

smart-process with spectro2guide

Step-by-Step Guide

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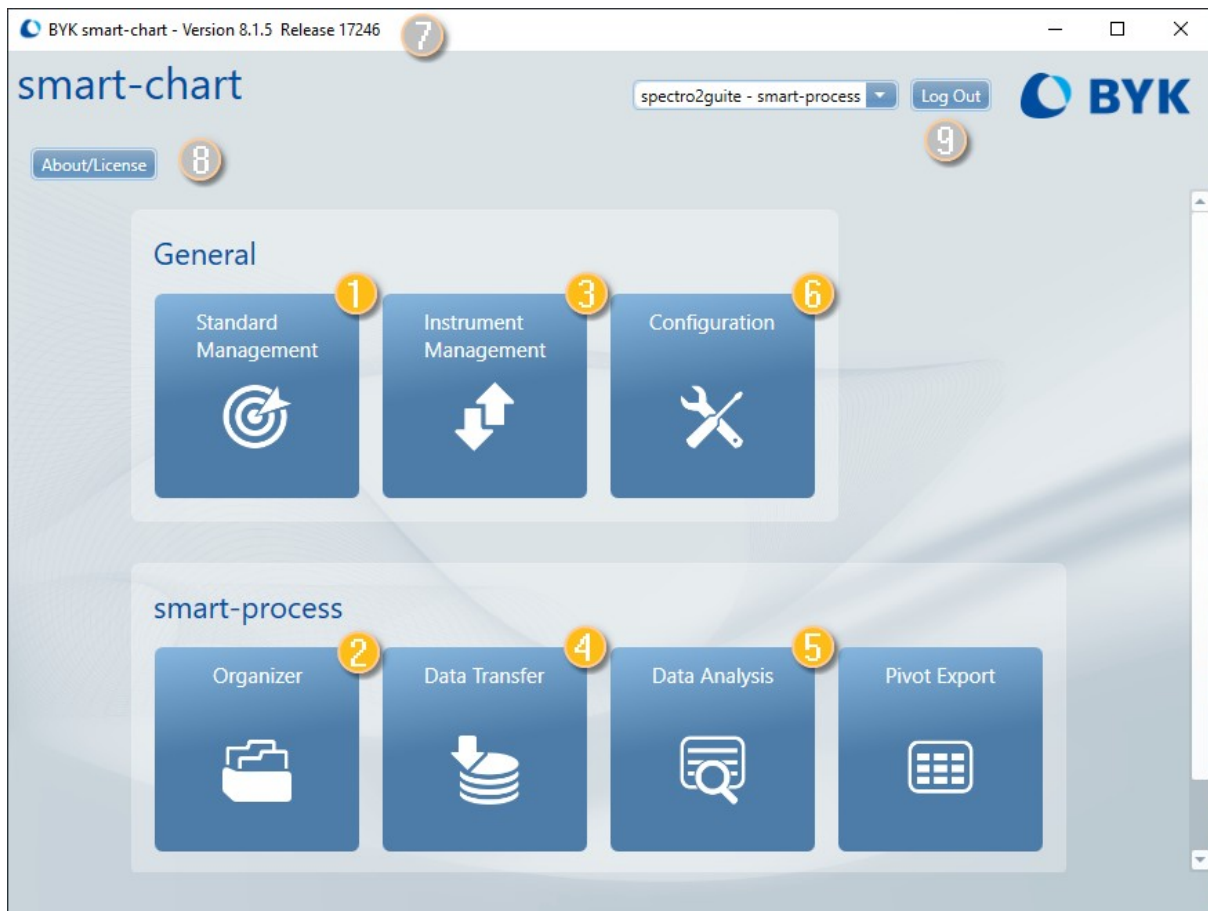
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1

System Description

The main window of smart-process consists of following elements.



1	Standard Management	Definition of color standards with pass/fail limits: Measurement of master panels or import of digital standards.
2	Organizer	Definition of a standard measurement procedure for clear sample identification and menu guided operation on the instrument.
3	Instrument Management	Preparation of the instrument by sending organizers including the selected color standards.
4	Data Transfer	Take readings with the instrument, download to smart-chart and save in a database.
5	Data Analysis	Data analysis of measurements in various reports: Test report for single vehicles up to trend reports over time.
6	Configuration	General program settings such as language, database setup, organizer management and data backup are defined.
7	Software Version	Will be up to date after download and installation. Please check in regular intervals if an update is available on our website. Usually updates take place twice a year.
8	About / License	With installation a 30 days trial period starts. Afterward the software is to be licensed. It also allows to return licenses in order to change over to a new PC.
9	User Group	Allows to login to a specific smart-chart user group. Details see Configuration > User groups .

2

Software Installation

2.1 Requirements

The target machine has to fulfill following requirements:

- Operating system: Windows® 10 1607 or later
- Hardware: i5 2.5 GHz; i9 recommended, or equivalent (x86 & x64 architecture only)
- Memory: 8 GB RAM, 32 GB recommended
- Free hard-disk capacity: 4 GB during installation
- Monitor resolution: 1920 x 1080 pixel; 4K recommended
- Interface: free USB-port

Latest details see "smart-chart installation guide" in the download archive.

2.2 Installation

Download and installation

1. Download the ZIP file per instrument:
 - <https://www.byk-instruments.com/en/software>
2. Extract the complete archive on your hard drive into a new folder.
3. In the extracted folder, right mouse click on the file "install.exe" and select the option "Run as administrator".
4. Follow the setup instructions on the screen.



NOTICE

During installation full administrator rights are necessary.

2.3 License

After download and installation, the software can be used for **30 days** free trial. Thereafter, you need to decide and register for the required software package. The standard delivery includes two licenses for the selected software package:

- smart-lab Color or
- smart-process Color

License activation

- Before activating the license, make sure to have a reliable internet connection.
- Start smart-chart and click on "About / License" in the upper left corner of the screen.
- The license window opens and shows the license agreement.
- Connect the instrument with the computer and click on the "License" tab.
- Select the desired software by clicking on the appropriate "Validate License" button.
- In case a license is available, the button "Import Online License" appears. Click on this button, fill in the registration form and click on "Register".
- The activation of the license is shown in the upper "License Information" field.

License transfer

If smart-chart is to be transferred to another computer, the license needs to be returned from the actual computer and activated on the new computer.

- Before returning the license, make sure to have a reliable internet connection.
- Start smart-chart and click on "About / License" in the upper left corner of the screen.
- The license window opens and shows the license agreement.
- Find the respective software license in the upper "License Information" field and click on the "Return License" button.
- A confirmation is shown that the license was successfully returned.



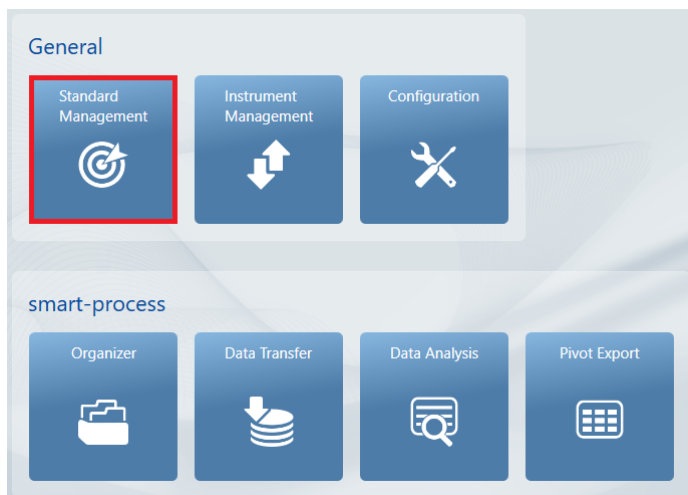
NOTICE

In case your computer has no internet connection, refer to file "Activate and return smart-chart license" in folder "C:\Program Files(x86)\BYKWARE\smart-chart3\Documentation".

3

Standard Management

Measurement settings for color standards, including pass/fail tolerances, are defined in **Standard Management**. Color standards can also be measured online here.

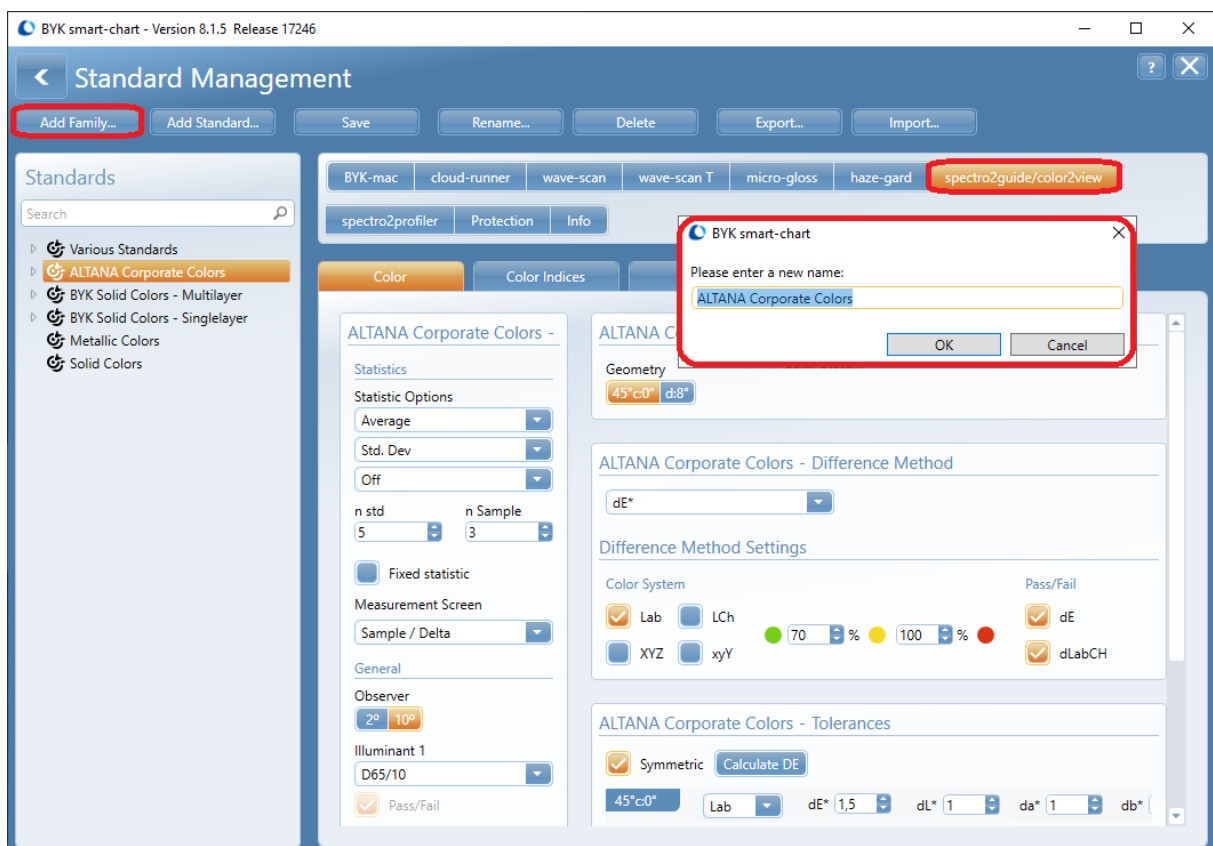


3.1 Color Families

A color family determines the common measurement settings. Create color families including color standards by measuring master panels.

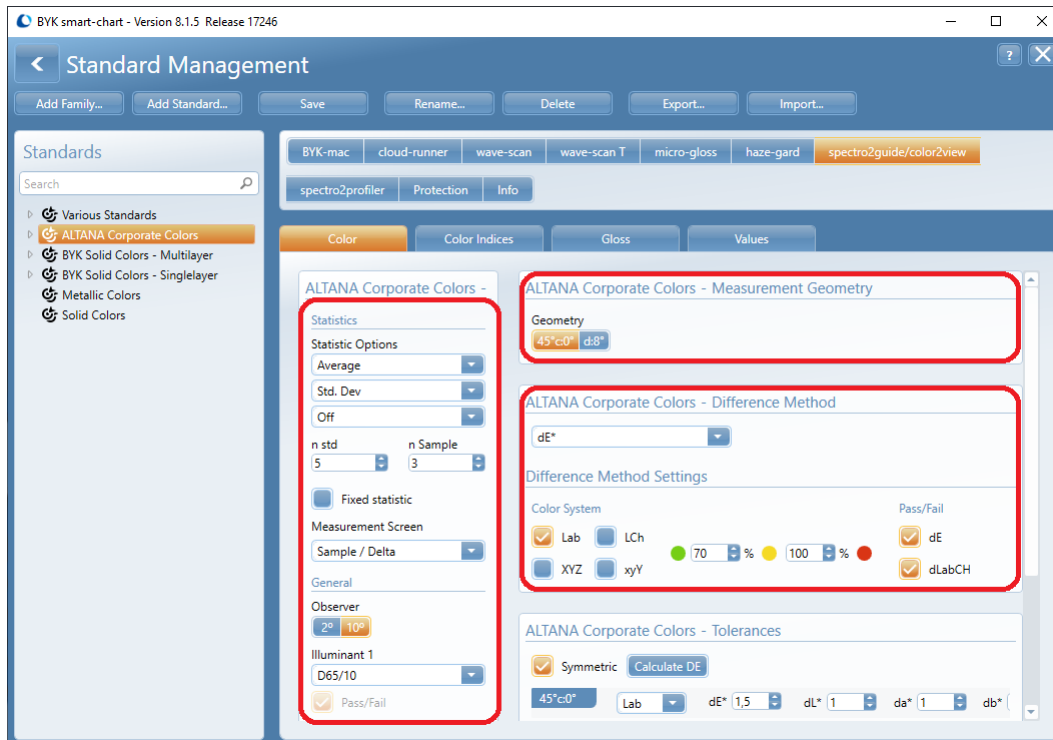
3.1.1 Create Color Family

Select the instrument to be used: **spectro2guide**. Select **Add Family** and enter a name for the family.

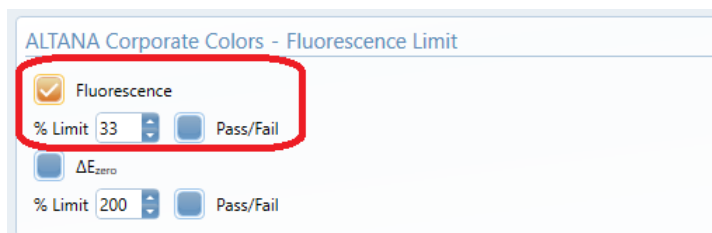


Select the tab **Color** and define:

- Measurement geometry
- Color difference method with tolerances for pass/fail decision
- Statistic options with number of readings for standards (master panels) and samples (check zones)
- Data to be displayed on measurement screen, e.g. sample and delta
- Illuminant and observer



Below the color difference method with tolerances the fluorescence threshold can be set, at which the device flashes (pink).



Select the tab **Gloss** and configure following items:

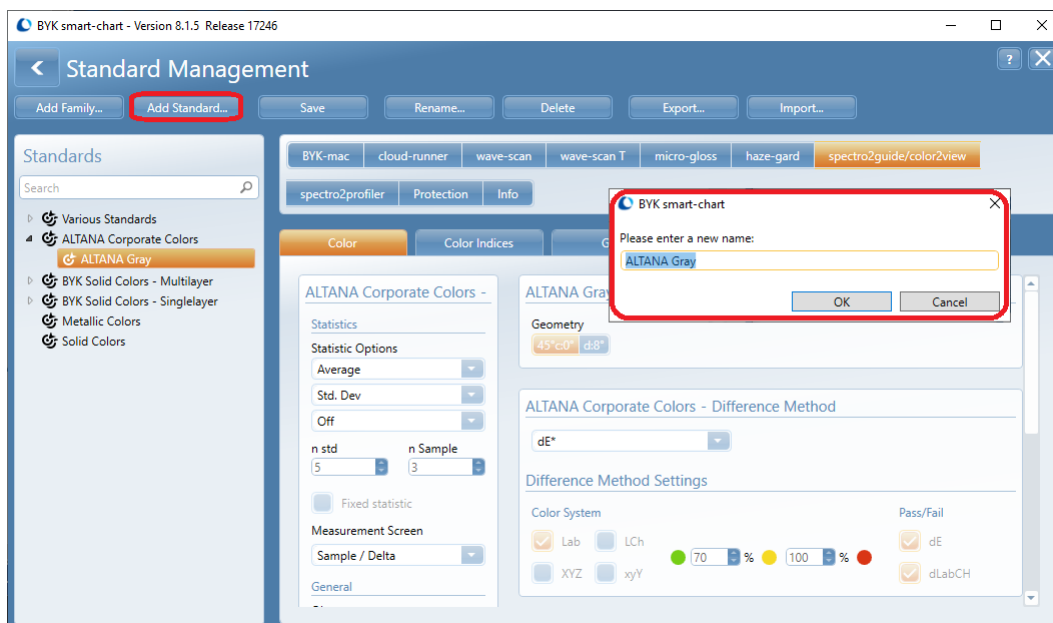
- Add the scale for the 60° gloss measurement.
- Activate the **Pass/Fail** decision.
- For the **Display** select **Absolute** and/or **Delta** values.



3.1.2 Add Color Standard

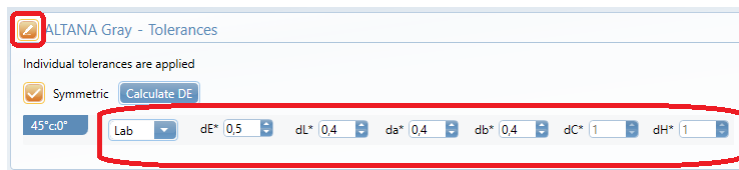
Add the specific color standard settings:

- Select **Add Standard** and input name, e.g. "ALTANA Gray".



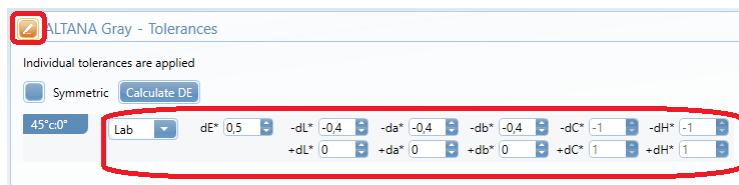
- Click on the **Edit** icon to unlock the color standard from the family and enter individual tolerances.
- The input options depend on the selected colour difference method, e.g. symmetrical and asymmetrical tolerance entries are possible when dE^* is selected.

Symmetric Tolerances



The **same** value is valid in each direction of the color system.

Asymmetric Tolerances

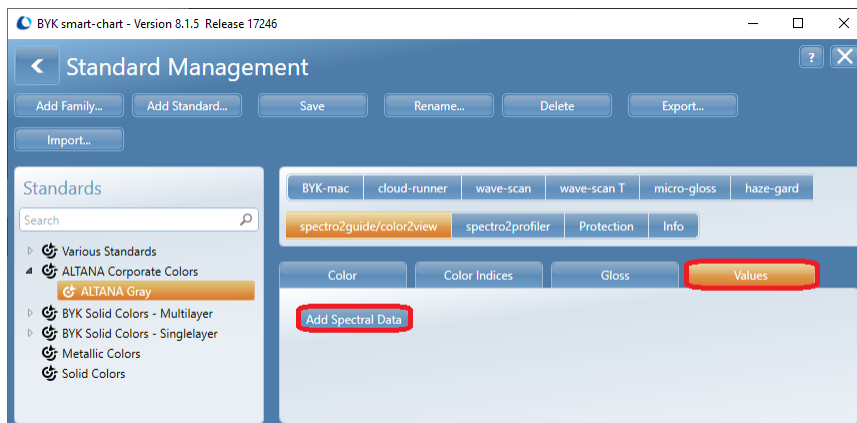


Different values are valid in the various directions of the color system.

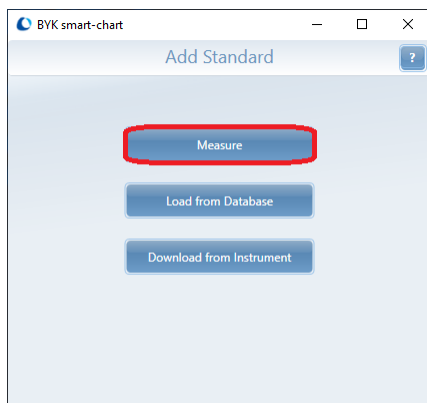
3.1.3 Add Spectral Data

Add the spectral data for the new color standard:

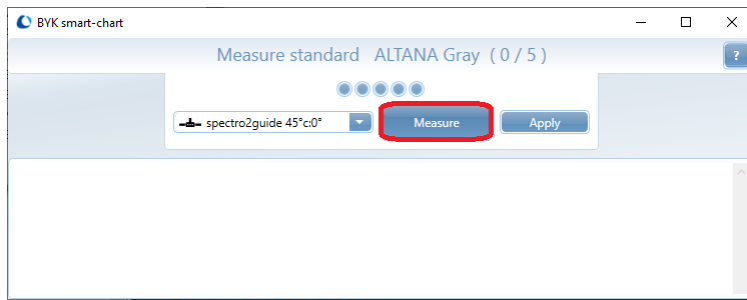
- Connect the spectro2guide with computer.
- Select tab **Values** and click on **Add Spectral Data** to move on to the measurement screen.



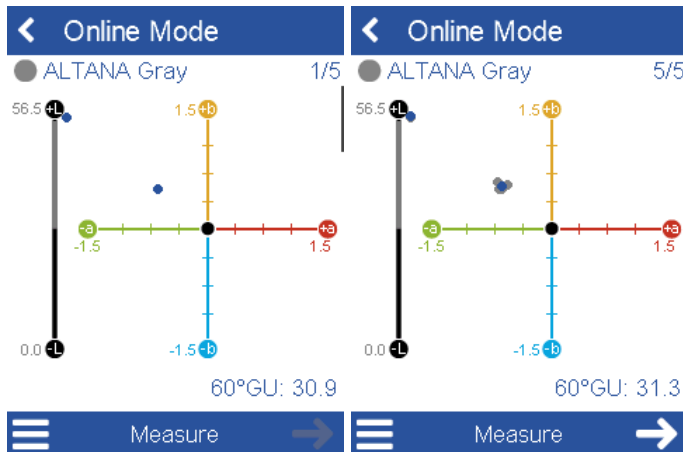
- Select **Measure**.



Place spectro2guide on the master panel and start taking measurements on different check zones by pressing either the **Operate** button on the instrument or the **Measure** button in the software.



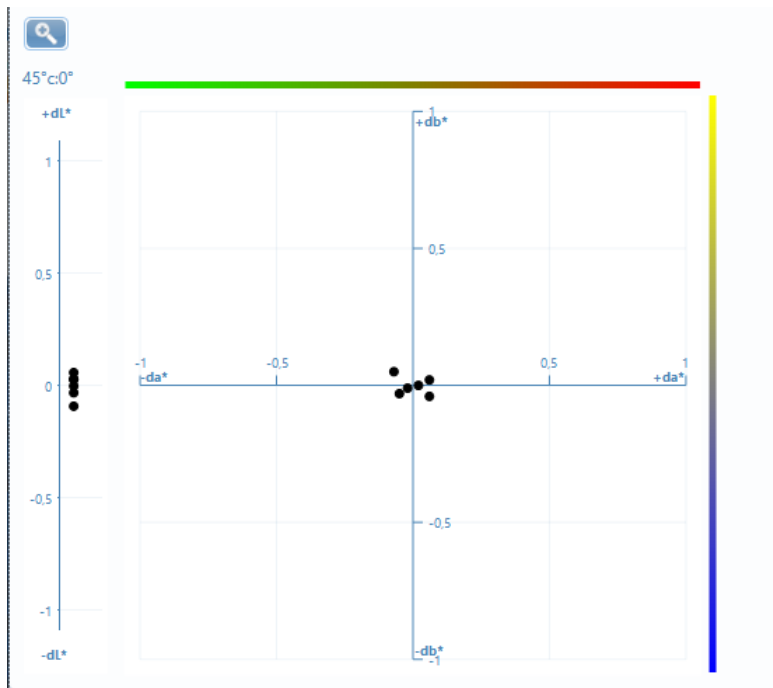
The left screen shows the spectro2guide after taking the first reading (1 of 5). The right screen shows the spectro2guide after taking the last reading (5 of 5).



The data in the table are the colorimetric data of the last measurement.

D65/10 45°c:0°				Gloss 60
L*	a*	b*	dE* FI	Gloss 60
56,15	-0,64	0,55	0,00	31,35

In the graph, all individual measurements are shown in comparison to the mean value.



- Outliers can be eliminated by highlighting the measurement in the graph with the mouse and using the **Delete** key on the keyboard.
- With **Apply** the measurement is accepted and the software returns to the main window of smart-chart.

BYK smart-chart - Version 8.1.5 Release 17246

Standard Management

Buttons: Add Family..., Add Standard..., **Save**, Rename..., Delete, Export..., Import...

Standards List:

- Various Standards
- ALTANA Corporate Colors
 - ALTANA Gray**
- BYK Solid Colors - Multilayer
- BYK Solid Colors - Singlelayer
- Metallic Colors
- Solid Colors

Standard Details: ALTANA Gray

serial No. 1234567 **Catalog No. 7075** Mode NRC Timestamp 8.5.2022 2:11 +02:00 **Waste bin icon**

LAB Shift

Angle	L*	a*	b*	dE* FI	Gloss
45°c:0° D65/10	56,15	-0,64	0,55	0,00	
60°					31,35

7070 = d/8 <> 7075 = 45/0!

Spectral Graph: D65/10, 400-700 nm, ALTANA Gray

- To delete spectral data again, the **Waste bin** icon can be used.
- Click the button **Define Master** icon to use this standard as a digital master standard. This allows the standard to be distributed to other facilities and suppliers and loading it to their respective instrument.
- To save data, click on the button **Save** icon.

**NOTICE**

It is advised to save any change in the spectral data as a new digital standard.

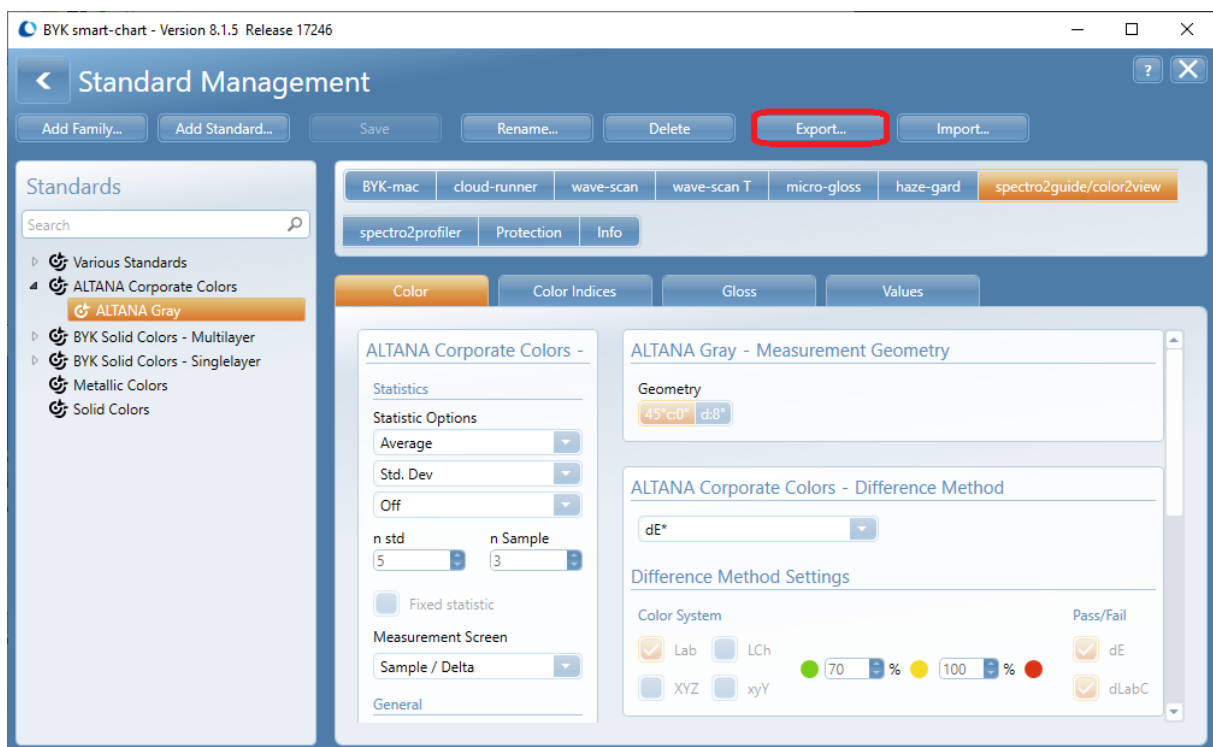
3.2 Digital Standards

To use digital standards save them as XML files and share with regional laboratories.

3.2.1 Export Digital Standard

Complete color families or individual standards can be exported for use as digital standards.

- Select the appropriate family or standard and click on the button **Export**.
- The XML file can be saved on a medium of your choice.

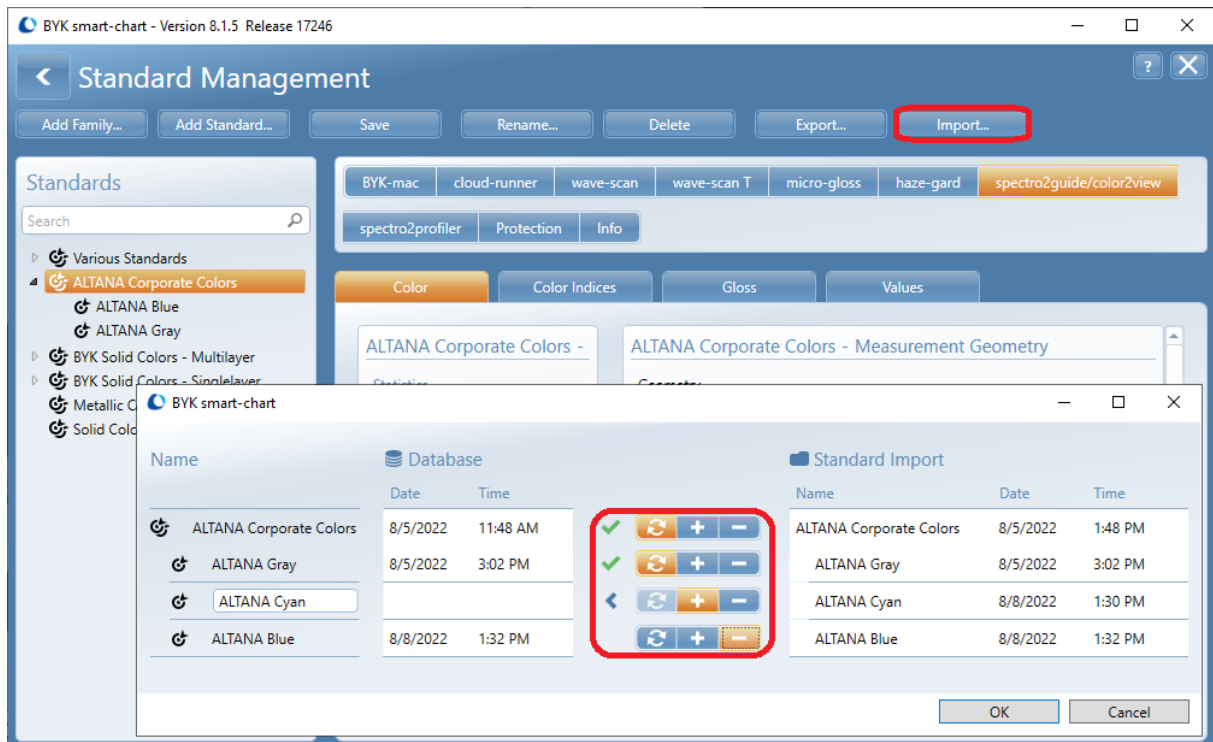


Digital standards can be exchanged as XML files via a network drive, email or USB stick.

3.2.2 Import Digital Standard

Digital standards are master standards that are saved as XML files. They are distributed by the central laboratory by email or via a network drive:

- Save the file to a USB stick and copy it to the computer on which smart-chart is installed
- Click on the button **Import** and select the corresponding file on the computer.



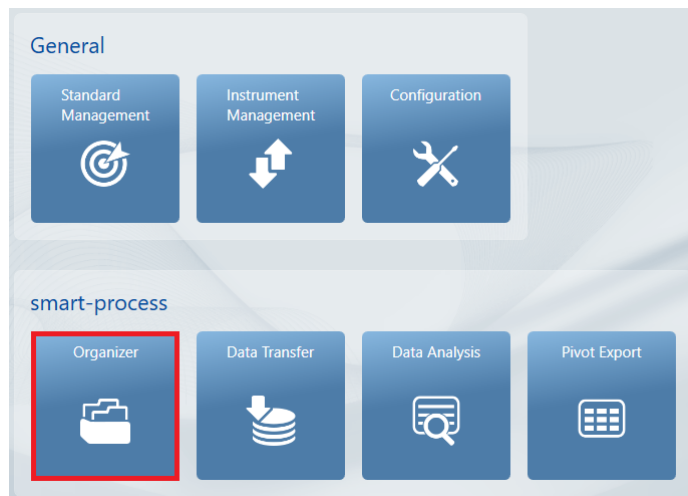
A dialogue box opens to set specific import options for families and standards:

- Updated in database: Double arrow.
- Created in database: Plus symbol (+).
- Excluded from import: Minus symbol (-).

4

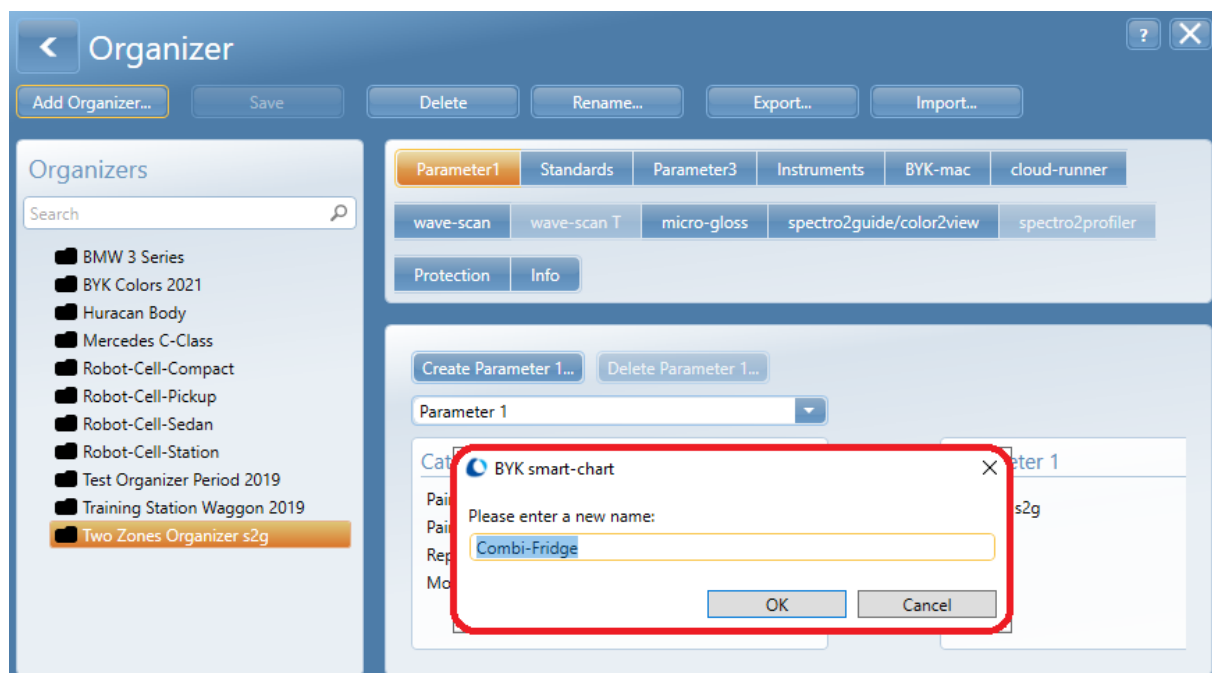
Organizer Measurement

Organizers allow menu-guided instrument operation and clear sample identification. Up to five parameters can be defined for sample identification, which are transferred to the instrument and therefore no longer have to be entered manually. The entered parameters can later be used to filter the database for specific measurement data.



4.1 Create Organizer

Select **Add organizer** and enter a name for the organizer family e.g. "Combi Fridge".



For organizers following rules apply:

- An organizer family groups together all models that use the same measurement sequence.
- An organizer defines all parameters for clear sample identification:
Model - Color - Paint line - Check zone
or
Customer / Supplier - Color - Component - Check zone
- For each parameter a specific catalog with multiple entries can be assigned.
- The default name of the catalog is **Parameter 1 - 5**.
- Application specific names can be assigned in the module [Configuration](#)⁵⁷, section [Manage Catalogs](#)⁶¹.

In the example given below following sample identification will be created:

- Parameter 1: Model
- Parameter 2: Color
- Parameter 3: Paint line
- Parameter 4: Serial number
- Parameter 5: Comment > not used yet



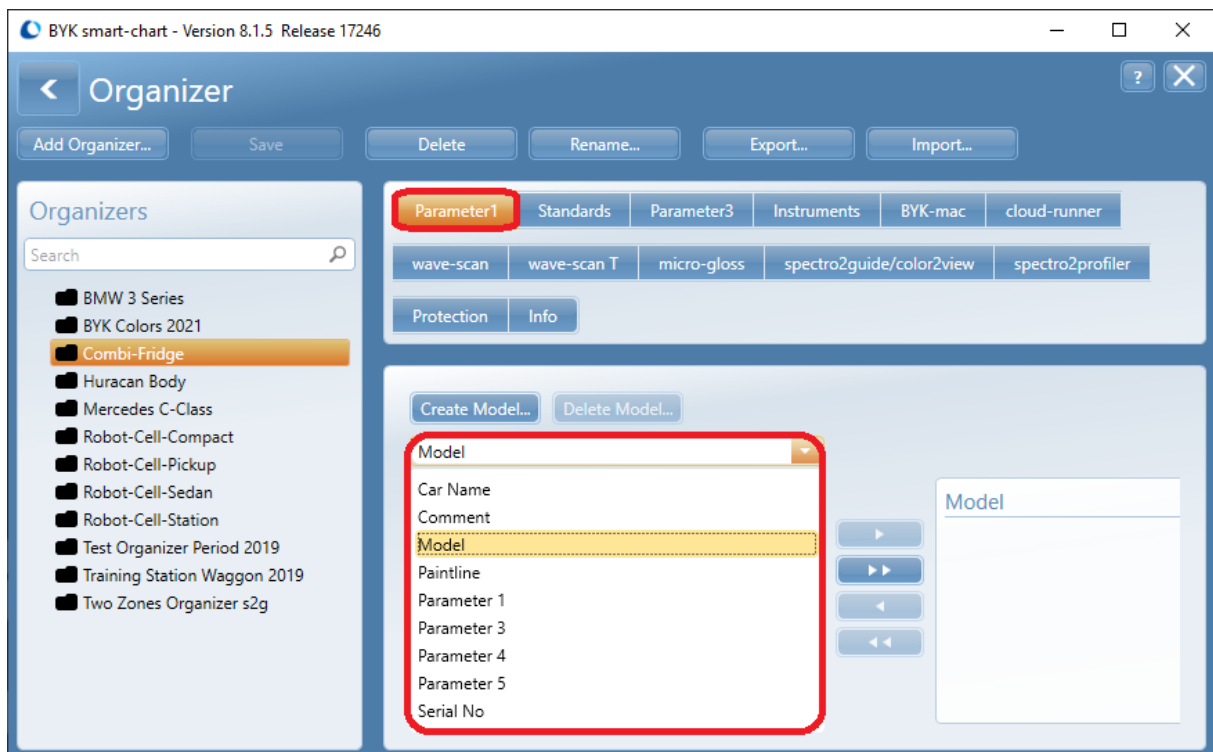
NOTICE

Parameter 2 is ALWAYS assigned to the color, i.e. the color standard.

Parameter 4 and 5 are NOT configured - just entered on instrument.

4.2 Create Model

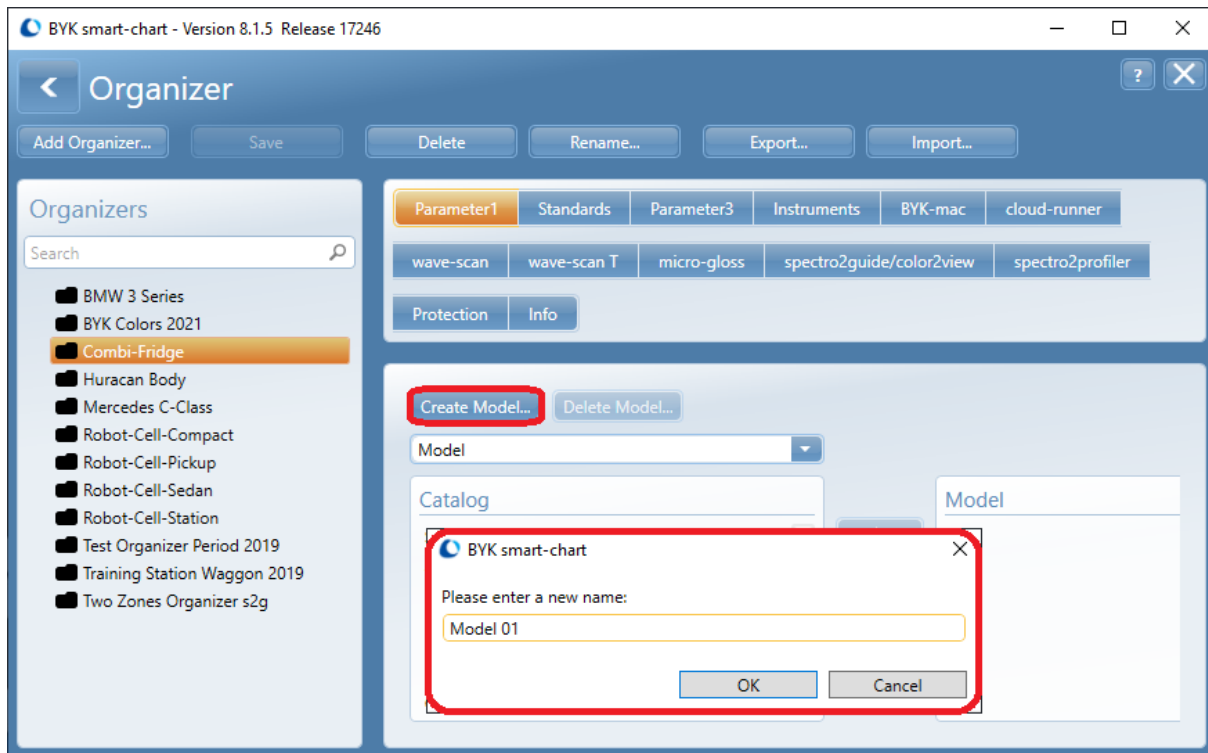
Click on **Parameter 1** and select as catalog for this parameter the entry **Model** by using the drop down box.



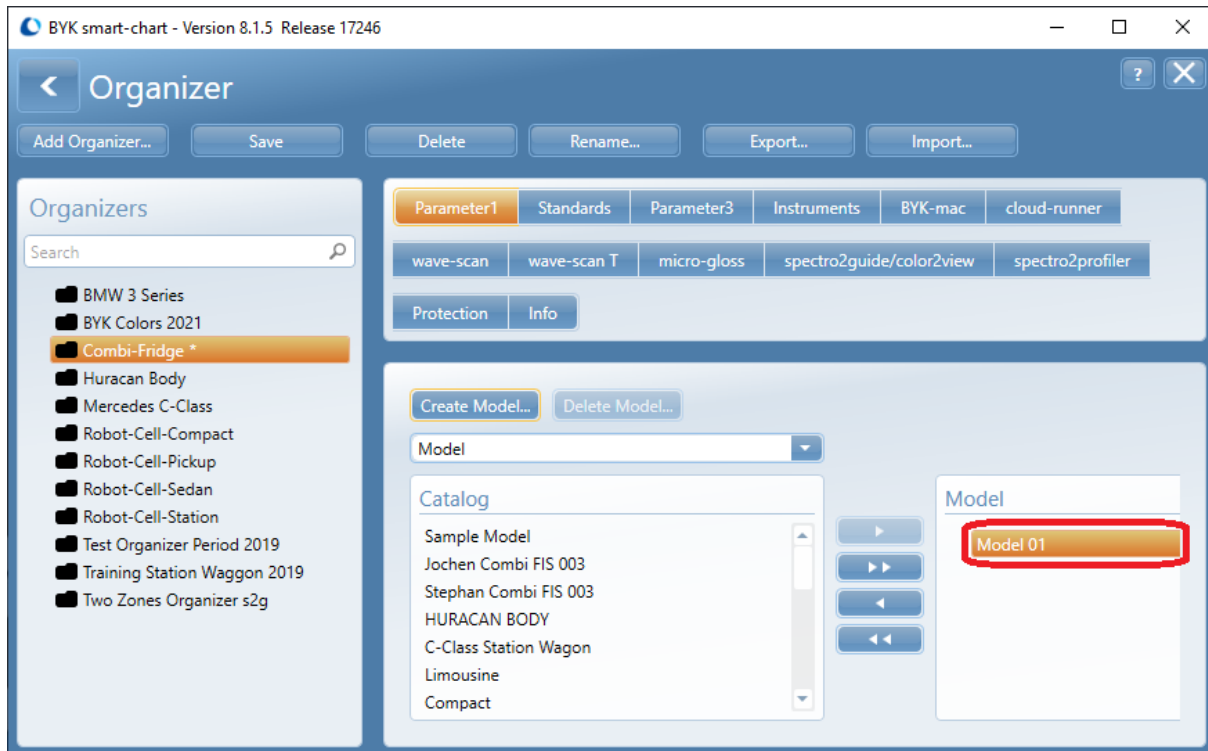
NOTICE

The catalog for a parameter can be selected only, if the option **Lock** is inactive in [Configuration](#)⁵⁷, section [Manage Catalogs](#)⁶¹.

To create a new model click on button **Create Model** and enter a name.



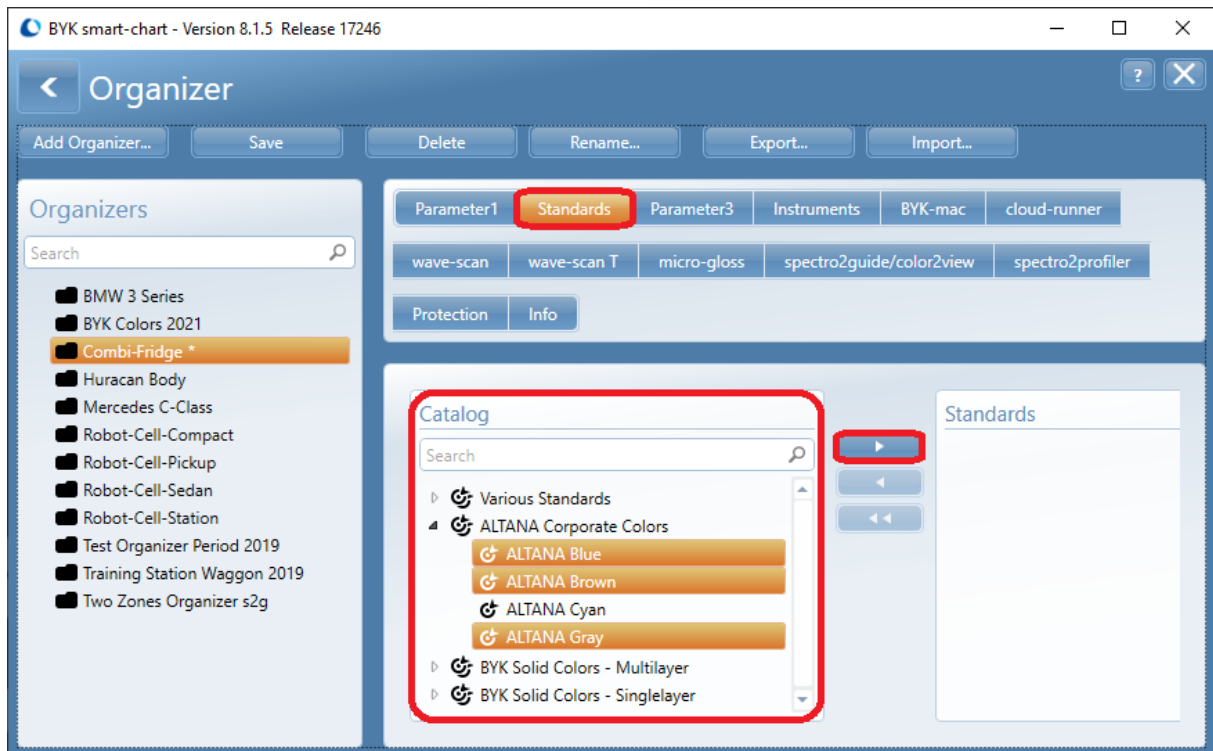
The new model is automatically selected in the organizer.



Repeat for additional models, if required.

4.3 Select Colors

Click on **Standards** and select all colors that are used for this model by either selecting the complete color family or individual colors. Note that the label of the button for parameter 2 is always **Standards**.



To add the selected colors to the organizer, click on the **Arrow right** button.

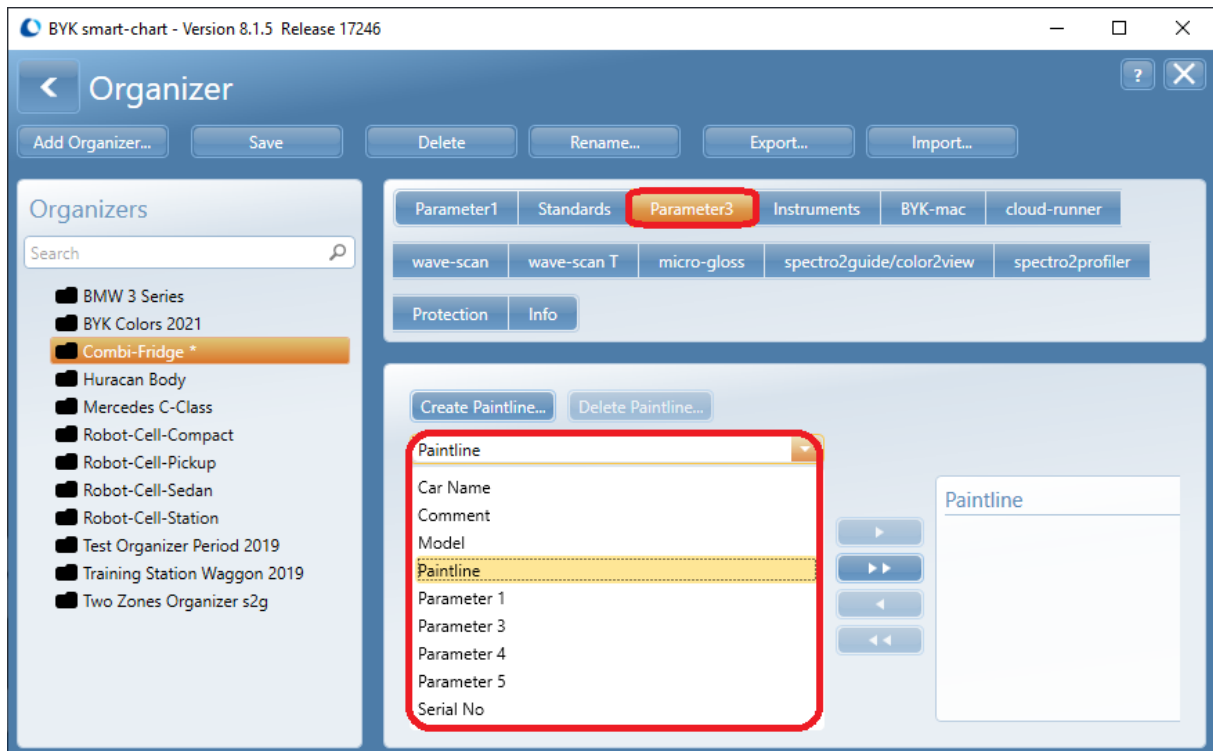


NOTICE

When new colors are added, the organizer needs to be updated and reset to the instrument.

4.4 Create Line

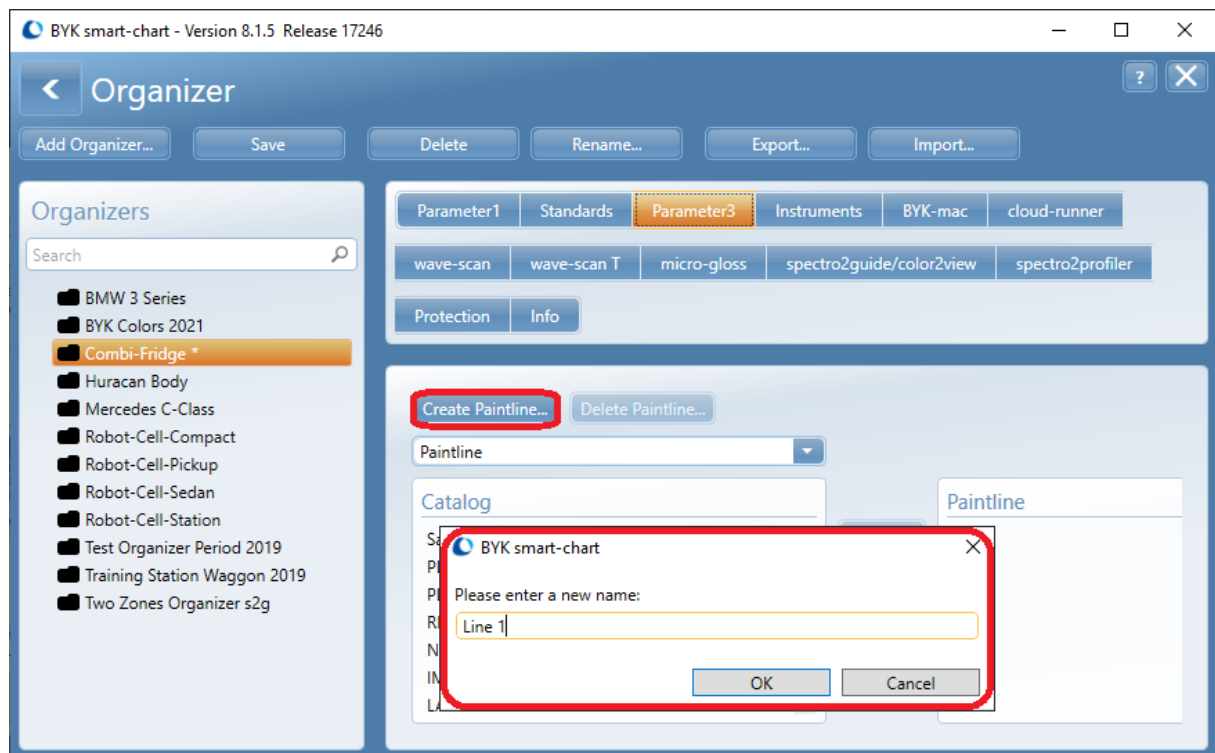
Click on **Parameter 3** and select as catalog for this parameter the entry **Paintline** by using the drop down box.



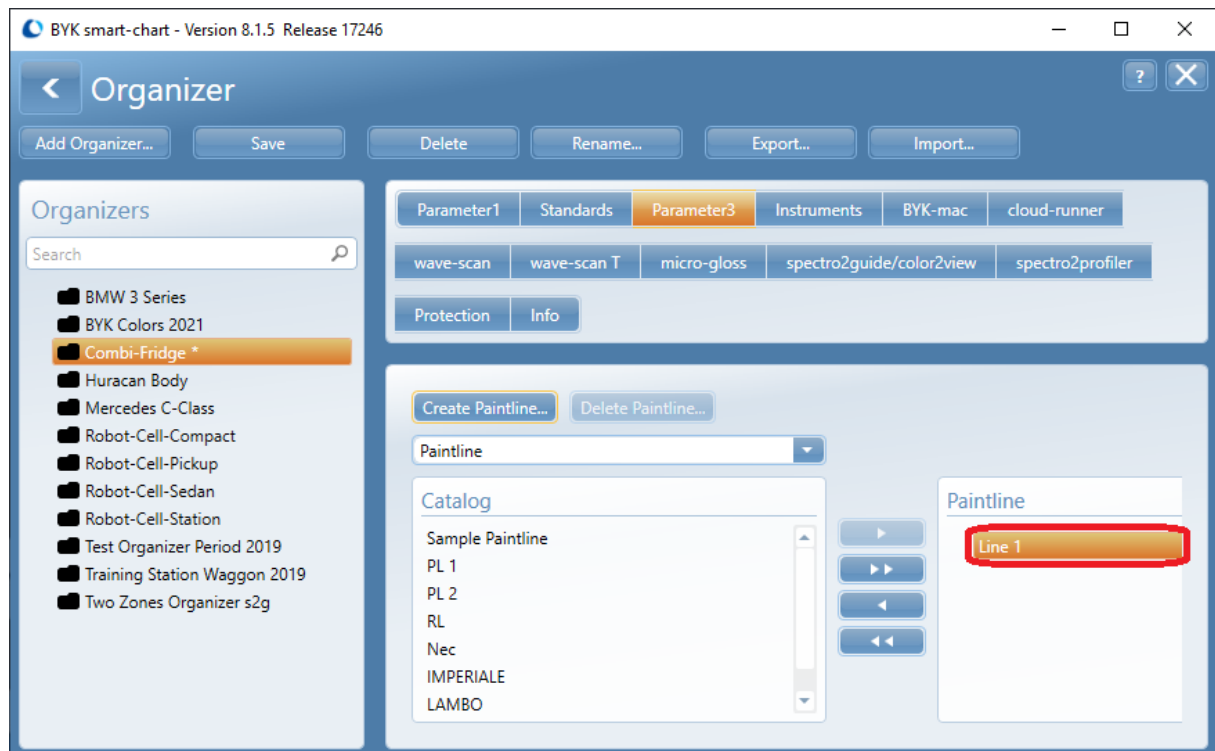
NOTICE

The catalog for a parameter can be selected only, if the option **Lock** is inactive in [Configuration](#)⁵⁷, section [Manage Catalogs](#)⁶¹.

To create a new paint line click on button **Create Paintline** and enter a name.



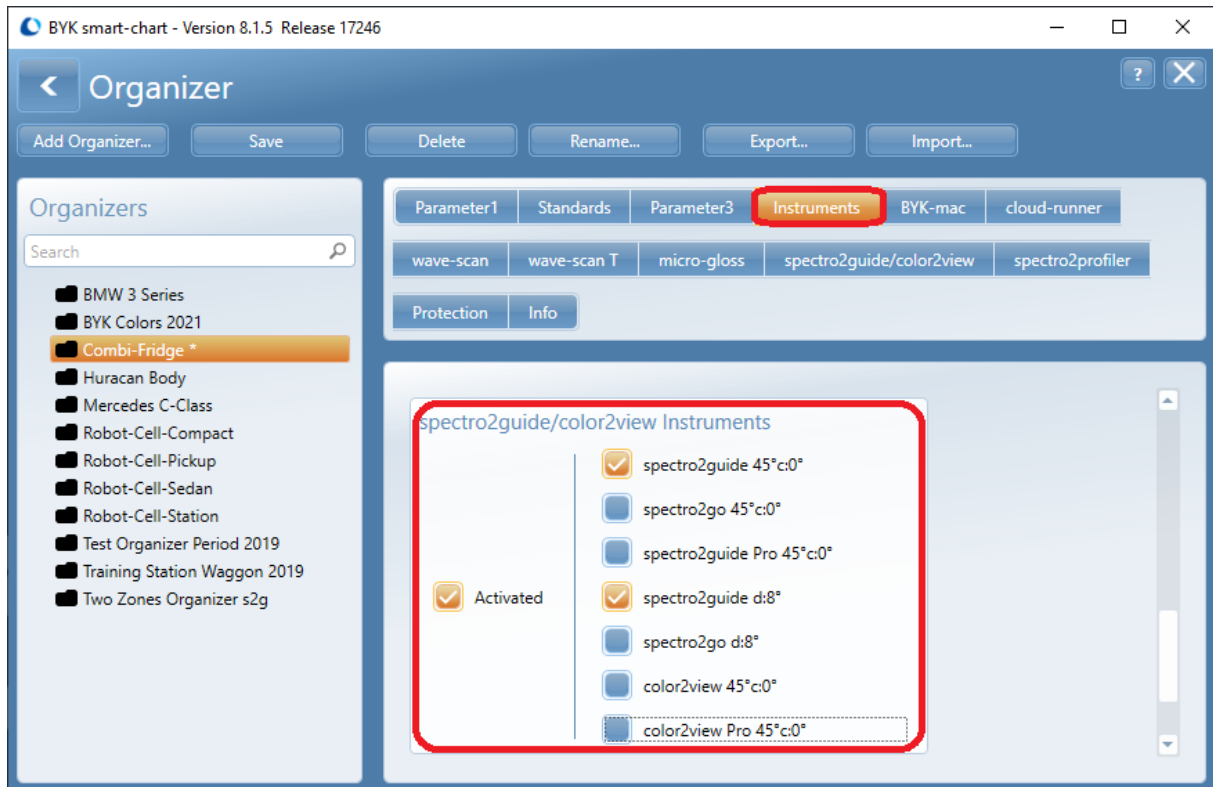
The new paint line is automatically selected in the organizer.



Repeat for additional paint lines, if required.

4.5 Activate Instruments

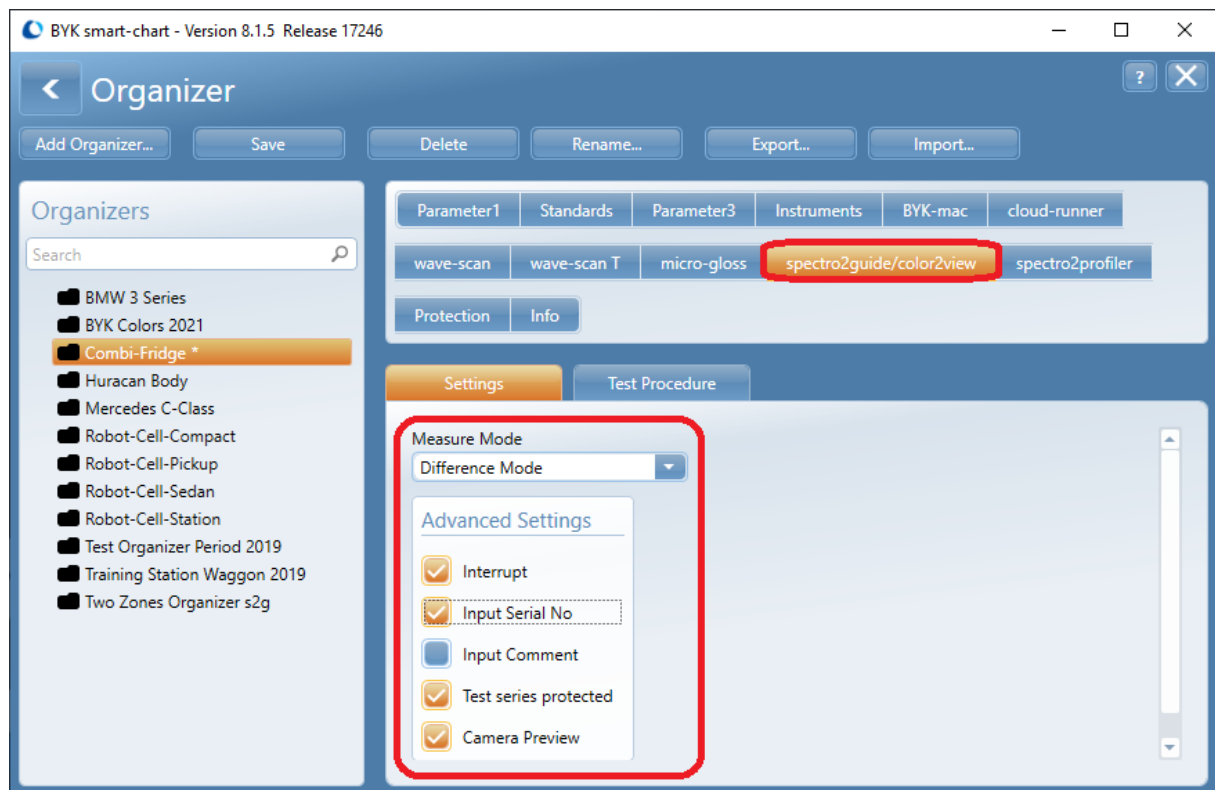
Click on button **Instruments** and select all devices to which the new organizer is to be sent.



Activate following instruments: spectro2guide 45°c:0° ([#7075](#)) and / or spectro2guide d:8° ([#7070](#)).

4.6 Configure Instrument

Click on button **spectro2guide/color3view** to configure measurement settings on the instrument.



The configuration options available here have the following meaning.

Measure Mode	<p>Absolute Mode: Only the values measured actually on the sample are displayed on the device.</p> <p>Difference Mode: The difference values compared to the standard are displayed on the device.</p>
Interrupt	Allows skipping test zones or ending a test series before all given test zones have been measured.
Input Serial No.	An individual identification for each test series must be entered on the device, e.g. the "part number".
Input Comment	A comment must be entered on the instrument for each test series, e.g. "New coating batch".
Test series protected	Organizers with the associated measurements cannot be deleted on the device, but only via the smart-chart software.
Camera Preview	The camera preview of the measuring spot on the device can be activated / deactivated.

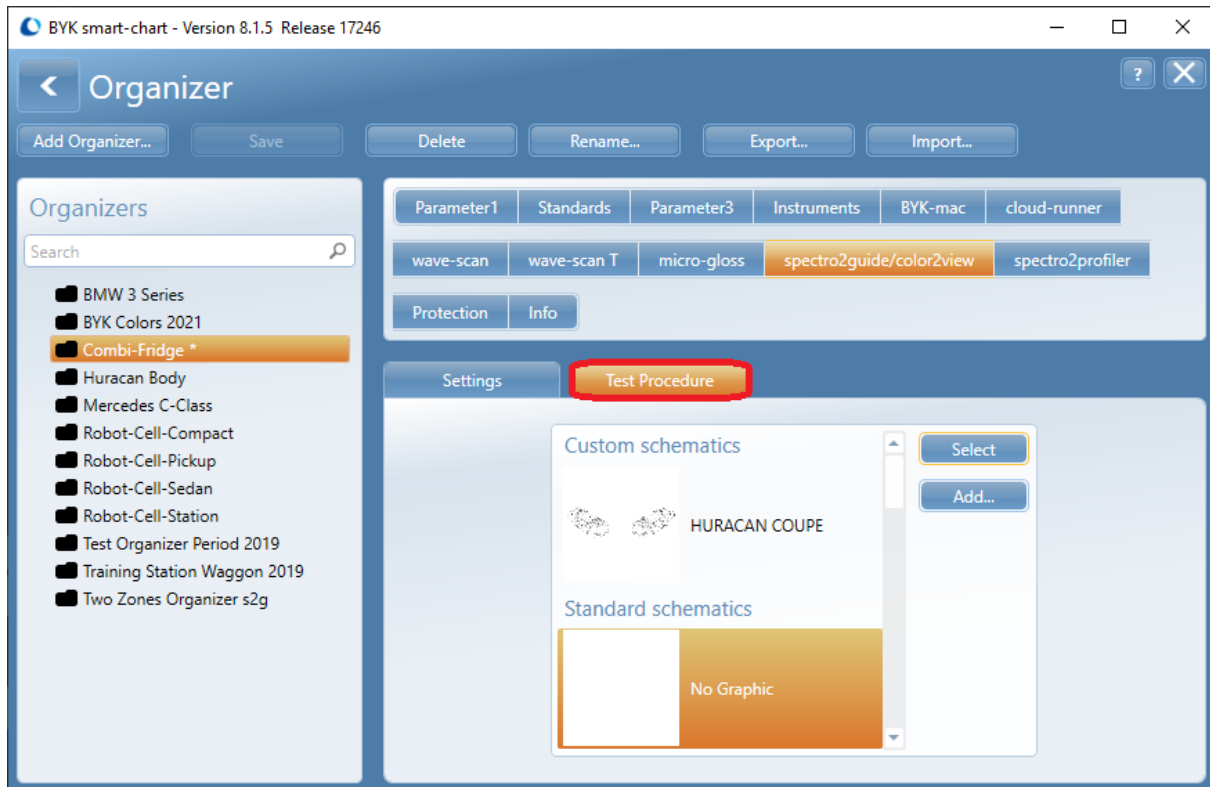


NOTICE

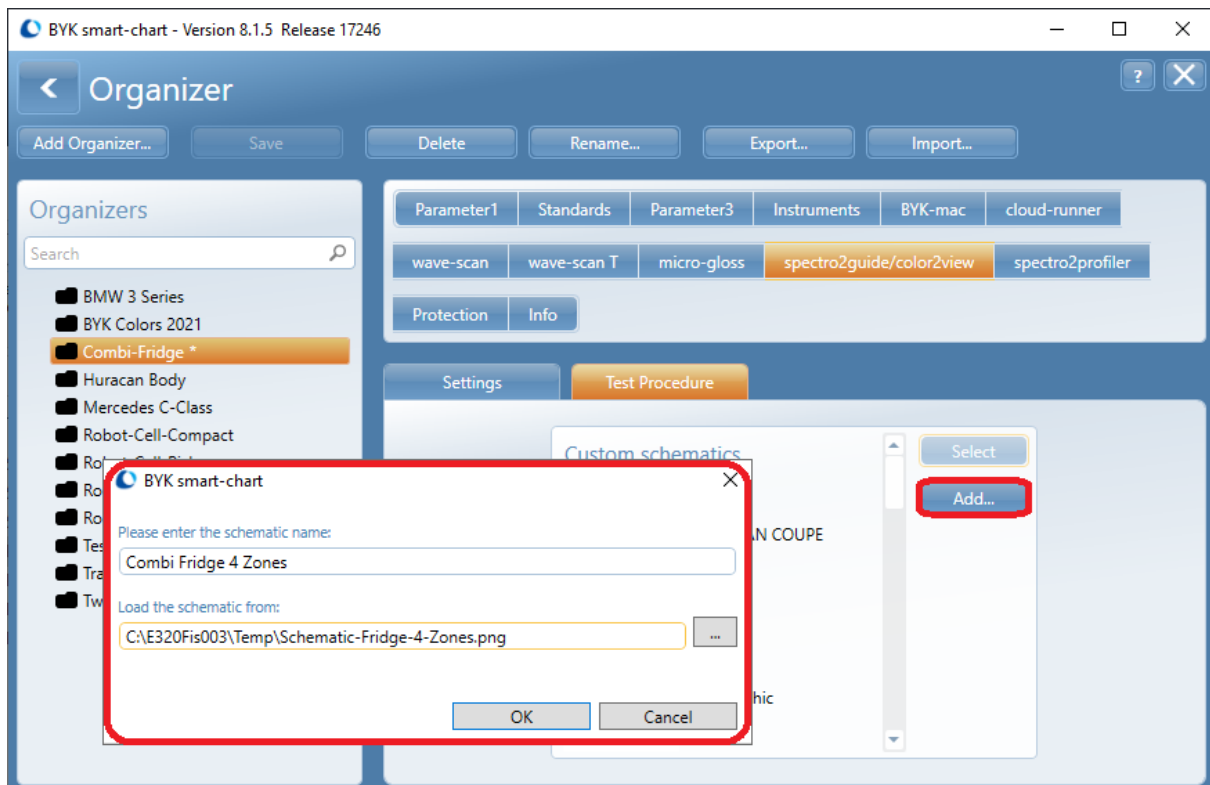
If **Serial Number** and **Comment** are not activated in the Organizer yet, they can also be entered subsequently at the time of [Data Transfer](#)³⁷ to the instrument.

4.7 Define Procedure

In the next step define the **Test Procedure** including the check zones required.



Select the appropriate schematic from the list or **Add** a new (custom) schematic. The **Standard schematics** are provided by smart-chart. To load a **Custom schematic** prepare and load a graphic file of type PNG, JPG, JPEG, XAML or SVG.



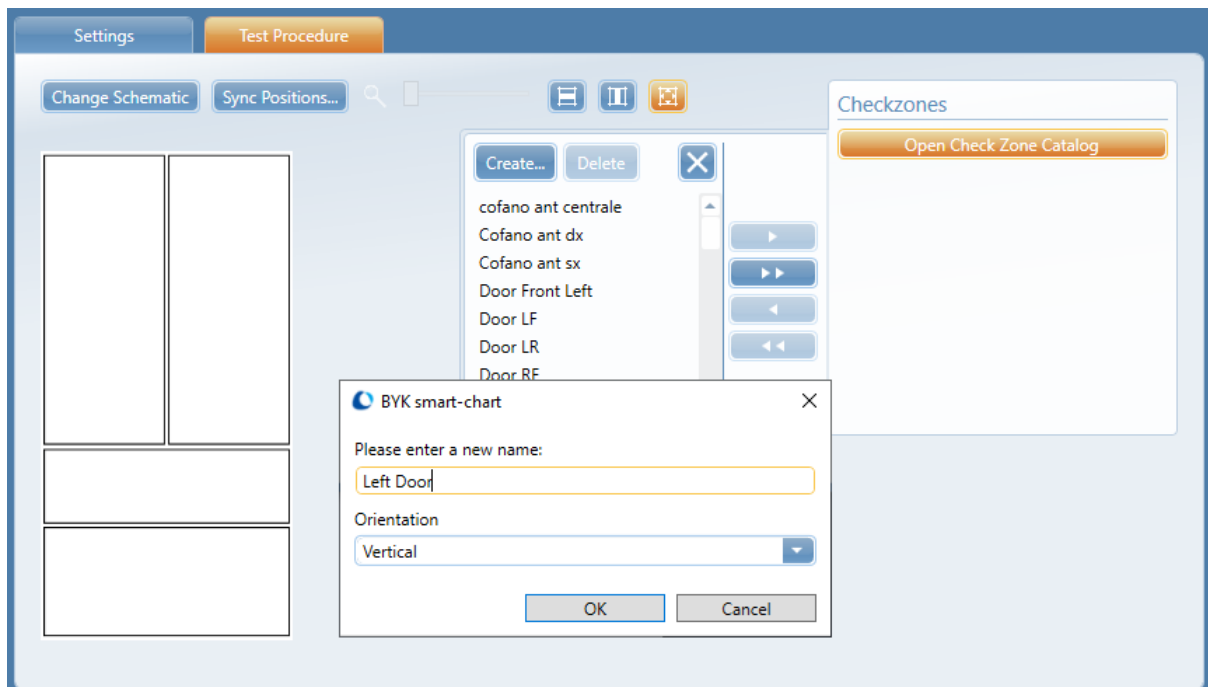
Schematics added to the [Standard Database](#)⁵⁷ are listed in the section **Custom schematic**.



NOTICE

The custom schematics can be managed in module [Configuration](#)⁵⁷, section [Manage Schematics](#)⁶⁰.

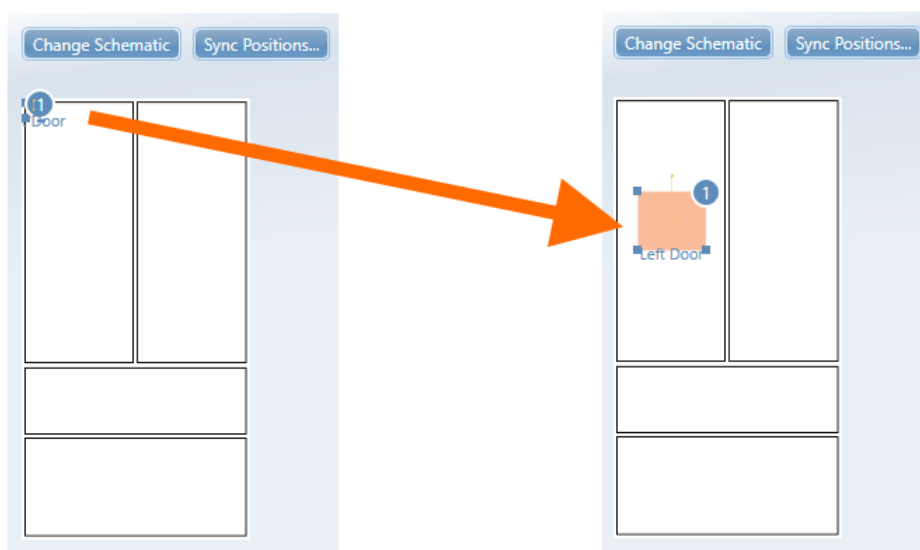
To create new check zones click the button **Create**.



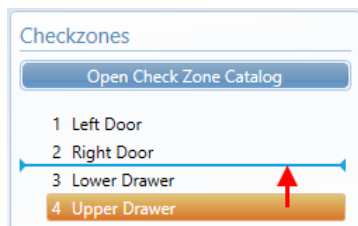
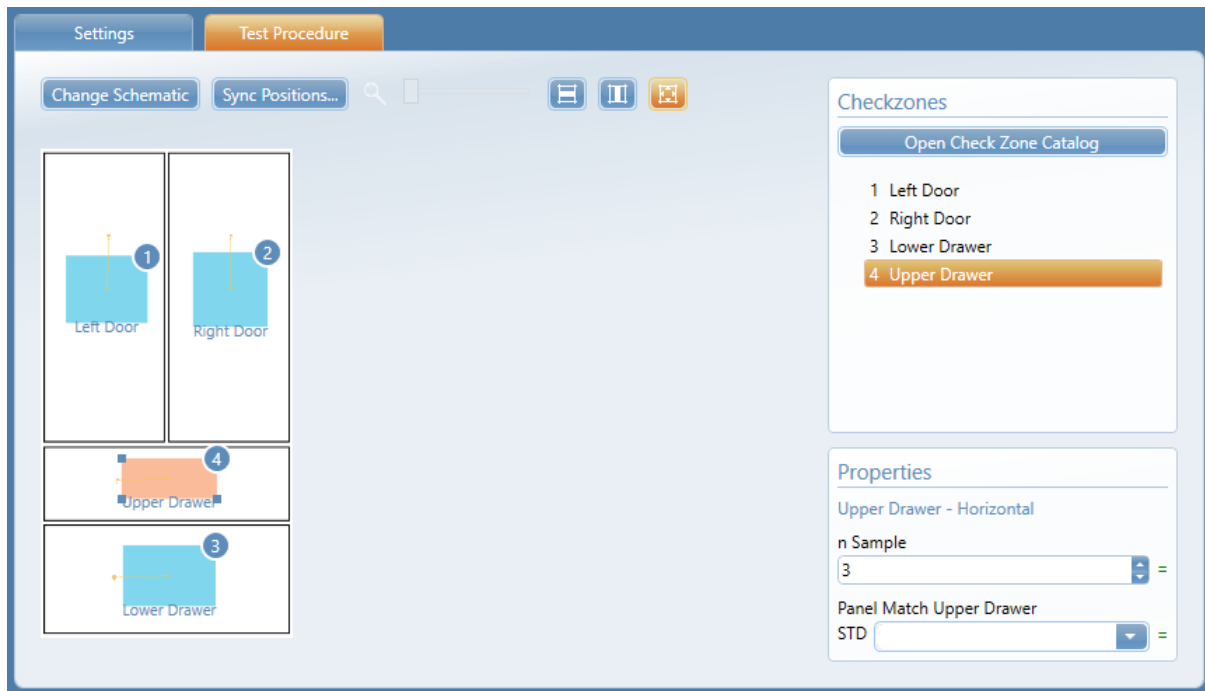
Enter a name and select the appropriate orientation (vertical / horizontal). This will make sure that the correct tolerances from **Standard Management** are applied.



A rectangular symbol with the sequence number appears in the upper left corner. Using the blue corners the check zone can be sized. Using drag & drop it can be moved to the correct position. Using the yellow arrow the measurement direction can be adjusted.



Repeat for all other check zones.

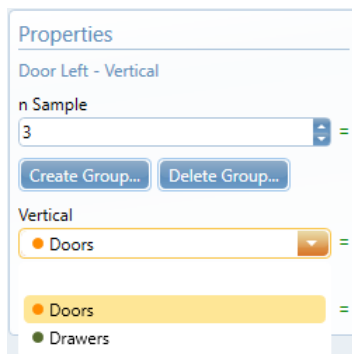
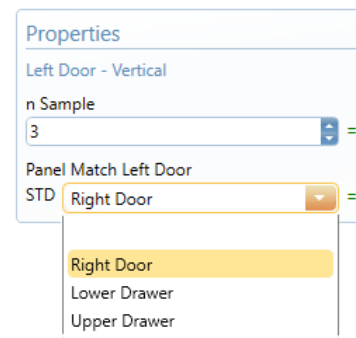


To change the measurement sequence, click on the check zone name with the mouse and drag & drop it to the desired position.

For each check zone individual properties need to be defined. For the **spectro2guide** following properties are relevant:

- **n Sample:** Defines the number of readings required for this check zone.
- **Panel Match:** Two adjacent check zones can be paired up, which allows to display a differences between the adjacent panels in [Data Analysis](#)⁴¹.

Standard is always the body panel.



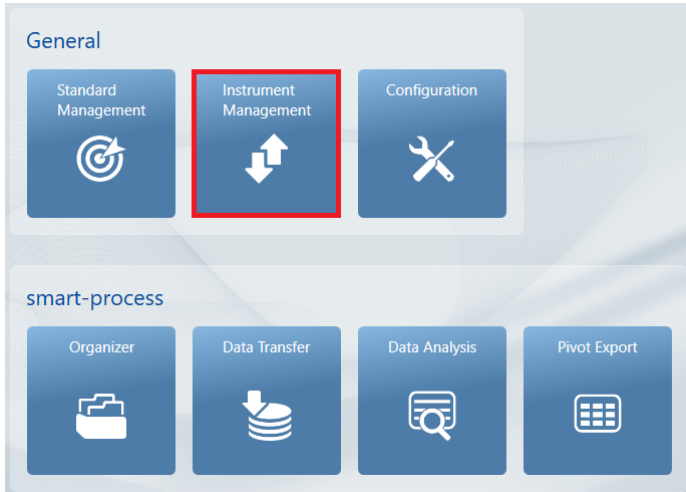
Several check zones can be combined to a group. In [Data Analysis](#)⁴¹ the average of each group will be displayed additionally. Highlight the zones to be grouped and select a name from the groups box or click **Create Group** to create a new name.

To save the organizer click on the button **Save**.

5

Instrument Management

Send organizers and color standards as files to the instrument.

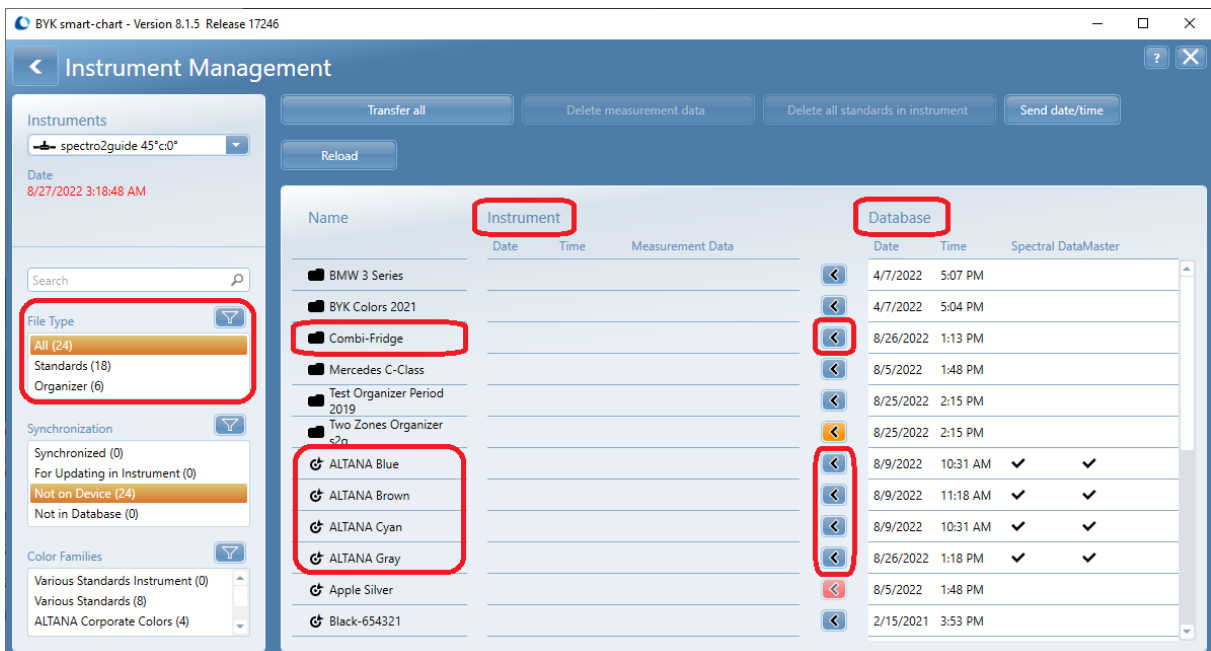


5.1 Transfer Data

The **Instrument Management** window opens. Following columns are displayed:

- **Name:** Lists organizers and standards depending on the selection on the left side.
- **Instrument:** Shows organizers and standards saved in the instrument.
- **Database:** Shows organizers and standards stored in the database.

On the left side a **filter** can be applied - for the type of files to be displayed. Standards are marked by a target symbol - Organizers by a folder symbol.



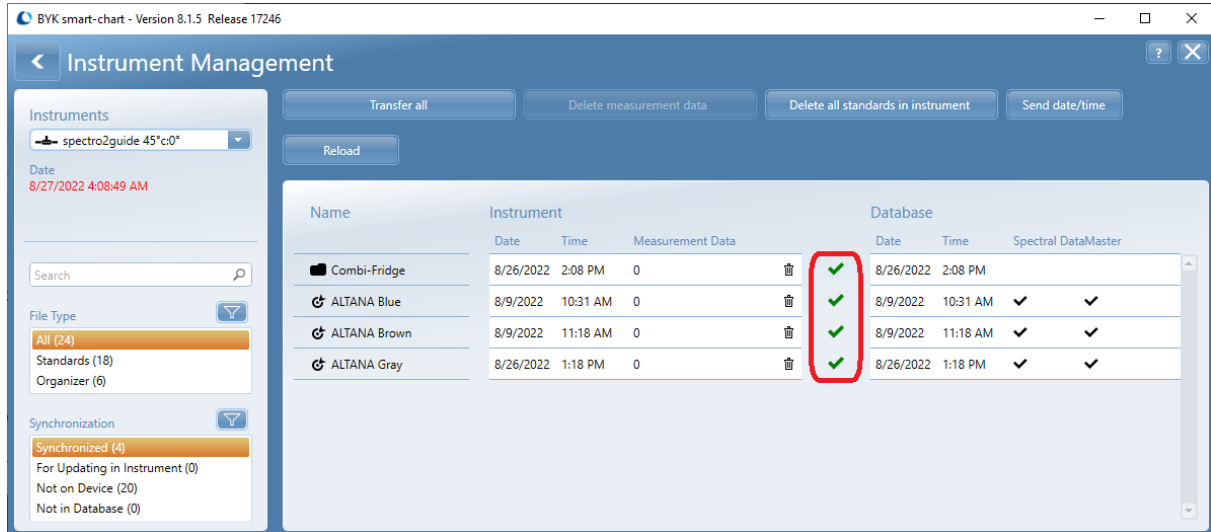
Organizers can be sent to the instrument by clicking on the arrow buttons pointing to the instrument column.



NOTICE

A red arrow indicates that some parameters are not defined yet in the organizer and thus the organizer cannot be sent to the instrument. Please review the settings in the module [Organizer](#).

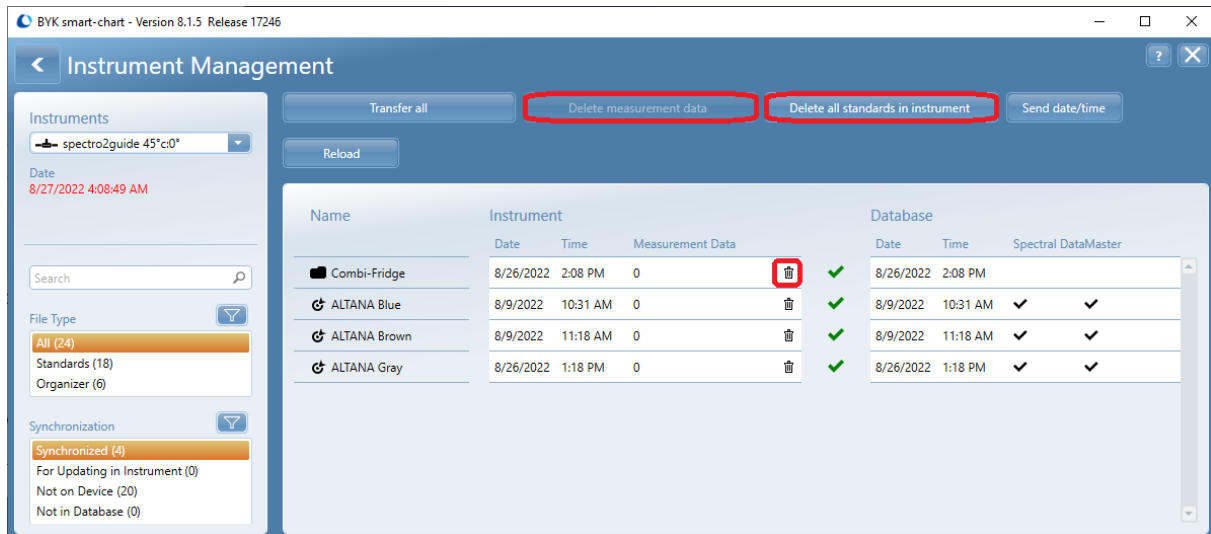
Sending the organizer automatically transfers all standards that are selected in the organizer.



After successful transfer a green check mark appears and the organizer/standards are now also shown in the **Instrument** column.

5.2 Delete Data

To delete individual standards or organizers in the instrument please use the **Waste bin** icon behind the respective entry. Use **Delete all standards in the instrument** to delete all standards at once.



Deletion of measurement data is usually done when using module [Data Transfer](#)³⁷ to transfer from instrument to database. In case the deletion was not done during data transfer it can be done afterward: Use **Delete measurement data** to delete measurements of test series.

5.3 Instrument Operation

Use the touch display on the spectro2guide to navigate through the menu **Organizer** in the instrument.



Click on **Arrow right** to go to the next check zone. After completion of last check zone the instrument returns to the organizer menu (screen #3). Repeat the complete organizer for the next object (new serial number). After last serial number click the upper left back arrow to return to the main menu.

6

Data Transfer

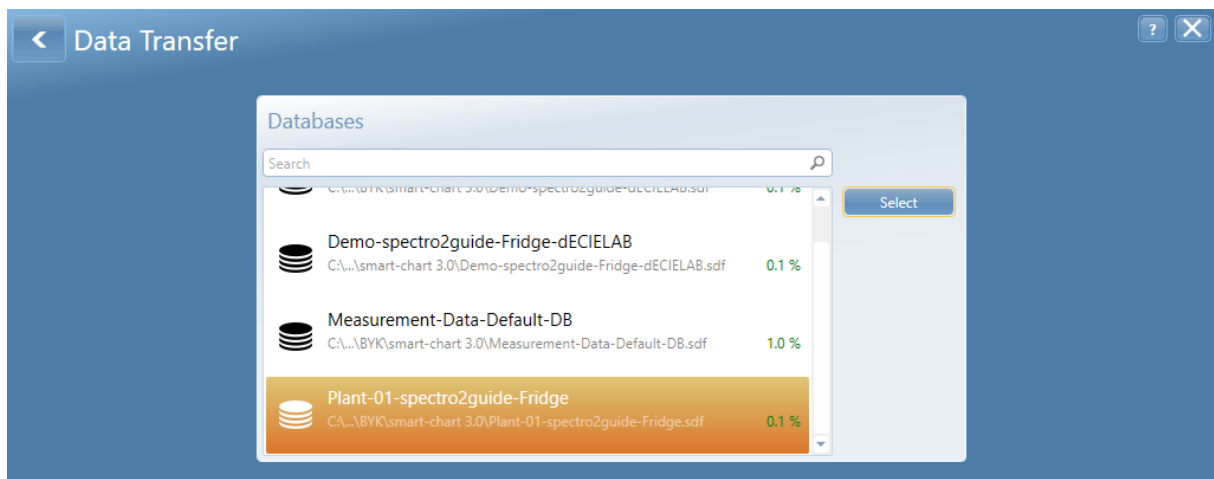
The measurement data can be transferred from the instrument to the software and saved to a database.



Connect the instrument to the PC and open the module **Data Transfer**.

6.1 Open Database

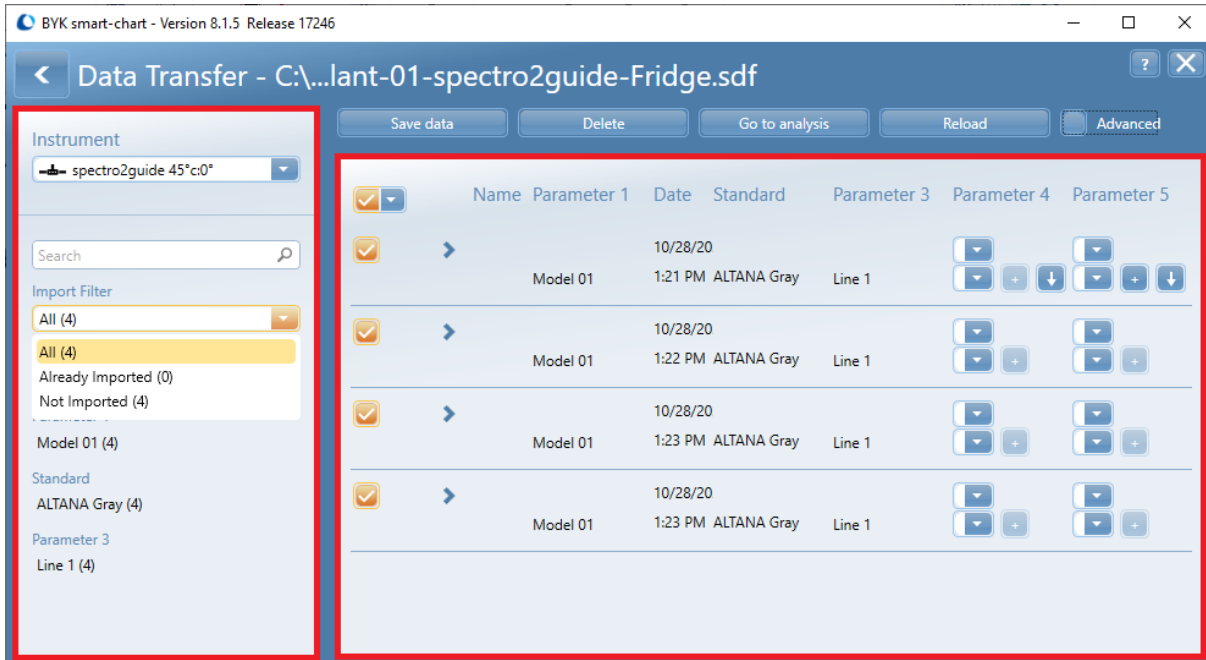
Select the database to which measurements are to be saved. If there is only one database, this dialog is skipped and the database is automatically selected.



The percentage after the database name indicates "how full" it is.

6.2 Transfer Results

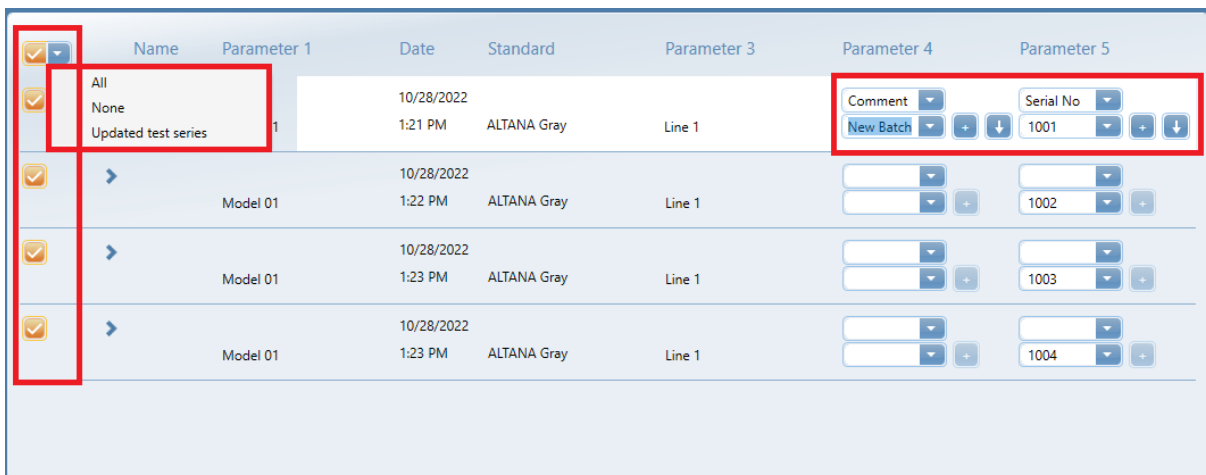
The transfer dialog consists of overview / filter pane, button pane and details pane. Using the filter options in the left pane, the displayed data can be selected according to **Organizer** - **Parameter 1** (Model) - **Standard** (Color) - **Parameter 3** (Line).



For the organizers following filter options exist:

- **All**
- **Already imported**
- **Not imported**

In the details pane on the right side the test series stored in the instrument can be selected. By default, all test series stored in the instrument are selected.



For the test series following filter options exist:

- By clicking on the orange control box, specific test series can be deselected.
- The check box in the header can be used to select **All** or **None**. With the option **Update test series** a test series that is already stored in the DB but has been supplemented on the instrument with additional measurements can also be updated in the DB.
- The headings of the individual parameters depend on the naming of the catalogs used.

Optionally, an entry can be made for parameters 4 and 5:

- To do this, open the upper drop-down box and select the appropriate catalog.
- The entry can then be made in the line below.
- The **Plus (+)** symbol saves the entry in the catalog.
- With the **Down Arrow** symbol, the input can be used for all subsequent test series.

To save the measurements, click on the button **Save data**. The test series saved in the DB get a green check mark.

The screenshot shows a software interface with a top navigation bar containing buttons: 'Save data', 'Delete', 'Go to analysis', 'Reload', and 'Advanced'. Below this is a dialog box with the text 'Data was transferred. Delete selected data?' and a 'Delete' button. Underneath is a table with the following columns: Name, Parameter 1, Date, Standard, Parameter 3, Parameter 4, and Parameter 5. The table contains four rows of data, each with a green checkmark in the 'Name' column. The first row's checkmark is highlighted with a red box. The 'Parameter 4' and 'Parameter 5' columns contain dropdown menus and plus/minus symbols.

Name	Parameter 1	Date	Standard	Parameter 3	Parameter 4	Parameter 5
✓ Model 01		10/28/2022 1:22 PM	ALTANA Gray	Line 1	Comment New Batch	Serial No 1001
✓ Model 01		10/28/2022 1:23 PM	ALTANA Gray	Line 1		1002
✓ Model 01		10/28/2022 1:23 PM	ALTANA Gray	Line 1		1003
✓ Model 01		10/28/2022 1:23 PM	ALTANA Gray	Line 1		1004

To delete data in the device the button **Delete** can be used. Select **Go to Analysis** to proceed directly with data analysis.



NOTICE

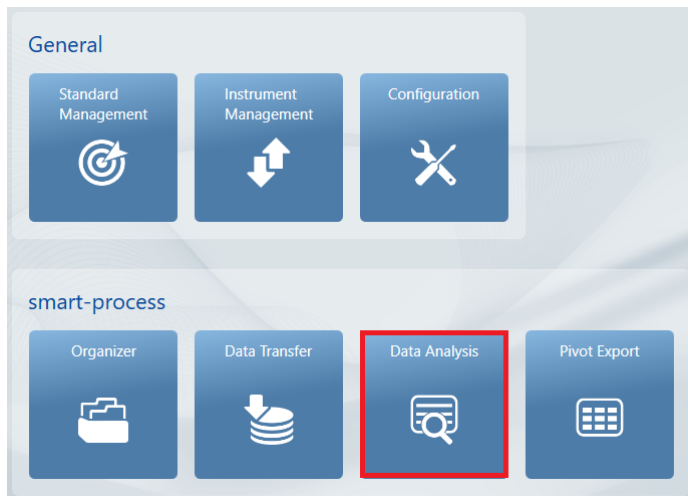
If you forget to delete the measurement data in the device, this can be done later in the module **Instrument Management** module.

7

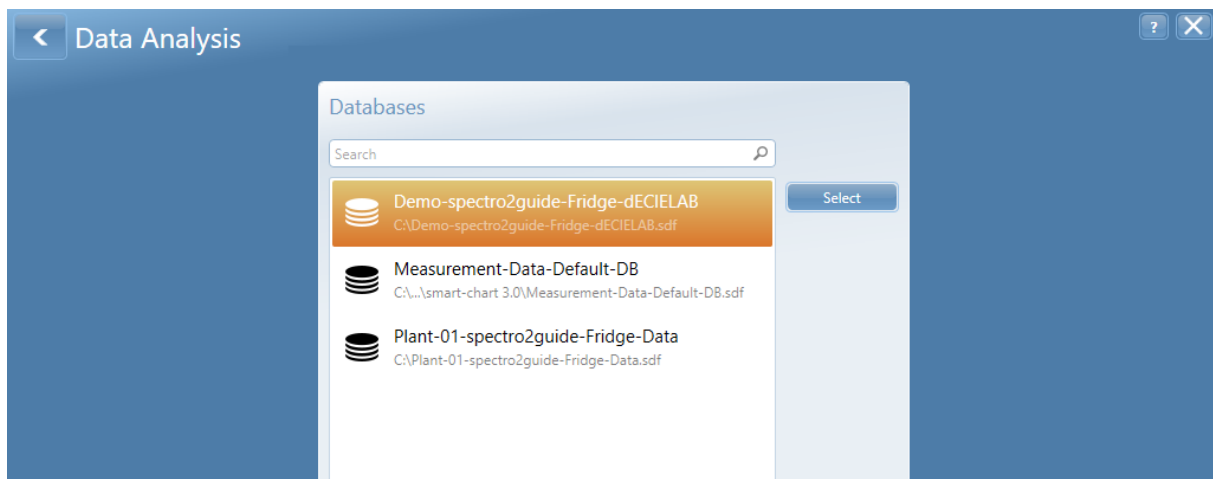
Data Analysis

Analyze measurement data in various reports:

- [Test Report](#)⁴²: Used for single vehicles.
- [Trend Report](#)⁴⁸: Used to control process stability over time.



Select the database in which the measurements are saved. If there is only one database, this dialog is skipped and the database is automatically selected.

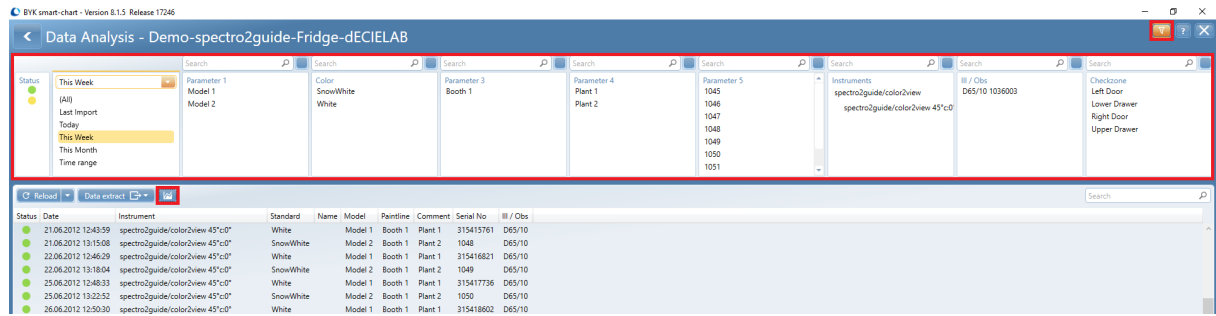


7.1 Database List

The top window allows to select test series from the database which will be listed in the lower area after pressing the **Reload** button.

The following **filter criteria** are available:

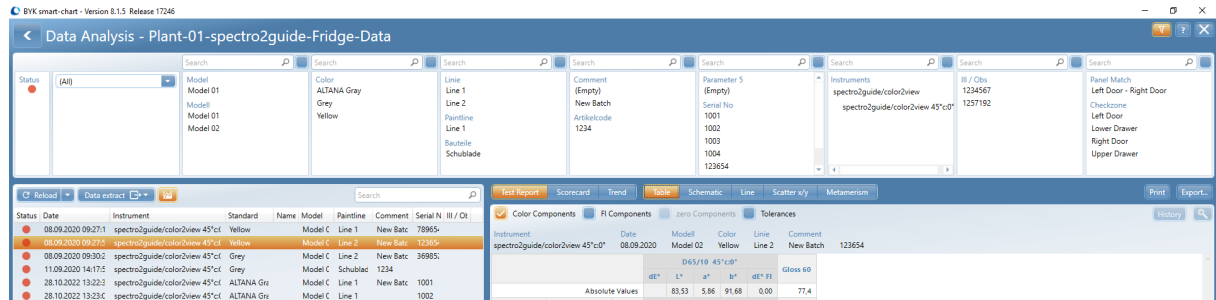
- Status: Pass – Warning – Fail; based on the tolerances defined in Standard Management.
- Date: Input time range or use predefined range, e.g. "Today", "This Week".
- Parameter 1 – 3: As defined in the organizer.
- Parameter 4 – 5: As input on the instrument.
- Instruments and Check Zones / Panel Matches



- To activate a filter criteria: Click on the respective item; it will be highlighted. To deactivate click again.
- The square above each filter field allows to select and deselect all items.
- To select the individual reports with graphical display click on the **Graph** icon.

7.2 Test Report

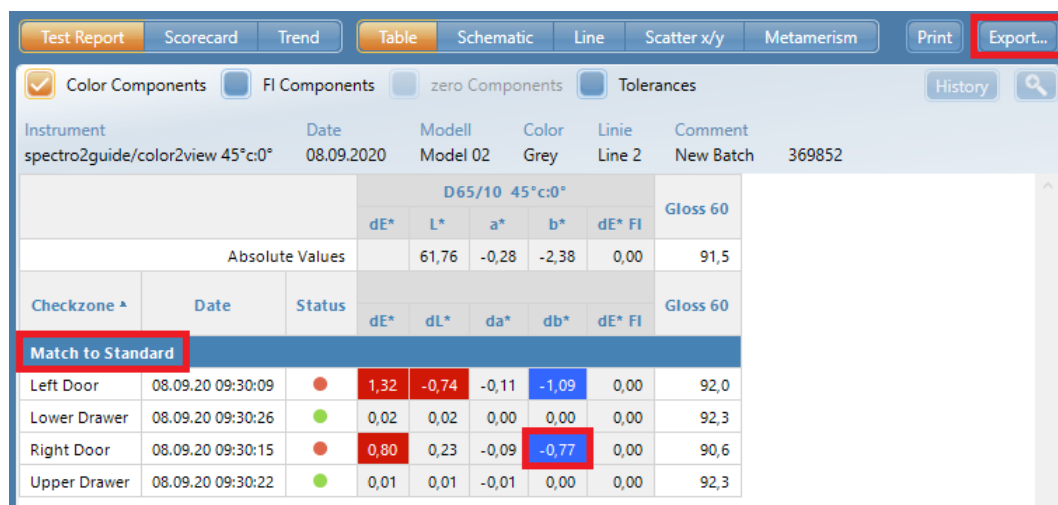
Measurement data of a single test series (fridge) is shown. It is the ideal report for color harmony reviews. Different graphical displays are available.



Select one test series in the list and click on the required graph.

7.3 Data Table

The data table shows the numerical measurement values.



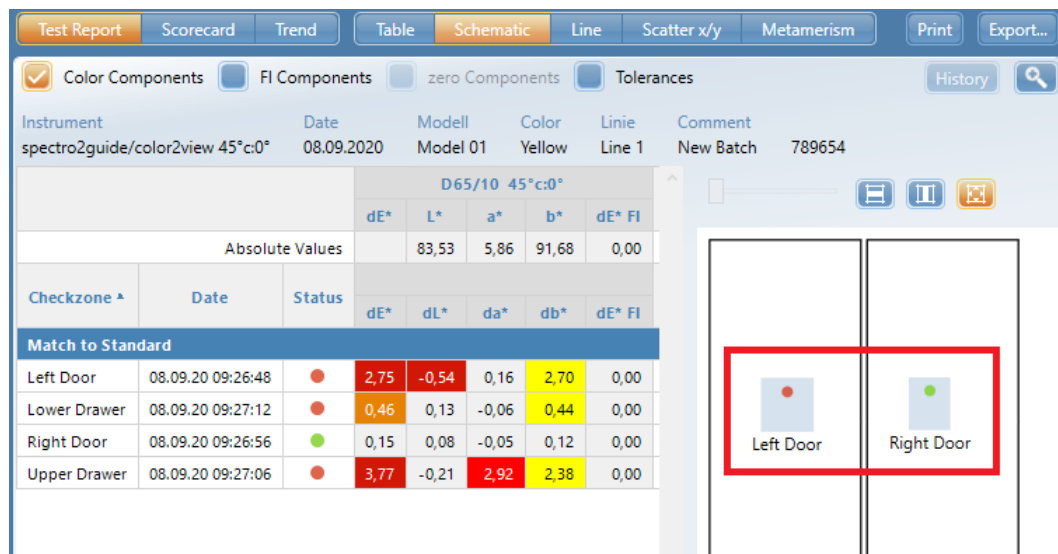
Differences between check zones and master standard (match to standard) as well as differences between two adjacent check zones as defined in the organizer (panel match) are displayed.

- A traffic light symbol is assigned to each check zone and panel match.
- Values out of tolerance are highlighted in yellow or red according to the pass/fail definition in **Standard Management**.
- If individual color components are out of specification, the data is colored to indicate the direction of the deviation, e.g. Δb^* negative > value is highlighted in blue.

The information of the data table can be exported to Excel by clicking on the **Export** button in the right corner above the data table.

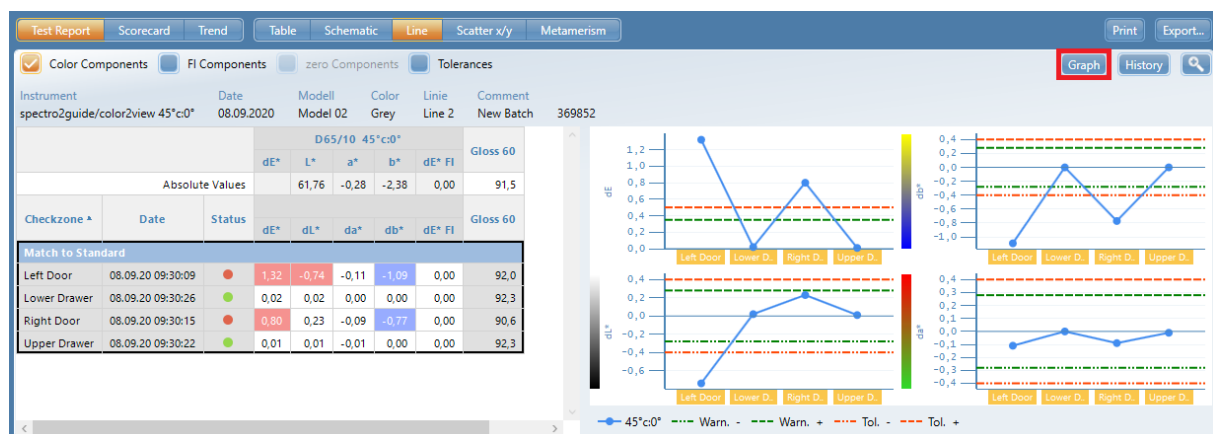
7.4 Test Object Schematic

Clicking on the **Schematic** icon displays the schematic of the test object as defined in the organizer with traffic light symbols.

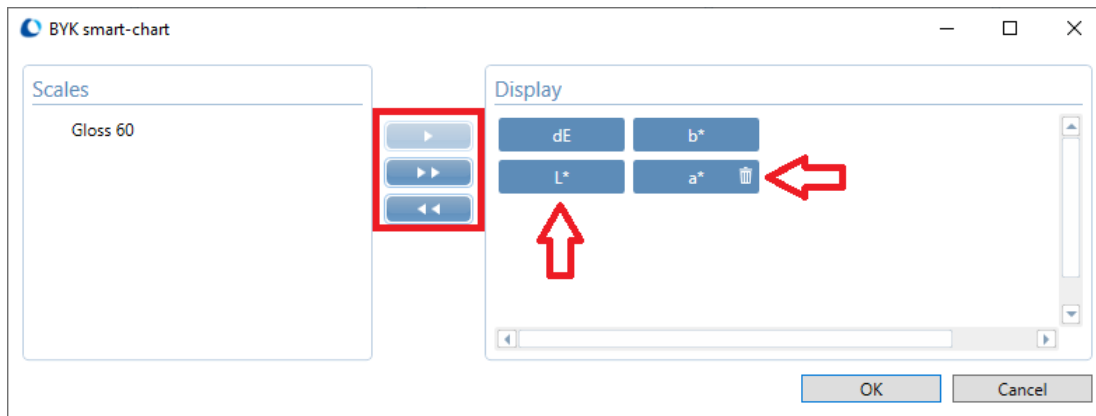


7.5 Line Graph

Clicking on the **Line** icon displays line graphs including the tolerances as defined in **Standard Management**.



The scales to be shown in the graph can be selected by clicking the button **Graph**.



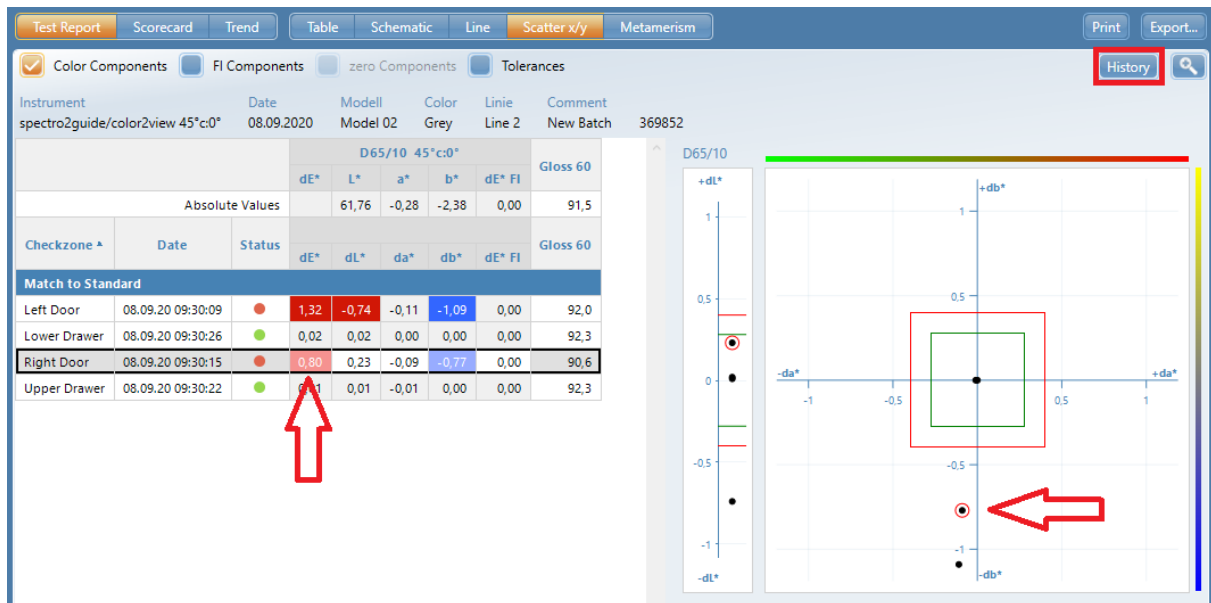
Scales can be moved to be displayed:

- Select the required scales by using the **Arrow** buttons.
- The order of the scales can be changed by using left mouse click and drag & drop.

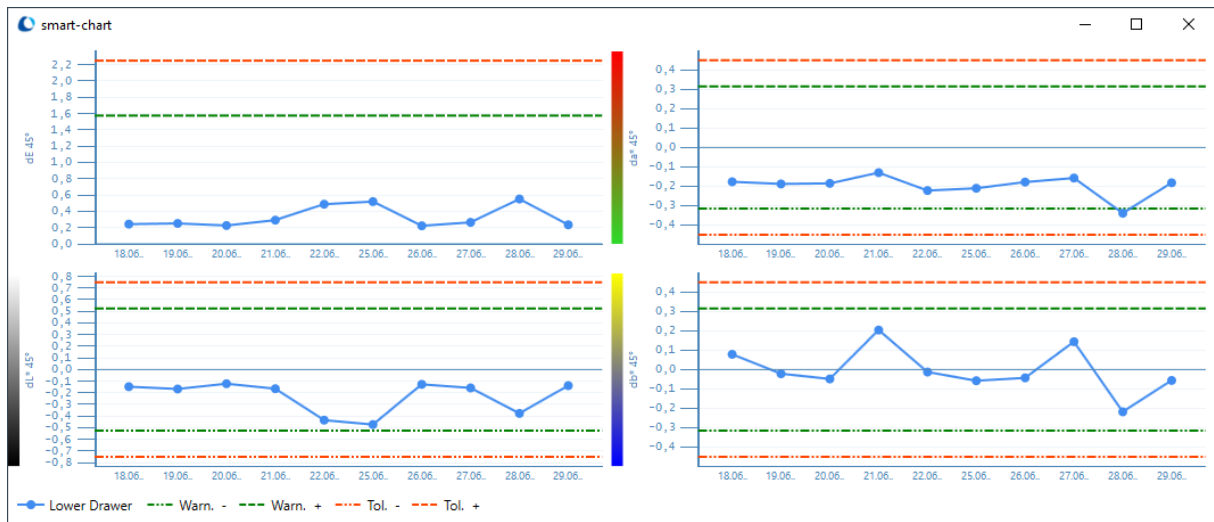
Individual scales can be deselected with the **Waste bin** icon which appears during mouse rollover.

7.6 Scatter Plot

Clicking on the **Scatter x/y** icon displays the CIELAB graph including the tolerances as defined in **Standard Management**. Selecting a check zone in the data table automatically borders the respective dot in the graph in red.



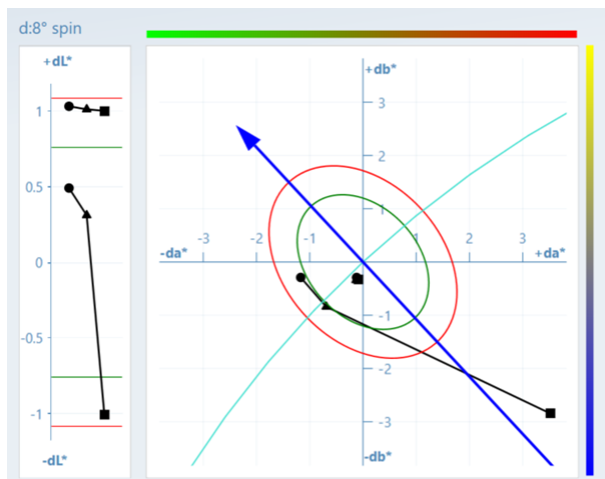
By clicking on **History** the trend for the current check zone with the maximum last 20 test series of the same parameter 1 - 3 (Model - Color - Paint Line) is displayed.



The layout of the graph is according to the definition in **Line Graph**.

7.7 Metamerism

By clicking on the button **Metamerism**, a CIELAB graphic is displayed for different standard illuminants. They must be selected in **Standard Management**.



Each illuminant uses its own symbol. The symbols of the same sample are connected with a line.

7.8 Scorecard Report

This report gives an overview how the individual colors are running over time. It can be used as a summary report for upper management as it will easily detect colors where actions have to be taken.

Status	Date	Instrument	Standard	Name	Model	Paintline	Comment	Serial No	Ill / Obs
●	18.06.2012 11:38:27	spectro2guide/color2view 45°c:0°	White		Model 1	Booth 1	Plant 1	315412951	D65/10
●	18.06.2012 12:55:00	spectro2guide/color2view 45°c:0°	SnowWhite		Model 2	Booth 1	Plant 2	1045	D65/10
●	19.06.2012 12:40:24	spectro2guide/color2view 45°c:0°	White		Model 1	Booth 1	Plant 1	315413930	D65/10
●	19.06.2012 13:09:43	spectro2guide/color2view 45°c:0°	SnowWhite		Model 2	Booth 1	Plant 2	1046	D65/10
●	20.06.2012 12:42:20	spectro2guide/color2view 45°c:0°	White		Model 1	Booth 1	Plant 1	315414763	D65/10
●	20.06.2012 13:12:47	spectro2guide/color2view 45°c:0°	SnowWhite		Model 2	Booth 1	Plant 2	1047	D65/10
●	21.06.2012 12:43:59	spectro2guide/color2view 45°c:0°	White		Model 1	Booth 1	Plant 1	315415761	D65/10
●	21.06.2012 13:15:08	spectro2guide/color2view 45°c:0°	SnowWhite		Model 2	Booth 1	Plant 2	1048	D65/10

A **Scorecard Report** is usually done for *all colors* over a specific time range (e.g. one month):

- Activate the respective **filter criteria** in the upper part of the window and click on **Reload**.
- **Select** all test series in the **List** with the mouse, click on the **Graph** icon.

In the report pane select **Scorecard** and **Table**.

	SnowWhite					White						
	Booth 1											
	dE 45	dL 45	da 45	db 45	dC 45	dH 45	dE 45	dL 45	da 45	db 45	dC 45	dH 45
- Model 1							0,36	-0,20	0,04	0,02	0,01	-0,04
- Match to Standard							0,36	-0,20	0,04	0,02	0,01	-0,04
Left Door							0,31	-0,13	0,03	0,26	0,25	-0,07
Lower Drawer							0,27	-0,20	0,08	-0,15	-0,16	-0,05
Right Door							0,53	-0,39	0,04	-0,35	-0,35	0,02
Right Door							0,45	-0,28	0,05	-0,34	-0,35	0,01
Upper Drawer							0,33	-0,10	0,02	0,30	0,29	-0,07
- Model 2	0,65	-0,56	-0,22	-0,11	-0,02	0,24						
- Match to Standard	0,65	-0,56	-0,22	-0,11	-0,02	0,24						
Left Door	1,05	-0,94	-0,27	-0,29	-0,16	0,37						
Lower Drawer	0,33	-0,23	-0,20	-0,77	0,07	0,19						
Right Door	0,25	-0,19	-0,11	0,11	0,14	0,07						
Upper Drawer	0,96	-0,88	-0,28	-0,24	-0,12	0,35						

The arrangement of data in **rows** and **columns** is defined by the blue **grouping fields** in the upper part of the table:

- To change the layout drag & drop the field to the row or column header area, or remove it to the top of the table.
- The grouping fields are related to the parameters defined in the organizer. Additional fields are available for **Day, Week, Month, Angle**.

For the table cells following rules apply:

- Values out of tolerance are highlighted in yellow or red according to the pass/fail definition in **Standard Management**.
- If individual color components are out of specification, the values are colored to indicate the direction of the deviation, e.g. db* negative > value is blue.

The scales to be shown in the table can be selected with the **Filter** symbol on the blue grouping field.

The screenshot shows the software interface with a table of test results. A dialog box titled 'smart-chart' is open, showing 'Scales' and 'Display' sections. The 'Scales' section lists 'Color', 'da', '45°', and 'db', '45°'. The 'Display' section shows 'dE 45°' and 'dL* 45°'. The 'Filter' symbol (a blue 'Y' in a red box) is highlighted in the top right corner of the table header area.

SnowWhite		White					
dE 45	dL 45	da 45	db 45	dE 45	dL 45	da 45	db 45
Right Door	0,25	-0,19	-0,11	0,11			
Upper Drawer	0,96	-0,88	-0,28	-0,24			

Select the required scales by using the **Arrow** buttons.

This filter function is available for all selected grouping fields and allows customization of the data table.

The data can also be viewed in **Scatter - Line - Metamerism** graph by clicking on an individual cell or a complete line.

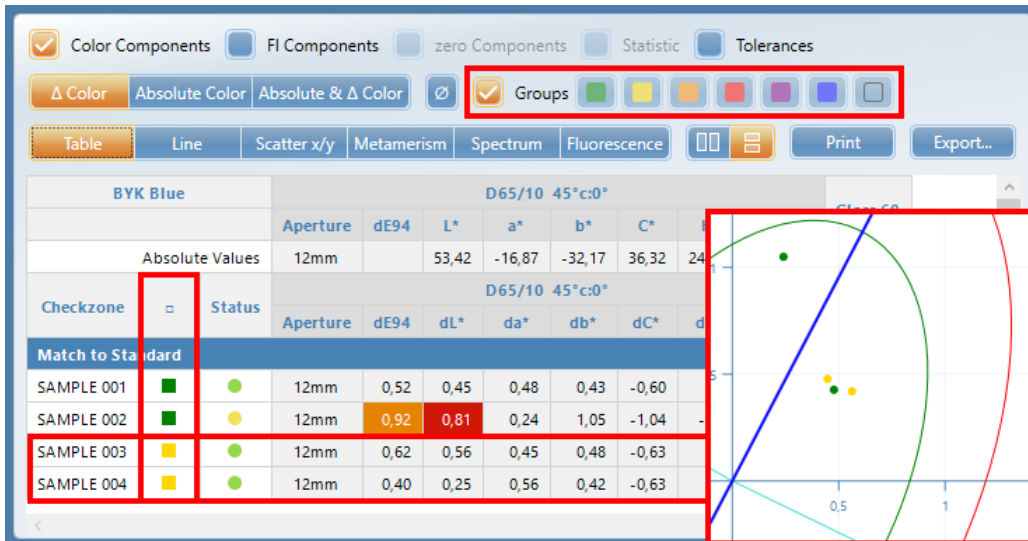


NOTICE

The value in a table cell is the average of all selected test series and is highlighted in yellow or red according to the pass/fail definition in **Standard Management**.

7.9 Grouping

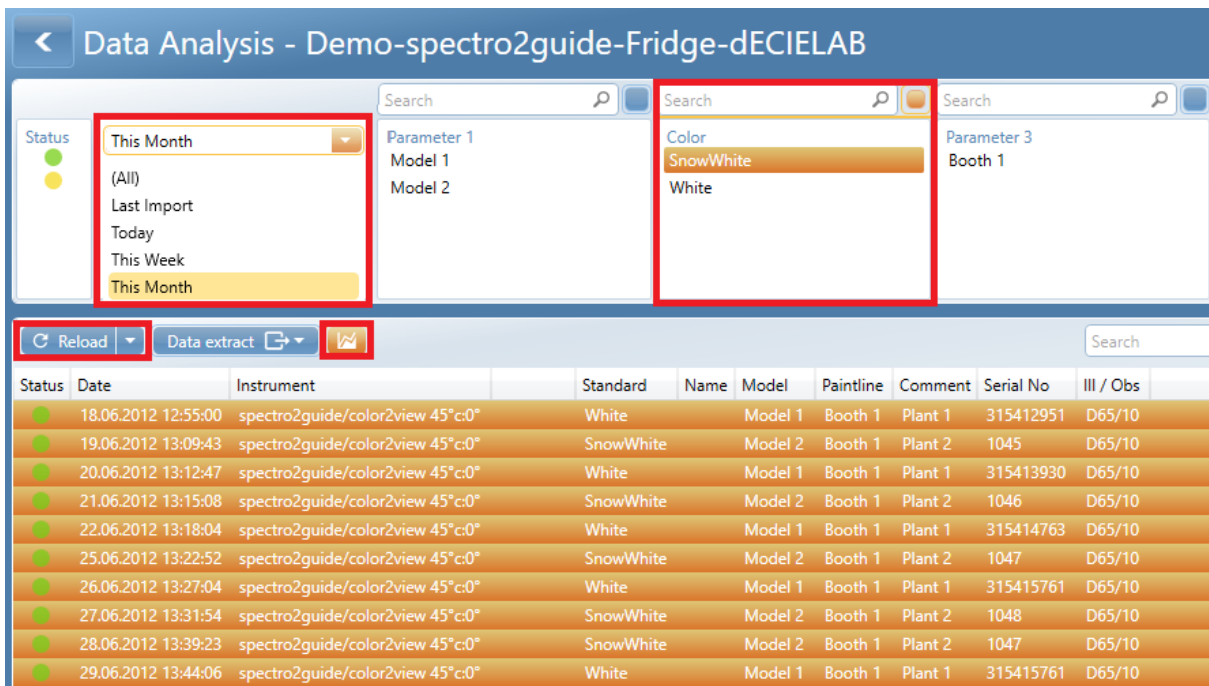
Several check zones can be combined to a group. In **Data Analysis** the average of each group will be displayed additionally.



Highlight the zones to be grouped and select a name from the **Groups** box or click **Create Group** to create a new name.

7.10 Trend Report

This report shows measurement data over time (day, week, and month) or by individual. It is the ideal tool to monitor process stability.



A **Trend Report** is usually done for *one color* over a specific time range (e.g. one month):

- Activate the respective **filter criteria** in the upper part of the window and click on **Reload**.
- **Select** all test series in the **List** with the mouse, click on the **Graph** icon.

The screenshot shows a software interface with a data table. The table has columns for dates (June 18-29, July 2-13) and rows for different components: Match to Standard, Left Door, Lower Drawer, Right Door, and Upper Drawer. The 'Match to Standard' row has a value of 0,74. The 'Left Door' row has values ranging from 1,57 to 1,73. The 'Lower Drawer' row has values ranging from 0,24 to 0,32. The 'Right Door' row has values ranging from 0,36 to 0,43. The 'Upper Drawer' row has values ranging from 0,81 to 1,12. A red box highlights the column headers, and red arrows point to the 'Day' and 'Scale' headers.

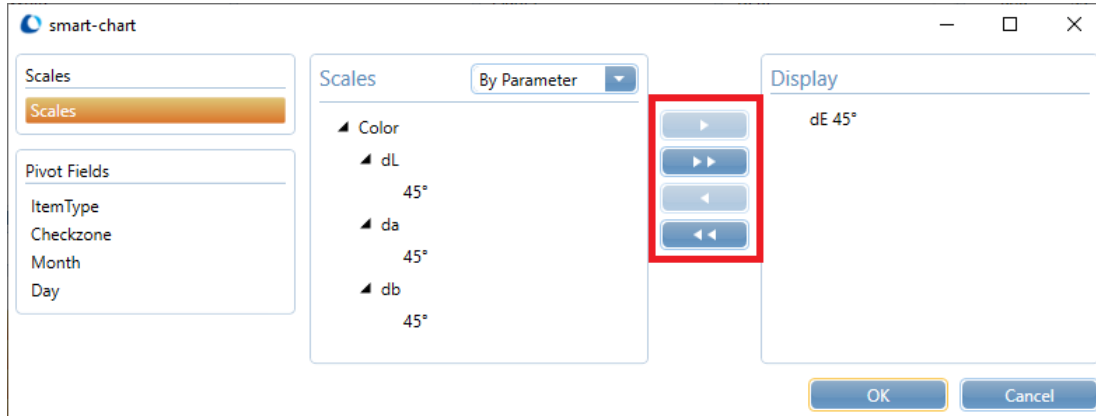
	June									July										
	18	19	20	21	22	25	26	27	28	29	2	3	4	5	6	9	10	11	12	13
	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45	dE 45
Match to Standard	0,74	0,60	0,58	0,70	0,65	0,67	0,63	0,65	0,65	0,61	0,67	1,07	0,97	0,90	0,92	0,97	0,99	0,94	0,94	0,90
Left Door	1,57	1,08	0,96	1,09	0,88	1,04	0,85	1,01	0,87	1,17	1,20	1,69	1,60	1,61	1,58	1,60	1,77	1,65	1,70	1,73
Lower Drawer	0,24	0,25	0,23	0,29	0,49	0,52	0,22	0,26	0,55	0,24	0,22	0,30	0,42	0,29	0,29	0,33	0,33	0,42	0,33	0,32
Right Door	0,36	0,19	0,25	0,32	0,31	0,22	0,24	0,20	0,21	0,23	0,23	0,58	0,55	0,32	0,51	0,49	0,37	0,39	0,37	0,43
Upper Drawer	0,81	0,87	0,88	1,10	0,92	0,89	1,21	1,13	0,98	0,82	1,02	1,69	1,32	1,38	1,32	1,44	1,50	1,32	1,37	1,12

In the report pane select **Trend** and **Table**:

- The arrangement of data in **rows** and **columns** is defined by the blue **grouping fields** in the upper part of the table.
- To change the layout drag & drop the field to the row or column header area, or remove it to the top of the table.
- The grouping fields are related to the parameters defined in the organizer. Additional fields are available for **Day, Week, Month, Year**.

Values out of tolerance are highlighted in yellow or red according to the pass/fail definition in **Standard Management**.

The scales to be shown in the table can be selected with **Filter** symbol on the blue grouping field.



Select the required scales by using the **Arrow** buttons.

The filter function is available for all selected grouping fields and allows customization of the data table.



NOTICE

The value in a table cell is the average of all selected test series and is highlighted in yellow or red according to the pass/fail definition in **Standard Management**.

7.11 Drill-In Function

The summarized data can be shown graphically in details by clicking on one or multiple rows, cells or columns.



The data on the x-axis can be selected by the drop down menu above the graph:

- **Daily - Weekly - Monthly - Yearly - Serial No. - Check Zone**

Selecting **Serial No.** (=Parameter 5) displays individual test series whereas **Daily, Weekly, Monthly, Yearly** still displays the average of all test series measured during this time frame.

The buttons above the graphs allow to view the data as **Line, Scatter** or **Metamerism** graph.

7.12 Comparison of check zones

To compare different check zones press the **CTRL** button and click on the desired rows. Then activate the option **Compare**.



The data on the x-axis can be selected by the drop down menu above the graph:

- **Daily - Weekly - Monthly - Yearly - Serial No. - Check Zone**

Selecting **Serial No.** displays individual test series whereas **Daily, Weekly, Monthly, Yearly** still displays the average of all test series measured during this time frame.

The buttons above the graphs allow to view the data as **Line, Scatter** or **Metamerism** graph.

8

Data Sharing

There are two possibilities to share data between headquarter - plants - suppliers:

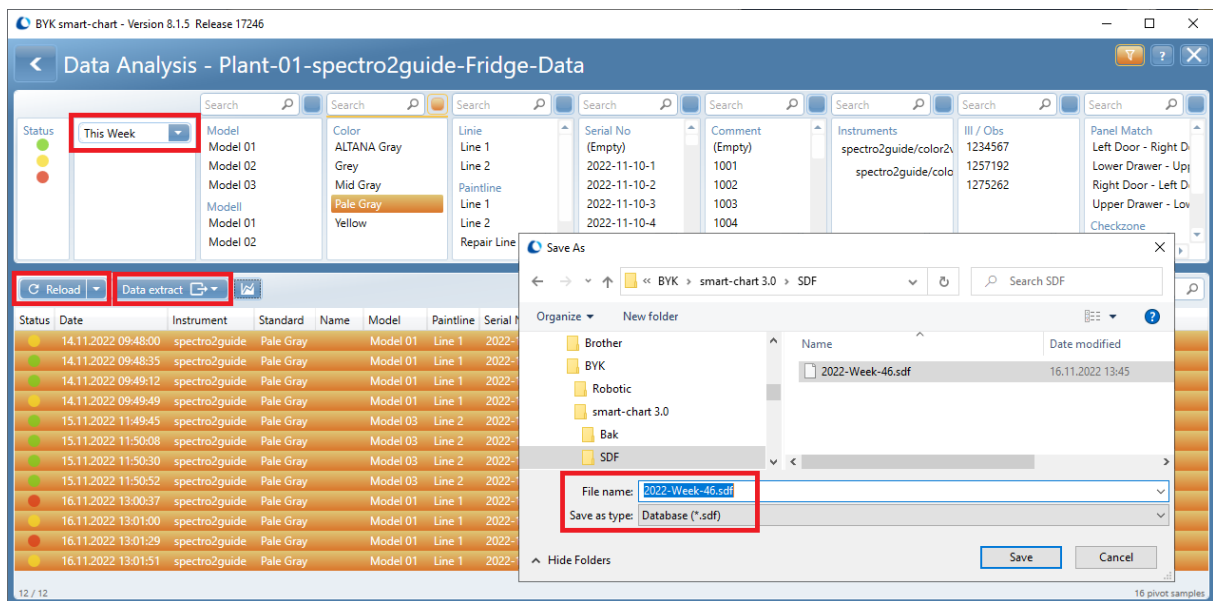
- [Extract \(Mini-DB\)](#)⁵³: Create an extract of the complete database, e.g. once per week.
- [Complete Database](#)⁵⁴: Always share the complete database.

8.1 Database Extract (=Mini Database)

Create an extract (= mini database):

- Select the required time frame, click on **Reload** and mark all test series in the **List** with the mouse.
- Click on **Data extract > DB** and type in a name for the extracted database, e.g. using the calendar week.
- The mini database is saved in the regular *.sdf format.

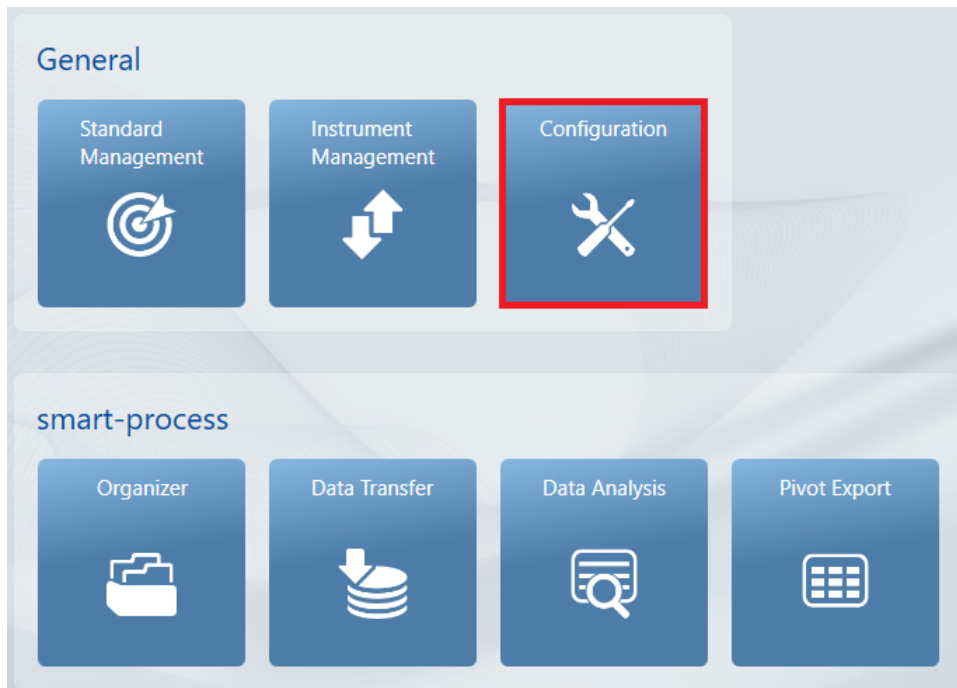
Close smart-chart, open Windows Explorer and navigate to the appropriate folder.



Create a zip archive of the *.sdf database file to make sure it can be sent safely by email (description see next page).

8.2 Complete Database

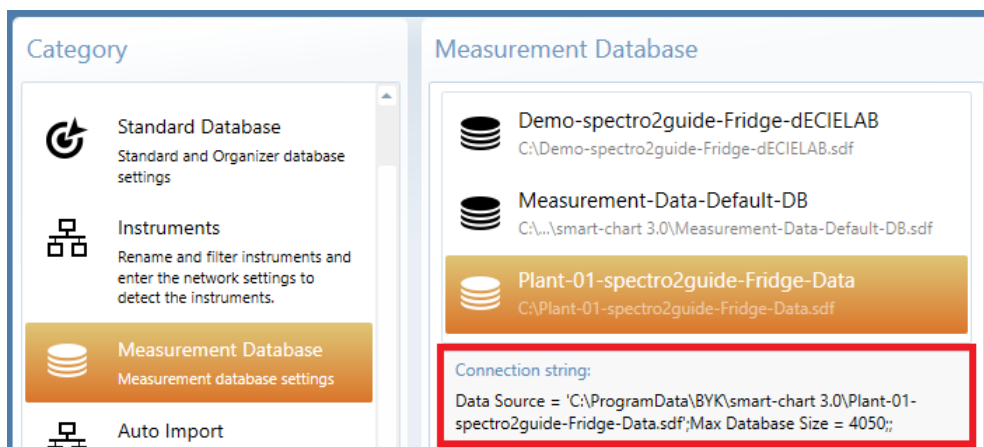
The complete database can also be shared. In order to find the folder where the database is stored click on **Configuration**.



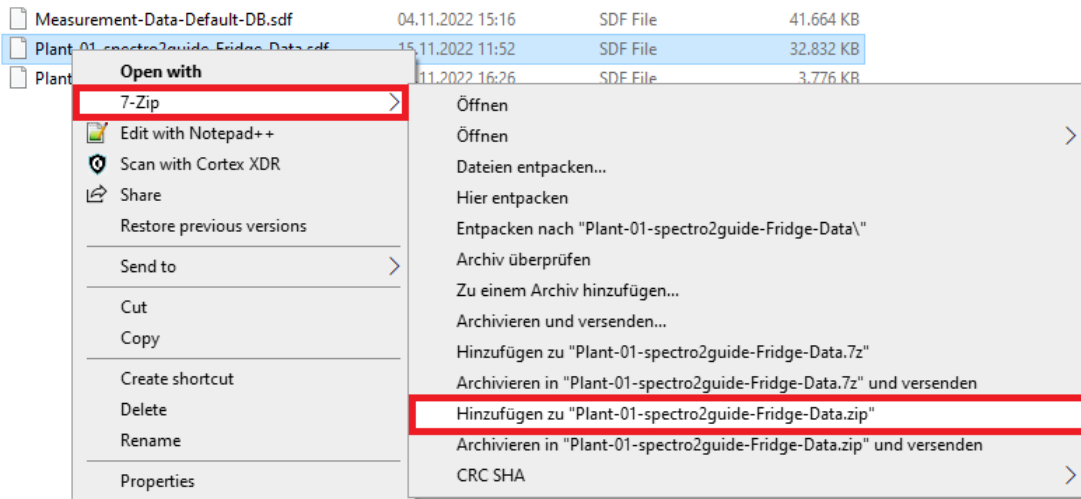
To share the complete measurement database:

- Under **Category**, select measurement database.
- All measurement databases are shown on the right side.
- Select the one you want to share.
- The folder where it is stored is displayed at the bottom as **Connection String - Data Source**.

Close smart-chart, open Windows Explorer and navigate to the appropriate folder.



Create a zip archive of the *.sdf database file to make sure it can be sent safely by email.



The example above shows how to quickly create ZIP archives with "7-Zip".

9

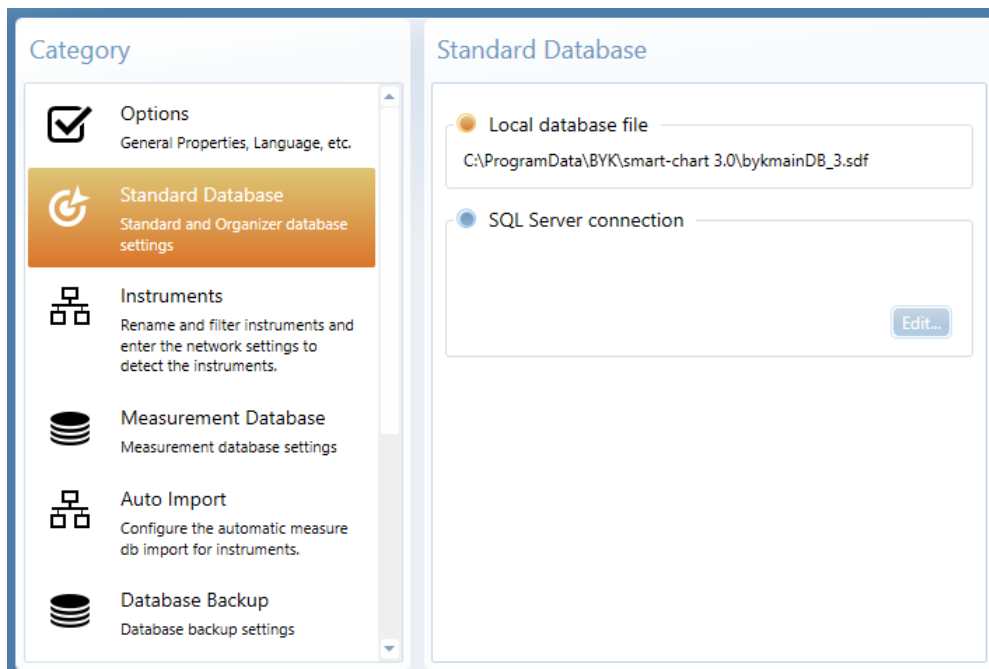
Configuration

Create measurement databases, load product schematics and assign names of catalogs for the parameters in the organizer.

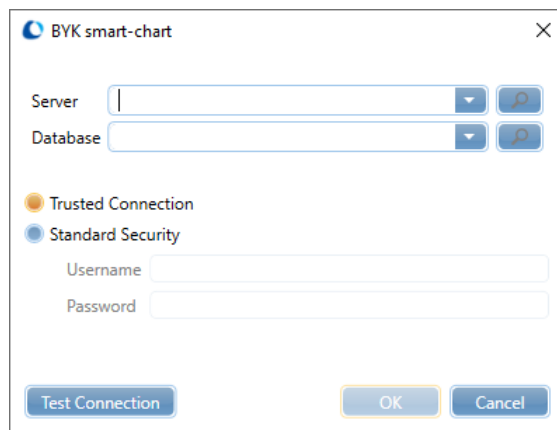


9.1 Standard Database

The standards (colors) and organizers (test procedures) are stored in the **Standard Database**. This DB is **fix assigned** to "C:\ProgramData\BYK\smart-chart 3.0\bykmainDB_3.sdf".



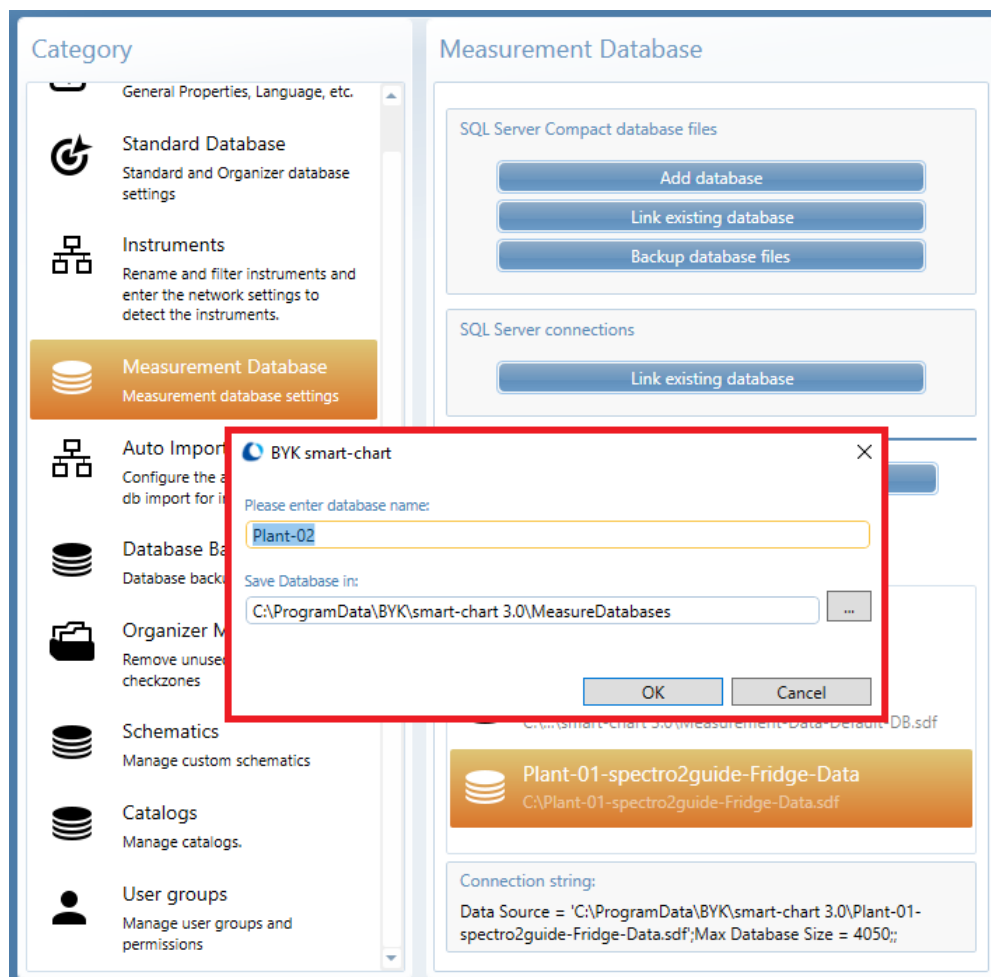
It is also possible to use an **SQL Server Connection** to link an SQL database on a server, to which all defined users have access.



The connection details can be requested from the database administrator.

9.2 Measurement Database

The measurement results are stored in a **Measurement Database**. As default, the database is created in the folder: "C:\ProgramData\BYK\smart-chart 3.0\MeasureDatabases".



For each purpose a different database can be created:

- Select **Measurement Database**.
- Select **Add database**.
- Input a database name, e.g. the plant code.

9.3 Delete Measurements

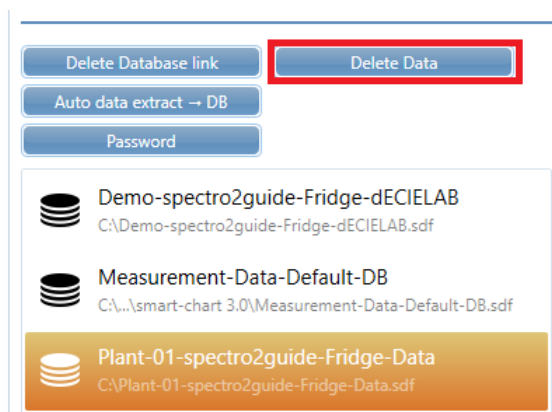


NOTICE

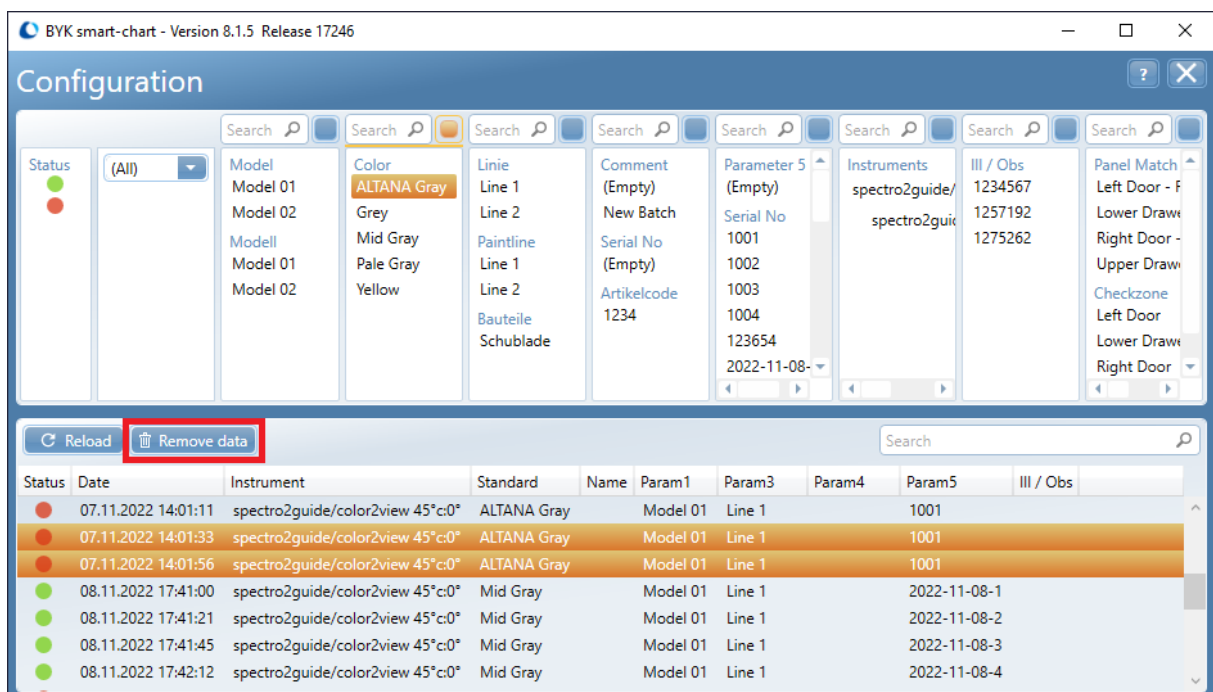
It is recommended to create a backup of the database file before deletion of data.

Test series not required anymore can be deleted from the database:

- Select **Measurement Database**.
- Select the required measurement database.
- Select **Delete Data**.



The database is opened for the deletion of test series. This dialog is similar the module **Data Analysis**.

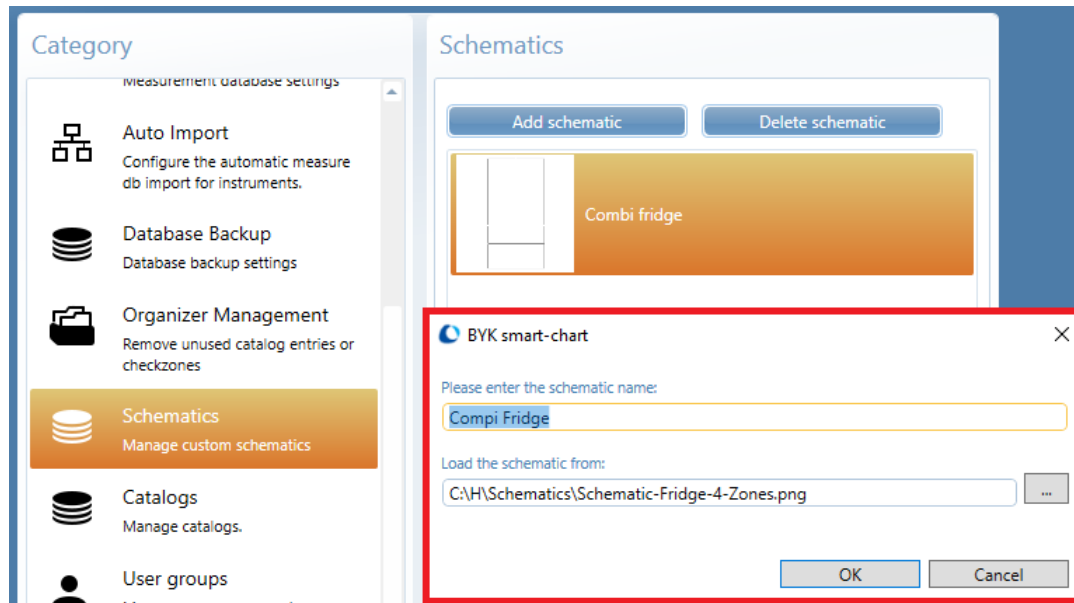


To delete specific test series:

- Define the filter criteria on the top.
- Select **Reload** to apply the filter criteria.
- Select the test series to be deleted with **Ctrl** and/or **Shift**.
- Select **Remove data** to apply the filter criteria.

9.4 Manage Object Schematics

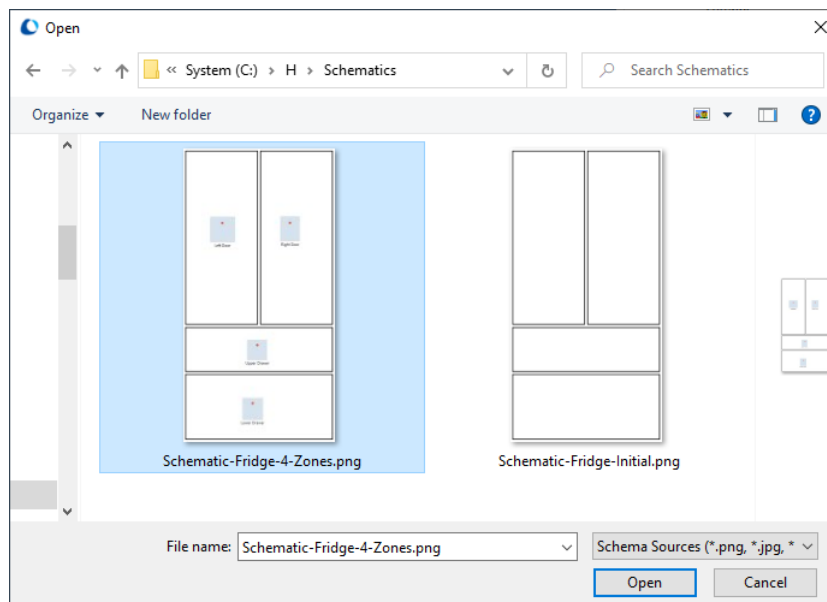
In **Schematics** the custom schematics to be used in the organizers are defined.



To load a new schematic:

- Select **Schematics**.
- Select **Add Schematic**.
- Enter name, e.g. "Combi Fridge".
- Load the corresponding graphic file on the computer.

With the button ... a browse dialog opens to navigate to the graphic file. The following file formats are supported: *.png, *.jpg, *.jpeg, *.xaml, *.svg.

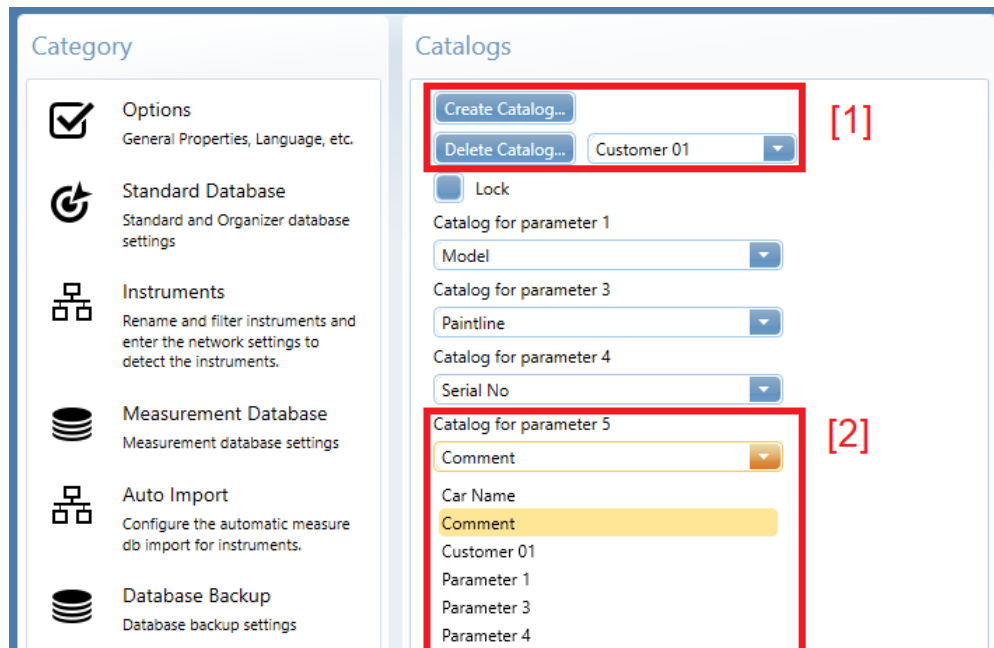


NOTICE

New custom schematics can also be defined in the module **Organizer**. Deletion of custom schematics is only possible here in the module **Configuration**.

9.5 Manage Organizer Parameters

In **Catalogs** the names to be used for parameter 1, 3, 4 and 5 an organizer are defined. This assignment can not be changed within the organizers if the option **Lock** is active.



To create a new catalog:

- Select **Create Catalog**.
- Enter name, e.g. "Customer 01".

To delete a catalog:

- Select the catalog from the top level combo box [1].
- Select **Delete Catalog**.

To select a catalog for a specific parameter:

- Select the catalog from the combo box for a parameter [2].
- Repeat for all remaining parameters (1, 3, 4 and 5).

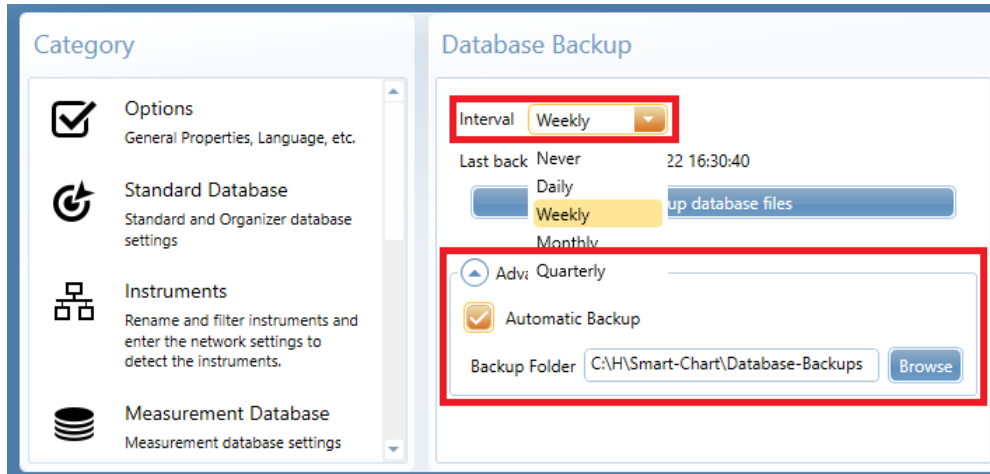


NOTICE

Parameter 2 is fix assigned to the catalog "Color".

9.6 Data Backup

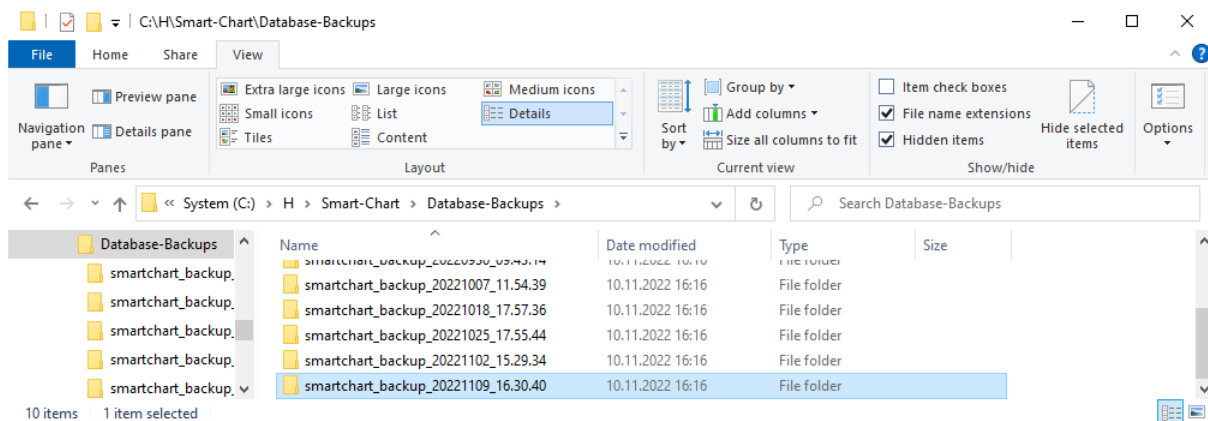
Backup of measurement data is very important to avoid any data loss. Running the back up at least once a week is recommended. In module **Configuration** an automatic backup procedure can be defined.



To backup the complete database:

- Under **Category**, select **Database Backup**.
- For the backup **Interval** select **Weekly**.
- Use the **Arrow** down in front of **Advanced** to activate **Automatic Backup** and **Browse** for the backup folder on your computer.
- A **folder** with the name shown below is created:
 - The name includes **date** and **time** of the backup.
 - The standard database as well as all linked measurement databases are saved.

The backup is automatically done when smart-chart is terminated.



Save all backup files on a second place, e.g. on a network drive, an external hard disk or a USB flash drive.

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Download your manuals from:

<https://www.byk-instruments.com/p/7075>

Download your software from:

<https://www.byk-instruments.com/spectro2guide>

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