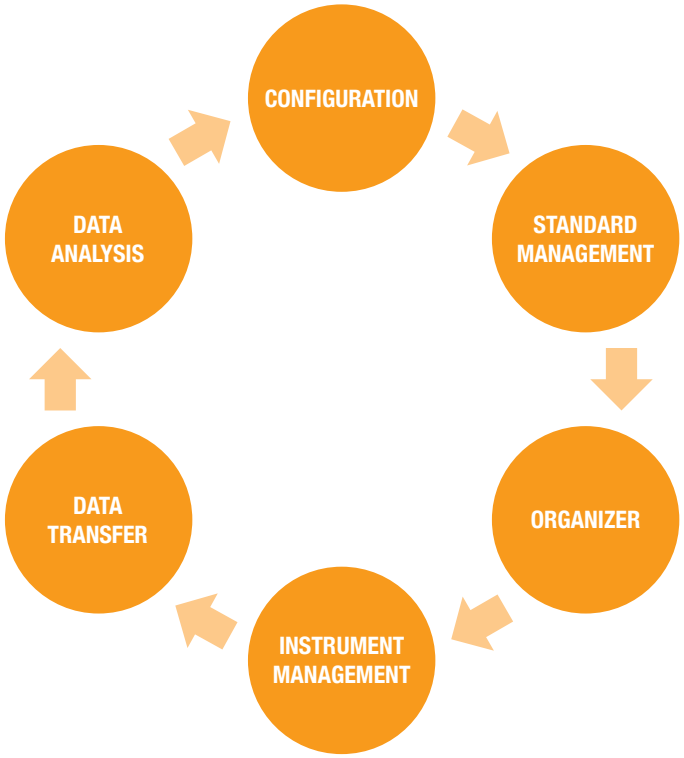
Measure what you see.

BYK-mac i with smart-chart



Step-by-Step Guide

A member of ALTANA

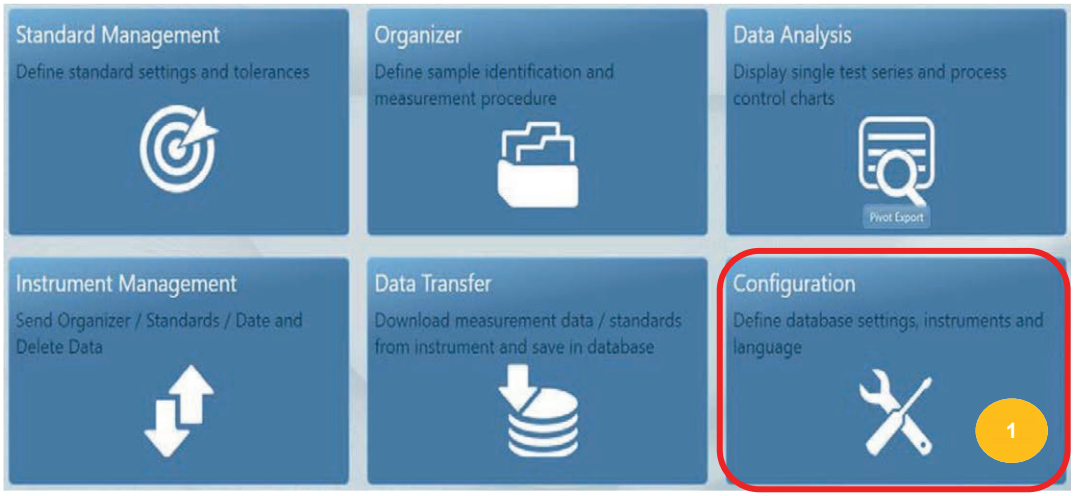
BYK

BYK-mac i with smart-chart

smart-process Overview

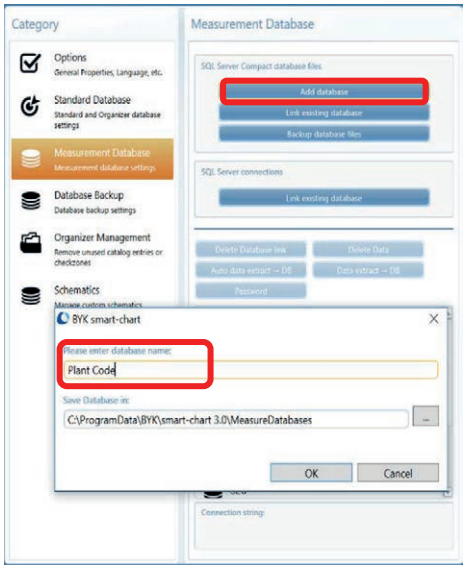
1	**Configuration**	General program settings such as Language, Database set-up, Organizer Management and Data Backup are defined.
2	**Standard Management**	Definition of color standards with Pass/Fail limits: Measurement of master panels or import of digital standards.
3	**Organizer**	Definition of a standard measurement procedure for clear sample identification and menu guided operation on the instrument.
4	**Instrument Management**	Preparation of the instrument by sending organizers including the selected color standards.
5	**Data Transfer**	Take readings with the instrument, download to smart-chart and save in a database.
6	**Data Analysis**	Data analysis of measurements in various reports: test report for single vehicles up to trend reports over time.
	smart-chart Version	Displayed in the header row or by clicking on the icon **About/License**

1. **Configuration**
   Define measurement database, load car schematics and assign names for parameters used in the organizer.



<u>Define measurement database</u>

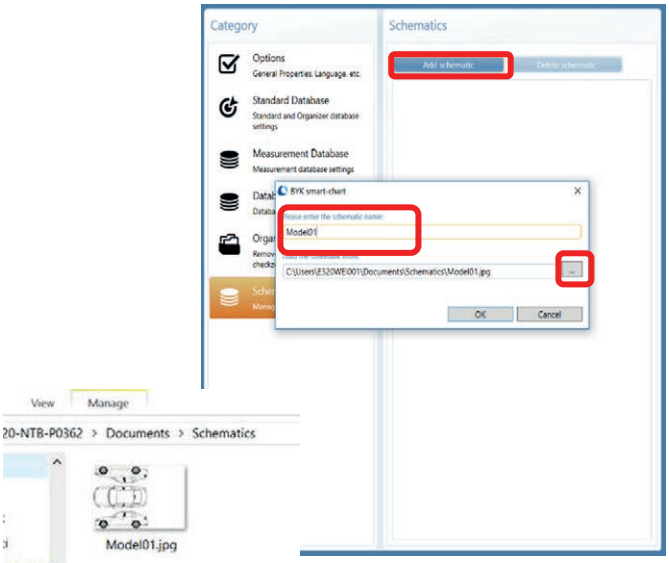
- Select **Measurement Database**
- Select **Add database**
- Input database name e.g. Plant Code



Note: As default, the database is created in the folder C:\ProgramData\BYK\smart-chart 3.0\MeasureDatabases

<u>Load car schematics</u>

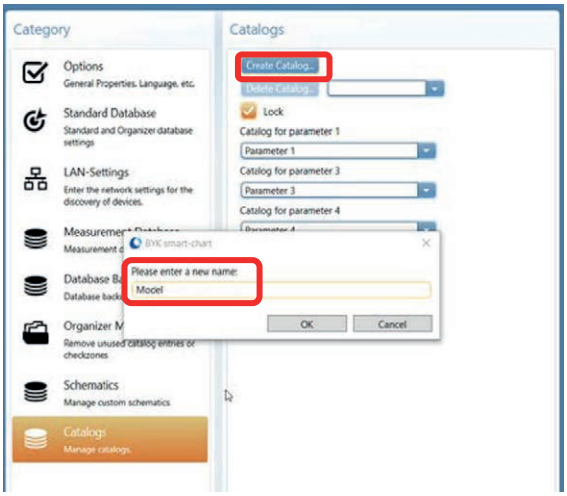
- Select **Schematics**
- Select **Add Schematic**
- Input name e.g. Model01
- Browse for respective file on your computer and load it
- The data source location appears next to the **Browse** button



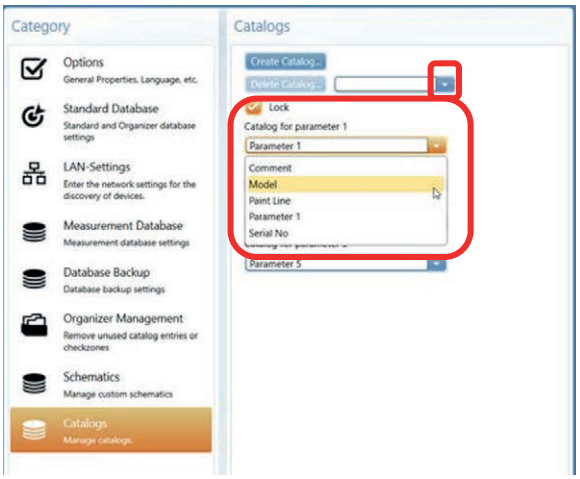
Note: The following file formats are supported: *.png, *.jpg, *.jpeg, *.xaml, *.svg

Assign names for parameters in organizer

- Select **Catalogs**
- Select **Create Catalog**
- Input name e.g. Model and Paint Line

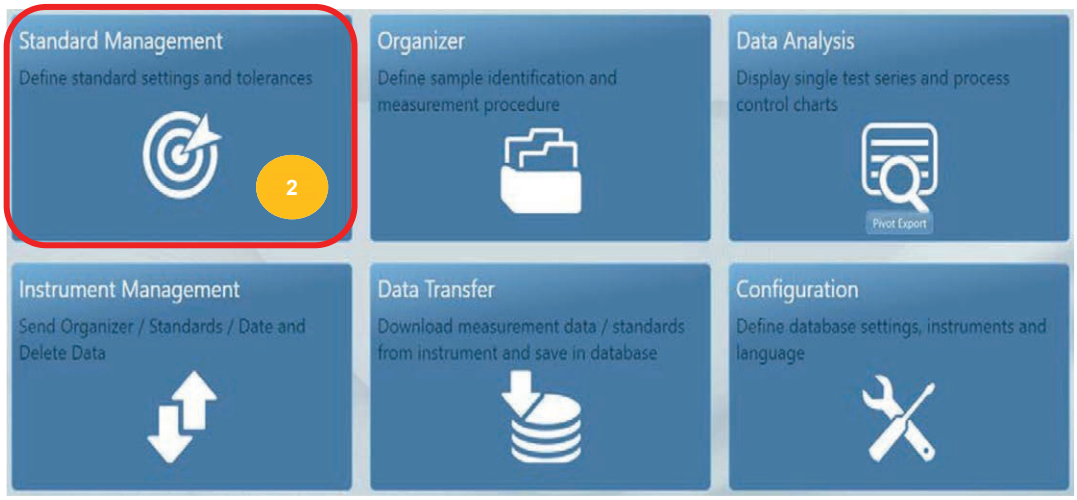


- Select the respective names for Parameter 1 -5 with the drop down box behind each parameter
- If **Lock** is activated, only the selected catalog can be used in the organizer. Otherwise, all available catalogs can be selected.



Note: Catalogs can be deleted by selecting them with the drop down box and click on **Delete Catalog.**

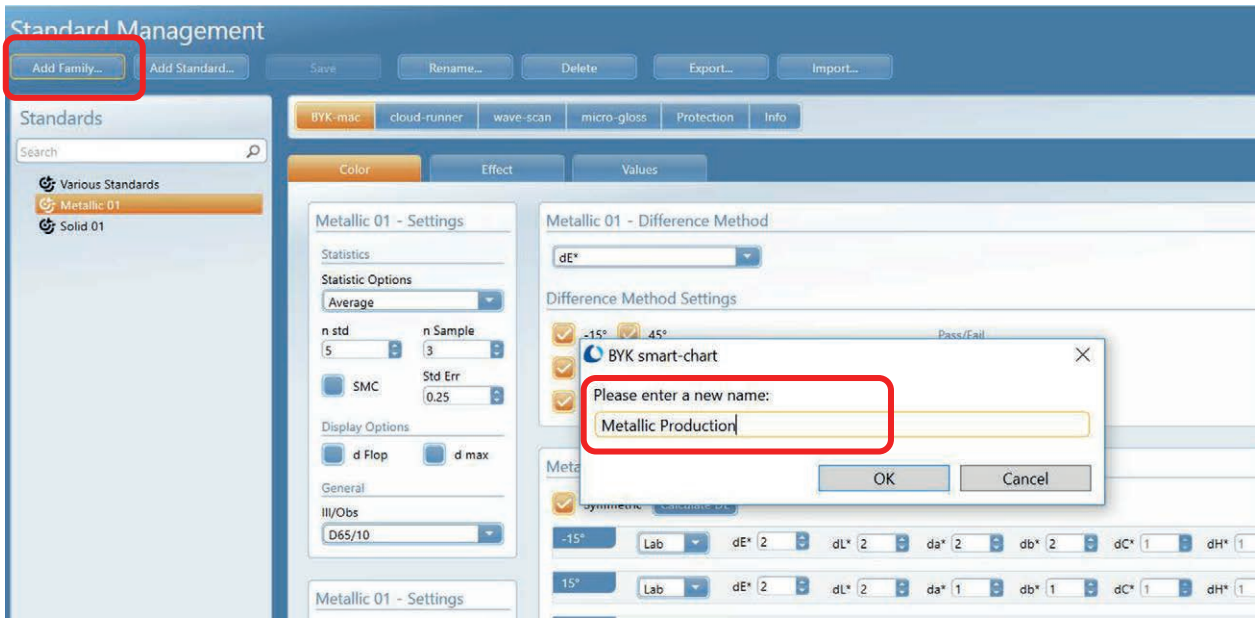
2. Standard Management



2.1. Create color families including color standards by measuring master panels

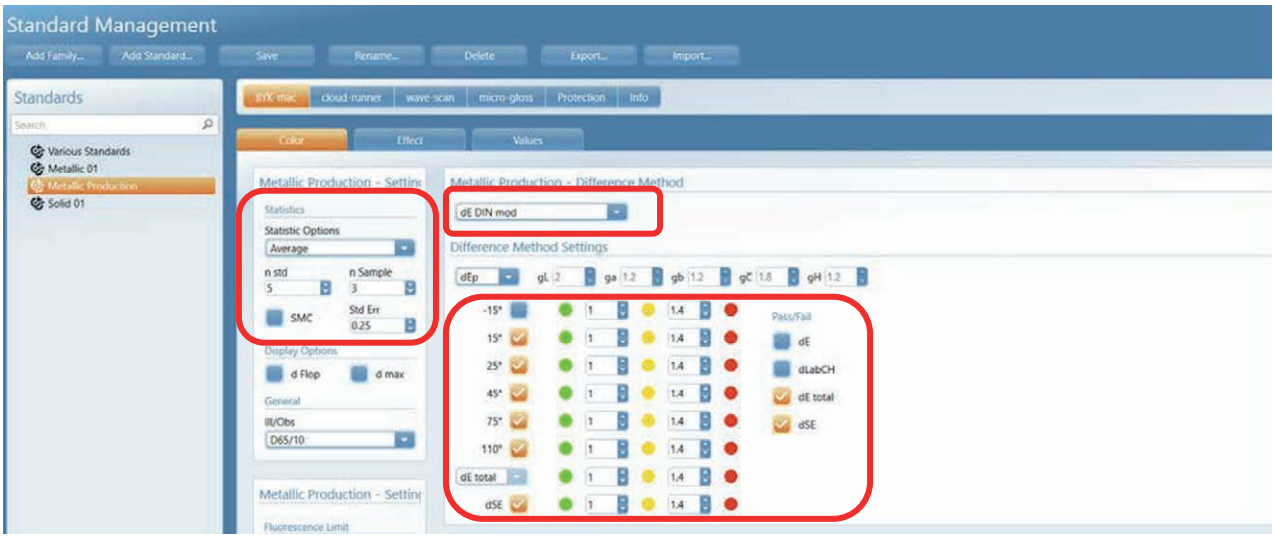
Create a Color Family

- Select **Add Family** and input name e.g. Metallic Production

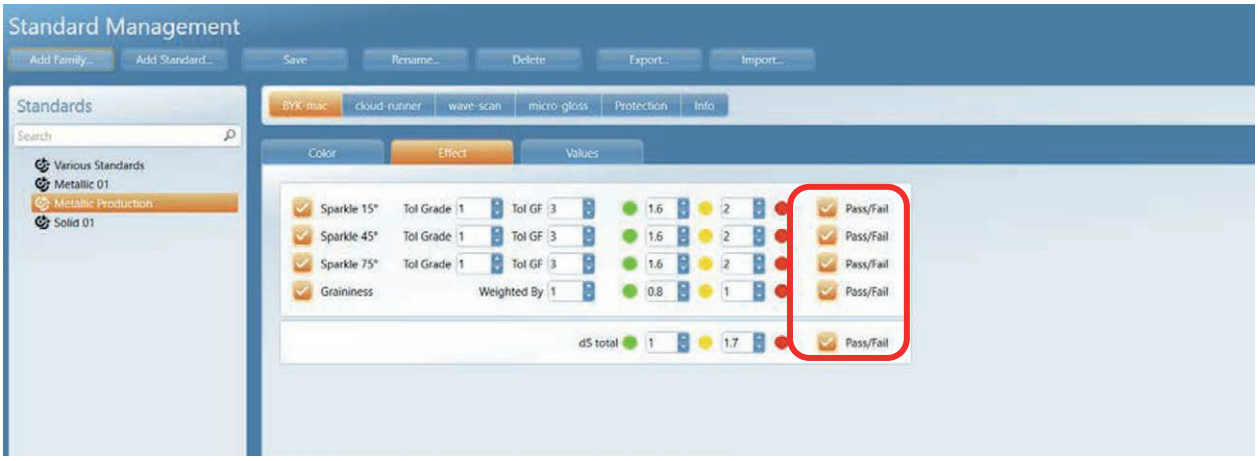


➔ A family defines the common measurement settings

- Select the tab **Color** and define the
  - Color difference method:
  - Measurement angles: 15°/25°/45°/75°/110°
  - Number of readings for standard (= master panel) and sample (= check zone)
  - Statistic Options

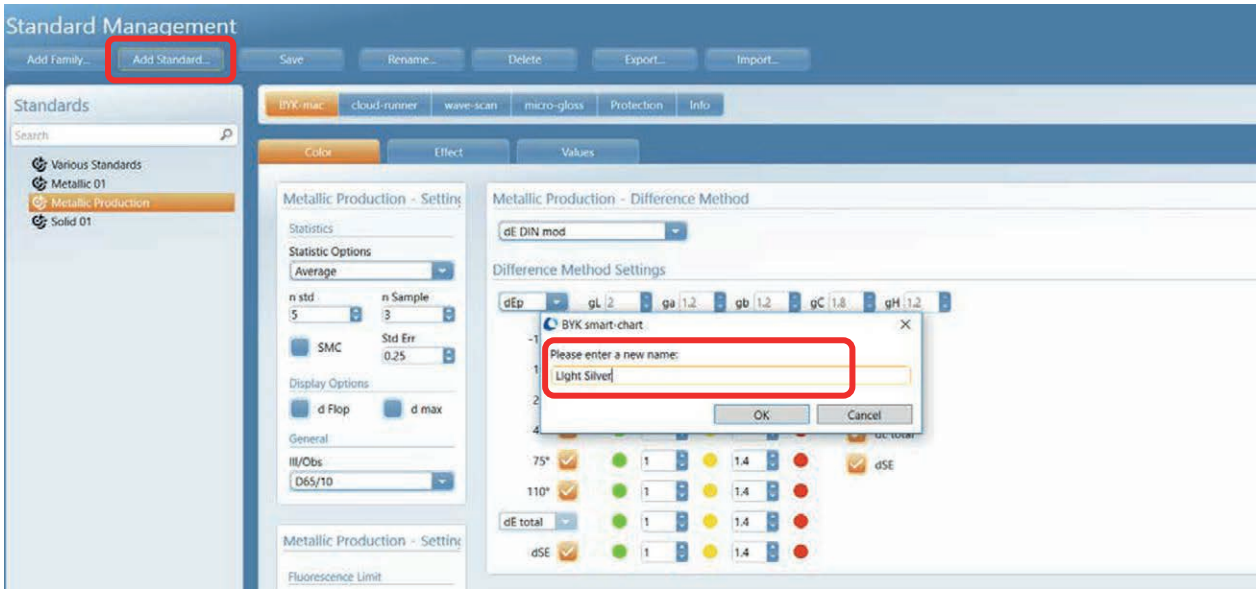


- Select the tab **Effect** and activate/deactivate Pass/Fail for Sparkle and Graininess
  ➔ If Pass/Fail is deactivated, effect parameters are measured but not used for Pass/Fail decision

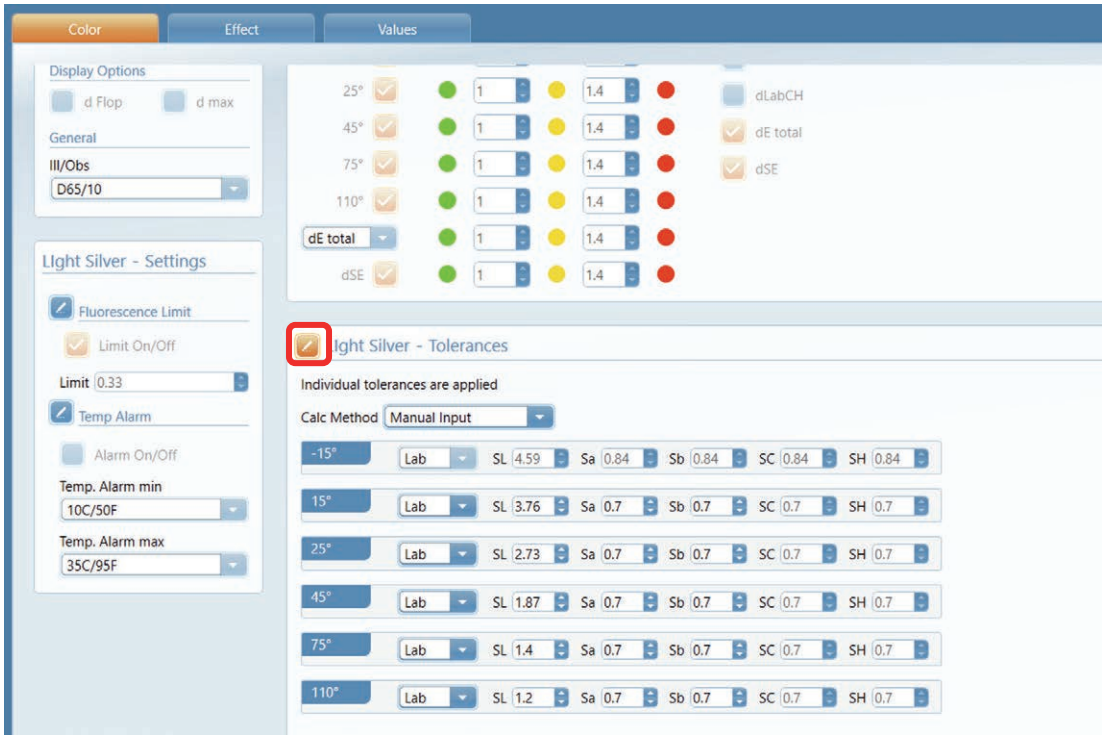


Add Color Standard settings

- Select **Add Standard** and input name e.g. Light Silver



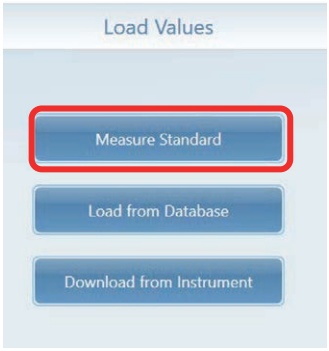
- Click on the **Edit** icon to unlock the color standard from the family and enter individual tolerances
- The input options are dependent on the selected color difference method

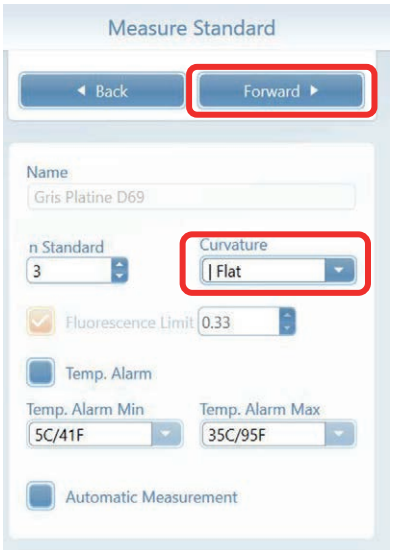


Add Color Standard spectral data

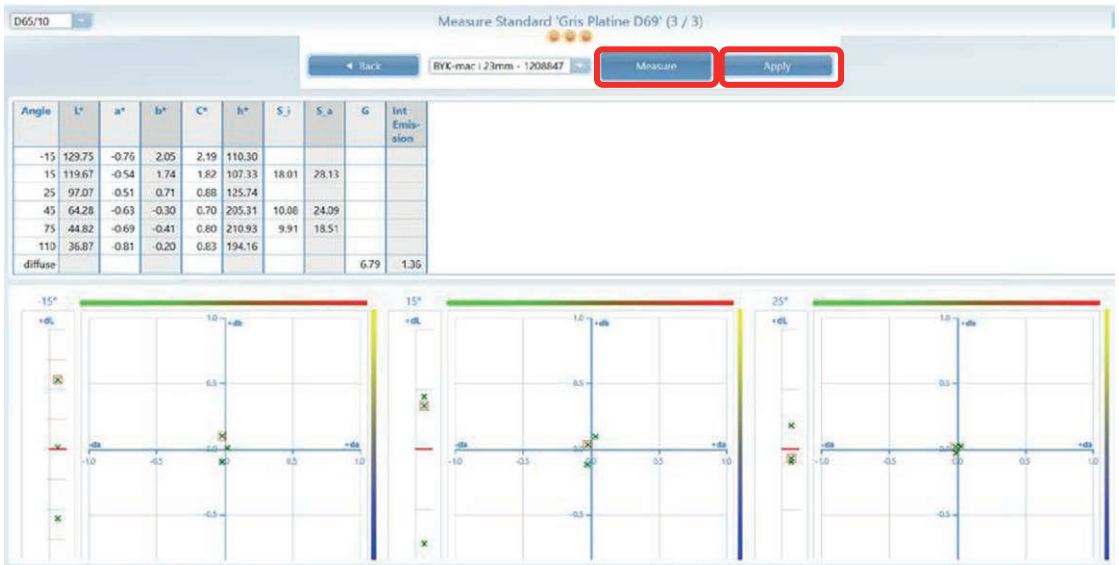
- Connect BYK-mac i with computer
- Select tab **Values** and click on **Add spectral data** to move on to the measurement screen

- Select **Measure Standard**
- Make sure to select Curvature = flat and proceed with **Forward**

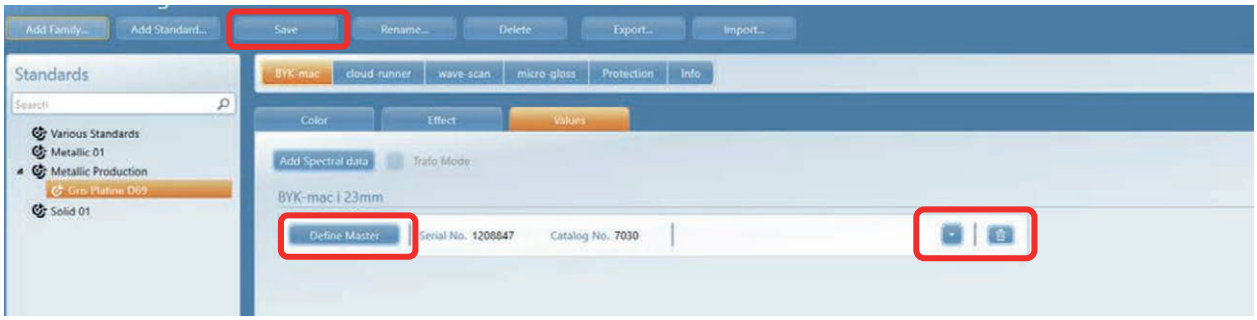




- Place BYK-mac i on the master panel and start taking measurements by pressing either the **Operate** button on the instrument or the **Measure** button in the software.



- The data table shows the colorimetric and effect data of the last reading
- The graph shows the individual readings compared to the average of all readings
- Outliers can be deleted by marking the reading in the graph with the mouse and using the **Delete** button on the key board
- Use **Apply** to accept the readings and the software returns to the main screen of smart-chart

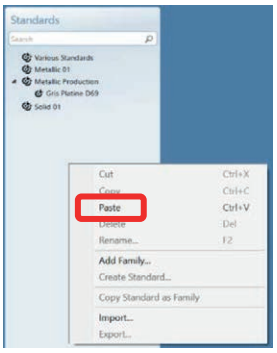


- To view the colorimetric and effect data of a standard use the **Arrow down** icon
- To delete spectral and effect data use the **Waste bin** icon
- To use the standard as a digital master standard click on the **Define Master** icon. This allows distributing it to other facilities or suppliers and loading it to their respective instrument
- To save data click on the **Save** icon

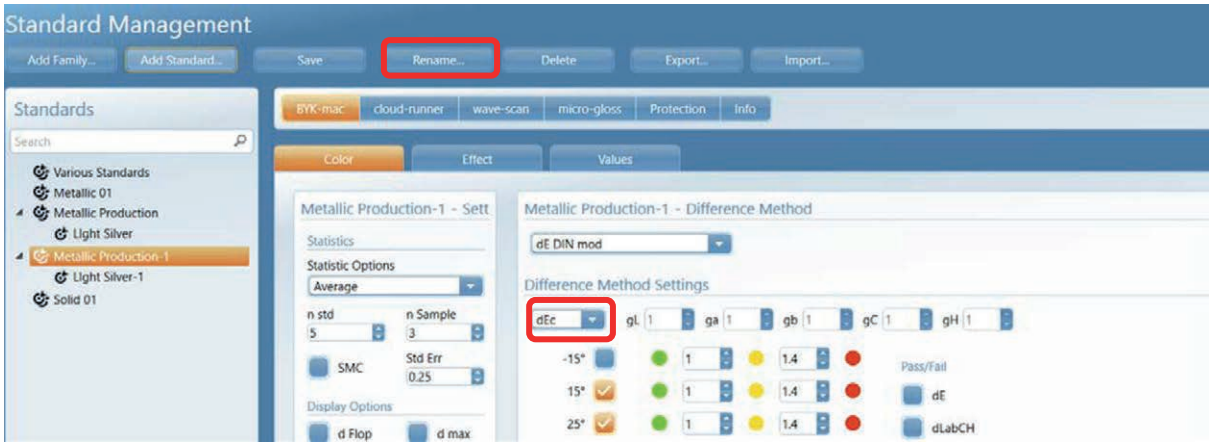
<u>Create Color Family “Metallic Batch” from existing Color Family “Metallic Production”</u>

For batch approval, usually tighter tolerances are used than for production QC. Nevertheless, the same color standards meaning the same set of spectral data can be used and the color standard does not have to be re-measured again.

- Right mouse click on the color family “Metallic Production” and select **Copy**



- Right mouse click on the empty area in the blue field and select **Paste**
- Change name of the copied color family and color standard by clicking on the **Rename** icon
- Change the color specific tolerances to batch approval tolerances

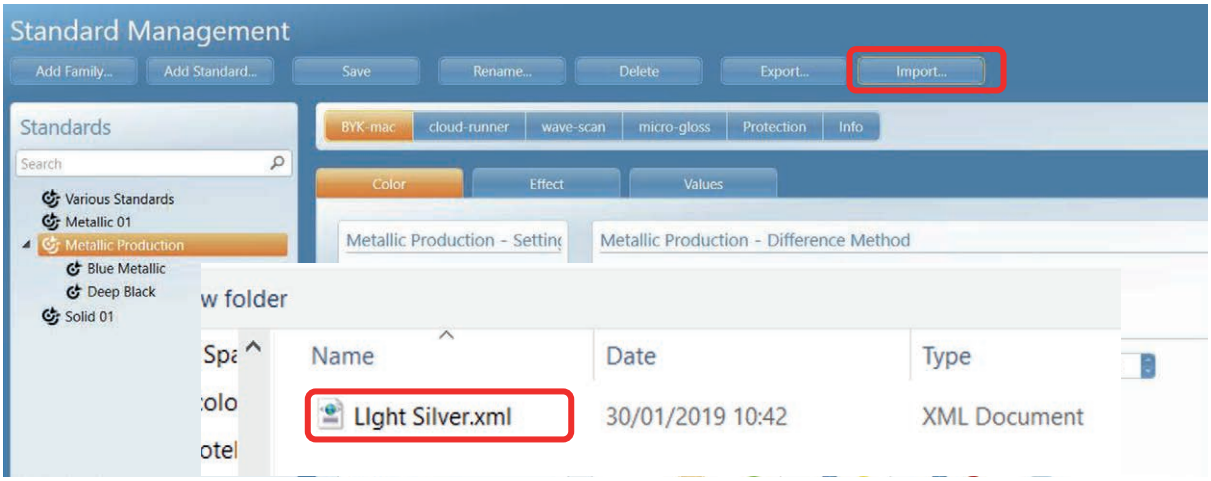


2.2 Use of digital standards

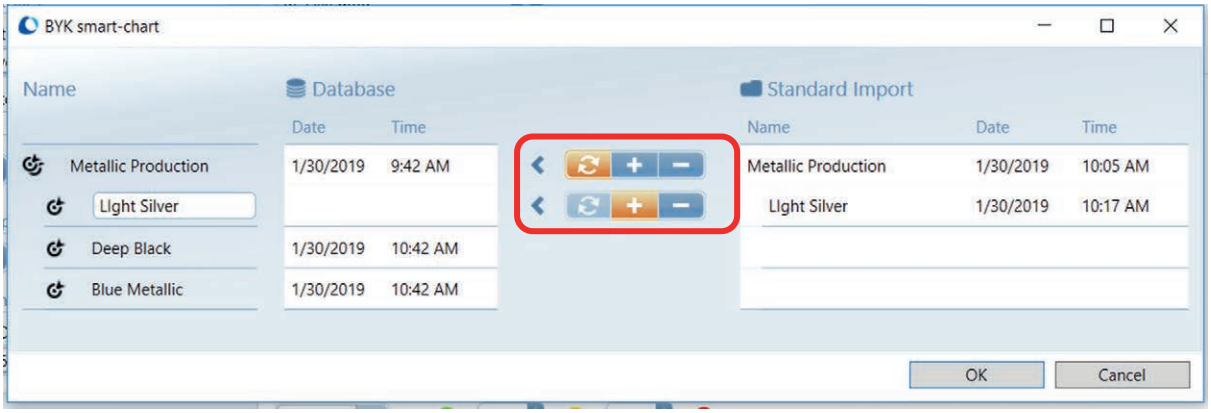
Import of digital masters

Digital standards are master standards saved as an *.xml file. They are distributed by headquarter through Email.

- Save the files on a USB stick and transfer them to the computer on which smart-chart is installed
- Click on **Import** and select the appropriate folder and file on your computer



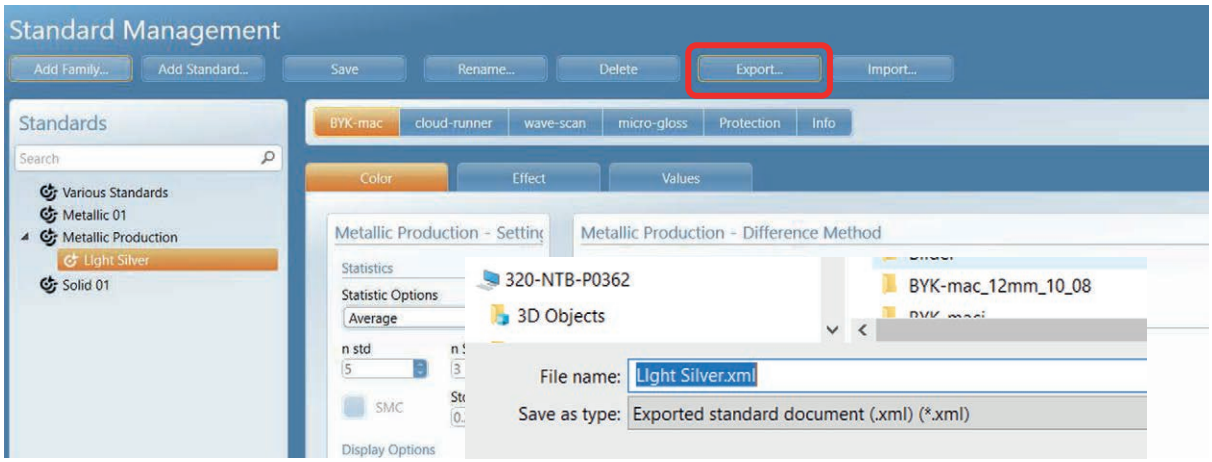
- A dialog box opens to set specific import options. Standard families and standards can be updated (double arrow), created new (+) or deleted from import (-).



Export of digital masters

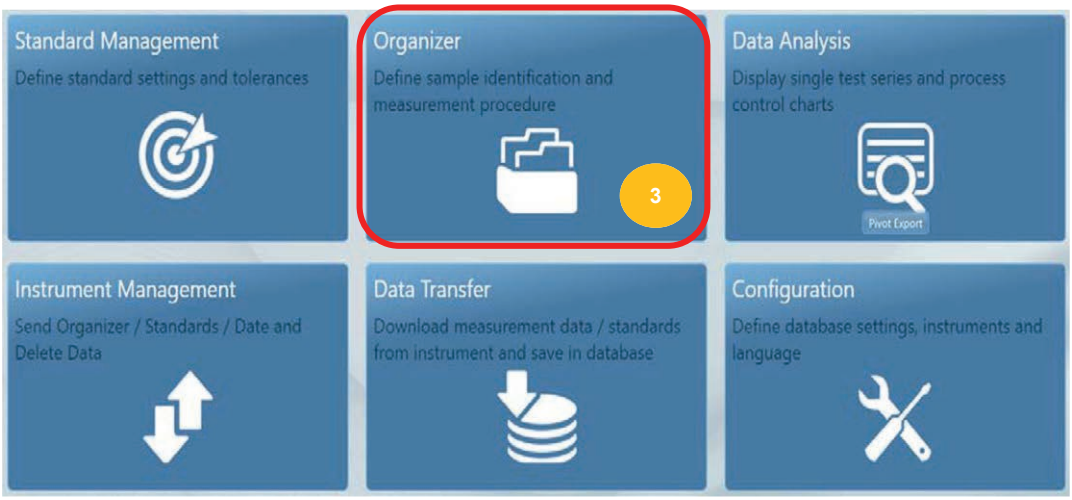
Complete color families or individual standards can be exported to be used as digital standards.

- Select the appropriate family or standards and click on the **Export** icon
- Save the *.xml file on a device of your choice

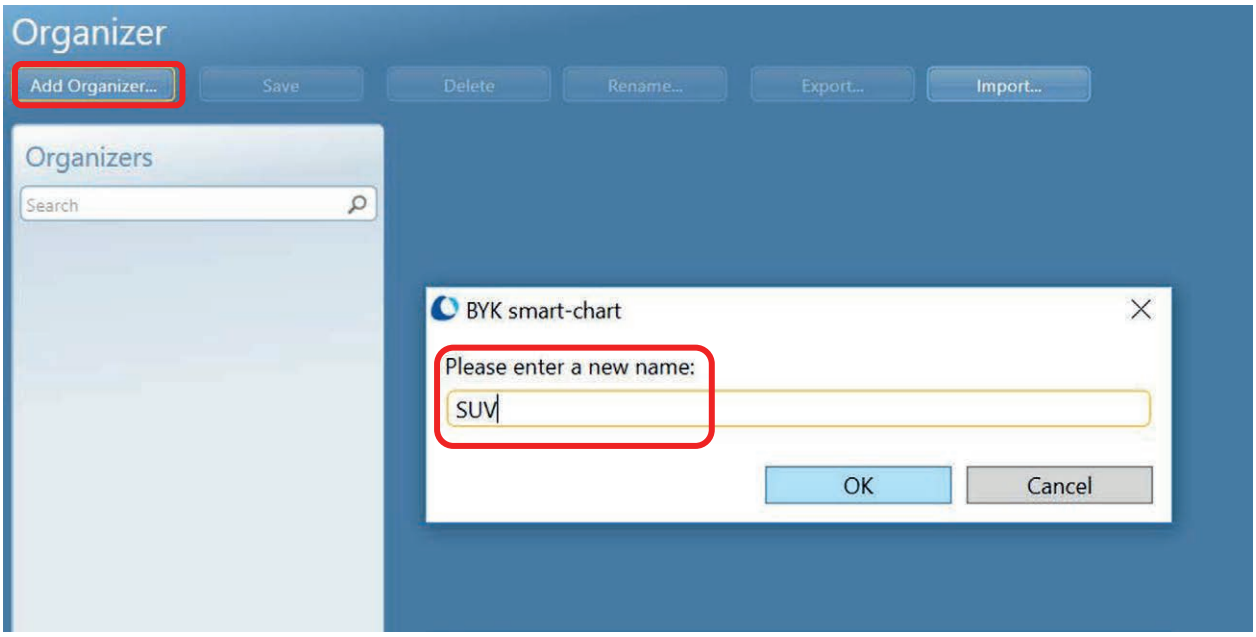


- You can share digital standard *.xml files using your shared drive, Email or USB stick

3. Organizer

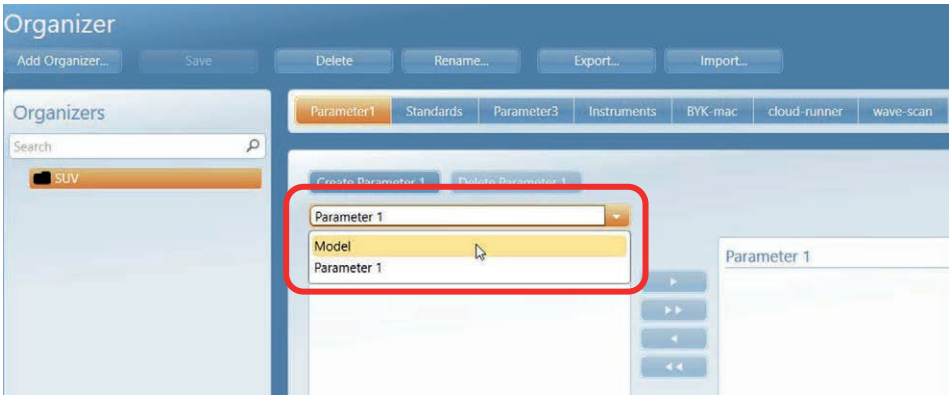


- Select **Add Organizer** and input name e.g. SUV

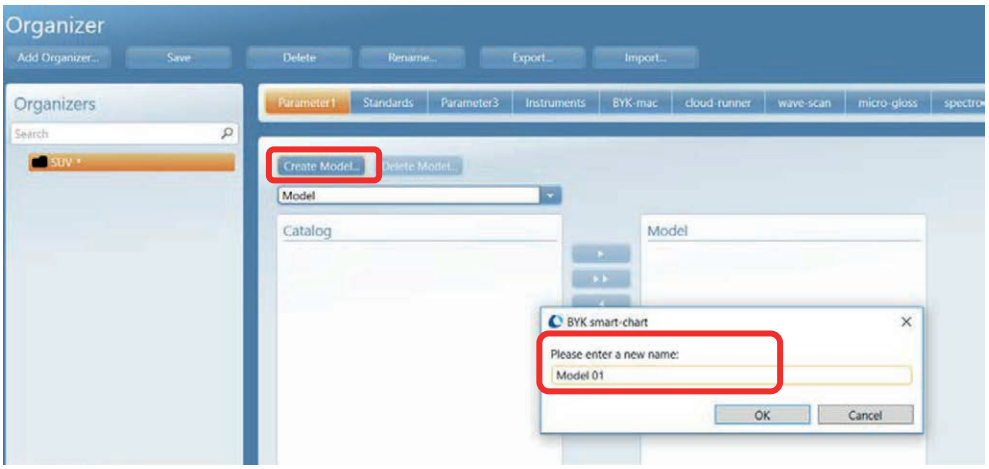


➔ An organizer includes all car models with the same measurement procedure
➔ An organizer defines all parameters for clear sample identification:
Model – Color – Paint line – Check zones
➔ For each parameter a specific catalog with multiple entries can be assigned
➔ The default name of the catalog is Parameter 1 - 5
➔ Application specific names can be assigned in the module **Configuration** (see page 3)

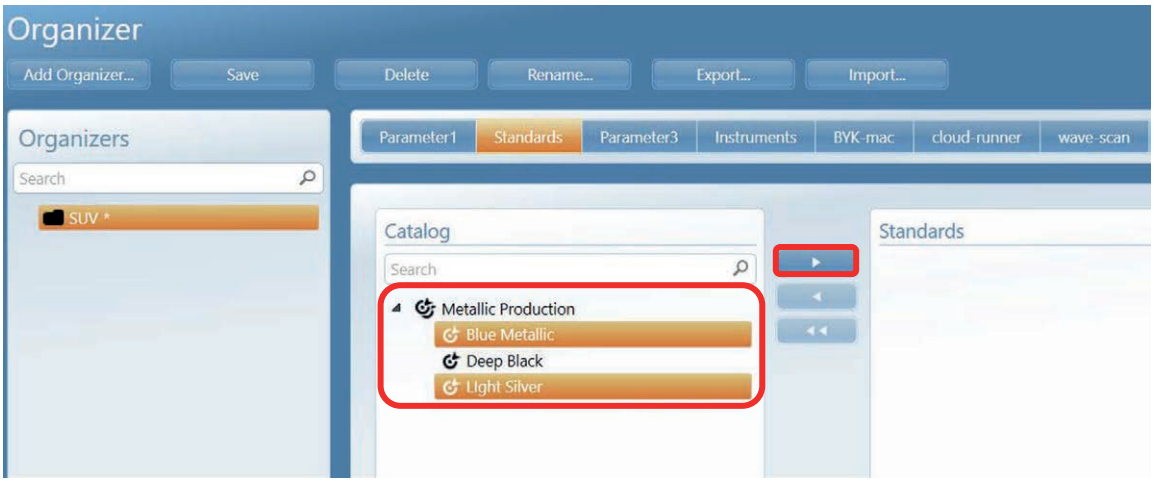
- Select catalog **Model** for parameter 1 by using the **Drop down** box



- Create a new model by clicking on the **Create Model** icon and input the model name
- The new model is automatically selected in the organizer

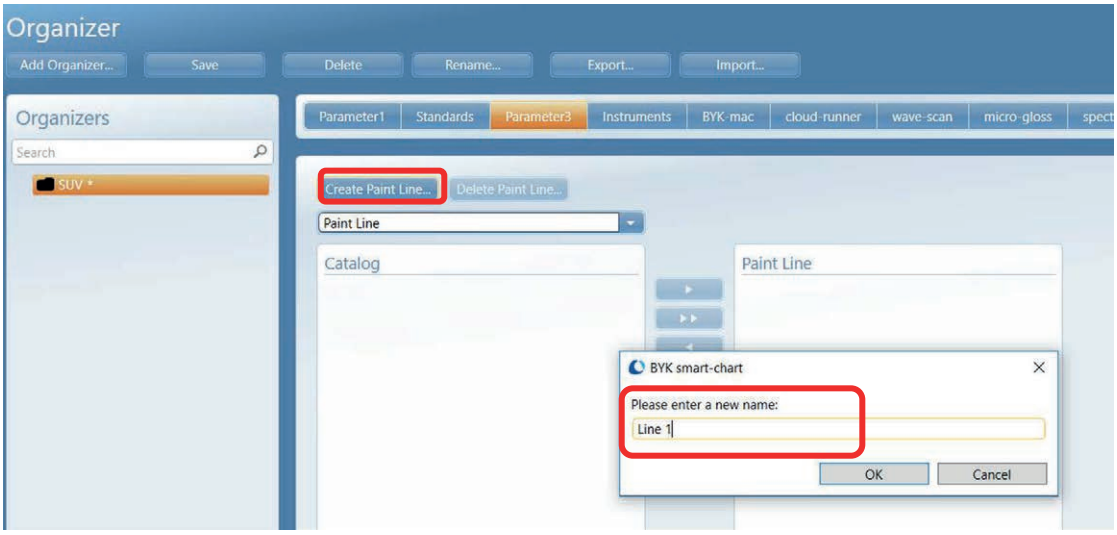


- Click on **Standard** and select all colors that are used for this model by either selecting the complete color family or individual colors
- To select them, click on the **Arrow right** icon

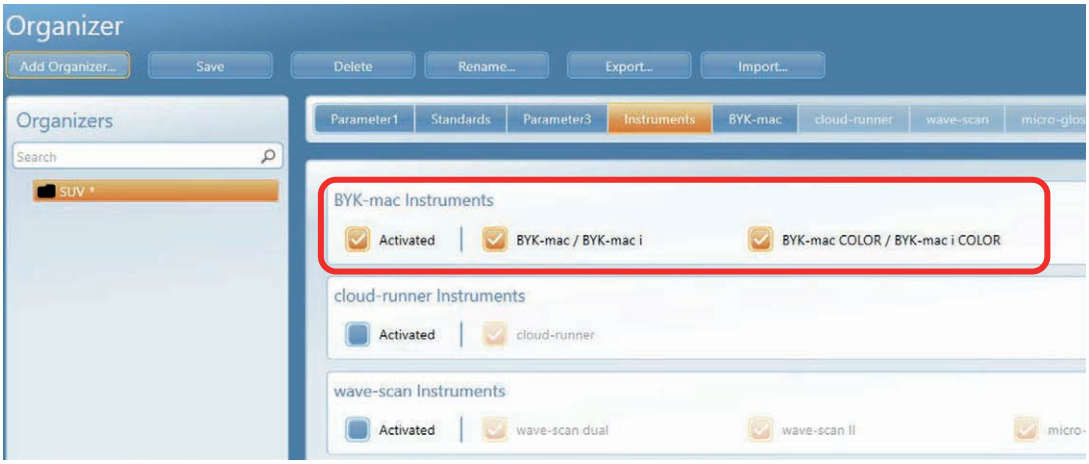


Note: When new colors are added, the organizer needs to be updated and resent to the instrument.

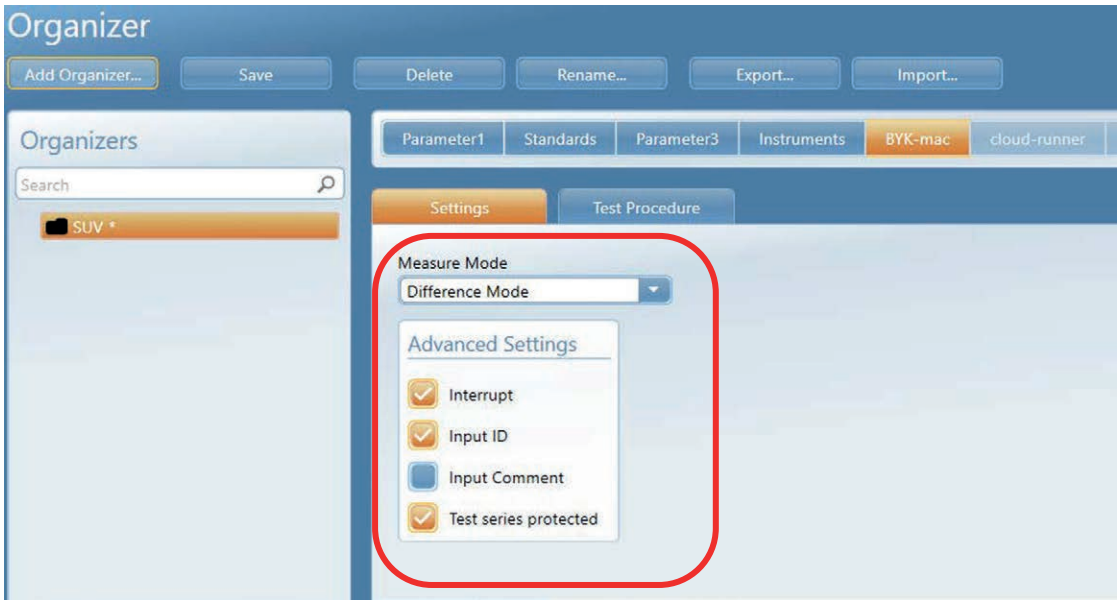
- For Parameter 3 select catalog Paint line
- Create a new Paint line by clicking on the **Create Paint Line** icon and input the name
- The new paint line is automatically selected in the organizer



- Under **Instruments** all instruments the organizer is going to be sent must be selected
  ➔ **Activate** BYK-mac / BYK-mac i

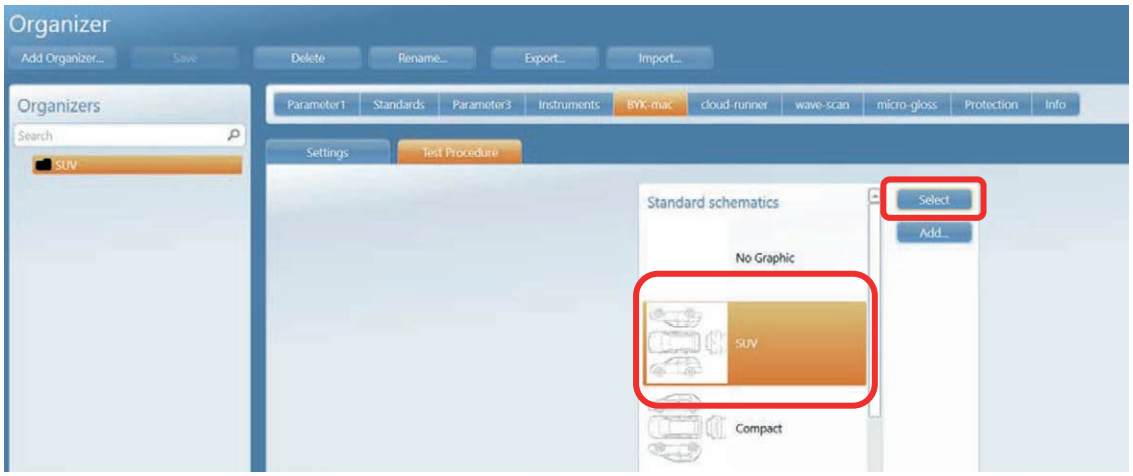


- Continue with defining the **Settings** for the BYK-mac i

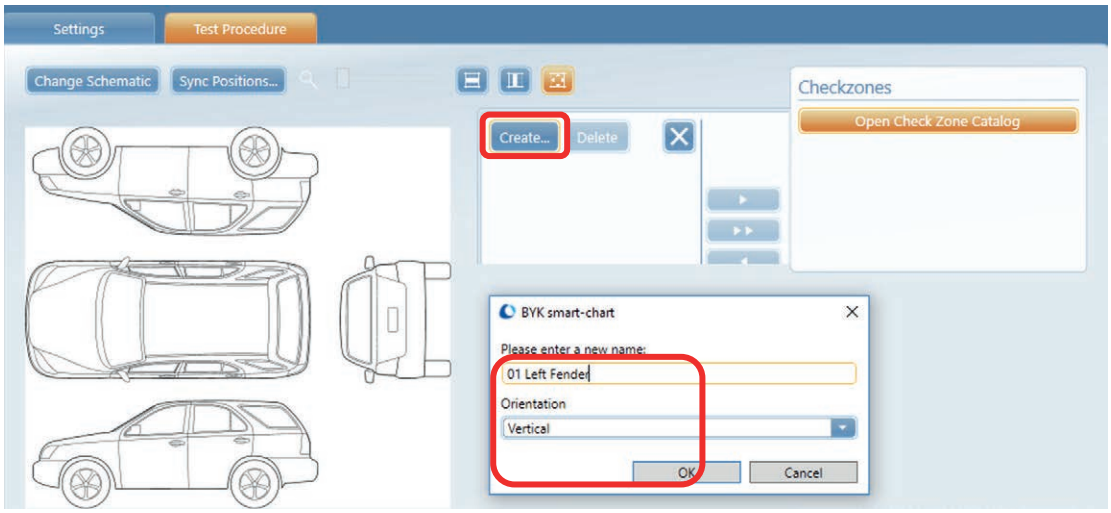


Difference Mode	Difference values compared to the master standards are shown on the instrument display.
Interrupt	Allows skipping check zones or ending a test series before all check zones are measured. **Note:** The operator is responsible for the validity of the readings!
Input ID	An individual identification can be entered on the instrument for each teste series e.g. PJI number
Test series protected	Organizers and associated measurements cannot be deleted on the instrument only via the software smart-chart.

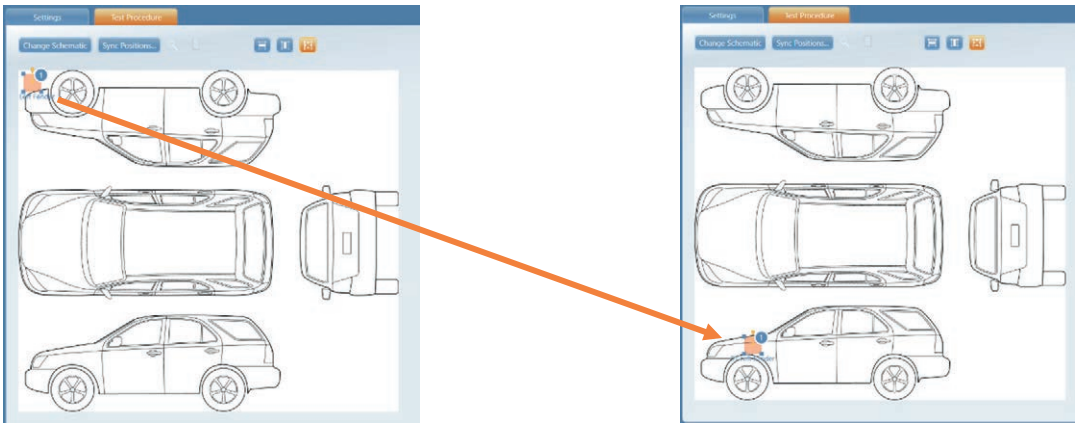
- In the next step define the **Test Procedure**
- **Select** the appropriate **car schematic** from the list



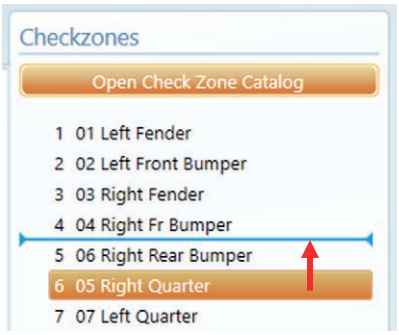
- **Create** check zones:
  Enter a name and select the appropriate **orientation** (vertical / horizontal). This will make sure that the correct tolerances from Standard Management are applied. Highly important for the wave-scan instrument.



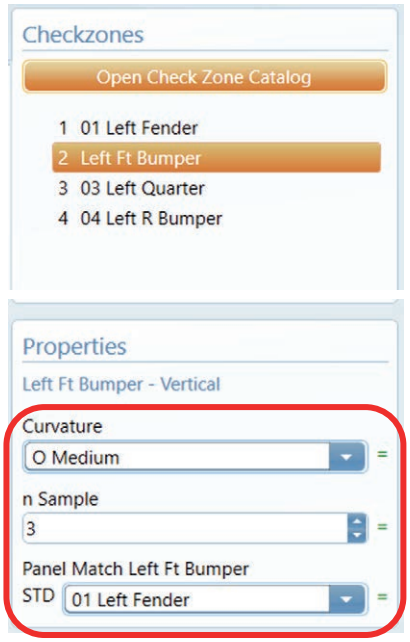
- A rectangular symbol with the sequence number appears in the upper left corner. Drag & Drop it with the mouse to the right position on the vehicle and adjust the direction of illumination.



- 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



Curvature:
Defines the sensitivity of the instrument against tilting. Recommended curvature settings are low or medium (see table below). The selected curvature has to be evaluated and checked by measuring a car body (model dependent).

N Sample:
Defines the number of readings for the check zone

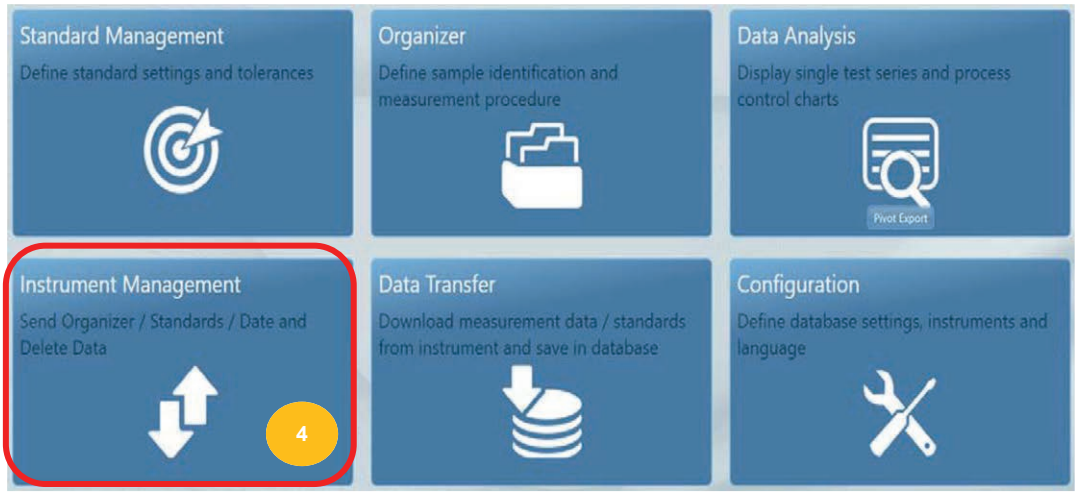
Panel Match:
Two adjacent check zones can be paired up, which allows in Data Analysis to display a differences between the adjacent panels.

Note: Standard is always the body panel

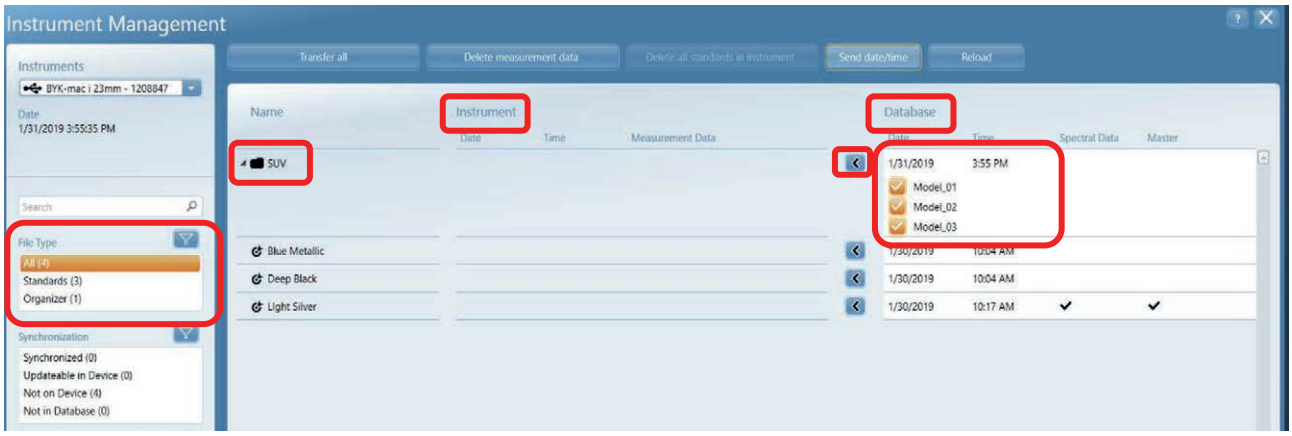
Symbol	Sample Curvature	Example	
I	Flat	Test Panel	4 Pins < 0.1 mm
)	Low curvature	Hood	3 Pins < 0.1 mm; 1 Pin < 0.3 mm
O	Medium curvature	Bumper	3 Pins < 0.3 mm; 1 Pin < 0.9 mm
o	High curvature	Mirror Housing	3 Pins < 0.6 mm; 1 Pin off
Off			Pins deactivated, but it is ensured that no ambient light will enter aperture

- To save the organizer click on the **Save** icon

4. **Instrument Management**
   Send organizer to instrument

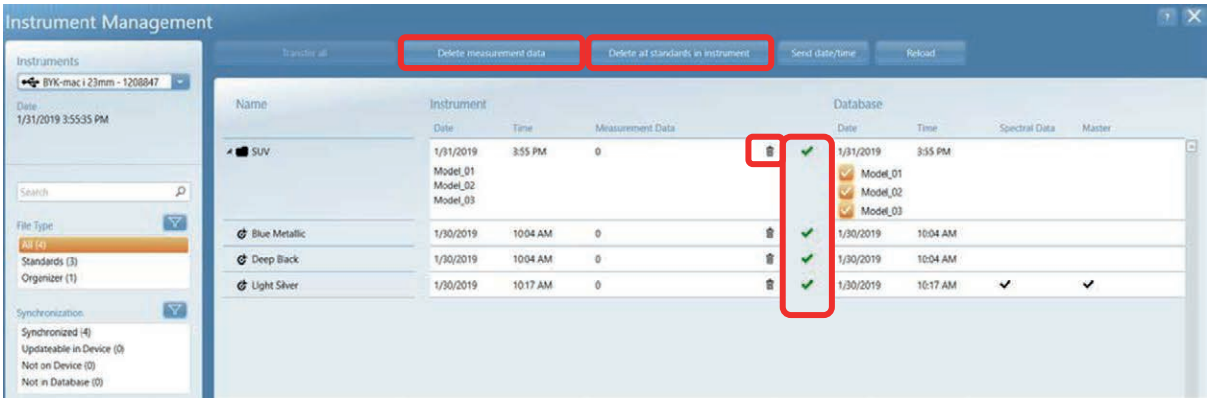


- The below window appears:
  - The column **Instrument** shows the organizers and standards saved in the instrument
  - The column **Database** shows all files stored in the database
  - Standards are marked by a target symbol – Organizers by a folder symbol
- On the left side you are able to **filter** which type of files to be displayed



- Clicking on the **arrow** in front of the organizer name displays all models that are included in this organizer. Individual models can be deselected
- Organizers can be sent to the instrument by clicking on the **arrow buttons pointing to the instrument column**.
- A red arrow indicates that some parameters are not defined in the organizer and the organizer cannot be sent to the instrument. Please review the settings in the Organizer module.

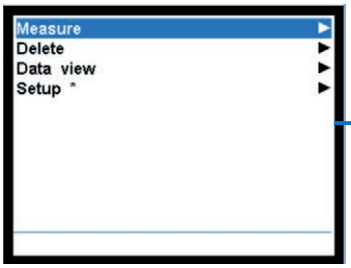
- Sending the organizer automatically transfers all standards that are selected in the organizer
- After successful transfer a green checkmark appears and the organizer/standards are now also shown in the **Instrument** column

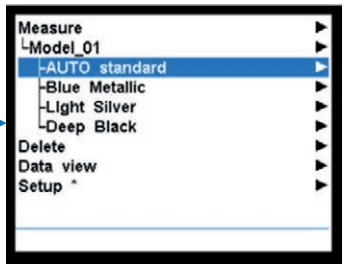


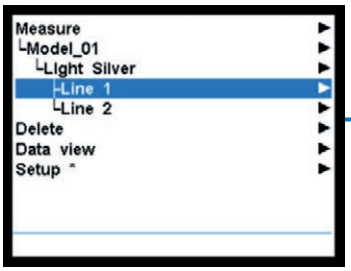
Delete Measurement Data

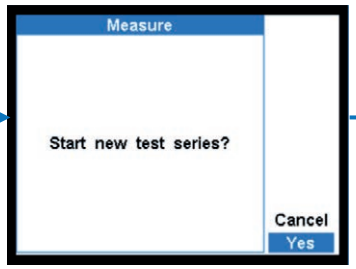
- In case you did not delete data in the instrument at time of data transfer to the measurement database it can be done afterwards
- Use **Delete measurement data** to delete measurements of vehicles
- Use **Delete all standards** in the instrument to delete all standards
- To delete individual standards or organizers in the instrument please use the **Waste bin** icon behind the respective entry

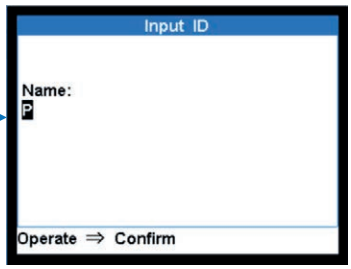
BYK-mac i Operation

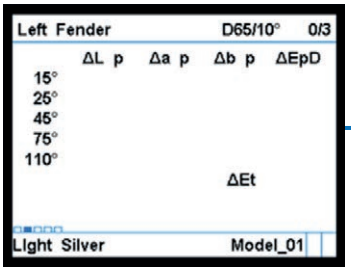


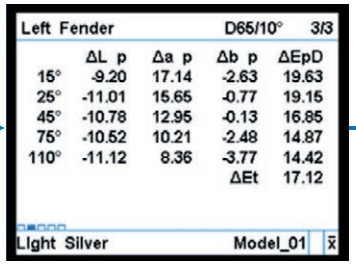


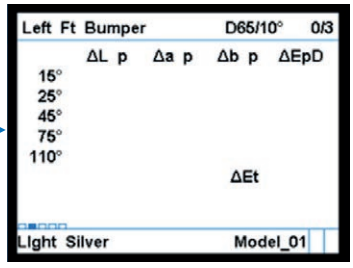








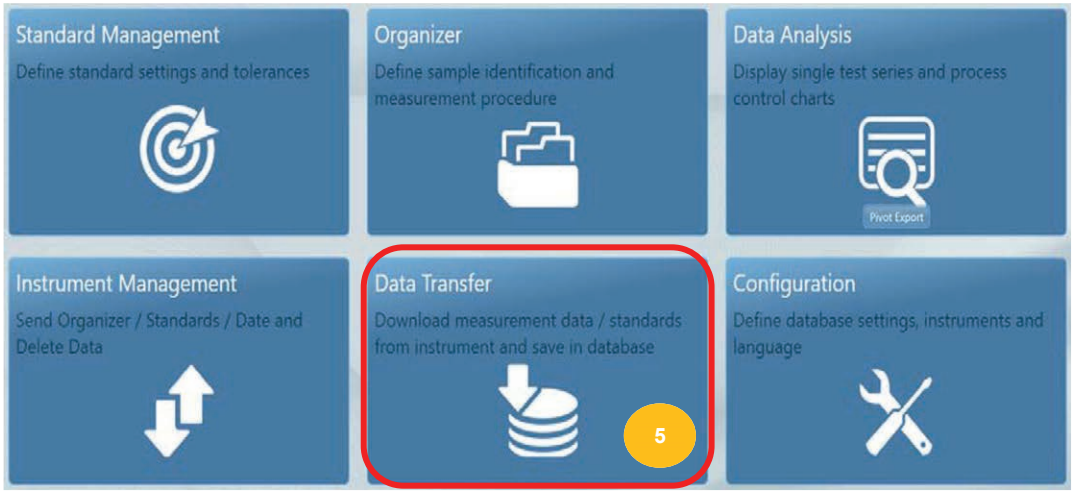




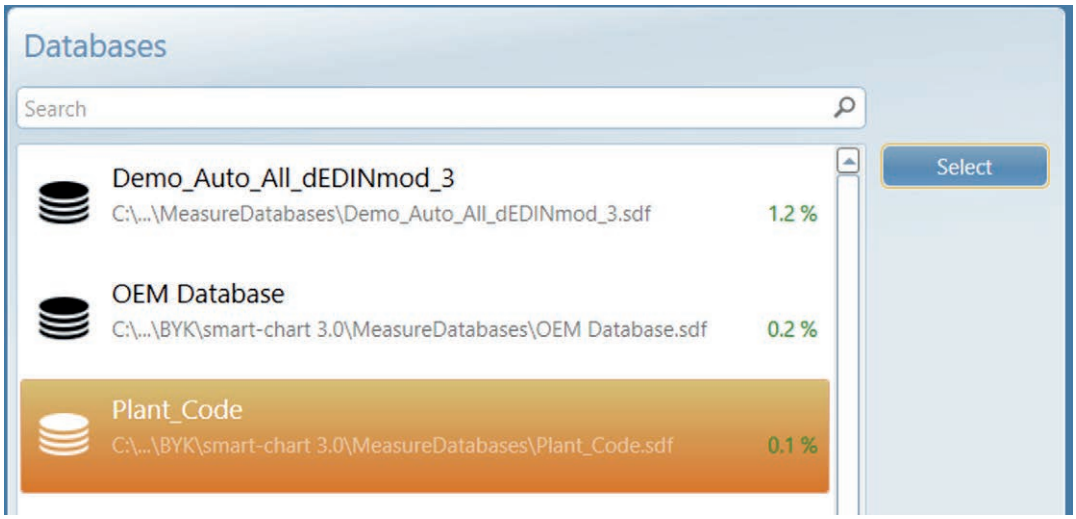
Press **Operate** button on the instrument to move to next check zone

Continue with check zones
After last check zone instruments returns to main menu

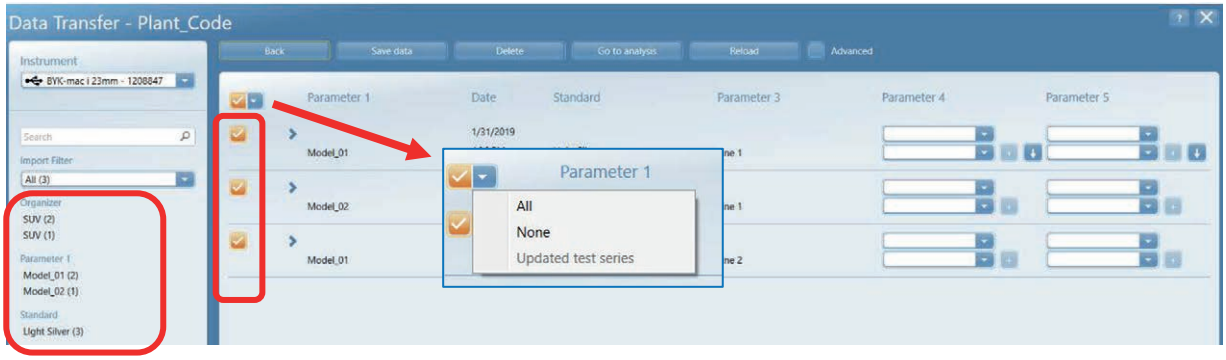
5. **Data Transfer**
   Download measurement data from instrument and save in database



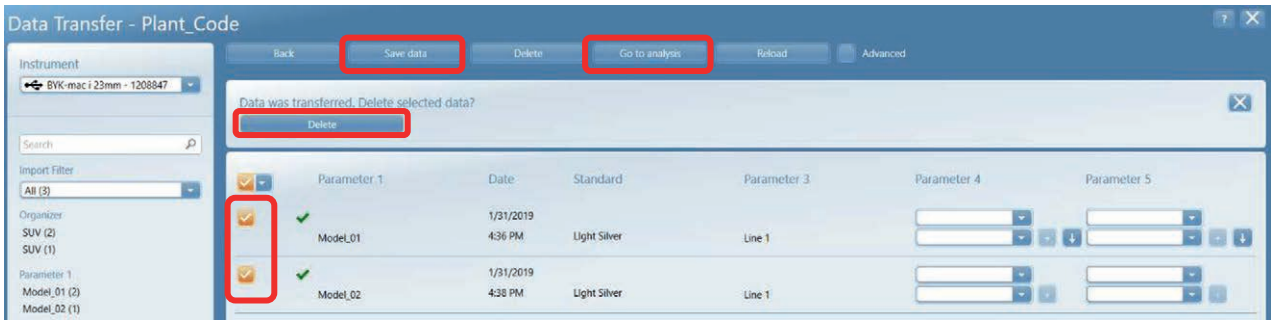
- **Select** database to store the readings. If only one database is available, the following screen is skipped and the database is automatically selected
- The percentage number behind the database name is an indication “how full” it is



- As default, all vehicles saved in the instrument memory are selected. By clicking on the orange **check box** you are able to deselect specific test series
- Or you can use the checkbox in the header to select **All** or **None**. The option **Updated test series** is only available for the instrument spectro2guide.
- The **Filter** option on the left side allows to select the displayed data by Organizer – Model – Standard



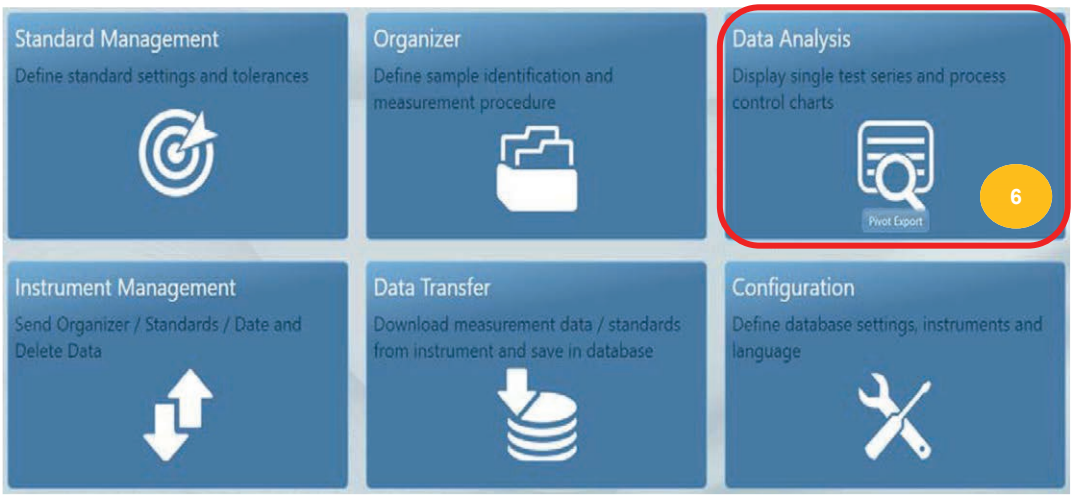
- To save the readings click on the **Save Data** icon. The saved files are shown with a check mark
- To delete data in the instrument, please select the option **Delete**
- Press **Go to Analysis** to continue directly with data analysis



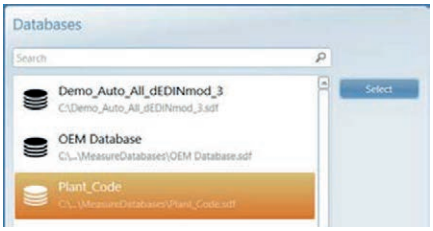
Note: In case you forgot to delete the measurement data, it can be done afterwards in the module **Instrument Management** (see page 17).

6. Data Analysis

Data analysis of measurements in various reports:
Test Report for single vehicles - Trend Reports to control process stability over time

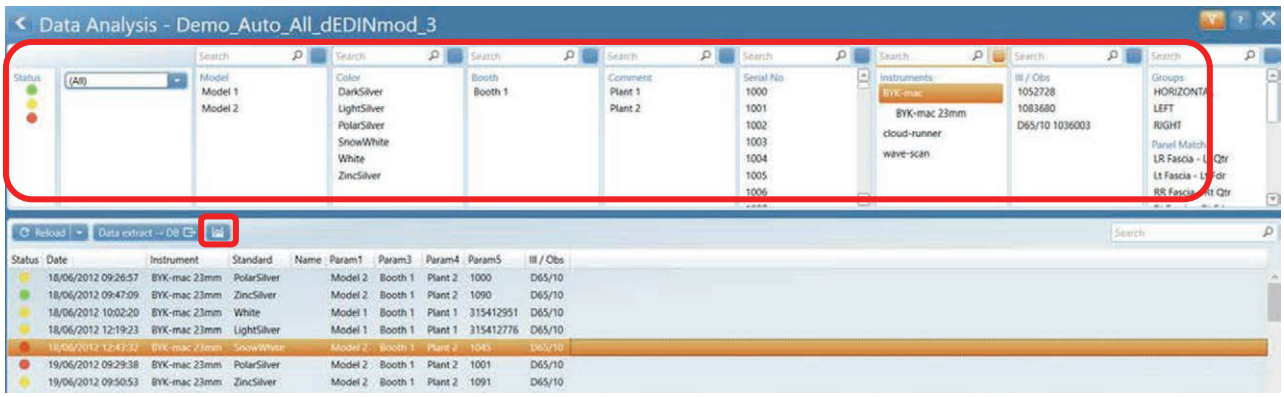


- **Select** database. If only one database is available, the screen aside is skipped and the database is automatically selected



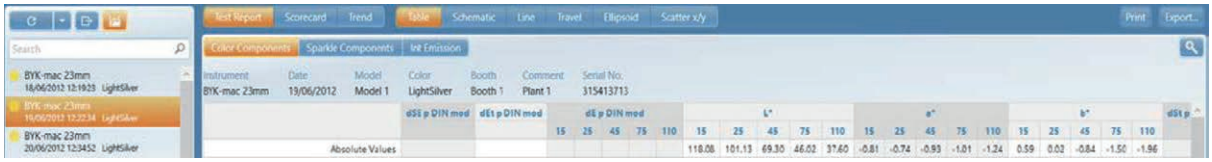
Database List

- 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 bases 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



Test Report

Measurement data of a single vehicle is shown. It is the ideal report for color harmony reviews. Different graphical displays are available.



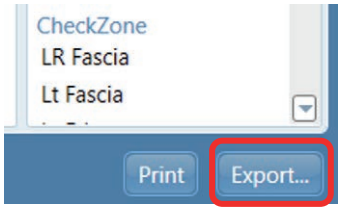
- Select one vehicle in the **List** and click on the required graph

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.

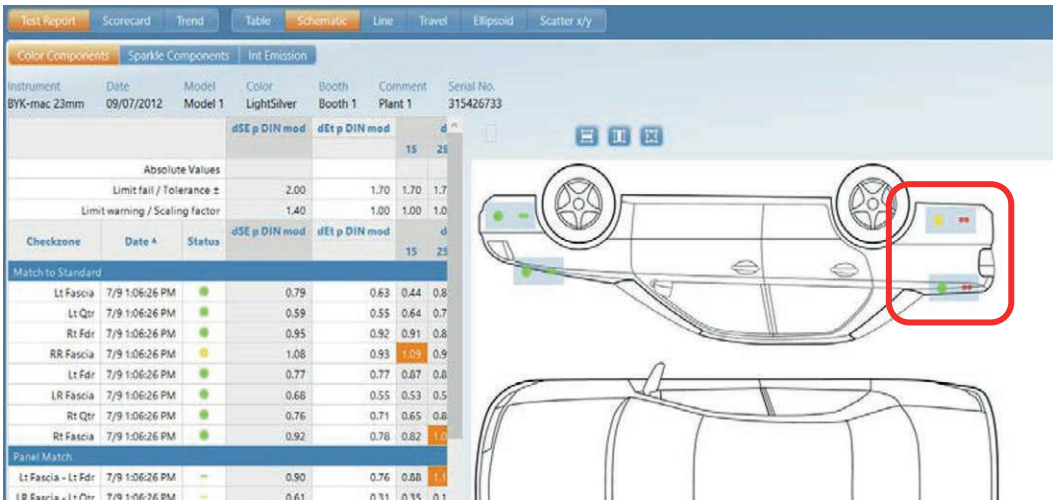
Checkzone	Date	Status	dSE p DIN mod	dEt p DIN mod	dE p DIN mod 15	dE p DIN mod 25	dE p DIN mod 45	dE p DIN mod 75	dE p DIN mod 110	dL p DIN mod 15	dL p DIN mod 25	dL p DIN mod 45	dL p DIN mod 75	dL p DIN mod 110	da p DIN mod 15	da p DIN mod 25	da p DIN mod 45	da p DIN mod 75	da p DIN mod 110	db p DIN mod 15	db p DIN mod 25	db p DIN mod 45	db p DIN mod 75	db p DIN mod 110
Absolute Values										118.08	101.13	69.30	46.02	37.60	-0.81	-0.74	-0.93	-1.01	-1.24	0.59	0.02	-0.84	-1.50	-1.96
Limit fail / Tolerance ±			2.00	1.70	1.70	1.70	1.70	1.70	1.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Limit warning / Scaling factor			1.40	1.00	1.00	1.00	1.00	1.00	1.00	7.46	5.54	3.90	2.88	2.42	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Match to Standard																								
Lt Fascia	7/9 1:06:26 PM		0.79	0.63	0.44	0.83	0.85	0.52	0.35	0.00	-0.24	-0.54	-0.35	-0.33	-0.08	-0.11	0.00	0.06	0.08	-0.43	-0.79	-0.65	-0.38	-0.06
Lt Qtr	7/9 1:06:26 PM		0.59	0.55	0.64	0.72	0.39	0.33	0.59	0.43	0.53	0.12	-0.31	-0.53	0.01	-0.08	-0.06	0.03	0.01	-0.48	-0.48	-0.36	-0.12	-0.25
Rt Fdr	7/9 1:06:26 PM		0.95	0.92	0.91	0.83	0.65	1.01	1.14	0.73	0.56	-0.43	-0.98	-1.07	0.22	0.08	0.05	0.07	0.03	-0.49	-0.61	-0.48	-0.22	-0.39
RR Fascia	7/9 1:06:26 PM		1.08	0.93	1.09	0.96	0.74	0.87	0.95	1.00	0.64	-0.18	-0.80	-0.94	-0.08	-0.09	0.03	0.14	0.15	-0.43	-0.71	-0.72	-0.32	0.01
Lt Fdr	7/9 1:06:26 PM		0.77	0.77	0.87	0.84	0.30	0.71	0.93	0.85	0.77	-0.11	-0.71	-0.89	0.02	-0.04	-0.02	0.03	0.04	-0.21	-0.33	-0.28	-0.09	-0.26
LR Fascia	7/9 1:06:26 PM		0.68	0.55	0.53	0.54	0.58	0.56	0.55	0.50	0.37	-0.21	-0.49	-0.54	-0.07	-0.09	0.02	0.10	0.10	-0.14	-0.39	-0.54	-0.25	0.09
Rt Qtr	7/9 1:06:26 PM		0.76	0.71	0.65	0.80	0.58	0.57	0.89	0.26	0.32	-0.10	-0.50	-0.79	0.17	0.12	0.07	0.07	0.04	-0.57	0.73	-0.56	-0.28	-0.40
Rt Fascia	7/9 1:06:26 PM		0.92	0.78	0.82	1.06	0.95	0.53	0.30	-0.03	-0.29	-0.32	0.06	0.14	-0.02	-0.10	0.03	0.06	0.08	-0.82	-1.02	0.89	-0.52	-0.25
Panel Match																								
Lt Fascia - Lt Fdr	7/9 1:06:26 PM		0.90	0.76	0.88	1.11	0.57	0.46	0.59	-0.85	-1.02	-0.43	0.36	0.55	-0.11	-0.07	0.02	0.05	0.04	-0.22	-0.45	-0.37	-0.28	0.20
LR Fascia - Lt Qtr	7/9 1:06:26 PM		0.61	0.31	0.35	0.19	0.39	0.24	0.35	0.07	-0.16	-0.33	-0.19	0.00	-0.08	-0.01	0.08	0.07	0.09	0.33	0.09	-0.17	-0.13	0.34

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



Schematic

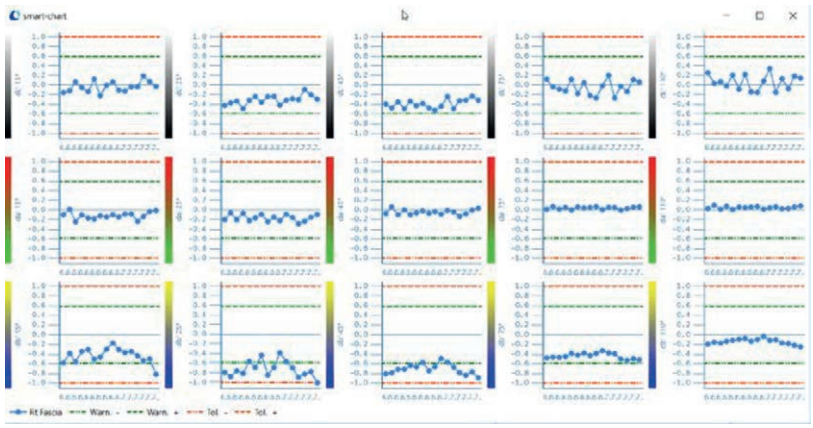
- Clicking on the **Schematic** icon displays the schematic of the car as defined in the organizer with traffic light symbols
  - “Single dots” for comparing check zone to standards
  - “Double dots” for panel match



Scatter Plot

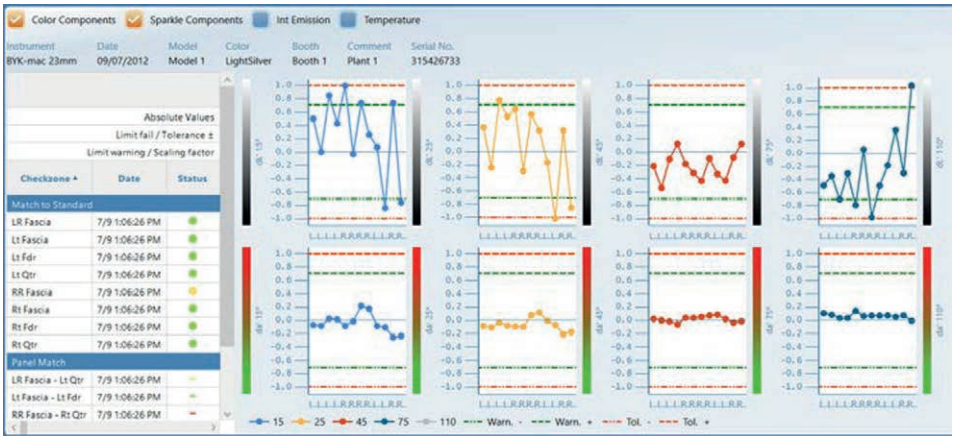
- Clicking on the **Scatter x/y** icon displays the CIELAB graph including the tolerances as defined in Standard Management
- Selecting a check zone in the data table automatically borders the respective dot in the graph in red

- By clicking on **History** the trend of the maximum last 20 vehicles of the same Model – Color – Paint Line is displayed. The layout of the graph is according to the definition in **Line Graph**.



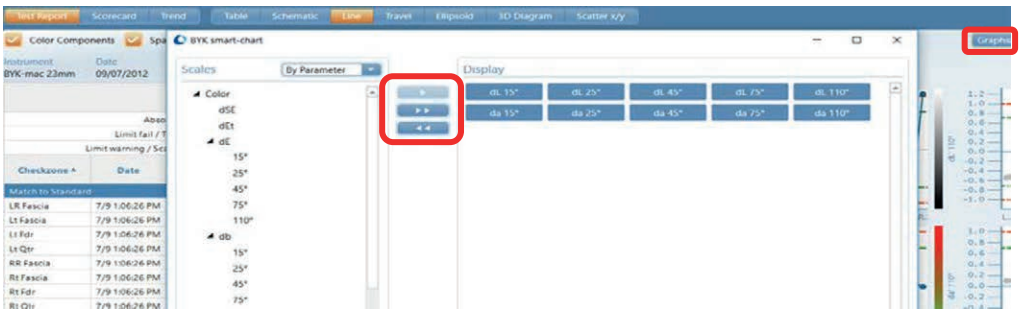
Line Graph

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



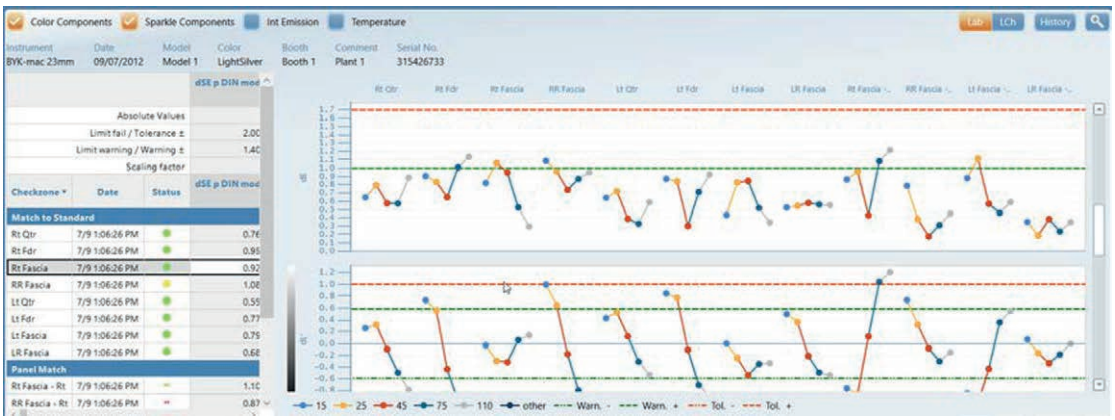
The scales to be shown in the graph can be selected with the icon **Graphs**. Select the required scales by using the **Arrow buttons**

- 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 roll-over



Travel Graph

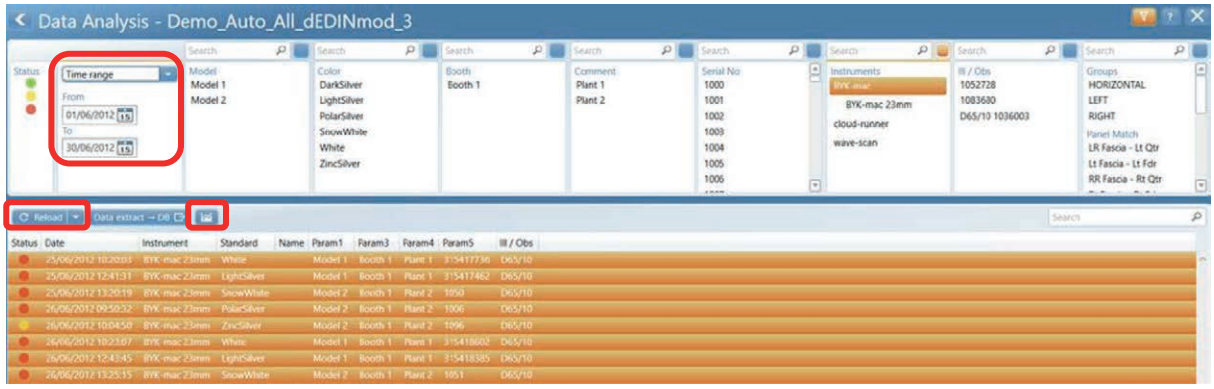
- Clicking on the **Travel** icon displays a graph showing the flop for each check zone. The individual measurement angles are shown in different colors.
- Red and green tolerance lines as defined in Standard Management are displayed as well.



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 were actions have to be taken.

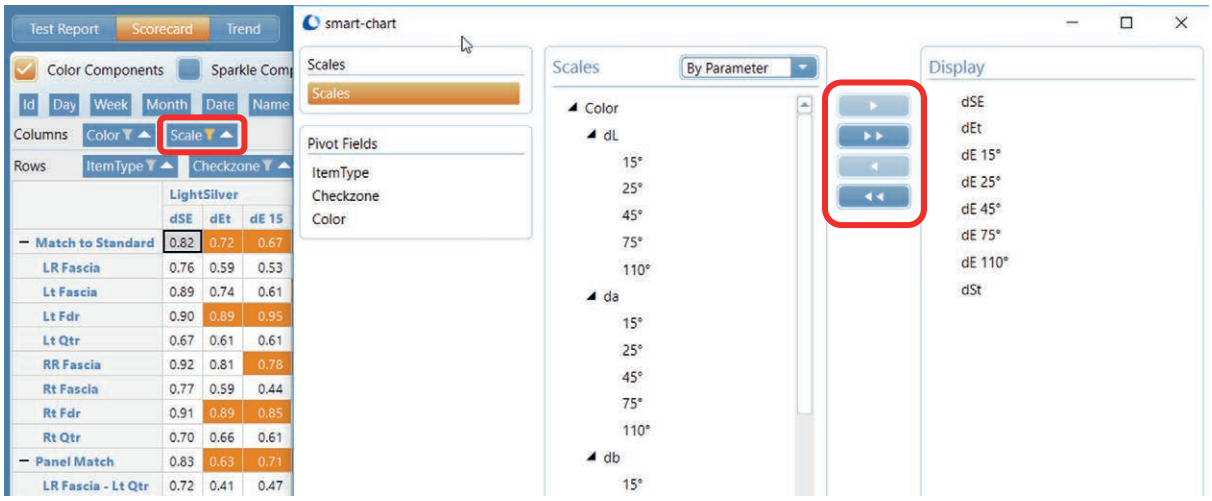
- A Scorecard Report is usually done for all colors over a specific time range (e.g. one month).
- Activate the respective **filter criteria** in the upper part of the window and click on **Reload.**
- **Select** all test series in the **List** with the mouse, click on the Graph icon and select **Scorecard** 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, Angle
- Values out of tolerance are highlighted in yellow or red according to the Pass/Fail definition in Standard Management

	LightSilver								PolarSilver								SnowWhite		
	dSE	dEt	dE 15	dE 25	dE 45	dE 75	dE 110	dSt	dSE	dEt	dE 15	dE 25	dE 45	dE 75	dE 110	dSt	dSE	dEt	dE
− Match to Standard	0.82	0.72	0.67	0.75	0.65	0.69	0.73	0.34	0.98	0.84	0.88	0.70	0.69	0.84	0.97	0.47	1.22	1.22	
LR Fascia	0.76	0.59	0.53	0.55	0.68	0.61	0.55	0.48	0.75	0.71	0.84	0.50	0.57	0.68	0.88	0.22	2.36	2.36	
Lt Fascia	0.89	0.74	0.61	0.91	0.99	0.61	0.39	0.48	0.92	0.85	1.07	0.91	0.67	0.62	0.88	0.34	0.58	0.58	
Lt Fdr	0.90	0.89	0.95	0.91	0.53	0.88	1.06	0.14	0.71	0.66	0.73	0.66	0.50	0.68	0.68	0.26	1.01	1.01	
Lt Qtr	0.67	0.61	0.61	0.64	0.39	0.52	0.79	0.27	0.88	0.81	0.84	0.64	0.62	0.94	0.92	0.34	0.65	0.65	
RR Fascia	0.92	0.81	0.78	0.78	0.73	0.82	0.83	0.44	0.81	0.73	0.85	0.55	0.54	0.67	0.89	0.32	2.42	2.42	
Rt Fascia	0.77	0.59	0.44	0.80	0.81	0.44	0.19	0.49	2.28	1.53	1.28	1.17	1.56	1.54	1.95	1.69	0.84	0.84	
Rt Fdr	0.91	0.89	0.85	0.80	0.63	0.97	1.13	0.18	0.78	0.73	0.74	0.60	0.58	0.85	0.82	0.28	1.09	1.09	
Rt Qtr	0.70	0.66	0.61	0.59	0.41	0.67	0.92	0.23	0.73	0.66	0.71	0.52	0.50	0.79	0.75	0.30	0.77	0.77	
− Panel Match	0.83	0.63	0.71	0.69	0.41	0.46	0.69	0.51	0.91	0.54	0.56	0.60	0.47	0.42	0.51	0.72	1.75	1.75	
LR Fascia - Lt Qtr	0.72	0.41	0.47	0.30	0.42	0.25	0.47	0.57	0.57	0.37	0.39	0.49	0.23	0.33	0.26	0.41	2.08	2.08	
Lt Fascia - Lt Fdr	0.90	0.75	0.82	1.04	0.53	0.50	0.69	0.49	0.63	0.40	0.51	0.46	0.36	0.29	0.26	0.48	1.28	1.28	
RR Fascia - Rt Qtr	0.69	0.50	0.68	0.46	0.45	0.21	0.47	0.47	0.66	0.41	0.57	0.47	0.25	0.26	0.30	0.50	2.33	2.33	
Rt Fascia - Rt Fdr	1.03	0.88	0.85	0.96	0.27	0.89	1.13	0.52	1.80	0.98	0.75	0.96	1.05	0.79	1.21	1.50	1.30	1.30	

- The scales to be shown in the table can be selected with the **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.



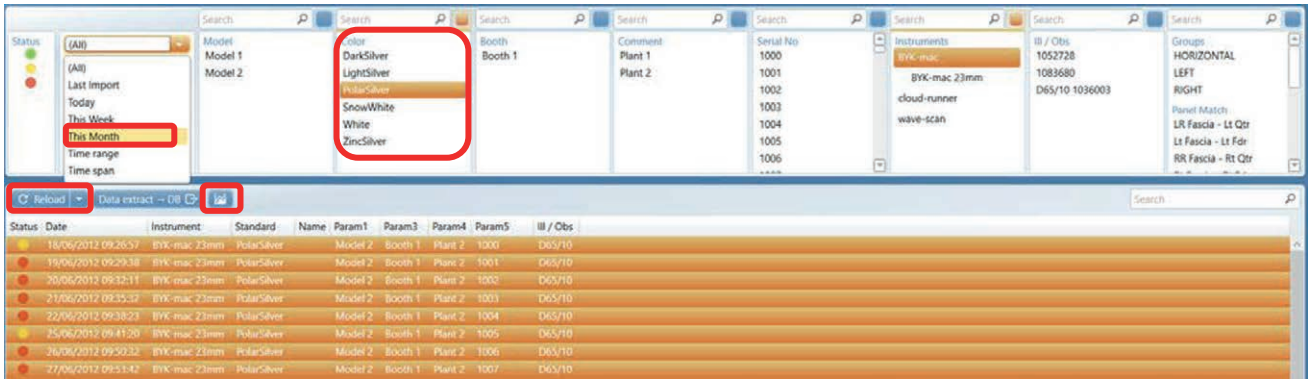
- The data can also be viewed in Scatter – Line – Travel graph by clicking on an individual cell or a complete line.

Note: 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

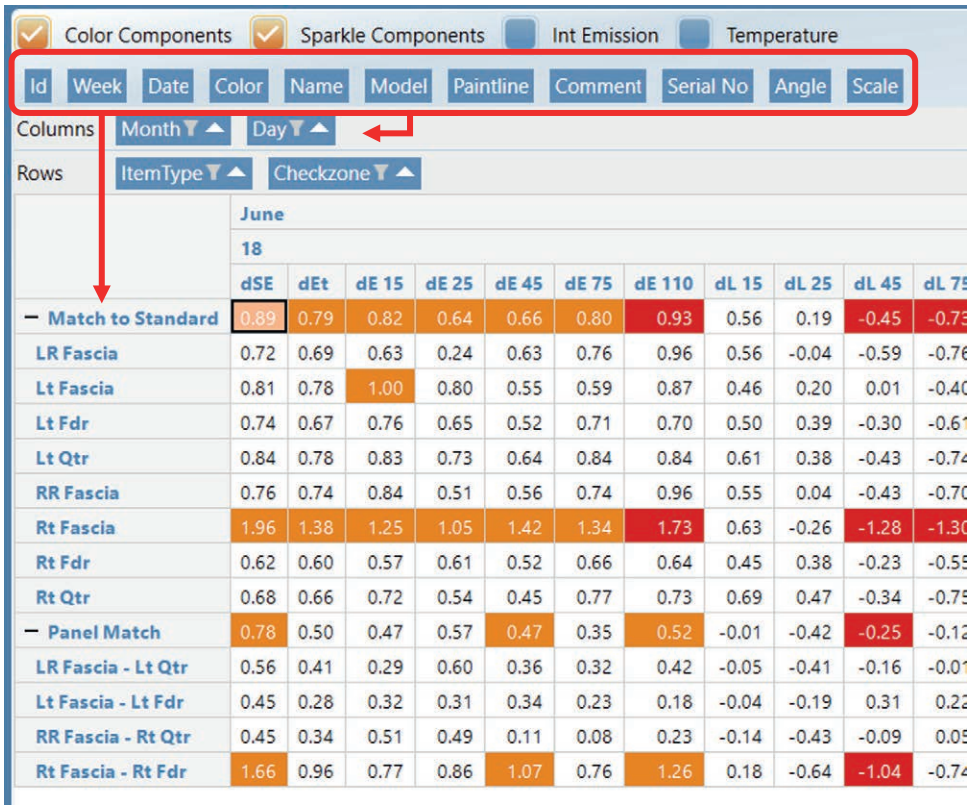
Trend Report

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 and select **Trend** and **Table**.

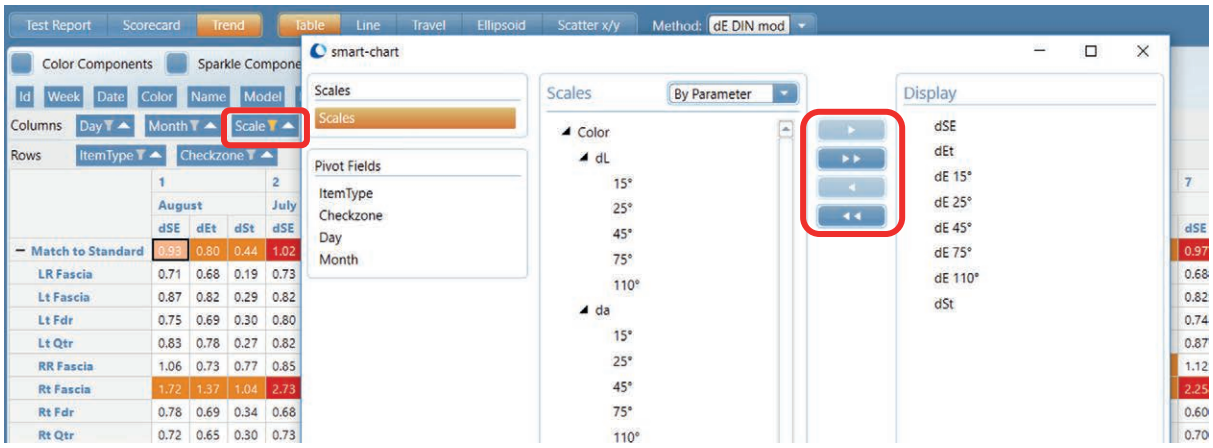


- The arrangement of data in **rows** and **columns** is defined by the blue **grouping fields** in the upper part of the table.
- To change the layout drag & drop the field to the row or column header area, or remove it to the top of the table
- The grouping fields are related to the parameters defined in the organizer. Additional fields are available for Day, Week, Month, Angle
- Values out of tolerance are highlighted in yellow or red according to the Pass/Fail definition in Standard Management



	June										
	18										
	dSE	dEt	dE 15	dE 25	dE 45	dE 75	dE 110	dL 15	dL 25	dL 45	dL 75
− Match to Standard	0.89	0.79	0.82	0.64	0.66	0.80	0.93	0.56	0.19	-0.45	-0.73
LR Fascia	0.72	0.69	0.63	0.24	0.63	0.76	0.96	0.56	-0.04	-0.59	-0.76
Lt Fascia	0.81	0.78	1.00	0.80	0.55	0.59	0.87	0.46	0.20	0.01	-0.40
Lt Fdr	0.74	0.67	0.76	0.65	0.52	0.71	0.70	0.50	0.39	-0.30	-0.61
Lt Qtr	0.84	0.78	0.83	0.73	0.64	0.84	0.84	0.61	0.38	-0.43	-0.74
RR Fascia	0.76	0.74	0.84	0.51	0.56	0.74	0.96	0.55	0.04	-0.43	-0.70
Rt Fascia	1.96	1.38	1.25	1.05	1.42	1.34	1.73	0.63	-0.26	-1.28	-1.30
Rt Fdr	0.62	0.60	0.57	0.61	0.52	0.66	0.64	0.45	0.38	-0.23	-0.55
Rt Qtr	0.68	0.66	0.72	0.54	0.45	0.77	0.73	0.69	0.47	-0.34	-0.75
− Panel Match	0.78	0.50	0.47	0.57	0.47	0.35	0.52	-0.01	-0.42	-0.25	-0.12
LR Fascia - Lt Qtr	0.56	0.41	0.29	0.60	0.36	0.32	0.42	-0.05	-0.41	-0.16	-0.01
Lt Fascia - Lt Fdr	0.45	0.28	0.32	0.31	0.34	0.23	0.18	-0.04	-0.19	0.31	0.22
RR Fascia - Rt Qtr	0.45	0.34	0.51	0.49	0.11	0.08	0.23	-0.14	-0.43	-0.09	0.05
Rt Fascia - Rt Fdr	1.66	0.96	0.77	0.86	1.07	0.76	1.26	0.18	-0.64	-1.04	-0.74

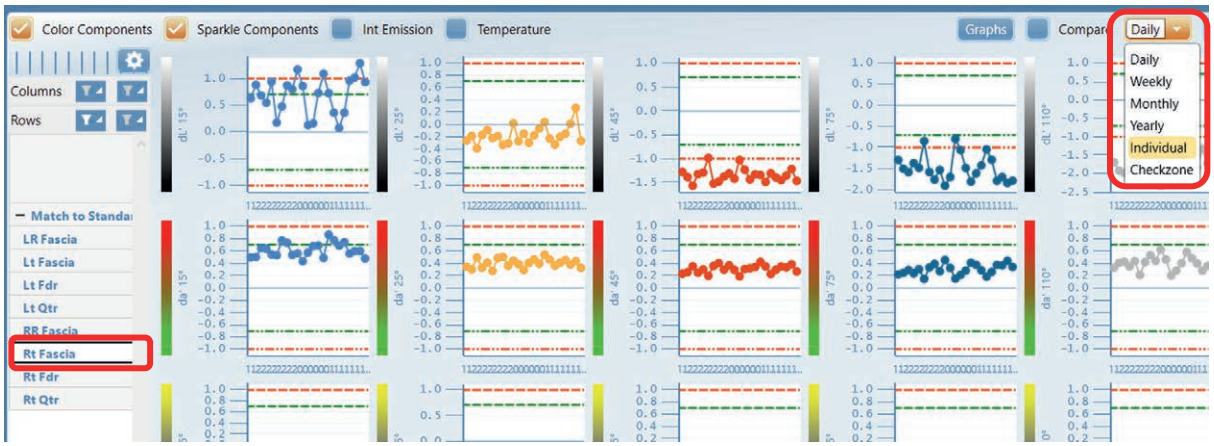
- The scales to be shown in the table can be selected with **Filter** symbol on the blue grouping field. Select the required scales by using the **Arrow buttons**
- The filter function is available for all selected grouping fields and allows customization of the data table.



Note: 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

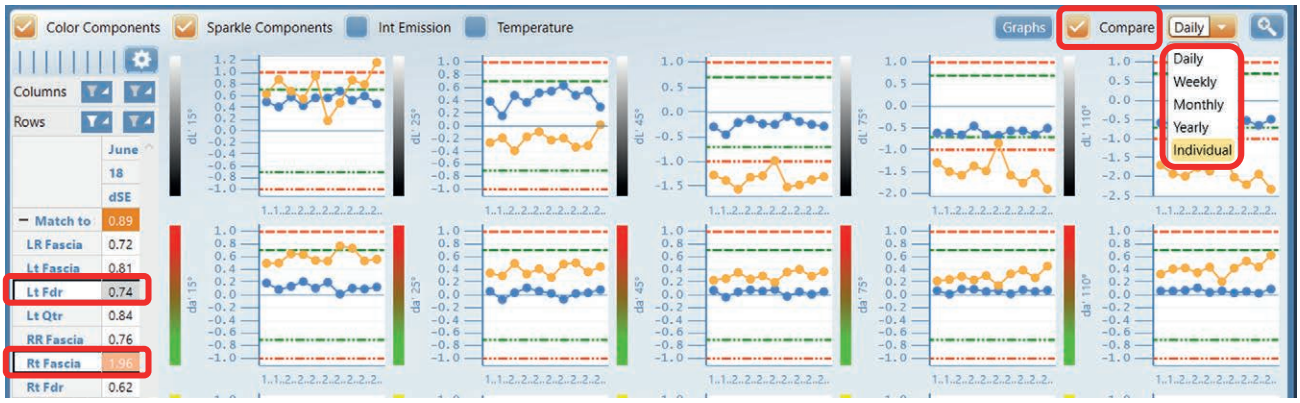
Drill-Down function

- 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 - Individual – Check Zone
  ➔ Selecting **Individual** displays **individual vehicles** whereas **Daily, Weekly, Monthly, Yearly** still displays the **average of all vehicles** measured during this time frame
- Buttons above the graphs allow to view the data as **Line, Travel** or **Scatter** graph



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 selected check zones are displayed as **different colored lines** in **Line graph** or **different colored dots** in **Scatter plot**
- The data on the x-axis can be selected by the drop down menu above the graph: Daily – Weekly – Monthly – Yearly - Individual
  ➔ Selecting **Individual** displays **individual vehicles** whereas **Daily, Weekly, Monthly, Yearly** still displays the **average of all vehicles** measured during this time frame
- Buttons above the graphs allow to view the data as **Line** or **Scatter** graph

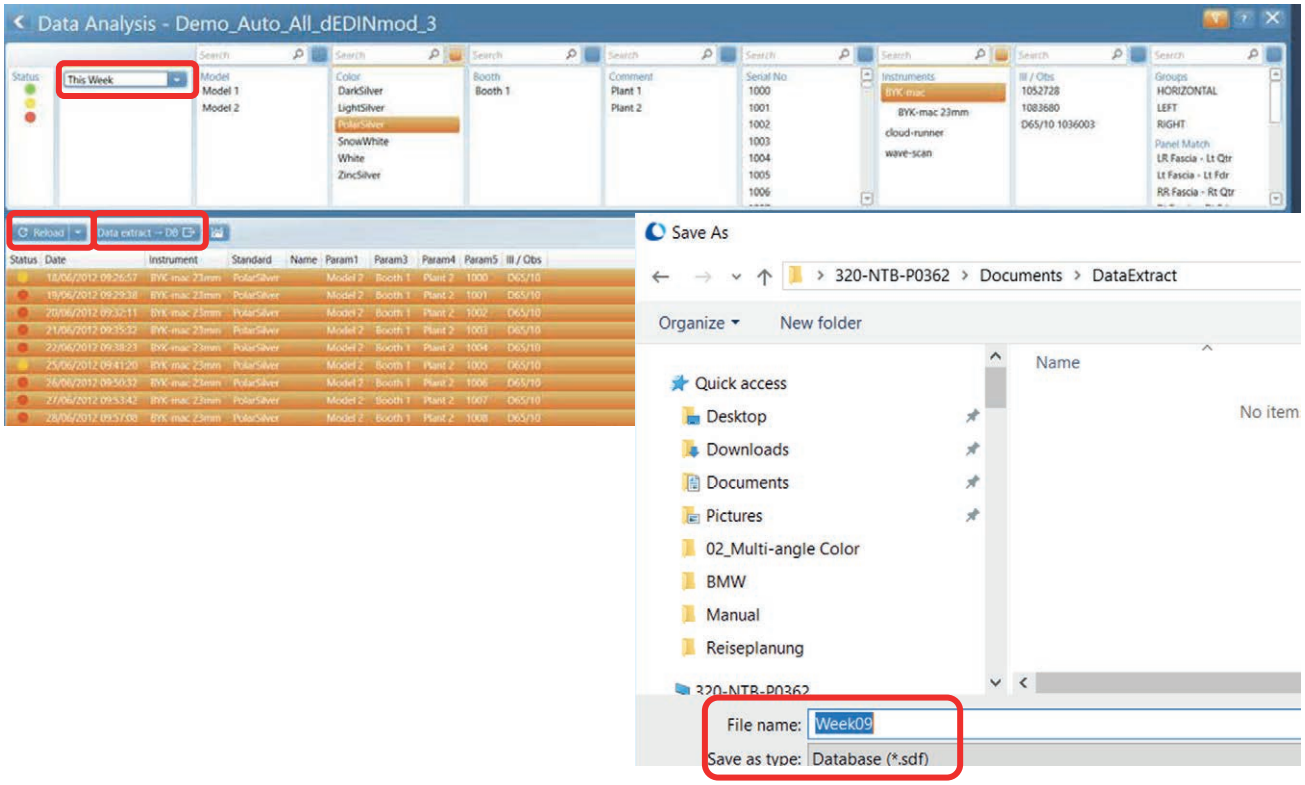


7. Data Sharing

There are two possibilities to share data between headquarter – plants - suppliers:
- Create an extract of the complete database e.g. once per week
- Always share the complete database

Create an extract (= mini database)

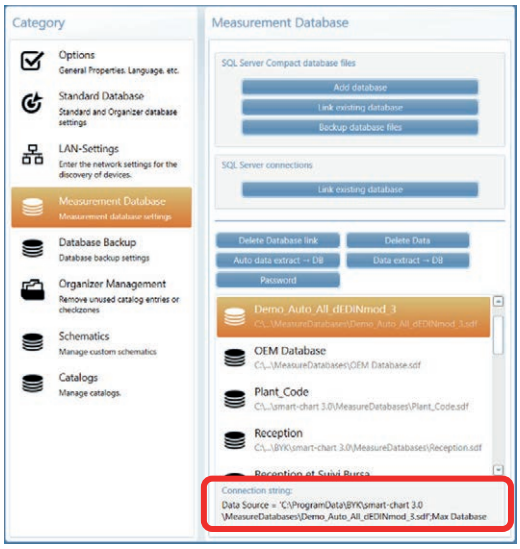
- Select the required time frame, click on **Reload** and mark all test series in the **List** with the mouse
- Click on **Data extract → DB** and type in a name for the extracted database e.g. calendar week Week09
- The mini database is saved in the regular *.sdf format
- Close smart-chart, open Windows Explorer and move to the appropriate folder
- Please create a zip archive of the *.sdf database file to make sure it can be sent safely by email (description see next page 32)

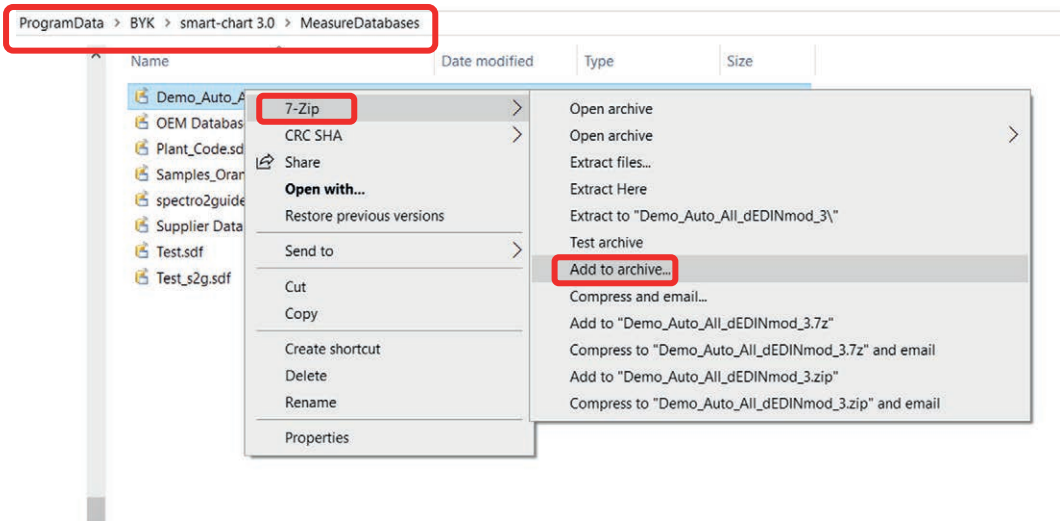


Share complete database

- In order to find the folder where the database is stored click on **Configuration**

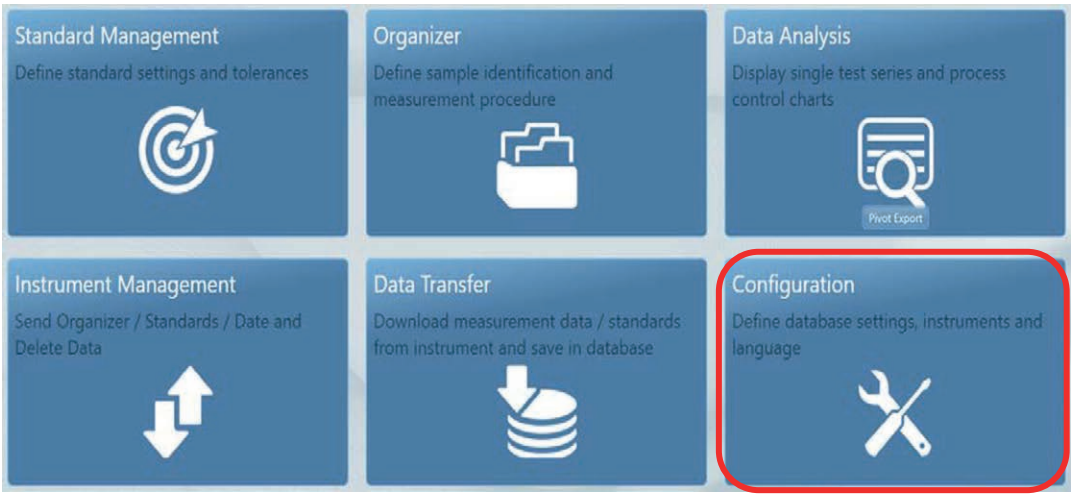
- Under **Category,** select **Measurement Database**
- All measurement databases are shown on the right side
- Select the one you want to share
- The folder were it is stored is displayed at the bottom as **Connection String - Data Source**
- Close smart-chart, open Windows Explorer and move to the appropriate folder
- Please create a zip archive of the *.sdf database file to make sure it can be sent safely by email





8. **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 **Configuration**, an automatic backup procedure can be defined.



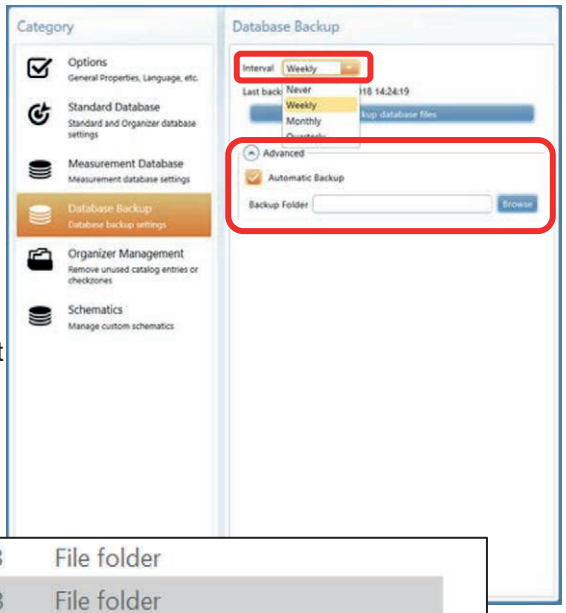
- Under **Category,** select **Database Backup**

- Select **Weekly** for the backup **Interval**

- 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



- Please save the back-up files on an external hard disk or USB key

smart-chart Installation Guide

***System Requirements:**
Computer: model Core 2 Duo, 2.2 GHz, i7, 2.5 GHz recommended, or equivalent
Operating system: Windows 7SP1, 8.1 or 10, 32 bits or 64 bits
Microsoft® .NET Framework 4.5.2
Excel® 2002 or later version for export
Memory: 4 GB RAM, 8 GB recommended
Free space on hard disk: 2 GB during installation
Monitor resolution: 1280 x 1024 pixel or higher
Free USB interface type 2.0 or under Windows 10 type 3.0 also possible

- **Administrator Rights**
  During installation full administrator rights are necessary.

- **Software installation**
  Download the zip-file, save it on your hard drive into a new folder and **extract** the complete archive. In the extracted folder, right mouse click on the file “install.exe” and select the option “Run as administrator”. Follow the setup instructions on the screen.

- **Installation of .net Framework 4.5.2**
  smart-chart requires .net Framework 4.5.2. In case it is not installed on your PC, it will automatically be installed during the installation procedure. This might take some time. Some computers might ask for rebooting during the installation process. Please **do not reboot right away**, but finish the complete installation and reboot afterwards.

- **Default directory**
  When using “Complete Installation” smart-chart is automatically installed in C:\Program Files (x86)\BYKWARE\smart-chart3.

- **Instrument driver installation**
  During installation you are asked to connect the instrument with the computer. It is highly recommended to do so **exactly** at that time and not before.
  In case the instrument driver is not installed automatically, please perform the following steps:
  - Close smart-chart and disconnect the instrument
  - In Windows Explorer open the folder C:\Program Files (x86)\BYKWARE\smart-chart3\Tools\USBDRIVER and run the file CDMXXXXX.exe as “Administrator”
  - Connect the instrument and start smart-chart again

- **Note:** Subject to change without notice. Please confirm with the software supplier.

smart-chart License Activation

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

Instrument	Software Package
BYK-mac i	smart-lab Color or smart-process (incl. smart-inline)
wave-scan	smart-process
cloud-runner	smart-process
haze-gard i	smart-lab Haze
micro-gloss	smart-lab Gloss or smart-process Gloss

How to activate the license?

- 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.

How to transfer the license?

If smart-chart needs 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

Note: In case your computer has no internet connection, please refer to the „Offline Licensing“ description in
C:\Program Files(x86)\BYKWARE\smart-chart3\Tools\OfflineLicense

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