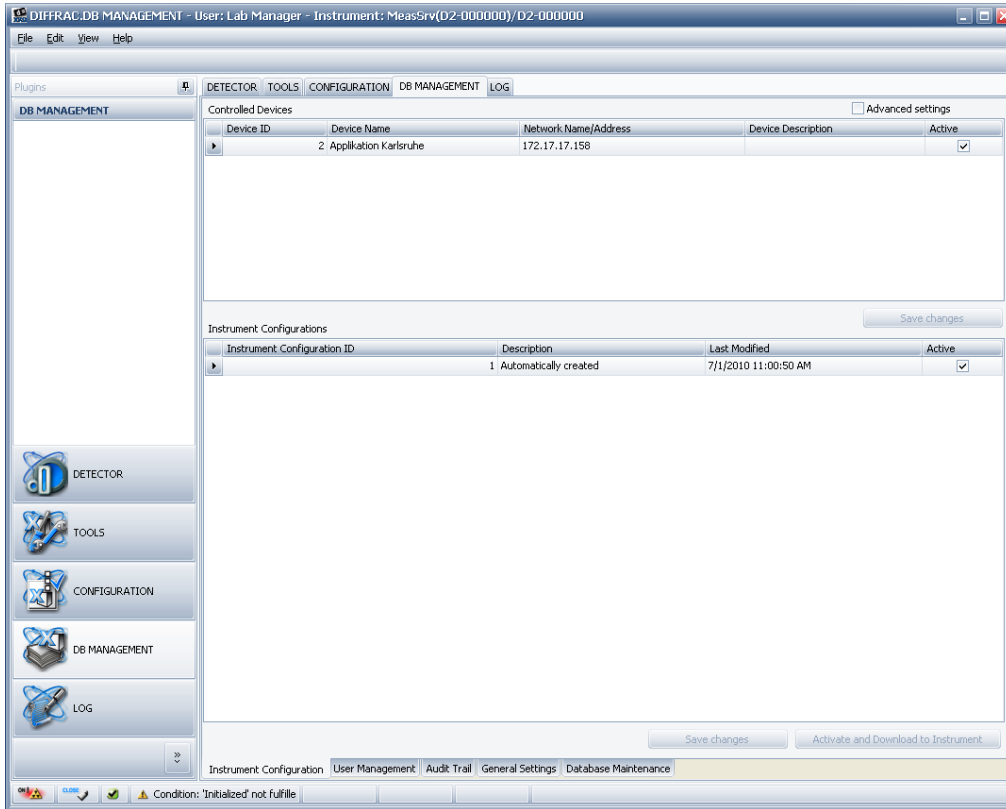


Figure 11.1: Instrument Configuration page

11.2.1.1 Controlled Devices Window

The table in the **Controlled Devices** window has the following columns:

Device ID	The unique ID of the device can be an instrument or a Measurement Server. The ID is generated by the database.
Device Name	The name of the device. This name can be changed by the user.
Network Name/ Address	The network name or the IP address of the device.
Device Description	In this column an accurate description of the device should be entered.
Active	If the check boxes in this column are marked, an attempt to get control of the corresponding instrument will be made at each start-up of the Measurement Server to which the instrument has been assigned. Unmark the check box if the instrument is to be ignored by the Measurement Server at start-up.
Advanced Settings	If this check box is marked at the top right of the screen, three additional columns with their information will be added to the table. These columns include the TCP/IP Port, the Assigned to Measurement Server entry, and the Is Instrument check box.
TCP/IP Port:	The port at which the instrument or Measurement Server listens for connections. Instruments listen by default at port 4284, while Measurement Servers listen at port 1904.
Assigned to Measurement Server	The name or the IP address of the Measurement Server to which the instrument has been assigned.

Direct Connection	This column contains check boxes indicating whether the corresponding device is an instrument or Measurement Server. An unchecked check box means that the device is a Measurement Server.
--------------------------	--



To change the settings in the **Controlled Devices** table, the user right **Change Software Configuration** is required.

11.2.1.1.1 Deleting Devices from the Database

As explained in the section [Instrument Configuration \[157\]](#) above, instruments are entered in the database automatically when they are assigned to a Measurement Server instance using the dialog box **Select Instruments** of the particular Measurement Server instance. At the same time, this Measurement Server instance will be entered in the database if it has not already been registered there. Once devices have been entered as described, they will appear in the **Controlled Devices** table.



Any changes made in the **Controlled Devices** table will not be stored in the database until they are saved and the Software is restarted!

Deleting Devices from the Database

1. A device can be deleted by right-clicking on the appropriate row in the **Controlled Devices** table.
 - When this is done, a context menu appears.
2. Click on **Delete devices** to delete the device and its configurations from the database.



To change the settings in the **Controlled Devices** table, the user right **Change Software Configuration** is required.

11.2.1.2 Instrument Configurations Window

The **Instrument Configurations** window contains a table listing all configurations applicable to a selected instrument. These configurations have been entered in the database using **CONFIG**.

An instrument can be assigned an unlimited number of configurations, but at any one time only one configuration can be the active configuration.

To display the configurations for an instrument,

1. Select the instrument by marking its **Device ID** in the **Controlled Devices** window.

The **Instrument Configurations** table contains the following columns:

Instrument Configuration ID	This column contains the unique ID of the instrument configuration. This ID is created by the database.
Description	An accurate description of the instrument configuration should be entered.
Last Modified	Date/time of the last change to the configuration.
Active	The check box in this column should be marked to activate the configuration. Only one configuration can be active at one time.

- The **Save Changes** button to the right below the **Instrument Configurations** window allows the user to save the changes to the database.
- The **Download to Instrument** button loads the selected configuration into the firmware of the appropriate instrument and restarts the instrument in order to activate the configuration.



To change the settings in the **Instrument Configurations** table, the user right **Change Software Configuration** is required.

Deleting Configurations

1. A configuration can be deleted by right-clicking on the appropriate row in the **Instrument Configurations** table.
 - In this case a context menu will appear.
2. Click on **Delete Configuration** to delete the instrument configuration.

11.2.2 User Management

The **User Management** page allows the user to manage the access rights of users and the user groups to which they are assigned. New users can be created and granted user rights by assigning them to one or several groups.

The **User Management** page contains two tables: **Users** and **Groups**. These are described in detail in the following sections.



To change the settings of the **User Management** page, the user rights **Create User**, **Delete User** and **Modify User** are required.

11.2.2.1 User and Group Rights Concept

The user and group rights concept implemented in the MEASUREMENT CENTER software is similar to that of the Windows operating system. However, the groups, group rights and user rights are independent of those of the Windows operating system. This means that users and groups used in the MEASUREMENT CENTER have to be specially created. They do not have any relevance for the operating system users. The software is delivered with a set of predefined groups and users.

- **Groups:** Groups are assigned group rights. The rights of a particular group are given to all users who are members of this group.
- **Users:** Users can be members of several groups and inherit all rights from these groups.

11.2.2.2 Users Table

The **Users** table contains a list of users, their user IDs, passwords, login names, and the user groups to which they have been assigned. In this table users can be added and deleted, user properties can be changed, new users can be assigned to user groups, and the user groups to which existing users belong can be changed.

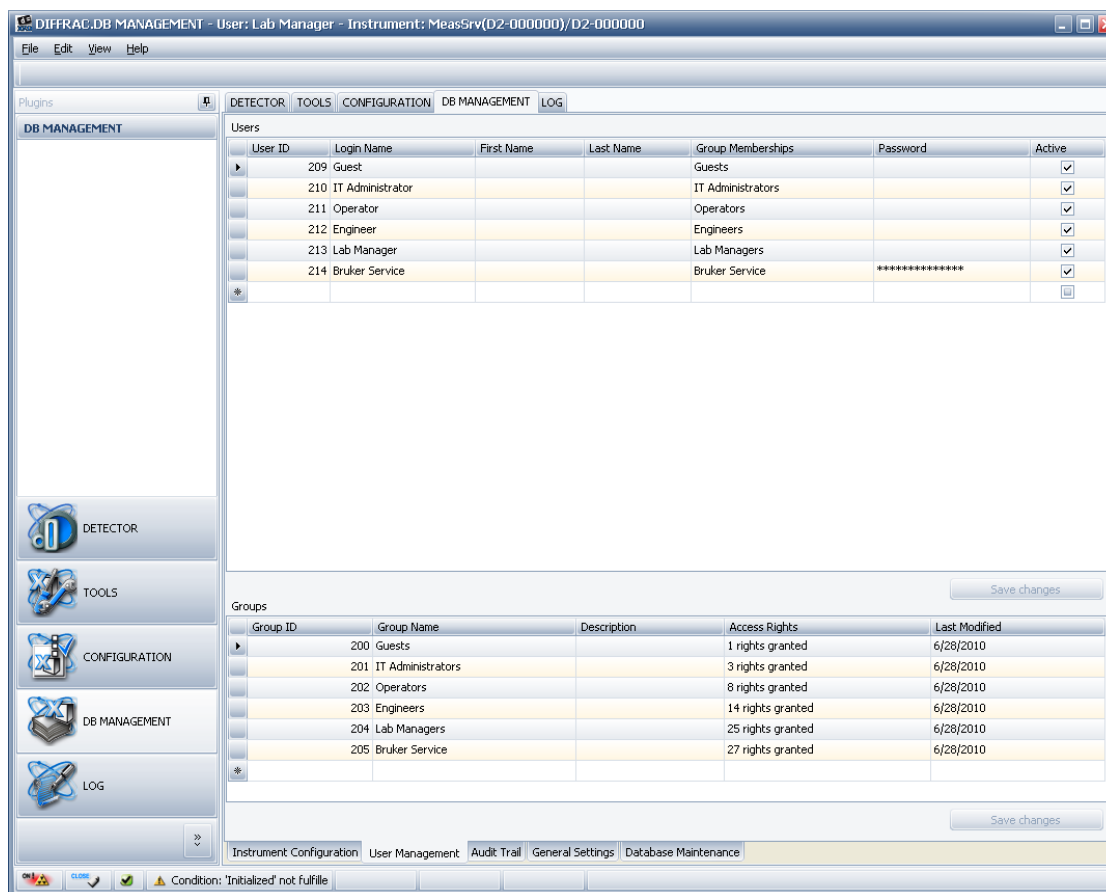


Figure 11.2: User Management page

The table contains the following columns:

User ID:	The unique ID of the user. The ID is created by the database.
Login Name:	The login name of the user. The login names are displayed in the login dialog when the software is started, or if the function Change User has been selected. Limitation: The login name of the Bruker Service user cannot be changed.
First Name:	The first name of the user.
Last Name:	The last name of the user.
Group Memberships:	In this column all available groups are displayed. Users can be added to and removed from groups.

- To assign a new user to a group or groups, or to assign an existing user to an extra group or groups, left-click on the corresponding cell in this column.

► The following context menu will appear.

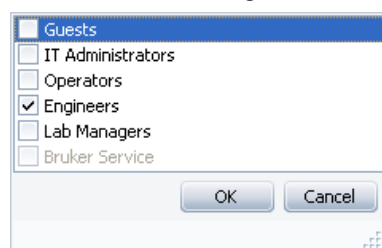


Figure 11.3: Context menu Group membership

2. Select the appropriate group or groups from this menu,
3. click on **OK**.

⇒ The group or groups will appear in the **Group Memberships** column alongside the user's name.

Limitation: The Bruker Service group can only be assigned to a user if the logged-in operator is a member of the Bruker Service group.

Password:	In this column a user's password can be changed.
Active:	If the check box in this column is unchecked, the user account can be temporarily disabled.
Adding new users:	To create a new user, enter the relevant information in the empty row at the bottom of the table. The User ID is 0 as long as the user's information is not saved in the database.
Save Changes:	This button becomes active if there are unsaved changes in the table.

Deleting Users and Storing Additional User Data

To delete users or enter additional user data and maintain user profiles, right-click on the table to get the following context menu:



This context menu offers the following options:

- **Delete User:** Deletes the selected user from the database
 Limitations: The Bruker Service user cannot be deleted.
 At least one user with the group membership **Lab Manager** is required. If the selected user is the last member of this group, the account cannot be deleted.
- **Properties:** This opens the dialog box **User properties**.

Figure 11.4: Dialog box **User properties**

Some of the properties in this dialog box are the same as those in the **Users** table. Changing them here also changes them in the **Users** table.

In addition, the user’s email address, postal address, phone/fax numbers and employee ID can be stored. The dialog box also contains a memo field in which additional text information can be entered and stored.

Limitations: The user with the Bruker Service login name cannot change his login name or password.

11.2.2.3 Groups Table

The **Groups** table lists all user groups and indicates the number of access rights assigned to them. These rights are defined in the database. Groups can be added and removed, and the user rights of a group can be changed.

The table has the following columns:

Group ID:	The unique ID of a group. Created by the database.
Group Name:	The unique name of a group. If a group is added to the table and a group with this name already exists, an error message will be displayed. Limitations: The group names Bruker Service and Lab Managers cannot be changed. The Lab Managers group is the highest group available to the customer. The Bruker Service group is the highest group available to Bruker Service personnel.
Description:	A description of the group including, for example, its access rights.

Access Rights:	Left-clicking on a cell in this column opens the context-sensitive dialog box Assign group rights for group: [name of group] (see following section).
Last Modified:	Date and time of the last modification to the group.

Adding or Removing Rights to/from a User Group

The user can add or remove rights to and from a user group by using the context-sensitive dialog box **Assign group rights for group: [name of group]**, which is obtained by left-clicking on the appropriate cell in the **Access Rights** column of the **Groups** table.

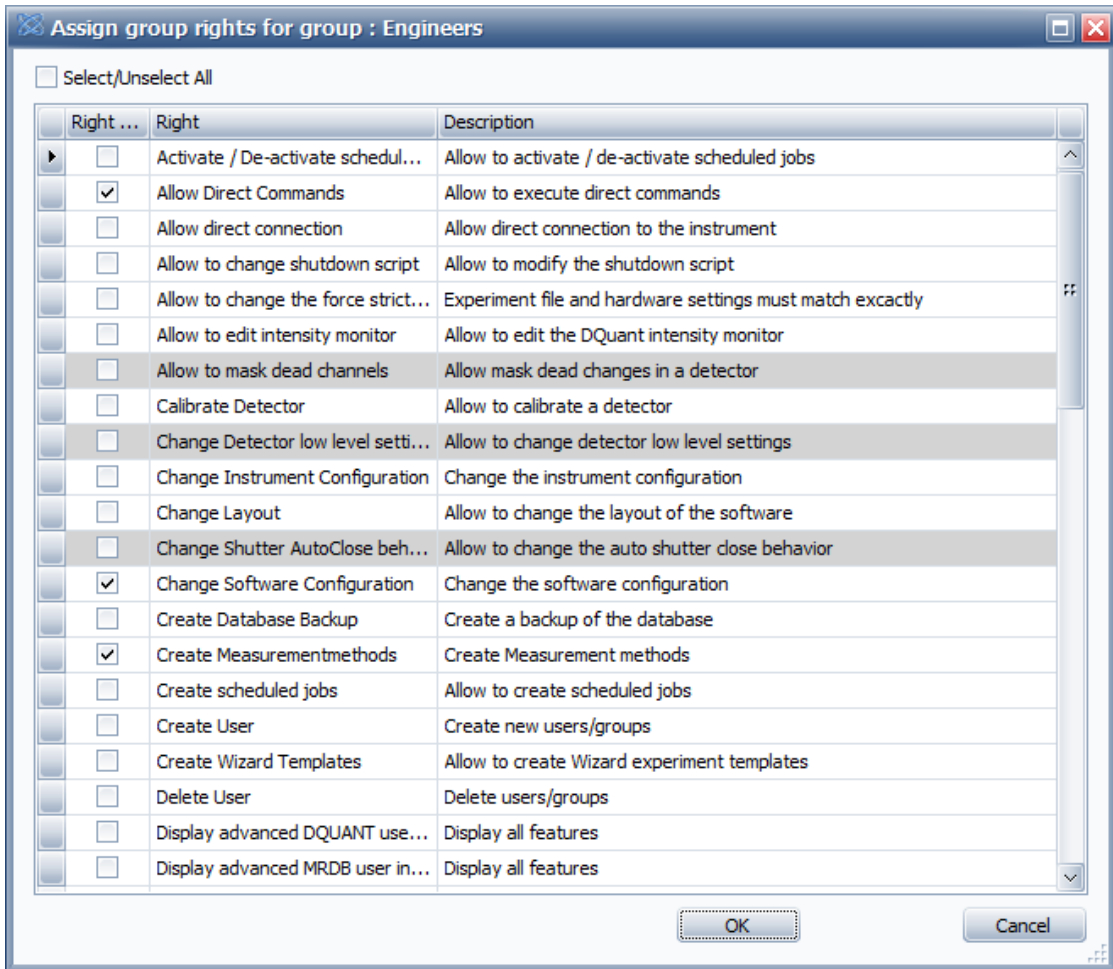


Figure 11.5: Dialog box **Assign group rights for group: [name of group]**

This dialog box contains a table listing all the available rights and their descriptions

- To add a right to the group, simply check the appropriate check box in the **Right Granted** column and click on **OK**.
- Rights are removed from groups by unchecking the check boxes.
- Rights highlighted in grey cannot be added to or removed from the group.

Deleting a User Group

Delete a user group by

1. first selecting the group in the **Group name** column and then
2. right-clicking in any other column of the **Groups** table.

- The context menu **Delete group** will appear.

3. Click on **Delete group** in this context menu to delete the selected group.

Limitations: A group can only be deleted if it no longer has any members. The groups **Lab Managers** and **Bruker Service** cannot be deleted.

11.2.3 Audit Trail

The **Audit Trail** page contains a table in which details of actions performed by users are displayed and recorded in the database. All actions performed from the time the software was first used. A specific time period can also be displayed. The actions are listed chronologically, with the most recent actions entered at the top of the list.

To display the logged actions,

1. choose the desired time frame in the scrollable list in the data field at the bottom right of the page and then
2. click on **Reload**.

Audit Trail ID	User ID	Audit Trail Created	Job ID	Module Name	Description
111	213	02.08.2017 12:56:34		DB MANAGEMENT	Settings changed for user :214 User Name:Bruker Service
110	213	02.08.2017 12:36:32		UserService DIFFRAC.Measurement Ce...	User logged on: Lab Manager.
109	213	02.08.2017 09:49:35		UserService DIFFRAC.Measurement Ce...	User logged off: Lab Manager.
108	213	02.08.2017 09:45:54		CommunicationService	The job with the ID '6' has finished.
107	213	02.08.2017 09:45:43		CommunicationService	The job with the ID '6' using the unsigned method 'COMMANDER_MEASUREMENT_Marcus.Bardic' with ID: 6 and the sample ID 'Commander Sample ID' has started on instrument 'Bruker AXS Instrument'.
106	213	02.08.2017 09:45:43		CommunicationService	The job with the ID '6' was created.
105	213	02.08.2017 09:45:13		UserService DIFFRAC.Measurement Ce...	User logged on: Lab Manager.
104	213	02.08.2017 09:45:13		UserService DIFFRAC.Measurement Ce...	User logged off: Lab Manager.
103	213	02.08.2017 09:42:33		CommunicationService	The job with the ID '5' has finished.
102	213	02.08.2017 09:42:23		CommunicationService	The job with the ID '5' using the unsigned method 'COMMANDER_MEASUREMENT_Marcus.Bardic' with ID: 5 and the sample ID '样品 ID' has started on instrument 'Bruker AXS Instrument'.
101	213	02.08.2017 09:42:22		CommunicationService	The job with the ID '5' was created.
100	213	02.08.2017 09:42:05		CommunicationService	The job with the ID '4' has finished.
99	213	02.08.2017 09:42:03		CommunicationService	The job with the ID '4' using the unsigned method 'COMMANDER_MEASUREMENT_Marcus.Bardic' with ID: 4 and the sample ID '样品 ID' has started on instrument 'Bruker AXS Instrument'.
98	213	02.08.2017 09:42:02		CommunicationService	The job with the ID '4' was created.
97	213	02.08.2017 09:41:31		UserService DIFFRAC.Measurement Ce...	User logged on: Lab Manager.
96	213	02.08.2017 09:41:31		UserService DIFFRAC.Measurement Ce...	User logged off: Lab Manager.
95	213	02.08.2017 09:40:46		CommunicationService	The job with the ID '3' has finished.
94	213	02.08.2017 09:40:34		CommunicationService	The job with the ID '3' using the unsigned method 'COMMANDER_MEASUREMENT_Marcus.Bardic' with ID: 3 and the sample ID 'Commander Sample ID' has started on instrument 'Bruker AXS Instrument'.
93	213	02.08.2017 09:40:34		CommunicationService	The job with the ID '3' was created.
92	213	02.08.2017 09:39:46		UserService DIFFRAC.Measurement Ce...	User logged on: Lab Manager.
91	213	02.08.2017 09:39:46		UserService DIFFRAC.Measurement Ce...	User logged off: Lab Manager.
90	213	02.08.2017 09:38:45		UserService DIFFRAC.Measurement Ce...	User logged on: Lab Manager.
89	213	02.08.2017 09:38:44		UserService DIFFRAC.Measurement Ce...	User logged off: Lab Manager.
88	213	02.08.2017 09:36:24		RESULTS MANAGER	View specification "[Show Measurements]" was written to database. New specification id: 4.
87	213	02.08.2017 09:33:54		CommunicationService	The job with the ID '2' has finished.
86	213	02.08.2017 09:33:40		CommunicationService	The job with the ID '2' using the unsigned method '8-9' with ID: 2 and the sample ID '2' has started on instrument 'Bruker AXS Instrument'.
85	213	02.08.2017 09:33:38		CommunicationService	The job with the ID '1' has finished.
84	213	02.08.2017 09:33:22		CommunicationService	The job with the ID '1' using the unsigned method '5-6' with ID: 1 and the sample ID '1' has started on instrument 'Bruker AXS Instrument'.
83	213	02.08.2017 09:33:22		CommunicationService	The job with the ID '2' was created.
82	213	02.08.2017 09:33:21		CommunicationService	The job with the ID '1' was created.

Figure 11.6: Audit Trail page

The table on the **Audit Trail** page contains the following columns:

Audit Trail ID	ID number of the logged action.
User ID	ID number of the initiator of the action.
Audit Trail Created	Date on which the action was logged.
Job ID	(optional) ID of the job (experiment or solution) creating the audit trail entry
Module Name	(optional) Name of the module or the plug-in creating the audit trail entry
Description	Description of action.

11.2.3.1 File Menu and Audit Trail Context Menu

The **File** menu contains **Exchange File Content** function as well as two **Audit Trail**-specific functions in a sub-menu in addition to its common functions.

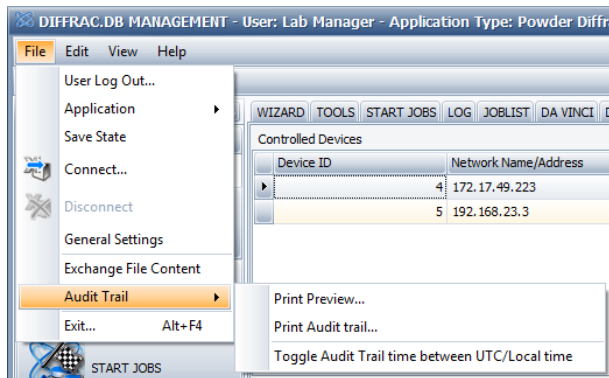


Figure 11.7: File menu (with Audit Trail-specific items)

With the function **Exchange File Content**, the user can select a file from the file system and update all occurrences of files with the same name at the database with the new file content. With this feature, it is e. g. possible to exchange a script file and all measurement templates using this script will work with the new file without the need to recreate all templates.



Please note: This function is only available if the user has the right to change the software configuration. The function is not available for systems operated in 21 CFR Part 11 mode.

The **Audit Trail** specific functions are:

- **Print Preview:** Shows a preview of the audit trail information to be printed.
- **Print Audit Trail:** Prints the audit trail information shown in the preview.
- **Toggle Audit Trail time between UTC/Local time:** This displays the time in the Audit Trail either in universal or in local time.

These functions are also available via the **Audit Trail** context menu, which is obtained by right-clicking anywhere in the table of the audit trail information.

11.2.4 General Settings

The **General Settings** page contains two windows: the **General Settings** window and the **Database Backup/Restore** window. The **General Settings** window allows the user to make system-wide settings and change them as required. In the **Database Backup/Restore** window the user can make a backup of the database and then restore the database by loading the backup.

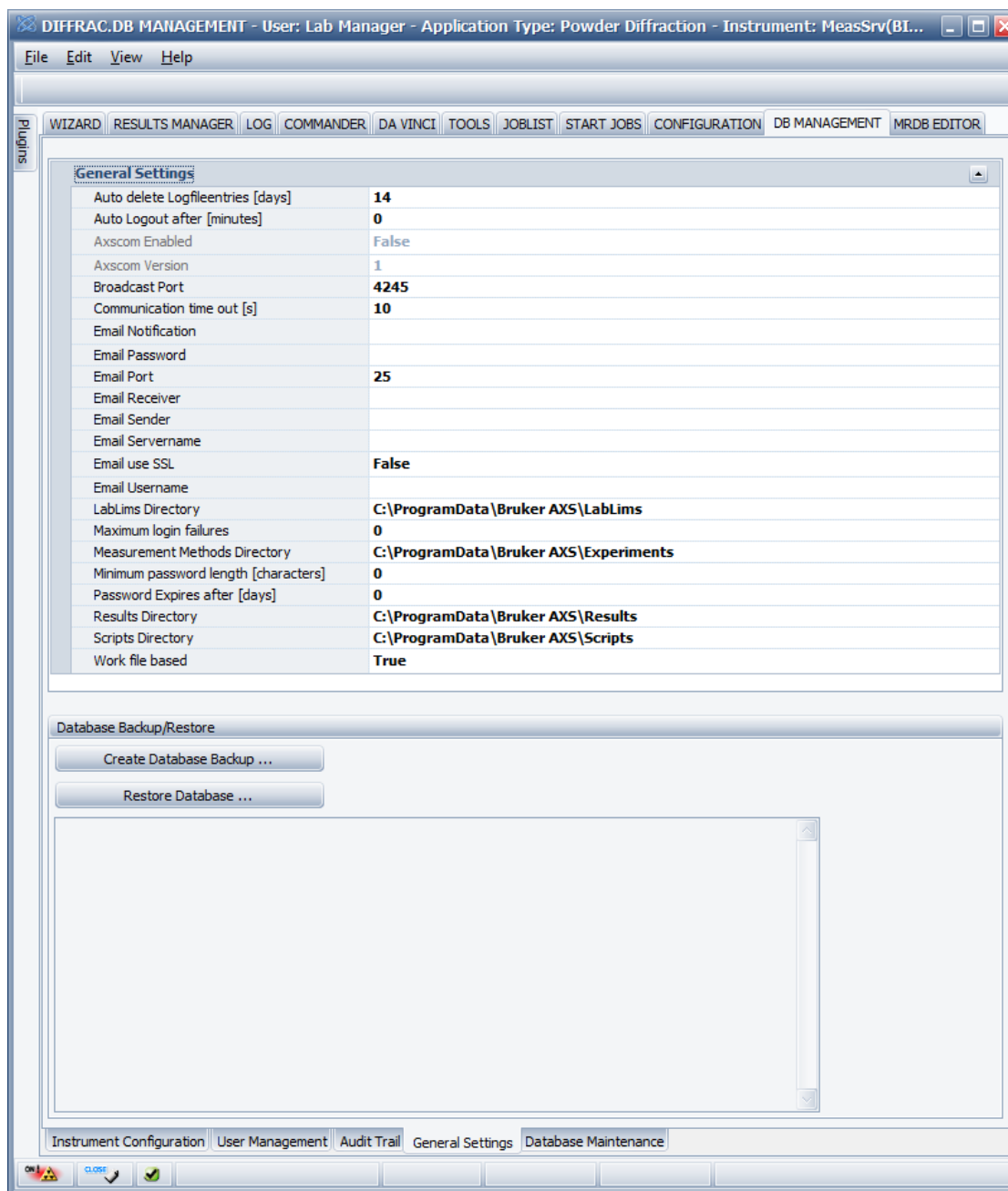


Figure 11.8: General Settings page

Password Settings

Any changes made to the password settings will only apply to new passwords entered in the database in **User Management**.

When the expiry time for passwords is set to zero, passwords will not expire. If a value other than zero is entered for the expiry time, users will be requested to change their passwords when logging in after expiration.



Any changes made to the general settings on the **General Settings** page will only become effective after the MEASUREMENT CENTER has been restarted.

11.2.4.1 General Settings Window

The **General Settings** window contains data entry fields in which the user can maintain the following system-wide settings:

Auto delete Log file entries [days]:	The time lapse in days when the database logfile entries are deleted by the system.
Auto Logout after [Minutes]:	The time lapse in minutes between the cessation of user interaction and the reappearance of the login window. A value of 0 disables this feature.
Axscom enabled:	Enables/Disables the Axscom automation interface in the measurement server
Axscom version:	The used Axscom version
Broadcast Port:	Default port at which the instruments listen for TCP/IP communication.
Communication timeout [s]:	The time lapse in seconds between the sending of a data packet from the Measurement Client to the Measurement Server or from the Measurement Server to the instrument and the interruption of the connection if no reply is received. In this case, an error message is displayed and the connection must be re-established.
Email Notification:	Allows to be notified if problems with the instrument or the experiment occur. The other settings below must also be set to correct values. If something fails, see the LOG plug-in for details.
Email Password:	The password of the email server.
Email Port:	Port of the email server. Default is 25.
Email Receiver:	Email address of the receiver of the email. E.g. b@c.com.
Email Sender:	Email address of the sender of the email. E.g. a@c.com.
Email Server name:	Name of the email server. E.g. mail.gmx.net.
Email use SSL:	True if SSL shall be used. Default: false.
Email User name:	Username of the user to login into the email server.
LabLims Directory:	Defines the path to the directory where the LabLims files are stored to run automatic jobs. A LabLims jobfile contains all information (position, experiment file, script file etc.) to execute a job on the device.
Maximum login failures:	Defines the number of wrong login attempts, before the user account will be deactivated. Zero ignores wrong logins, and the account will never be deactivated. An account can be reactivated by a user with the right Modify User .
Measurement Methods Directory:	Defines the default path to the directory in which the measurement methods (also called “experiments” or “solutions” in the software) are stored. The default path is %APPDATA%\Bruker AXS\Experiments. On an English-language operating system this is the path \Documents and Settings\All Users\Bruker AXS\Experiments.
Min Password Length [characters]:	Defines the minimum required length of a password. 0 ignores this feature.

Password Expires after [days]:	The time period between the creation of a password and its expiry.
Results Directory:	Defines the default path to the directory in which the measurement results are stored. The default path is %APPDATA%\Bruker AXS \Results. On an English-language operating system the path is \Documents and Settings\All Users\Bruker AXS \Results.
Scripts Directory:	Defines the default path to the directory in which the scripts are stored. The default path is %APPDATA%\Bruker AXS\Scripts. On an English-language operating system this is the path \Documents and Settings\All Users\Bruker AXS \Scripts.
Work file based:	True if the framework works with files e.g. bsml experiment files. False if the framework works database based only. In this case, files like experiment files are imported into the database once, and then reused with the help of an Open Database dialog. Result files are also stored in the database only, but can be exported if necessary. See START JOBS plug-in for details.
Strict hardware check enabled:	In strict mode, a bsml experiment file must match exact to the hardware settings. If strict mode is off, the hardware matcher checks only if a component is present (e.g. a slit) but the size of the slit is ignored.

11.2.4.2 Database Backup/Restore Window

Creating a Database Backup

To make a database backup,

1. first click on the **Create Database Backup** button at the top of the **Database Backup/Restore** window
 - A standard Windows **Save as** dialog box opens.
 2. Enter a file name in the appropriate field of this dialog box. Backup files are of the type **.backup** . The **Database backup** directory into which backup files are saved has been created as standard by Bruker AXS.
- ⇒ After saving the contents of the database to the backup file, information concerning the successful or unsuccessful completion of the backup and the path to the backup file is displayed in the **Backup/Restore** window.

Restoring a Database

If the database runs on the same computer as the instance of the Measurement Client which is being used (as in the standard system configuration), the database can be restored after a backup has been made. This means that all information entered in the database after the backup is made will be deleted. Restoration of the database requires the closing down of the Measurement Server and client.

To restore a database:

1. Click the **Restore Database** button near the top of the **Database Backup/Restore** window.
 - A pop-up window will appear and warn the user about the resulting loss of data. The pop-up window will request confirmation that the user wants to proceed. For details about the database restore procedure.

2. Finally, the user must restart the **Measurement Server** and the **Measurement Client**.



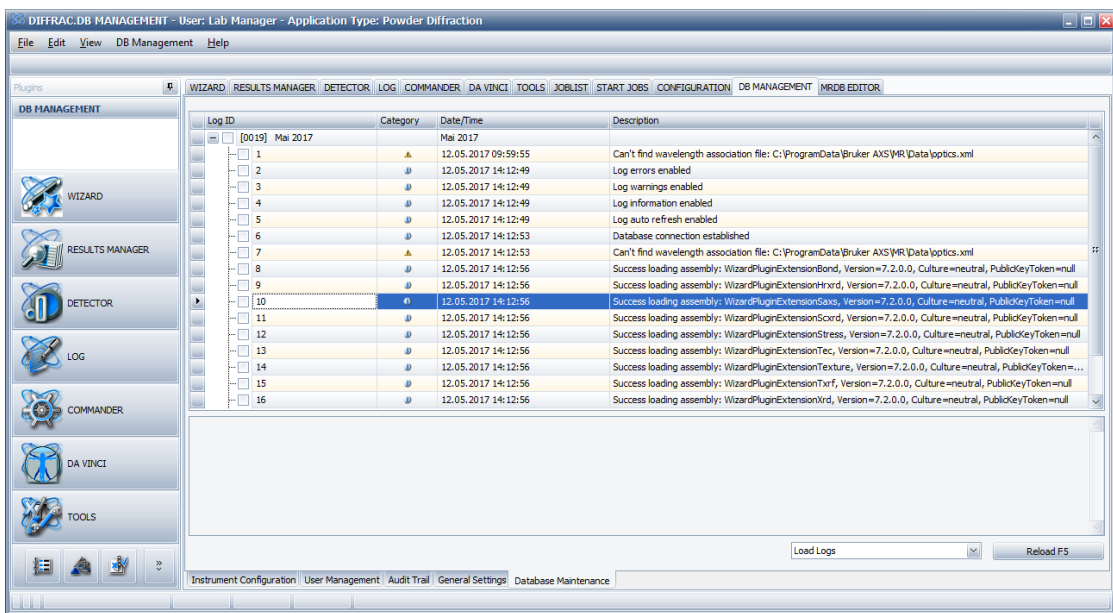
It is only possible to make a backup of a database and restore it afterwards if the Measurement Client and the database run on the same computer.

11.2.5 Database Maintenance Window

With the **Database Maintenance** window, data from the actual database can be removed from the database.

Cleaning the database may increase the speed of the software, and help the user to keep a better overview. Every experiment generates several KB of data on the hard disk and in the database.

1. Right click the mouse on an item or a group of items displayed in the context menu and
2. select **Delete**, to remove the selected items from the database.



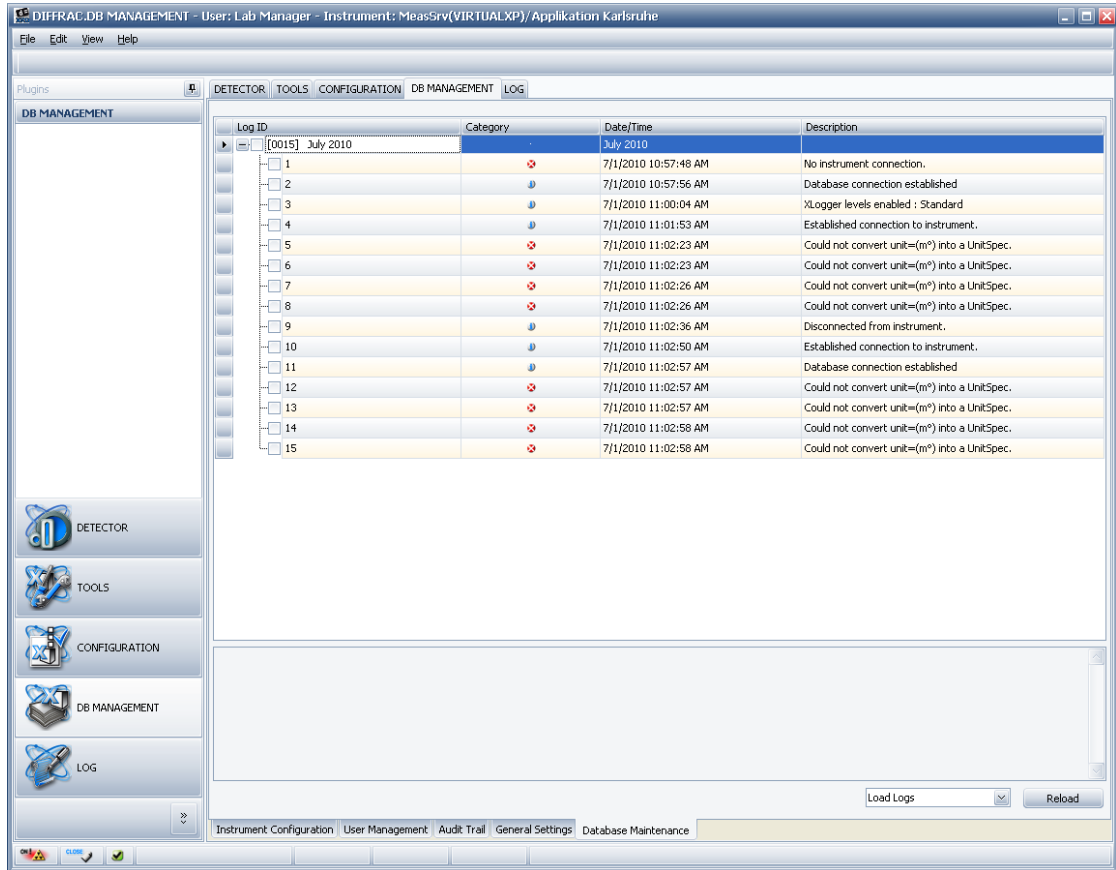


Figure 11.9: Database Maintenance

In the combo box in the right corner, you can select the following options:

Toggle Solution Visibility

(Available for XRF instruments only) This allows solutions to be

- **Publish:** A solution is usable for all users
- **Visible in LOADER:** A solution is visible in the LOADER or not
- **Visible in WIZARD:** A solution is visible in WIZARD or not

Load Experiments

This loads all experiments from the database and displays the result in a tree view, sorted by month.

1. To delete data, either select the month checkbox to select all experiments of a month or click the + to open a month and display the single experiments.
2. To start a delete action with the selected items, press the right mouse over the tree view.
 - After a security question, the clean-up process starts and the status is displayed in the status window below.



Depending on the number of selected items, a database maintenance procedure can take a while to finish. You can stop the process at any time by pressing the **Stop** button.

Load Logs

This loads all log entries from the database and displays the result in a tree view, sorted by month.

1. To delete data, either select the month checkbox to select all logs for that month, or click the + to open a month and display the single experiments.

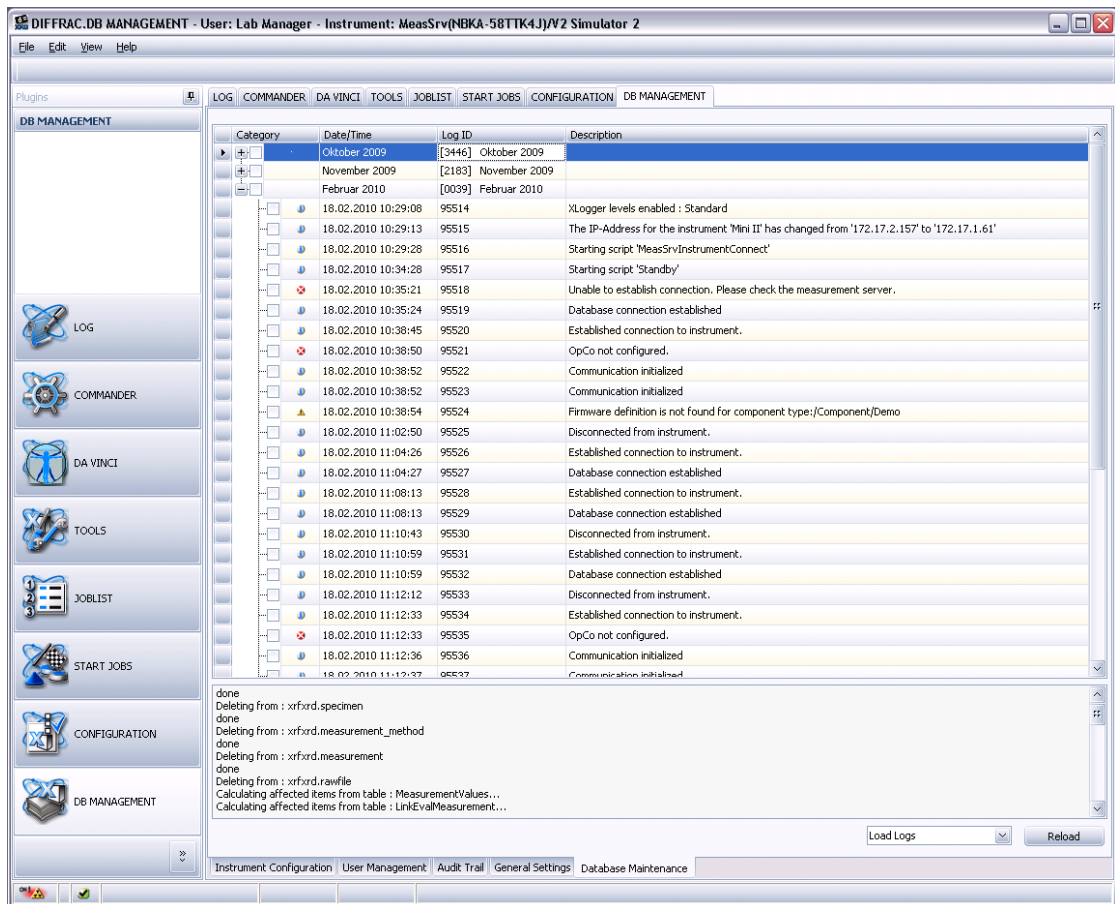
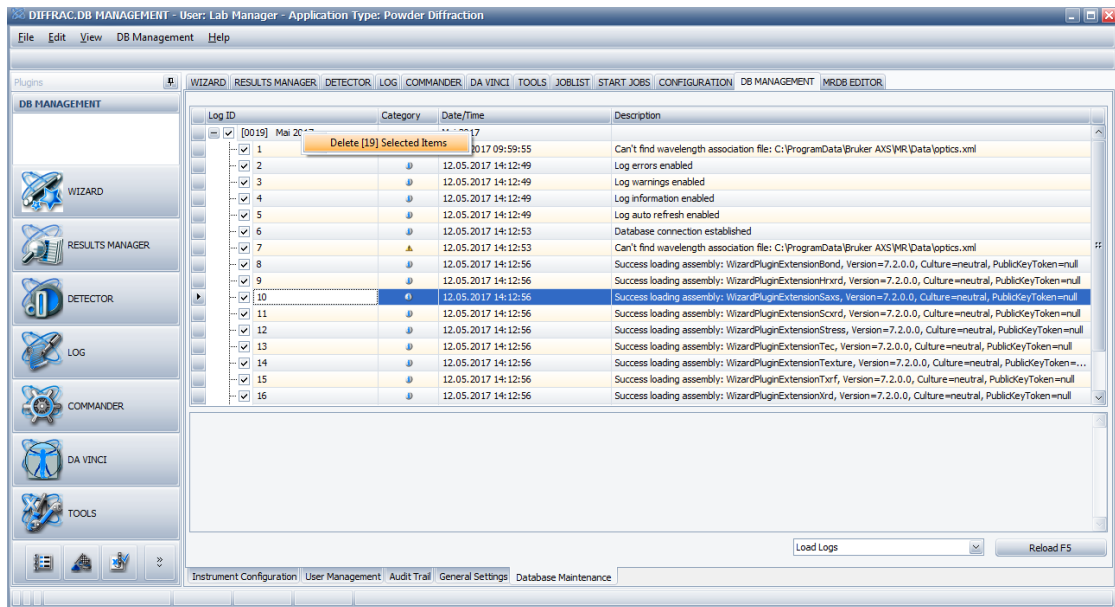


Figure 11.10: Database Maintenance

2. To start a delete action with the selected items, press the right mouse over the tree view.
 ⇒ After a security question, the clean-up process will begin, and the status will be displayed in the status window below.

Detector Darks	Loads all Dark Currents (2D detectors only) from the database and displays them in a tree structure as above. The deletion process works similar to the functions above.
Detector Floods	Loads all Flood files (2D detectors only) from the database and displays them in a tree structure as above. The deletion process works similar to the functions above.
Detector Spatial	Loads all Spatial files (2D detectors only) from the database and displays them in a tree structure as above. The deletion process works similar to the functions above.
Detector Positions	Loads all Positions (2D detectors only) from the database and displays them in a tree structure as above. The deletion process works similar to the functions above.
Detector Centers	Loads all Detector Centers (2D detectors only) from the database and displays them in a tree structure as above. The deletion process works similar to the functions above.
Database Cleanup	This function starts a low level database cleanup procedure. The database is internally realigned, comparable with a hard disk defragmentation. No data are deleted, but the hard disk footprint will be reduced, and the speed increased.

12 CONFIG

12.1 General

Creating a configuration for a set of hardware components requires a firmware definition. This is a detailed description of the hardware components allowed for the instrument, as well as their functionality and constraints. An instrument's firmware definition is automatically loaded from the firmware into **CONFIG** when a connection is established with the instrument. If working with **CONFIG** off-line without a connection to the instrument, a firmware definition can be loaded directly from a file or database using functionality provided by the Offline Mode menu.

The loaded firmware definition is automatically saved to the database every time the configuration is saved to the database.

As soon as the firmware definition is loaded existing configurations can be changed or new ones can be created. The active configuration can be changed, which appears on the screen when a connection with the instrument has been established, by adding and deleting components and changing the settings for component properties. The entry for the active configuration can be overwritten with the modified configuration in the database (see [Save Configuration to Database \[▶ 187\]](#)). Finally, the modified configuration can be activated (see [Activate Configuration \[▶ 190\]](#)).

Any inactive configuration can be changed by loading it into **CONFIG** from a file or the database, editing its information, and then overwriting the configuration file or the entry for the configuration in the database.

Completely new configurations can be created and saved to a file or the database.

NOTICE

A completely new or changed instrument configuration must be saved to the database before it can be applied to the instrument.

To activate a new configuration, copy it from the database to the instrument and restart the instrument firmware.

In contrast with other plug-ins, **CONFIG** can communicate with the X-ray instruments directly, without the Measurement Server acting as an intermediary.

See also

- Save Configuration to Database [▶ 187]
- Activate Configuration [▶ 190]

12.1.1 Getting Control of the Instrument

Control of the instrument by **CONFIG** is required for activation of a configuration. This is obtained automatically by the software, regardless of whether the user has established an indirect (that is, using the Measurement Server) or direct connection between **CONFIG** and the instrument. If, when activation of a configuration is attempted, the instrument is controlled by another plug-in instance, this will be signaled by an error message.

As with other plug-ins, getting control of a connected instrument by means of an indirect connection presupposes that control of the instrument has already been obtained for the Measurement Server. This is done using the item **Status window** of the start menu of the **Measurement Server** (see Section [Getting and Releasing Control of and Reconnecting to Instruments \[▶ 22\]](#)).

12.2 Screen Layout and Operation

The **CONFIG** page consists of two windows: the **Config Tree** window to the left, in which the components of an instrument are arranged hierarchically in a tree structure and the **Properties** window adjoining it to the right, with sub-windows containing groups of data entry fields in which settings for the instrument components can be made and existing settings changed.

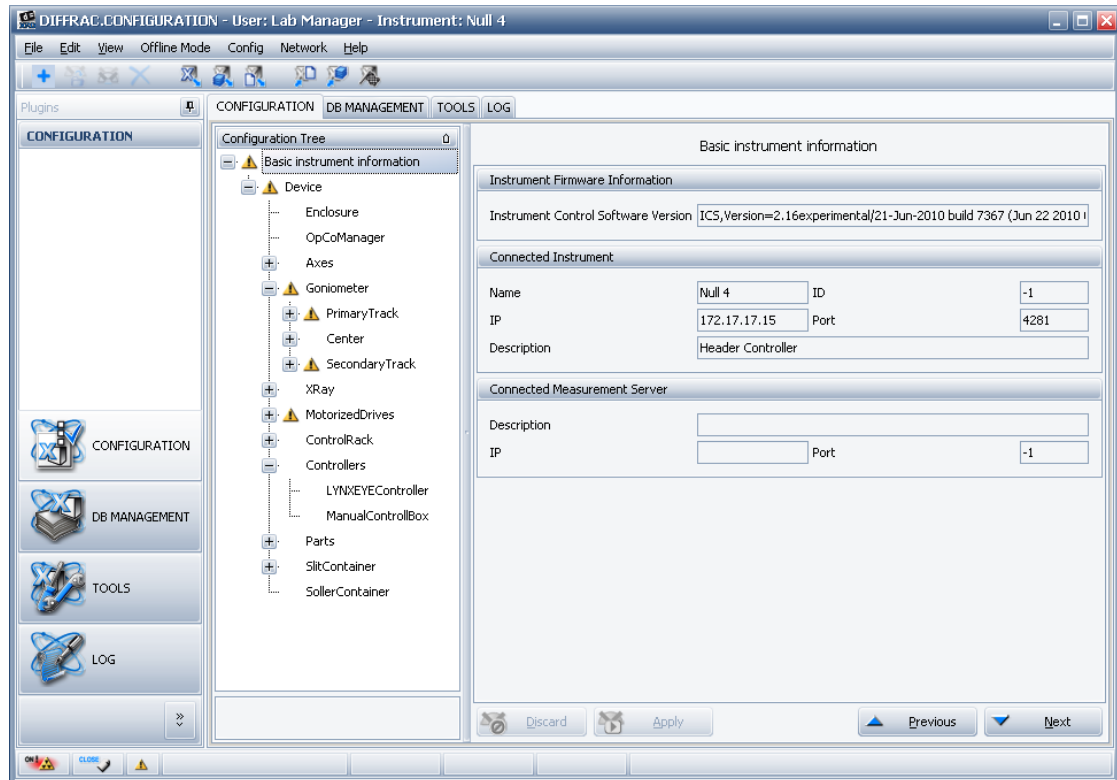


Figure 12.1: Interface of the **CONFIG** plug-in

A series of **Speed** buttons is located directly above the **Config Tree** window (see Section [Speed Buttons \[196\]](#) below) for quick and easy access to the most frequently used **CONFIG** functions.

The two windows are separated by a splitter line. The width of both windows can be altered by seizing this line with the mouse pointer and dragging it to the left or right.

NOTICE

The appearance of the **Configuration** tab page varies depending on the connected instrument, since the mounted components may vary in each case.

12.2.1 Config Tree Window

The configuration tree shown in the **Config Tree** window is a logical arrangement of the configurable components of an X-ray instrument. In some cases, the hierarchical relationship between a component at one level and sub-components at the level below it reflects a physical state. In this case, the higher-level component is called a “container”. The component **ControlRack**, for example, contains a set of sub-components **DIBOARD0**, **AIBOARD0** and **AIBOARD2**, which are circuit boards that are inserted into the control rack.

Selecting a component in the **Configuration tree** causes its configurable properties to appear in the **Properties** window.

The first tree item (Basic Instrument Information, see next figure CONFIG: Properties window) shows firmware version and network information of the currently connected Instrument and network information of the Measurement Server.




When configuring the X-ray instrument it is advised to start with the highest component in the tree and then work through the other components in their hierarchical order.

12.2.1.1 Component Status

Icons to the left of the component names in the **Configuration** tree indicate the current status of the components. Components for which no icons appear have the status **OK**.

If a component has an error or warning status, the status will also be indicated for all higher-level components in the tree. If one lower-level component has a warning status but another has an error status, the higher-level components will be assigned an error status since this is prioritized.

Component Status Icons

Icon	Description	Meaning
	Error	An incorrect value has been entered for a component property (for example, it lies outside the allowed range, the socket is already used by another plug, or a lower-level component has an error status). To correct the error adjust the setting.
	Unknown	A component of this type is not described in the current firmware definition. Therefore, the firmware will ignore this component. The properties cannot be changed.
	Warning	This could be caused by an unconnected optional plug or the warning status of a lower-level component.

NOTICE

By placing the mouse pointer on a component name in the **Configuration** tree, a tooltip appears that indicates the current status. If an error and a warning message appears, a reason for the status is given.



12.2.2 Properties Window

The **Properties** window contains several sub-windows that vary in number and kind according to the component selected.

The plugs of the component along with the components to which they are connected are listed in table form in the sub-window **Plugs**. The socket numbers of the target components into which the plugs are plugged are listed as well. Editable data fields are provided. These allow a plug to be plugged into the socket of a selected target component. These allow the existing plug-socket connections to be changed as required.

In the sub-window **Sockets** the sockets of the component and the components whose plugs are plugged into them are listed in table form. Since data cannot be entered in the table, this overview can only be used for diagnostic purposes.

The sub-windows **Settings**, **Expert Settings** and **Advanced Settings** contain other sets of component properties. A special sub-window **Registers** for drives contains drive-specific properties. In these sub-windows data fields are provided for editing the property settings.

Each of the sub-windows can be opened and closed by clicking on the button in the top right corner. This button appears as either:  closed or  open.

Some sub-windows, such as those for expert settings or registers, are closed by default. In order to edit the settings the sub-windows must be opened.

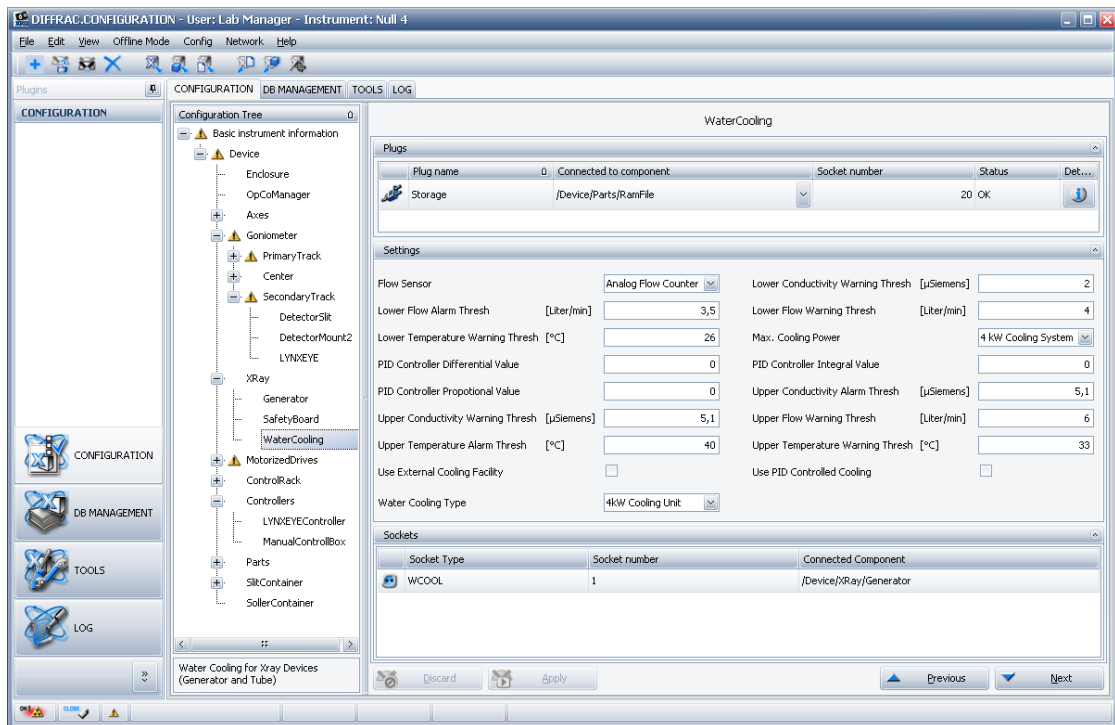
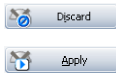


Figure 12.2: Properties window (on the right) with sub-windows containing properties for the water cooling unit

At the bottom of the **Properties** window the following buttons are located:



- Discards any changes made in the present session and restores the previous values.
- Click on this button to record any changes made to the property settings for a component. Otherwise, these changes will be lost when switching to the properties of another component or when exiting the module.



- Click on these buttons to scroll up and down through the items of the tree.
- Press the ↑ and ↓ arrow keys of the keyboard to scroll through the components.

12.2.2.1 Editing Control

When editing settings in the **Properties** window use the editing control, which provides a guide for the entering of data in the data fields.

To activate the editing control, place the mouse pointer over the name of a parameter, a unit of measure, or a data entry field. In the first two cases, an information window will appear with the raw name and a description of the parameter. This window contains information on the constraints which apply to the parameter value as well as its default value. In the third case, a tooltip providing information on the constraints and the default value will appear.

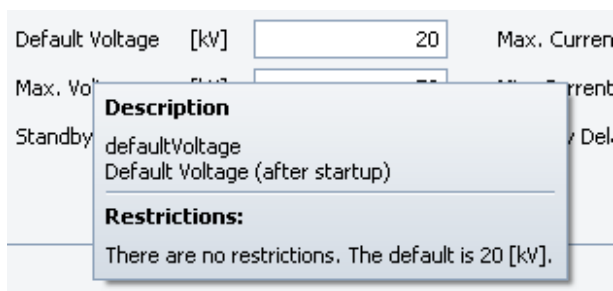


Figure 12.3: Information window

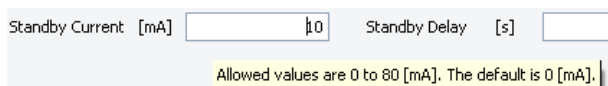


Figure 12.4: Tooltip

If an incorrect value is entered, the error will be displayed in red and a red warning symbol next to the data field will appear.

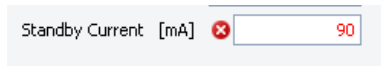


Figure 12.5: Warning symbol indicating an incorrect value




12.2.2.2 Plugs and Sockets

Some hardware components of the X-ray instruments are connected to other components by electrical cables. This physical reality is reflected in the software program by plugs and sockets. A plug corresponds to a cable with a male connector and a socket corresponds to a female connector. For example, the cable that connects the motor to the axes indexer board is represented by a plug in the configuration.

A plug may also be regarded as an outgoing connection. A socket may be regarded as an incoming connection from/to an instrument component.

Plugs have statuses that are indicated by icons:

Plug Status Icons

Icon	Meaning	Description
	OK	Plug is OK.
	Warning	1. The optional plug is not connected. 2. Status unknown. The plug is not described in the firmware definition. This plug can be deleted using the menu item Delete Unknown Plugs in the Edit menu (see Section The Edit Menu [▶ 205]).
	Error	A mandatory plug is not connected or the plug path points to a non-existent component or socket.

The settings of the plug and the sockets of the component **Safety Board** are shown in the following figure as they appear in the sub-windows **Plugs** and **Sockets**.

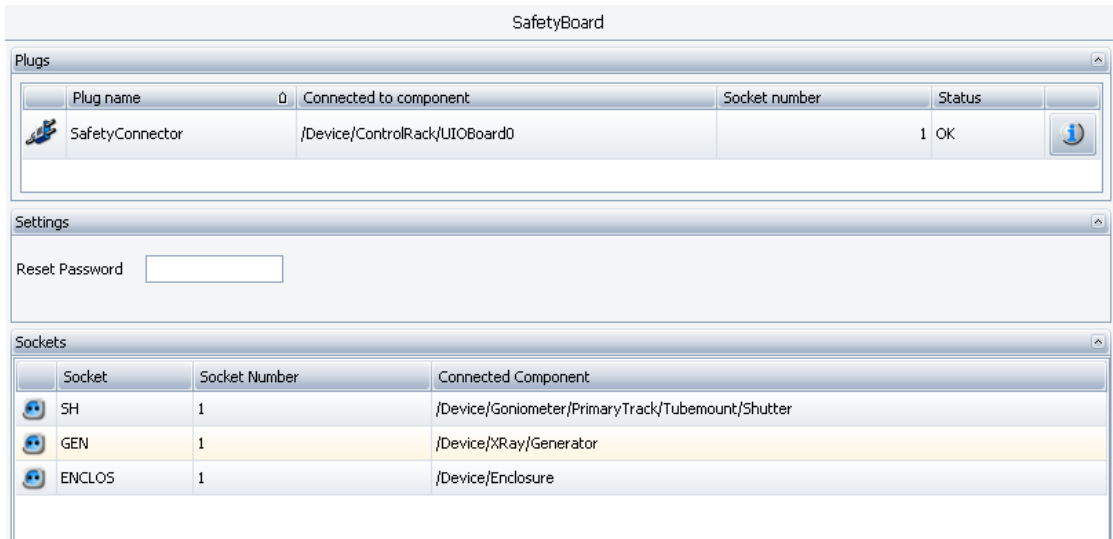


Figure 12.6: Sub-windows **Plugs** and **Sockets** containing settings for the plug and sockets of the **Safety Board**

As shown in the table of the sub-window **Plugs**, the plug **Safety Connector** of the component **Safety Board** is connected to **Socket 1** of the target component **UIOBoard0**. In the column **Connected to Component** the path to the target component is specified.



Information on the constraints regarding the connection of a plug is obtained by clicking on the **Information** button at the end of the row of plug information. This opens the **Plug Details** window.

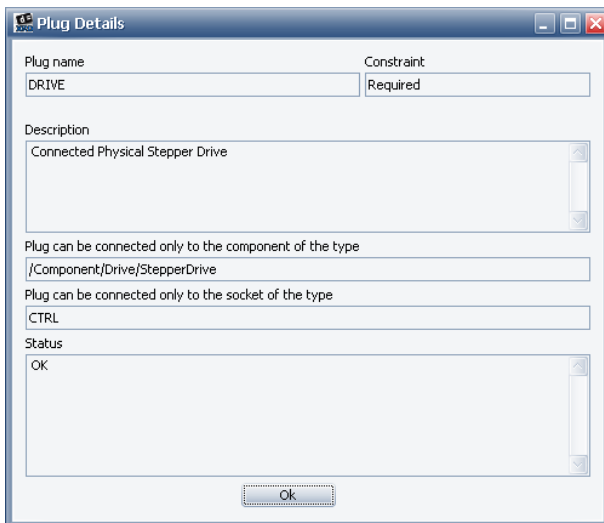


Figure 12.7: **Plug Details** window for plug **Safety Connector**

The field **Constraint** in the **Plug Details** window indicates whether the plug is mandatory or optional. Mandatory plugs must be connected in the configuration by the user, otherwise, the instrument will not work properly. If a mandatory plug is not connected, it will be assigned a red status icon. If an optional plug is not connected, a yellow status icon will appear as a warning.

Other fields indicate the type of component and socket to which the component must be connected, if connection is mandatory or desired by the user.

The field **Status** contains the same information as that which is displayed for the plug in the **Status** column of the **Plugs** table.

Connecting a Plug

To connect a plug,

1. select a target component with the required socket type from the appropriate drop-down list in the **Connected to component** column of the **Plugs** table.
2. Now select a socket number from the appropriate drop-down list in the **Socket number** column.
3. Finally, click on **Apply**.

The plug will be plugged into the selected socket of the selected target component.

If the target component drop-down list is empty, this means there are no target components of the required type with a free socket of the required type in the configuration. In this case, to establish a connection a new component of the type specified in the **Plug Details** window must be created (for example, **/Component/LogicalDrive/Detector**). To learn how to add a new component, see Section [The Config Tree Context Menu \[197\]](#).

12.2.2.3 Resource Providers

Resource providers and consumers extend functionality provided by the plugs and sockets described above. It provides additional degree of freedom for a more detailed configuration and additional properties for transformation of hardware signals.

Resource Provider is very similar to Socket. Control for the resource provider consists of four columns: Status, Type, Name and Connected Component, which shows component connected to the resource.

Status	Type	Name	Connected Component
	/GenericDrive	DRV	
	/GenericDigitalOut	LOCK	/Device/Parts/DigitalOut:DigitalOut

Figure 12.8: Resource Providers.

12.2.2.4 Resource Consumers

Resource consumer functionality is very similar to the plug functionality. Every resource consumer has a name, which is shown in the **Name** column. Resource consumer could be connected to some resource provider of the required type. The type of the provider is displayed in the **Type** column. The particular resource can be selected by the name in the **Element** column.

Status	Name	Connected Component	Type	Element	Status Text	Properties
	AnalogIn	/Device/ControlRack/UIOBoard0	/GenericAnalogIn	ANIN0	Ok	

Figure 12.9: Resource Consumers.



The **Properties** button at the left end of the row opens **Resource Configuration** dialog. One can specify there additional transformation properties e.g. **Translation Offset** or **Translation Scalar** shown in the figure below. This dialog shows also some additional information about resource e.g. description of the required resource, type of the required resource, constraint of the consumer.

Consumer with a **Required** constrained has to be connected to the resource, whereas **Optional** constraint allows a consumer to be unconnected as well.

Show Components button displays a list of all components from the current configuration, that contain at least one required resource.

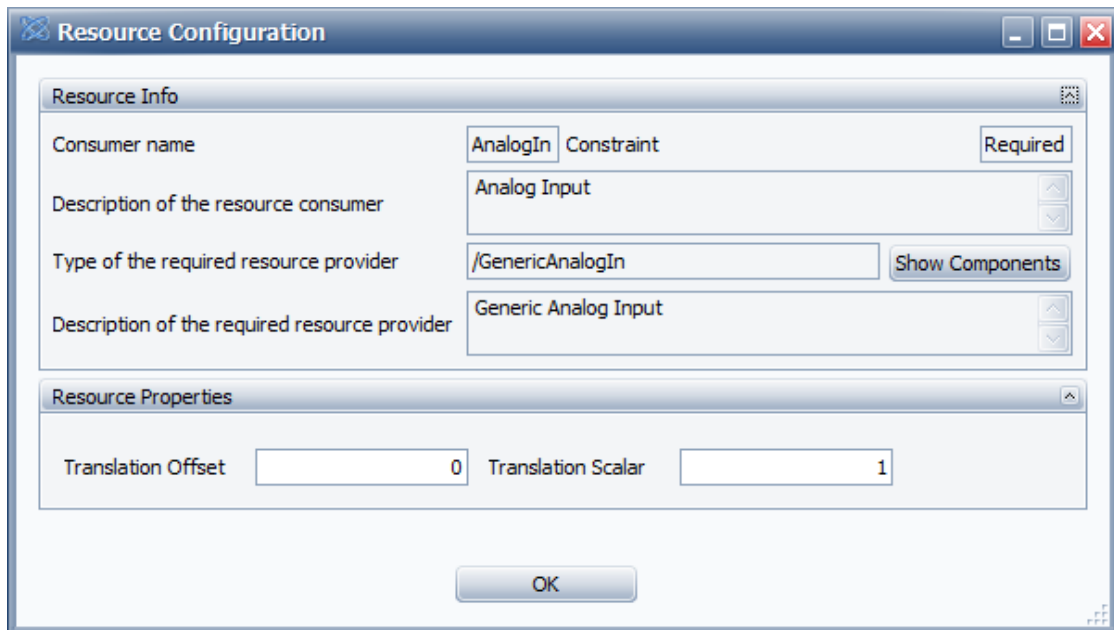


Figure 12.10: **Resource Configuration** dialog.

12.2.3 The File Menu

This menu contains the following items:

Connect

Connects to the selected instrument. After connection with an instrument has been established, CONFIG plugin loads automatically firmware definition and configuration from the instrument. Loaded configuration will be verified against firmware definition. If the configuration version is older or younger than firmware definition, then an automatic upgrade or downgrade of the configuration will be done inside of the **CONFIG** plugin. To make changes active for the instrument one has to save and activate upgraded or downgraded configuration into the instrument with help of **Config | Save Configuration To Database | Save And Activate**, see [Save Configuration to Database \[187\]](#) for more information.

Disconnect

Disconnects MEASUREMENT CENTER from the instrument. After disconnecting **CONFIG** plugin still preserves previously loaded configuration and firmware definition, so one can continue editing of the configuration. When disconnected one can't apply changes to the instrument.

Save State

Saves instrument state into the file. The State file contains a complete description of the instrument and includes the following items: instrument configuration, firmware definition, actual property values of all components, translation table and system information.

Open State

Opens instrument configuration from the state file.

Open State from Config file

Opens instrument configuration and firmware definition from the configuration file. Opening state from configuration file is possible for configuration files created by MEASUREMENT CENTER since version 3.

See also

- Save Configuration to Database [▶ 187]

12.2.4 The Offline Mode Menu

The **Offline Mode** menu is located in the menu bar at the top of the screen. It allows the creation of new configurations in offline mode. This means that configurations are possible without establishing a connection to the instrument. Instead of loading the firmware definition into CONFIG from the instrument, it is loaded from a file or the database. However, the **Offline Mode** menu also enables the user to load the firmware definition from the instrument for the creation of configurations in online mode. In addition, a menu item allows the user to save the currently loaded firmware definition to a file.

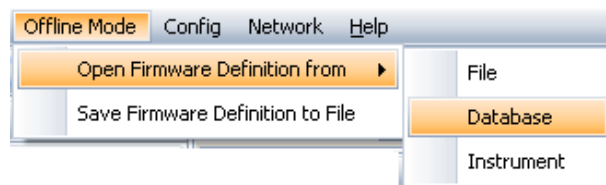


Figure 12.11: Offline Mode menu

This menu contains the first three items which are provided in a sub-menu:

12.2.4.1 Open Firmware Definition from File

Loads a firmware definition from the file on the hard disk of the computer. When this option is selected, the window **Open firmware definition from file** opens.

1. Select a firmware definition file with the extension *bfdef* in this window and then
2. click on **Open**.

12.2.4.2 Open Firmware Definition from Database

Loads the firmware definition from the database. When this option is selected, the dialog box **Open firmware definition from database** opens.

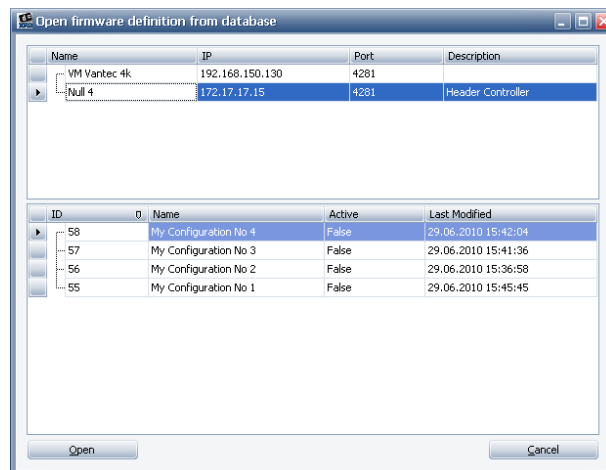


Figure 12.12: Dialog box **Open firmware definition from database**

1. Select the instrument to which the firmware definition belongs in the upper window of this dialog box and then
2. select the firmware definition in the lower window.
3. Then click the **Open** button.

Open Firmware Definition from Instrument: Loads the firmware definition from the currently connected X-ray instrument.

Save Firmware Definition To File: Saves the currently loaded firmware definition to a file on the hard disk. When this option is selected, the window **Save firmware definition to file** opens. An existing file can be overwritten or newly created.

12.2.5 The Config Menu

The **Config** menu is located in the menu bar at the top of the screen and is used to edit and activate configurations.

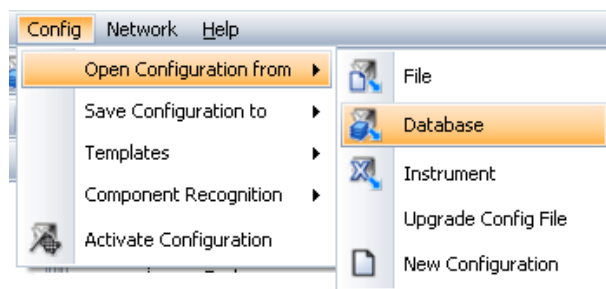


Figure 12.13: **Config** menu with opened **Open Configuration** sub-menu

The menu contains the following items:

- Open Configuration from
- Save Configuration to
- Templates
- Component Recognition
- Activate Configuration

12.2.5.1 Open Configuration From

Loads only configuration from the selected source, e.g. from file, into CONFIG plugin. Loaded configuration will be verified against currently loaded firmware definition in the CONFIG plugin.

Open Configuration From File

Loads a configuration from the **ConfigTemplates** directory, which is the standard directory for configuration files and template files or a directory.

Choosing this option opens the window **Open Configuration from File**, in which the contents of the **ConfigTemplates** directory are displayed. Configuration files have the extension *bfcfg*.

1. Select the file to import and
2. click on **Open**.

Open Configuration From Database

Loads a configuration from the database. When this option is chosen, the dialog box **Open Configuration** opens.

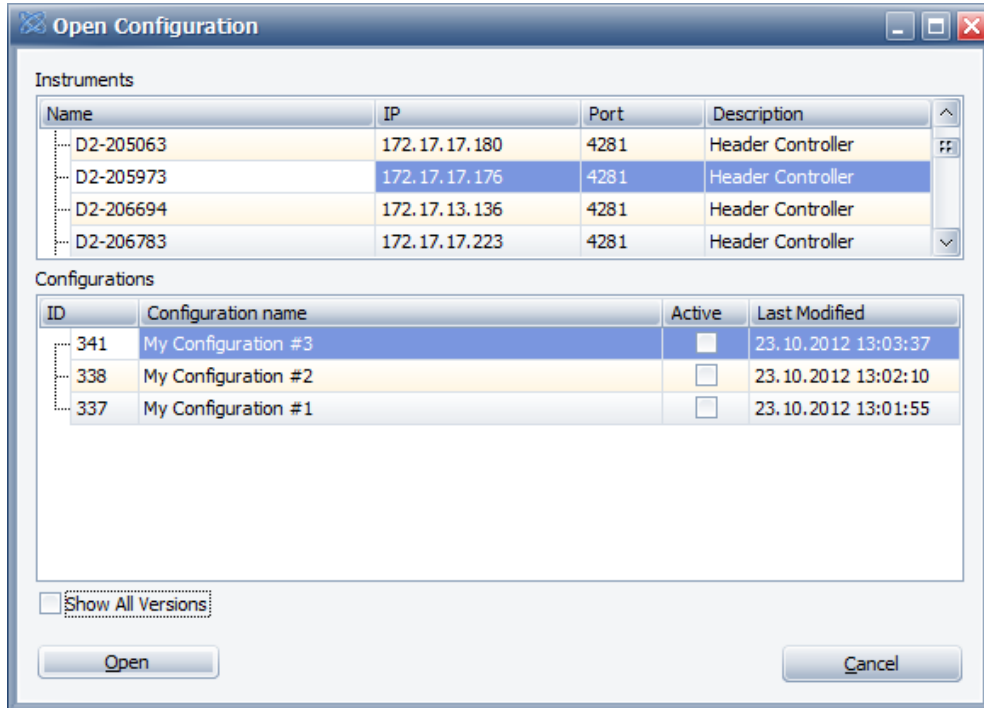


Figure 12.14: Dialog box **Open Configuration from Database**

1. Select the instrument to which the configuration belongs in the upper window of this dialog box and then
2. select the configuration in the lower window.
3. Then click the **Open** button.

By clicking on **Show All Versions** check box, all previously saved versions of the highlighted configuration are shown. One can open any older version of the configuration.

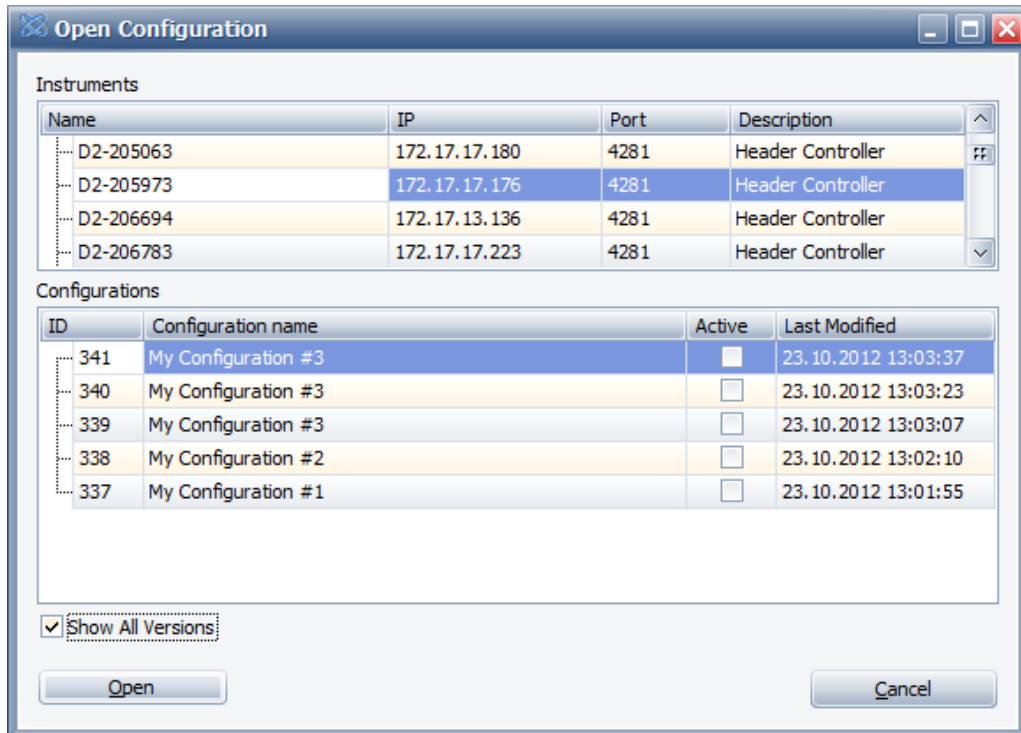


Figure 12.15: Dialog box **Open Configuration from Database. Show All Versions.**

Open Configuration From Instrument

Loads the active configuration from the currently connected X-ray instrument.

Upgrade Config File

Upgrades selected configuration file to the firmware version, which is currently loaded in the Configuration Plugin. The user can see the currently loaded firmware version in the user control **Instrument Control Software Version** from the first tree item: **Basic Instrument Information** (see the figure CONFIG: Properties window).

New Configuration

Clears the currently loaded configuration.

12.2.5.2 Save Configuration To File

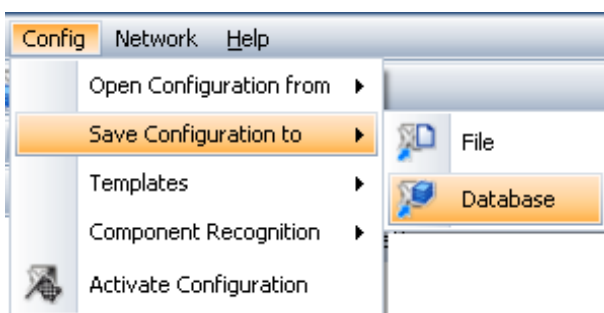


Figure 12.16: **Config** menu with opened **Save Configuration** sub-menu

Saves the currently loaded configuration to the **ConfigTemplates** directory or a directory of choice.

If a configuration should be saved with the intention of loading it later using the **Open Configuration from File** function (see above) it should be saved to the **ConfigTemplates** directory. Likewise, if a configuration should be saved in part or whole using the **Import Templates function** (see below), it should be saved to the **ConfigTemplates** directory. This is the standard directory for template and configuration files.

NOTICE

Saving a configuration to a file or database will not cause it to become active on the instrument. Use the **Save and Activate** function to make configuration active for an instrument or use the **Activate Configuration** function (see below).

12.2.5.3 Save Configuration to Database

Saves the currently loaded configuration to the database. When this option is chosen, the dialog box **Save Configuration to Database** opens.

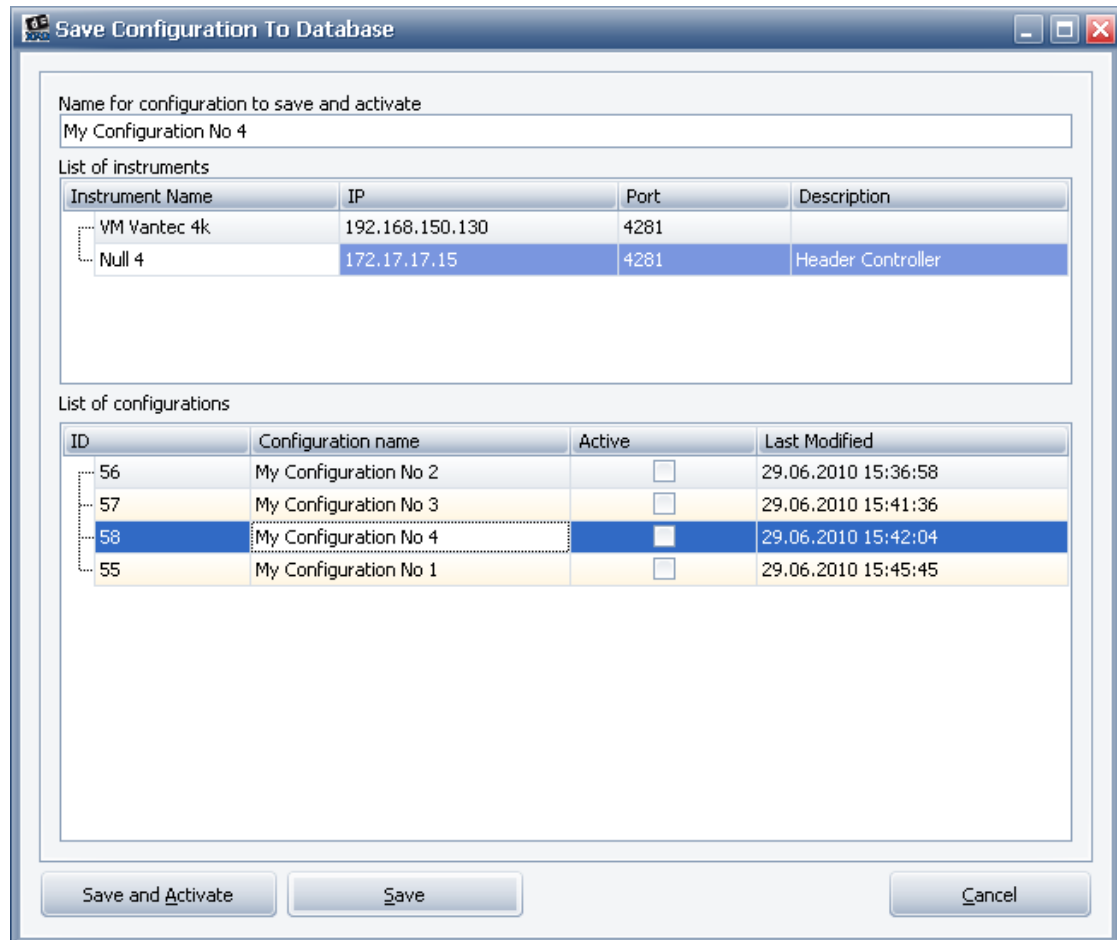
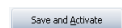


Figure 12.17: Dialog box **Save Configuration to Database**

Save and Activate Button



The **Save and Activate** button activates the current configuration for an instrument. This function includes the copying of the configuration to the instrument, to the database and restarts the instrument firmware. The user can overwrite an existing database entry for a configuration or create a new one.

In order to overwrite an existing database entry,

1. select it in the lower window of the dialog box and
2. click on **Save and Activate**.

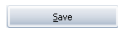
To create a new entry,

1. overwrite the name of the configuration entry with the new name in the data field at the top of the dialog box.
2. Then click on **Save and Activate**.

- If the activation is successful, a notification window will appear (see figure [Notification window \[190\]](#)). The connection between the **Measurement Server** and the instrument must then be re-established.

⇒ Once this has been done, the newly activated configuration can be used for measuring operations.

Save Button



Saves the currently edited configuration to the database.

1. Select the instrument to which the configuration belongs from the list of instruments in the upper window of this dialog box.
2. Save the configuration to the database.
 - In doing so, an existing entry can be overwritten for a configuration or newly created.

To overwrite an existing entry,

1. select it in the lower window of the dialog box and
2. click on **Save**.

To create a new entry,

1. overwrite the name of the selected configuration with the name of the new configuration in the data field at the top of the dialog box and then
2. click on **Save**.

12.2.5.4 Import Templates (from File)

Inserts the contents or part of the contents of a template file into the configuration that is currently being edited.

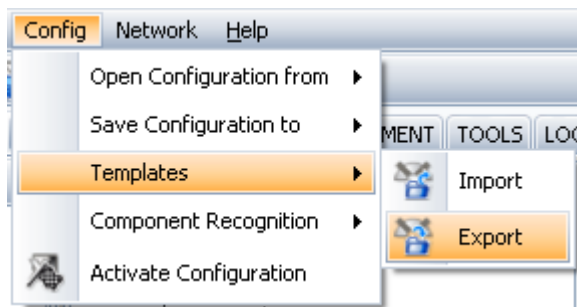


Figure 12.18: Fig. 70: **Config** menu with opened **Templates** sub-menu

A template is a collection of property settings for a group of logically connected components that can be used in the modification of existing configurations or in the creation of wholly new ones. For example, when an existing configuration contains a certain type of generator and water cooling unit, new settings for these component types can be imported from a template file into the configuration.

A collection of templates for each type of instrument operated by the customer is delivered with the software. These templates are located in folders in the **ConfigTemplates** directory, which is the standard directory for template files and configuration files.

Templates can be created by exporting the property settings for a component or a group of components from loaded configurations (see the **Export Templates** function below.)

With the **Import Templates** function, the user can import complete configurations or parts of configurations from configuration files created and saved using the **Save Configuration to File** function (see above). In this case, the configuration file serves as the template file.

Choosing this option opens the **Import Sections from file** window, which shows the contents of the **ConfigTemplates** directory. The names of configuration files have the extension *bfcfg*. The template files have the extension *bfscn*.

To import a template or configuration in whole or in part,

1. select the appropriate file in the **Import Sections from file** window and
2. click on **Open**.
 - This opens the dialog box **Import Sections from the File**.

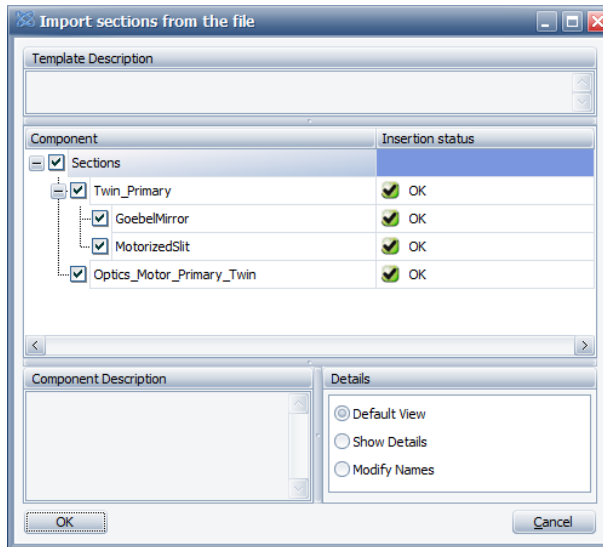


Figure 12.19: Dialog box **Import Sections from the File**

In this dialog box, all the components whose settings can be imported from the selected file are shown and arranged in a hierarchical structure. Selecting one of the components causes a description of the component to appear in the **Component description** sub-window. If the **Show Details** check box is checked, the component types and absolute paths for the components appear in columns.

1. Select the desired component or components by clicking the corresponding check boxes, and then
2. click on **OK**.

⇒ The related settings will be imported.

12.2.5.5 Export Templates (to File)

Exports the property settings for a component or group of components to a template file in the ConfigTemplates directory or a directory.

Before choosing this option, select the component or components whose settings are to be exported in the **Configuration** tree. To export a single component and its settings,

1. press and hold down the **Ctrl** key and
2. click on the component.

To export a range of components and their settings,

1. press and hold down the **shift** key and
2. click on the top and bottom components in the range.
 - The intervening components will be automatically selected.
3. Alternatively, the user can scroll through the range of components using the **↑** and **↓** arrow keys while holding down the shift key.

After selecting the component or components,

1. click on the menu item.
 - This opens the window **Export Config Sections to File**, in which the contents of the **ConfigTemplates** directory, the standard directory for template files and configuration files, are shown.
2. Type a name for the template file (the extension *bfscn* is supplied by the software) into this window and
3. click on **Save** to create the template and save it to the **ConfigTemplates** directory.

12.2.5.6 Activate Configuration

Activates any configuration from the database for use by an instrument in measuring operations. Configurations must be saved to the database before they can be activated.

The activation function includes the upload of the configuration from the database to the currently connected instrument (the configuration present in the instrument will be overwritten) and the restart of the instrument firmware.

Choosing the **Activate Configuration** option opens the dialog box **Activate Configuration**.

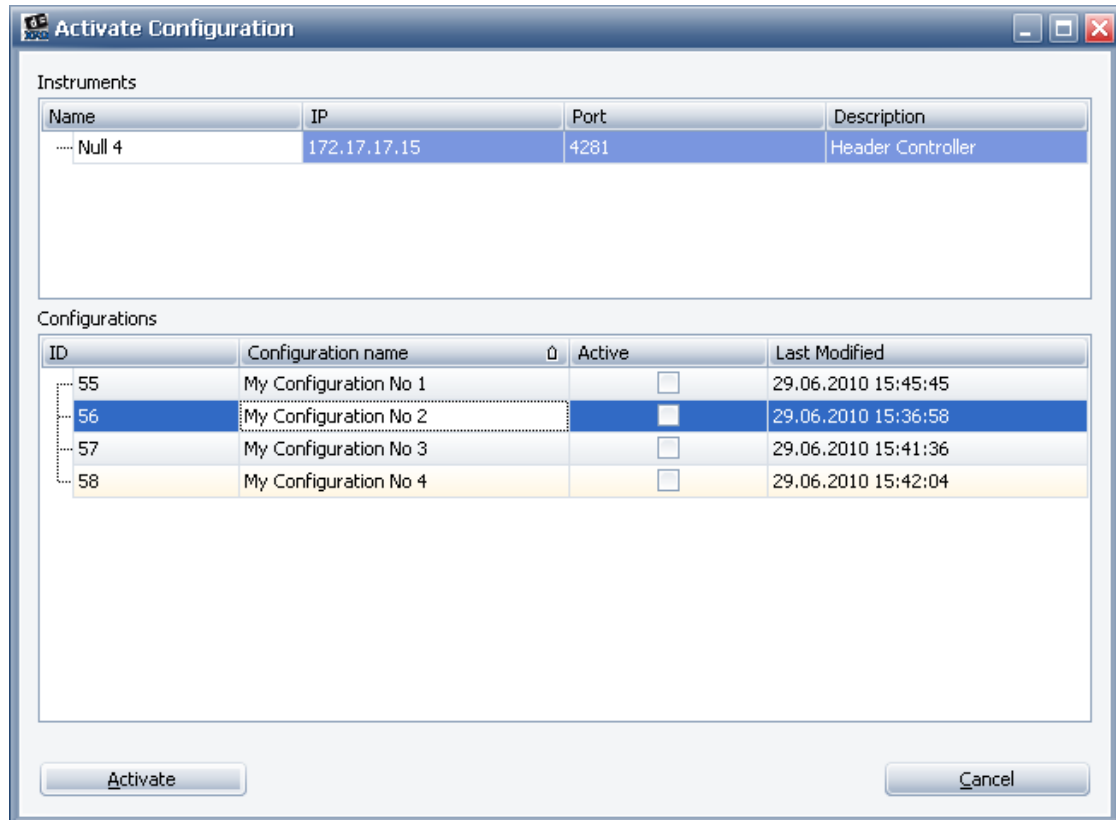


Figure 12.20: Dialog box **Activate Configuration**

In this dialog box a list of configurations available in the database for the currently connected instrument is displayed.

1. Select the configuration to be activated and then
2. click on the **Activate** button.
 - The configuration will be copied to the instrument and the instrument firmware will be automatically restarted.
 - A notification window will appear informing the user that activation has been successful and that the connections between the **Measurement Server** and the instrument and between the plug-in and the instrument must be re-established.



Figure 12.21: Notification window

1. Click on **OK** in this window to confirm that this information has been read before re-establishing the connections.
- ⇒ Once this has been done , the newly activated configuration can be used for present tasks.

12.2.6 The View Menu

The **View** menu is located in the menu bar at the top of the screen. This allows the user to view the contents of the XML files of the currently loaded configuration and firmware definition. In addition, a firmware component reference in RTF format from the XML file of the firmware definition can be generated. This reference can be a useful tool in the creation of configurations.

Other options allow the user to show the type of the selected component and description of the component in a special window that is opened for this purpose at the bottom of the **Config Tree** window.

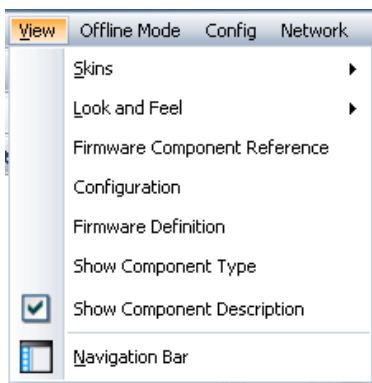


Figure 12.22: **View** menu

The menu items are as follows:

Firmware Component Reference

Allows the user to generate a firmware component reference in RTF format from the XML file of the firmware definition. This RTF document can be copied to the clipboard and then pasted into a Word document.

Selecting this option opens the dialog box **Generate component reference**.

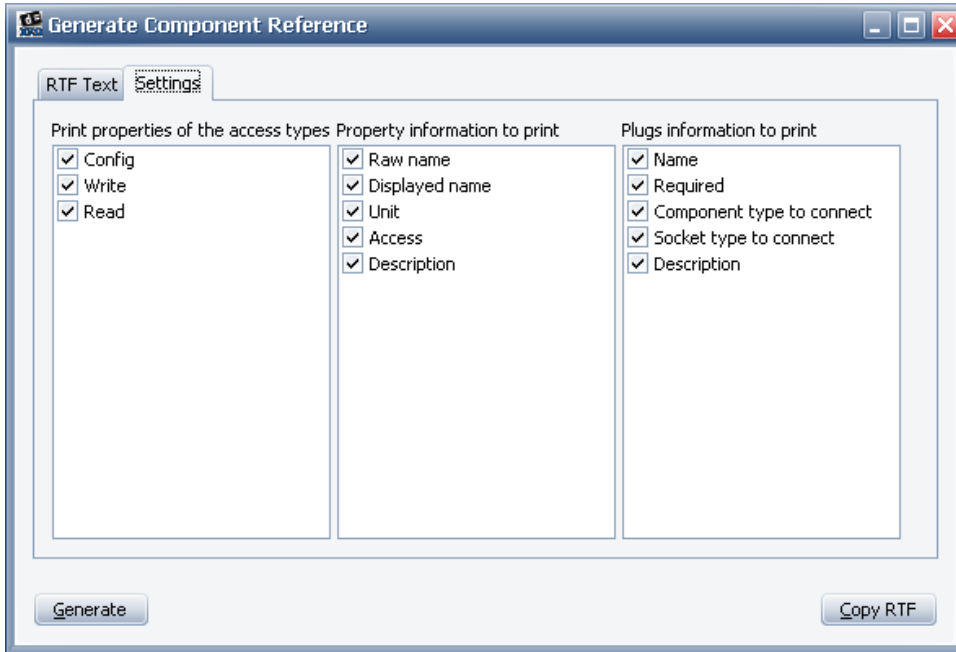


Figure 12.23: Dialog box **Generate Component Reference**

This dialog box contains two tab pages. The **Settings** page contains three columns of check boxes that allow the user to specify the type of information to be included in the component reference.

In the first column of check boxes, check the **Config** box to include those properties that are displayed and whose values can be changed in **CONFIG**. If the **Write** box is checked, the displayed properties and values can be changed in **COMMANDER** and **TOOLS**. Checking the **Read** box will display those properties whose values cannot be changed in **COMMANDER** and **TOOLS**.

After choosing these settings,

1. click on the **Generate** button to generate the component reference.
 - The generated reference will appear as an RTF document on the **RTF Text** tab page.

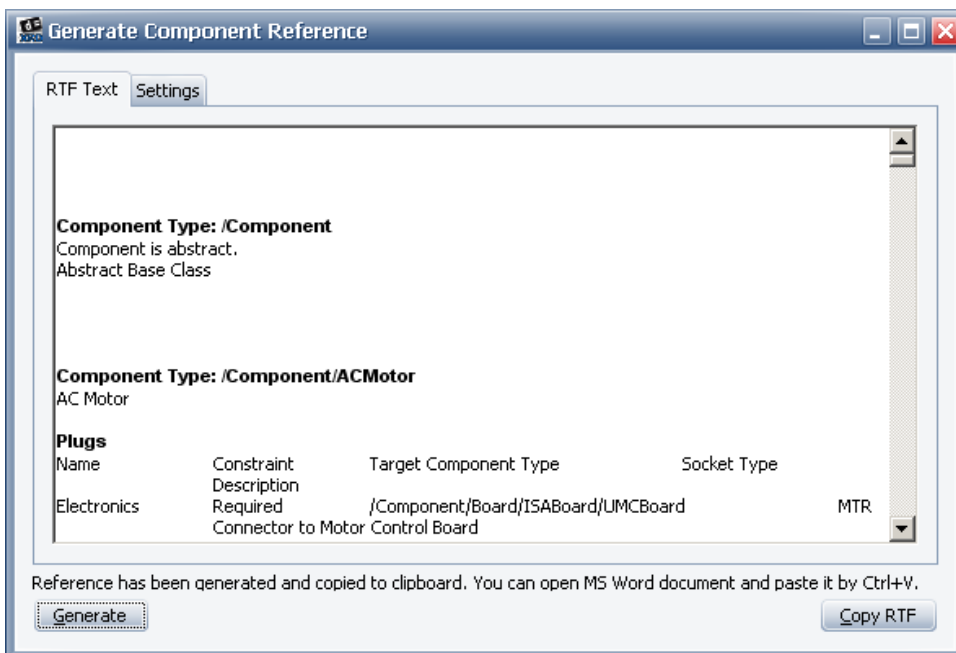
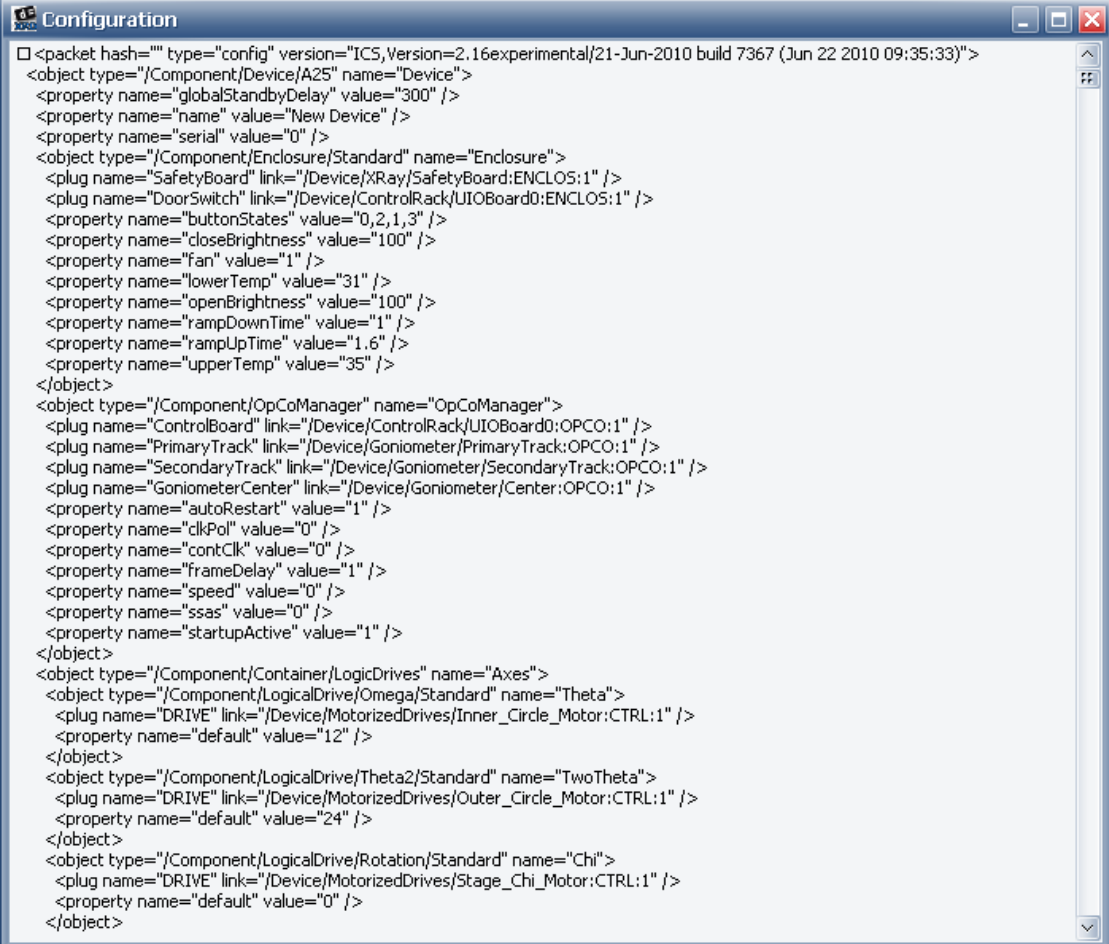


Figure 12.24: Generated component reference

When generated, the reference will be copied to the clipboard automatically. It can then be pasted into a Word document. If only a section of the reference is to be copied, mark the section with the mouse and click on the **Copy RFT** button to copy it to the clipboard.

Configuration

Opens a window in which the contents of the XML file of the configuration currently loaded in **CONFIG** are displayed.



```

<packet hash="" type="config" version="ICS,Version=2.16experimental/21-Jun-2010 build 7367 (Jun 22 2010 09:35:33)">
<object type="/Component/Device/A25" name="Device">
  <property name="globalStandbyDelay" value="300" />
  <property name="name" value="New Device" />
  <property name="serial" value="0" />
</object>
<object type="/Component/Enclosure/Standard" name="Enclosure">
  <plug name="SafetyBoard" link="/Device/XRay/SafetyBoard:ENCLOS:1" />
  <plug name="DoorSwitch" link="/Device/ControlRack/UIOBoard0:ENCLOS:1" />
  <property name="buttonStates" value="0,2,1,3" />
  <property name="closeBrightness" value="100" />
  <property name="fan" value="1" />
  <property name="lowerTemp" value="31" />
  <property name="openBrightness" value="100" />
  <property name="rampDownTime" value="1" />
  <property name="rampUpTime" value="1.6" />
  <property name="upperTemp" value="35" />
</object>
<object type="/Component/OpCoManager" name="OpCoManager">
  <plug name="ControlBoard" link="/Device/ControlRack/UIOBoard0:OPCO:1" />
  <plug name="PrimaryTrack" link="/Device/Goniometer/PrimaryTrack:OPCO:1" />
  <plug name="SecondaryTrack" link="/Device/Goniometer/SecondaryTrack:OPCO:1" />
  <plug name="GoniometerCenter" link="/Device/Goniometer/Center:OPCO:1" />
  <property name="autoRestart" value="1" />
  <property name="clkPol" value="0" />
  <property name="contClk" value="0" />
  <property name="frameDelay" value="1" />
  <property name="speed" value="0" />
  <property name="ssas" value="0" />
  <property name="startupActive" value="1" />
</object>
<object type="/Component/Container/LogicDrives" name="Axes">
  <object type="/Component/LogicalDrive/Omega/Standard" name="Theta">
    <plug name="DRIVE" link="/Device/MotorizedDrives/Inner_Circle_Motor:CTRL:1" />
    <property name="default" value="12" />
  </object>
  <object type="/Component/LogicalDrive/Theta2/Standard" name="TwoTheta">
    <plug name="DRIVE" link="/Device/MotorizedDrives/Outer_Circle_Motor:CTRL:1" />
    <property name="default" value="24" />
  </object>
  <object type="/Component/LogicalDrive/Rotation/Standard" name="Chi">
    <plug name="DRIVE" link="/Device/MotorizedDrives/Stage_Chi_Motor:CTRL:1" />
    <property name="default" value="0" />
  </object>
</object>

```

Figure 12.25: **Configuration** window showing contents of XML file of currently loaded configuration

Firmware Definition

Opens a window in which the contents of the XML file of the firmware definition currently loaded in **CONFIG** are displayed.

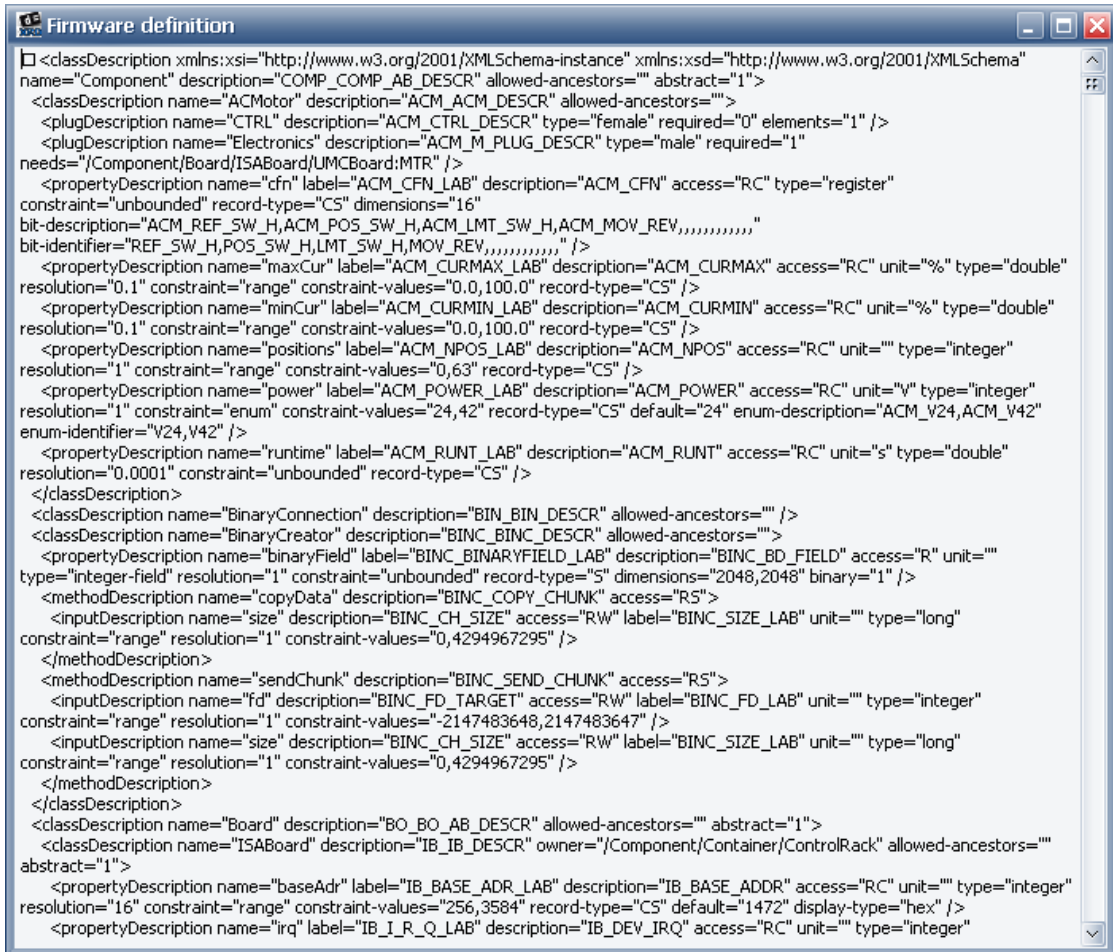


Figure 12.26: **Firmware definition** window showing contents of XML file of currently loaded firmware definition


Set Component Sorting Indexes

This menu option provides functionality that is of interest to Bruker Support personnel only. **Show Component Type:** Shows the type of the selected component in a window that is opened especially for this purpose at the bottom of the **Config Tree** window. The name of the component type is preceded by the names of other component types in a hierarchical order specified in the firmware definition. If this item has been chosen, a checked check box appears alongside the item name in the menu, indicating that the function remains active for any further components that are selected. It can be deactivated by clicking on the check box.

Show Component Description

Shows a description of the selected component in a window that is opened especially for this purpose at the bottom of the **Config Tree** window. When the option **Show Component Type** is chosen, a checked check box appears next to the item name in the menu. This indicates that the function remains active for any other components that are selected. It can be deactivated by clicking on the check box.

Show Warnings

Shows yellow warning icons  for those object nodes which have warning messages, e.g. optional plug is not connected.

12.2.7 The Tools Menu

The **Tools** menu is located in the menu bar at the top of the screen and contains the single option: **Instrument Setup**.

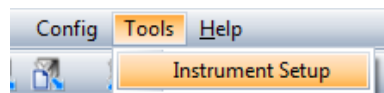


Figure 12.27: Tools menu

12.2.7.1 Instrument Setup

Allows the user to perform the instrument network setup. Choosing this option opens the dialog box **Instrument network setup**. The name of the instrument, its static network address or the dynamic address acquisition, the network mask and communication ports, etc. can be specified.

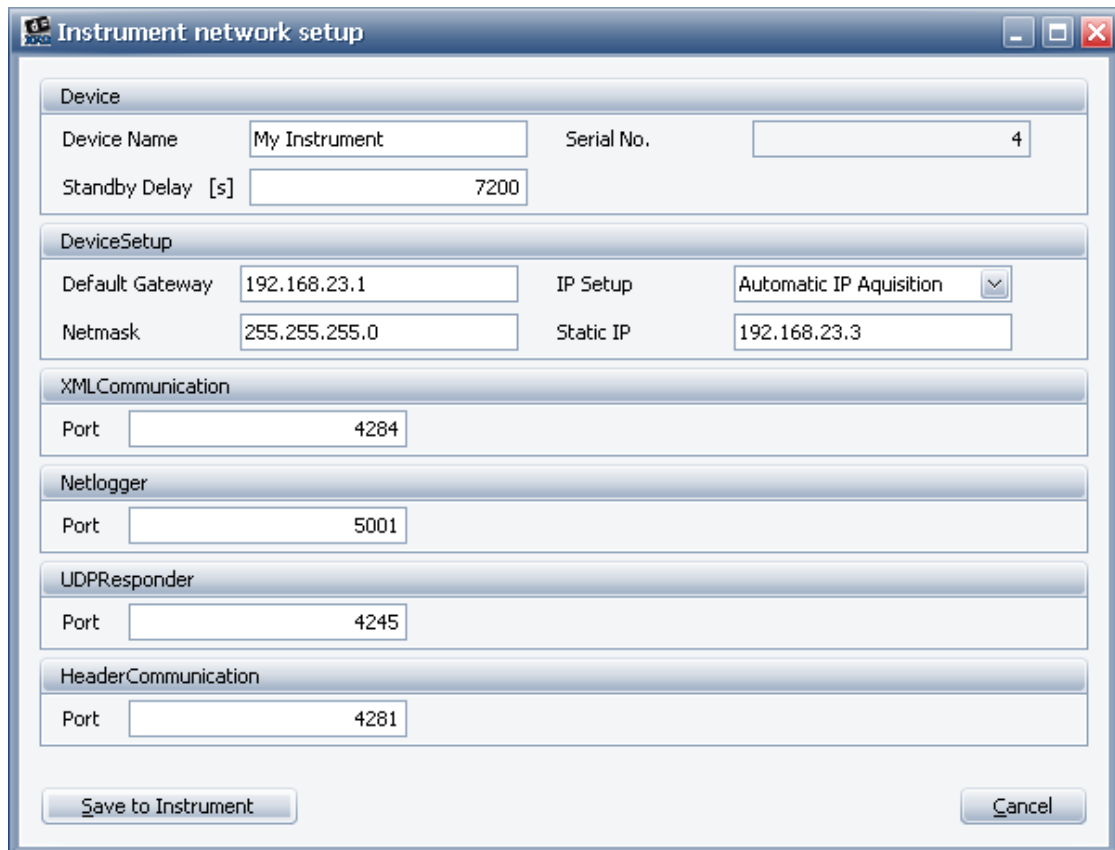


Figure 12.28: Dialog box **Instrument network setup**

1. After entering this data, click on the button **Save to Instrument** to save the settings to the instrument.
 - Successful uploading of the network setup to the instrument is confirmed by a dialog box.

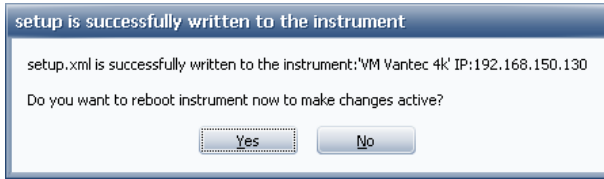


Figure 12.29: Dialog box **Setup is successfully written to the instrument**

2. Click on **Yes** in this dialog box to enable the new network setup for the instrument. Otherwise, the instrument will run with the old network settings until the next reboot of the instrument.
 - When **Yes** is selected, the connection between the instrument and the Measurement Server will be broken and a notification window will appear.



Figure 12.30: Notification window **Instrument is rebooted**

3. Re-establish the connections between the Measurement Server and the instrument and between the shell and the Measurement Server in order to continue working with **CONFIGURATION** plugin.

12.2.7.2 Shutdown Script

Users with Bruker Service access level can use the **Shutdown Script** menu in order to upload a new shutdown script to the instrument.

Before changing the shutdown script one has to ensure that Shutdown component is configured in the instrument configuration.

To change script

1. click onto **Change** menu item and
 2. select the script file in the upcoming open file dialog.
- ⇒ CONFIG plugin will upload selected script file into the instrument and will change instrument configuration by copying the script filename into **Macro Path** property of the **Shutdown** component of the instrument configuration.

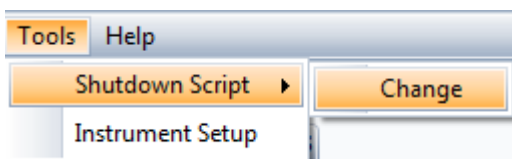












Figure 12.31: Menu item to change shutdown script.

12.2.8 Speed Buttons

The speed buttons are located in a row directly below the Menu bar. They provide quick mouse access to frequently used CONFIG functions.

Button	Description
	Add components. Manual and automatic component configuration. For the automatic component configuration, see Register new components [▶ 200].

Button	Description
	Export template
	Clone component
	Delete component
	Open configuration from currently connected instrument
	Open configuration from database
	Open configuration from file
	Save currently loaded configuration to file
	Save currently loaded configuration to database
	Save configuration to instrument and activate

For detailed information on the functions **Add components**, **Export template**, **Clone component** and **Delete component**, which are also accessible using the context-sensitive menu of the **Config Tree** window, see Section [The Config Menu \[184\]](#).

For detailed information on the functions **Open configuration from currently connected instrument**, **Open configuration from database**, **Open configuration from file**, **Save currently loaded configuration to file**, **Save currently loaded configuration to database**, and **Save configuration to instrument and activate**, which are also available in the **Config** menu, see Section [Speed Buttons \[92\]](#).

12.2.9 The Config Tree Context Menu

The **Config Tree** context menu is opened by right-clicking anywhere in the **Config Tree** window. It provides access to editing functions of **CONFIG**.

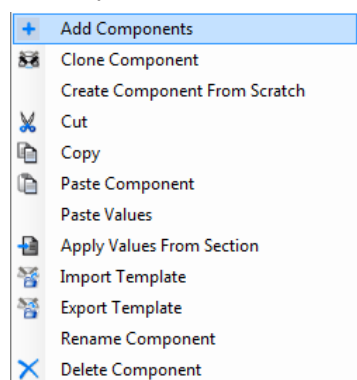


Figure 12.32: **Config Tree** context menu

The **Import Template** and **Export Template** options of this menu are also provided by the **Config** menu. For a description of these options, see Section [The Config Menu \[184\]](#).

NOTICE

The functions **Add Components**, **Clone Component** and **Delete Component** are also available as speed buttons (see Section [Speed Buttons \[196\]](#)).

12.2.9.1 Add Components

Adds a new component or components with their property settings to the currently loaded configuration. This function facilitates the modification of existing configurations and the creation of wholly new ones.

Choosing this option opens the dialog box **Add Components**. In the left sub-window of this dialog box the contents of the Instrument Configurations directory are displayed. This is the standard directory for template files and configuration files. These files are stored in folders in the directory, as described in Section [The Config Menu \[184\]](#).

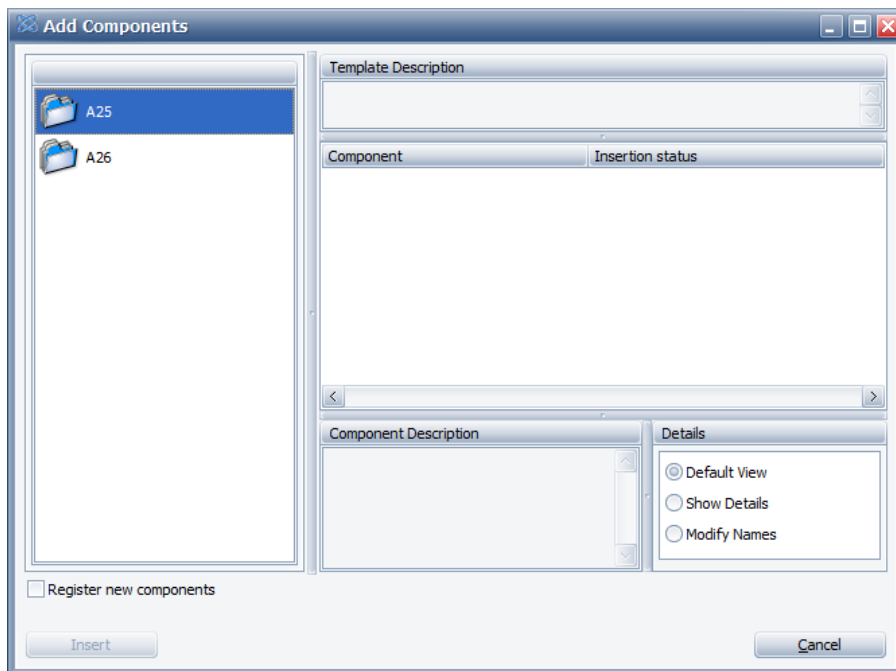


Figure 12.33: Dialog box **Add Components**

To add a component or components,

1. select the appropriate folder in the left pane with a double mouse click.
2. Then select a template file or a configuration file with a single mouse click from the contents of the folder that are then displayed in this pane.

The components contained in the selected file will be displayed. They will be arranged in a hierarchical structure, in the Component pane on the right. A description of the component will be displayed in the Component description pane near the bottom of the dialog box when this component is selected. The Insertion status column shows if the insertion of the component into current configuration is possible for every component in the template:

OK	Ok.Component will be copied from template into configuration.
Warning	Component with the same name and path is already existing in the configuration. Only compatible values will be copied from a template into existing component. An existing component preserves its type.
Error	Can not insert the component into configuration. A parent component with given path does not exist in the configuration.



(The components from the Component pane can be cleared by clicking on the arrow pointing backwards at the top of the left pane. Double-clicking on this arrow returns the user to the folder level within the Instrument Configurations directory.)

1. Select the desired component or components by selecting the corresponding check boxes in the **Component** pane with a mouse and
2. click on **OK**. The component or components along with their settings will be added to the configuration.

12.2.9.2 Add Components: Show Details

The component types and absolute paths for the components appear in the **Component** pane when the **Show Details** box is checked.

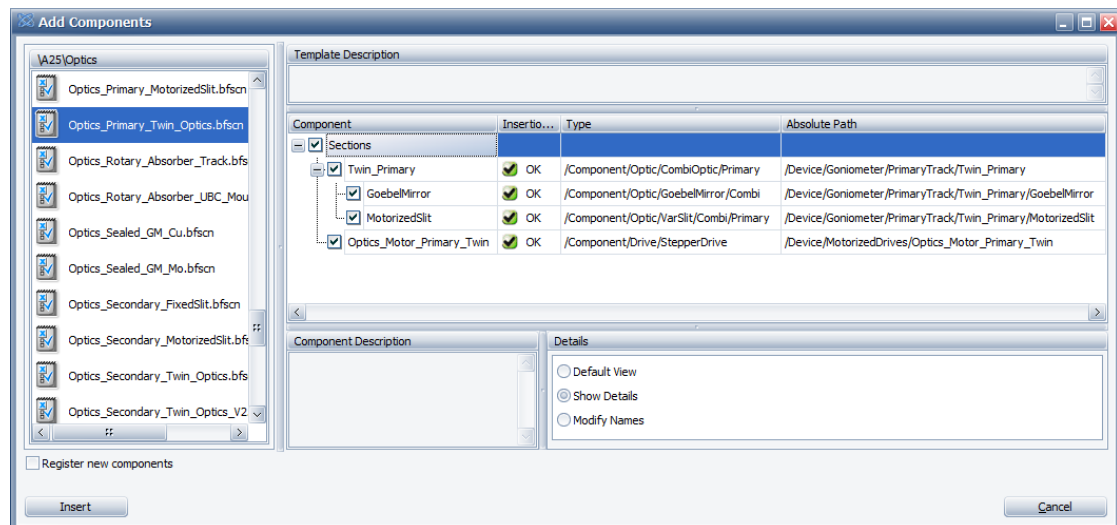


Figure 12.34: Show Details

12.2.9.3 Add Components: Modify Names

This menu allows to adjust names and modify absolute paths of the components in the template before adding them into configuration.

To change a component name

1. click with left mouse button onto the component and
2. type the new name.

When changing the name or path of the component, paths of all subcomponents will be adjusted automatically.

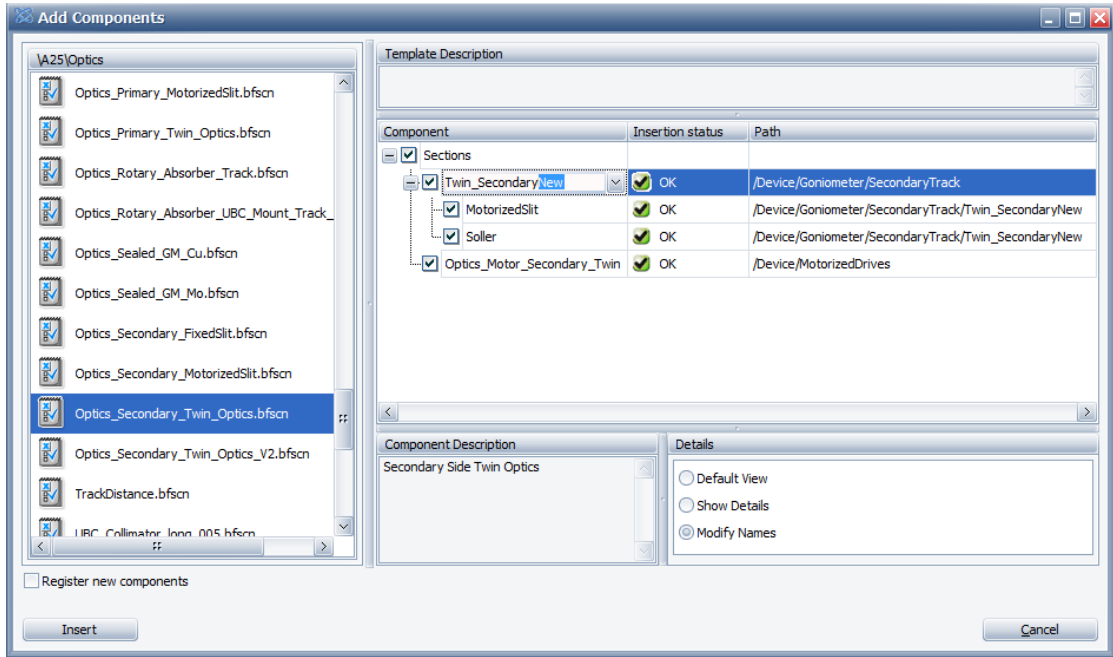


Figure 12.35: Changing the name of the component.

For complex instruments with multiple tracks, it allows to select a track where the component has to be inserted.

To select another track or change component absolute path

1. click with left mouse button onto component's path and
2. select new path from the upcoming drop down list. Absolute path can be changed only for top level components.

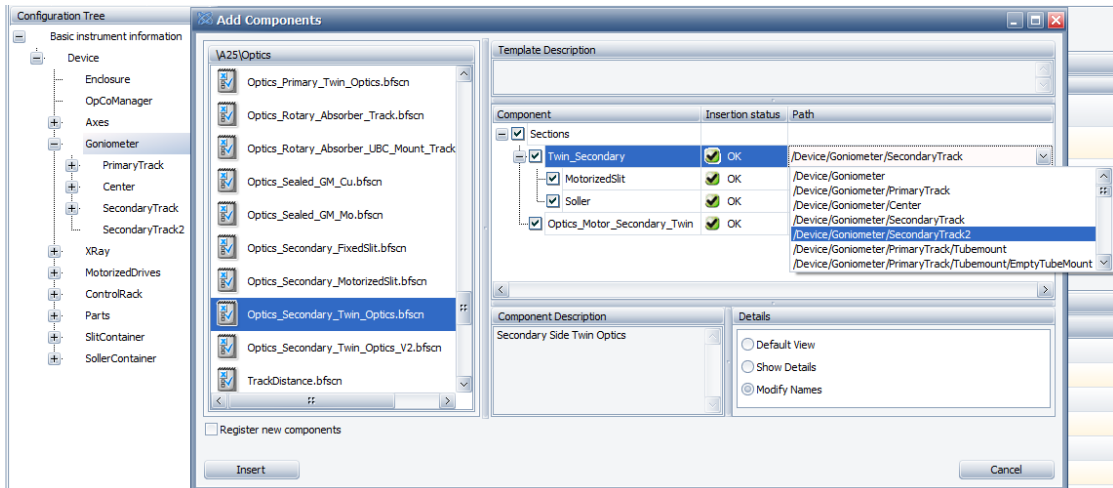


Figure 12.36: Changing the track for the component.

12.2.9.4 Register new components

Automatically adds optical components that support self-recognition to the currently edited configuration.

In this mode all mounted optical components are automatically recognized in the instrument. The corresponding configuration template is automatically offered for adding to the currently edited configuration.

In the left top pane a list of new chips that have been recognized in the instrument is displayed. Every chip has unique identifier and corresponds to a certain optical component.

The left bottom pane displays component names, which belong to the highlighted chip item.

The middle pane displays the recommended configuration template for all components that belong to the highlighted chip item. The right top pane lists all components in the recommended configuration template.

In general, all components from the recommended template should be inserted.

The required chip can be selected by clicking on the line in the **Recognized new chips** pane.

To add a configuration template to the currently edited configuration,

1. click on the **Insert** button.
 - The highlighted chip item will now disappear from the list of the **Recognized new chips**.
2. One can repeat this operation until all chips disappear from the list.

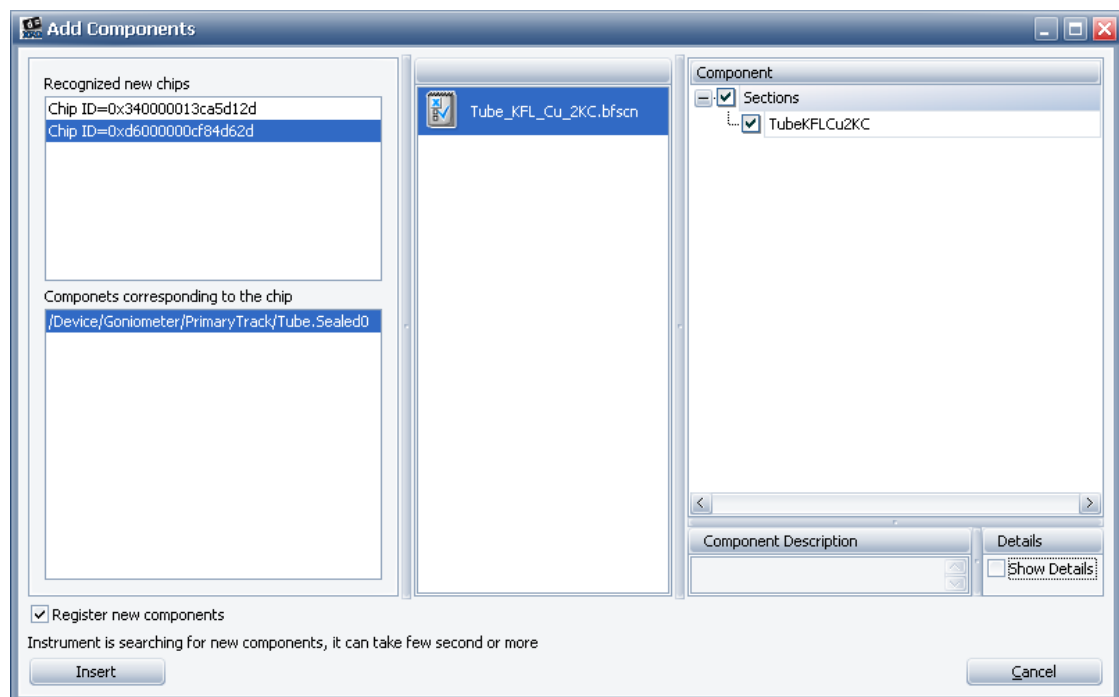


Figure 12.37: Dialog box **Add Components** with enabled automatic component registration.

12.2.9.5 Clone Component

Creates an exact copy of a component including all of its property settings.

1. Select this item after right-clicking on the component to be cloned in the **Configuration** tree to open the menu.
 - This will open the dialog box **Name for the new component**.
2. Overwrite the name of the component to be cloned with the name of the clone.



Figure 12.38: Dialog box **Name for the new component**



- The red icon on the left side of the **New name for the component** field indicates a mandatory data entry. Once a new name is entered, the icon disappears. The icon also serves as a warning if the entry in this field has already been used by a component in the configuration. In this case, the red icon will reappear after having left the field.

3. After the new name has been entered, click on **OK**.

⇒ The clone will appear at the same level in the configuration tree as the component from which it was cloned.

12.2.9.6 Create Component from Scratch

Creates a new component in the currently loaded configuration without importing the component and its property settings from a template file or a configuration file.

Select this item after right-clicking on the “parent” component in the configuration tree to open the menu. The “parent” component is the component under which the new component will be added at the next level in the configuration tree. This opens the dialog box **Create Component**.

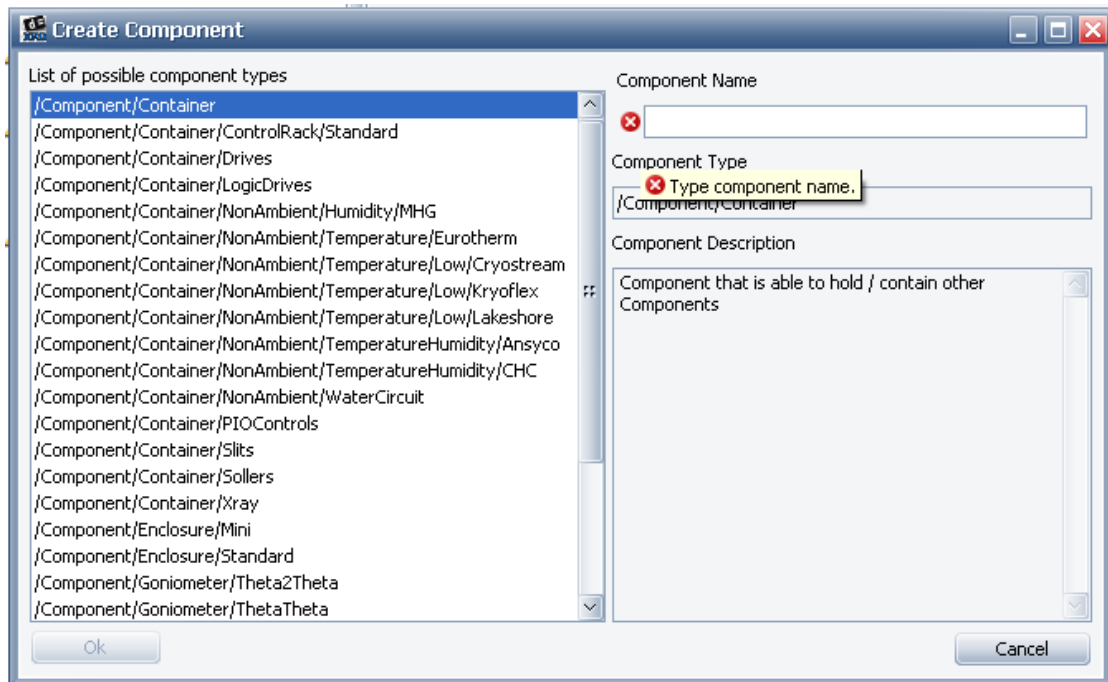


Figure 12.39: Dialog box **Create Component**

- In this dialog box select the requested component from a list of allowed component types and then
- enter the new component’s name in the **Component Name** field.



- The red icon at the left end of the **Component Name** field indicates that data entry in this field is mandatory. Once the data has been entered, the icon disappears. The icon also serves as a warning if a name that has already been used by a component in the configuration is entered. In this case, the red icon appears after having left the field.
 - Due to software constraints, the first character of the new component's name must be a letter.
3. After the new component's name has been entered, click on **OK**.
- ⇒ The new component will appear with default property settings under the parent component in the **configuration** tree. These settings must be edited as required.

12.2.9.7 Cut

Cuts highlighted component from the configuration and stores it in the temporary storage. Child components will be lost in this case.

12.2.9.8 Copy

Copy the highlighted component with all properties, resource and plug values from the highlighted component into the temporary storage.

12.2.9.9 Paste Component

Pastes previously copied component as child to the highlighted component.

12.2.9.10 Paste Values

Paste all properties, resource and plug values from the temporary storage into highlighted component.

Values can be pasted into the component only if the values were previously copied from the component of the same or related type of component.

12.2.9.11 Apply Values from Section

Applies the property settings of a source component in a template file or configuration file to a target component in the currently loaded configuration. Only the components in the file that have the same type as the target component are displayed for selection as the source component and thus for application of their settings.

1. Right-click on the target component in the **Configuration** tree to open the menu.
2. This opens the window **Apply Values from Section**, in which a template file (extension *bfscn*) or a configuration file (extension *bfcfg*) can be selected by double-clicking.
 - This file is located in the standard **ConfigTemplates** directory. This in turn opens the dialog box **Apply Values from Section**, in which a list in table form is displayed. These are similar to the target components. Next to each component the component type is displayed.
3. Select the appropriate component in the table by clicking on the component itself or the component type next to it, or scroll up and down using the arrow keys ↑ and ↓.
4. Finally, click on **Apply** to apply the property settings of the source component to the target component.

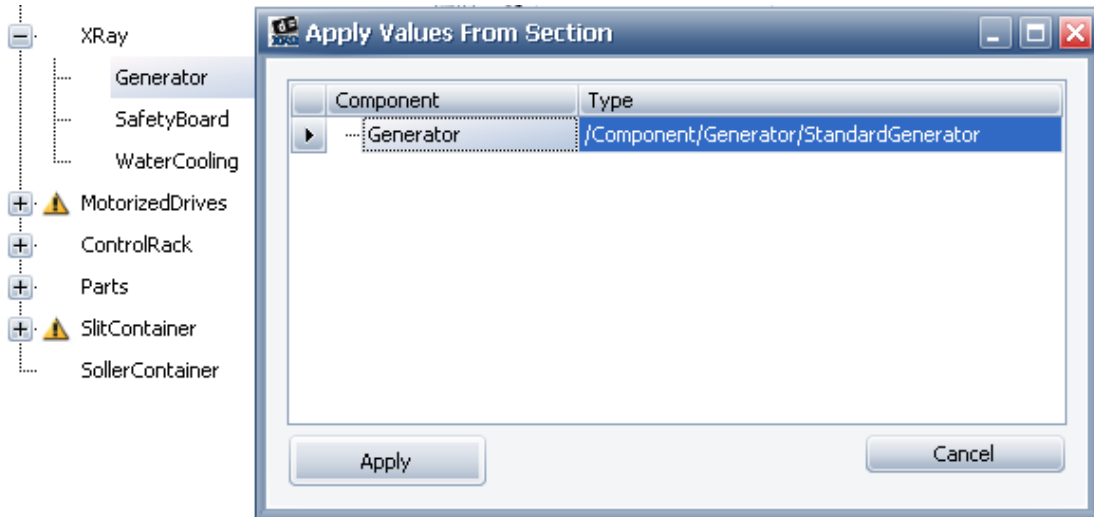


Figure 12.40: Dialog box **Apply Values from Section**



Only settings for properties common to both the source component and the target component will be copied.

12.2.9.12 Rename Component

Renames a component in the currently loaded configuration.

1. Right-click on the component to be renamed in the configuration tree to open the menu.
 - This will open the dialog box **New component name**
2. Type in the new name. Finally, click on **OK** to rename the component.



Figure 12.41: Dialog box **New component name**



⇒ The red icon in this dialog box at the left end of the data entry field indicates that the data entry in this field is mandatory. Once a name is entered, the icon disappears. The icon also serves as a warning to indicate that the data entry has already been used for a component in the configuration. In this case, the red icon appears after having left the field.

12.2.9.13 Delete Component

Deletes a selected component.

1. Select this item after right-clicking on the component to be deleted in the **Configuration** tree to get the menu.

One can select multiple components for deleting them at once by keep pressing **CTRL** button and clicking with left mouse button onto components in the tree.

12.2.10 The Edit Menu

The **Edit** menu is located in the menu bar at the top of the screen.

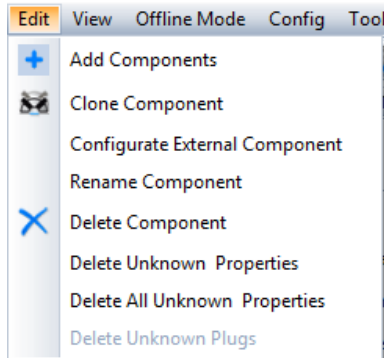


Figure 12.42: The **Edit** menu

The first tree items and fifth item of this menu are also available in the **Config Tree** context menu. For a description of these functions, see Section [The Config Tree Context Menu \[▶ 197\]](#).

Configure External Component

One can configure components with an external configuration interface, e.g. video camera, after selecting this component in the **Configuration** tree. This menu opens dialog shown in the next figure. One selects corresponding script in the upper combo box, e.g. **ExternalVideoDetector.cs**, and configures this component by clicking **Configure** button.

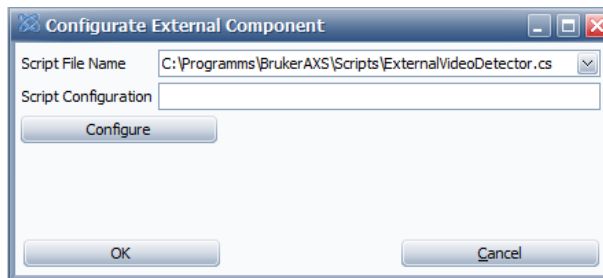


Figure 12.43: The **Configure External Component** dialog

Delete Unknown Properties

Deletes all properties that have an “unknown” status. This refers to component properties which are not described (not available) in the actually loaded firmware definition.

Delete All Unknown Properties

Deletes all properties that have an “unknown” status. This refers to properties that are not described in the actual firmware definition from all components in the configuration.

Delete Unknown Plugs

Deletes all plugs that have an “unknown” status. This refers to plugs which are not described in the actual firmware definition.

13 TOOLS

13.1 General

The TOOLS plug-in provides the user with information on the state of the components of an instrument. This is used primarily to diagnose faults or malfunctions that may occur during measurements and to carry out “repairs”. This refers to the restoration of impaired components to their normal working state.

If a fault or malfunction occurs, the components affected are automatically assigned an error status and the cause of the error is indicated in error registers for these components. This allows the problem to be identified and resolved quickly.

The necessary “Repair” work usually involves changing of property values and/or sending commands to the instrument software (firmware), which executes them. For example, if a drive has moved beyond an upper or lower limit as a result of a malfunction it can no longer be used for normal measuring operations. However, the drive can be moved back within the limit using the Step up or Step down commands. Thus, the drive will be restored to its normal working state.

In some cases, the remedial measures can only be carried out directly on the instrument. For example, if an X-ray tube fails, it must be replaced by an instrument technician.

TOOLS can also be used to perform operations on instrument components for reasons unconnected with a fault or malfunction. For example, a drive may need to be repositioned in order to permit access to an instrument part that requires readjustment.

The plug-in indicates faults or malfunctions with an error status to the components. Likewise, impending problems are indicated in the same manner. The reason for the warning is indicated in the warning registers. The user is then able to take the necessary preventive measures. For example, if the conductivity of the water in the water cooling unit is too high, the water registry of the component will be signaled. The user can then respond by replenishing the water.

Finally, TOOLS can be used to monitor an instrument during measurements and other operations.

Getting Control of the Instrument

Control of the instrument by TOOLS is required for sending information to the instrument, for example, while changing property values or performing “repairs”. In TOOLS, control of the instrument can be obtained and released using the **Get Control/Release Control** speed button in the TOOLS interface (see Section [Speed Buttons \[216\]](#)). If , the instrument is controlled by another plug-in instance when control is requested, a window will appear requesting confirmation. If confirmed, control will be handed over. Any measurement and/or other operations, which are in progress will be aborted.

As is the case with other plug-ins, obtaining control of a connected instrument for the plug-in by using an indirect connection presupposes that control of the instrument has already been obtained for the Measurement Server. Obtaining control of the instrument is carried out by selecting the item Status window in the start menu of the Measurement Server (see Section [Getting and Releasing Control of and Reconnecting to Instruments \[22\]](#)).

13.2 Screen Layout and Operation

The TOOLS page consists of two windows: the **Component Tree** window to the left contains the components of a connected instrument, which are arranged hierarchically in a tree structure. This is similar to the CONFIG plug-in and the **Component State** window adjoining it to the right, in which information on the state of the component selected in the component tree is displayed. This information also includes the properties of the component. For some properties, data entry fields are available. In these fields the property values for “repair” or other purposes can be changed.

In addition, two TOOLS-specific menus, the **Settings** menu and the **Utilities** menu (some components only), are provided in the menu bar at the top of the screen.

The **Settings** menu is used to save an overview of component states for later use and to access **Direct Command Mode** for changing property values and sending of commands easily.

The **Utilities** menu provides a component-specific set of commands. These commands are made available as speed buttons. (see Section [Speed Buttons \[216\]](#) below).

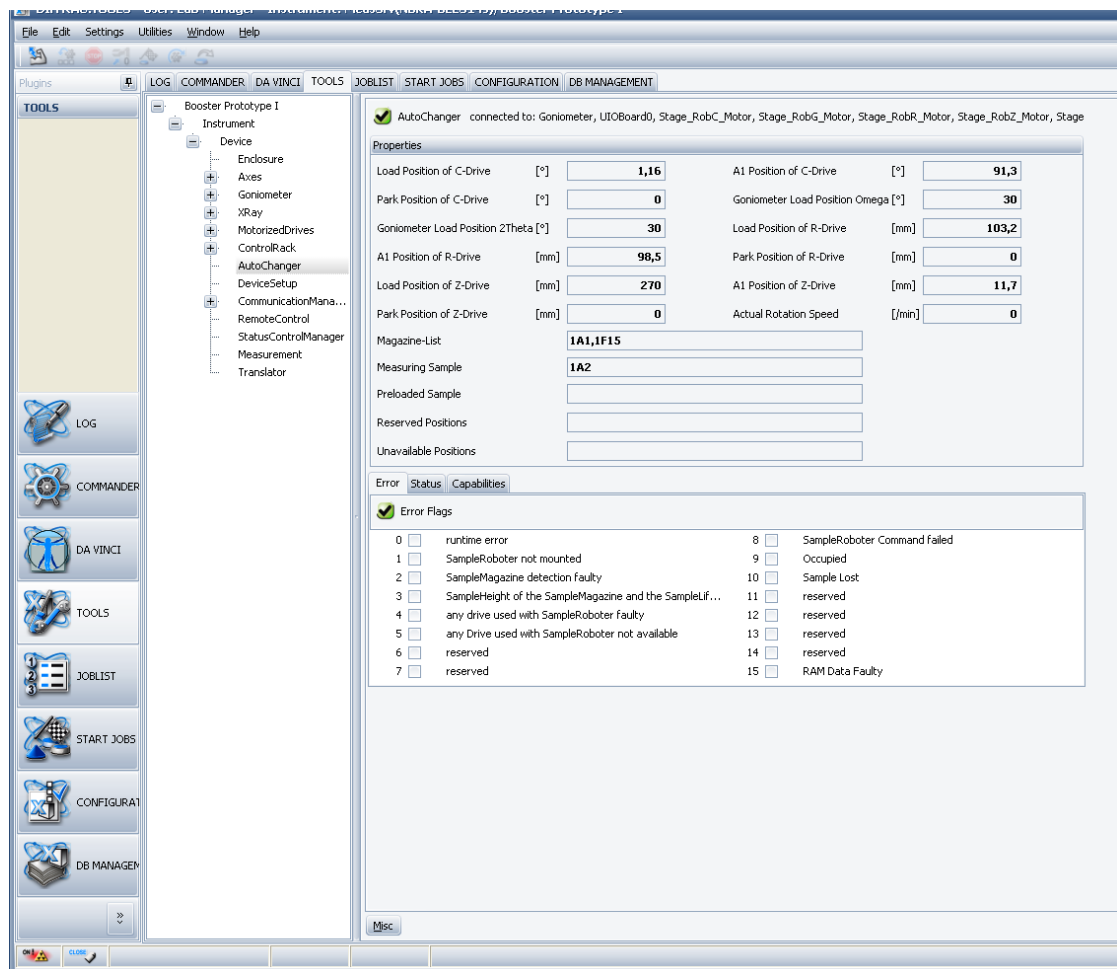


Figure 13.1: User interface of the TOOLS plug-in

The two windows on the TOOLS page are separated by a splitter line. To increase or reduce the width of the views offered by each window, this line must be dragged with the mouse pointer to the right or left. In addition, the height can be increased or reduced by dragging the lower edge of the screen with the mouse pointer up or down.

13.2.1 Component Tree Window

As in the CONFIG plug-in, the tree shown in the **Component Tree** window is a logical arrangement of the components of the connected X-ray instrument. Some of the components are actually subcomponents of other components (the term “components” is used loosely in the software and in this documentation to describe both components and subcomponents), and in these cases the component tree also reflects this physical state. In such cases, the higher-level component is called a “container”. For example, the component **ControlRack** contains a set of subcomponents **DIBoard0**, **AIBoard0** and **AIBoard2**, which are circuit boards that are inserted into this control rack.








The component tree also contains virtual components such as **RemoteControl** and **Measurement**. The functions of these two components are described in Sections [Remote Control \[220\]](#) and [Measurement \[221\]](#) below.

Selecting a component in the **Component Tree** causes information on the state of the component to appear in the **Component State** window.



Right click brings up the context menu. This menu provides a list of operations supported by the component. The menu is identical to the [The Utilities Menu \[213\]](#).

The status of each component is indicated by a status icon that appears alongside the component name. Except for the **OK** icon, which does not appear in the **Component Tree** window, all icons appear in both windows. The following status icons are used:

Component Status Icons

Icon	Meaning	Description
	OK	The component can now be used in measurements.
	Busy	The component is currently in operation.
	Warning	A warning has been given for a component. However, for the time being the component can be used in measurements
	Error	Indicates a faulty component. This means that the component cannot be used in measurements. Other components that are dependent on the faulty one cannot be used either.
	Disabled	The component is not available. Use the CONFIG plug-in to check whether the component has been configured correctly.
	Unmounted	The component is not mounted on the instrument. The user can change this status by mounting the component.
	Unknown	No status has been transmitted by the firmware.

See also

-  [Remote Control \[220\]](#)
-  [Measurement \[221\]](#)

13.3 Component State Window

At the top of the **Component State** window the name of the selected component is displayed. Directly to the left, an icon indicating the component’s status is also shown. This icon appears next to the component in the **Component Tree**, except for when it indicates the status **OK**.

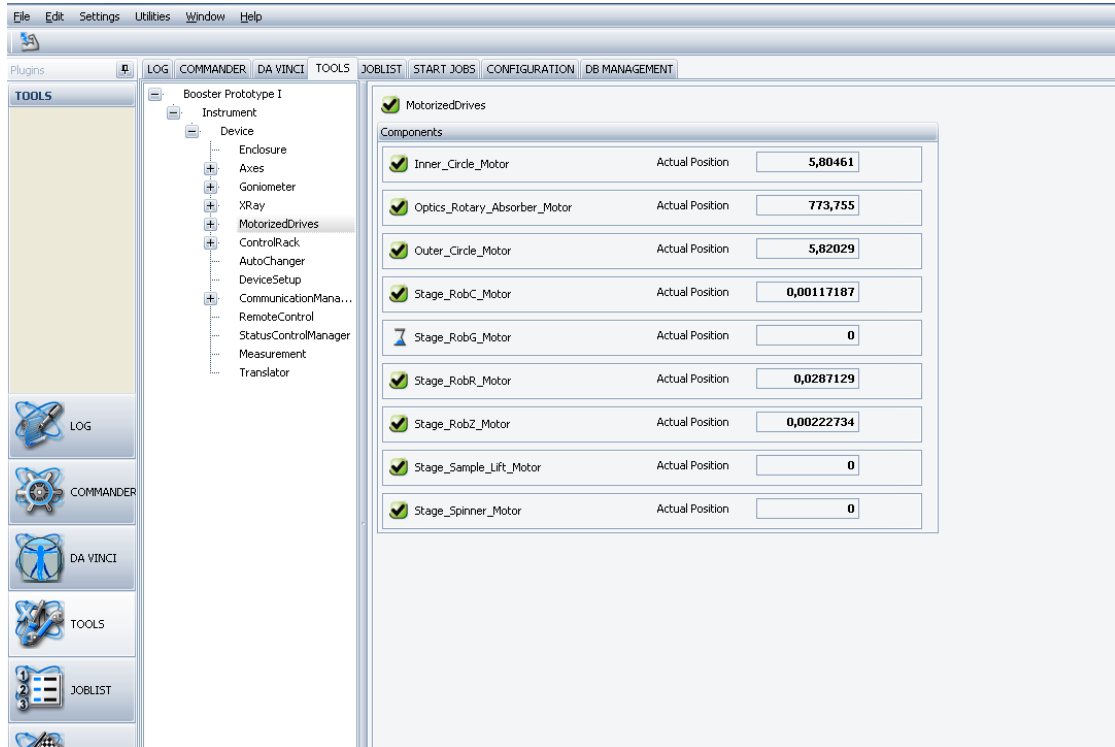


Figure 13.2: **Component State Window** (on the right) showing selected component with subcomponents

If the component contains subcomponents, these are displayed in the area below the name of the component. The user can navigate to any subcomponent by clicking on its name. The subcomponent is then automatically selected in the component tree and information on its state is displayed in the Component State window.

Properties Area

The Properties area is located directly below the subcomponents area or the component name. In this area, the most important properties of the component and their values are displayed.

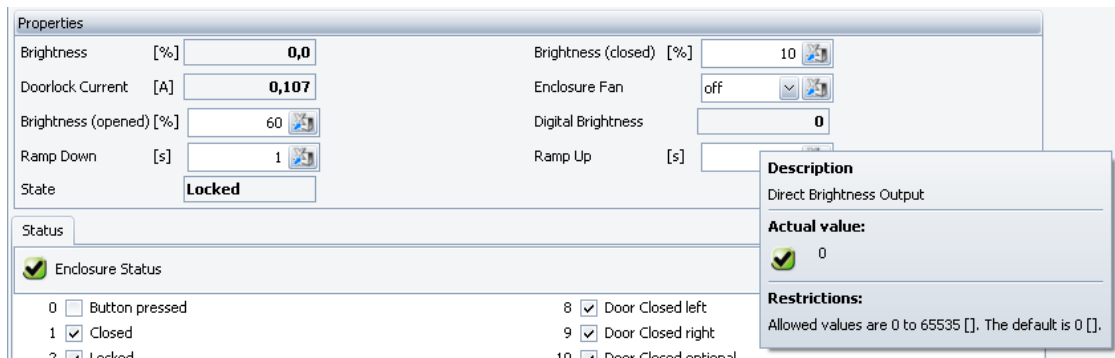



Figure 13.3: **Properties area** for component *Enclosure* with an open property information window



In most cases, some or all of the properties can be edited. Properties whose values can be changed are recognized by the buttons  in their data fields. These buttons are used to send newly entered property values to the instrument.

Position the mouse pointer above the name of a property. A property information window will appear and a description of the property and the restrictions applying to the value in each case will be given.

Registers

A set of component registers, either in tab pages or as lists is usually located below the Properties area. The user can navigate between the lists by clicking on the list names in the list directory. The set of registers often includes error, warning, and state registers. If a component has an error status, the nature of the error is indicated by a checked box next to an item in the error register. Likewise, the nature of a warning is indicated by a checked item in the warning register. Information about the current state of the component is provided in the state register. A checked item does not necessarily mean that the component has an error or warning status.



Figure 13.4: Alarm register for a water cooling unit

Miscellaneous Properties Window

The **Misc** button in the bottom left-hand corner of the **Component State** window provides access to the **Misc Properties** window, in which all properties of the component, their values and units of measure in tabular form are displayed. Descriptions of the properties are also provided.

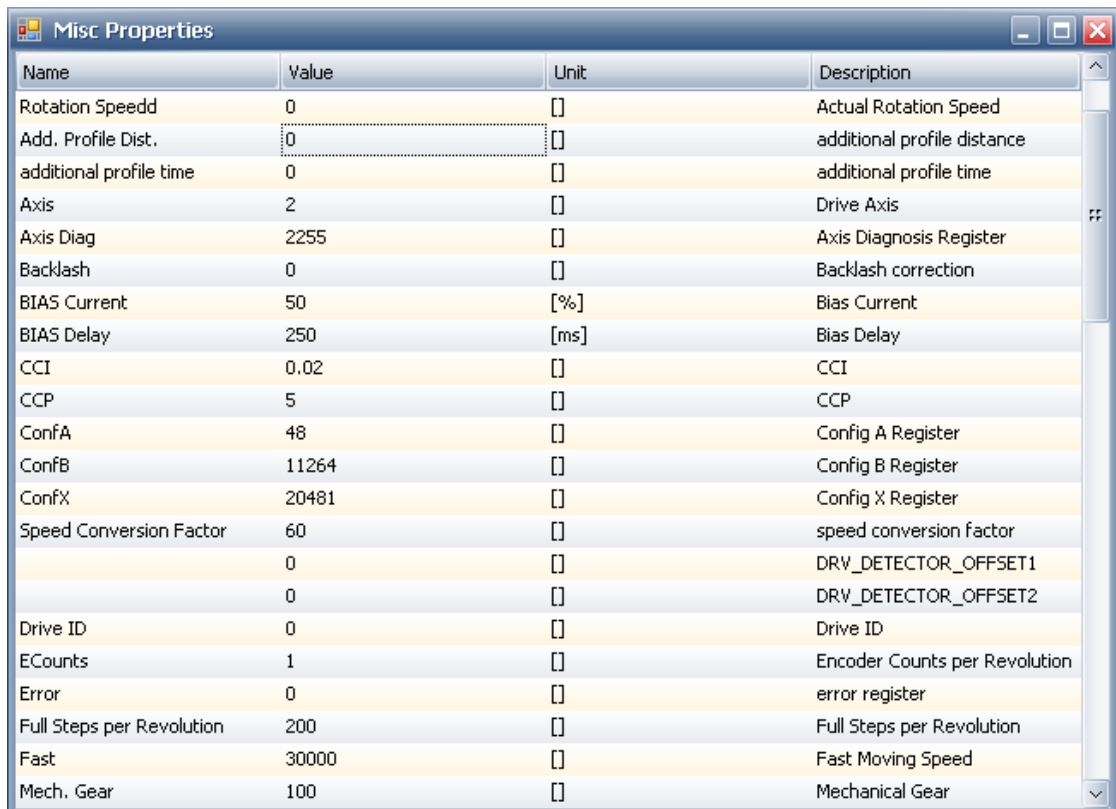


Figure 13.5: Misc Properties window

As in the Properties section, the values of editable properties can be changed. For more information on changing property values, see the following section.

13.3.1 Changing the Value of Properties

To change the value of properties in the **Properties** area of the **Component State** window and in the **Misc Properties** window, sufficient user rights are necessary. In addition, the TOOLS plug-in instance must have control of the instrument. (To get control of the instrument for the TOOLS plug-in, follow the instructions in Section [Speed Buttons \[216\]](#) below.)

Changing the Values of Properties in the Properties Area

Place the mouse pointer on the data entry field of a changeable property in the Properties area and a tooltip will appear, describing the constraints applying to the value entered. This is standard for data entry fields for properties throughout the application modules of the Bruker AXS MEASUREMENT CENTER.

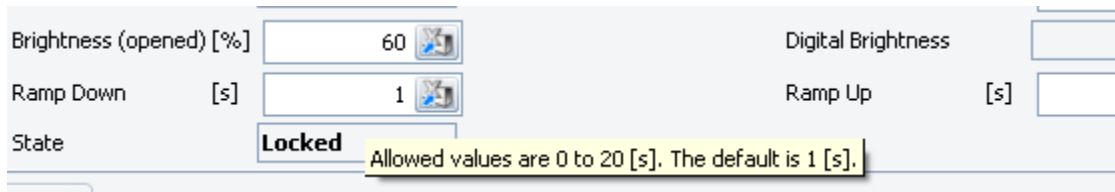


Figure 13.6: Properties area with tooltip for the property Ramp down

After changing the value of a property, click on the button in the data field to send the newly entered value to the instrument.

If an erroneous value for a property has been entered, the value will appear in red font after having clicked on the send button. If the value has not been accepted by the instrument for any reason, a red icon with a white cross will appear to the left of the data field. When the mouse pointer is positioned over the red icon, a text appears stating the reason for rejection of the newly entered value.

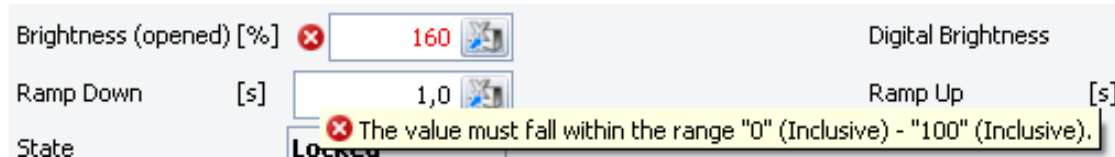


Figure 13.7: Fig. 102: Red icon and red font indicating an incorrect value

Changing the Values of Properties in the Misc Properties Window

To change the value of a property in the **Misc Properties** window,

1. click on the appropriate cell in the value column to open a window containing a standard data entry field for a property.
2. Enter the new value in this field within the specified constraints.
3. After entering the new value, click on the **Send** button to send it to the instrument.

To exit the window containing the date entry field at any time,

1. press the **Esc** button.

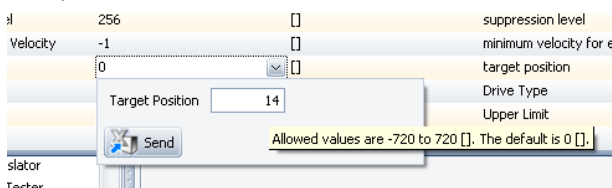


Figure 13.8: Dialog box for changing property values in Misc. Properties window

In the example shown above the value for the target position of the drive has been changed. This moves the drive to the newly specified position.

NOTICE

Damage to the instrument

The changing of property values may result in damage to the instrument. Both the property values and the instrument should be kept under close observation during these operations. For safety reasons, ReadWrite rights for the TOOLS plug-in should be granted to experienced users only.

13.3.2 TOOLS-Specific Menus

In addition to the **File**, **Edit**, **Help** and **Window** menus (common to all plug-ins), the menu bar of the TOOLS plug-in contains the **Settings** menu and (some components only), the **Utilities** menu. While the contents of the **Settings** menu are the same for all components, those of the **Utilities** menu differ according to the selected component.

The most important commands of the **Utilities** menu are made available as speed buttons, which are arranged in a row directly below the menu bar.

In the following section, the **Utilities** menu for drives of the stepper type is described by way of example.

13.3.2.1 The Utilities Menu

As explained above, the commands made available in the **Utilities** menu are employed to carry out “repair” and other operations on components. In the next figure a version of the **Utilities** menu specific to drives of the stepper type is shown by example. Versions with other items are available for other types of drives. However, many of these items are the same as those in the menu version of the stepper drive. The items shown within the **Utilities** menu are identical to the ones displayed by **Object Tree** context menu.

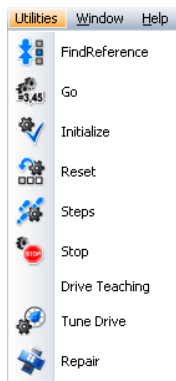










Figure 13.9: Utilities menu for a stepper drive

Utilities Menu Commands for Drives of Stepper Type

Command	Name	Description
	Find Reference	Move drive to position of light barrier serving as reference point for ZI value
	Go	Go to
	Initialize	Initialize drive

Command	Name	Description
	Reset	Reset drive
	Steps	Steps
	Stop	Stop drive
Drive Teaching	Drive teaching	Enable drive teaching
	Tune drive	Moves the drive upwards and downwards at speeds controlled by a slider. The user must choose between two maximum speeds.
	Repair	Guides the user through a repair process by calling several methods. Whenever available, this command should be used to carry out repairs. For more detailed information on the Repair command, see below.

The most important commands of the **Utilities** menu version for stepper drives are available as speed buttons (see Section [Speed Buttons \[216\]](#)) as with other versions of the **Utilities** menu.

Repair Command

The **Repair** command is only available for components that can be “repaired” in a user-guided automatic process.

Initially, the **Repair** method analyzes the component. If the component is faulty, the method starts to “repair” the component by calling available methods using the commands of the speed buttons and the **Utilities** menu. During this process the user may be asked to make decisions that the repair method itself is unable to make. He may be asked to decide, for example, in what direction the drive should be moved in search for a reference point.

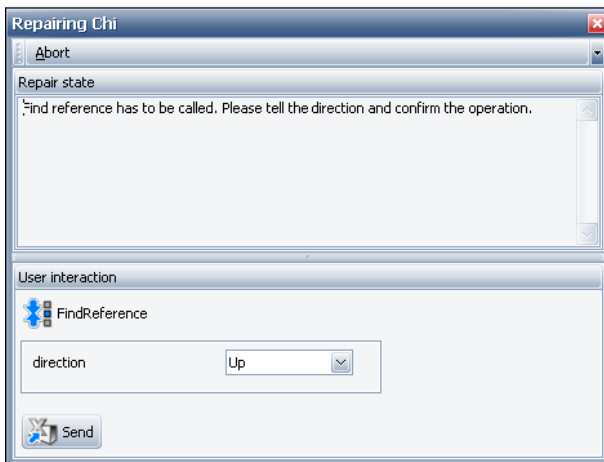


Figure 13.10: Dialog box **Repairing** – with request for user guidance

The user follows the “repair” process in the dialog box **Repairing**. In the example shown above, the user has been requested to specify the direction in which the search for a reference point is to be carried out.

The repair process can be stopped with the **Stop** command at any time. For example, if a drive is moved in the wrong direction during a search for a reference point and there is a risk of collision with another drive, the **Stop** command can be used to interrupt the movement. The Find Reference command can then be used to initiate a search in the other direction. If

the “repair” should continue the dialog box must first be closed and the Repair process started again. Alternatively, the remaining repair work can be carried out manually with the commands provided.

When the “repair” has been successfully completed, a notification is displayed in the upper part of the dialog box.

See also

Speed Buttons [▶ 216]

13.3.2.2 Dialog Boxes for Commands

Some commands require setting of parameters. When such a command is selected by clicking on an item in the **Utilities** menu or on a speed button, a dialog box for the value entry will appear. Examples of two dialog boxes are shown below.

Dialog Box Go

The dialog box **Go** is opened when the drive-specific command **Go** is selected.

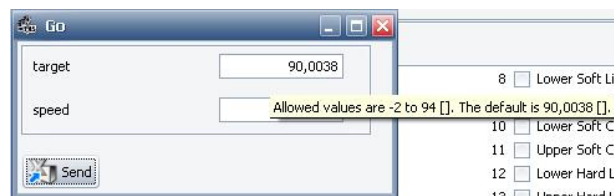


Figure 13.11: Dialog box **Go**

The values of the parameters can be changed in the data fields.

1. Click on the specific parameter or click directly on the data field.
 - Restrictions for entering values will then appear. After the values have been entered,
2. click on the **Send** button to send the command to the instrument.

NOTICE

Damage to the Instrument

Sending commands may result in damage to the hardware, for example, through the collision of two drives. Therefore, ReadWrite access rights should be granted to advanced users only. When sending commands, keep the instrument under observation with a camera.

Dialog Box Tune Drive

The dialog box **Tune Drive** is opened when the drive-specific command **Tune drive** has been selected.

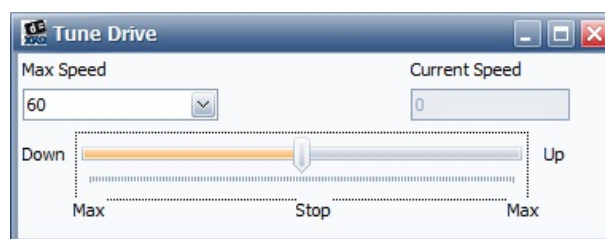


Figure 13.12: Dialog box **Tune Drive**

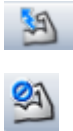
The combo box on the left side of this dialog box offers two maximum speeds - slow and fast - for selection. Dragging the slider in the lower part of the dialog box to the left causes the drive to move downwards; dragging it to the right causes it to move upwards. The further the slider is dragged in either direction, the faster the drive moves. The maximum speed is the speed selected in the combo box. The actual speed is shown in the Actual value field. When the mouse button is released, the slider jumps back to the central position and stops the drive movement.

NOTICE

When moving the drive using the dialog box **Tune Drive**, always allow for the delay that occurs between actuation of the slider and the resulting acceleration/deceleration of the drive. This time lag is due to the mass inertia of the drive.

13.3.3 Speed Buttons

Depending on the component selected in the **Configuration Tree**, different speed buttons are available in the speed bar directly below the menu bar. The speed buttons provide access to the most important commands of the **Utilities** menu version made available for the selected component.



A **Get Control/Release Control** speed button is provided in all cases independently of the component selected. If control of the connected instrument has not yet been obtained, this button remains in the **Get Control state**. It switches automatically to the **Release Control state** when control is obtained.

The **Get Control/Release Control** speed button is located at the left end of the speed bar.

If the TOOLS plug-in instance does not have control of the connected instrument, all speed buttons that provide access to commands of the **Utilities** menu will be disabled.



Figure 13.13: Speed bar as it appears for a selected drive – control not yet obtained



Figure 13.14: Speed bar as it appears for a selected drive – control obtained

Getting and Releasing Control of the Connected Instrument

The TOOLS plug-in is unique among the modules of the Bruker AXS MEASUREMENT CENTER: The control of the connected instrument must be requested and obtained from the Measurement Server or from the instrument itself before operations can be carried out on the instrument.

If a direct connection with the instrument has been established activating the **Get Control/Release Control** speed button in the **Get Control state** sends a **GetControl** command to the instrument. An attempt will then be made by the TOOLS plug-in to get control. If a connection with the instrument has been established using the Measurement Server, the command will be sent to the Measurement Server and a similar attempt to get control will be made. The Measurement Server can only give instrument control to the TOOLS plug-in if control has already been granted (see Section [Getting and Releasing Control of and Reconnecting to Instruments](#) [22] above) and has not been passed on to another plug-in instance.

NOTICE

Obtaining control of an instrument with the TOOLS plug-in will abort all measuring operations being carried out on the instrument. When control is released, the job is restarted.

1. Click on the **Get Control/Release Control** speed button in the **Release Control state** to release control of the connected instrument.

If the user leaves TOOLS or exits the Bruker AXS MEASUREMENT CENTER without releasing control of the instrument in this way, control will be released automatically.

13.3.4 Diagnosing Faults and Malfunctions and Taking Remedial Action

This section describes how to diagnose a fault or malfunction and provides the necessary commands to rectify the situation. An error affecting a drive of the stepper type serves as an example. Errors affecting other instrument components, must be solved using relevant hardware manuals, which provide information on remedial action. Once the problem is identified the appropriate commands must be selected for the component by the software.

The figure below shows an error register for drives of the stepper type.

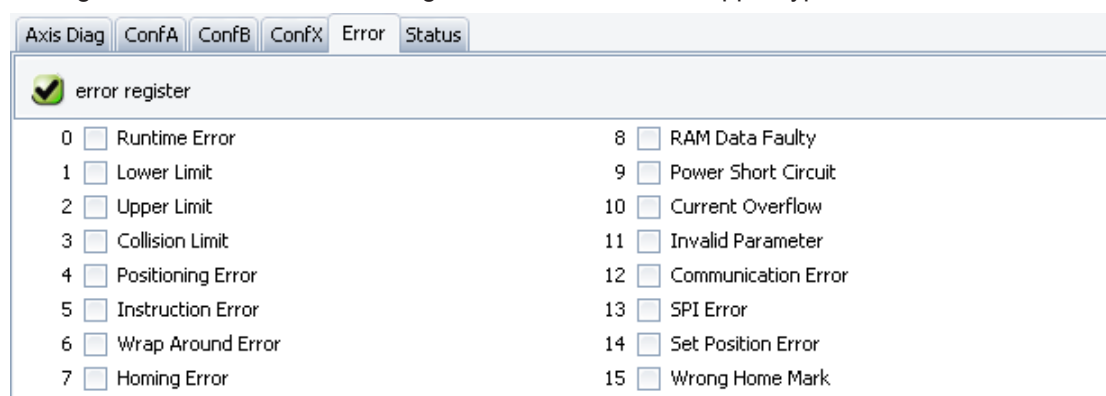


Figure 13.15: Error register for drives of stepper type

Checked items in the error register whose names end with “limit” indicate that a limit has been exceeded and the actual drive position is incorrect. With the command **Steps** or **Tune drive**, the drive must be moved back to a position within the limit. For example, a drive for which **Lower limit** is checked must be moved upwards to be brought back within the limit. Depending on the drive and the nature of the error, the command **Tune drive** may be unavailable.

If multiple drives must be moved to resolve the error, the order in which they should be restored to their normal operating state must be predicted by studying the drive arrangement on the instrument.

If **Homing Error** or **Wrong Home Mark** is checked, the user must search for a reference point using the command **Find Reference**.

For various other errors, the user should use the command **Reset** and then select **Stop**. After this procedure has been completed, the error flag must be re-analyzed. After a drive has been reset, it may be necessary to search for the reference and use **Initialize**.

NOTICE

Damage to the Instrument

Moving drives may result in damage to the instrument. Both the drives and the instrument should be kept under close observation during these operations. For reasons of safety, **ReadWrite rights** for the TOOLS plug-in should be granted to experienced users only.

13.3.5 The Settings Menu

The **Settings** menu is located in the menu bar at the top of the screen.

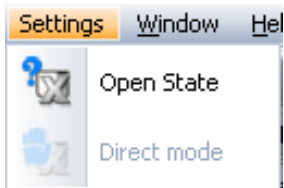


Figure 13.16: **Settings** menu

The **Settings** menu contains the following items:

Open State

Displays an overview of an instrument state that has been saved previously to a file using the **Save** function of the **File** menu's **Save State** entry.

Saving and Opening Instrument States

The overview of the current state of an instrument provided by both windows of the TOOLS page can be saved to a Zip file using the **File** menu. This file can be opened later and the overview displayed for analytical purposes. The file can also be sent to a Bruker Service specialist for analysis when support is needed to identify malfunctions.

When the Zip file is opened, the instrument state overview is displayed in an **Offline State** window. The interactive functionality of the two windows of the TOOLS page is still available. This means that the components in the **Component Tree** window can be selected and their status can be viewed in the **Component State** window as is normally done when working with TOOLS.

Direct Command Mode

Offers a convenient way of changing component properties and/or sending commands to an instrument. Choosing this option opens the **Direct Command Mode** window.

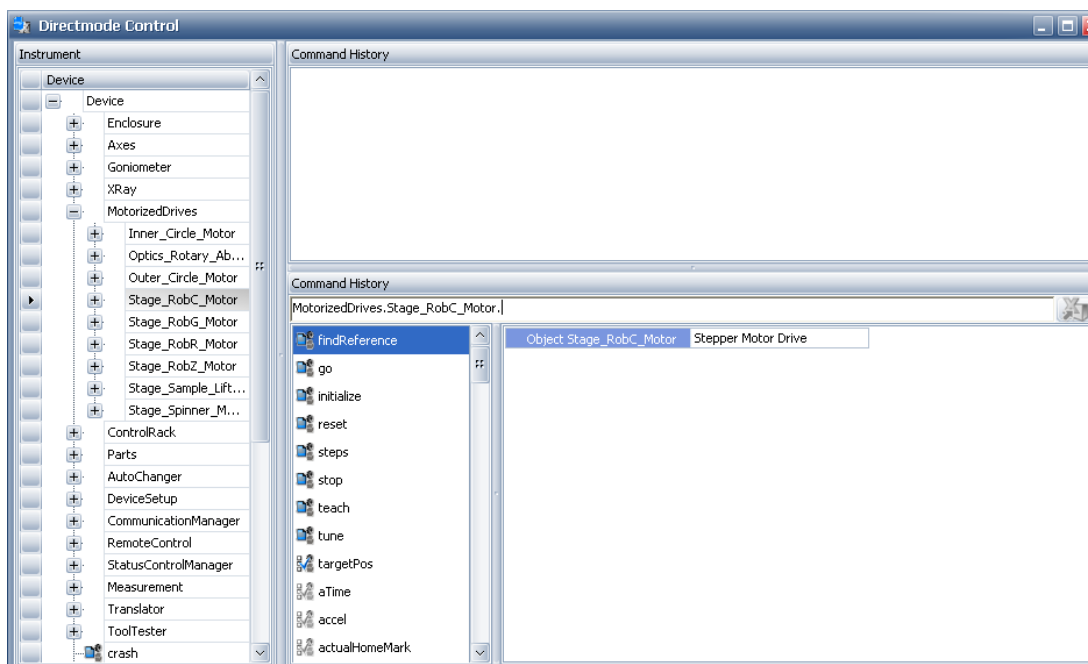


Figure 13.17: **Direct Command Mode** window

The **Direct Command Mode** window consists of three sub-windows: **Instrument**, **Command History** and **Command**.

The **Component tree** is displayed in the **Instrument** sub-window.

The properties and commands which belong to the components are displayed as branches in a tree. The commands are identified by a violet symbol and the properties are identified by a yellow and grey symbol.

The **Command** sub-window has three panes. When a component is selected in the component tree, its related commands and properties appear in the left-hand pane of the **Command** sub-window, where they are arranged as in the component tree. The name of the component appears in the upper pane and a description of the component appears in the right-hand pane.

When a command is selected in the **Component Tree** or in the left-hand pane of the **Command** sub-window, its name appears next to the component name in the upper pane. The related parameters and their default values may be displayed as well. When parameters have not been assigned a default value, a question mark will be displayed in its place. In the right-hand pane information related to the command and its parameters will be displayed. This includes a description of the command (called a “method” in this pane) and lists of the restrictions for parameter value data entry. The parameter value measurement units is listed as well.

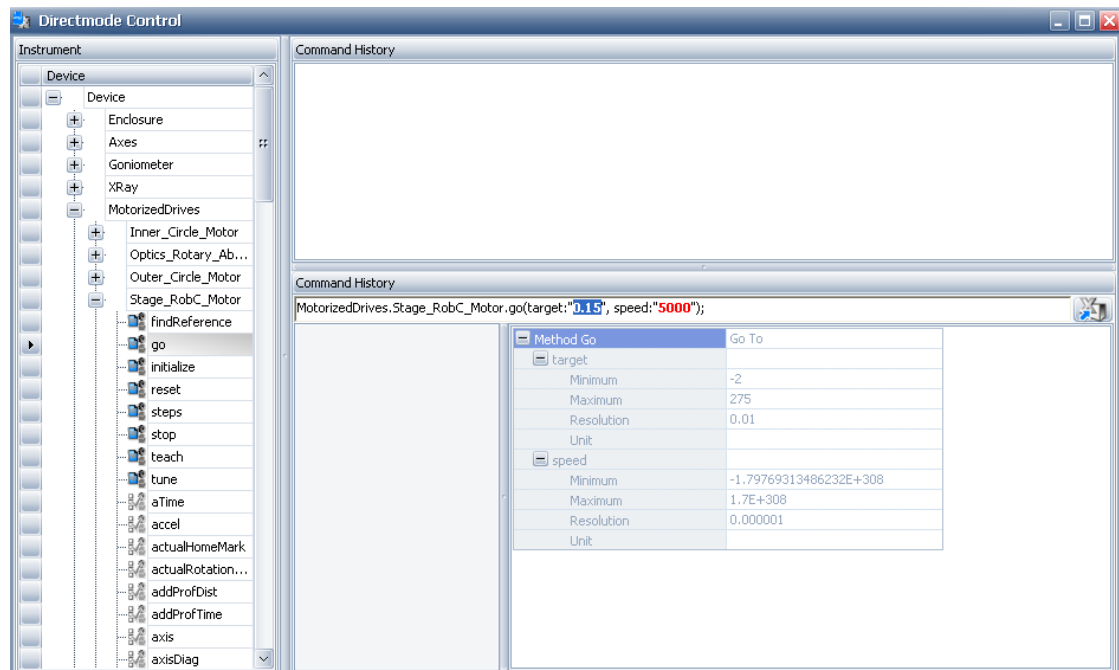


Figure 13.18: Entering values for commands in **Command** sub-window of **Direct Command Mode** window

When a property is selected in the component tree or left-hand pane, its name and a related default value or question mark are displayed. A description of the property and its value restrictions are displayed in the **Command** window in a manner similar to that described for the “selection of commands” above.

Enter a value or values for a command or property, then press the **Return** key to send the new values to the instrument software. If a value that is not permitted has been entered, this value will not be sent and a red exclamation symbol appears in the right hand corner of the **Command** sub-window. If the mouse pointer is moved over this symbol, an explanation concerning the rejected data is displayed.

When data is successfully sent to the instrument software, the contents of the upper pane of the **Command** sub-window disappear. This data reappears in the **Command history** sub-window. The information can be copied, reinserted in the upper pane using the paste function, changed if necessary, or resent. The user can repeat a previous command quickly and easily.

Switching between components and their related commands and properties is facilitated by a **Search function**. To search for a component, mark the contents of the upper pane by pressing **CTRL + A**. Type in the first letter or letters of the name of the component. Each additional letter which is typed in refines the search. The **Search Results** are displayed in a list in the left-hand pane. The user can scroll through the list and select the desired component using the **mouse button** or the **tab key**.

The **tab key** can be used to navigate between the values and question marks in the upper pane. The selected value or question mark is highlighted in blue, while other entries are displayed in red. Simply overwrite the default value or question mark to change a value.

13.4 Remote Control

The virtual component **RemoteControl** is located in the lower part of the **Component Tree**. If this component is selected, information on the control status of the instrument is displayed in the **Instrument Master** field of the **Properties** panel of the **Properties** window.

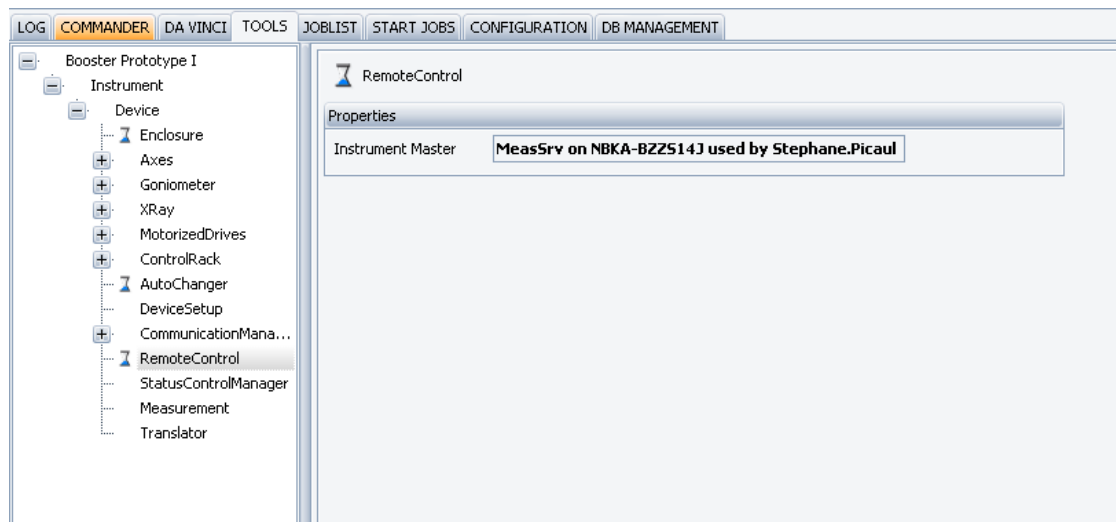


Figure 13.19: **RemoteControl**

If the instrument is already controlled by a plug-in that is connected to it using a Measurement Server instance, the name of the PC hosting the Measurement Server instance and the name of the user of the plug-in appear in the **Instrument Master** field. If the instrument is controlled by a plug-in that is connected directly to the instrument, the name of the computer hosting the plug-in and the name of the plug-in user is displayed.

1. Click on the text to insert the cursor.
2. Then, scroll the text in the field to the left and right by using the **arrow** buttons.

If the instrument is not controlled by a plug-in, no information is displayed in the **Instrument Master** field. In this case, the user can obtain control of the instrument with the **Get Control command**.

13.5 Measurement

Like **RemoteControl**, the component **Measurement** is a virtual component. It can be used to monitor the status of an instrument before, during and after measuring operations.

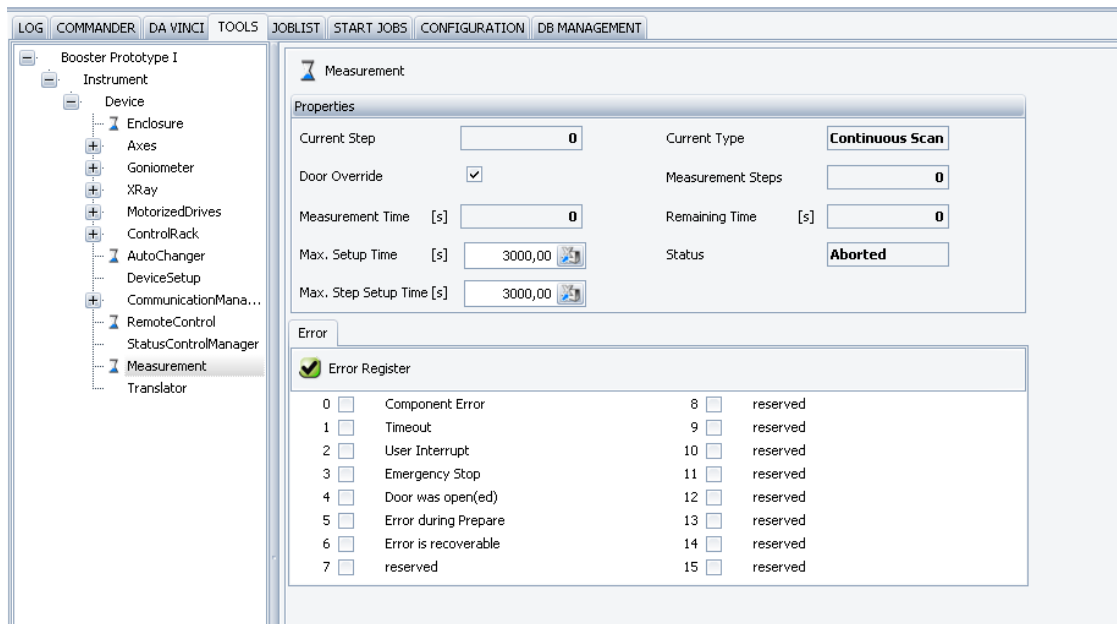


Figure 13.20: **Measurement** view

The **Properties** area in the **Component State** window contains fields in which the values of important properties are displayed. The properties **Max Setup Time** and **Max Step Setup Time** can be altered.

If a measuring operation is currently in progress, control of the instrument cannot be obtained. However, once the control of the instrument is obtained, the values in the fields **Max Setup Time** and **Max Step Setup Time** can be altered.

14 DETECTOR

14.1 General

DETECTOR plugin is used to calibrate detectors for desired measurement mode. In the DETECTOR plugin one can simply with just a few mouse clicks perform detector specific calibration measurement, evaluate estimated data and apply new calibration settings to the detector. DETECTOR plugin provides a set of special calibration procedures for every detector type and model, for example resolution and zero offset determination, flood field determination etc.

The actually mounted detector will be automatically selected by the DETECTOR plugin. In case if the instrument has more than one detector mounted on multiple tracks one has to select the desired detector name in the dropdown box as it shown in figure below.

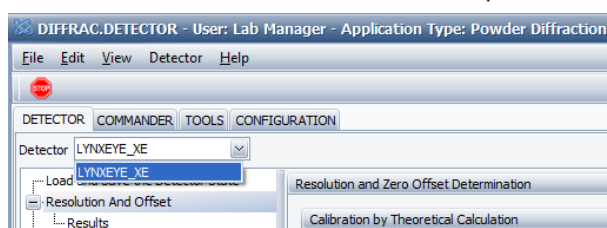


Figure 14.1: Detector selection

In order to be able to make measurements with help of the DETECTOR plugin, one has to connect the MEASUREMENT CENTER to the measurement server and it presupposed that the Measurement Server has already obtained the control over the instrument.

14.2 Detector Menu

DETECTOR plug-in has **Detector** menu at the top of the view.

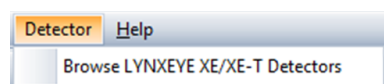


Figure 14.2: Detector menu

Browse LYNXEYE XE detector

This opens a dialog to find a LYNXEYE XE detector in the local area network.

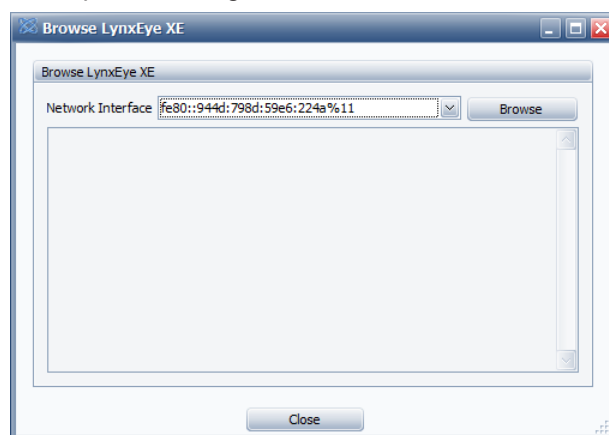


Figure 14.3: Browse LYNXEYE XE detector dialog.

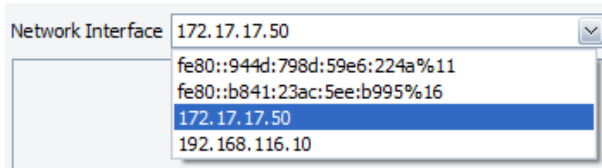


Figure 14.4: Selecting **Network Interface**.

1. Select **Network Interface** (network adapter) in the drop down list box and
 2. click **Browse** button to find detector, as shown in the picture above.
- ⇒ When detector has been found its name, IP address and MAC address will be displayed.

Keep Shutter Close

This function can be applied only to 2D detectors.

14.3 1D Detector Calibration

Position sensitive detectors (1D detectors) like LYNXEYE XE, LYNXEYE, SSD160, VANTEC-1 can be adjusted and calibrated with help of DETECTOR plugin.

Please refer to the LYNXEYE XE-T User Manual DOC-M88-EXX239 to get specific information about the calibration of this detector.

14.3.1 Resolution and Zero Offset

Determination of the detector angular resolution (angular size of the single detector channel) and zero offset of the detector. This function supports LYNXEYE XE, LYNXEYE, SSD160 and VANTEC-1 detectors.

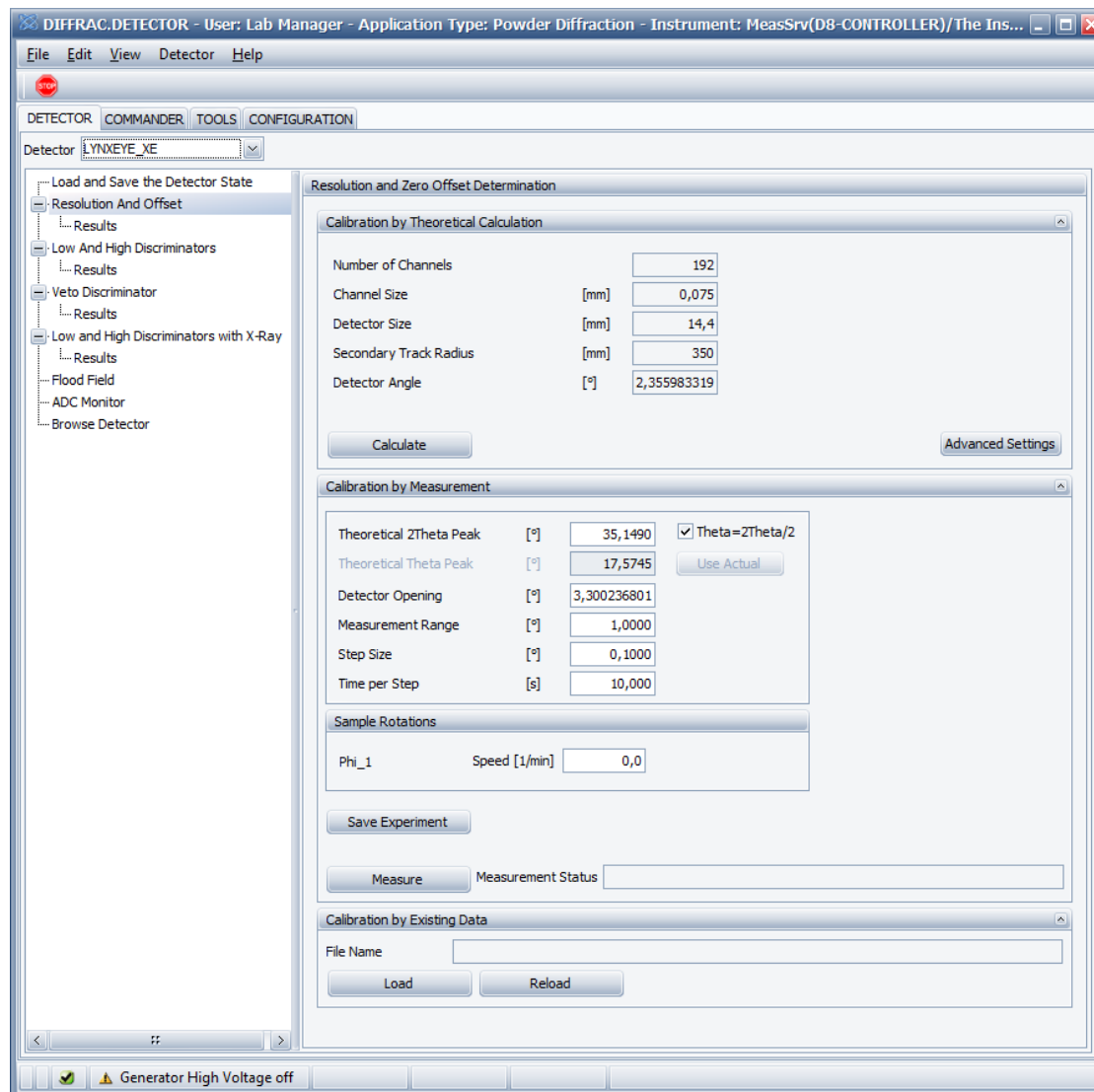


Figure 14.5: Resolution And Offset.

14.3.1.1 Calibration by Theoretical Calculation

In order to get the calibration measurement succeeded one need to specify approximate values for the current detector resolution and zero offset. When even approximate values of the resolution and zero offset are unknown, one can calculate them theoretically with help of **Calculate** button.

The secondary track radius, total number of the detector channels and size of the single detector channel will be determined automatically by the DETECTOR plugin.

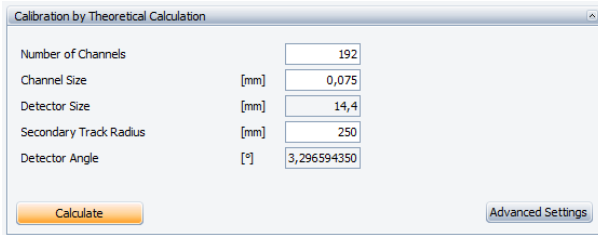


Figure 14.6: Calibration by **Theoretical Calculation**

Advanced Settings The **Advanced Settings** button enables editing of the track radius, number of channels and size of the channel values.

Calculate By clicking the **Calculate** button, the view will be changed to the **Results** view as shown in figure below.

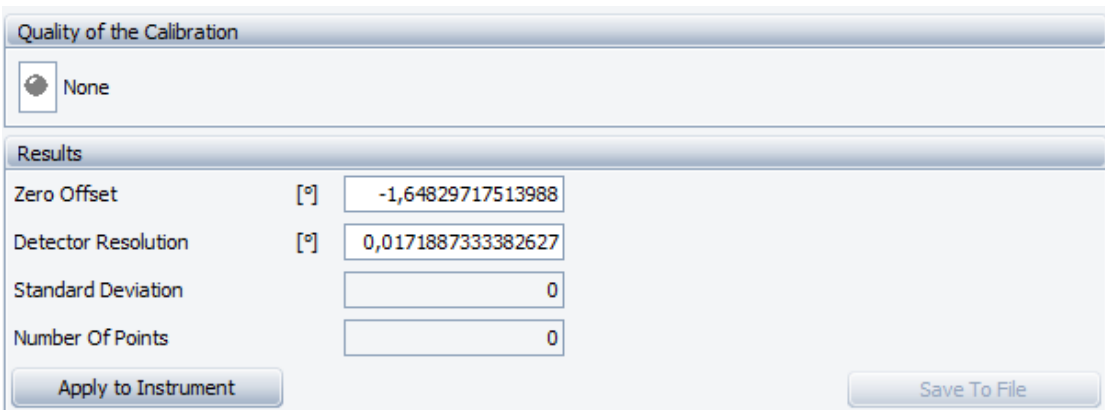


Figure 14.7: Results of the **Resolution And Zero Offset Calculation**

Quality of the Calibration will stay unchanged in the case of theoretical calculation.

Zero Offset	[°]	-1,64829717513988	displays calculated zero offset of the detector
Detector Resolution	[°]	0,0171887333382627	displays calculated resolution of the detector

Apply to Instrument In order to apply calculated resolution and zero offset values to the instrument one has to click the **Apply to Instrument** button. This will save the configuration with new values into the database and into the instrument, which requires a restart of the instrument and reconnection of the DETECTOR plugin.



The LYNXEYE XE detector will immediately change the actual and configuration values for the instrument without restart of the instrument.

14.3.1.2 Calibration by Measurement

For the best angular resolution results one has to perform calibration measurement for the detector. When doing so, the DETECTOR plugin will perform a set of fixed scans and after that calculate automatically the resolution and zero offset of the detector.

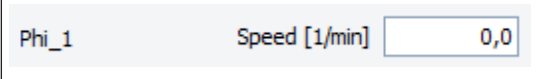
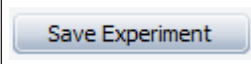

The screenshot shows a software window titled "Calibration by Measurement". It contains the following fields and controls:

- Theoretical 2Theta Peak [°]: 35,1490
- Theoretical Theta Peak [°]: 17,5745
- Detector Opening [°]: 3,300236801
- Measurement Range [°]: 1,0000
- Step Size [°]: 0,1000
- Time per Step [s]: 10,000
- Theta=2Theta/2
- Use Actual button
- Sample Rotations section:
 - Phi_1
 - Speed [1/min]: 0,0
- Save Experiment button
- Measure button
- Measurement Status field

Figure 14.8: Calibration by Measurement

Calibration measurement provides following options:

Theoretical 2Theta Peak	[°]	35,1491	Determines position of the two theta axis.
Theoretical Theta Peak	[°]	17,5745	Determines position of the theta axis.
<input checked="" type="checkbox"/> Theta=2Theta/2			When checked, the Theta value is set automatically to a half of 2Theta value. In order to specify a user defined value, please uncheck the box. Unchecking the box enables Use Actual button.
Use Actual			Copies actual position of the theta axis into the Theoretical Theta Peak field.
Detector Opening	[°]	3,300236801	Determines maximum detector opening. Measurement has to be started with maximum detector opening.
Measurement Range	[°]	1,0000	Determines the range of the measurement. It should be less then maximum detector opening.
Step Size	[°]	0,1000	Determines the increment of the detector position between two fixed scans.
Time per Step	[s]	10,000	Determines the measurement time for a single fixed scan.
When the instrument has a sample rotation axes, one can specify rotation speed for every axis.			

	Specifies rotation speed for the sample rotation axis.
	Saves a calibration experiment with specified parameters to a file. One can start the save "brml" file as a job with help of START JOBS [67] plugin
	Starts the calibration measurement, analyses measured data and calculates resolution and zero offset values.

Parameter values for all other optics (e.g. variable slit size.), which are not displayed in the DETECTOR plugin could be set in the [COMMANDER \[37\]](#) or [DAVINCI \[95\]](#) plugins.

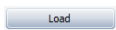
One can observe the progress of the calibration measurement in the [COMMANDER \[37\]](#) plugin.



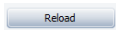
Aborts actually running calibration measurement started by DETECTOR plugin.

When calibration measurement has been finished the DETECTOR plugin will change automatically to the [Results \[228\]](#) view.

14.3.1.3 Calibrate by Existing Data



One can analyse saved calibration data again by clicking the **Load** button. In the upcoming file open dialog one can select **brml** file to analyse. DETECTOR plugin will change automatically to the **Results** window, which is described in the next section.



The **Reload** button reloads a selected **brml** file and determines resolution and zero offset for the detector again.

14.3.1.4 Results

The view of the **Results** of the resolution and zero offset calibration is shown in picture below.

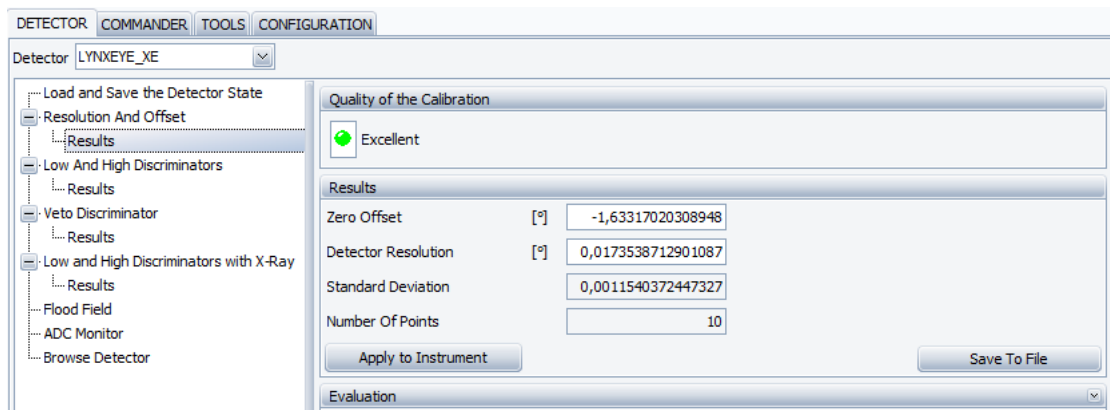
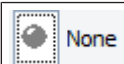
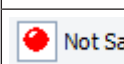




Figure 14.9: Results of the **Resolution and Zero Offset** measurement

The **Quality of the Calibration** field will be displayed at the top of the **Results** view and can take following values:

	None	Calibration measurement has not been done.
	Not Satisfying	Quality of the calibration measurement is not satisfying.

 Satisfying	Quality of the calibration is satisfying. Number of points ≥ 6 and standard deviation $< 1e^{-2}$.
 Excellent	Quality of the calibration is excellent. Number of points ≥ 10 and standard deviation $< 1.5e^{-3}$.

Save To File

Saves measured calibration data to a **brml** file. A saved file can be analysed again in the [Calibrate by Existing Data \[228\]](#) section.

Apply to Instrument

In order to apply measured resolution and zero offset values to the instrument one has to click the **Apply to Instrument** button. This will save the configuration with new values into the instrument and into the database, which requires restart of the instrument and reconnection of the DETECTOR plugin to the measurement server. Measurement server has also to be reconnected to the instrument.



The LYNXEYE XE detector will immediately change the actual and configuration values for the instrument without restart of the instrument.

14.3.2 LYNXEYE XE

14.3.2.1 Load and Save The Detector State

A LYNXEYE XE detector can be used in few different modes (e.g. High Resolution or High Count Rate) moreover it could be used with different X-ray tubes (e.g. Cu or Mo tubes). A detector requires a set of special calibrations to be done for every combination of tube and mode. Making a set of calibrations once one can save the calibrated detector state to a file. The LYNXEYE XE detector allows to simply reload a detector state from the file without restarting of the instrument, when using desired tube and mode combination again.

Load State To Detector

Loads all detector settings from a file into detector. It does not need a restart of the instrument. In the first step user selects state file and after that user can select properties which have to be send to the detector, see figure below. User can send to detector only properties for position calibration or only for energy calibration.

Save State To File

Saves all detector settings to file.

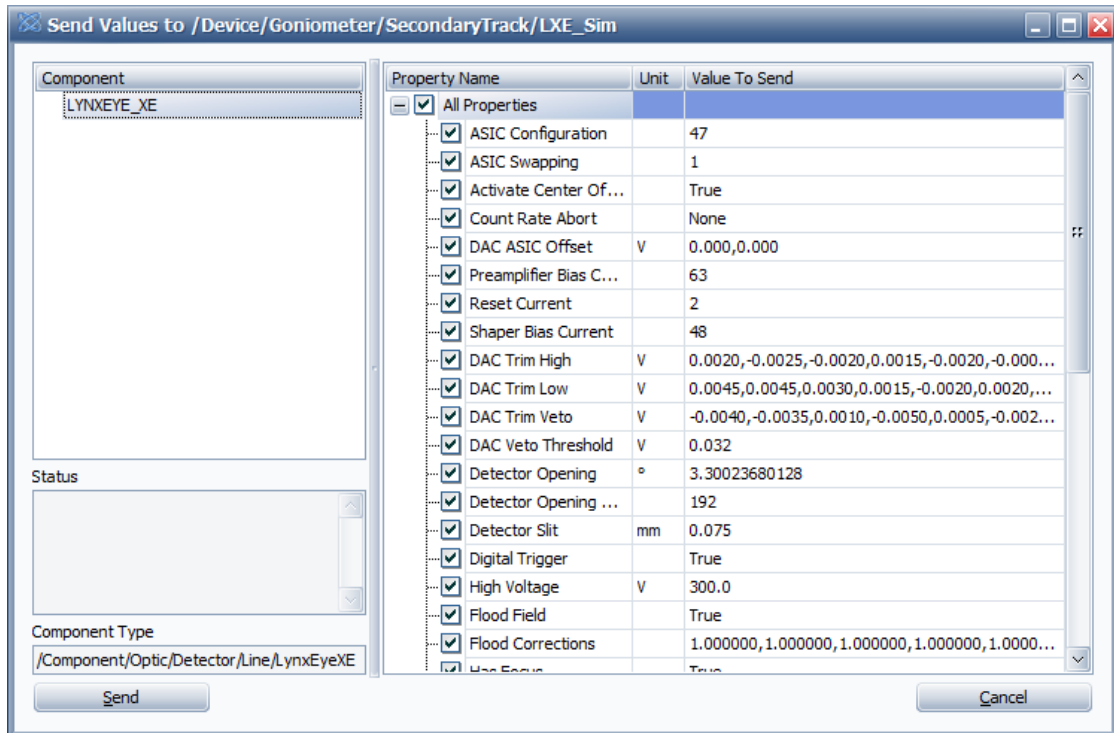


Figure 14.10: Loading values from state file to detector.

14.3.2.2 Low and High Discriminators

Performs trimming of the low and high discriminators with help of the internal simulated pulses without X-ray beam.

Internal simulated pulses are used when trimming with help of X-ray beam is not possible, in other cases trimming with the monochromatic X-ray beam is recommended.

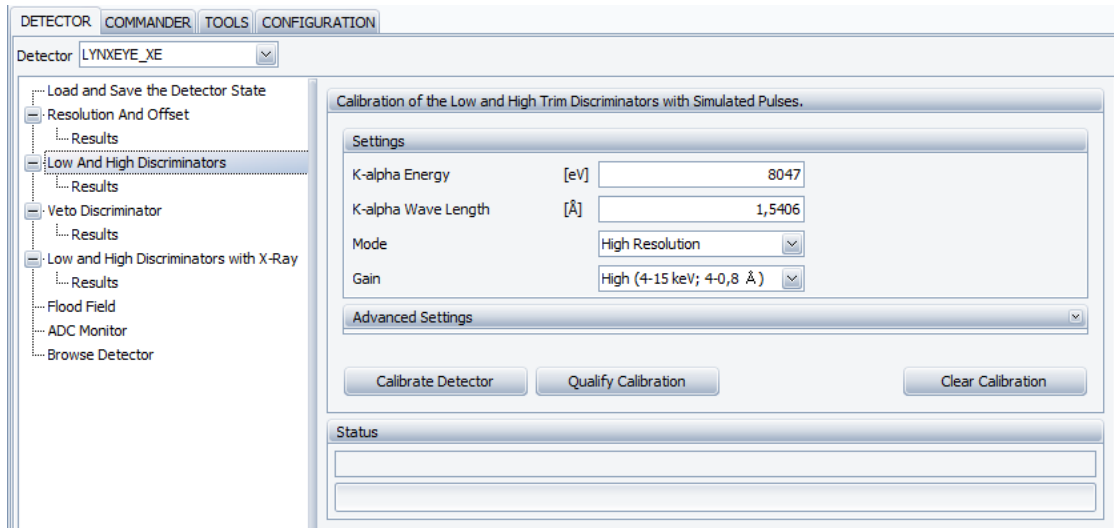


Figure 14.11: Low and High Discriminators

The functions of all dialogs and buttons are identical to the functions described in the chapter [Low and High Discriminators with X-ray](#) [232]. Please refer to the this chapter for more information.

14.3.2.3 Veto Discriminator

A LYNXEYE XE has a veto discriminator, which can discriminate signals, that come simultaneously in the neighbour channels. This normally happens when the same gamma quant deposits its energy in more than one channel.

The veto discriminator can be adjusted for every single detector channel in the **Veto Discriminator** section. Veto calibration will be done with the closed shutter.

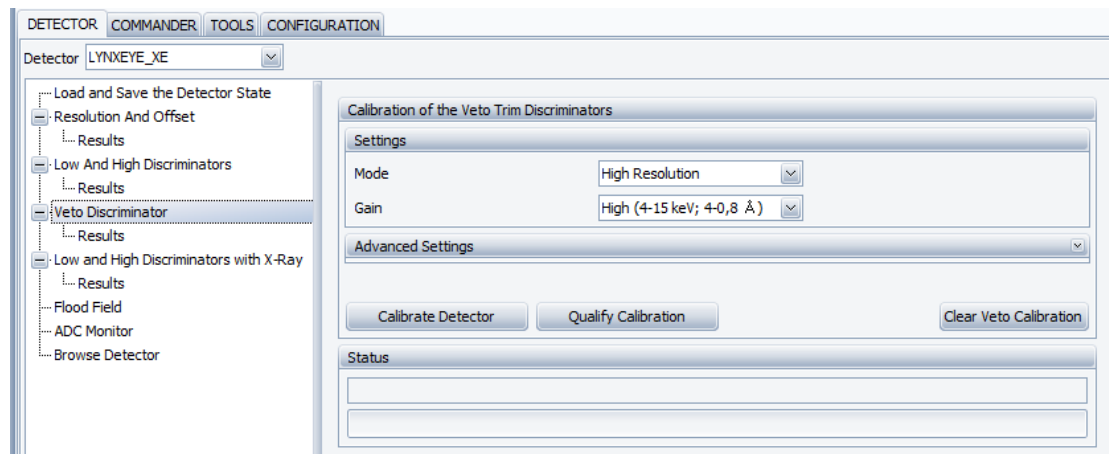


Figure 14.12: Veto Discriminator

Veto trimming provides following options:

Mode	High Resolution	Determines detector mode: High Resolution applies settings for maximum energy resolution to the detector. High Count Rate applies settings for maximum count rate to the detector. Actual Settings is a user custom mode. Trimming will be performed with actual detector settings.
Gain	High (4-15 keV; 4-0,8 Å)	Determines amplification gain of the detector.
	Clears veto calibration of the detector.	
	Qualifies actual veto calibration of the detector. Actual settings of the detector will be not changed.	
	Starts calibration measurement and determines veto calibration for the detector. Calibration will be applied automatically to the detector. Actual and configuration values of the detector will be changed. Configuration with new values will be written into database. The instrument does not require restart or reconnect.	

Status and progress of the detector calibration or qualification will be shown in the status display, see figure below.

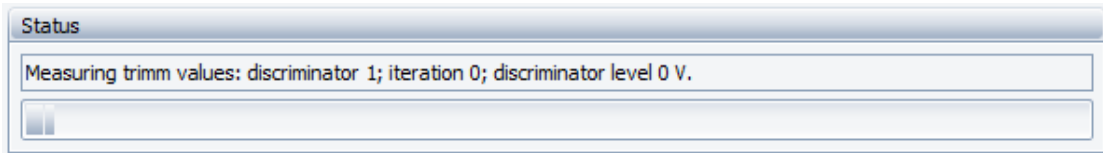


Figure 14.13: Status and progress of the measurement.

When calibration or qualification measurement has been finished, the DETECTOR plugin will change automatically to the **Results** view.



One can abort actual measurement by clicking the **Stop** button in the toolbar menu at the top-left corner.

14.3.2.3. Results

1

View of the Results of the veto trimming calibration is shown in the figure below.

 A screenshot of a software window titled "Quality of the Calibration". It shows a green checkmark icon and the word "Excellent". Below this is a sub-window titled "Veto" which contains a table with three rows and two columns. The columns are labeled "ASIC1" and "ASIC2". The rows are labeled "Mean value, V", "Standard deviation, V", and "6Sigma width (99.7%), V".

	ASIC1	ASIC2
Mean value, V	0,0341670410160951	0,0344204008570174
Standard deviation, V	0,00113747498094702	0,00126981970871063
6Sigma width (99.7%), V	0,0113248498856821	0,0136189182522638

Figure 14.14: Veto Trimming Results

Mean Value, V: This is the optimum value for the **Veto Discriminator**.

Standard Deviation, V: Statistical deviation of the discriminator values for all channels.

6Sigma width, V Interval on the discriminator axis, which includes about 99,7 % of measured values for all channels, usually it is less than 1 LSB, which is 0,002 V for LYNXEYE XE.

14.3.2.4 Low and High Discriminators with X-ray

LYNXEYE XE has high and low energy discriminators. For best energy discrimination results every detector channel has to be trimmed with help of monochromatic X-ray beam.

LYNXEYE XE detector has to be set up for the calibration as it described in the detector manual.

View of the trimming of the low and high discriminators with help of X-ray measurement is shown below.

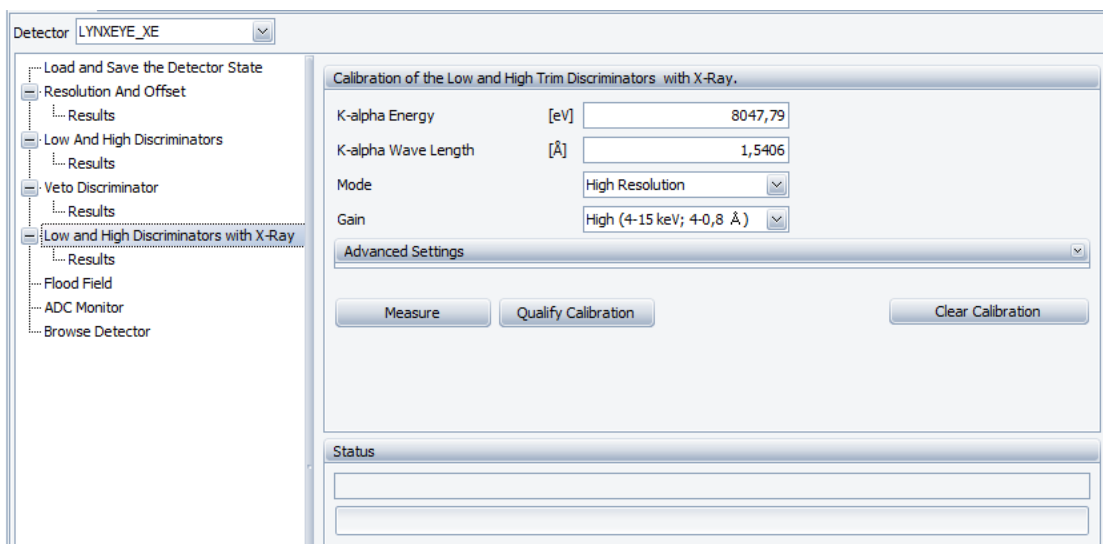
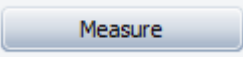


Figure 14.15: Trimming with X-ray

Trimming with X-ray provides following options:

<p>K-alpha Energy [eV] <input type="text" value="8047,79"/></p>	<p>Determines energy of the X-ray source. Actual value specified in the X-Ray tube will be automatically set into this field.</p>
<p>K-alpha Wave Length [Å] <input type="text" value="1,5406"/></p>	<p>Determines wave length of the X-ray source. Actual value specified in the X-Ray tube will be automatically set into this field.</p>
<p>Mode <input type="text" value="High Resolution"/></p>	<p>Determines detector mode: High Resolution applies settings for maximum energy resolution to the detector. High Count Rate applies settings for maximum count rate to the detector. Actual Settings is a user custom mode. Trimming will be performed with actual detector settings. It is recommended only for advanced users.</p>
<p>Gain <input type="text" value="High (4-15 keV; 4-0,8 Å)"/></p>	<p>Determines amplification gain of the detector.</p>
<p><input type="button" value="Clear Calibration"/></p>	<p>Clears actual high and low discriminator trim values and correction values.</p>
<p><input type="button" value="Qualify Calibration"/></p>	<p>Qualifies quality of the actual trimming settings for the low and high discriminators. Detector settings will stay unchanged.</p>

	Starts trimming measurement, determines trimming settings and applies them to the detector. Actual and configuration settings of the detector will be changed. Configuration with new settings will be written into database. At the end of the trimming the view will be changed to Results [234] view.
---	---

Status and progress of the detector calibration or qualification will be shown in the status display, see figure below.

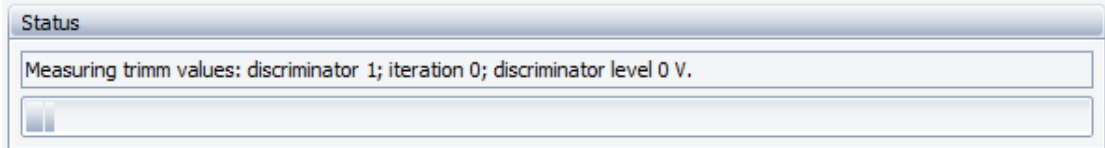


Figure 14.16: Status and progress of the measurement.



One can abort actual measurement by clicking the **Stop** button in the toolbar menu at the top-left corner.

14.3.2.4. Results

1

Displays results of the calibration for low and high discriminators.

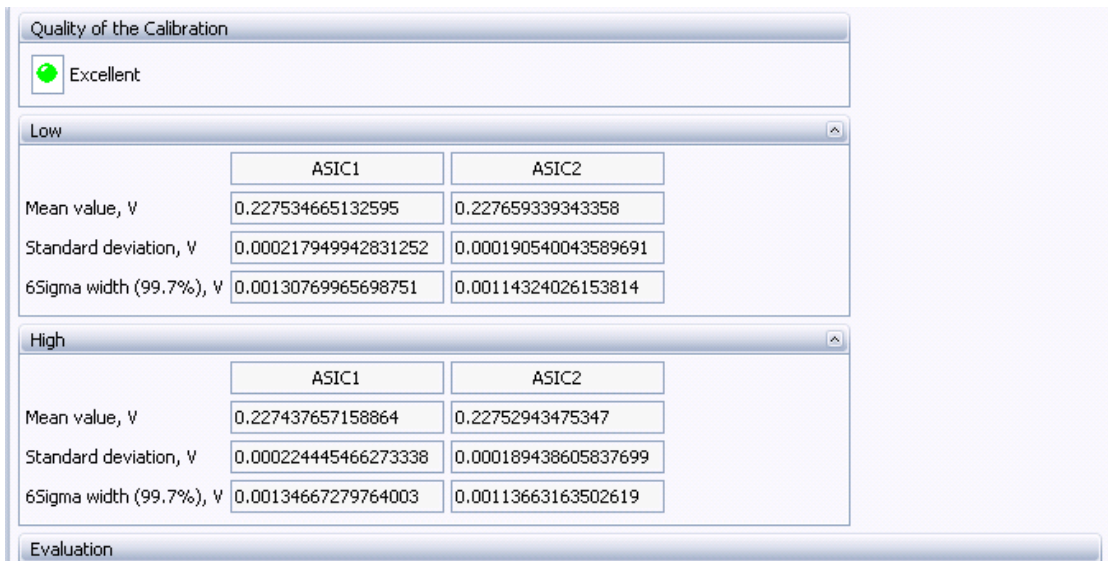






Figure 14.17: Results of the calibration.

Quality of the Calibration can take following values:

 None	Calibration measurement has not been done.
 Not Satisfying	Quality of the calibration measurement is not satisfying.
 Satisfying	Quality of the calibration is satisfying.
 Excellent	Quality of the calibration is excellent.

Following statistical parameters will be displayed:

Mean Value, V: Discriminator value, which corresponds to the energy of the X-ray radiation used in the calibration.

Standard Deviation, V: Statistical deviation of the discriminator values for all channels.

6Sigma width, V: Interval on the discriminator axis, which includes about 99,7 % of measured values for all channels, usually it is less than 1 LSB, which is 0,002 V for LYNXEYE XE.

14.3.2.5 Flood Field

Flood field calibration equalizes sensitivity of detector channels by determining of linear coefficients for every channel.

Detector should be set up for the calibration as it described in the LYNXEYE XE detector manual.

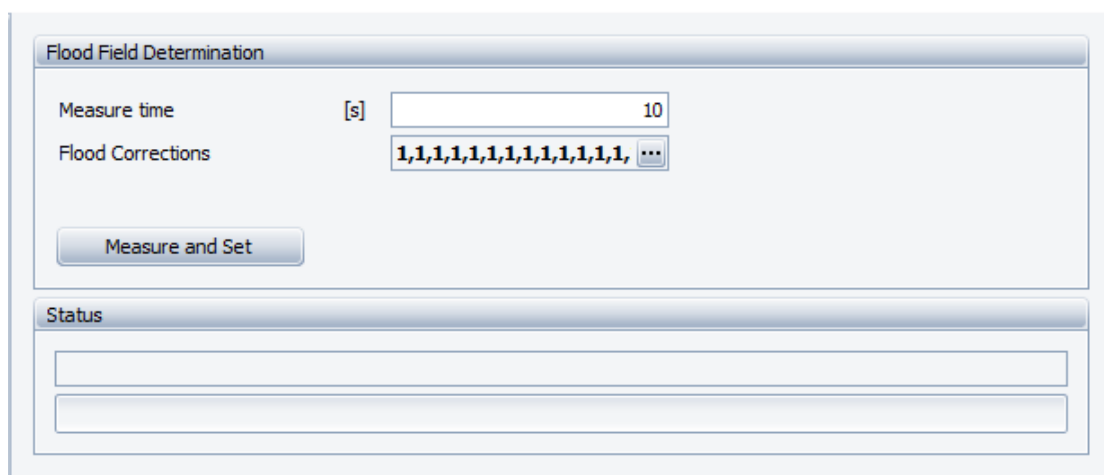


Figure 14.18: Flood Field Determination

Flood field determination provides following options:

Measure time [s] <input type="text" value="10"/>	Specifies measurement time.
Flood Corrections <input type="text" value="1,1,1,1,1,1,1,1,1,1,1,1,1,1, ..."/>	Actual detector flood corrections.
<input type="button" value="Measure and Set"/>	Starts a flood field calibration measurement. Coefficients will be automatically determined from the measured data and applied to instrument, actual and configuration values of the instrument will be changed. The new configuration will be written into database.

The status bar at the bottom displays progress and status of the calibration measurement.

14.3.2.6 ADC Monitor

Monitors and records LYNXEYE XE detector properties (e.g. high voltage, ASIC temperature, etc.) over time.

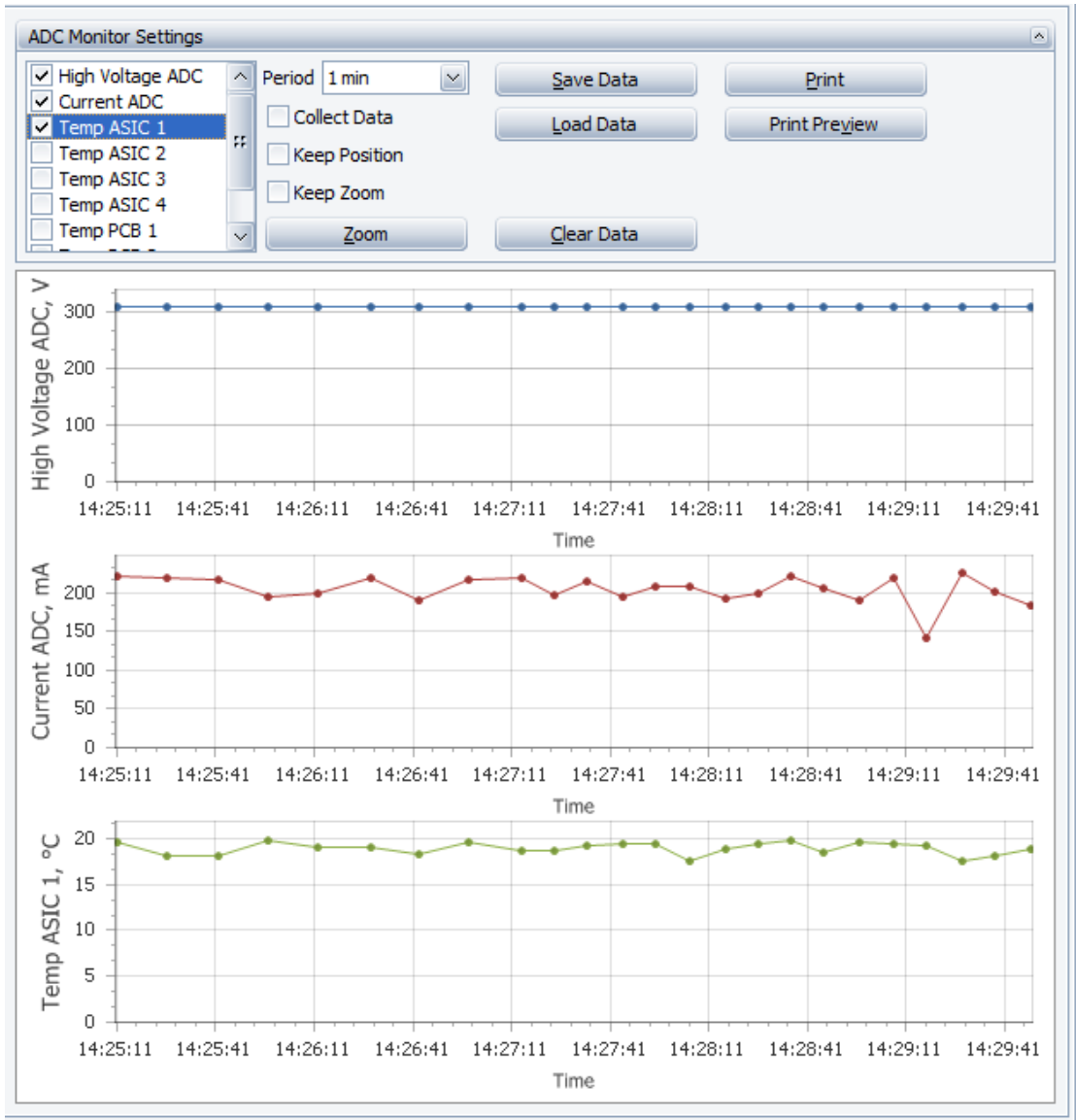
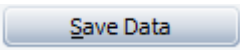
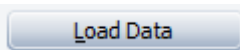
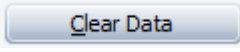
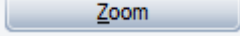
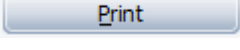
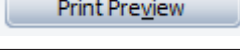


Figure 14.19: ADC Monitor

In order to record detector data ensure that **Collect Data** check box is checked. Select properties to be recorded by checking them in the list at the top left corner.

ADC monitor provides following options:

<input type="checkbox"/> Collect Data	Collects detector data (e.g. Temp ASIC 1, etc.) when checked.
<input type="checkbox"/> Keep Position	Keeps position of the chart when checked.
<input type="checkbox"/> Keep Zoom	Keeps zoom of the chart when checked.
Period <input type="text" value="1 min"/> <input type="button" value="v"/>	Specifies data collection period.

	Saves collected data to file with text based format.
	Loads data from file.
	Clears actual data.
	Specifies zoom – minimum and maximum values for the chart axes.
	Prints actual chart.
	Opens print preview dialog.

14.3.2.7 Detector Browse

Finds LYNXEYE XE detector in the local area network.

1. Select **Network Interface** (network adapter) in the drop down list box and
2. click **Browse** button to find detector.

When the detector has been found its name, IP address and MAC address will be displayed.

See more description in the [Detector Menu \[223\]](#) section of chapter [Detector Menu \[223\]](#).

14.3.3 VANTEC-1 on N8 HORIZON

One can perform following calibrations for position sensitive detector VANTEC-1 on N8 HORIZON instrument: resolution and position determination, flood field calibration and changing of the multiplication voltage.

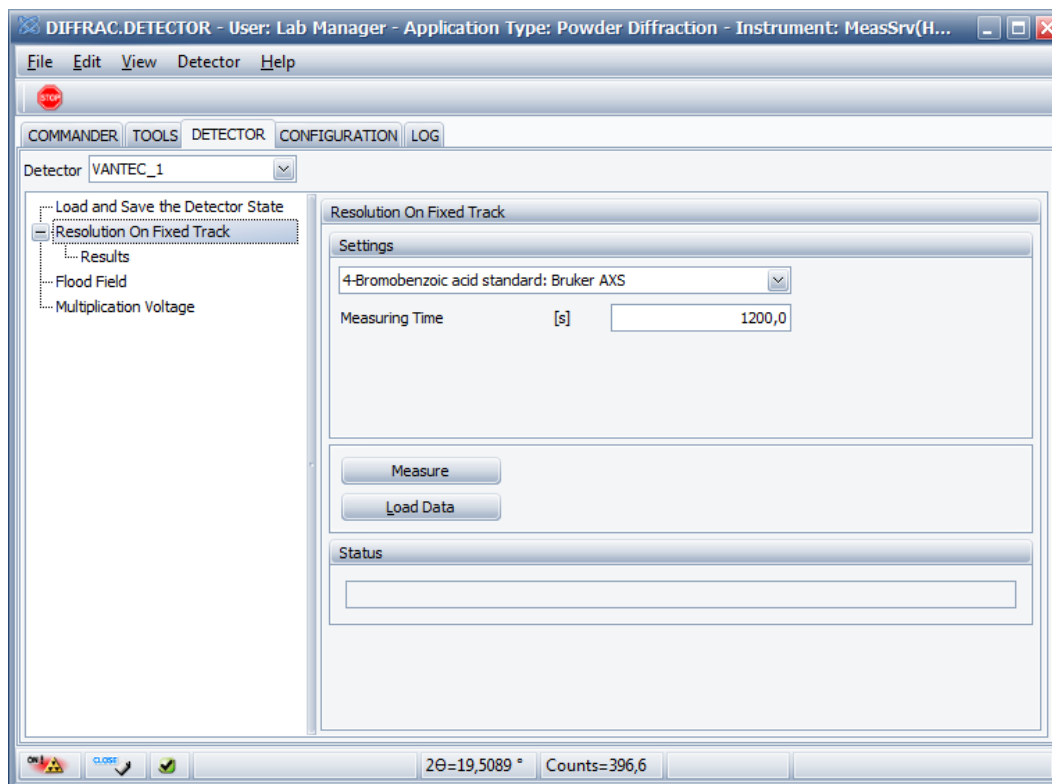


Figure 14.20: List of VANTEC-1 calibrations on N8 HORIZON

14.3.3.1 Resolution on Fixed Track

Resolution calibration procedure maps VANTEC-1 channels to two theta axis by determining of resolution (angular size of the single channel in degrees) and absolute position of the detector on the two theta axis.

VANTEC-1 detector has a fixed position in the N8 HORIZON instrument, therefore it requires different resolution calibration procedure than that is used on D8 instruments.

Resolution calibration is recommended to be done with help of “4-Bromobenzoic acid standard” defined by Bruker AXS, which contains multiple good recognizable peaks. This standard is selected by default in the combo box, when one clicks on the “Resolution On Fixed Track” item. Measurement time of 20 minutes (1200 seconds) is set by default as minimum required time recommended by Bruker AXS. One can increase this time if it is necessary.

Resolution calibration has following options:

<input type="text" value="4-Bromobenzoic acid standard: Bruker AXS"/>	Selects calibration standard, with predefined peak lines.
Measuring Time [s] <input type="text" value="1200,0"/>	Specifies measurement time.
<input type="button" value="Measure"/>	Starts calibration measurement and calculates angular resolution of the detector from the measured data. After calibration measurement has been done DETECTOR plugin changes automatically to the results tab, in order to show calibration results.
<input type="button" value="Load Data"/>	Loads measured data from BRML file and calculates angular resolution of the detector. After loading it changes automatically to the results tab to show calibration results.

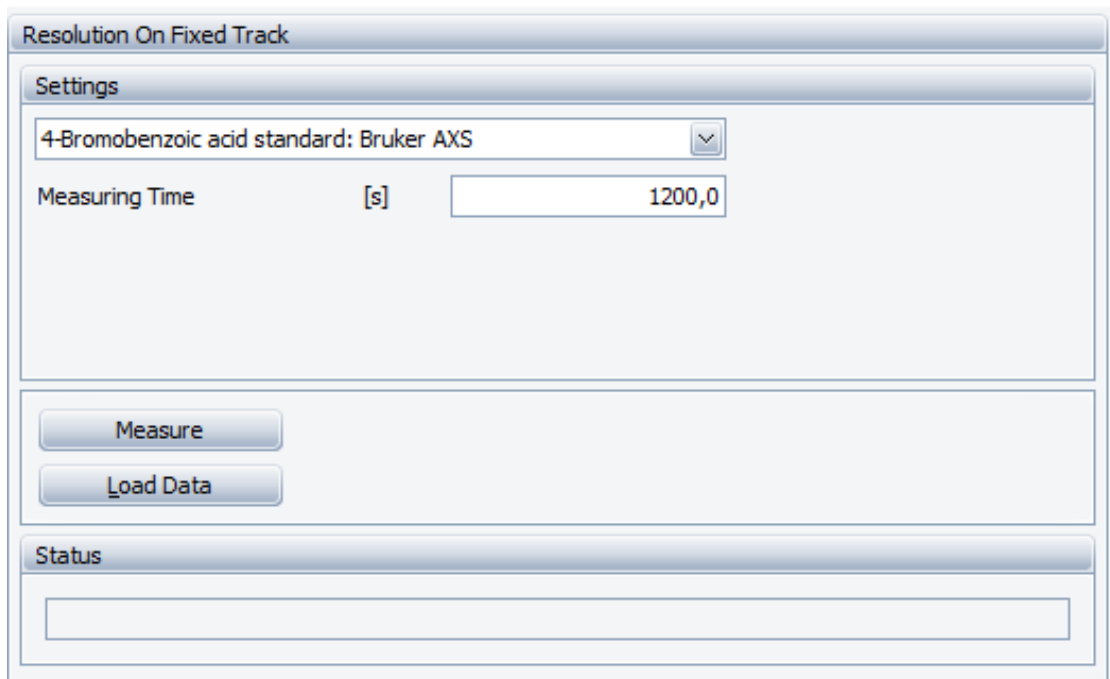


Figure 14.21: Resolution calibration tab for VANTEC-1 on N8 HORIZON.

Results

Detector plugin automatically finds peak positions from the measured data, performs identification of measured peaks, fits regression line and calculates resolution and offsets. Results of the detector calibration are displayed in the upper part of the **Results** tab.

In order to apply calibration to the instrument configuration one has to click **Apply to Instrument** button and restart instrument ICS.

Detector Resolution	[°]	0,006373261	Angular size of the detector channel.
Zero Offset	[°]	-4,87554499:	Offset of the detector center relative to the detector edge.
Standard Deviation		0,003340917	Standard deviation from regression fitting.
Detector Center Position	[°]	22,17289741	Absolute angular position of the detector center on two theta axis.
Apply to Instrument		Applies actual calibration to the instrument configuration.	
Save Measured Data		Saves measured data to file.	

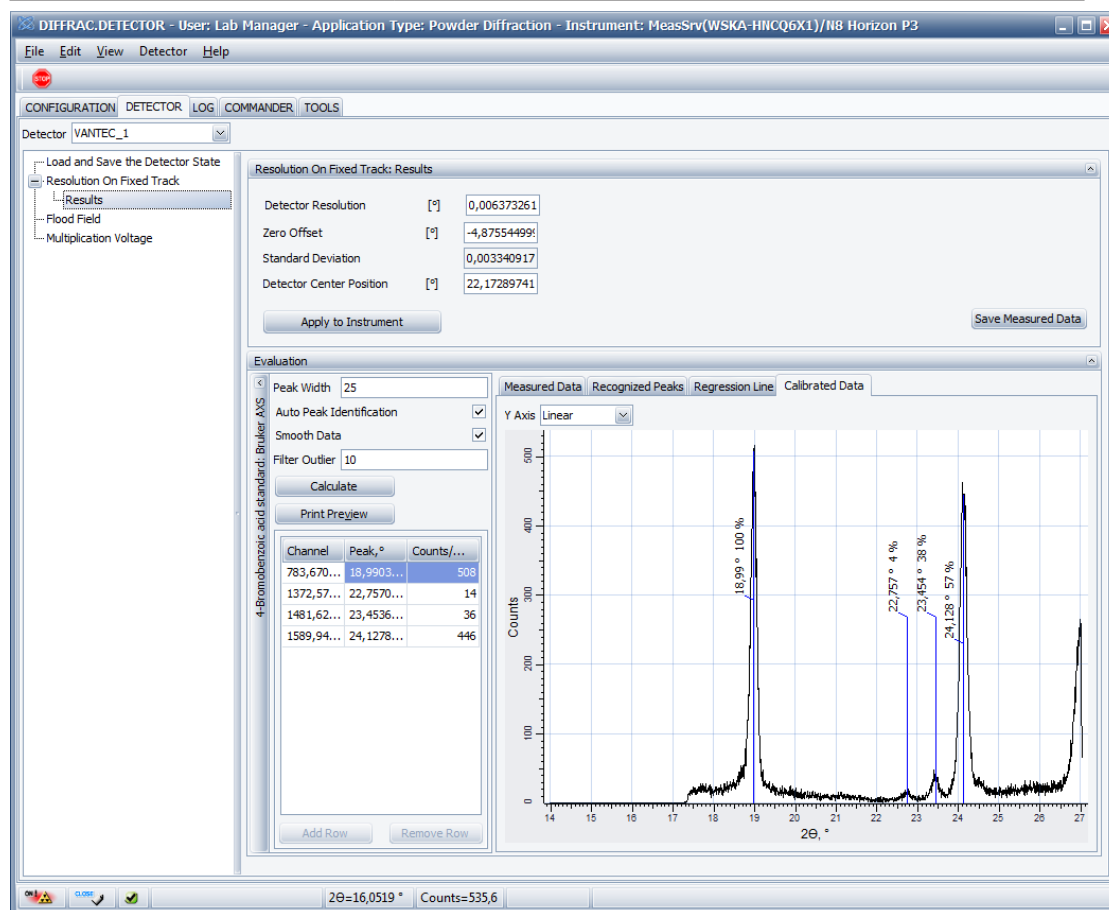


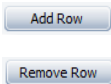
Figure 14.22: Results of the resolution calibration of VANTEC-1 on N8 HORIZON.

Evaluation

Evaluation window is displayed in the lower part of the Results tab. Peaks automatically identified by the DETECTOR plugin are displayed in the grid in the left lower part of the window. Calibrated measured data is displayed in the right part of the window. One can control quality of the calibration in evaluation window or perform custom peak search and manual peak identification. Parameters available for the custom user peak search are displayed at the left upper part of the window and listed below:

Peak Width <input type="text" value="25"/>	Defines peak width in channels for the peak search algorithm.
Auto Peak Identification <input checked="" type="checkbox"/>	Performs automatic peak search and peak identification, when checked. If this is unchecked then user can specify calibration peaks manually in the data grid, see small figure below.
Smooth Data <input checked="" type="checkbox"/>	Performs data smoothing for the peak search, when checked.
Filter Outlier <input type="text" value="10"/>	Strength of outlier filtering, use 0 to switch off filtering.
<input type="button" value="Calculate"/>	Calculates calibration. Performs peak search and identification if the corresponding function is checked.
<input type="button" value="Print Preview"/>	Shows print preview dialog.

Calibration points for the regression line are displayed in the grid and is not editable if the **Auto Peak Identification** is switched on.



When **Auto Peak Identification** is switched off, one can perform custom peak identification by adding new lines into the grid with help of **Add Row** button or removing lines from grid with help of **Remove Row** button.

One can edit every line in the grid and specify position of the measured peak in channels and corresponding theoretical peak in degree by selecting them from combo box or typing custom value. When all peaks are added click “Calculate” button to calculate calibration.

Channel	Peak, °	Counts/...
783,670...	18,990	508
1372,57...	17,1791	14
1481,62...	18,9903	36
1589,94...	21,0987	446
	22,7571	
	23,4536	
	24,1278	
	24,5567	

Figure 14.23: Manual peak identification by editing of grid data.

Charts and diffractograms, which are displayed for visual control of calibration quality in the right part of the window, are listed below:

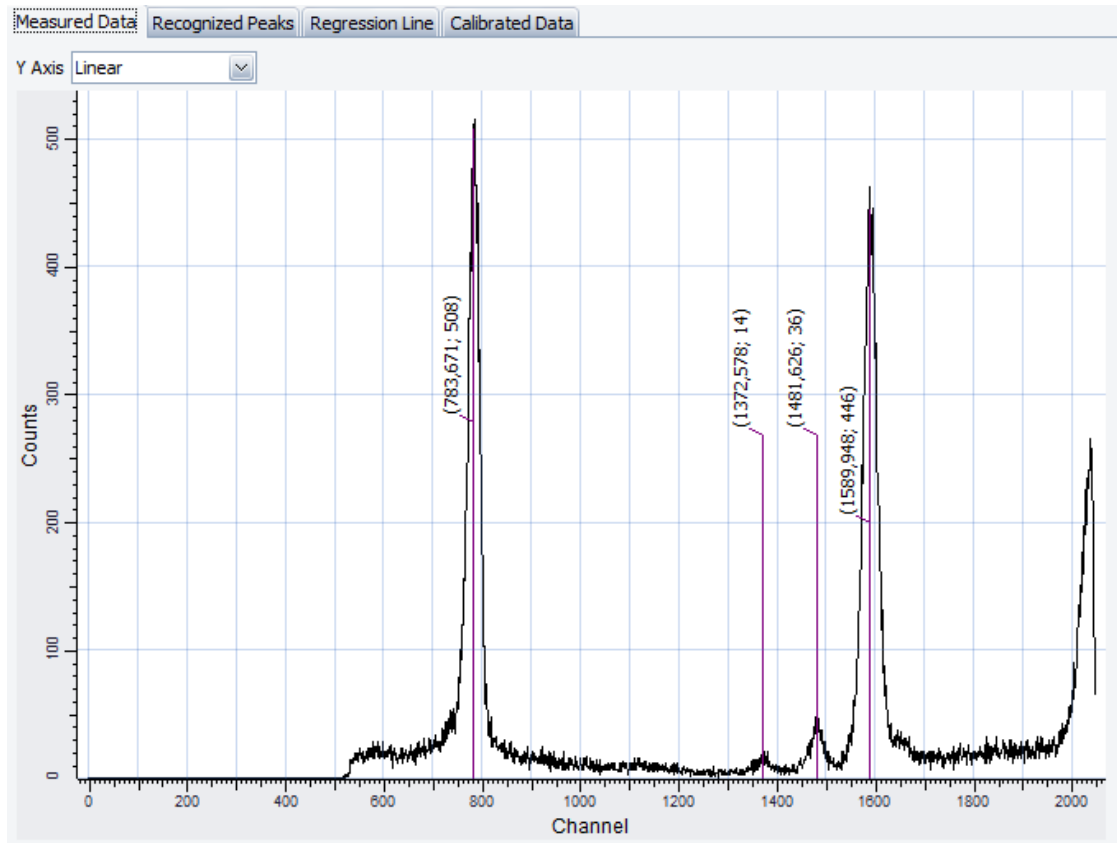


Figure 14.24: Measured data and found peak positions in channels.

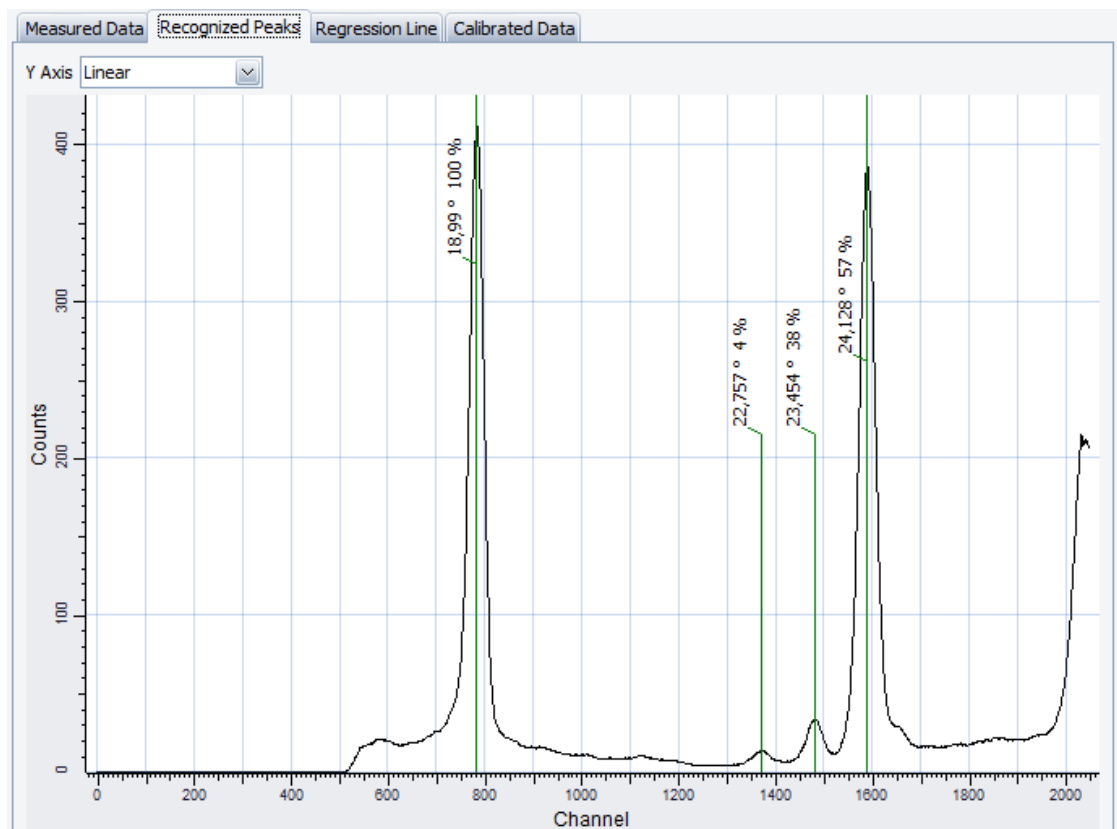


Figure 14.25: Identified theoretical peak lines.

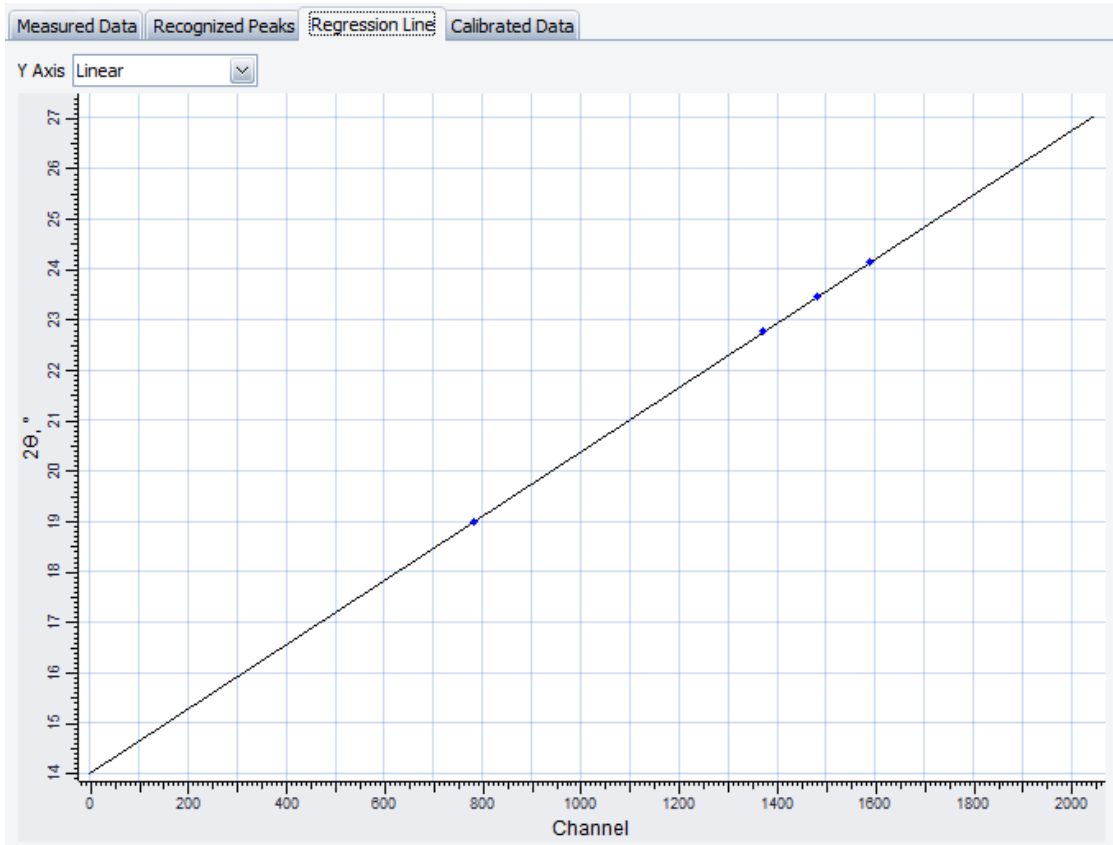


Figure 14.26: Regression line.

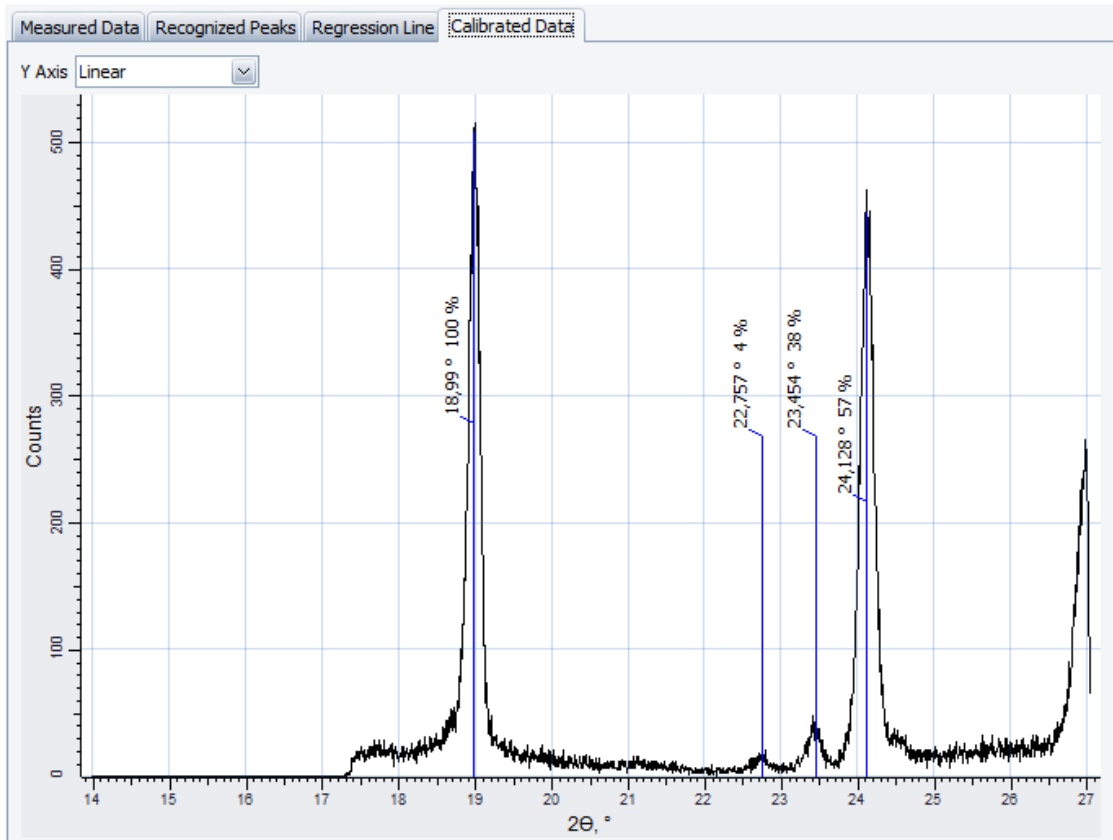


Figure 14.27: Measured data with applied calibration to it and calibrated peak positions in degrees.

14.3.3.2 Flood Field

Flood field calibration equalizes sensitivity of detector channels by determining of linear coefficients for every channel from measurement where detector is irradiated by beam with uniform intensity. Detector should be set up for the calibration as it described in the VANTEC-1 detector manual.

Flood field determination provides following options:

Measuring Time [s] <input type="text" value="600,000"/>	Measurement time.
Flood Field Data <input type="text" value="..."/>	Actual flood field coefficients.
<input type="button" value="Measure and Set"/>	Starts flood field measurement, calculates coefficients from measured data and applies them to the instrument configuration. Instrument ICS has to be restarted to make changes active for the detector.
<input type="button" value="Save Experiment"/>	Saves specified experiment to file.
<input type="button" value="Save Measured Data"/>	Saves measured data to BRML file.
<input type="button" value="Open File and Set"/>	Reads data from BRML file, calculates coefficients and applies them to the instrument configuration. Instrument ICS has to be restarted to make changes active for the detector.

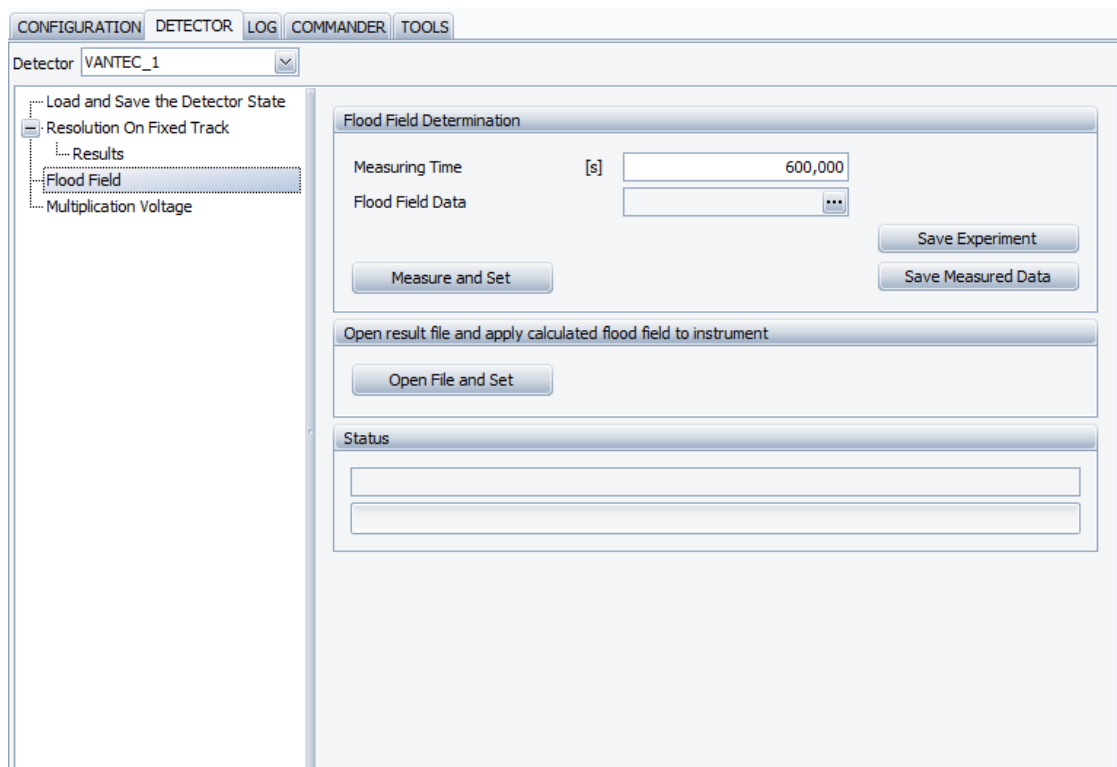


Figure 14.28: Tab for the Flood Field calibration.

14.3.3.3 Multiplication Voltage

Configuration value for the multiplication voltage of the detector can be changed here.

Multiplication Voltage tab provides following options:

Multiplication Voltage [V] <input type="text" value="5567"/>	One can manually type new value in the edit box.
<input type="button" value="Read From Ini File"/>	Browse Ini file in the upcoming dialog and read multiplication voltage from the file into edit box.
<input type="button" value="Apply To Detector"/>	Saves displayed value into instrument configuration.

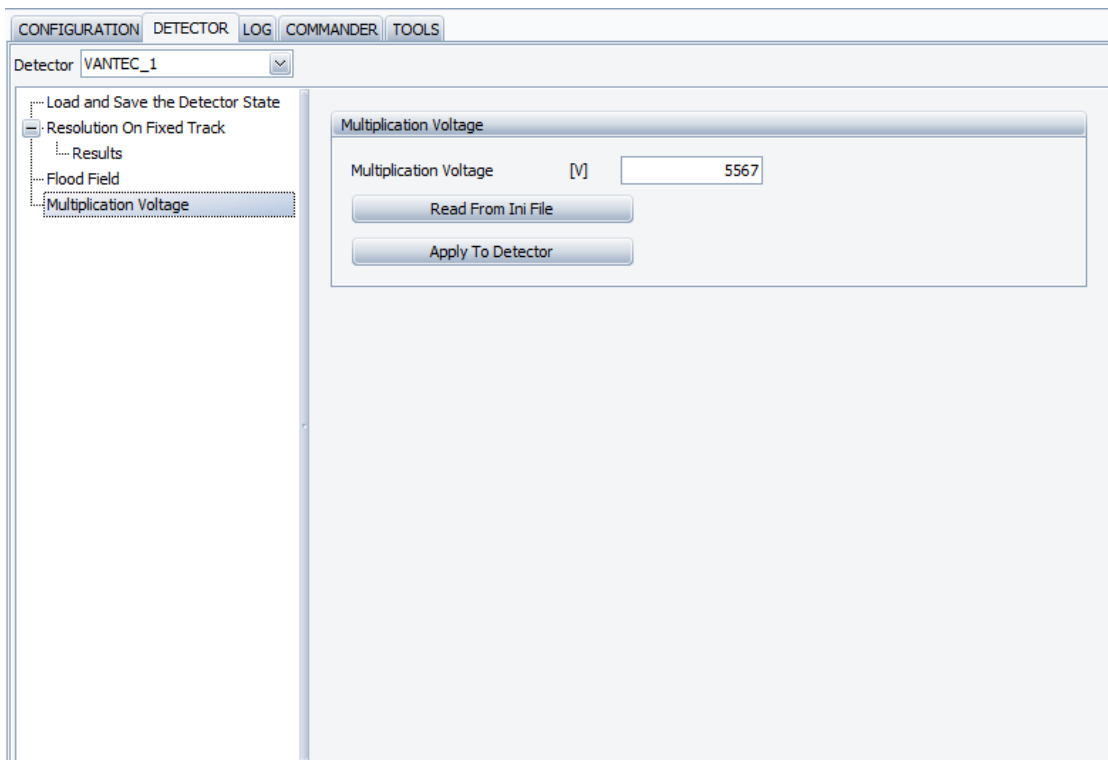


Figure 14.29: Tab for changing of the **Multiplication Voltage**.

14.4 2D Detector Calibration

For VANTEC 500 detector calibration, please refer the manual: *VANTEC-500 Detector User Manual*.

For PILATUS detector calibration, please refer the manual: *PILATUS3 R 100K A Detector User Manual*.

15 LOG

15.1 General

The LOG plug-in provides a record of user actions and system events that have occurred during use of the MEASUREMENT CENTER. The entries are displayed in table form. The actions and events are listed chronologically with the most recent entries appearing at the top of the list.

15.2 Screen Layout and Operation

Category	Date/Time	Description	Details
Kein Bild vorhanden			
	02.Okt.2015	Deleted the journal entry with the ID's :1328728,1328729,1328730	
	02.Okt.2015	Virtual-Chi scan undefined	No Virtual-Chi scan be...
	02.Okt.2015	Problem connecting to the external detector: No camera found at IP:192.168.23.10	BrukerAXIS.Common.E...
	02.Okt.2015	Deleted the journal entry with the ID's :1328714,1328715,1328716,1328717,1328718,1328719,1328720,1328721,1328722,1328723,1328724,...	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionXrf, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionXrd, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionTxf, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionTexture, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionTec, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionStress, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionScord, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionSaxs, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionHxrd, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Success loading assembly: WizardPluginExtensionBond, Version=5.2.2.0, Culture=neutral, PublicKeyToken=null	
	02.Okt.2015	Can't find wavelength association file: C:\ProgramData\Bruker AXIS\WR\Data\optics.xml	
	02.Okt.2015	Could not convert unit=(cm3) into a UnitSpec.	
	02.Okt.2015	Could not convert unit=(cm3) into a UnitSpec.	
	02.Okt.2015	Deleted the journal entry with the ID's :1328703,1328704,1328705,1328706,1328707,1328708,1328709,1328710,1328711,1328712,1328713	
	02.Okt.2015	Database connection established	

Figure 15.1: Interface of LOG

Four toggle buttons are located above the table. The user can alter the display of **Errors**, **Warnings** and items of **Information** that have occurred since the recording began. Additionally, the user can filter the table by the following items:

Instruments	This filters the table by the instrument to which the framework was connected.
Modules	This filters the table by software modules that produced the log entry.
Date/Time	This filters the table by using predefined time settings.



The number of events listed in this table is limited to 10000 items. The filter settings are stored in the user profile of the database and are reloaded at the next start of the software.

When a button is pressed down, the items belonging to the button are included in the table. Otherwise, the items are excluded, and the buttons are grayed. This allows a very easy event filtering.

The left most button toggles the auto refresh of the table. If off, the button becomes gray and the table is not updated automatically. However, the user can manually update the table by pressing the F5 key.

15.2.1 The LOG Context Menu

The **LOG** context menu is opened by clicking with the right mouse button anywhere in the table on the **LOG** page.

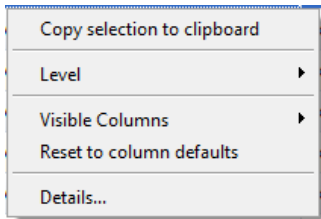


Figure 15.2: Log context menu

This context menu contains the following items:

Copy selection to clipboard: Copies information from the table to the clipboard. The information can be pasted into an email or a Word document.

To copy information to the clipboard,

1. first select the row or rows of information in the table.
2. Select a single line with a mouse click or multiple lines by holding down the **Shift** key and scrolling through the rows using the arrow keys \uparrow and \downarrow .
3. Right-click on the selected row or rows to open the context menu.

Table 15.1:

Level	Allows the user to choose between different types of logging information. Choosing Standard provides standard logging information. The other options provide additional information in addition to the standard information. For example, the option Communication provides additional information relating to the communication between the Measurement Client, the Measurement Server, and the instruments.
Visible Columns	Allows the user to select the columns to be displayed in the table from a set of predefined columns.
Reset to column defaults	Displays the default columns Category , Date/Time , Description and Details in the table. Resets the filter settings.
Details	Shows a dialog with detailed information about the event. With the Up/Down buttons, the user can switch to the next/previous event.



Figure 15.3: Log details dialog

16 CAMERA HIGH RESOLUTION

16.1 General

The CAMERA HIGH RESOLUTION plug-in is used to work with IP based high resolution web cameras. The user can watch a certain area in an instrument remotely, or watch the alignment of a sample or instrument components. If a microscope camera is mounted on the instrument, the camera can be calibrated. Thus, on screen distance measurements are possible.

To configure a camera to be used in the CAMERA plug-in, use the CONFIG plug-in and define a component of the type **/Component/Video**. Locate the IP address of the camera and configure the Camera IP Address property of the component. After a restart of the firmware and a reconnect of the framework, the CAMERA plug-in will attempt to connect to the camera. If successful, the camera displays an image.

The number of frames/second depends on the connection speed, the illumination level, the gain and the size of the images. Up to 12 frames/second can be transmitted with Gigabit Ethernet connections.

The number of cameras is unlimited. Each camera is displayed in a new tab. To reduce the network load, the camera is disabled if the plug-in is not visible.

16.2 Screen Layout and Operation

The user interface of the CAMERA plug-in consists of a tab for each configured camera. Each camera has its own properties which can be set in the **Camera** menu.

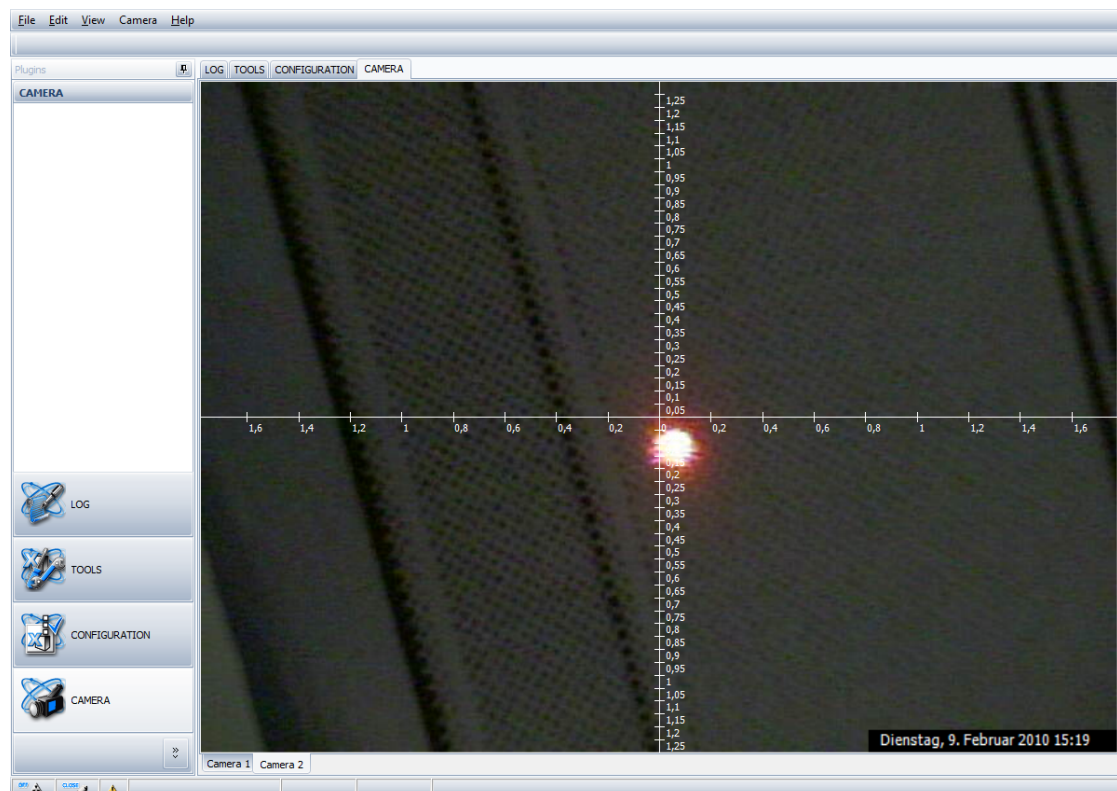


Figure 16.1: User interface of CAMERA plug-in

The cross-line can be dragged around by clicking in the middle of the cross-line with the left mouse button. The cross-line can be used for measurements. To reach the camera origin, select **Restore camera origin** from the menu.

16.2.1 The Camera Menu

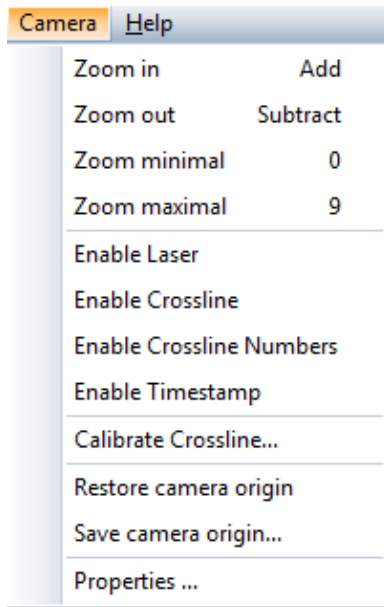


Figure 16.2: Menu of CAMERA plug-in

Zoom in	Increases the zoom level by increasing the image. The zoom is increased at the middle of the cross line center.
Zoom out	Decreases the zoom level digitally.
Zoom minimal	Sets the zoom level to minimum.
Zoom maximal	Sets the zoom level to maximal.
Enable Laser	This menu item is available if a laser is configured in the instrument. This toggles the laser (On/Off).
Enable Cross line	Toggles the cross line (On/Off) on the camera picture.
Enable Cross line Numbers	Toggles the numbering on the cross line (On/Off) on the camera picture.
Enable Timestamp	Toggles the timestamp (On/Off) on the camera picture.
Calibrate Cross line	Calibrates the screen/real world relationship in pixel/mm. After a camera picture is calibrated, the cross line displays the real world distances in [mm]. To calibrate the picture, click and drag the mouse on a visible object with known dimensions. After releasing the mouse, type the dimension in [mm] in the dialog box.
Restore camera origin	Moves the cross line back to a stored cross line position.
Save camera origin	Saves the actual camera position as camera origin.
Properties	Shows the Camera properties dialog

16.2.2 Camera Properties Dialog

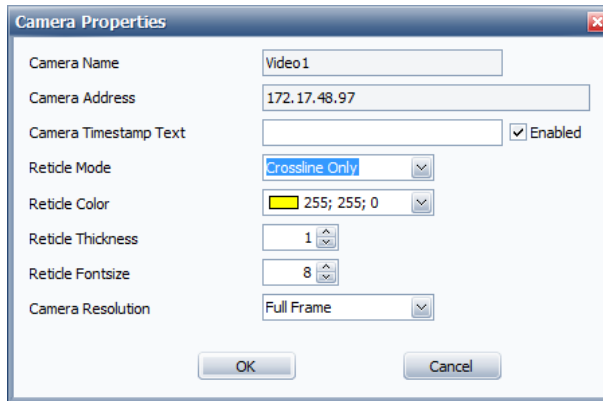


Figure 16.3: The **Camera Properties** Dialog

Camera Name	Name of the camera defined in the CONFIG plug-in. The name is also shown at the bottom of the tab.
Camera IP Address	This shows the camera IP Address as defined in the CONFIG plug-in. Camera Timestamp Text: Each camera image can have a timestamp and a timestamp text in the right bottom corner. The timestamp can be enabled with the checkbox.
Reticle Mode	Defines how the reticle looks like. The following modes are possible: <ul style="list-style-type: none"> • No crossline • Crossline only • Crossline and circle
Reticle Color	Defines the color of the cross line.
Reticle Thickness	Defines the thickness of the cross line.
Reticle Fontsize	Defines the font size of the cross line.
Camera Resolution	To increase the frame rate, the user can select between Full Frames and Half Frames. Selecting Half Frames reduces the network load and increases the frame rate, but reduces the image quality.

16.2.3 User Right Restrictions

The logged-in user can change CAMERA settings only if he has been assigned the user right **Change Software Configuration**. For information on user rights, see Section [Users Table \[p 160\]](#).

Since high resolution cameras generate a high network bus load, there are some restrictions

- ▶ Only one client is allowed to view the camera image at one time. If a second client connects to the same instrument, a second image will not be displayed for this client.
 - ▶ A Gigabit Ethernet connection is recommended to obtain the best quality. A fast Ethernet connection can function. However, the frame rate will be reduced dramatically, since all other client communication with the instrument must be performed using the same network connection.
 - ▶ If the network connection is too slow, the camera might be disabled and the camera image will be frozen. In order to render the camera functional again, reconnect the framework after the network connection is improved.
 - ▶ There is no limitation in the number of cameras which can be used in an instrument, since hidden cameras are disabled and when necessary, reactivated automatically.
 - ▶ Only a basic set of camera parameters are predefined by the CAMERA plug-in. Use the camera vendors software utilities to improve image quality. To facilitate high resolution of the image, install the camera drivers manually. The drivers can be found on the MEASUREMENT CENTER software CD.
-



17 LOADER for D8 ENDEAVOR

17.1 Introduction

LOADER is the measurement editor; this is where you declare the name of the sample, the measurement method to use, etc. Moreover, LOADER provides a virtual display of the sample magazine status. When you declare new samples to measure, they are placed on the virtual display, so you can check that display on the screen corresponds to the arrangement of samples in the sample magazine, and then run the measurement job on desired samples.

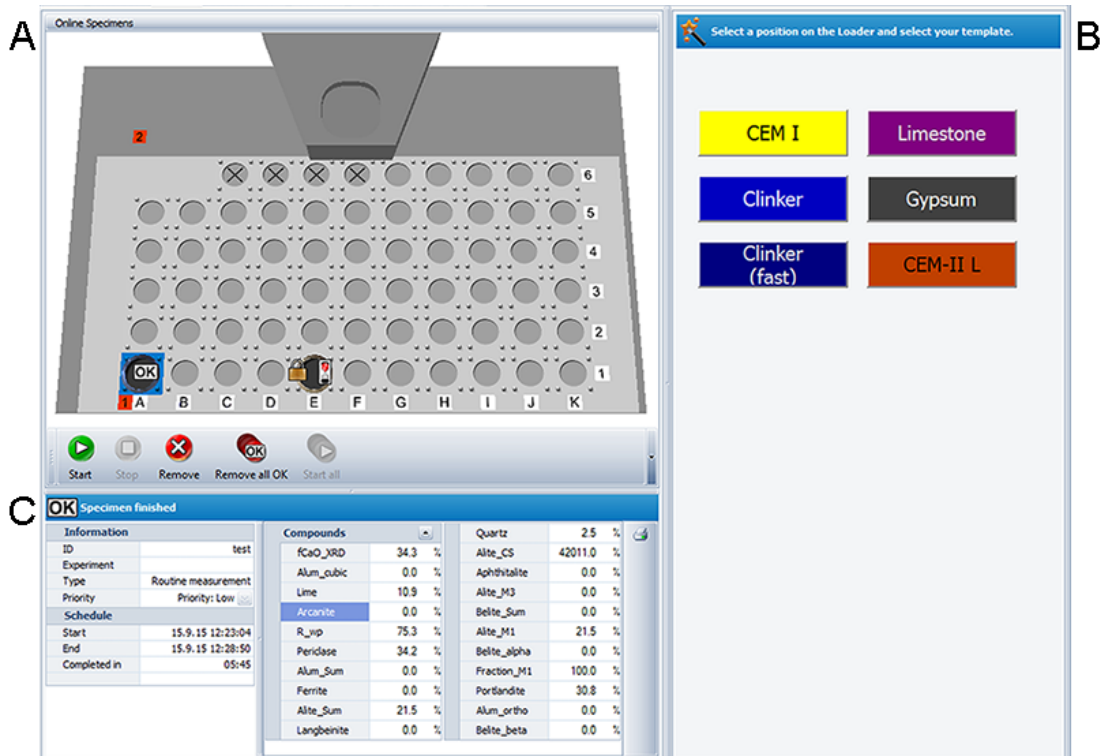


Figure 17.1: LOADER screen with 3 areas

A	Graphical Status
B	Templates
C	Sample Information

17.2 How to Start Measurements on the LOADER

1. Use the template editor in START JOBS to create a new template.
 - The template will appear as a button in the LOADER.
2. Select the desired measurement position in LOADER.
3. Select the required **Template** button.

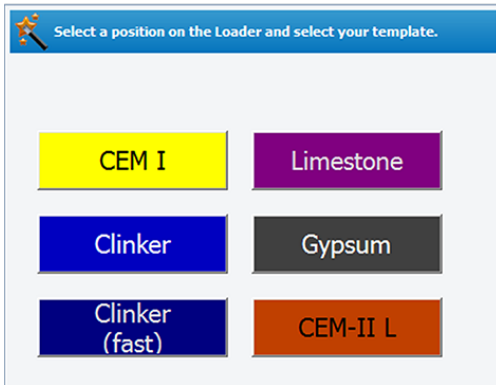


Figure 17.2: Templates area

- ▶ If additional information is required, a dialog will appear as shown in the figure above.
4. Enter the required information
 5. Press the **OK** button
- ⇒ The measurement will start automatically.

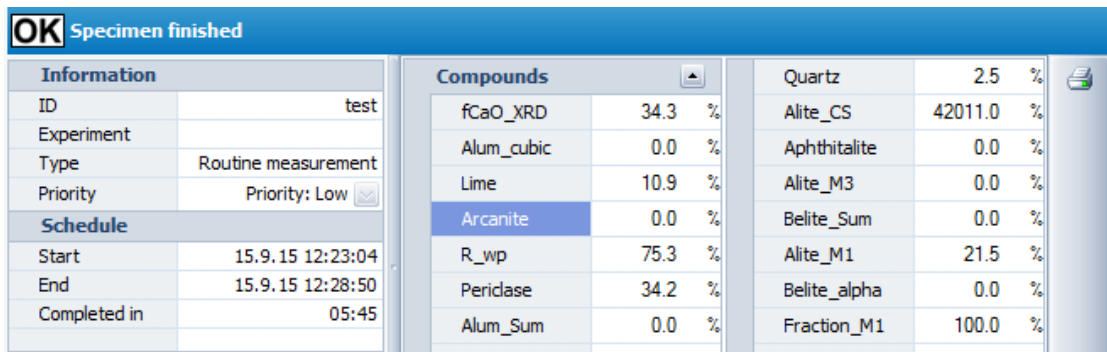


Figure 17.3: Specimen information

Table 17.1: New Specimen


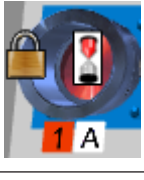

	Setting	Description
Information	ID	Name of the selected specimen. It can be edited.
	App.	Name of the application used for the measurement
	Type	Type of measurement: standard, control specimen or routine measurement
	Priority	Shows the measurement priority.
Schedule	Start	Time scheduled for the start of the measurement.
	End	Time scheduled for the end of the measurement.

17.3 How to Send Specimens to the Measurement Process

17.3.1 Display of a Sample Sent to Measurement

The display of a sample sent to measurement changes as follows:

Table 17.2: Display of a sample sent to measurement

	Sample being sent to measurement
	Sample being measured
	Sample measurement completed

17.3.2 Display of the Results

Once the measurement completed, the specimen is labeled as **OK** and the quantitative results are displayed in the table below the virtual LOADER.

OK Specimen finished	
Information	
ID	test
Experiment	
Type	Routine measurement
Priority	Priority: Low
Schedule	
Start	15.9.15 12:23:04
End	15.9.15 12:28:50
Completed in	05:45
Compounds	
fCaO_XRD	34.3 %
Alum_cubic	0.0 %
Lime	10.9 %
Arcanite	0.0 %
R_wp	75.3 %
Peridase	34.2 %
Alum_Sum	0.0 %
Ferrite	0.0 %
Alite_Sum	21.5 %
Langbeinite	0.0 %
Quartz	2.5 %
Alite_CS	42011.0 %
Aphthitalite	0.0 %
Alite_M3	0.0 %
Belite_Sum	0.0 %
Alite_M1	21.5 %
Belite_alpha	0.0 %
Fraction_M1	100.0 %
Portlandite	30.8 %
Alum_ortho	0.0 %
Belite_beta	0.0 %

Figure 17.4: Result Display in LOADER



It is possible to open the print preview by clicking the button on the right side of the results

17.3.3 How to Stop a Measurement

The measurement of selected samples can be stopped by

1. selecting them on the virtual LOADER and
2. clicking the **Stop** button below.

The overall measurement process (and not only the selected samples) can be stopped by the

1. clicking the **STOP** button at the top right of the **Loader** window.

To start the measurement process again,

1. click the **Restart** button.

⇒ In both cases when the measurement is stopped the sample is labeled as **Aborted**. Its display changes as shown below:






17.3.4 How to Remove Samples

In addition to simply stopping the measurement of selected samples, you can also remove them from the LOADER. To do so:

1. Select the samples that you want to remove.
2. Click the **Remove** button.

Other commands to remove samples from the LOADER are available on the **Online specimens** menu.

Table 17.3: Remove sample commands

Command	Shortcut key	Description
 Remove all completed	F2	To remove all the samples which measurement has been successfully completed from the LOADER display
 Remove all failed	F3	To remove all the samples which measurement has failed or has been aborted from the LOADER
 Remove all	F4	To remove all the samples from the LOADER whatever their status

17.4 How to Print Online Specimens and Results

17.4.1 How to Print Results

Results displayed in the LOADER program can be printed by



1. clicking the **Print results** button, see section *Display of the Results* [253].

Information	
ID	test
Experiment	
Type	Routine measurement
Priority	Priority: Low
Schedule	
Start	15.9.15 12:23:04
End	15.9.15 12:28:50
Completed in	05:45

Compounds	
fCaO_XRD	34.3 %
Alum_cubic	0.0 %
Lime	10.9 %
Arcanite	0.0 %
R_wp	75.3 %
Peridase	34.2 %
Alum_Sum	0.0 %
Ferrite	0.0 %
Alite_Sum	21.5 %
Langbeinite	0.0 %

Quartz	2.5 %
Alite_CS	42011.0 %
Aphthitalite	0.0 %
Alite_M3	0.0 %
Belite_Sum	0.0 %
Alite_M1	21.5 %
Belite_alpha	0.0 %
Fraction_M1	100.0 %
Portlandite	30.8 %
Alum_ortho	0.0 %
Belite_beta	0.0 %

Figure 17.5: Result Display in LOADER

- This will open the **Print Preview** window.

Specimen Details

ID	test
Experiment	
Type	Routine measurement
Priority	Priority: Low
Start	15.9.15 12:23:04
End	15.9.15 12:28:50
Completed in	05:45

Specimen results

fCaO_XRD	34.3 %
Alum_cubic	0.0 %
Lime	10.9 %
Arcanite	0.0 %
R_wp	75.3 %
Peridase	34.2 %
Alum_Sum	0.0 %
Ferrite	0.0 %
Alite_Sum	21.5 %
Langbeinite	0.0 %
Quartz	2.5 %
Alite_CS	42011.0 %
Aphthitalite	0.0 %
Alite_M3	0.0 %
Belite_Sum	0.0 %
Alite_M1	21.5 %
Belite_alpha	0.0 %
Fraction_M1	100.0 %
Portlandite	30.8 %
Alum_ortho	0.0 %
Belite_beta	0.0 %

Report Layout | Header/Footer | Parts | Watermark

Paper: A4

Orientation: Portrait Landscape

Margins [mm]: Top 25, Bottom 25, Left 25, Right 25

Page Layout: Header Font: Microsoft Sans Serif, 8.25; Standard Font: Microsoft Sans Serif, 8.25

Figure 17.6: Print preview for results

The window displays a preview of the printed pages. For results, specimen details and specimen results are displayed by default.

The print settings can be configured in a set of tabs on the right of the preview: Page Setup, Header/footer, Parts and Watermark. See section [How to Configure the Print Settings \[▶ 256\]](#) for more details.

Once the printout customized,

1. click the **Print** button to print the resulting page(s).

17.4.2 How to Configure the Print Settings

The print settings can be configured in a set of tabs on the right of the preview: Page Setup, Header/footer, Parts and Watermark.

To apply them to the current document:

1. Select the desired settings and
2. click the **Apply** button
 - ▶ A report layout corresponding to the selected settings can be saved and then be applied to another document:
3. Click the **Save** button to display the New Report Layout dialog box.
4. Enter a name for the New Report layout.
5. Click **OK**.

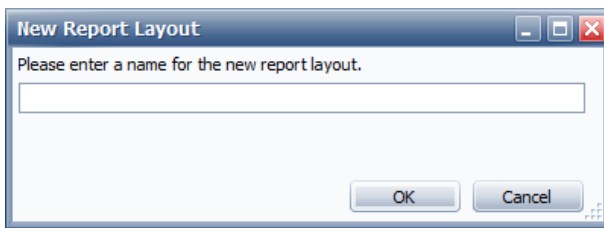


Figure 17.7: Definition of report layout

⇒ To reuse a layout in future previews the name can be selected in the selection box.

17.4.2.1 Report Layout Tab

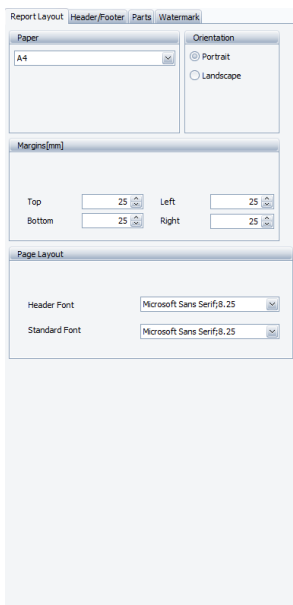


Figure 17.8: Report Layout tab

In the **Report Layout** tab the following properties can be set:

Table 17.4: Report layout options

Property	Description
Paper	Type of paper
Orientation	Default orientation of all report parts: portrait or landscape
Margins [mm]	Margins for the top, bottom, left and right in mm
Title Font	Font to be used for displaying part titles.
Header Font	Font to be used for displaying headers.
Standard Font	Font to be used for displaying all text that is not configured otherwise.

17.4.2.2 Header/Footer Tab

The **Header/Footer** tab allows setting formatted text as header and footer.

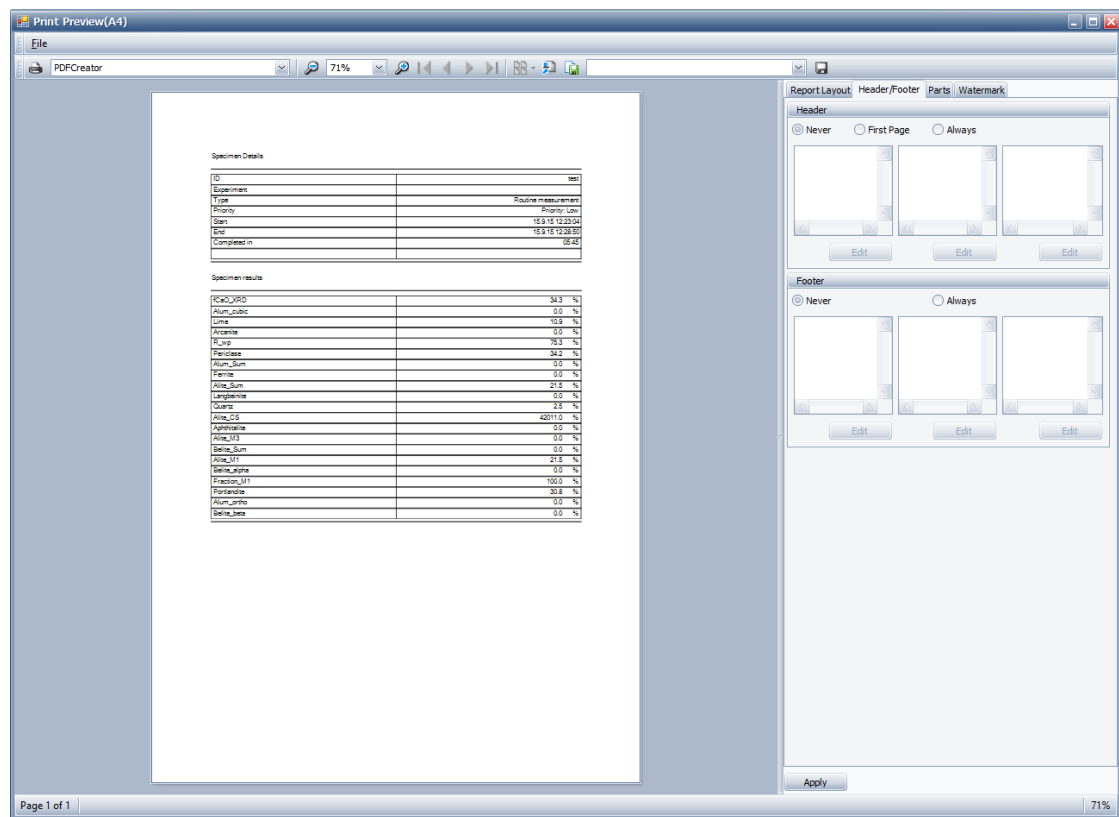


Figure 17.9: Header/Footer tab

To define a header/footer:

1. Select one the following options:

Never: No header/footer will be printed in the document.

First Page: The header/footer will be added only to the first page of the document.

Always: The header/footer will be added to all the pages of the document.

- Three list boxes appear below these options. Each list box is associated with a part of the page header/footer. For example, the list box on the left corresponds to the left part of the page header/footer.

To create or modify items in the lists.

1. Click the **Edit** button
 - The Edit dialog box will be displayed.

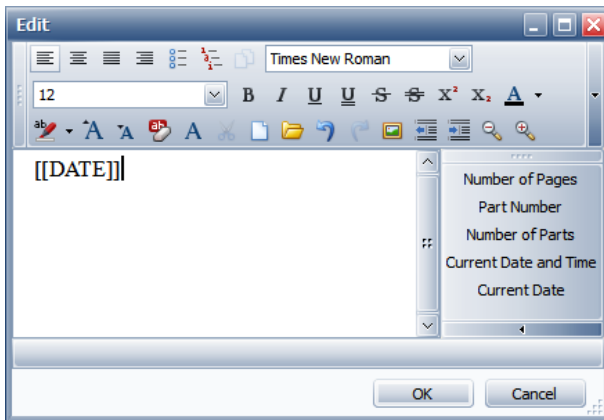


Figure 17.10: Definition of header

A wide range of formatted elements are supported in header and footer including various font sizes, images, tables.

In the right area of the text editor some macros are available. These macros are replaced during printing time. Available macros include **Page Number** and **Current Date**.

1. Click **OK**.

17.4.2.3 Parts Tab

A report can be composed of several parts. In the **Parts** tab the printout of these parts can be changed.

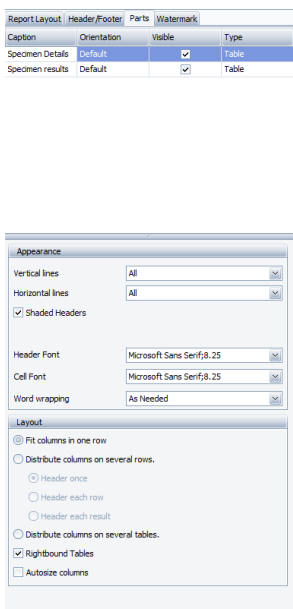


Figure 17.11: Parts tab

The parts overview table contains the following settings:

Table 17.5: Parts settings

Setting	Description
Caption	Title of the part. This can be changed.
Orientation	This is usually the default orientation of the report that has been set in the Report Layout tab. It can be overridden for an individual part.
Visible	Parts can be made invisible and thus included from the printout.
Type	The type displays information whether the part is a table or image.

17.4.2.4 Watermark Tab

The **Watermark** tab allows selection of an image and printing it out in the background of the report.

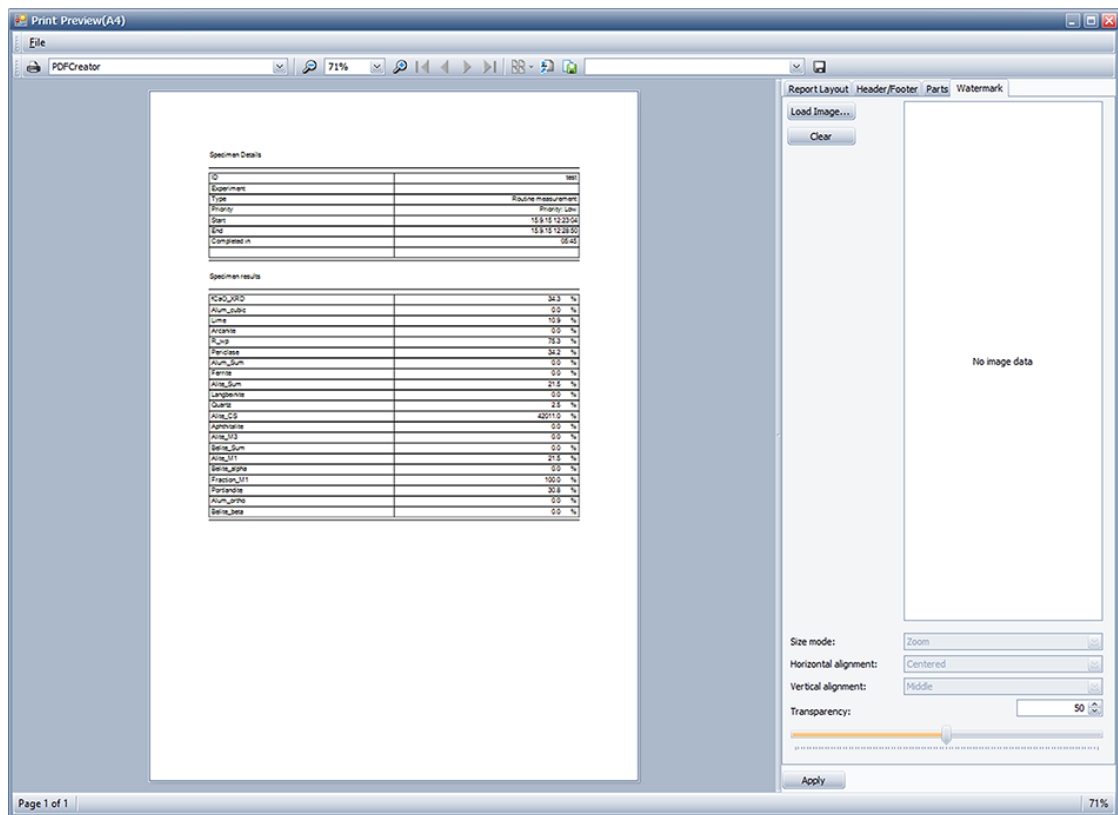


Figure 17.12: Watermark tab

To add a watermark:

1. Click the **Load Image** button to load the image to be used as a watermark.
2. Select the **Size mode** in the drop-down list.
3. Select the Horizontal and Vertical alignment.
4. Adjust the transparency by entering the desired value or by using the slider.

To remove the watermark:

1. click the **Clear** button.

18 Database Maintenance

18.1 General

Database Maintenance is used to install a new database/replace an existing database, or upgrade an existing database to a newer version. It is used by the installation program during the setup procedure in an automatic mode, or it can be used in manual mode.

18.2 Screen Layout and Operation

Database Maintenance has two options:

- **Upgrade:** This keeps existing data in the database, and upgrades the database to the latest structure. Upgrade is normally made by the installation program during the setup procedure automatically.
- **Overwrite:** This removes an existing database, deletes any existing data and replaces the entire database with a new one. A empty valid database with the suffix **.backup** can be found in the installation directory of the software. Warning: This deletes all settings and measurements/results. Overwrite is used when a database is to be restored which was created during a previous backup procedure. Overwrite can also be used to establish an empty database similar to the state after the installation of the software.

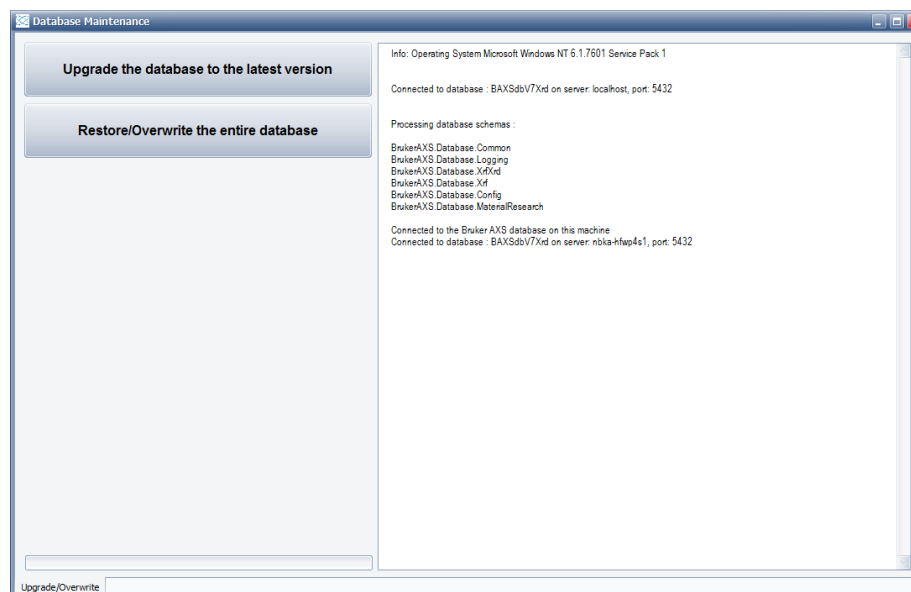


Figure 18.1: Screen Layout

To use **Database Maintenance**, start the application as an **Administrator**:

- **Windows XP:** double-click with the left mouse button on **Database Maintenance**. Administrator rights are required to start **Database Maintenance**.
- **Under Windows 7:** right-click on **Database Maintenance** and selecting **Run as Administrator** in the resulting dialog box.

If no valid database exists, log in as a **Repair User** in the login window.

The required password is: **Repair-User**.

If a valid database exists, log in with the username and password and click on **OK**.

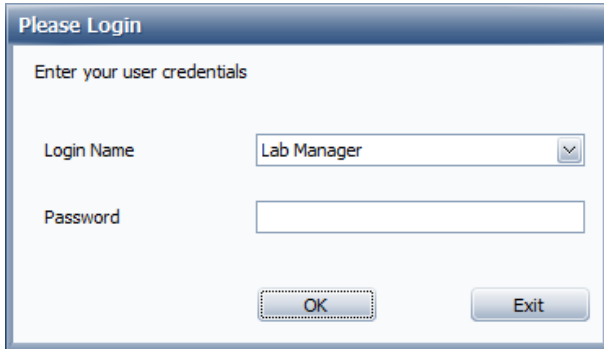
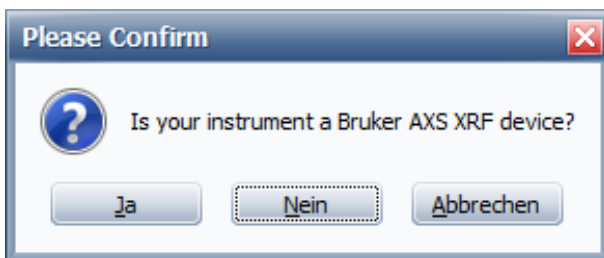


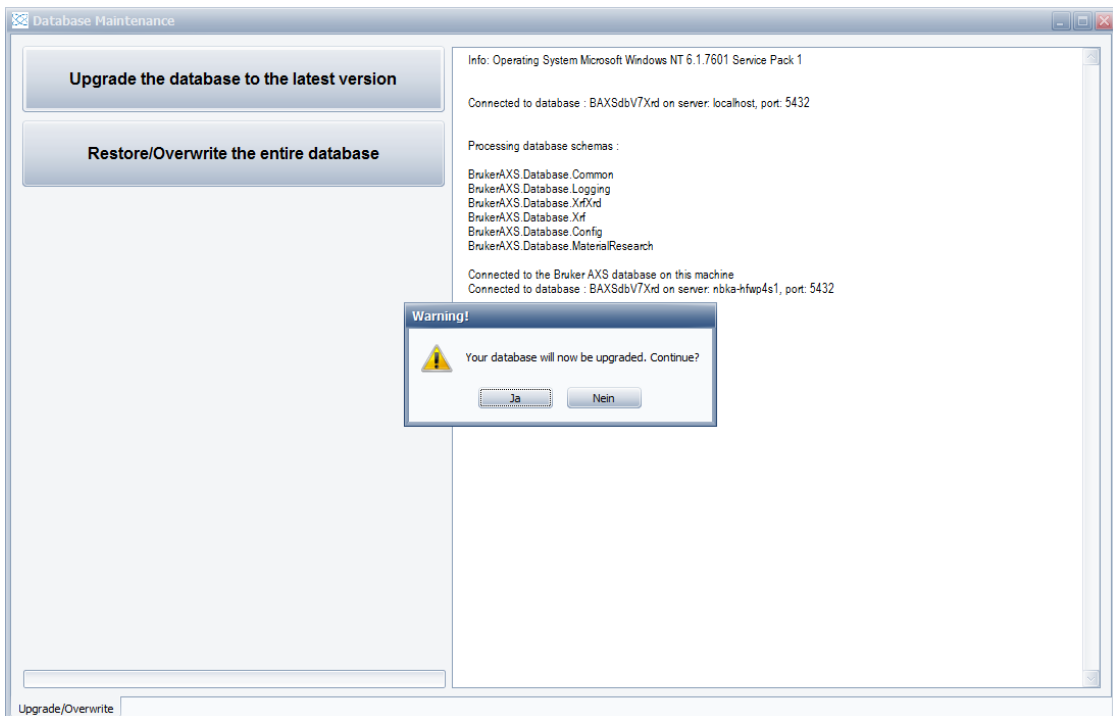
Figure 18.2: Login Dialog

18.3 Upgrade Database

1. Select **Upgrade Database** to upgrade an existing database to the latest database structure delivered by a software update. This is usually performed automatically by the setup program during installation. To do so,
2. Click **Upgrade the database to the latest version**, and select a valid **.backup** database backup file in the **File Open dialog**.
3. Distinguish between a Bruker AXS XRF instrument or not:



4. In the **Warning dialog**, click **Yes** to confirm to continue the process



- The new selected database is installed in the background as a temporary database.

- During the upgrade procedure, **Database Maintenance** provides progress information.

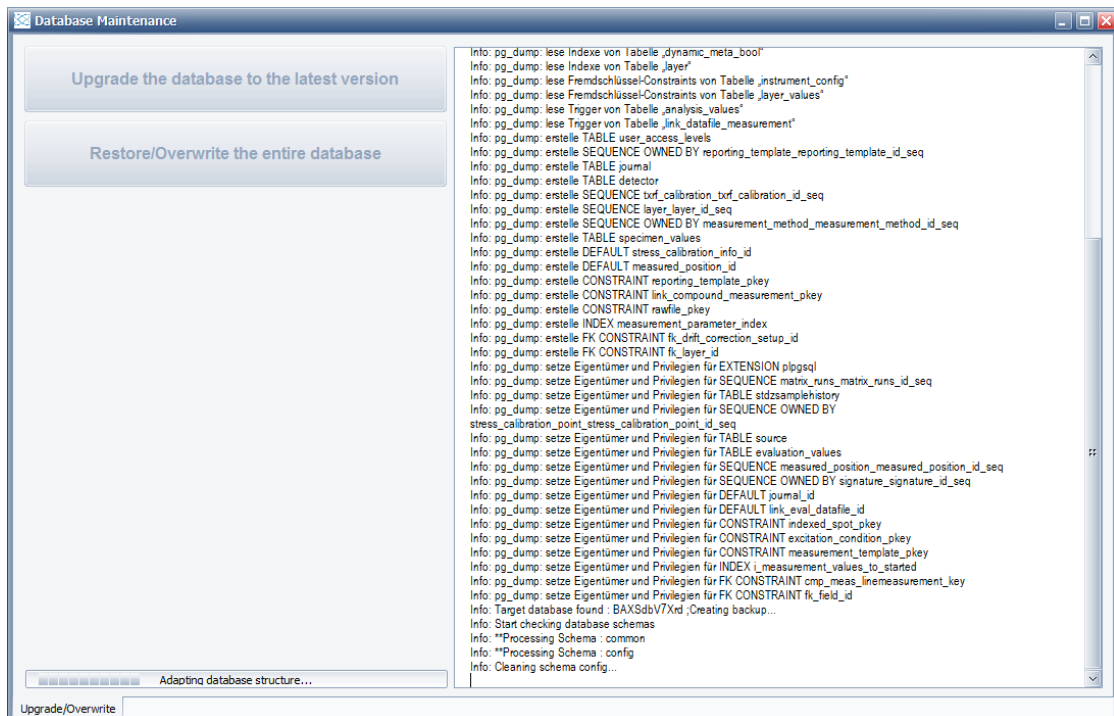


Figure 18.3: Upgrade finished

5. The application can be closed after the **Patching finished** notification is displayed.

18.4 Overwrite Database

Select **Overwrite the entire database**, if an existing database is to be replaced with a new one. Alternatively, the command can be used to revert the system to the status at the time of the software installation by overwriting the current database. The database can also be overwritten with a previously created backup.

NOTICE

ALL the data stored in the current database will be LOST!



Before an Overwrite or Upgrade procedure, **Database Maintenance** creates a security copy of the existing database. This backup database is stored in the folder:

Documents and Settings\Bruker AXS\Database Backup

1. Select **Overwrite the entire database**, and select a valid **.backup** database backup file in the **File Open dialog**.
2. Distinguish between a Bruker AXS XRF instrument or not

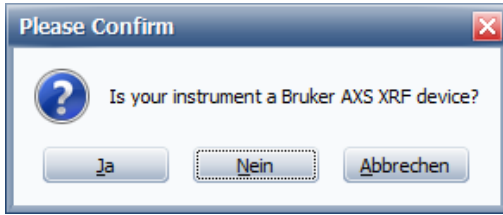


Figure 18.4: Confirm replace

3. Confirm the warning dialog to continue.

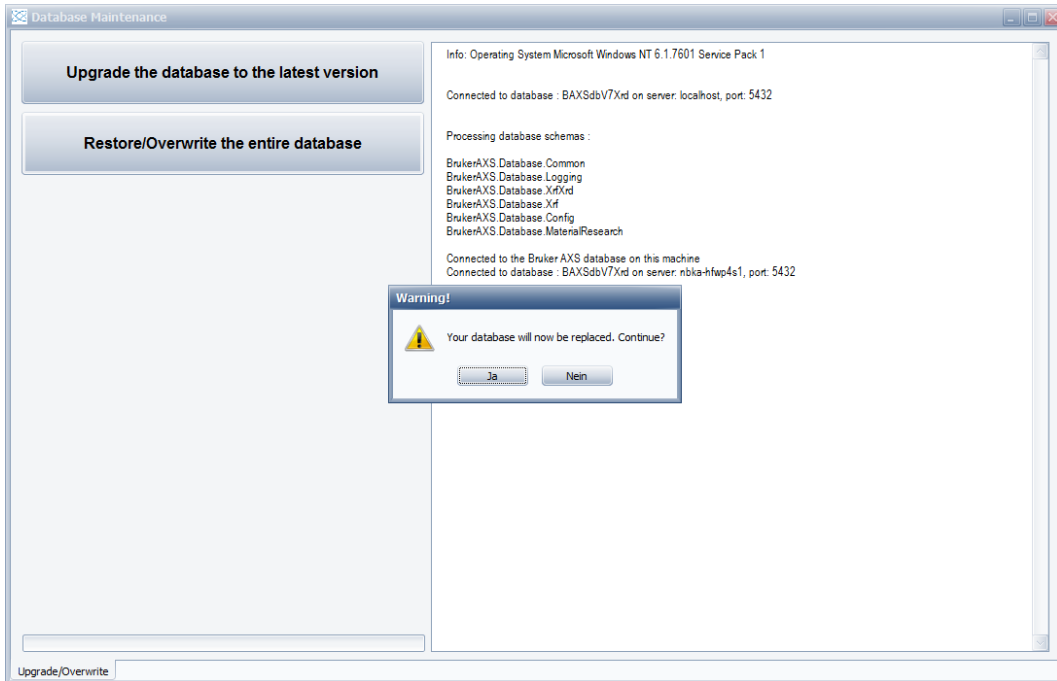


Figure 18.5: Overwrite procedure in progress

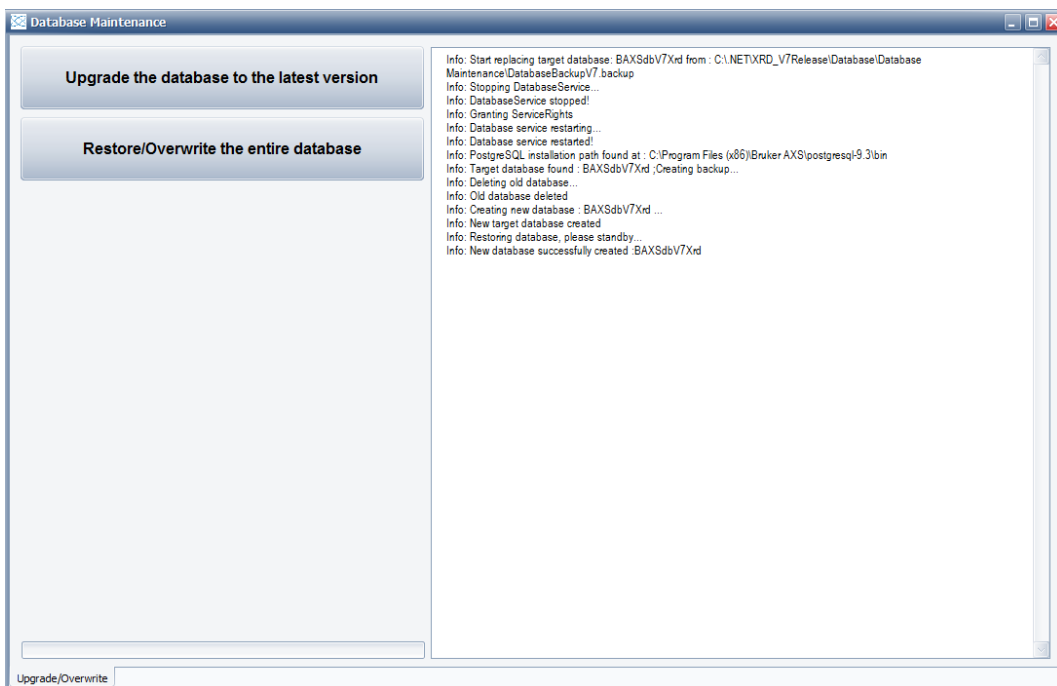


Figure 18.6: Overwrite procedure completed

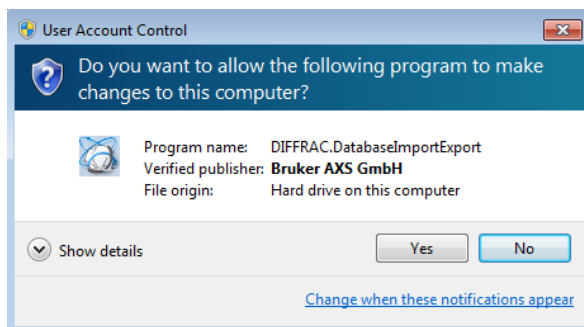
4. After the completion message in the right window the **Database Maintenance** can be closed.

18.5 Creating an Automatic Database Backup

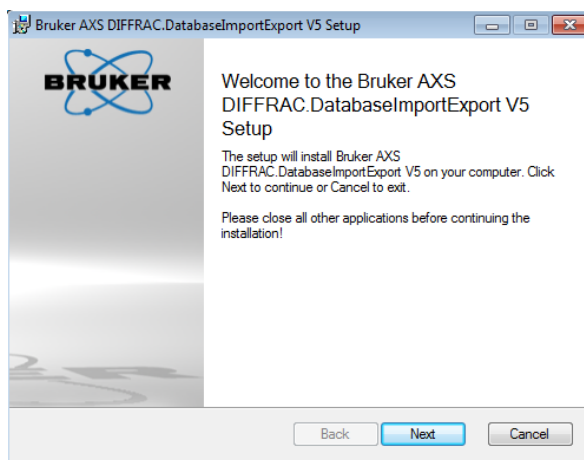
In order to create a Database Backup of the actual database, the utility **DatabasImportExport** can be used. It allows an automatically created backup at defined times, e.g. every week.

Installation

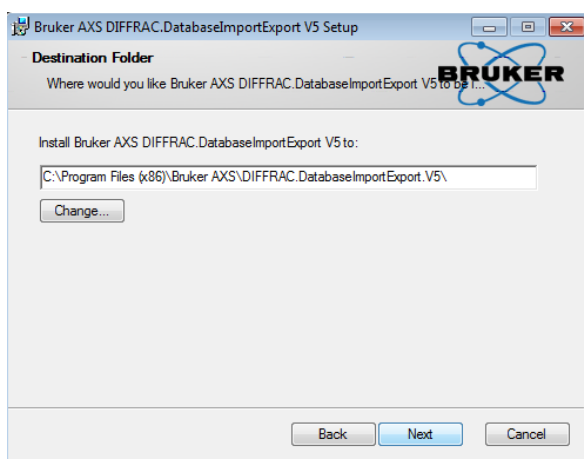
1. To install, navigate to the **\Database** folder on the installation CD.
2. Double click the file **DatabasImportExportSetup.exe**



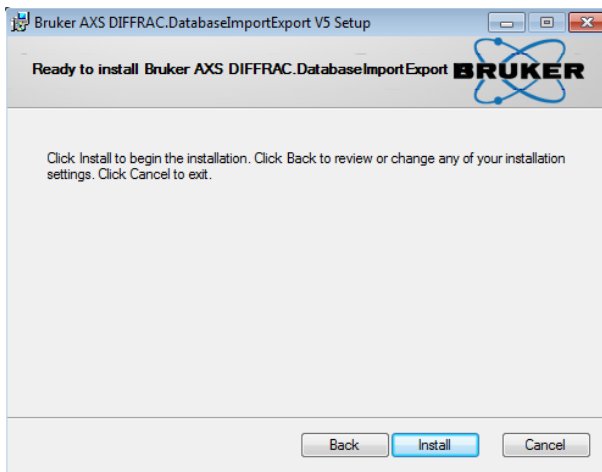
3. Press **Yes**



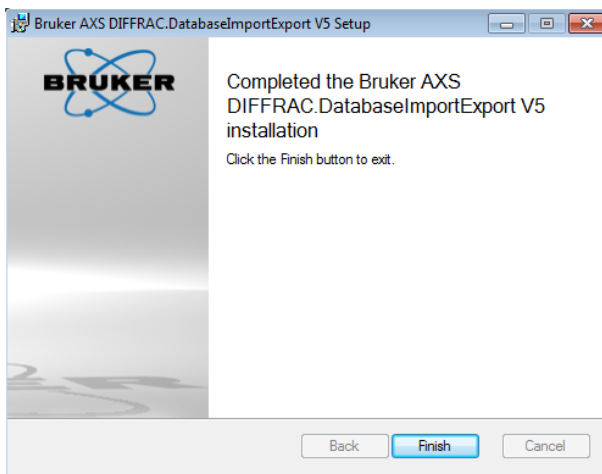
4. Press **Next**



5. Select the installation directory, and press **Next**.



6. Press **Install** to start the installation.



7. Press **Finish** to close the installation program.

Set up an automatic backup

To set up an automatic database backup, install **DatabaselmportExport** on the PC where the Bruker AXS database is installed, first.

The installation directory is usually:

C:\Program Files (x86)\Bruker AXS\DIFFRAC.DatabaseImportExport.Vx

where x is the version of **DatabaselmportExport.exe** e.g. V5

The default settings of an automatic database backup are: One backup every 14 days at midnight.

The backup is stored in the default directory, usually:

c:\ProgramData\Bruker AXS\Database Backup

If you want to change the default settings,

1. Open the file **DatabaselmportExport.exe.config** with a text editor e.g. Notepad.exe:
2. Navigate to the end of the file:
3. And modify the items **StartHour**, **StartMinute**, **Intervall**, **BackupPath**, **StartDay**, **StartMonth**, **StartYear**.
4. Edit the text between **<value>** and **</value>** to your needs.
5. Then save the file into the same directory.

```

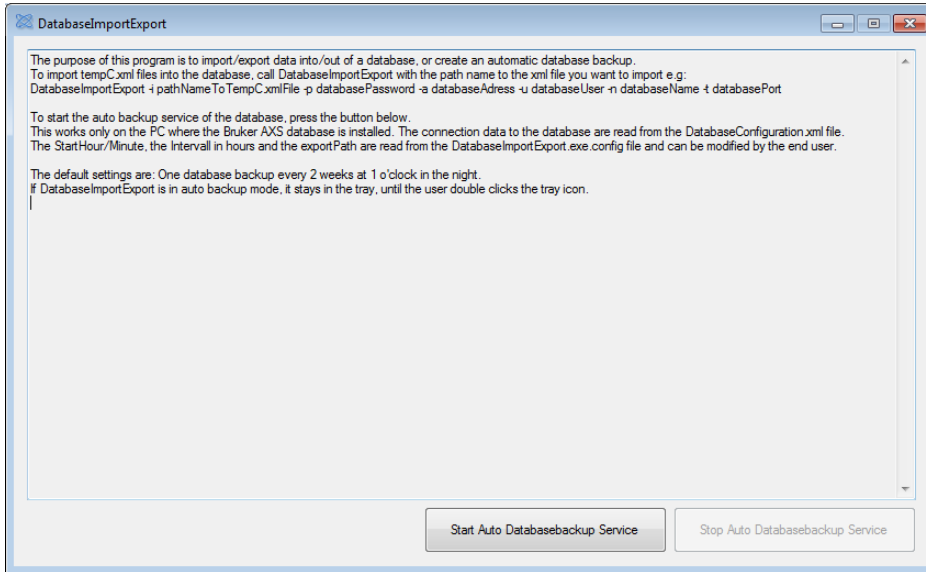
<BrukerAXS.Database.DatabaselImportExport.Properties.Settings>
  <setting name="StartHour" serializeAs="String">
    <value>1</value>
  </setting>
  <setting name="StartMinute" serializeAs="String">
    <value>0</value>
  </setting>
  <setting name="Intervall" serializeAs="String">
    <value>14</value>
  </setting>
  <setting name="BackupPath" serializeAs="String">
    <value></value>
  </setting>
  <setting name="StartDay" serializeAs="String">
    <value>1</value>
  </setting>
  <setting name="StartMonth" serializeAs="String">
    <value>1</value>
  </setting>
  <setting name="StartYear" serializeAs="String">
    <value>2015</value>
  </setting>
</BrukerAXS.Database.DatabaselImportExport.Properties.Settings>

```

StartHour	Start hour of the auto backup in 24h format. Allowed values 0..23
StartMinute	Start minute of the auto backup in minutes. Allowed values 0..59
Intervall	Interval in days. Defines after how many days a backup shall be performed. Allowed values from 1 to 365. Default 1 for a daily backup.
BackupPath	The directory path where the backup files shall be stored. If empty, the default path: c:\ProgramData\Bruker AXS\Database Backup\ is used.
StartDay	Start day of the auto backup. Allowed values from 1 to 31
StartMonth	Start month of the auto backup. Allowed values from 1 to 12
StartYear	Start year of the auto backup, e.g. 2015

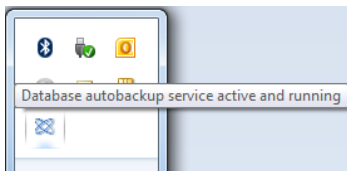
Start an automatic backup

1. Start the file **DatabaselImportExport** from the explorer, or the menu.



2. Press the **Start Auto Databasebackup Service**.

- ▶ The program disappears into the **Windows** tray.



- ▶ The program stays in memory and checks periodically, if an auto backup shall be performed, beginning from the Start date/time and the defined interval.

If you want to watch the status, or stop the auto backup,

1. double click the icon in the **Windows** tray and
2. press the **Stop Auto Databasebackup Service**.

To check if the auto backup succeeded,

1. either open DIFFRAC.SUITE or SPECTRA.ELEMENTS and use the **LOG** plugin.

...	Date/Time	Description	Details
▼	K...		
!	03 August 2015...	Database backup file successfully created : C:\ProgramData\Bruker AXS\Database Backup\BAXSdb_03Aug2015_1610.backup	
▶	03 August 2015...	DatabaseImportExport started, Parameters : -b	

2. or double click the icon in the **Windows** tray to show up the user interface.
3. or navigate to the logs directory:
c:\ProgramData\Bruker AXS\Logs
4. and open the file **DatabaseImportExport.log**.

NOTICE

DatabaseImportExport shall be installed on the PC where the Bruker AXS database is installed. Otherwise the auto backup won't work.

NOTICE

It is possible to create a consistent backup while the instrument is running. However the backups should be created at times where the job load of the instrument is reduced, e.g. in the night.

19 Database Troubleshooting

The database is essential for a reliable function of the measurement or evaluation software. If only a **Repair User** appears in the login screen of the framework, something went wrong. This could be:

1. Wrong database address in the database configuration files
2. Wrong database version
3. Database Service not running

19.1 Wrong Database Address in the Database Configuration Files

At startup, the software reads the location of the database server from two configuration files. They are located in the directory: **c:\ProgramData\Bruker AXS\Config**

There are two files (x is the actual version, e.g. 7):

- **DatabaseConfigurationVx.xml** (Used for the client software, e.g. SPECTRA.ELEMENTS or DIFFRAC.SUITE)
- **DatabaseConfigurationMeasurementServerVx.xml** (used for the measurement server only)

Both files have the same structure:

```
...
</AssemblyNames>
<DatabaseName>BAXSdb</DatabaseName>
<DatabaseAddress>localhost</DatabaseAddress>
<DatabasePort>5432</DatabasePort>
...
```

Check the line **<DatabaseAddress>localhost</DatabaseAddress>**. Most probably the address is wrong, or the database server doesn't answer, because the firewall blocks the access, or the database server is configured to work locally only.

The files are modified by the software, if the user connects to another instrument, and this instrument use another database server as the actual instrument.

Mostly, the instruments are configured to work with a local database only, then the correct settings in the configuration files would be:

- **<DatabaseAddress>localhost</DatabaseAddress>**
or
- **<DatabaseAddress>%COMPUTERNAME%</DatabaseAddress>**

Both settings are equivalent.

If your database is configured to be on a remote database server, then the ip address, or the computer name of the database server PC must be configured here.

- Take care that the database server is reachable, e.g. with a ping command in a DOS box
- The database is configured to allow remote access (see **Readme_PostgreSQL.txt** in the **\Database** directory on the installation CD for details)
- The firewall of the database server is configured to allow connections at port 5432 (see **Readme_Firewall.txt** in the **\Database** directory on the installation CD for details)

19.2 Wrong database version

The software version and the database version must exactly match, since the structure of the database changes from version to version, and the software relies on the exact structure. For that reason the database version is checked at startup against the version required by the software. If the versions don't match, you will get the **Repair User** as well.

In the installation directory of the measurement software, e.g.:

C:\Program Files (x86)\Bruker AXS\DIFFRAC.MEASUREMENT CENTER

There is a valid empty database image, **DatabaseBackupVx.backup**, where x is the version number of the database, e.g. 7.

1. Use **DatabaseMaintenance.exe** and the function **Overwrite Database**, to overwrite the actual database.
2. Then restart the software.

19.3 Database Service Not Running

To correct the problem:

1. Select **Start | Control Panel | Administrative Tools | Services**

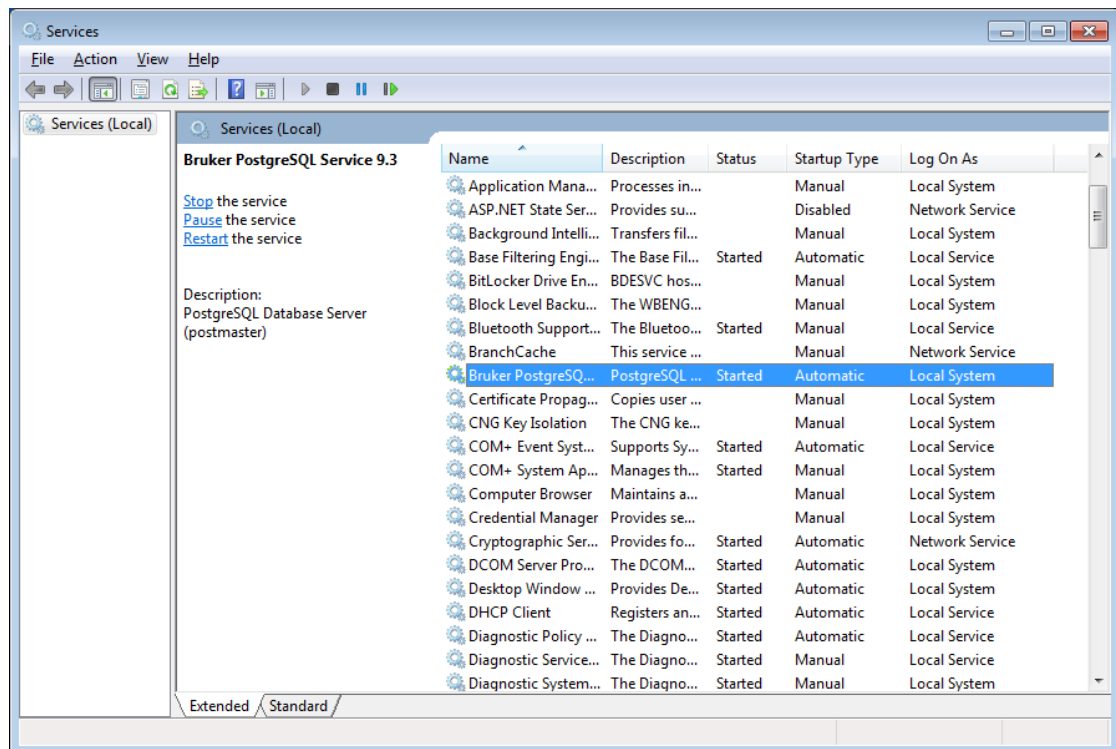


Figure 19.1: The Services screen

2. Locate the entry **Bruker PostgreSQL**. The status of the service must be on **Started**.
3. If the service is not started, right click on the line and select **Start**.
 - The operating system attempts to start the service.
4. If the service status changes to **Started**, log in to the software again.
 - If the **Repair User** does not re appear the repair process was successful.
5. If the service cannot be started, locate the file **postmaster.pid** on the hard disk.
6. If the software was installed on an English operating system with default settings, the path to the file is: **c:\Users\All Users\Bruker AXS\data-9.3**

7. Delete the file and restart the service as described above.
8. If this fails, restart the entire PC.
9. If the service continues to fail, uninstall the **Bruker PostgreSQL database** by selecting **Start | Administrative Tools | Control Panel | Add or Remove Programs**

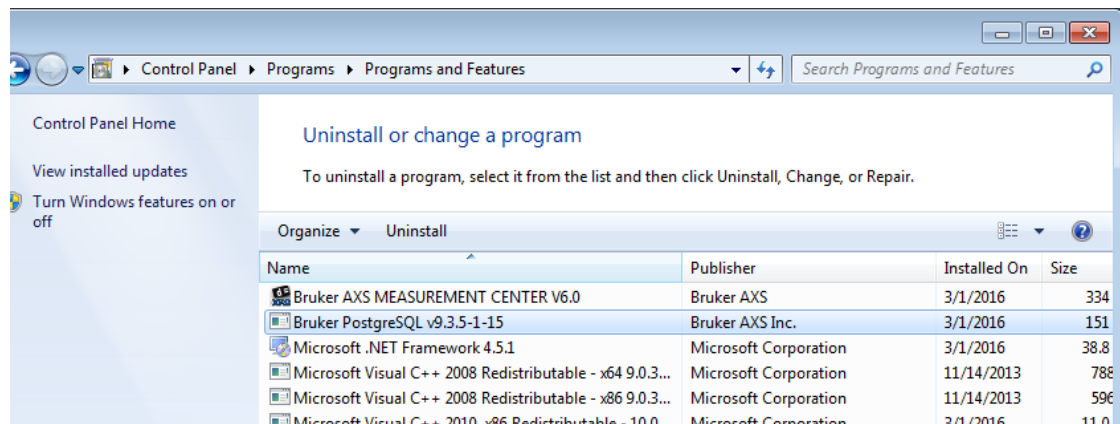


Figure 19.2: Add or Remove Programs

10. Click on **Remove** to un-install **Bruker PostgreSQL**.
11. After the un-installation, delete the two directories: **data-9.3** and **BAXSdb-9.3** from the hard disk. The locations of the directories on an English operating system are: **c:\Users\All Users\Bruker AXS**
12. Delete the following directories: **9.3.6 | bnpython | postgresql-9.3** from the **c:\Program Files\Bruker AXS** directory.
13. After the directories have been removed, install the **Bruker PostgreSQL database** again from the installation CD of the software.

After the installation, use **Database Maintenance** to install a valid **database backup file** as stated under section [Wrong database version \[270\]](#).

20 Script Designer

20.1 General

The **Script Designer** is an easy to use, yet powerful tool that enables the user to create custom measurement scripts. The tool provides scriptable access to many aspects of the measurement procedure as well as to the behavior and the status of the instrument.

High level functions like measurement setup, measurement execution, peak fitting, and so on can be combined in all thinkable ways and can be arranged via standard structuring elements like loops, conditional execution, user functions, and so on.

Commonly used high level tasks like complete alignment procedures can be imported from provided libraries and can easily be integrated into measurement procedures.

20.2 Screen Layout and Operation

20.2.1 Opening the Script Designer

The script designer can be opened from the menu item **Commander | Script Designer | ...** within the COMMANDER plugin. Selecting this item opens the **Script Designer** in a separate window.

20.2.2 The Main Window

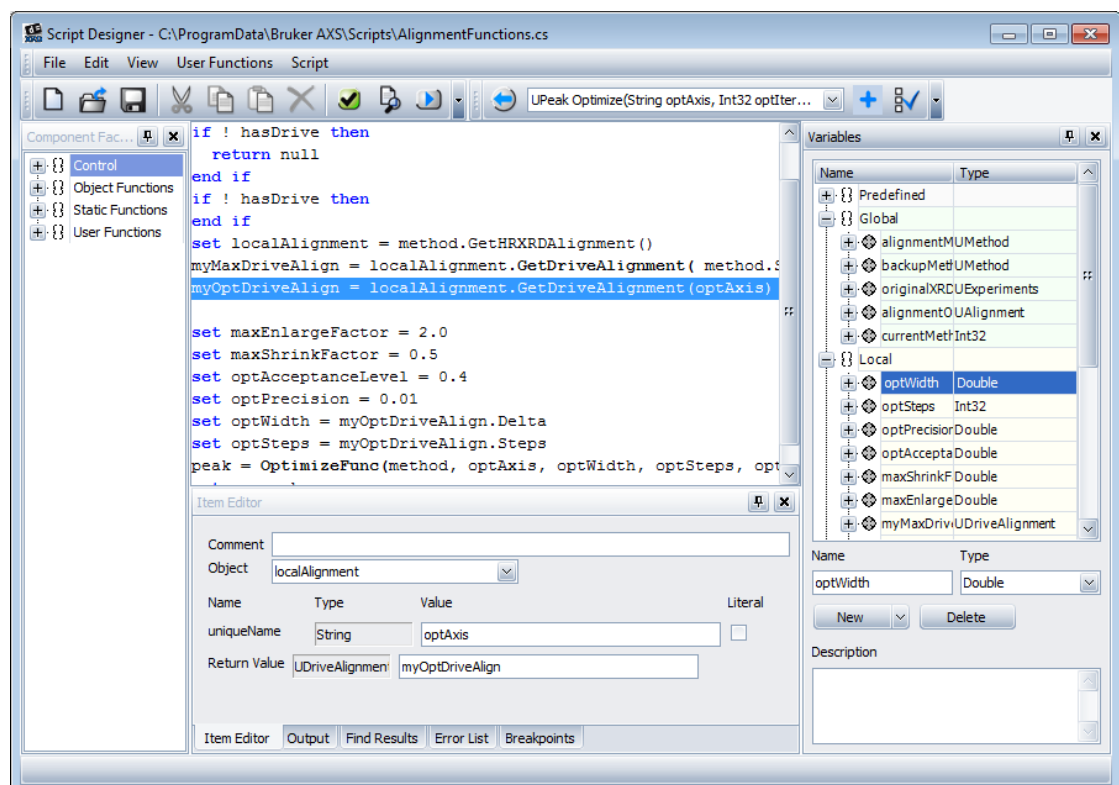


Figure 20.1: Main Window of the **Script Designer**

The main window of the **Script Designer** consists out of different functional areas:

- Menus
- Toolbars
- Script Item Panel
- Component Factory
- Item Editor
- Output
- Find Results
- Error List
- Breakpoints

The following sections describe the individual items and associated dialogs of all menus and functional areas.

20.2.2.1 The Menus

This section describes the individual items and associated dialogs of all menus.

20.2.2.1.1 The File Menu

New	This item creates a new empty script.
Open...	This item shows a file selection dialog which lets the user choose a script file to open. Supported file types are Script-Files ending with cs files that were created with the Script Designer as well as Libraries ending with dll that were created with the Script Designer . Note that cs files and dll files that were not created with the Script Designer can't be opened in the Script Designer .
Recent Files	This sub menu shows the recently opened files. Clicking on one of them opens the appropriate script file or library.
Save	This item saves the currently opened script at its associated location. If no file name is known (i.e. new scripts), a file selection dialog will show up which lets the user select a file name.
Save As Script...	This item shows a file selection dialog which lets the user select a script file name. The actual script will be saved as a script-file (cs).
Save As Library...	This item shows a file selection dialog which lets the user select a library file name. The actual script will be saved as a library (dll) which can be referred by other scripts or libraries via Library References....
Library References...	This item shows the library reference dialog. Within this dialog, the user is able to add libraries (dll) that were created with the Script Designer to the current script or library. Adding a library means that all exported functions of the referenced library can be used within the current script or library. The referenced library functions can be used (called) via the component factory tree in the branch Library Functions .
File Properties...	This item shows a dialog where script associated data can be edited:

Library Namespace	<p>If the current document is saved as a library, this field indicates the namespace which encapsulates the exported functions of the library. This is useful to arrange library functions of multiple libraries in a natural way.</p> <p>Note: Namespaces can be nested by using the period (.). So, for instance, the namespace Math.Fitting would encapsulate the exported functions to another script via Library Functions Math Fitting.</p>
Open Instrument Configuration...	<p>The Script Designer can be started stand-alone. In that case the designer is not connected to any instrument. In order to support enumeration of scan types, detector names, drive names, and so on of a given instrument, its instrument configuration file (biml) can be opened. With that, it is possible to work on scripts offline.</p> <p>Note: An opened instrument configuration is indicated in squared brackets in the title bar of the script designer.</p>
Recent Instrument Configuration	This sub menu gives access to recently opened instrument configuration. A click on a recently used instrument configuration opens the associated configuration.
Close Instrument Configuration	This item closes an opened instrument configuration.
Preferences...	This item shows a dialog which provides access to various user settings that influence the behavior of the script designer.
Startup	<ul style="list-style-type: none"> • Reopen last script on startup: If this item is enabled, the script or library that was opened when exiting the script designer will automatically be reopened when starting the script designer the next time. • Reopen last instrument configuration on startup: If this item is enabled, the instrument configuration that was opened when exiting the script designer will automatically be reopened when starting the script designer the next time.
Default Application Type	<ul style="list-style-type: none"> • Use the following application type as default: The selected application type will be suggested by default when creating a measurement method or setting up a scan, unless it is overridden by the framework (see next preference item). • Prefer application type provided by framework: If this item is enabled, the default application type (see preference item above) will be acquired from the application type that is currently selected in the measurement framework.
UI	<ul style="list-style-type: none"> • Automatically collapse previous branch when expanding new branch: This item affects the behavior of the trees of the component factory panel as well as the variables panel. If this item is enabled, all other branches of the same hierarchy level will automatically collapse if the user opens a branch. This feature is useful for a better clearness of the actually selected branch. • Bring output window to front on script start: If this item is enabled, the script designer will make sure that the output panel is visible when starting a script.

	<ul style="list-style-type: none"> • Remember UI layout: If this item is enabled, the UI layout (position and sizes of movable windows, toolbar customization, menu customization, main window position and size, etc.) will be saved when closing the script designer. These layout settings will automatically be restored when opening the Script Designer again. Note: The layout can be reset to factory defaults via the menu item View Restore Default Layout or with the keyboard shortcut Ctrl+Shift+R. • Ask user before discarding unsaved changes: If this item is enabled, the script designer will ask the user to save unsaved changes before creating a new script, opening another script, or leaving the script designer.
Wizard	<ul style="list-style-type: none"> • Show Create variable dialog for unknown identifiers: If this item is enabled, a 'create variable' dialog shows up each time an unknown variable identifier is recognized within the item editor panel. This dialog facilitates the creation of new variables.
Exit	This menu item closes the Script Designer .

20.2.2.1.2 The Edit Menu

Enable/Disable	This item toggles the Enable/Disable annotation of the currently selected script items. Note: This item is also accessible via the context menu (right mouse click) of the script item panel.
Cut	This item removes the currently selected script items and copies them to the clipboard. Note: This item is also accessible via the context menu (right mouse click) of the script item panel.
Copy	This item copies the currently selected script items to the clipboard. Note: This item is also accessible via the context menu (right mouse click) of the script item panel.
Paste	This item inserts script items from the clipboard before the actual selection. If no script items are currently selected, the script items from the clipboard will be appended. Note: This item is also accessible via the context menu (right mouse click) of the script item panel.
Delete	This item deletes the currently selected script items. Note: This item is also accessible via the context menu (right mouse click) of the script item panel.
Find	This item shows a dialog which lets the user search any text within the current script. The results of the search will be shown in the separate panel called Find Results .

20.2.2.1.3 The View Menu

Previous Function	This item navigates back to the previously opened user function. With this feature it is easier to navigate through the user functions of a script or library.
Component Factory	This item shows / hides the component factory panel.
Item Editor	This item shows / hides the item editor panel.

Variables	This item shows / hides the variables panel.
Output	This item shows / hides the output panel.
Find Results	This item shows / hides the find results panel.
Error List	This item shows / hides the error list panel.
Breakpoints	This item shows / hides the breakpoints panel. Restore Default Layout This item restores the user interface layout of the Script Designer to the factory settings. The keyboard shortcut is Ctrl+Alt+R . This is useful if this item can't be accessed due to a missing menu.

20.2.2.1.4 The User Functions Menu

Add Function...	This item shows a dialog which lets the user create a new user function:
Function Name	This edit field defines the name of the user function. Note: The function name must be unique – function overloading is not supported.
Return Type	This defines the type of the return value of the user function. Note: The type Void indicates that the user function does not return a value.
Synopsis	This field provides room to document the new function as a whole. Individual calling parameters and an optional return value can be documented in the Description field and the Return Value Description field, respectively.
Return Value Description	This field is intended to document the meaning of the returned value. Note that this field is only accessible if the return value is not Void .
Function Parameters	The function parameter list defines the parameters that need to be provided in order to call the user function. Function parameters can be added via the New button. Their name and type can be defined via the appropriate widgets. With the buttons Up and Down , the order of the function parameters can be altered. Note: When changing the signature of an existing user function (i.e. number, type, and order of function parameters), all calls to that function need to be revised and updated manually.
Description	This field is intended to document the meaning of the currently selected function parameter. Export as library function. This check mark box indicates that this user function shall be exported to other scripts or libraries. This field is only visible if the current script is saved and edited as a library (see menu File Save As Library ...).
Remove Function...	This item removes the user function that is currently selected in the component factory (not the function selector).
Parameters...	This item opens the function signature of the currently selected function (via function selector). The dialog lets the user alter the function name, return type, and parameter number, type, and order of the function parameters. Note: When changing the

	signature of an existing user function (i.e. number, type, and order of function parameters), all calls to that function need to be revised and updated manually.
--	---

20.2.2.1.5 The Script Menu

Check Script	This item test-compiles the current script with the C# compiler in order to see if there are any errors in the script. If errors are detected, they will be shown in the Error List panel. A double click on an error item will navigate the user to the erroneous location within the script that caused the compilation error.
View C#...	This item opens a read-only editor which shows the C# source code that is generated by the script designer from the current script. This is a diagnostic feature. However, this feature also demonstrates advanced script programmers how to create pure C# scripts without using the Script Designer .
Run	This item compiles and runs the current script. If a library is started via this item, it is compiled and executed as a script (therefore also the function Main is executed, although the function Main is not used when saved and used as a library).
Debug	This item is similar to the Run item except that the compilation includes additional debug information. This item is only useful if a C# debugger is attached and used.
Documentation ...	This item opens a dialog which creates a document from the built-in documentation system. The documentation covers built-in functions as well as documented user functions and their parameters.
Built-In Object Functions:	This check mark box indicates that built-in object functions shall be included in the generated document.
Built-In Static Functions	This check mark box indicates that built-in static functions shall be included in the generated document.
User Functions:	This check mark box indicates that user functions shall be included in the generated document.
Suppress Undocumented Items	This check mark box indicates that undocumented functions will not be included into the resulting document.
Save As	This check mark box indicates that the generated document shall be saved. The path to the generated document can be selected via the field below.
Open in Internet Explorer:	This check mark box indicates that the generated document shall be opened in a web browser. If Save As is not selected, a temporal path is created automatically

20.2.2.2 The Toolbars

By default, there are two toolbars which are located above the script item panel (below the menu). One contains shortcuts to the most frequently used functions.

The other toolbar contains the function selector which is used to switch the actually displayed function content in the script item panel.

20.2.2.3 Script Item Panel

The script item panel is the area in the middle of the window. It is a list of single script items that build up the currently selected function (see function selector toolbar above). When starting with an empty script, this area is completely empty (white).

20.2.2.4 Component Factory

The component factory is a movable tree panel which is by default docked at the left side of the script item panel. It contains all possible script items that can be created by dragging and dropping items from the component factory panel into the script item panel.

The creatable script items are ordered hierarchically within the tree panel. The items are classified into the following main groups:

Control	This group contains all script items that influence the program flow of the script. It includes standard elements like conditional branching (“if” statements), loops (“for” or “while” statements), exception handling, and other flow controlling statements of procedural programming languages.
Object Functions	This group contains all the functions that refer to distinct variables (objects) of a specific type. In object oriented programming languages, these functions are also known as the methods of a specific type. These functions provide the interface to the measurement and instrument logic.
Static Functions	This group contains all built-in static functions. Static functions are not related to specific variable types (like object functions). Static functions can therefore be called from anywhere without the need for an associated variable type.
User Functions	This group contains the (static) functions that are defined within this script. By dragging and dropping functions from this group, the associated user defined function will be called. Note: In order to create new user functions or change existing ones, use the function selector widget from the toolbar.
Library Functions	This group contains (static) functions from referred libraries. They provide access to higher level tasks that are encapsulated in libraries. Note: This group is only visible if the actual script refers to libraries. See also the menu item File Library References

20.2.2.5 Item Editor

The item editor is a movable form panel which is by default docked at the bottom side of the script item panel. Its content is context sensitive and reflects adjustable parameters of the currently selected script item of the script item panel.

20.2.2.6 Output

The output editor is a movable text panel that is by default docked at the bottom side of the script item panel. By default, it shares the same docking window as the item editor and is therefore accessible via the tab selector **Output**.

The output panel shows textual output created by scripts via the static function **Logging | WriteToOutput**. It is primarily intended as a monitoring and debugging feature.

20.2.2.7 Find Results

Find Results is a movable text panel that is by default docked at the bottom side of the script item panel. By default, it shares the same docking window as the item editor and is therefore accessible via the tab selector **Find Results**.

Find Results lists all matching items that were previously searched with the menu item **Edit | Find**. Double clicking on a result line brings the appropriate item into focus.

20.2.2.8 Error List

Error List is a movable text panel that is by default docked at the bottom side of the script item panel. By default, it shares the same docking window as the item editor and is therefore accessible via the tab selector **Error List**.

Error List lists all errors and warnings created by the script compiler. Double clicking on an error or warning line within this list brings the appropriate item into focus.

20.2.2.9 Breakpoints

Breakpoints is a movable text panel that is by default docked at the bottom side of the script item panel. By default, it shares the same docking window as the item editor and is therefore accessible via the tab selector **Breakpoints**.

Breakpoints lists all active breakpoints that were set within the current script. Double clicking on a breakpoint line within this list brings the appropriate item into focus. Note that breakpoints can only be used if a debugger is attached to the script designer. Variables

The variables widget is a movable panel that is by default docked at the right side of the script item panel. Its task is to display all declared variables in the given context as well as creating, editing, and deleting variables. Besides, each variable shows its associated object functions and properties. Depending on the context, variables, functions, and properties can be dragged from this panel and dropped into the script item panel and/or into fields of the item editor.

Predefined	This section of the variables panel displays the variables that are always available when starting a script.
Global	This section of the variables panel displays the variables that are globally defined by the script. Globally defined variables can be accessed by any user function.
Local	This section of the variables panel displays the variables that are locally defined by the currently selected user function. These variables are only accessible within the current user function and can't be accessed by any other function. This section of the variables panel displays the function variables. These are the variables that are passed to the user function by the function caller. Note that these variables are also local and can only be accessed by the user function itself.
Scope	This section of the variables panel displays scope variables. Scope variables are only accessible within a distinct scope. Scope variables are implicitly defined by some kind of control blocks like For / End For , ForEach / End ForEach , or Try / Catch / Finally / End Try and are only accessible within their scope.

20.3 Controlling Script Items

Script items that control the program flow can be created via the **Control** branch of the component factory tree. The goal of this section is to describe each control item and its associated parameters that can be manipulated via the item editor panel.

Note that the principal program flow is top down starting at the first (most upper) script item of a function.

Note also that each element has an additional text field called **Comment** which may or may not contain a line of text which describes, documents or simply comments the intention of the statement.

Comment

The purpose of a comment item is to place a comment line in the script item panels. A comment item is usually used to document the behaviour and or the intention of the following script items. A comment item does not influence the program flow. The one and only field that is editable for a comment item is its "Comment" field which may contain one line of free text.

Conditional Branching

Conditional branching is intended to execute blocks of script items depending on the outcome of a given condition.

- **If / End If:** The block of script items which is surrounded by "if / end if" is only executed if and only if the associated conditional expression field evaluates to "true". The associated conditional expression can be edited via the text field "Boolean Expression" in the item editor. Besides, any variable or subordinated function which is needed within this expression can be dragged from the variables panel and dropped into this text field.
- **Else If:** The "else if" statement is a supplementary optional statement that can be used inside an "if / end if" block. Its conditional expression is only evaluated if none of the preceding "else if" or the embracing "if" statements evaluated to "true". If the "else if" condition is considered (because none of the previous conditions hold), the following block of script items is executed if and only if the expression evaluates to "true". Note: The "else if" item has no meaning outside of an "if / end if" block. If found outside of an "if / end if" block, the compiler will mark this as a syntactical error.
- **Else:** The "else" statement is a supplementary optional statement that can be used inside an "if / end if" block. Its following block of script items will only execute if none of the previous "if" and optional "else if" conditions hold. Note that an "else" item can only be used inside an "if / end if" block. If the block contains one or more of the optional "else if" blocks, the "else" item may only occur after the last "else if" statement.

Conditional Multi Branching

Conditional multi branching compares an expression (declared in "switch / end switch") against multiple unique constants (declared in one or more "case / end case" statements). If the evaluated expression matches a given constant, the block of script items inside the associated "case / end case" statement will be executed. If none of the given constants matches the evaluation result of the expression the script items inside the optional statement "default case / end case" will be executed.

- **Switch / End Switch:** This statement is the surrounding required statement for conditional multi branching. It defines the expression field that will be evaluated to compare the result against constants defined in nested "case / end case" statements. The type of the expression results must be a type that can be expressed as constants (literals). These are namely the types 'int' and 'string', but also other types might be suitable. Note that all script items inside a "switch / end switch" must be nested in either a "case / end case" or inside the "default case / end case" statement.

- **Case / End Case:** The “case / end case” statement compares its (optionally multiple) constants against the expression evaluation result of the surrounding “switch / end switch” statement. If one of its constants matches the evaluation result, the nested block of script items will be executed. Note that all constants must be unique, that is no constant must be equal to any other case constant inside the same “switch / end switch” block.
- **Default Case / End Case:** Code surrounded by the “default case / end case” statement is executed if and only if none of the constants given by the other “case / end case” statements within the same “switch / end switch” block match the expression.

Exceptions

Exception handling (throwing as well as catching exceptions) is supported by the script designer. Exceptions are usually raised (thrown) if there is an error situation which can't be resolved at this point within the code. Raised (thrown) exceptions in turn can be caught by the function caller, who then decides how to deal with the error situation.

- **Throw:** The “throw” statement raises (throws) a new exception. The thrown exception is always of the type “UException” which supports definition of an error text, an error category, an error ID, and an error severity. If a thrown exception is not caught by a caller via the “Try / Catch / Finally / End Try” statement, the thrown execution will result in the termination of the script, and the error message attached to the exception will be printed to the “Output” window.
- **Try / Catch / Finally / End Try:** The “Try / Catch / Finally / End Try” statement catches any exception that was raised while executing the script items between “Try” and “Catch”. If an exception is raised by a script item (possibly a user function) the remainder of script items between “Try” and “Catch” will be skipped and the items between “Catch” and “Finally” will be executed. The “Try / Catch / Finally / End Try” statement defines an exception variable which needs to be named by the user and which may be used between “Catch” and “Finally” in order to retrieve exception information. It is accessible via the “Scope” variables of the “Variables” panel. Finally, the script items between “Finally” and “End Try” will always be executed when leaving the whole “Try / Catch / Finally / End Try” block, regardless if an exception was thrown and caught or if no exception occurred

Loops

Loops are one of the very basic statements of any procedural / object oriented program languages. They are used to repeat a block of script items several times. Loops come in different flavours in order to suit different situations.

- **For / End For:** The “For / End For” loop defines a counting variable (of type integer) which needs to be named by the user and which can be accessed via the “Scope” variables of the “Variables” panel. The variable will be initialized with the value given by the expression “Start” and will be incremented by one after each execution of the nested script items. The loop will be executed one last time if the counting variable reaches the expression given by “End” and will be left afterwards. Note that “End” must be greater or equal to the “Start” expression. Nonobservance will result in an endless loop. Note: If you need more detailed control over a loop (i.e. counting variable type, stepping size, stepping direction), consider using the “While / End While” statement instead.
- **While / End While:** The script items between the “While” and “End While” statement will be executed as long as the associated condition (Boolean expression) evaluates to ‘true’. Note that the expression will be evaluated **before** executing the nested items. The loop will be left immediately if the expression evaluates to false.
- **Do / While:** The script items between “Do” and “While” statement will be executed as long as the associated condition (Boolean expression) evaluates to ‘true’. Note that the expression will be evaluated **after** executing the nested items. Therefore the loop always executes at least one time.

- **ForEach / End ForEach:** The “for each” statement may be used to iterate through all items of an enumerable collection like lists (UList<...>), but also other enumerable objects like “UExperiments”, “UExperiment”, or strings. The user needs to provide an iteration variable name and the collection that shall be iterated. The iteration variable type is determined automatically via the given collection. Note that the iterated collection within a “for each”-loop must not be modified. Therefore, the order of the elements and the size of the collection can’t be changed within a “for each”-loop. If you need to change the elements of a collection within a loop, consider using one of the alternative loops like “For / end for”, “while / end while”, or “do / while”, instead.
- **Break:** The “break” statement can be used inside any loop. The “break” statement leaves the actual loop immediately and the program flow continues after the broken loop. Note that for nested loops, the “break” statement only leaves (breaks) the most inner loop.
- **Continue:** The continue statement can be used inside any loop. The “continue” statement skips the remainder of the script items inside the loop and continues execution at the expression evaluation.

Return

The “Return” statement leaves the actual function immediately and returns the provided expression result to the caller. Note that the type of the resulting value must match the return type of the function declaration. If the return type is “Void”, the return expression must be left blank.

Note: A “Return” statement inside the “Main” function terminates the script.

Set Variable

The “Set Variable” statement assigns a value (the result of an expression) to a variable.

Verbatim C# Statement

“Verbatim C# Statement” inserts plain C# code provided by the user at the current position. It is intended for advanced users, who are familiar with the C# programming language, to access extended C# syntax and techniques that can’t be accomplished with the standard elements of the script designer.

21 License Notes

The Bruker AXS MEASUREMENT CENTER is protected by copyright law and international treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.

The Bruker AXS MEASUREMENT CENTER is based on modules that are under the license models below. Please check the different license models for details.

Bruker AXS will provide upon written request via email and/or traditional paper mail the applicable GPL and LGPL source code files via CD-ROM for a nominal cost to cover shipping and media charges as allowed under the GPL and LGPL.

LGPL

NHibernate
Mono.Security
Npgsql

Apache Licence

Castle Core
Castle.DynamicProxy2
log4net

GPL

ICSharpCode.SharpZipLib

Microsoft Public License (Ms-PL)

Ionic.Zip

Others

Iesi.Collections
NUnit
SQLite

Instrument Firmware modules

In the instrument, the Linux based firmware uses the modules listed below that are under a GPL license. These modules are available on request as required by the GPL license policy:

Module	License	Homepage
Linux	GPLv2	http://kernel.org
Bridge	GPLv2+	http://bridge.sourceforge.net

Module	License	Homepage
BrukerAXS drivers	GPLv2	n.a.
Busybox	GPLv2	http://busybox.net
Directfb	LGPLv2+	http://www.directfb.org/
Dosfstools	GPLv2+	ftp://ftp.uni-erlangen.de/pub/Linux/LOCAL/dosfstools/
e3	GPLv2+	http://sites.google.com/site/e3editor/
gcc	GPLv2+/LGPLv2.1+	http://gcc.gnu.org
gcrypt	LGPLv2.1+	http://directory.fsf.org/project/libgcrypt/
glibc	LGPLv2.1+	http://www.gnu.org/software/libc/
gnutls	LGPLv2.1+	http://www.gnu.org/software/gnutls/
grub	GPLv3+	http://www.gnu.org/software/grub/
inetutils	GPLv3+	http://www.gnu.org/software/inetutils/
kvm	GPLv2/LGPLv2.1	http://www.linux-kvm.org/page/Main_Page
libelf	LGPLv2+	http://www.mr511.de/software/
libgpg-error	LGPLv2.1+	http://www.gnupg.org/download/
libtasn1	GPLv3/LGPLv2.1	http://www.gnu.org/software/libtasn1/
libxau	modified MIT	http://xorg.freedesktop.org/archive/individual/lib/
libz	ZLIB	http://www.zlib.net/
lm-sensors	GPLv2+	http://www.lm-sensors.org/
nano	GPLv3+	http://www.nano-editor.org/
nas	modified MIT	http://www.radscan.com/nas.html
nct	GPLv2+	n.a.
ncurses	modified MIT	http://www.gnu.org/software/ncurses/ncurses.html
pam	3-clause BSD/GPL	http://www.kernel.org/pub/linux/libs/pam/
realtek	r8168 GPLv2+	http://www.realtek.com.tw/
rtai	GPLv2+/LGPLv2+	http://www.rtai.org/
schedutils	GPLv2	http://rlove.org/
SDL	LGPL2.1	http://www.libsdl.org/
Strace	3-clause BSD	http://sourceforge.net/projects/strace/
Svgalib	free	http://www.svgalib.org/
Syslinux	GPLv2+	http://syslinux.zytor.com/
Thttpd	2-clause BSD	http://acme.com/software/thttpd/
Tunctl	GPL	http://tunctl.sourceforge.net/
xfree86	XFree86 License	http://www.xfree86.org/

Index

A

Action button	131, 139
Adding users to database	160
Advanced settings	158
Audit trail	157, 165
Audit trail context menu	166
Automatic ordering	109
Average	133

C

Chart area context menu	55
Charts view	135
Column chooser	105
Column editor	71
COMMANDER plug-in	37
Communication timeout	168
Component properties	177, 210
Changing the value of component properties	212
Component status	177
Component status icons	96, 177, 209
Component type icon	96
Components	
Adding to config tree	198
Cloning	201
Creating from scratch in configuration	202
Deleting in configuration	204
Renaming in configuration	204
Compound statistics view	133
Compounds	
sequence	109
Config menu	184
Config Tree context menu	197
Configuration file	
Applying values from configuration file to component in configuration	203
Configuration tree in CONFIG	176
Connected clients	26
Connecting plug-in to instrument	31, 34
By browsing the database (indirect connection)	34
By browsing the network (direct and indirect connections)	35
Control samples	140
Controlled Devices window	158
Copying data from a table	105

D

DA VINCI plug-in	95
Darks	173
Database backup/restore	166, 169
Database Maintenance Window	170

Darks	173
Floods	173
Load Experiments	171
Load Logs	172
Positions	173
Spatials	173
DATABASE MANAGEMENT plug-in	157
Defaults	110
Deleting a user group	164
Deleting devices from database	159
Deleting users from database	160, 162
Detail view	130, 132, 133
Detect mode	113
Detector control	50
Diagnosing faults and malfunctions	217
Direct command mode	63, 218
Disconnecting plug-in from instrument	31
Display Name	107
Drives	
Changing drive properties	44
Drive control	42
Initializing and moving	43

E

Edit menu	30
For CONFIG	205
Editing control	178
Editing the measurement information in START JOBS	70
Editing the measurement information of suspended jobs in JOBLIST	89
Emergency operation	
In the case of database failure	15
In the case of system failure	15
Entering devices in database	159
Error messages	25
Error register	217
Evaluation properties	111
Exiting from MEASUREMENT CENTER	31

F

File menu	31
For all plug-ins	31
Filter	119
application	124
Comment field	129
compound	129
experiment	126
formatting method	126
measurement file	124
measurement method	125
Script file	125
task file	125
time spans	127
user	128
Firmware component reference	191

- Firmware definition 175
 Opening from file, database, or instrument
 183
 Saving to file 184
 Floods 173
 Format 109
- G**
- General settings 157, 166, 168
 Getting control of instruments
 For Measurement server 22, 158
 From TOOLS 207, 216
 Global visualization settings... 141
 Goniometer 96
 Groups table 163
- H**
- Handing over plug-in to other user 31
 Header/Footer 152
 Header/Footer Tab 257
 Help menu 33
- I**
- Instrument configuration 157
 Instrument configurations
 Activating 190
 Deleting from database 160
 Loading into firmware of instrument 160
 Opening from file, database, or instrument
 184
 Saving to file or database 186
 Instrument Configurations window 159
 Instrument network setup 195
 Instrument state
 Opening overview of instrument state 218
 Saving overview of instrument state.... 33, 218
- J**
- Job History 89
 Job priority levels 87
 Job scheduler
 Malfunction 25
 Status 25
 Joblist context menu 94
 JOBLIST plug-in 87
- L**
- Limits highlighting 140
 Load Experiments 171
 Load Logs 172
 Log context menu 246
 LOG plug-in 245
 Logging in/out 29
- Logging options 18
- M**
- Maintaining user data 162
 Maintaining user groups 163, 164
 Maintaining user profiles 160, 162
 Measurement client 29
 Measurement methods ("experiments")
 Directory 168
 Measurement properties 111
 Measurement server
 About Measurement server 26
 Making preliminary settings for Measurement
 server 17
 Measurement server start menu 17
 Miscellaneous properties of components 211
 Modules 114
 Monitoring mode
 number of results 116
- N**
- Network packets 25
 Number of digits 109
- O**
- Offline mode menu 183
- P**
- Parts 154
 Parts Tab 258
 Password settings 167
 Plug status icons 179
 Plug-in concept 29
 Plugs and sockets 179
 Connecting a plug 181
 Positions 173
 Preset mode 113
 Print
 preview 150
 Results 255
 settings 256
 Printout 143
 PSD realtime display 62
- R**
- Reconnecting to instruments 22
 Refresh 118
 Releasing control of instruments
 For Measurement server 22
 From TOOLS 207, 216
 Remote control (virtual component) 220
 Removing samples 254
 Report Layout 151, 256

Repositioning Joblist and Job Details windows	88
Result columns	145
Result rows	144
Results	253
Display	253
invalidate	130
print	143
validate	130
Results directory	169
Results formatting	106
RTF reports	146

S

Sample changer control	42
Scan control	51
Scheduled jobs	90
Creating scheduled jobs	90
Scripts directory	169
Sequence	109
Settings menu	218
Shell interface	30
Show comment View	139
Show measurements View	137
Shown compounds	113
Shown modules	114
Shown parameters	111
Spatials	173
Speed buttons	
In CONFIG	196
In JOBLIST	92
In TOOLS	216
Start Jobs context menu	71
Start Jobs menu	73
START JOBS plug-in	67
Status bar	30
Status window	22
Stopping measurements	254
System configuration	
Extended configuration	13
Standard configuration	13
System information	33

T

Templates	
Applying values from template file to component in configuration	203
Exporting to file	189
Importing from file	188
Text appearance	141
Text size	131
Tools menu	195
TOOLS plug-in	207

U

Unit	107
------	-----

User and group rights concept	160
User management	157, 160
User privileges	103
Users table	160
Utilities menu	213

V

View formatting/specification	102
View menu	191
View pictures View	139
View	
formatting/specification	101
General	101
LAUNCHER	100
results	100
Visibility	107

W

Watermark	155
Watermark Tab	259
Window menu	31

X

X-ray generator control	49
-------------------------	----

Z

ZI and offset determination	63
Zooming in chart area	56





Bruker Corporation

info.baxs@bruker.com
www.bruker.com