FACTS

User Guide

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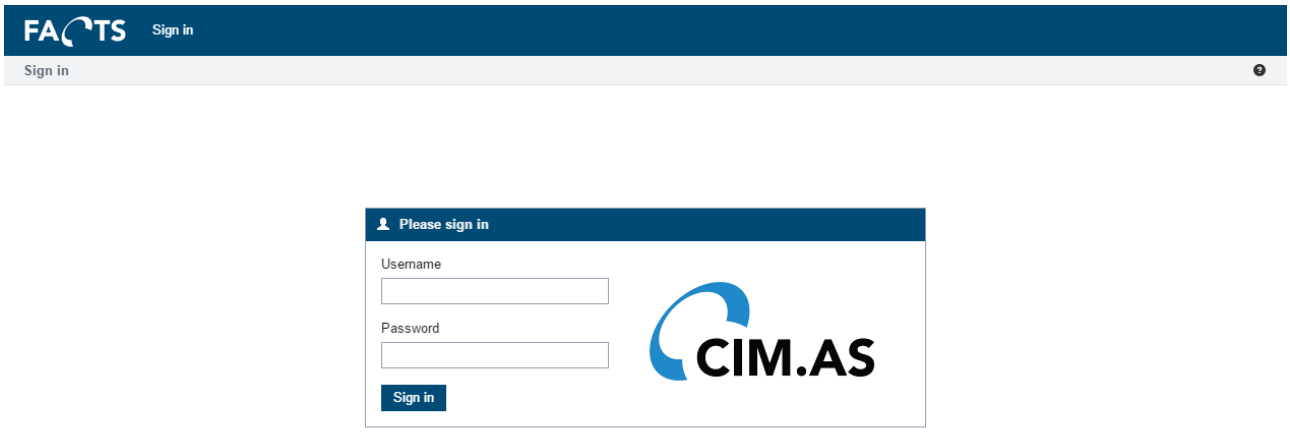
Sign in



To sign in, enter provided username and password and press the ‘Sign in’ button. When signed in the Dashboard page is presented.

1 Main menu

The FACTS main menu line is placed at the top of the page.

The above menu is taken from the reports / SPC page. This is indicated by ‘gray’ area. This area shows the actual page. You can click in the gray area to shortcut back in the menu.

To select a main menu item, simply click the text in in the green area.

1.1 Menu items

FACTS – Opens info page about FACTS, including build version etc.
Dashboard – Opens the Dashboard page
Reports – Opens the main report page
System – Opens the system main page
Question mark – Opens the user manual

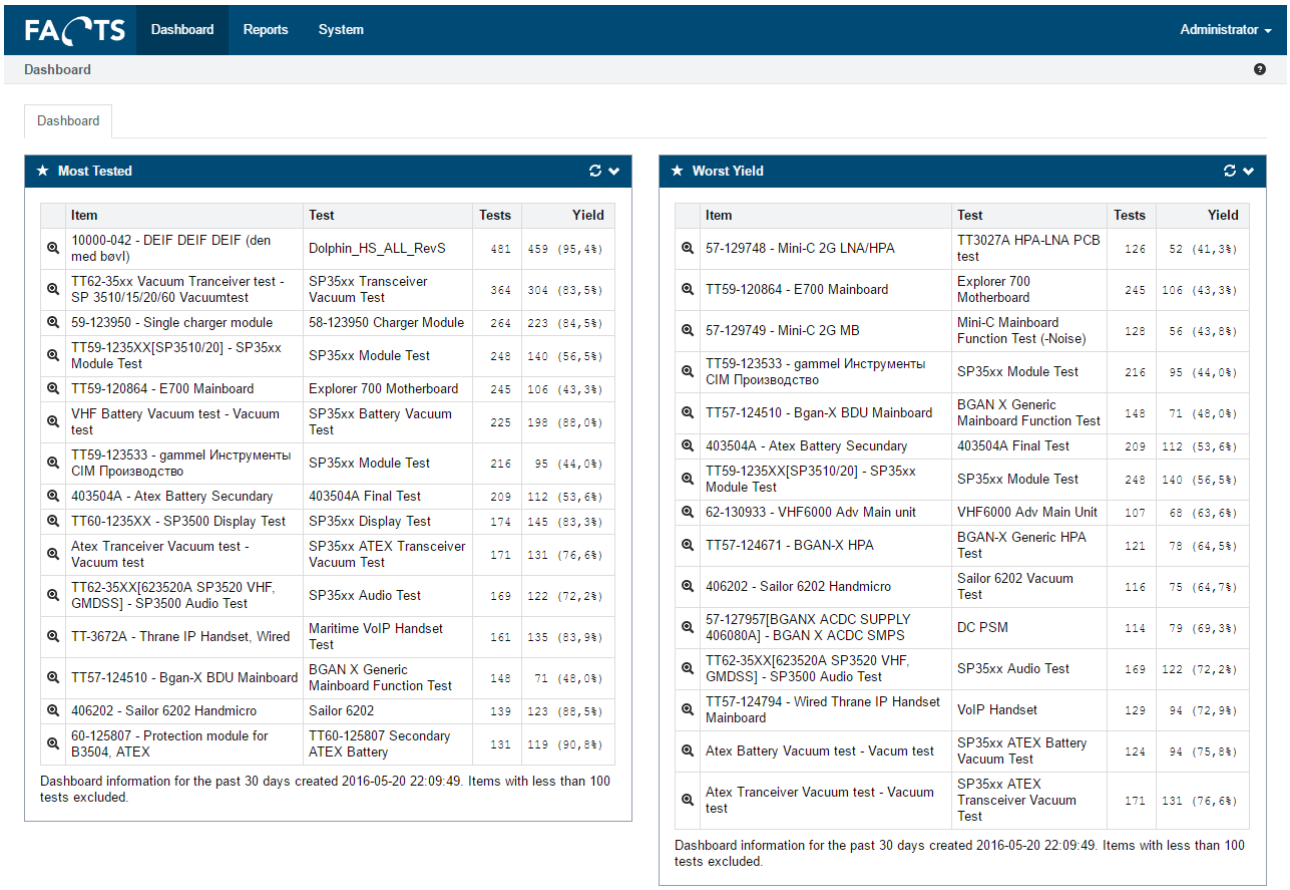
Remark

Depending of the assigned user rights some menu items will not be available.

2 Dashboard

To enter Dashboard, click the 'Dashboard' text in menu line.

The Dashboard shows the performance of the test data by providing a top 15 of 'Most Tested' and 'Worst Yield' tests.

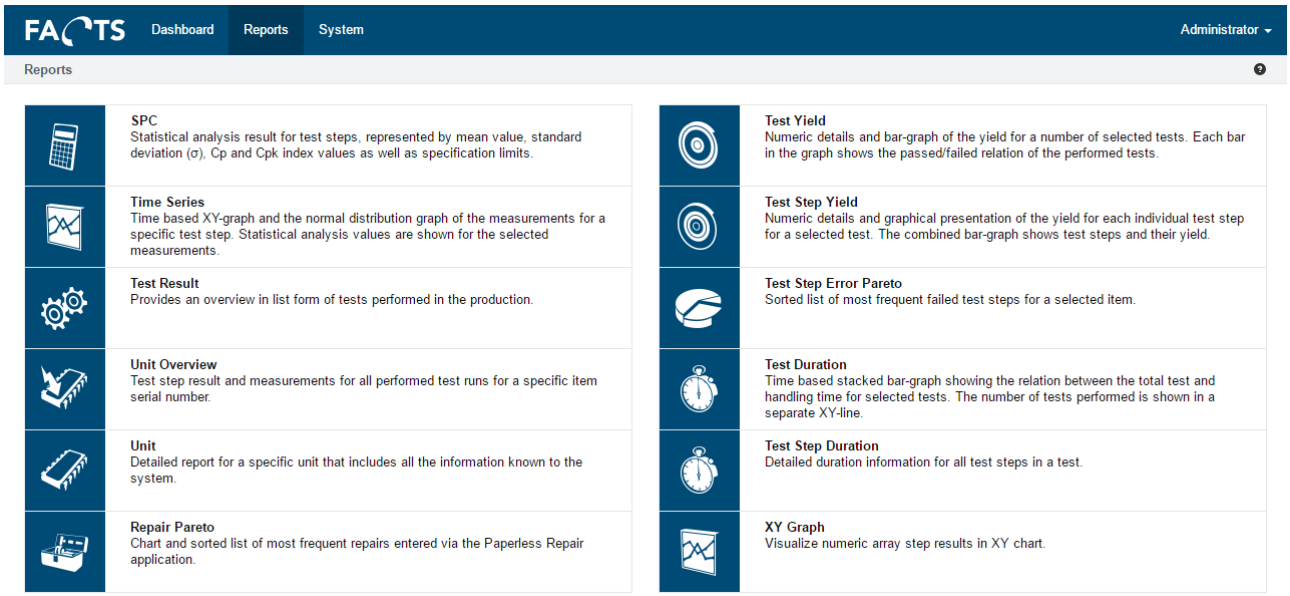


Data is loaded when page is shown. By clicking the button, the view is refreshed with the latest data available. The number of days and minimum number of tests to take into consideration in this view can be adjusted in the personal settings (see section 6.1).

3 Reports

To enter Report main page, click the 'Reports' text in menu line.

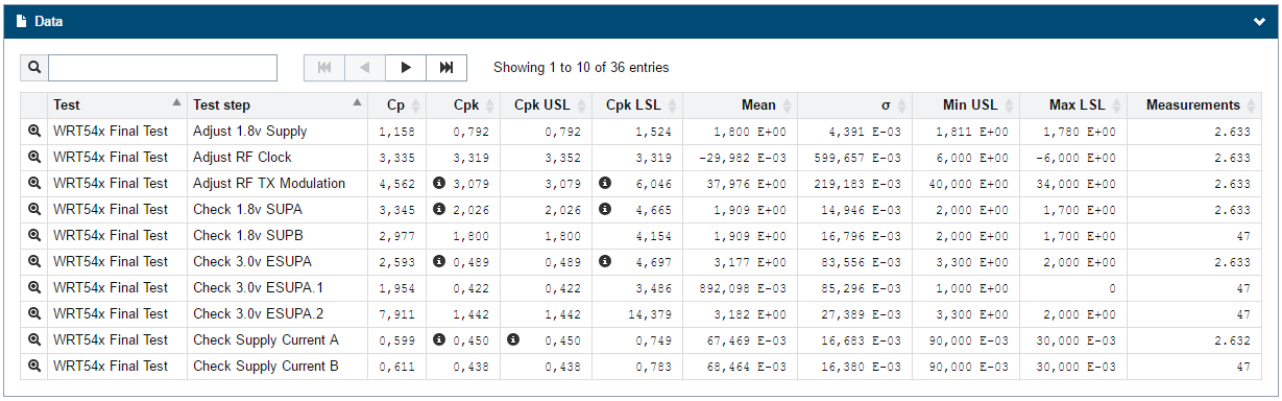
The page presents the available reports (depends on the current user rights).



To select a report, move the mouse over the appropriate report square and select.

3.1 Navigating in Data grids

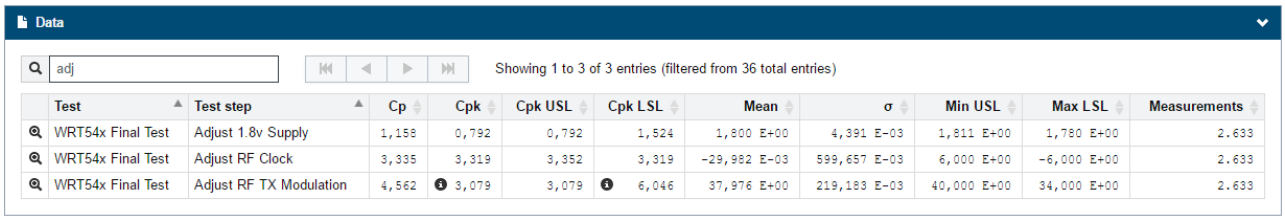
When report results are presented in a grid (table) as shown below, the following navigation can be used.



Test	Test step	Cp	Cpk	Cpk USL	Cpk LSL	Mean	σ	Min USL	Max LSL	Measurements
WRT54x Final Test	Adjust 1.8v Supply	1,158	0,792	0,792	1,524	1,800 E+00	4,391 E-03	1,811 E+00	1,780 E+00	2.633
WRT54x Final Test	Adjust RF Clock	3,335	3,319	3,352	3,319	-29,982 E-03	599,657 E-03	6,000 E+00	-6,000 E+00	2.633
WRT54x Final Test	Adjust RF TX Modulation	4,562	3,079	3,079	6,046	37,976 E+00	219,183 E-03	40,000 E+00	34,000 E+00	2.633
WRT54x Final Test	Check 1.8v SUPA	3,345	2,026	2,026	4,665	1,909 E+00	14,946 E-03	2,000 E+00	1,700 E+00	2.633
WRT54x Final Test	Check 1.8v SUPB	2,977	1,800	1,800	4,154	1,909 E+00	16,796 E-03	2,000 E+00	1,700 E+00	47
WRT54x Final Test	Check 3.0v ESUPA	2,593	0,489	0,489	4,697	3,177 E+00	83,556 E-03	3,300 E+00	2,000 E+00	2.633
WRT54x Final Test	Check 3.0v ESUPA.1	1,954	0,422	0,422	3,486	892,098 E-03	85,296 E-03	1,000 E+00	0	47
WRT54x Final Test	Check 3.0v ESUPA.2	7,911	1,442	1,442	14,379	3,182 E+00	27,389 E-03	3,300 E+00	2,000 E+00	47
WRT54x Final Test	Check Supply Current A	0,599	0,450	0,450	0,749	67,469 E-03	16,683 E-03	90,000 E-03	30,000 E-03	2.632
WRT54x Final Test	Check Supply Current B	0,611	0,438	0,438	0,783	68,464 E-03	16,380 E-03	90,000 E-03	30,000 E-03	47

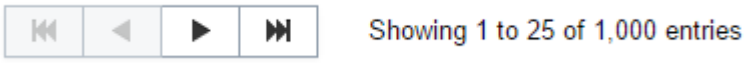
Text can be searched in columns containing text. In the above screenshot the Test and Test step columns can be searched. To search, simply enter a text in the search field. The text can be any part of the texts contained in the searched columns.

Example of search with "adj"



Test	Test step	Cp	Cpk	Cpk USL	Cpk LSL	Mean	σ	Min USL	Max LSL	Measurements
WRT54x Final Test	Adjust 1.8v Supply	1,158	0,792	0,792	1,524	1,800 E+00	4,391 E-03	1,811 E+00	1,780 E+00	2.633
WRT54x Final Test	Adjust RF Clock	3,335	3,319	3,352	3,319	-29,982 E-03	599,657 E-03	6,000 E+00	-6,000 E+00	2.633
WRT54x Final Test	Adjust RF TX Modulation	4,562	3,079	3,079	6,046	37,976 E+00	219,183 E-03	40,000 E+00	34,000 E+00	2.633

If a table contains more rows than defined by a user setting, the paging control is enabled. To navigate through the pages, click arrow icons or page number directly.

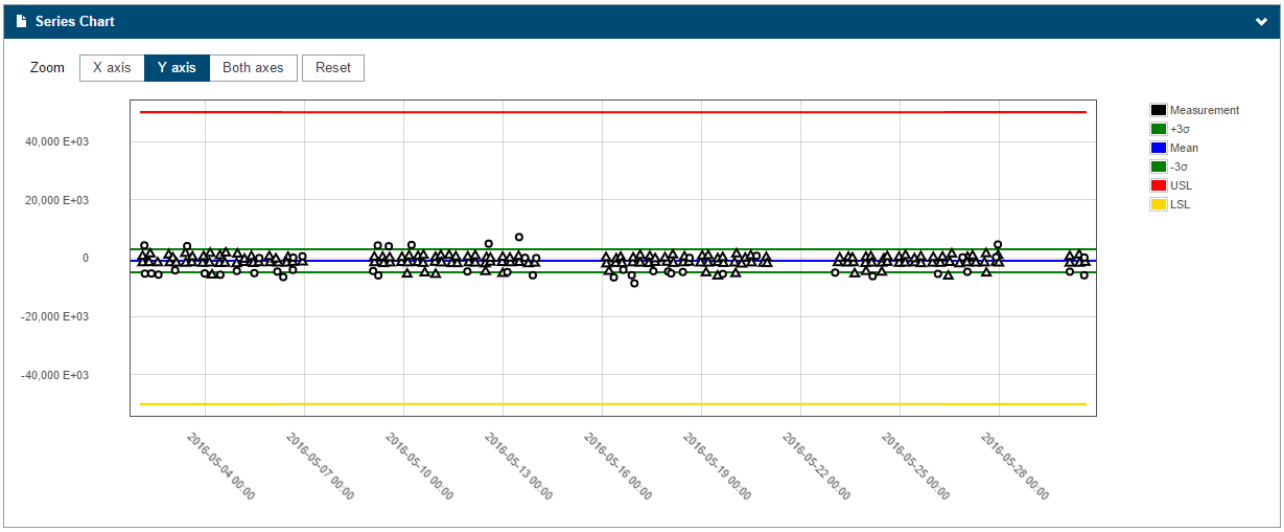


The sort order of the table can be set to order from high to low, or low to high. Further, the sort order can be controlled by selecting multiple columns headers (hold shift key while clicking the headers). When multi selecting, the sort order is determined by the order the columns is selected. Click a column header once to choose low to high sorting, and click twice to select high to low sorting.

3.2 Navigating in charts

In reports containing graphs, the following navigation can be used.

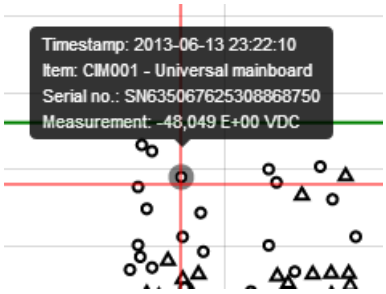
3.2.1 XY – chart



Meaning of circle and triangle:
Circles represent a single measurement, triangles represent a group of measurements.

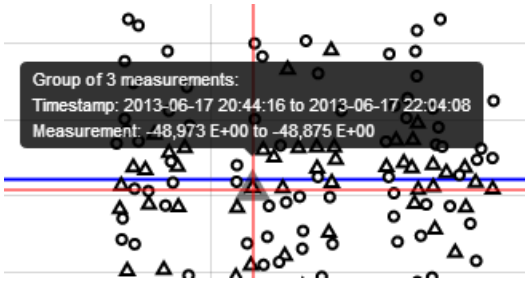
Tooltip: By moving the mouse curser over either a circle or a triangle, detailed information appears.

Tooltip - circle

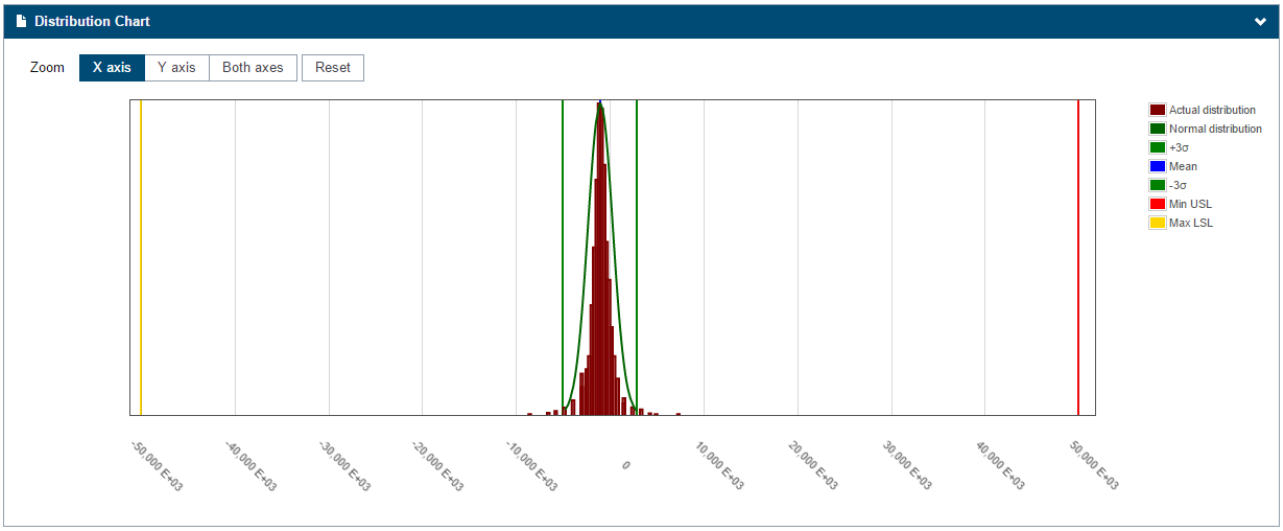


If the mouse is clicked on a circle, the report Unit Overview is shown, with filter options filled out corresponding to the selected unit.

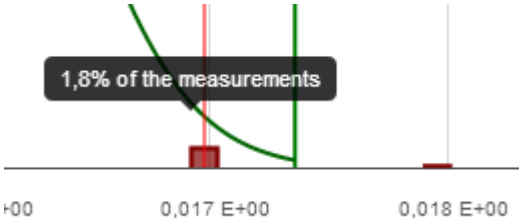
Tooltip – triangle



3.2.2 Normal distribution chart



Each bars represent a percentage of measurements. Hold the mouse over a bar to see a tooltip with detailed information:



3.2.3 Zoom

The zoom mode is controlled by the buttons “X axis”, “Y axis” and “Both axes”.

“X axis” – Zoom in only on X axis
“Y axis” – Zoom in only on Y axis
“Both axes” – Zoom in by selection rectangle

To reset zoom level back to the initial level, press reset button, or double click the graph.

3.2.4 Scale

Some charts allow switching between linear and logarithmic scale. This functionality is controlled by the button “Linear” and “Logarithmic”.

“Linear” – Linear scale on X axis
“Logarithmic” – Logarithmic scale on X axis

3.3 Exporting reports

Most reports can be exported to Microsoft Excel and Adobe PDF.

3.3.1 Export to PDF

This report type exports all the result data including graphs, filter settings etc.

To export to PDF, select menu item “Export” and then Report to PDF. The report is generated on the server and presented as a download file.

3.3.2 Export to Excel

This report type exports all the result data for the report. Filter selection is presented on the first page, and the data on second page.

To export to Excel, select menu item “Export” and then Report to Excel. The report is generated on the server and presented as a download file.

3.4 Filtering reports

All reports are made based on test data selected with filter. Each report has a set of default filter options and some additional advanced filter options:

By clicking the Default button, all default filtering options are visible. Clicking the Advanced button makes further filter options available for the selected report.

Whenever possible, the selected filtering options are transferred when switching between different types of reports.

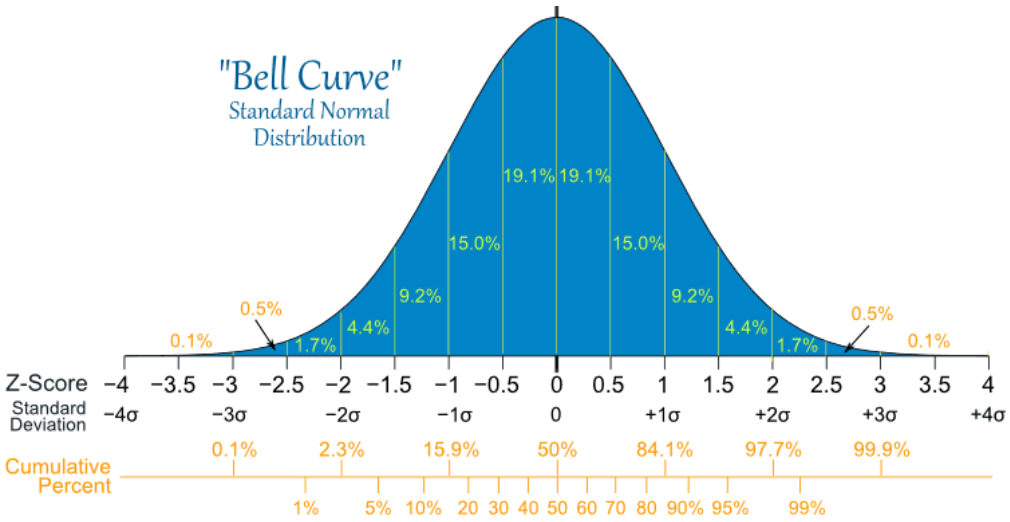
Clicking the Reset button causes all filtering options to be reset to their initial state and value.

3.5 SPC report

Statistical analysis result for test steps represented by mean value, standard deviation (σ), C_p and C_{pk} index values as well as specification limits. For further information on the calculated statistical values, please refer to section 7.

Typical use:

The SPC report contains the results of the statistical analysis performed on the data selected by the filter criteria. Please notice, that the correct use of the SPC report presumes the filtered data is normal distributed and lies within the normal distribution "Bell Curve" (see further explanation in section 3.6).



The capability values C_p and C_{pk} are used to indicate the performance of the production processes involved in generating the selected data. Typically these values are used in Six Sigma process optimizations to give a direct indication of a process' sigma level and the defects PPM (Defect Parts Per Million) See estimated conversion table below:

C_{pk} value	Sigma level	Defects (PPM)
0.333	1	691000
0.667	2	308500
1.000	3	66800
1.333	4	6200
1.667	5	230
2.000	6	3.4

Please note, at the above show conversion between sigma level and C_{pk} value is an estimate. Further, the conversion assumes a 1.5 sigma shift. For further details please refer to Six Sigma literature.

Notes on specification limits (Min USL and Max LSL):

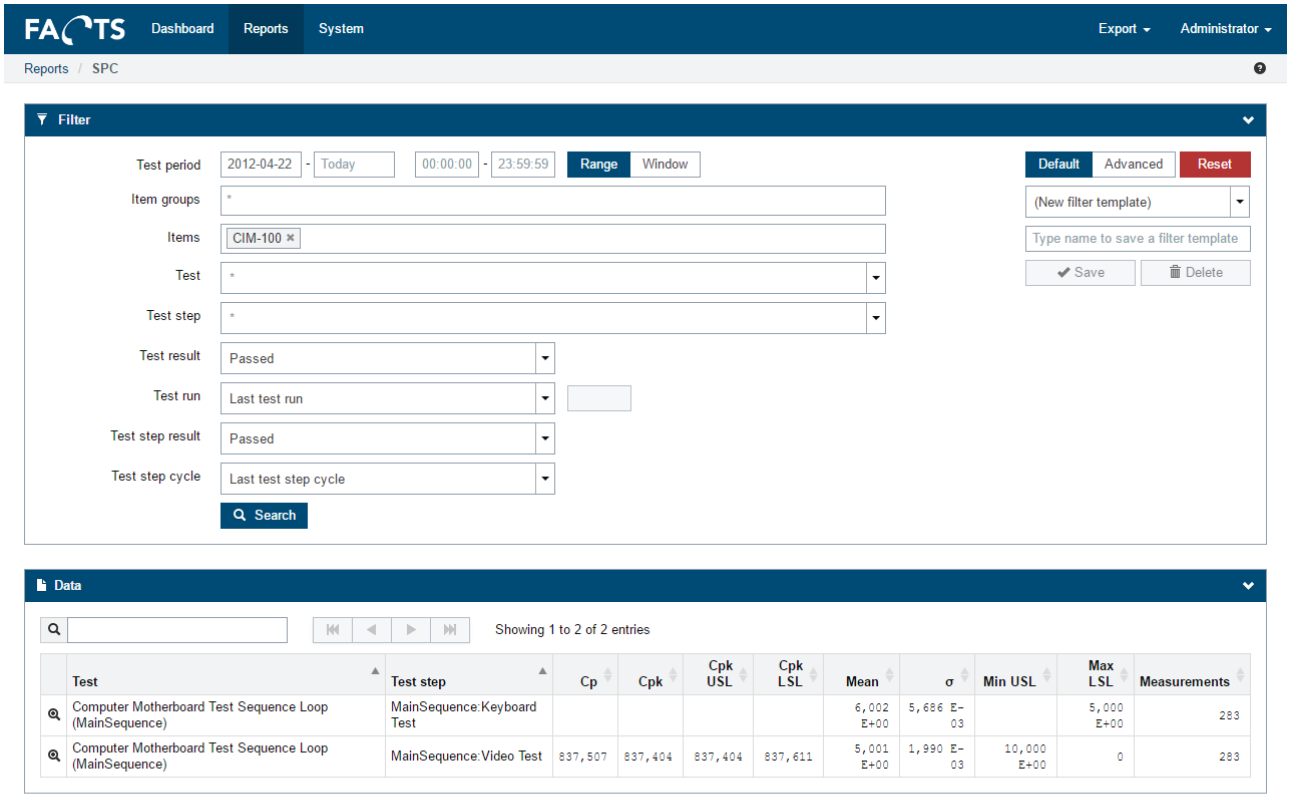
In some cases, the upper and lower specification limits (USL and LSL) vary within the data selected by the filter. In those cases, all statistical values are calculated from a worst case perspective, using the minimum upper specification limit and the maximum lower specification limit found in the filtered data. When presented in the SPC report, these values are denoted Min USL and Max LSL, respectively. All calculated

statistical values in the SPC report are calculated using the formulas described in section 7, using the Min USL and Max LSL as specification limits in the formulas.

Notes on C_p and C_{pk} values:

By definition, the C_{pk} value is the adjustment of C_p for the effect of non-centered distribution (a centered distribution has its mean value right in the middle of LSL and USL). C_{pk} is calculated both against USL (denoted C_{pk} USL) and against LSL (denoted C_{pk} LSL). The final C_{pk} value is the lower of these two values. This means, that if the distribution is centered or close to centered, C_{pk} equals C_p. On the other hand, if C_{pk} is relatively much less than the C_p value, this indicates a mean value far off the center of USL and LSL. In these cases, something significant might have changed within the production process, or perhaps USL or LSL simply needs adjustment to cope with changed circumstances. C_{pk} values above 2, corresponding to less than 3.4 defects per million is a clear indication that USL and LSL are set at a level allowing almost everything to pass through the test.

To get the SPC report, fill out the appropriate filter options and click the Search button.



To see measurements in a “Time Series report”, simply click the magnifying glass in the first column of each row. This opens the Time Series report with prefilled filter options according to the selected test step.

3.6 Time Series report

Time based XY-graph and the normal distribution graph of the measurements for a specific test step. Statistical analysis values are shown for the selected measurements.

Typical use:
Based on the filter criteria including a specific test step, the Time Series report shows three pieces of information:

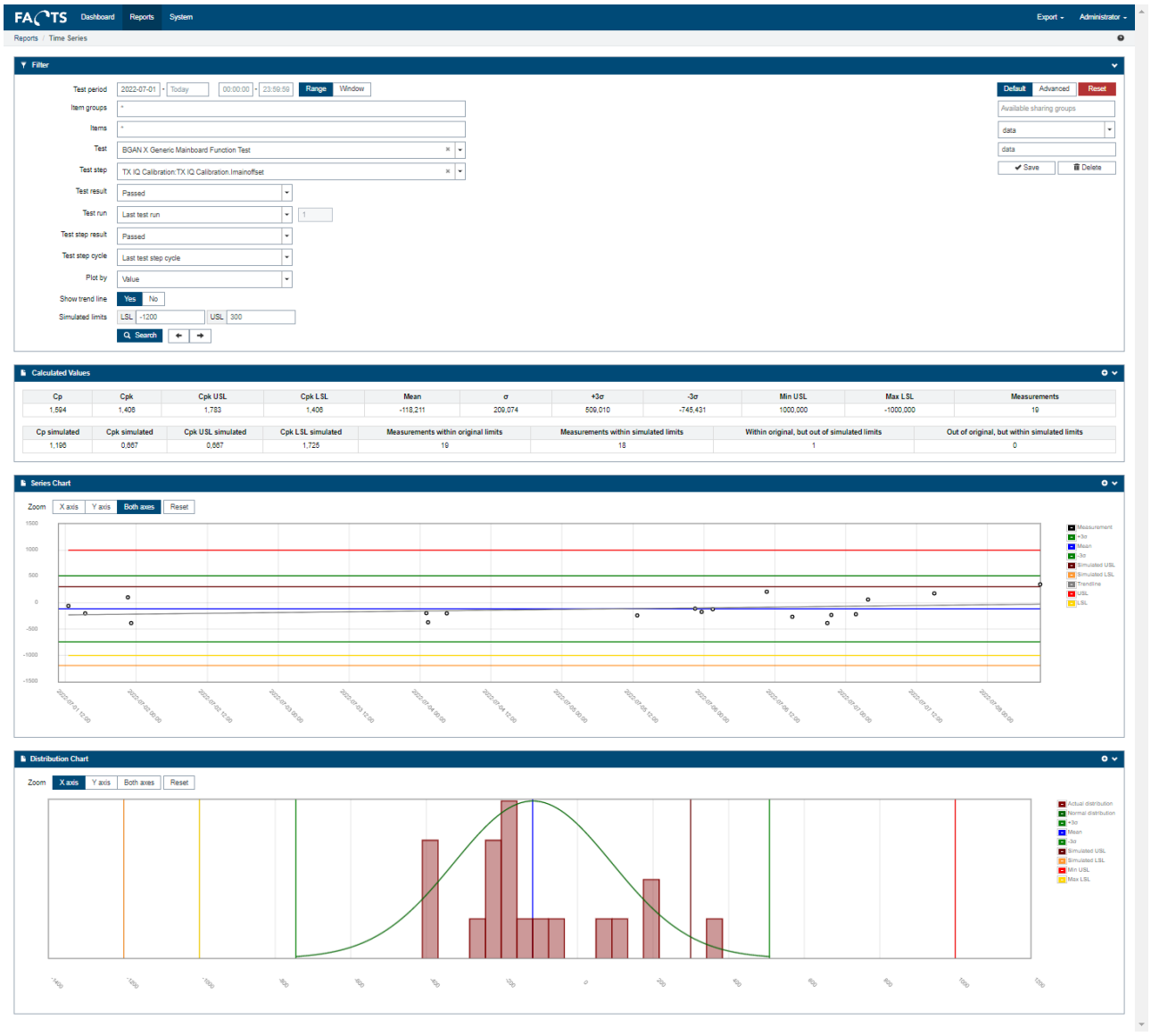
- **Calculated Values**: All calculated statistical values for the given filter criteria. These values correspond to the values visible on the SPC report. Also visible are additional values corresponding to the mean value minus/plus 3 times standard deviation. These values are denoted -3σ and +3σ and are normally called “control limits”.
  If simulated limits are entered, additional values related to simulated limits are shown.

- **Series Chart**: Time based XY chart showing all measurements for the given filter criteria. The chart also contains indications of the values USL, LSL as well as the above mentioned control limits, denoted -3σ and +3σ.
  Trendline and simulated limits (simulated LSL, simulated USL) are shown in the series chart if they are enabled.

- **Distribution Chart**: Chart showing the distribution (population) of the measurements in the given filter criteria. Following the prerequisite that SPC can only be done on data, which has a normal distribution, the chart should show a clear “Bell Curve” of the distribution. The chart also contains indications of the values Min USL, Max LSL as well as the above mentioned control limits, denoted -3σ and +3σ.
  Trendline and simulated limits (simulated LSL, simulated USL) are shown in the distribution chart if they are enabled.

The Time Series report can be used to check the normal distribution of the selected data. According to the empirical rule for normal distribution, only 0.3% of the measurements should lie outside the control limits. This means, that in case the distribution shows more than 0.3% outside the control limits, the distribution might not have a proper normal distribution, or the process producing the measurements are out of statistical control. Production outside statistical control is a good reason to check the selected data further.

To get the Time Series report, fill out the appropriate filter options and click the Search button.



3.7 Test Result report

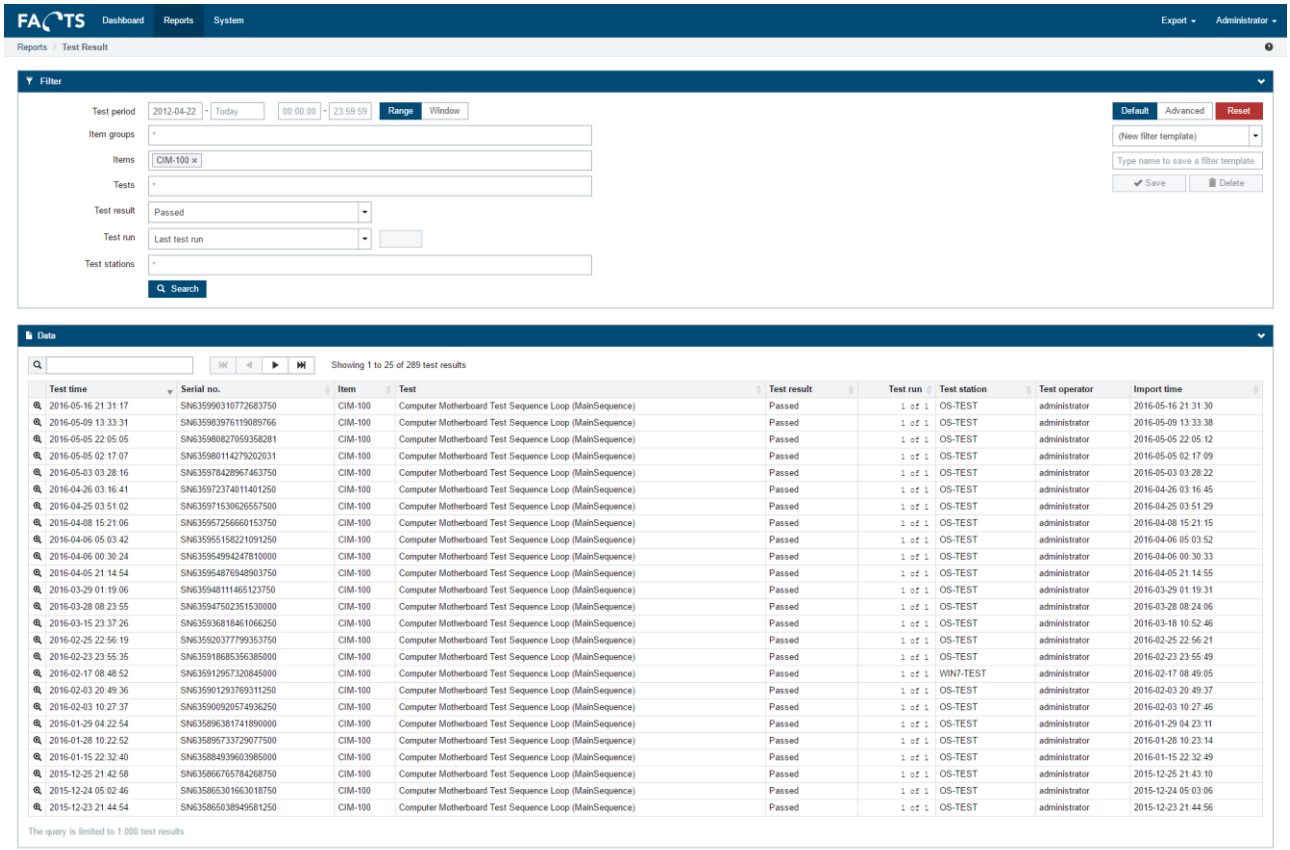
The report shows the most recent test data and test results imported by the system.

Typical use:

The Test Result report is typically used to get an overview of what has recently been tested in the production. It provides an overall overview of tests performed on units, the number of re-tests performed, test station names and test operators.

By setting the appropriate filter options, the report can be used to see what has been tested on a given station. It also provides an efficient tool to check if re-testing is widely used for certain products or certain periods during the day. By entering a specific serial number for a unit in the filter options, test data for that specific unit can be found and displayed.

To get the Test Result report, fill out the appropriate filter options and click the Search button.



3.8 Unit Overview report

Test step result and measurements for all performed test runs for a specific item serial number.

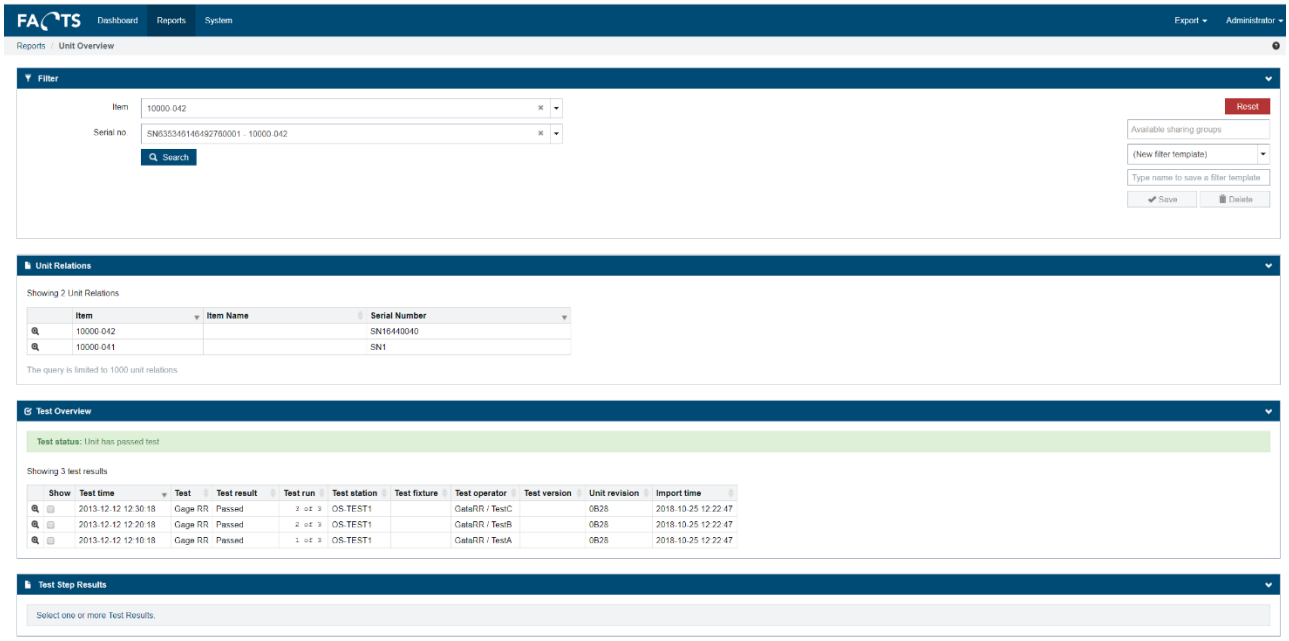
Typical use:

The Unit Overview report is typically used to get full test reports for specific units. The report includes a list of all related units. The relation of units is setup in the import of data. Via the Unit Relations table, it is possible to navigate to any of the related units.

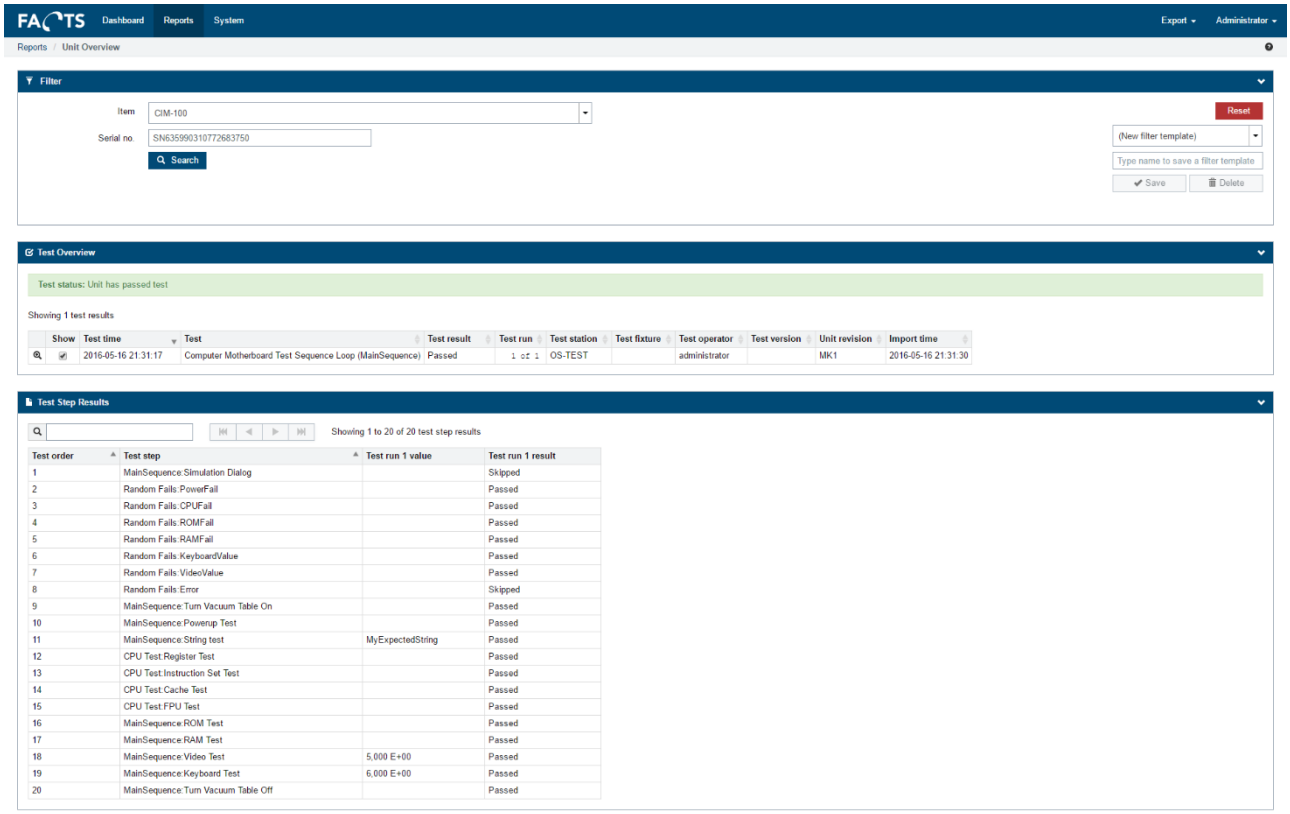
In case a unit has been tested more than once, the performed tests can be selected and shown side-by-side. This way it is easy to get an overview and compare the results of each test step and any differences in test conditions and parameters.

The report can also be used as an easy way to get full product test documentation in case the product undergoes repair or the like.

To get the Unit Overview report, fill out the filter options and click the Search button.



To see and compare specific test step measurements, select appropriate tests in the “Test Overview” section. The view is automatically updated during test selection.



3.9 Test Yield report

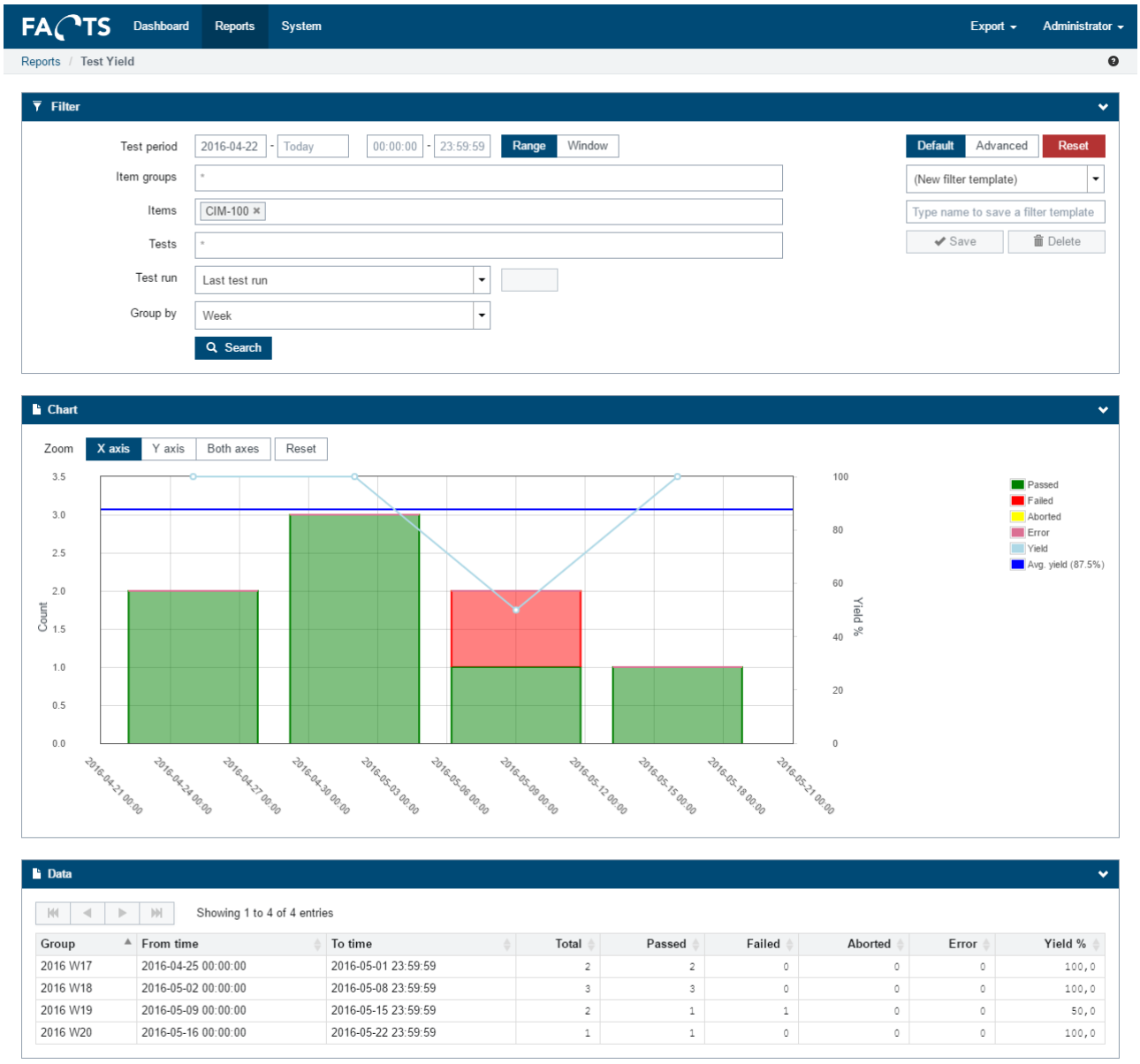
Numeric details and bar-graph of the yield for a number of selected tests. Each bar in the graph shows the passed/failed relation of the performed tests.

Typical use:

The Test Yield report is typically used get an overview of the actual yield and percentage yield for tests performed on a given product or product group. Normally all attention should be focused on maximizing first-pass yield, as any subsequent tests will add cost to the product and hence lower production efficiency. So, comparing first-pass yield with last-pass yield gives a tangible indication of production inefficiency and added costs. Of course, when looking at yield, the production volume is also a key element to determine where to focus any production optimizing efforts in order to get the best payback.

Another way to use this report is to compare the yield results of different time periods and thereby directly compare the production capability for time periods or different shifts, operators etc.

To get the Test Yield report, fill out the appropriate filter options and click the Search button.



A tooltip with detailed information will appear when holding the mouse pointer on bars in the graph.

Remark

Selecting an item, leaving the filter option “Tests” at the default value (*) “All tests”, will not give the net production yield for the selected item. In order to get the net production yield, the last test performed before shipping must be selected as a filter option along with the Item itself.

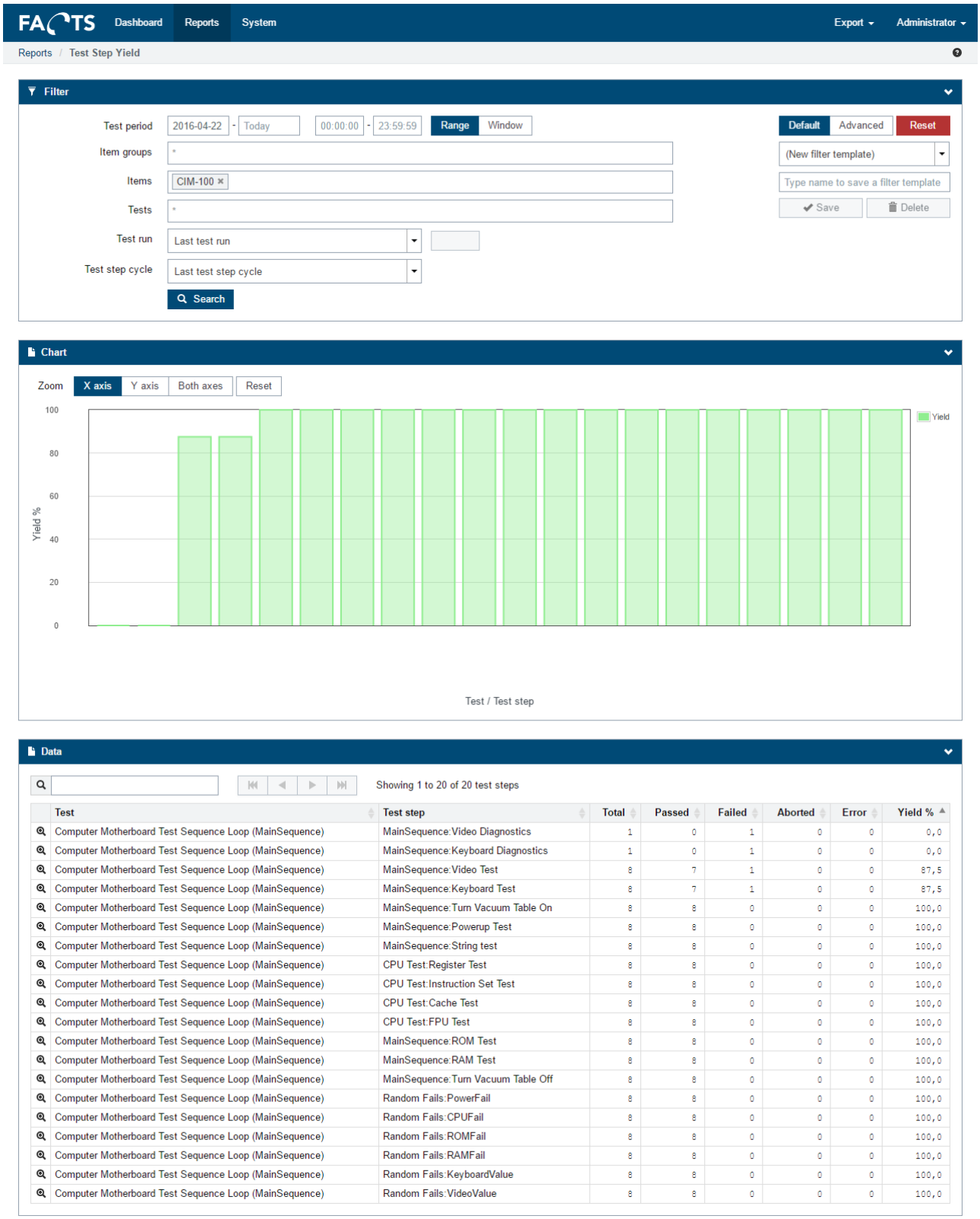
3.10 Test Step Yield report

Numeric details and graphical presentation of the yield for each individual test step for a selected test. The combined bar-graph shows test steps and their yield.

Typical use:

The Test Step Yield report can be used to determine which of the performed tests are the most likely to fail, and which steps are most likely to always succeed. A common picture on this report indicates that half of the test steps performed hardly ever fails. There can be several reasons behind this, but it could be a sign, that the specification limits (USL and LSL) for these test steps are too conservative, and as a result almost never catches any errors. Another reason could be that the step is not necessary at all. Whatever the reason, a test step that does not directly improve quality by catching errors, could be considered a waste of testing time and an undesired increase in production time and costs. Put together it might be a potential for increased yield.

To get the Test Step Yield report, fill out the appropriate filter options and click the Search button.



Test	Test step	Total	Passed	Failed	Aborted	Error	Yield %
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Video Diagnostics	1	0	1	0	0	0,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Keyboard Diagnostics	1	0	1	0	0	0,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Video Test	8	7	1	0	0	87,5
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Keyboard Test	8	7	1	0	0	87,5
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Turn Vacuum Table On	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Powerup Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:String test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:Register Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:Instruction Set Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:Cache Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:FPU Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:ROM Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:RAM Test	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Turn Vacuum Table Off	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:PowerFail	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:CPUFail	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:ROMFail	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:RAMFail	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:KeyboardValue	8	8	0	0	0	100,0
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:VideoValue	8	8	0	0	0	100,0

A tooltip with detailed information will appear when holding the mouse pointer on bars in the graph.

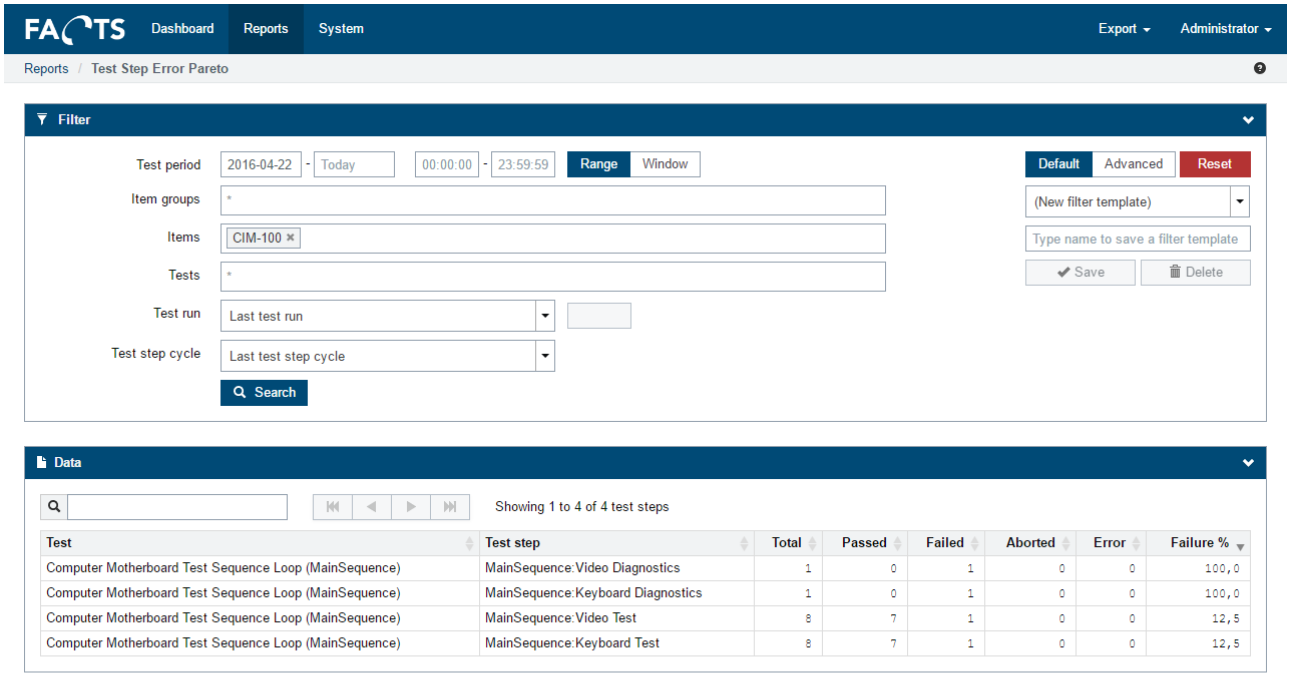
3.11 Test Step Error Pareto report

Sorted list of most frequent failed test steps for a selected item.

Typical use:

The Test Step Error Pareto report is very similar to the Test Step Yield report and essentially shows the same data. The only difference is that it focuses on errors (failed tests), where the Test Step Yield report focuses on succeeded tests. The two reports can be used for the same purposes. Please refer to section 3.10 for further description on the use of these reports.

To get the Test Step Error Pareto report, fill out the appropriate filter options and click the Search button.



3.12 Test Duration report

Time based stacked bar-graph showing the relation between the total test and handling time for selected tests. The number of tests performed is shown in a separate XY-line.

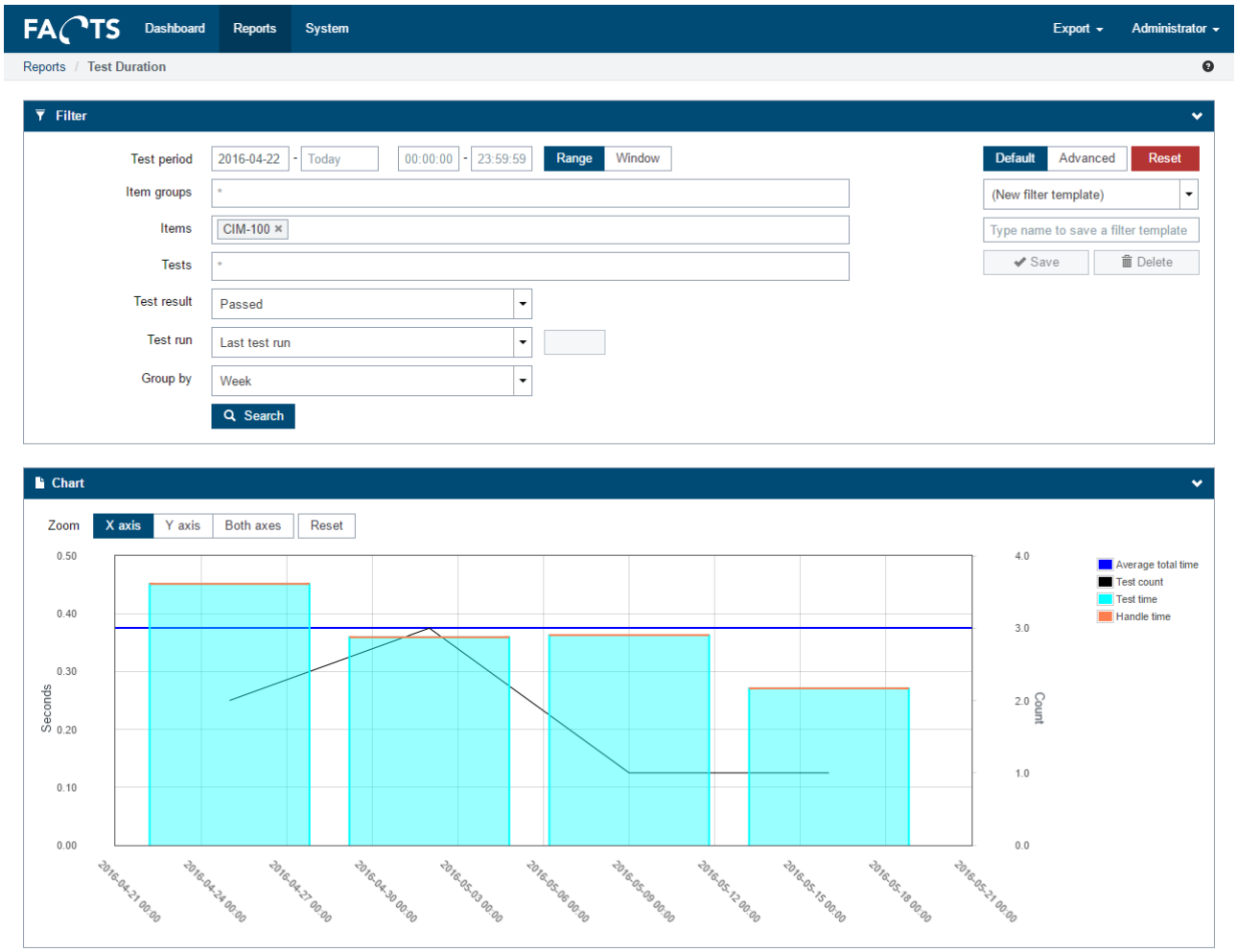
Typical use:

The Test Duration report can be used to map the time used to test a product. It shows the relation between testing time and handling time between two tests. Handling time is defined as the time from the end of one test until the beginning of the next test. In essence, handling time is waste and hence loss of production efficiency, so all efforts should be made to minimize handling time (provided there is a significant production volume to pay for the investment). Poor handling time can originate from a number of different sources – naming a few:

- Test fixtures and connectors are too difficult and time consuming to handle
- Products undergo transport between tests
- Manual handling is too slow

Whatever the reason is for the poor handling time, it should be properly investigated, perhaps as part of a LEAN project to optimize production logistics and maybe even reduce or simplify production steps. Like the Test Yield report, the Test Duration report can also be used to compare performance as a function of time periods, operators, test fixtures or shifts.

To get the Test Duration report, fill out the appropriate filter options and click the Search button.



A tooltip with detailed information will appear when holding the mouse pointer on bars in the graph.

3.13 Test Step Duration report

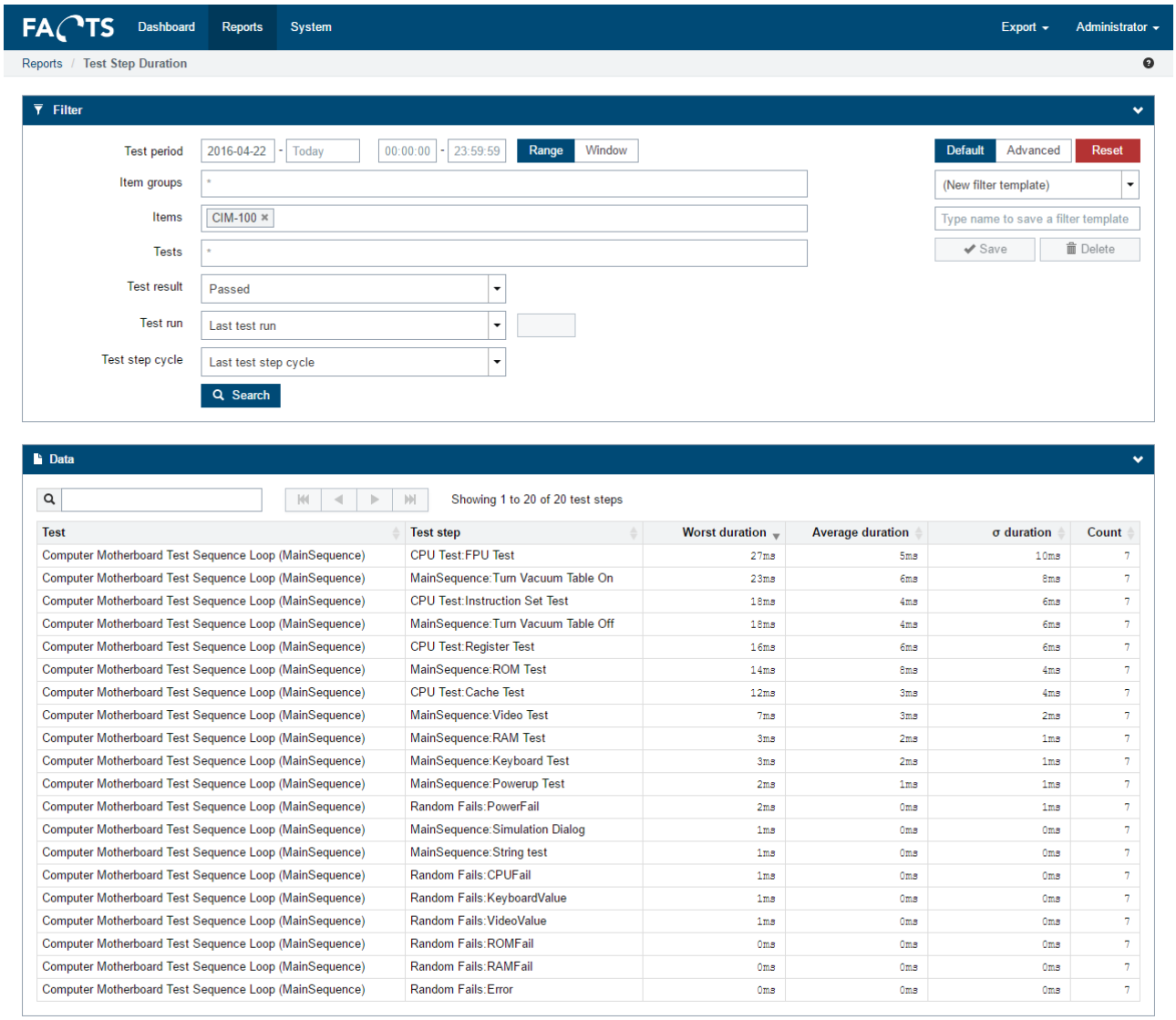
Detailed duration information for all test steps in a test.

Typical use:

The Test Step Duration report can be used to get a deeper insight into time it takes for each test step to complete. The report provides simple statistics for the time spent for each test step, including average duration, standard deviation and worst duration. As test time is one of the limiting elements for production capacity, efforts should be made to investigate and optimize any test step taking up to majority of time.

When looking at time spent on test steps, it is also very interesting, if any of the “unnecessary test steps” found via the Test Step Yield report is also taking up lots of time when testing. In that case, much time is spent on completing test steps that hardly ever fail – perhaps a serious candidate for optimization.

To get the Test Step Duration report, fill out the appropriate filter options and click the Search button.

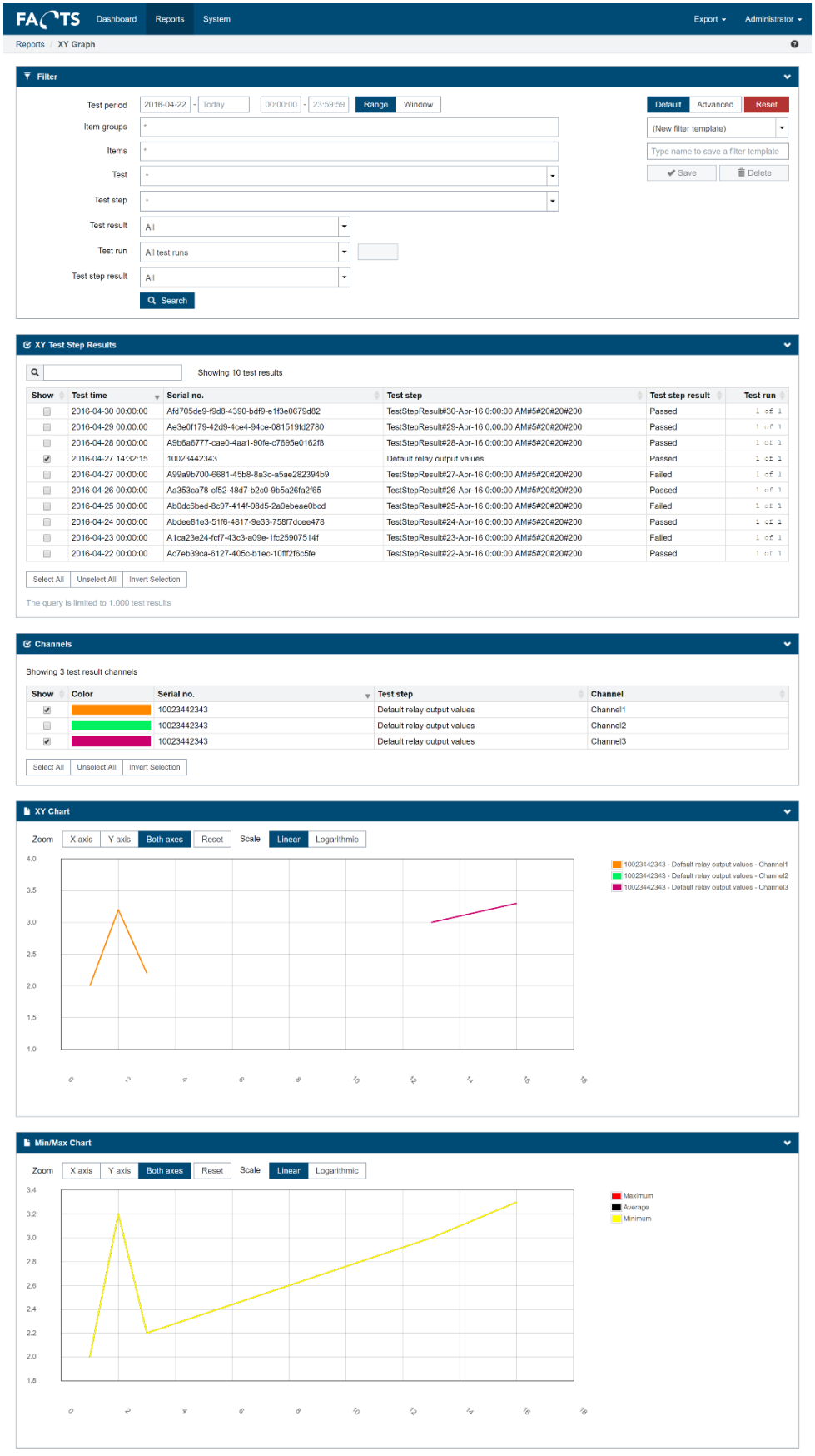


Test	Test step	Worst duration	Average duration	σ duration	Count
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:FPU Test	27ms	5ms	10ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Turn Vacuum Table On	23ms	6ms	8ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:Instruction Set Test	18ms	4ms	6ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Turn Vacuum Table Off	18ms	4ms	6ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:Register Test	16ms	6ms	6ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:ROM Test	14ms	8ms	4ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	CPU Test:Cache Test	12ms	3ms	4ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Video Test	7ms	3ms	2ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:RAM Test	3ms	2ms	1ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Keyboard Test	3ms	2ms	1ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Powerup Test	2ms	1ms	1ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:PowerFail	2ms	0ms	1ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:Simulation Dialog	1ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	MainSequence:String test	1ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:CPUFail	1ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:KeyboardValue	1ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:VideoValue	1ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:ROMFail	0ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:RAMFail	0ms	0ms	0ms	7
Computer Motherboard Test Sequence Loop (MainSequence)	Random Fails:Error	0ms	0ms	0ms	7

3.14 XY Graph report

Numeric array based XY-graph and min/max XY-graph for a set of specified test steps and channels.

- **XY chart:** Shows the numeric measurements for selected channels.
- **Min/max chart:** shows the average, min and max values for the selected channels.



Both the XY chart and the Min/Max chart allows switching between logarithmic and linear scale.
This is done using the buttons, located next to the zoom functionality.

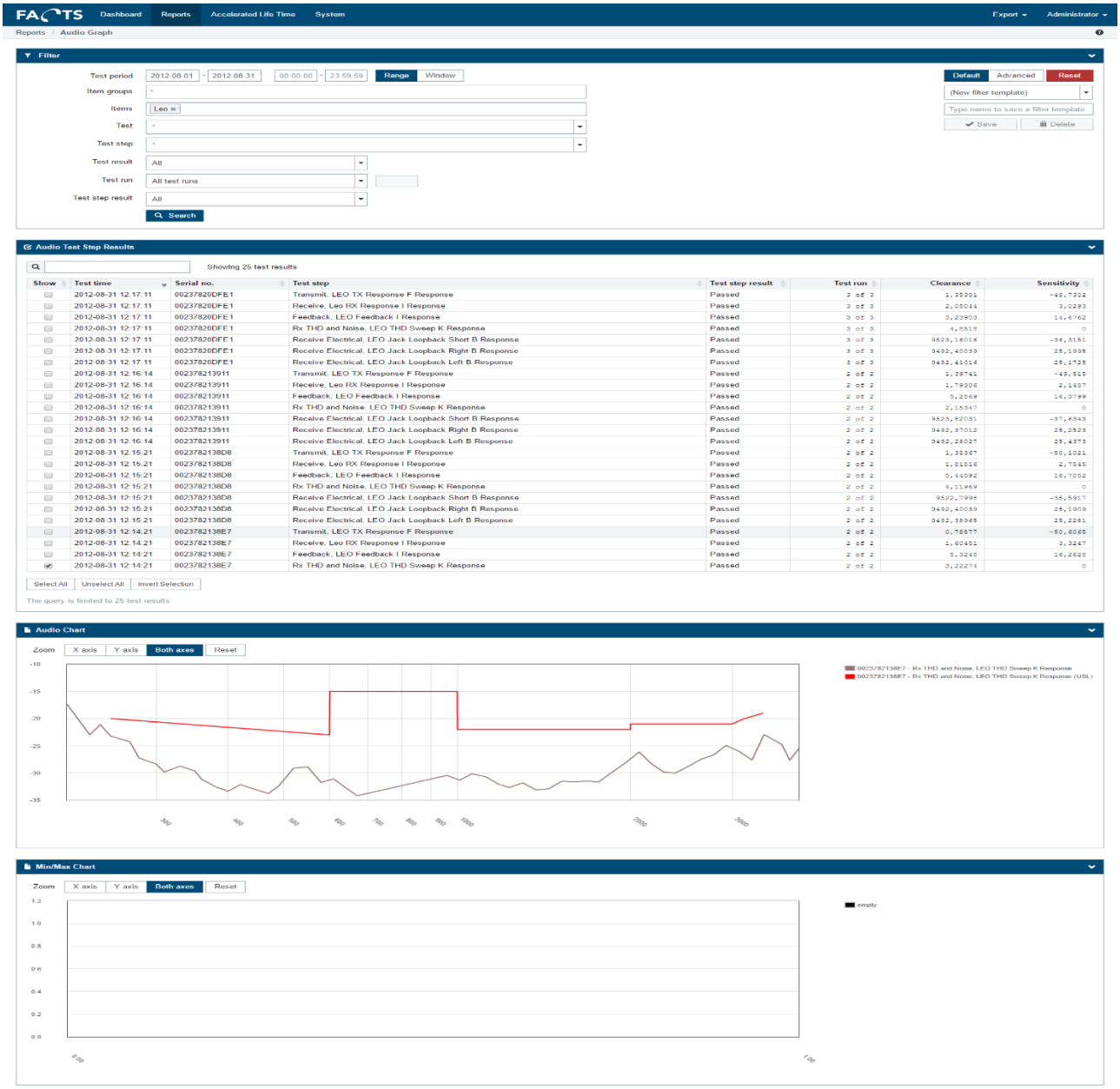
Both charts default to linear scale.

3.15 Audio Graph report

Audio based XY-graph for a specific test step.

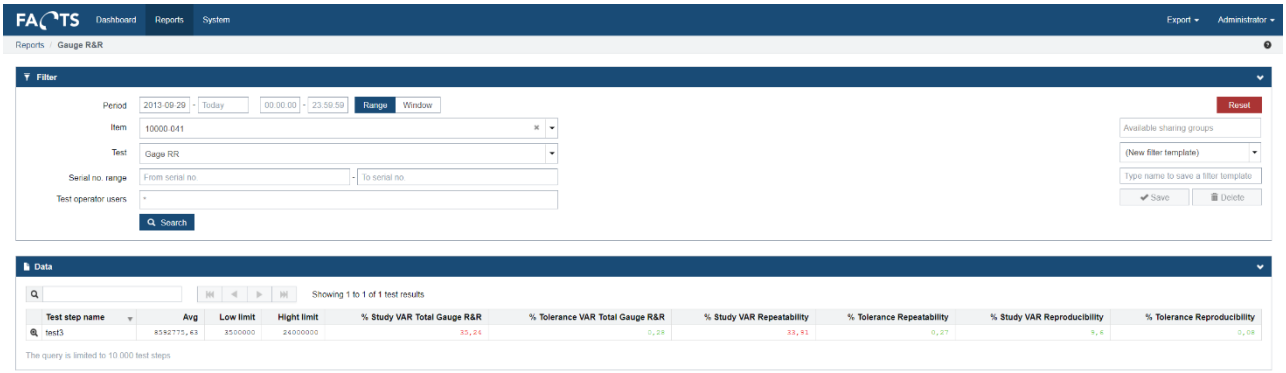
Typical use:
Based on the filter criteria including a specific test step, the Audio Chart shows the actual measurements and potential upper- and lower- limits.

- **Audio Chart:** Shows measurements for the selected test steps and potential limits.
- **Min/Max chart:** Shows the average, higher and lower measurements of all the combined test steps.



3.16 Gauge R&R

The Gauge R&R analysis (Type 2 or Type 3) can be used to quantify the amount of variation in a measure that comes from the measurement system itself rather than from product or process variations. This analysis uses the Analysis Of Variance (ANOVA) method for computing the repeatability and reproducibility.



3.16.1 Details

It is possible to see details on each Gauge R&R analysis. This is done via the icon .

FACTS
Dashboard
Reports
System
Administrator
Reports / Gauge R&R / Gauge R&R report details
Calculated Values
Source of variation | Variance components | % Contributions | Standard deviations | % Study VAR | % Tolerance
Repeatability | 0.03 | 99.77 | 0.18 | 99.88 | 78.4
Operator | 0 | 0.23 | 0.01 | 4.84 | 3.8
Part*operator | 0 | 0 | 0 | 0 | 0
Part to part | 0 | 0 | 0 | 0 | 0
Reproducibility | 0 | 0.23 | 0.01 | 4.84 | 3.8
Total Gauge R&R | 0.03 | 0 | 0.18 | 100 | 78.5
NDC: | 1
Run Chart
Zoom
X axis
Y axis
Both axes
Reset
Value
Average
By Appraiser (TestStation)
TestA
TestB
TestC
Average
By Part
Normal Distribution By Appraiser
Normal Distribution By Part

3.16.2 Import

When importing Gauge R&R data it is important to tell the importer that the data is part of an GAGE R&R analysis. This is done to make sure Gauge R&R measurement data is not include in other analysis, like Yield analysis. To mark data as Gauge R&R data, then set TestCategory to 'GaugeRR' in the import files. Also make sure to include metadata on each test result, which indicates which trial it is. A test result, including trial metadata, could look like this.

```
<TestResult TestName="Gage RR" Result="Passed" TestTime="2013-12-12T12:10:18+01:00" TestCategory="GaugeRR" TestStation="OS-test2"
TestOperatorUser="TestA" TestOperatorType="GataRR">
        <Unit SerialNo="SN635346146492760001" Revision="0B28" ItemNumber="10000-042" />
        <Metadata Name="trial" Value="1" />"
                <TestSteps>
                        <TestStepResult Name="test2" Result="Passed">
                                <NumericValue Comparison="GELE" UpperLimit="5.5" LowerLimit="4.1" Value="5.435" Unit="DAC" />
                        </TestStepResult>
                </TestSteps>
</TestResult>
<TestResult TestName="Gage RR" Result="Passed" TestTime="2013-12-12T12:11:18+01:00" TestCategory="GaugeRR" TestStation="OS-test2"
TestOperatorUser="TestA" TestOperatorType="GataRR">
        <Unit SerialNo="SN635346146492760001" Revision="0B28" ItemNumber="10000-042" />
        <Metadata Name="trial" Value="2" />"
                <TestSteps>
                        <TestStepResult Name="test2" Result="Passed">
                                <NumericValue Comparison="GELE" UpperLimit="5.5" LowerLimit="4.1" Value="4.435" Unit="DAC" />
                        </TestStepResult>
                </TestSteps>
</TestResult>
```

3.17 Station comparison

Visualize yield and mean and standard deviation of numeric measurements based on grouped data.

Typical use:

The Station comparison report can be used to find test stations which are performing different from other station based on grouped data. This will make it easier to identify outlier stations.

To get the Station Comparison report, fill out the appropriate filter options and click the Search button.

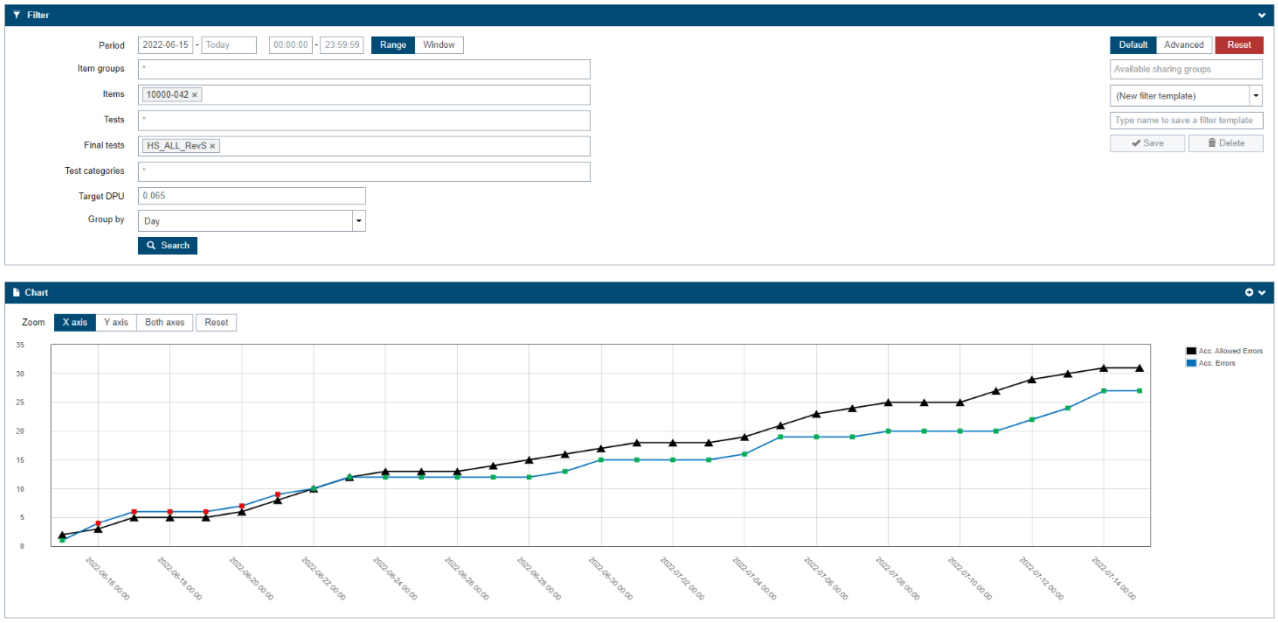
3.18 DPU (Damages per unit)

Visualize the errors (failed tests or test steps) per produced unit. The real DPU is compared in a cumulative graph to a target DPU value that is set as a filter.

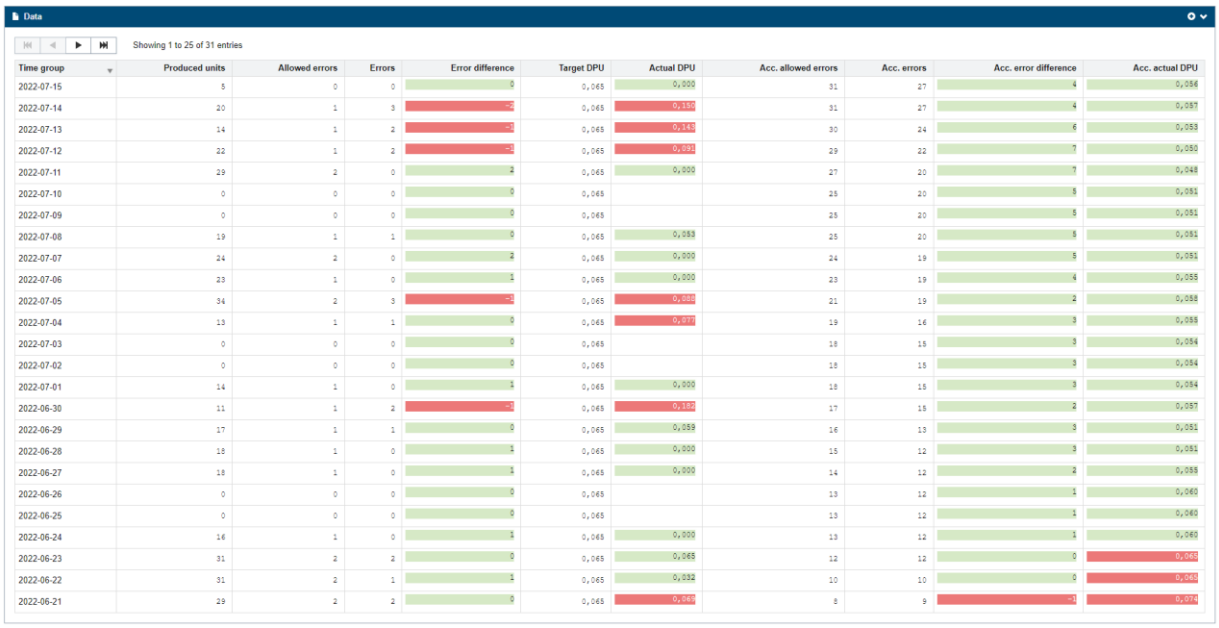
Typical use:

This graph is typically used if you have a goal for how many errors there should be on a product per produced unit. An example could be that you have a complex product where you expect that there are repairs on each product but on an average, there should not be more than 1.5 errors per produced unit.

- The errors are counted based on the items and tests, selected in the filter.
- The produced units are counted based on how many units have passed the tests selected in the "Final tests" filter.
- A damage can be configured to either be a failed test or a failed test step by changing the "Count errors based on" filter. The default is to count failed test steps.



In addition to the cumulative graph, a table gives an overview over the DPU values at different times. A color indicates if the value is below or above the desired DPU.


Data

Showing 1 to 25 of 31 entries

Time group	Produced units	Allowed errors	Errors	Error difference	Target DPU	Actual DPU	Acc. allowed errors	Acc. errors	Acc. error difference	Acc. actual DPU
2022-07-15	5	0	0	0	0,065	0,000	31	27	4	0,056
2022-07-14	20	1	3	-2	0,065	0,150	31	27	4	0,057
2022-07-13	14	1	2	-1	0,065	0,143	30	24	6	0,053
2022-07-12	22	1	2	-1	0,065	0,091	29	22	7	0,050
2022-07-11	29	2	0	2	0,065	0,000	27	20	7	0,048
2022-07-10	0	0	0	0	0,065		25	20	5	0,051
2022-07-09	0	0	0	0	0,065		25	20	5	0,051
2022-07-08	19	1	1	0	0,065	0,053	25	20	5	0,051
2022-07-07	24	2	0	2	0,065	0,000	24	19	5	0,051
2022-07-06	23	1	0	1	0,065	0,000	23	19	4	0,055
2022-07-05	34	2	3	-1	0,065	0,088	21	19	2	0,058
2022-07-04	13	1	1	0	0,065	0,077	19	16	3	0,055
2022-07-03	0	0	0	0	0,065		18	15	3	0,054
2022-07-02	0	0	0	0	0,065		18	15	3	0,054
2022-07-01	14	1	0	1	0,065	0,000	18	15	3	0,054
2022-06-30	11	1	2	-1	0,065	0,182	17	15	2	0,057
2022-06-29	17	1	1	0	0,065	0,059	16	13	3	0,051
2022-06-28	18	1	0	1	0,065	0,000	15	12	3	0,051
2022-06-27	18	1	0	1	0,065	0,000	14	12	2	0,059
2022-06-26	0	0	0	0	0,065		13	12	1	0,060
2022-06-25	0	0	0	0	0,065		13	12	1	0,060
2022-06-24	16	1	0	1	0,065	0,000	13	12	1	0,060
2022-06-23	31	2	2	0	0,065	0,065	12	12	0	0,065
2022-06-22	31	2	1	1	0,065	0,032	10	10	0	0,065
2022-06-21	29	2	2	0	0,065	0,069	8	9	-1	0,074

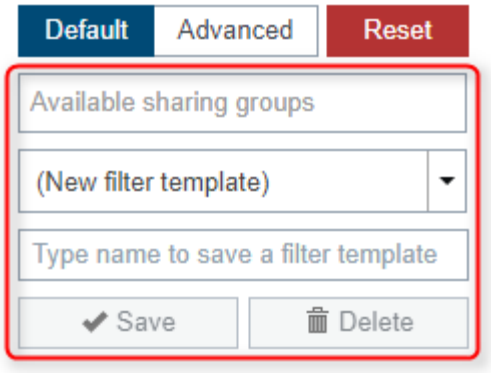
4 Report filters

This chapter provides detailed information on the different report filter elements:

Hint: When showing a report based on selected filer criteria, you can copy the page link (URL) and store or send to a colleague by e-mail. When opening the copied link (URL) in an internet browser, the same report content will reappear based on the original filter options.

4.1 Filter Templates

Filter templates is an easy way to save and load any filters on a report. Filter templates are available on all report types. The list of filter templates is filtered on each report to only contain the relevant templates.



4.1.1 Using filter templates

To use a filter template to generate a report, simply open the wanted report type, then select the wanted filter in the list. The report filters will now be populated using the filter.

4.1.2 Adding filter templates

It is possible to added new filter templates before and after searching using the form.

When you have filled out the filters on form, type in a new name and click Save. Your filter will now appear in the list of filters, for the current report type and for your report widgets, so that you may add it to your dashboard.

4.1.3 Updating filter templates

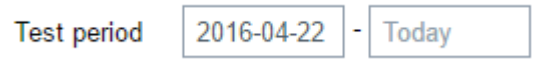
To update an existing filter, simply select the filter in the list, then modify the filter options using the report filters and click Save. This will update an existing filter.

4.1.4 Deleting filter templates

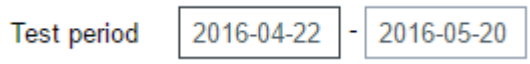
To delete a filter template, select it in the list, then click Delete.
You cannot delete a filter template that is being used by a widget.

4.1.5 Filter templates and Test Period

Filter templates treat Test Period selections different than reports.



If Test Period contains a from-date but no to-date, filter templates will calculate how many days are between the selected date and the current and use this interval for any future reporting.



If Test period contains both dates, filter templates will save the selected dates and always use those when accessing the filter.

4.1.6 Sharing filter templates

Adding sharing groups to a filter template will allow other group-members to access the template. The shared filter template will appear in the template list, for all other members of the selected sharing groups. Note that only the creator of the template has the permission to edit or delete the template.

4.2 Filter option relations

Some filter options are inter-related. This means that for these inter-related filter options, only existing combinations can be selected as search criteria for a given report. For example: If a filter option for “Test” is filled out, all other filter options related to “Test” are pre-filtered so that they only contain values that relates to the selected value for “Test”.

The following filter options are inter-related:

- Items
- Test
- Test step
- Test station
- Test fixture

4.3 Test period

Defines start and end time for data selection:

To select a date using a calendar window, select date field with a single click. Double click a date field, if the date is entered manually using the keyboard.

Date field is formatted as [yyyy-MM-dd] (year – month – day)
Time field is formatted as [hh:mm:ss] (hour – minutes – seconds)

Time span - "Range" or "Window"

Defines how data is selected over a day.

- Range: Selects all data in the time range given in Test period filter
- Window: Selects only data between start time [hh:mm:ss] and end time [hh:mm:ss] each day between start date and end date. This feature can be used to filter work shifts etc.

Example

Report time	Included in Range	Included in Window
2012-03-28 10:00:00		
2012-04-29 10:30:00	X	
2012-04-30 00:45:00	X	
2012-05-01 20:00:00	X	X
2012-06-01 23:00:01	X	
2012-06-02 19:00:00	X	X

Available in the following report(s)

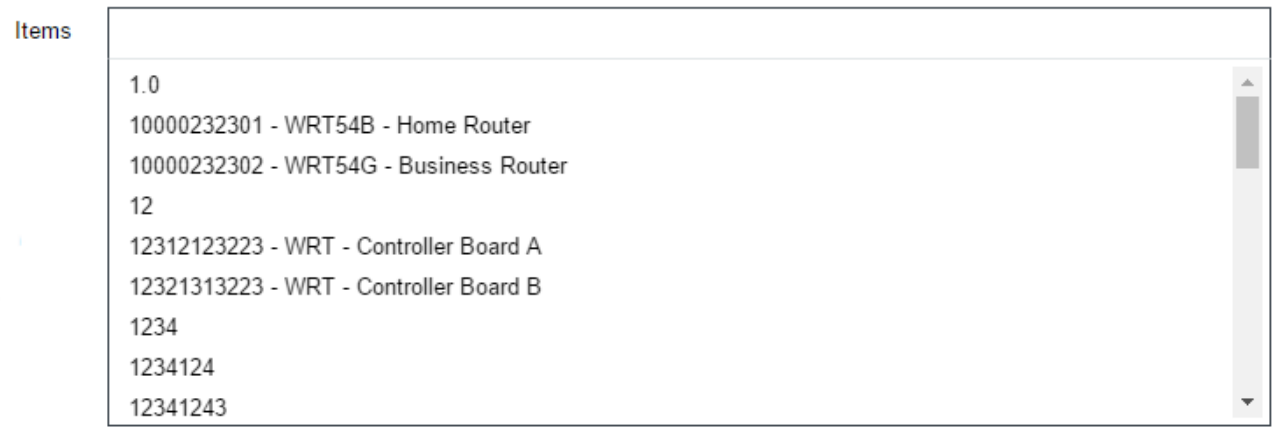
Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Test Result	X	
Repair Pareto	X	
Test Yield	X	
Test Step Yield	X	
Test Step Error Pareto	X	
Test Duration	X	
Test Step Duration	X	
DPU	X	

4.4 Items

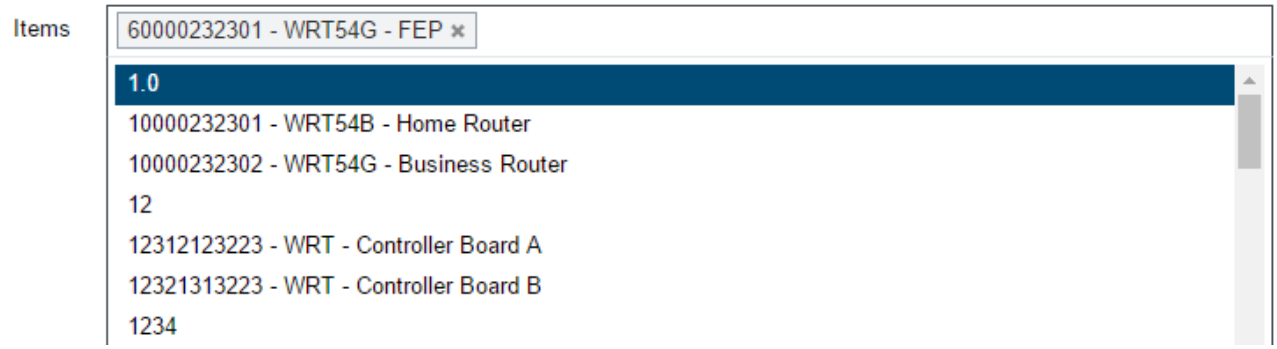
Limits data so that it only includes data concerning the selected items.

By default (*), all items are selected, however this is an inter-related field (see section 4.2), so a selection in one of the other related fields will influence the available contents of the Items field.

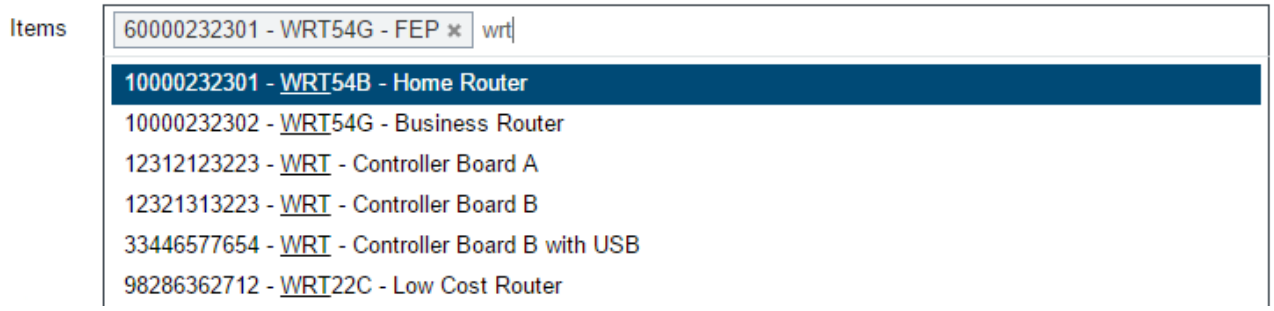
To select an item to include, set focus onto the Items field by clicking it with the mouse. A list of all available items is shown. Select an item to include by clicking it.



To select more items, simply select another item by clicking it.



To search for a specific item, simply type any part of the item number or description text.



Remark

If specific Test(s) are selected, the available items are limited to items related to the selected test(s). Available items can also be limited by assigned user rights.

Available in the following report(s)

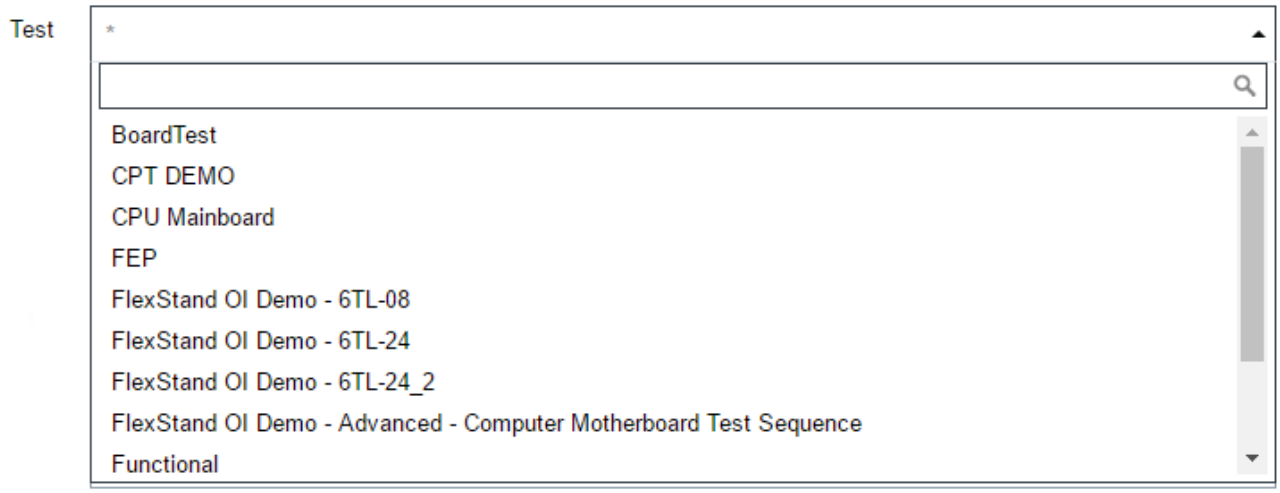
Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Test Result	X	
Repair Pareto	X	
Test Yield	X	
Test Step Yield	X	
Test Step Error Pareto	X	
Test Duration	X	
Test Step Duration	X	
DPU	X	

4.5 Test

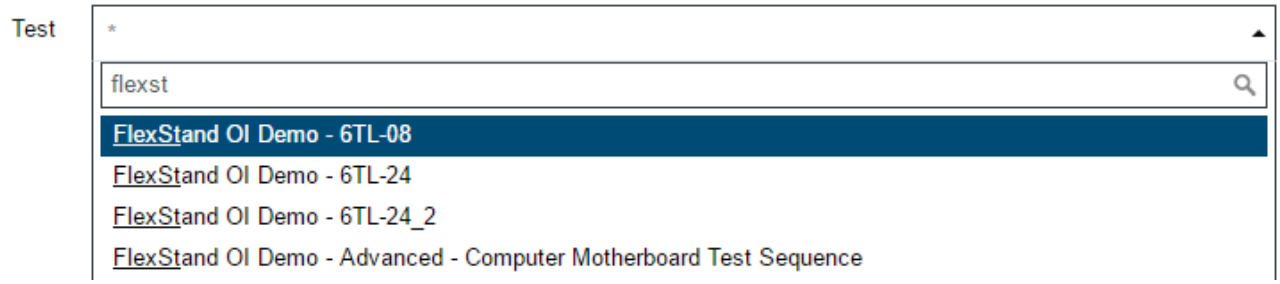
Limits data so that it only includes data concerning the selected tests.

By default (*) all items are selected, however this is an inter-related field (see section 4.2), so a selection in one of the other related fields will influence the available contents of the Test field.

To select a test to include, set focus onto the Test field by clicking it with the mouse. A list of all available tests is shown. Select a test to include by clicking it.



To search for a specific test, simply type any part of the test name.



Remark

If specific Item(s) are selected, the available tests are limited to tests related to the selected item(s). Available tests can also be limited by assigned user rights.

Available in the following report(s)

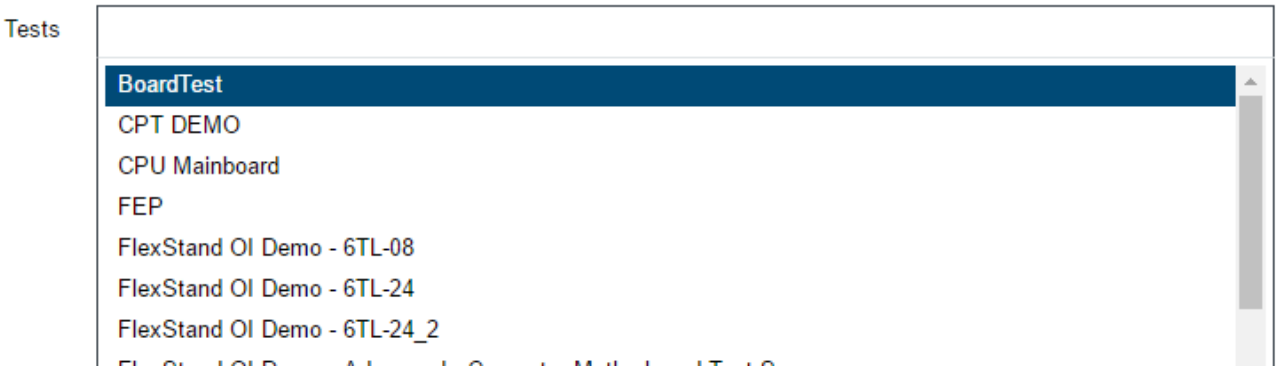
Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Repair Pareto	X	

4.6 Tests

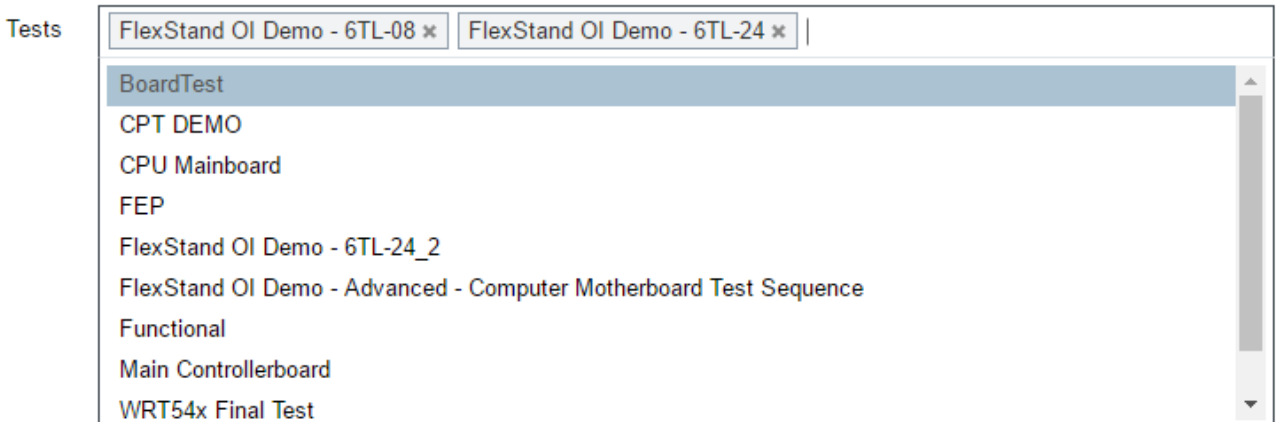
Limits data so that it only includes data concerning the selected tests.

By default (*), all tests are selected.

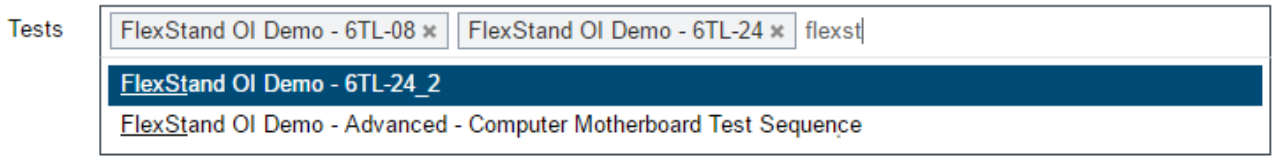
To select a test to include, set focus onto the Test field by clicking it with the mouse. A list of all available tests is shown. Select a test to include by clicking it.



To select more tests, simply select another test by clicking it.



To search for a specific test, simply type any part of the test name.



Remark

If specific Item(s) are selected, the available tests are limited to tests related to the selected item(s). Available tests can also be limited by assigned user rights.

Available in the following report(s)

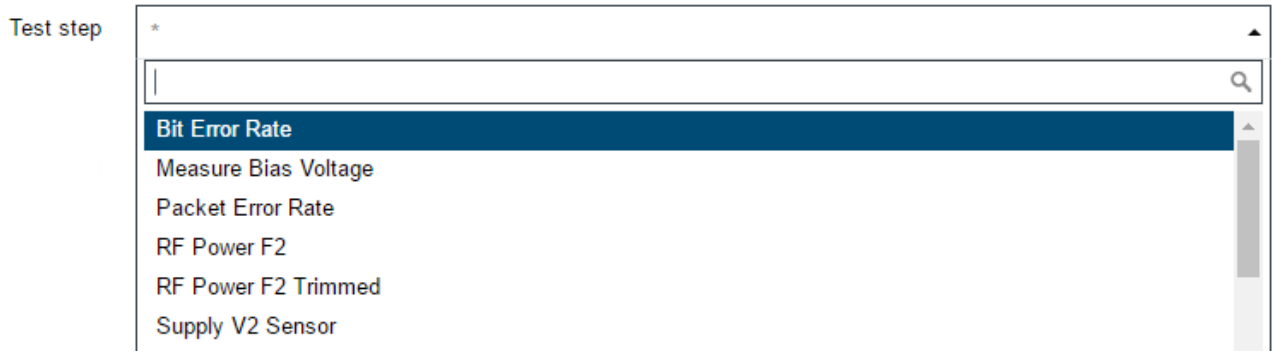
Report	Default filter	Advanced filter
Test Result	X	
Test Yield	X	
Test Step Yield	X	
Test Step Error Pareto	X	
Test Duration	X	
Test Step Duration	X	
DPU	X	

4.7 Test step

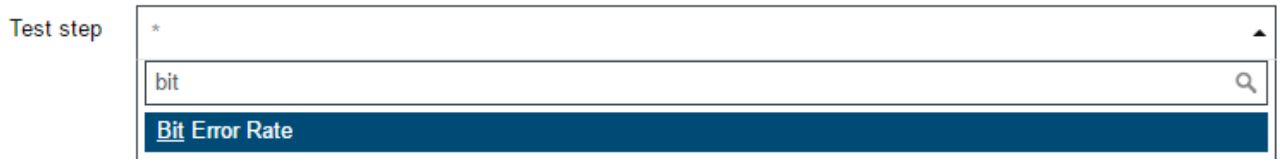
Limits data so that it only includes data concerning the selected test step.

By default (*), all items are selected, however this is an inter-related field (see section 4.2), so a selection in one of the other related fields will influence the available contents of the Test Step field.

To select a test step to include, set focus onto the Test step field by clicking it with the mouse. A list of all available test steps is shown. Select a test step to include by clicking it.



To search for a specific test step, simply type any part of the test step name.



Remark

A least one item or test must be selected, before a specific test step name can be selected.

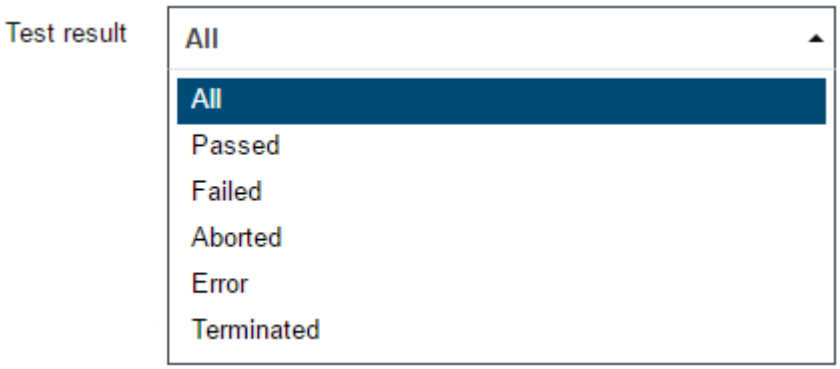
Available in the following report(s)

Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Repair Pareto	X	

4.8 Test result

Limits data so that it only includes data with the selected test result parameter.

To change the test result parameter, set focus onto the Test result field by clicking it with the mouse. A list of all available test results is shown. Select a test result to include by clicking it.



Parameters

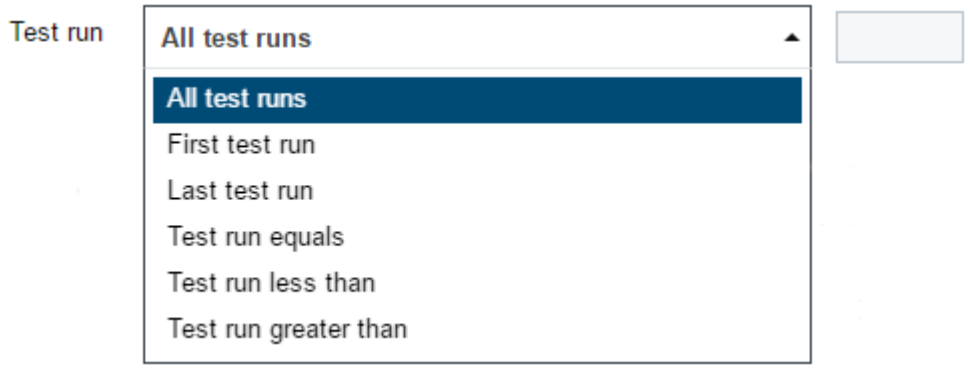
All: includes all test reports regardless of test result
Passed: includes only “passed” test reports
Failed: includes only “failed” test reports
Aborted: includes only “aborted” test reports
Error: includes only “error” test reports
Terminated: includes only “terminated” test reports

Available in the following report(s)

Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Test Result	X	
Test Duration	X	
Test Step Duration	X	

4.9 Test run

Limits data so that it only includes data with the selected test run parameter. Test run is defined by the number of times an individual unit has been tested in the same test.



Parameters

All test runs	Include all test runs in selected data
First test run	Only the first test run is selected
Last test run	Only the last test run is selected
Test run equals	Only the test run number specified in the numeric field is selected
Test run less than	Only test runs less than test run number specified in the numeric field is selected
Test run greater than	Only test runs greater than test run number specified in the numeric field is selected

Available in the following report(s)

Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Test Result	X	
Test Yield	X	
Test Step Yield	X	
Test Step Error Pareto	X	
Test Duration	X	
Test Step Duration	X	

4.10 Test step cycle

Limits data so that it only includes data with the selected test step cycle parameter. Test step cycle is defined by how many times an individual test step has reported a result in the same test report

Parameters

All test step cycles	Includes all test step cycles in selected data
First test step cycle	Only the first test step cycle is selected
Last test step cycle	Only the last test step cycle is selected

Available in the following report(s)

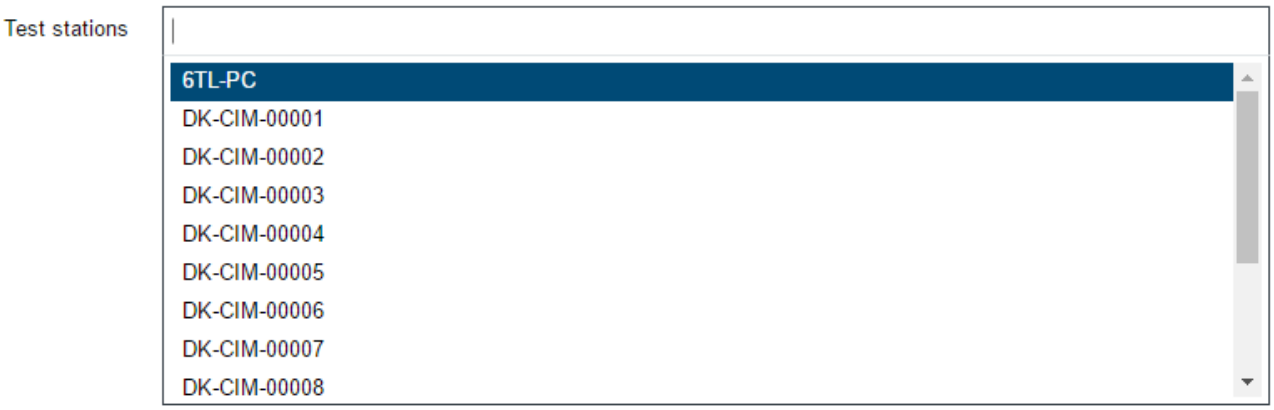
Report	Default filter	Advanced filter
SPC	X	
Time Series	X	
Test Step Yield	X	
Test Step Error Pareto	X	
Test Step Duration	X	

4.11 Test stations

Limits data so that it only includes data from the selected test station(s).

By default (*), all items are selected, however this is an inter-related field (see section 4.2), so a selection in one of the other related fields will influence the available contents of the Test stations field.

To select a test station to include, set focus onto the Test stations field by clicking it with the mouse. A list of all available test stations is shown. Select a test station to include by clicking it.



To select more test stations, simply select another test station by clicking it.

To search for a specific test station, simply type any part of the test station name.

Remark

Test stations are not related to specific tests. Therefore, all known test stations can be selected.
Since test stations is not a mandatory field, there can be test results without any relation to test station.

Available in the following report(s)

Report	Default filter	Advanced filter
SPC		X
Time Series		X
Test Result		X
Test Yield		X
Test Step Yield		X
Test Step Error Pareto		X
Test Duration		X
Test Step Duration		X
DPU	X	

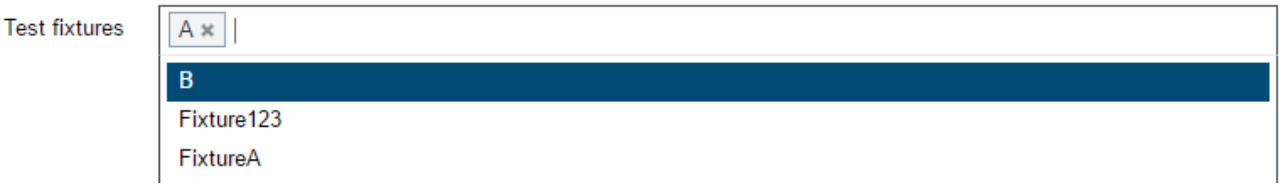
4.12 Test fixtures

Limits data so that it only includes data from the selected test fixture(s).

By default (*), all items are selected, however this is an inter-related field (see section 4.2), so a selection in one of the other related fields will influence the available contents of the Test fixtures field.

To select a test fixture to include, set focus onto the Test fixtures field by clicking it with the mouse. A list of all available test fixtures is shown. Select a test fixture to include by clicking it.

To select more test fixtures, simply select another test fixture by clicking it.



To search for a specific test fixture, simply type any part of the test fixture name.

Remark

Test fixtures are not related to specific test stations, tests etc. Therefore, all known fixtures can be selected.
Since test fixture not is a mandatory field, there can be test results without any relation to test fixture.

Available in the following report(s)

Report	Default filter	Advanced filter
SPC		X
Time Series		X
Test Result		X
Test Yield		X
Test Step Yield		X
Test Step Error Pareto		X
Test Duration		X
Test Step Duration		X
DPU		X

4.13 Test version

Filters on the version of the Test software used to test the units (Test sequence version).

By default (*), all test versions are selected.

To select a test version to include, set focus onto the Test version field by clicking it with the mouse. A list of all available test versions is shown. Select a test version to include by clicking it.

To search for a specific test version, simply type any part of the test version name.

Remark

Test version is not related to specific tests. Therefore all known test versions can be selected.
Since test version isn't a mandatory field, there can be test results without any relation to test version.

Available in the following report(s)

Report	Default filter	Advanced filter
SPC		X
Time Series		X
Test Result		X
Test Yield		X
Test Step Yield		X
Test Step Error Pareto		X
Test Duration		X
Test Step Duration		X
DPU		X

4.14 Test category

Filter on one or more test categories. Test categories can for example be “Production” or “Commissioning”. If all real production data is marked with test category “Production”, the filter can be used to filter out all data that is not related to units being produced.

Note: The filter depends on the availability of test category in the data being imported.

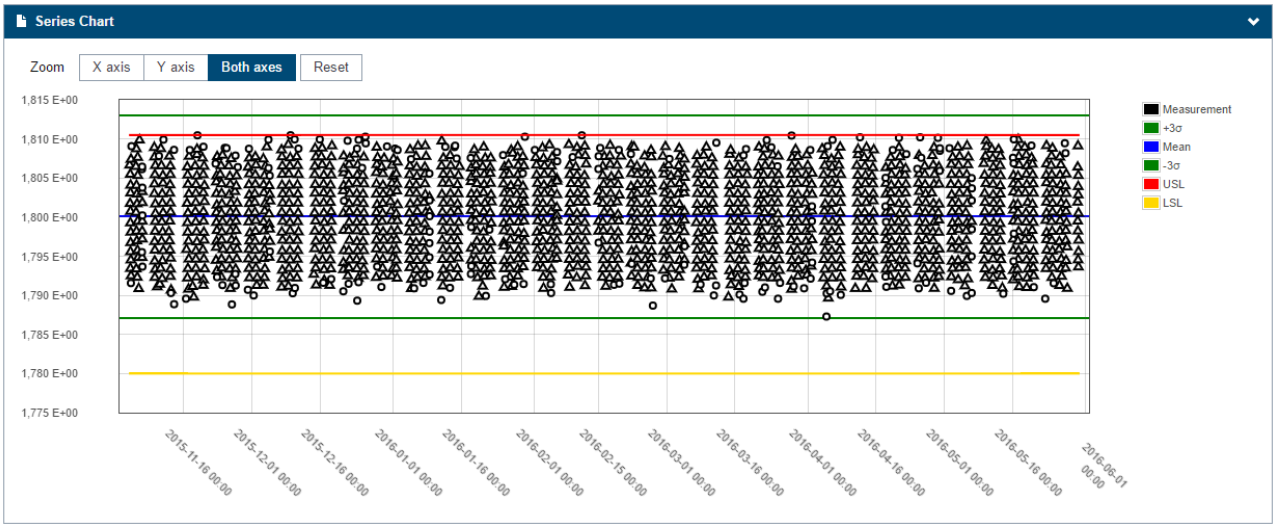
Available in the following report(s)

Report	Default filter	Advanced filter
SPC		X
Time Series		X
Test Result		X
Test Yield		X
Test Step Yield		X
Test Step Error Pareto		X
Test Duration		X
Test Step Duration		X
DPU		X

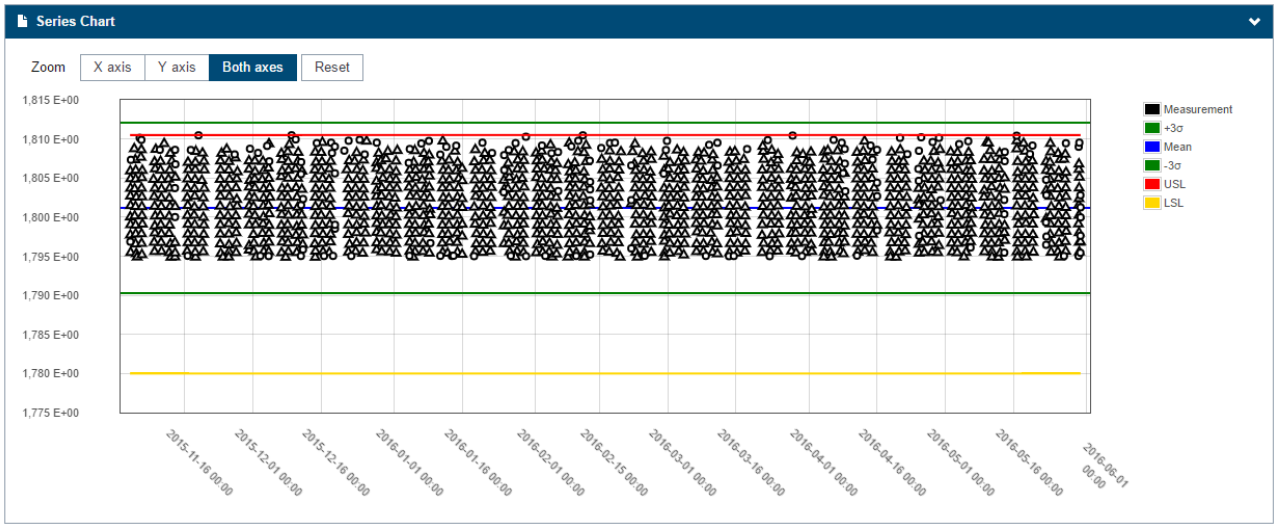
4.15 Measurement range

Measurement range is used to filter numeric measurements. The Min and Max value can be used together or individually.

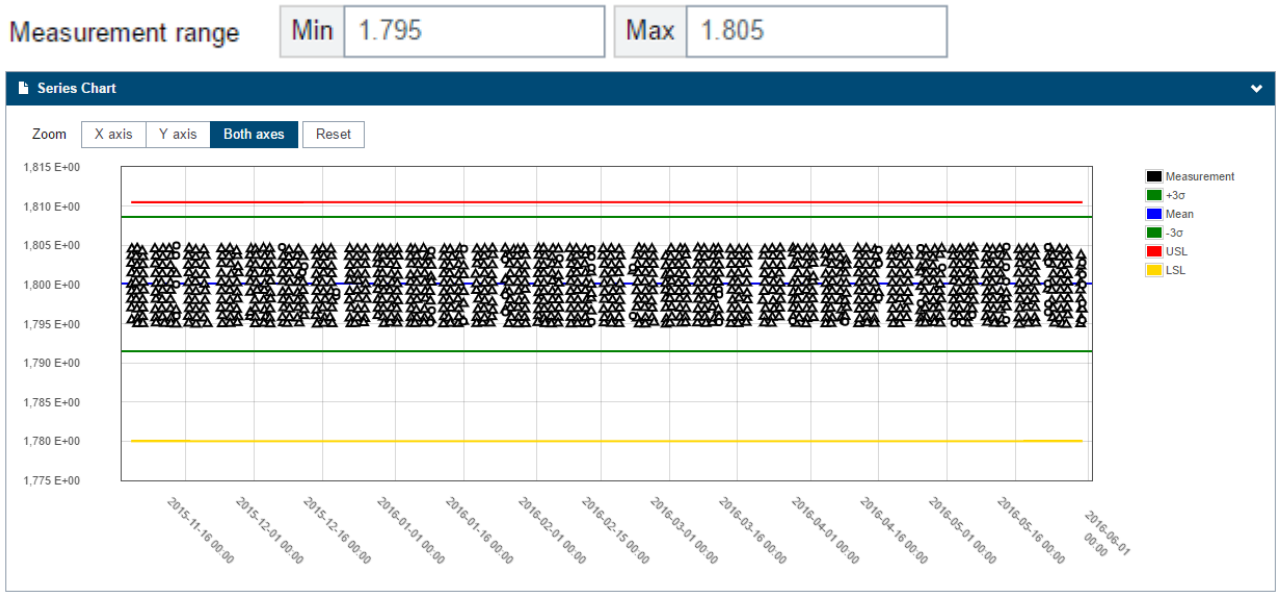
Example:
Measurements without Min or Max set.



Measurements with Min set to 1.795 and no Max limit.



Measurements with Min set to 1.795 and Max set to 1.805



Available in the following report(s)

Report	Default filter	Advanced filter
Time Series		X

4.16 Sort by

Used to present data in the Time Series graph, either by time stamp (date) or by serial number. The sorting of serial numbers is handled as texts.

Example of text sort:

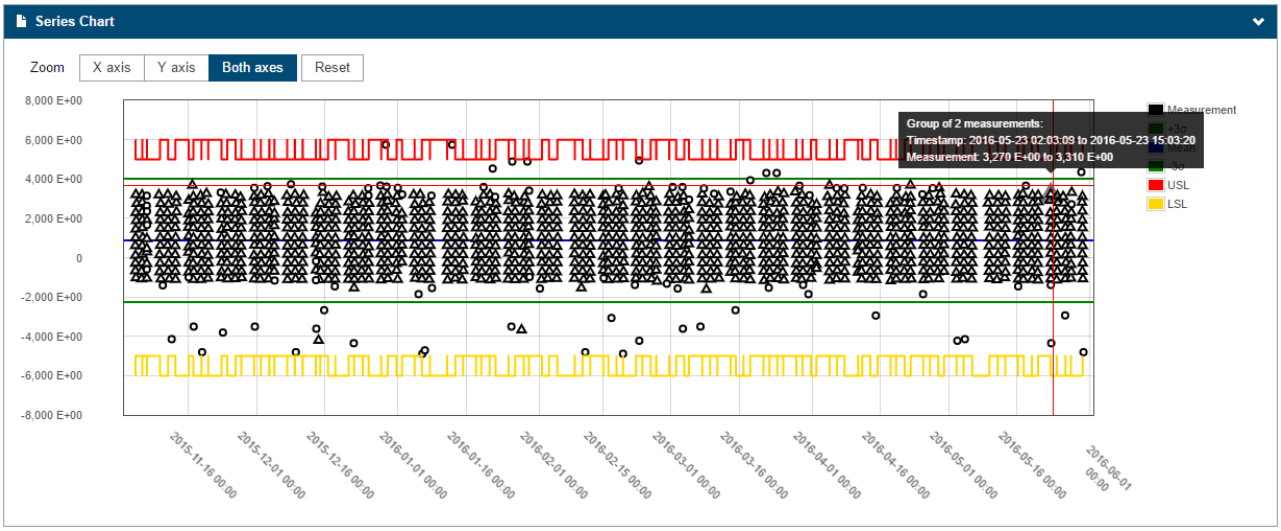
SER1

SER2

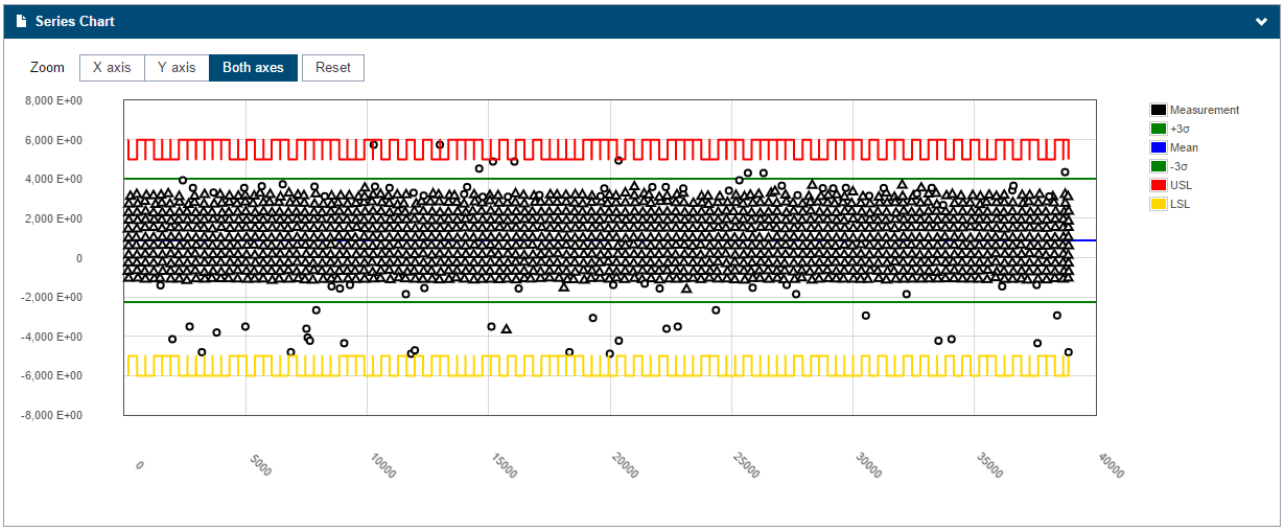
SER20

SER3

Example of data presented by time:



Same data presented by serial no.:



Available in the following report(s)

Report	Default filter	Advanced filter
Time Series		X

4.17 Serial no. range

Filters on specific serial numbers.

There are two ways to search for serial numbers: Either by filling in only “From serial no.” or by filling in both “From serial no.” and “To serial no.”

From serial no. (only):
The “*” character can be used as a wild card to create a search like this: AT8IN10*HA09. The result of this search will be all the units ranging from AT8IN100000HA09 to AT8IN109999HA09 assuming that is the format of the given serial number.

The “*” can be any character, not only numbers, and any number of characters.

From serial no. and To serial no.:
When using both “From serial no.” and “To serial no.”, the “*” character cannot be used. Instead, type in two serial numbers like this: From AT8IN100000HA09 to AT8IN109999HA09. The result of this search will be the same as above – all units ranging from AT8IN100000HA09 to AT8IN109999HA09.
Also, the “From – To” search is based on characters, not numbers - so searching like this would also be valid: From AT8IN100000AA09 To AT8IN100000ZZ09.

Available in the following report(s)

Report	Default filter	Advanced filter
SPC		X
Time Series		X
Test Result		X
Repair Pareto		X
Test Yield		X
Test Step Yield		X
Test Step Error Pareto		X
Test Duration		X
Test Step Duration		X
DPU		X

4.18 Unit Revision

Limits data so that it only includes data from the selected unit revision(s).

By default (*), all unit revisions are selected.

To select a unit revision to include, set focus onto the unit revisions field by clicking it with the mouse. A list of all available unit revisions is shown. Select a unit revision to include by clicking it.

To select more unit revisions, simply select another unit revision by clicking it.

To search for a specific unit revision, simply type any part of the unit revision name.

Remark

Unit revisions are not related to specific test stations, tests etc. Therefore, all known unit revisions can be selected. Since unit revision not is a mandatory field, there can be test results without any relation to a unit revision.

Available in the following report(s)

Report	Default filter	Advanced filter
SPC		X
Time Series		X
Test Result		X
Test Yield		X
Test Step Yield		X
Test Step Error Pareto		X
Test Duration		X
Test Step Duration		X
DPU		X

4.19 Item

Limits data so that it only includes data from the selected item.

To select an item to include, set focus onto the Item field by clicking it with the mouse. A list of all available items is shown. Select an item to include by clicking it.

To search for a specific item, simply type any part of the item number or name.

Available in the following report(s)

Report	Default filter	Advanced filter
Unit Overview	X	

4.20 Serial no.

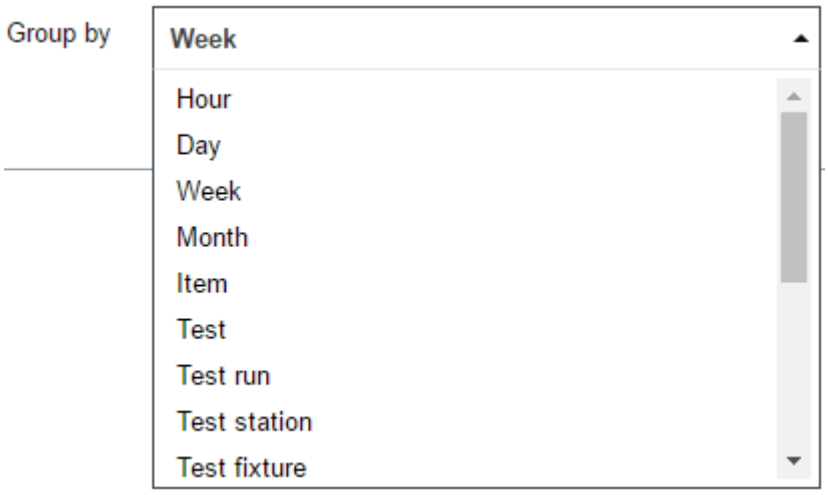
Used to find a specific unit. Serial number must be identical to the unit's serial number.

Available in the following report(s)

Report	Default filter	Advanced filter
Unit Overview	X	

4.21 Group by

Group by is used to group presented data.



Parameters

Hour	Group data selection in hours
Day	Group data selection in days
Week	Group data selection in weeks (Monday is the first day of the week)
Month	Group data selection in months
Item	Group data selection by item
Test	Group data selection by test
Test run	Group data selection by test run
Test station	Group data selection by test station
Test fixture	Group data selection by test fixture
Test socket	Group data selection by test socket
Test version	Group data selection by test version
Test category	Group data selection by test category
Test operator type	Group data selection by test operator type
Test operator user	Group data selection by test operator user
Order No.	Group data selection by order No.
Unit Revision	Group data selection by unit revision
None	Group data as one selection

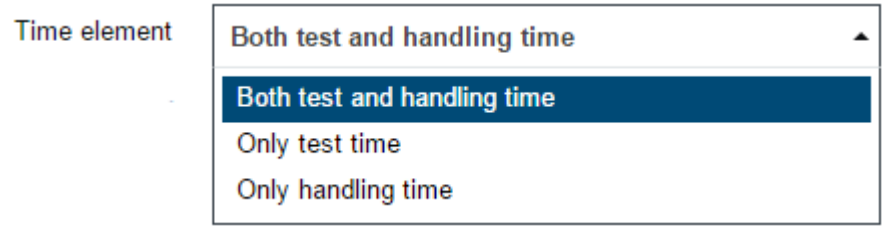
Note: A group with no name indicates that the grouped value is missing on values. This is due to how certain properties on result sets are optional.

Available in the following report(s)

Report	Default filter	Advanced filter
Test Yield	X	
Test Duration	X	
DPU	X	

4.22 Time element

Time element is used to filter by test and / or handling time.



Parameters

Both test and handling time	Shows test time and handling time in selection data result
Only test time	Shows only test time in selection data result
Only handling time	Shows only handling time in selection data result

Available in the following report(s)

Report	Default filter	Advanced filter
Test Duration		X

4.23 Handling time cutoff

Defines the upper limit of the handling time between two tests. If the time between two tests exceeds handling time cutoff, the handling time is set to the cutoff value.

Time is entered as hh:mm:ss (hours : minutes : seconds)

Available in the following report(s)

Report	Default filter	Advanced filter
Test Duration		X

4.24 Show trend line

The trendline is showing the overall direction of the data available in the chart by calculating a regression model. The chart will be extended with the trendline prediction if the test period is extended to a future time (if enabled). If trendline is disabled, then no trendline will be shown and the chart will not be extended beyond todays date.

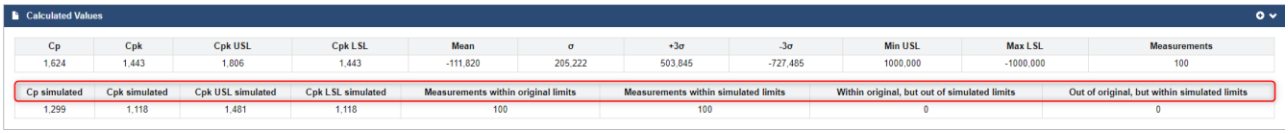
Available in the following report(s)

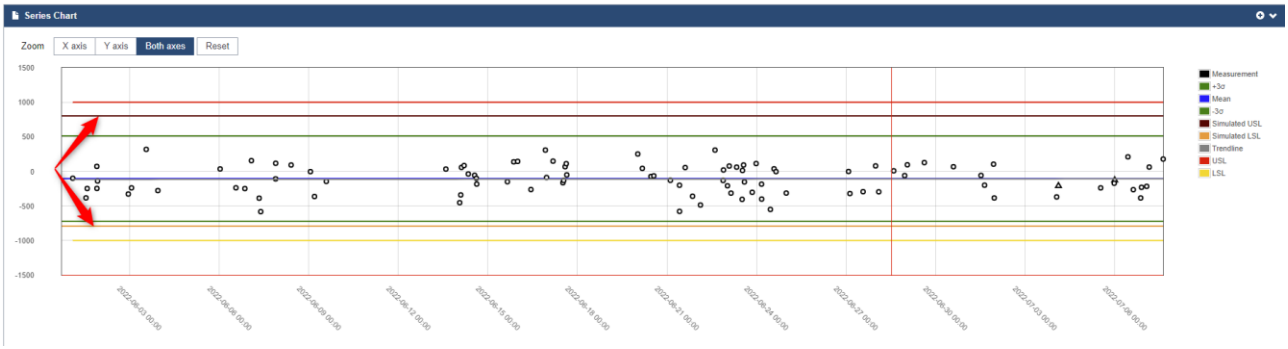
Report	Default filter	Advanced filter
Time Series	X	

4.25 Simulated limits

If one or both of the simulated values (LSL, USL) fields have a value, the value is used for simulated capability calculations and for plotting the time series chart. In addition, 8 new fields are shown in the "Calculated Values" section:

- Cp simulated
- Cpk simulated
- Cpk USL simulated
- Cpk LSL simulated
- Measurements within original limits
- Measurements within simulated limits
- Within original, but out of simulated limits
- Out of original, but within simulated limits





Report	Default filter	Advanced filter
Time Series		X

4.26 Final tests

This field is used to define the final test of a selected item. The final test is ONLY used to count the number of produced items. An item is assumed to have finished production if it has a passed test on the final test.

Report	Default filter	Advanced filter
DPU	X	

5 System

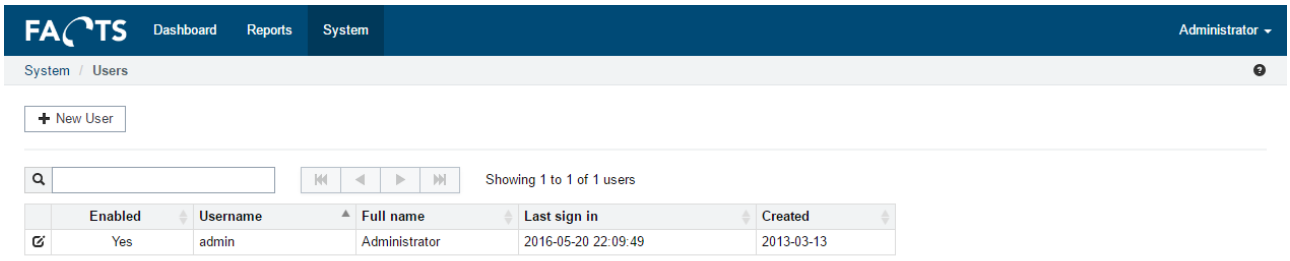
By selecting System from the menu, the follow page is shown.

5.1 User management

Gives access to maintain users and security groups.

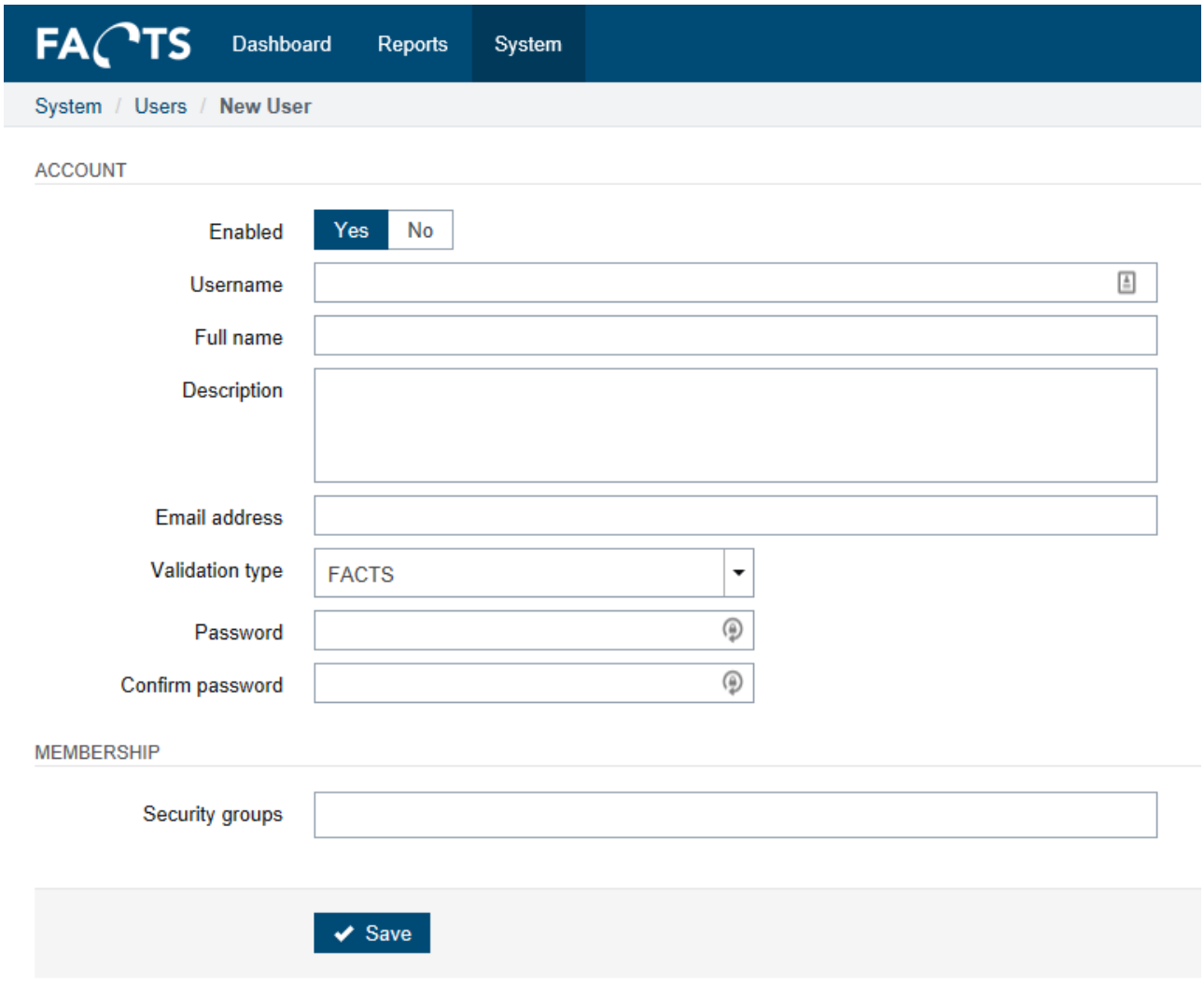
5.1.1 Users

Gives a list of all users in the system. Existing users cannot be deleted. If access needs to be restricted/blocked for a certain user, edit the user and uncheck the “Enabled” check box.



5.1.1.1 Add new user

To add a new user, click the 'New User" button on the Users page. Fill out the fields on the page and click Save.

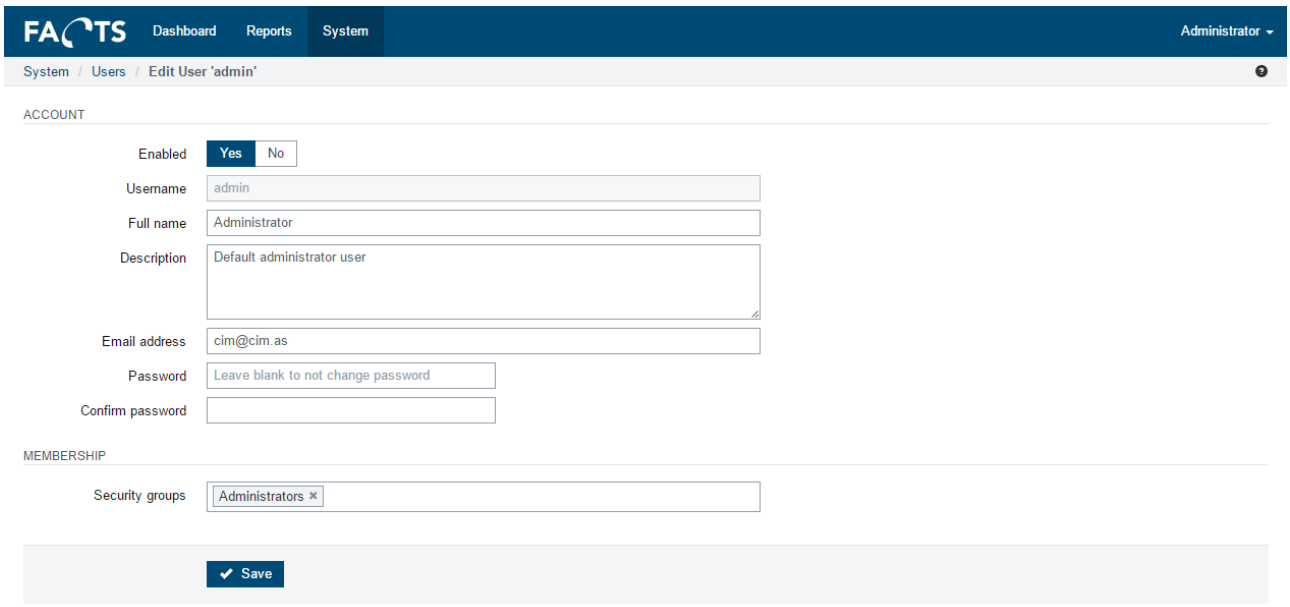


In order to get access to the system, the user must be enabled and be assigned one or more security groups.
Validation type can be set to one of the following:

Validation Type	Description
FACTS	Uses the local FACTS database to store credentials and only validates against this.
Local Machine	Stores username in FACTS database, but validates against the local Windows OS users.
Active Directory	Stores username in FACTS database, but validates against the domain that the current machine is part of. **Only available when server is part of a domain**.

5.1.1.2 Edit user

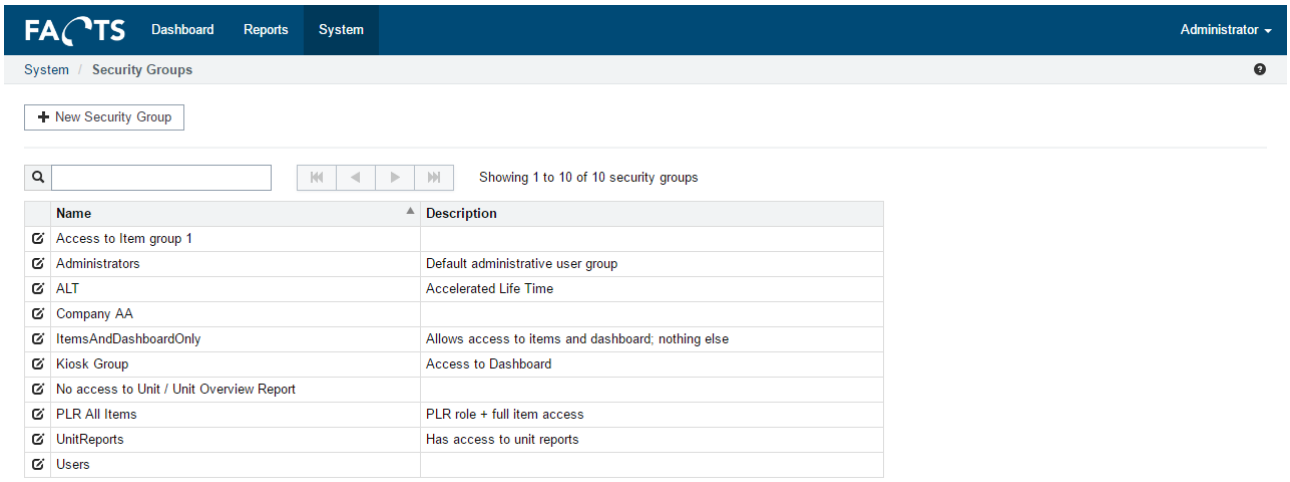
To edit an existing user, click the edit icon in the user list.



When finished editing user settings, click Save to store changes.

5.1.2 Security Groups

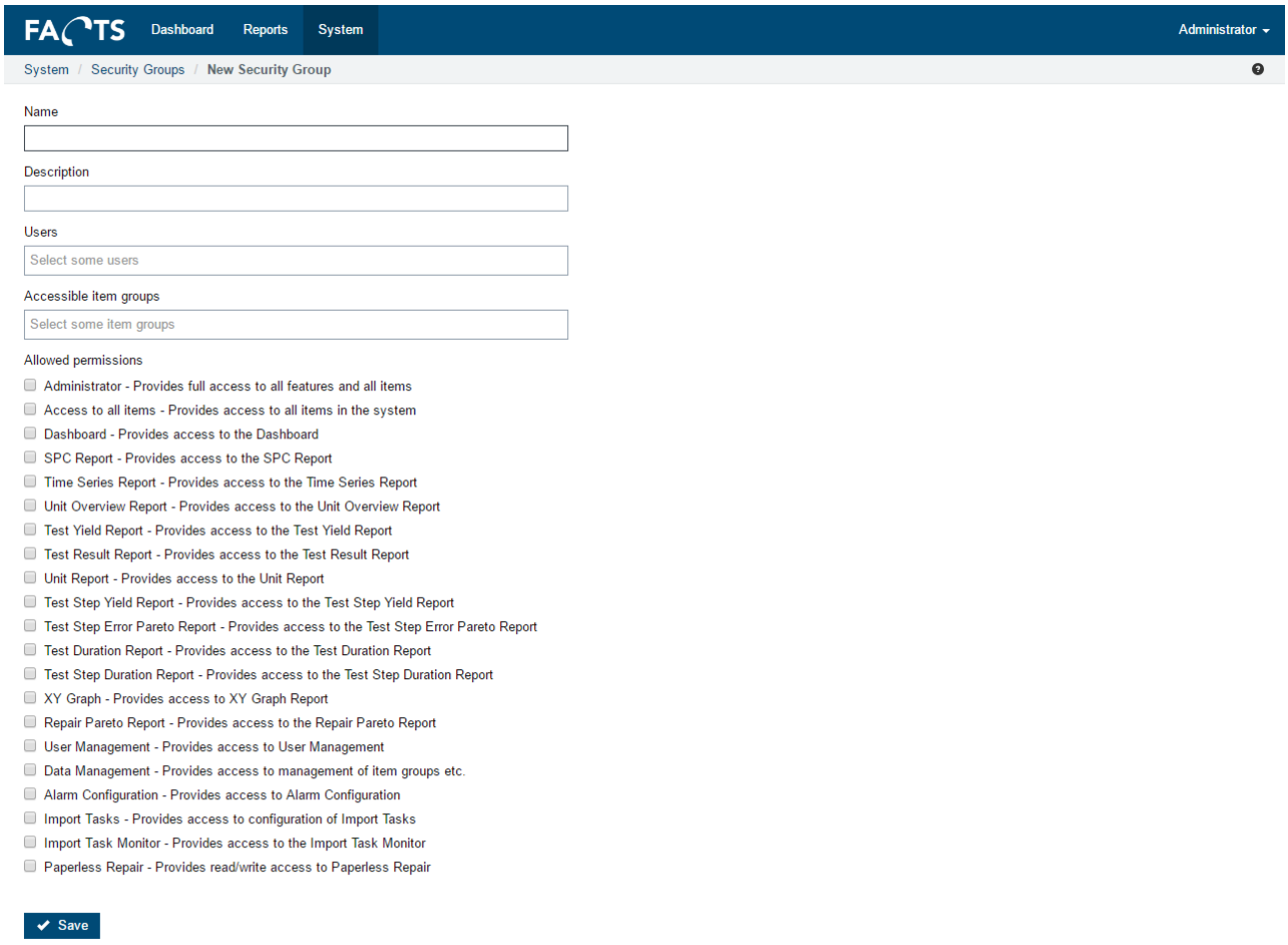
Security groups control which pages and items a user is allowed to access.



If a user is a member of more security groups, it is the sum of all allowed items and pages that defines the final access rights for the user.

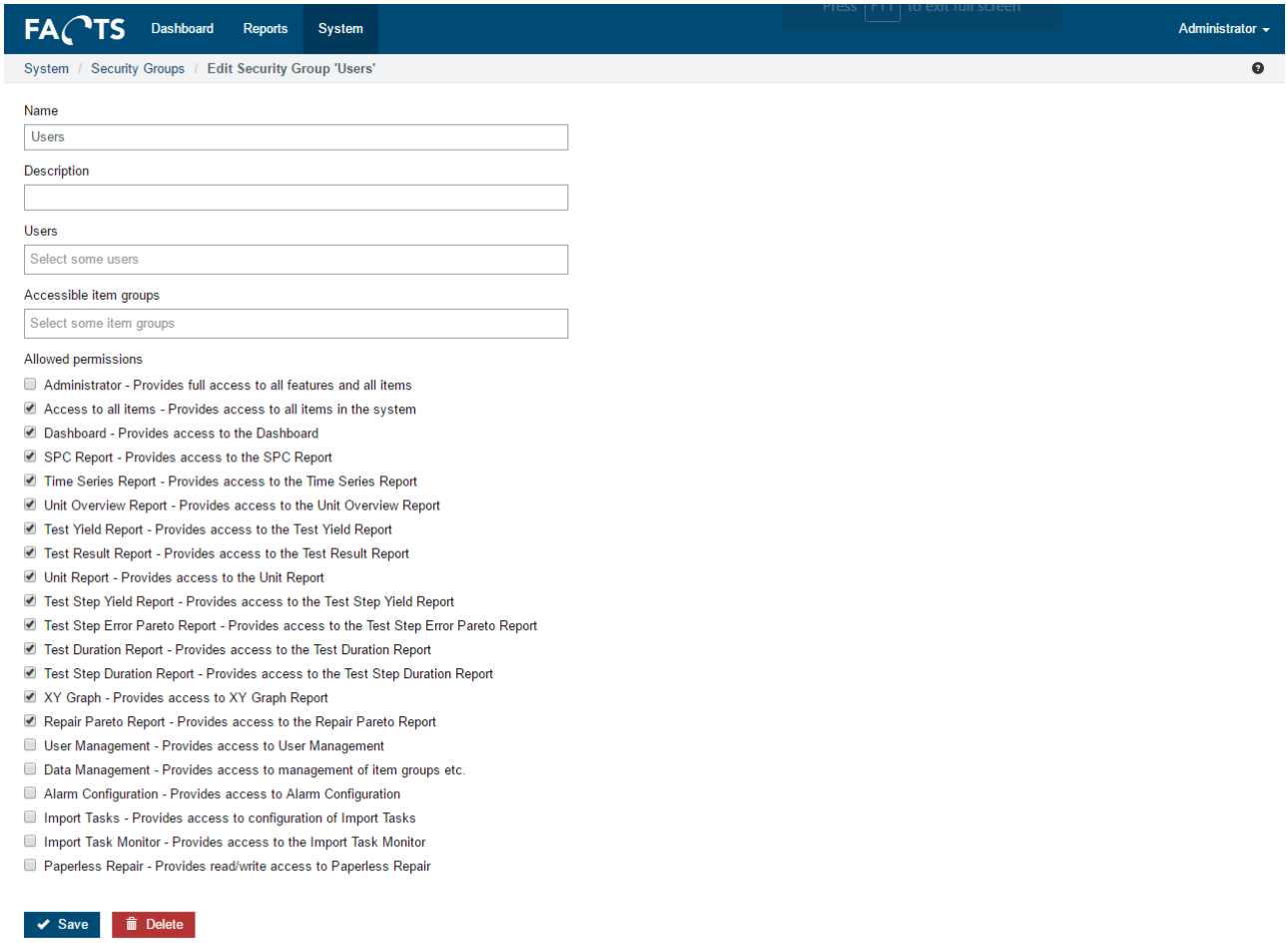
5.1.2.1 Add new security group

To add new security groups, click the “New Security Group” on “Security Group page”. Fill in the fields on the page and click Save.



5.1.2.2 Edit security group

To edit an existing security group, click the edit icon in the security group list.

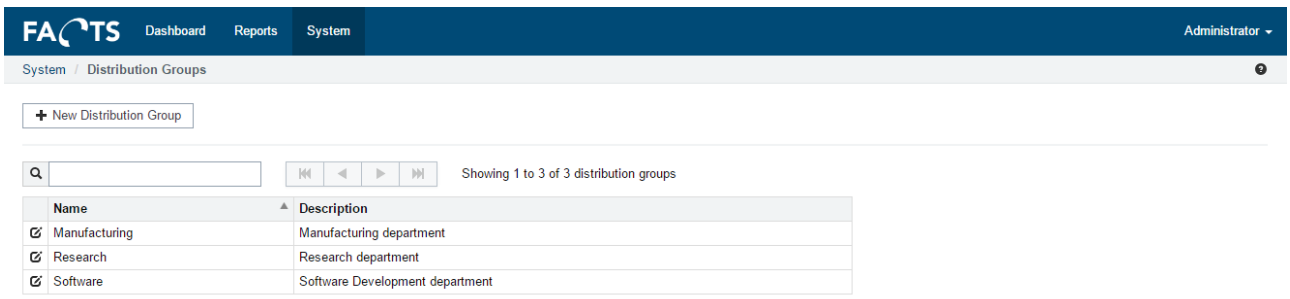


Save stores changes to the security group

Delete removes the security group from all users and deletes the security group from the system. This action may affect the access rights of existing users.

5.1.3 Distribution Groups

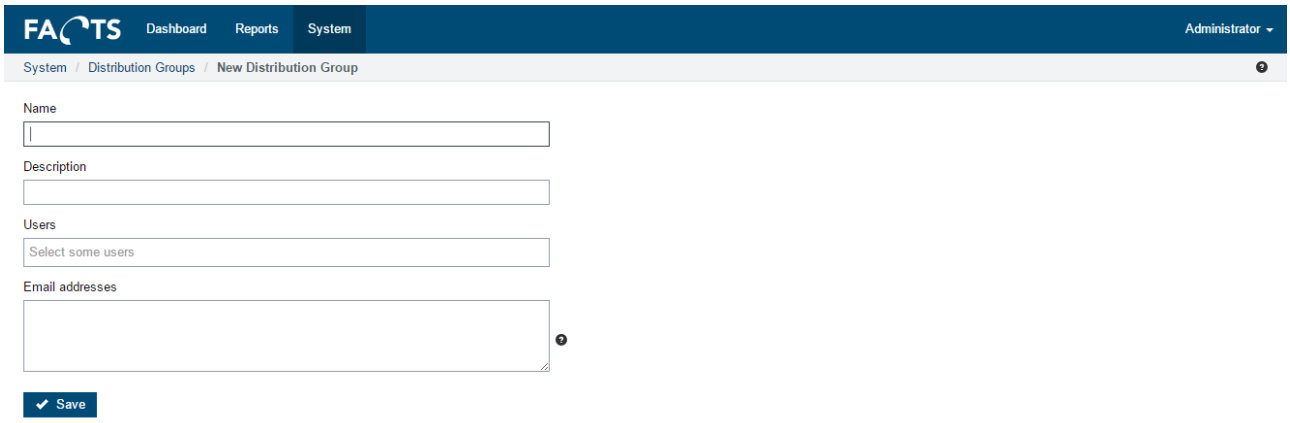
Distribution groups control which users are notified in events where alarms are fired.



If a user is a member of more distribution groups, they will be notified of all alarms that are sent to any of the distribution groups.
Distribution groups allows external contacts to receive notifications.

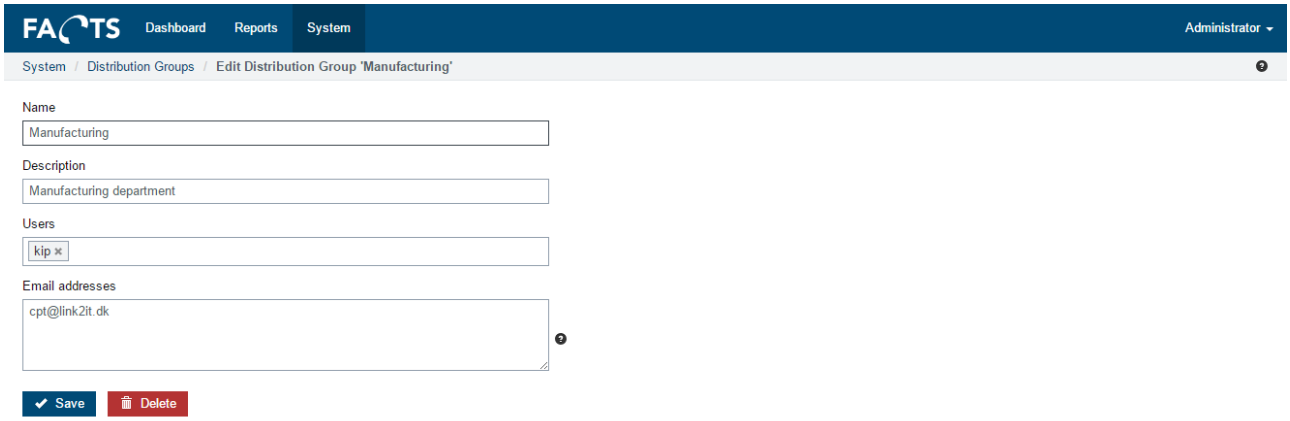
5.1.3.1 Add new distribution group

To add new distribution groups, click the “New Distribution Group” on “Distribution Group page”. Fill in the fields on the page and click Save.



5.1.3.2 Edit distribution group

To edit an existing distribution group, click the edit icon in the distribution group list.

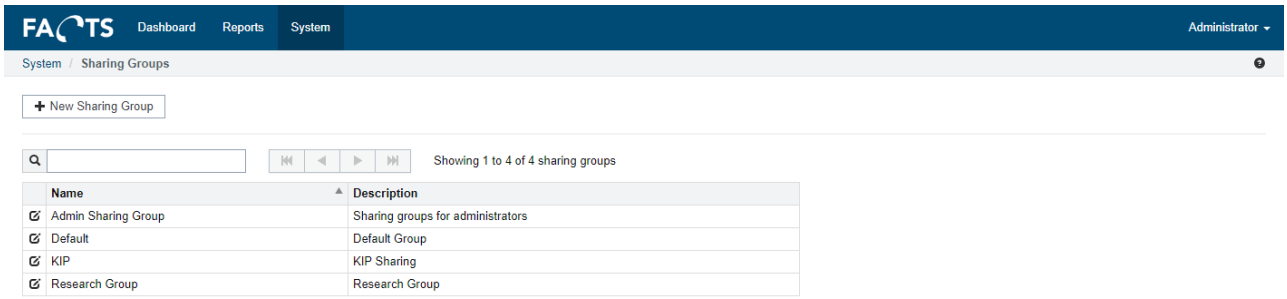


Save stores changes to the distribution group

Delete removes the distribution group from all users and deletes the distribution group from the system. This may affect alarm configurations.

5.1.4 Sharing Groups

The Sharing group feature allows the user to create and manage internal groups and to share content such as filter templates, with other group members.

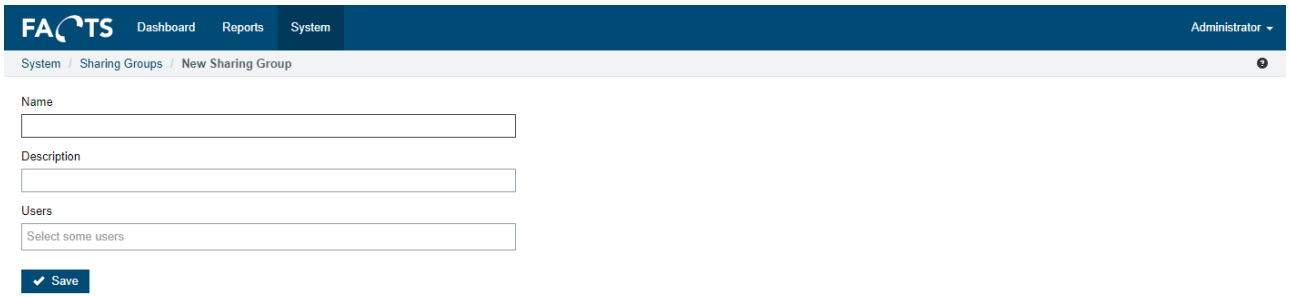


With this option, the user is able to create dashboard views by using the shared templates. The feature also allows to generate default dashboards for new users by sharing dashboard views, and subscribe the user to the shared group.

If you want to read more about these FACTS functionalities, go to:
Sharing filter templates 4.1.6
Sharing dashboard view 5.2.2.3

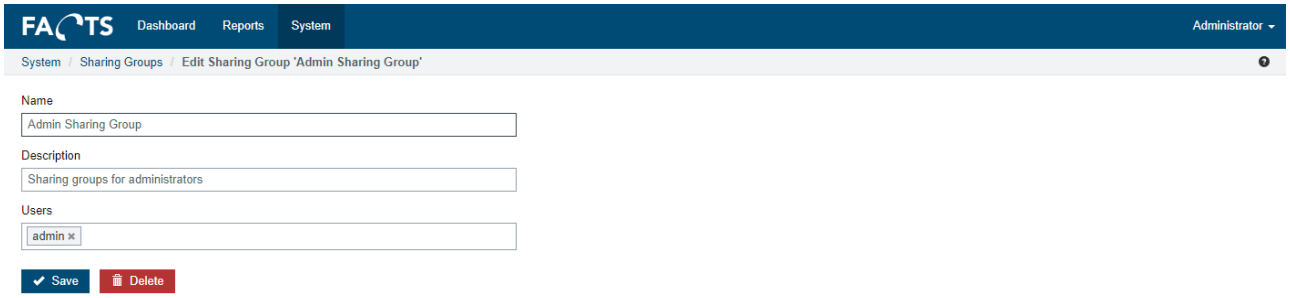
5.1.4.1 Add new sharing group

To add new sharing group, click the “New Sharing Group”. Fill the form with a name, description and attach users you want to give access to the shared content. Click save to save the group.



5.1.4.2 Edit sharing group

To edit an existing sharing group, click the -icon, in the list of sharing groups.



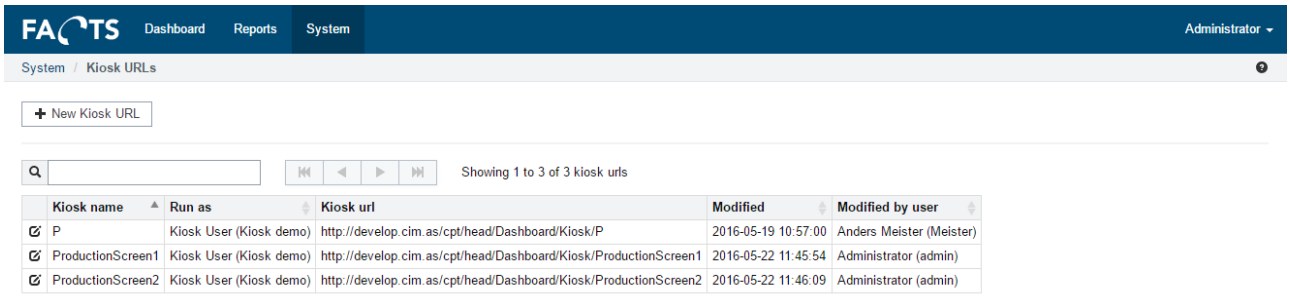
Click save to store the changes.

If you want to remove the sharing group from the system, click delete button.

5.1.5 Kiosk URLs

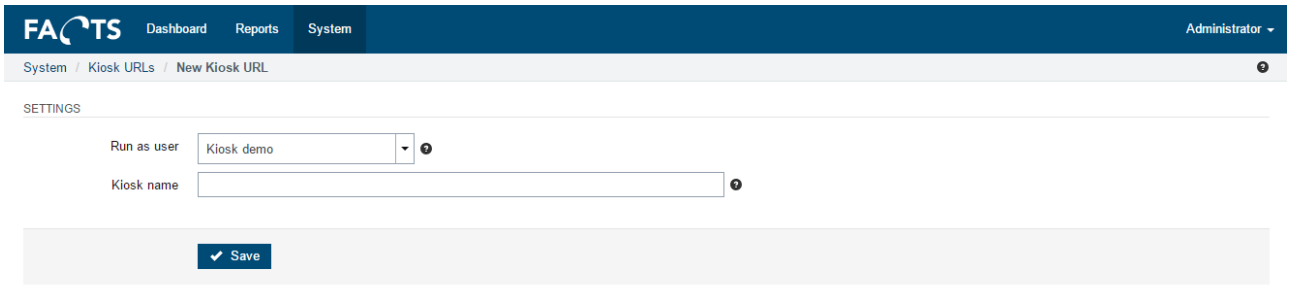
Kiosk URLs or Kiosk mode allows setting up auto sign-in using specific URLs.
Kiosk URLs can be disabled by disabling the user which is used for authorization.
Kiosk mode is a way of showing multiple dashboard views, that automatically change at a set interval.

To use kiosk mode, configure a dashboard with the wanted views and widgets, and set up a device to show the kiosk URL.



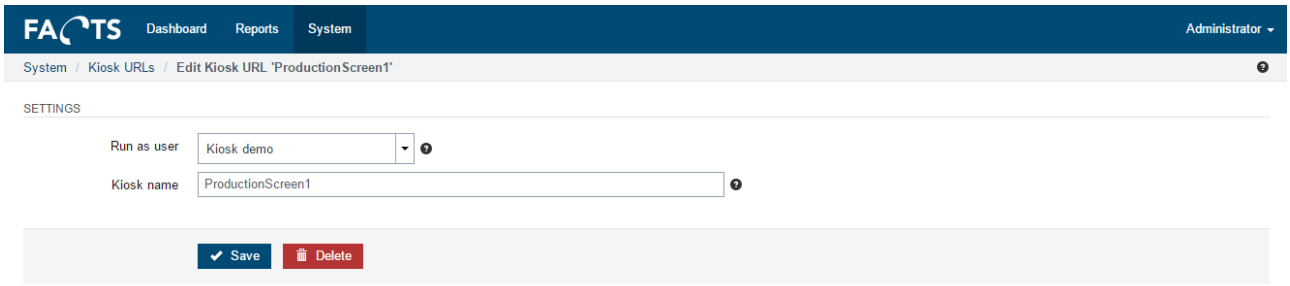
5.1.5.1 Add new Kiosk URL

To add a new kiosk URL, click the “New Kiosk URL” on “Kiosk URLs page”. Fill in the fields on the page and click save.



5.1.5.2 Edit kiosk URL

To edit an existing kiosk URL, click the edit icon in the kiosk url list.

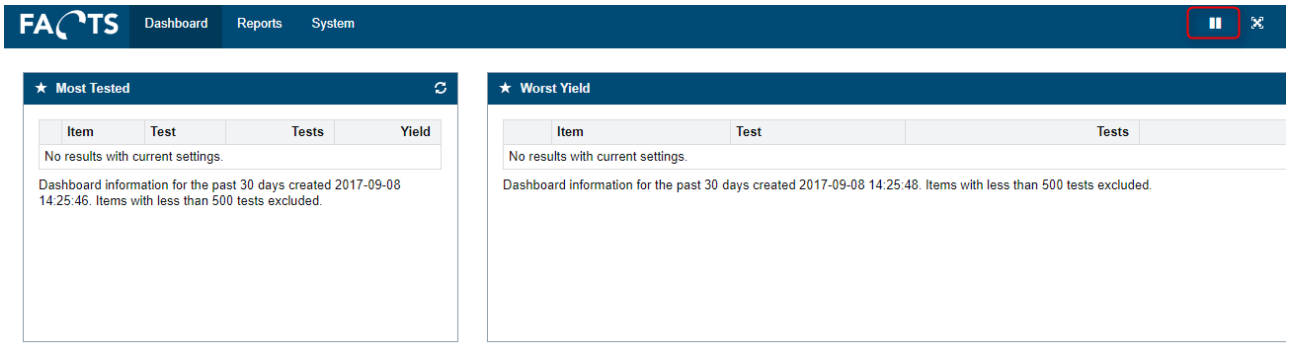


Save stores changes to the kiosk URL.

Delete removes the kiosk URL from the system. This may affect any devices configured to automatically sign on, using a kiosk URL.

5.1.5.3 Play and pause in Kiosk

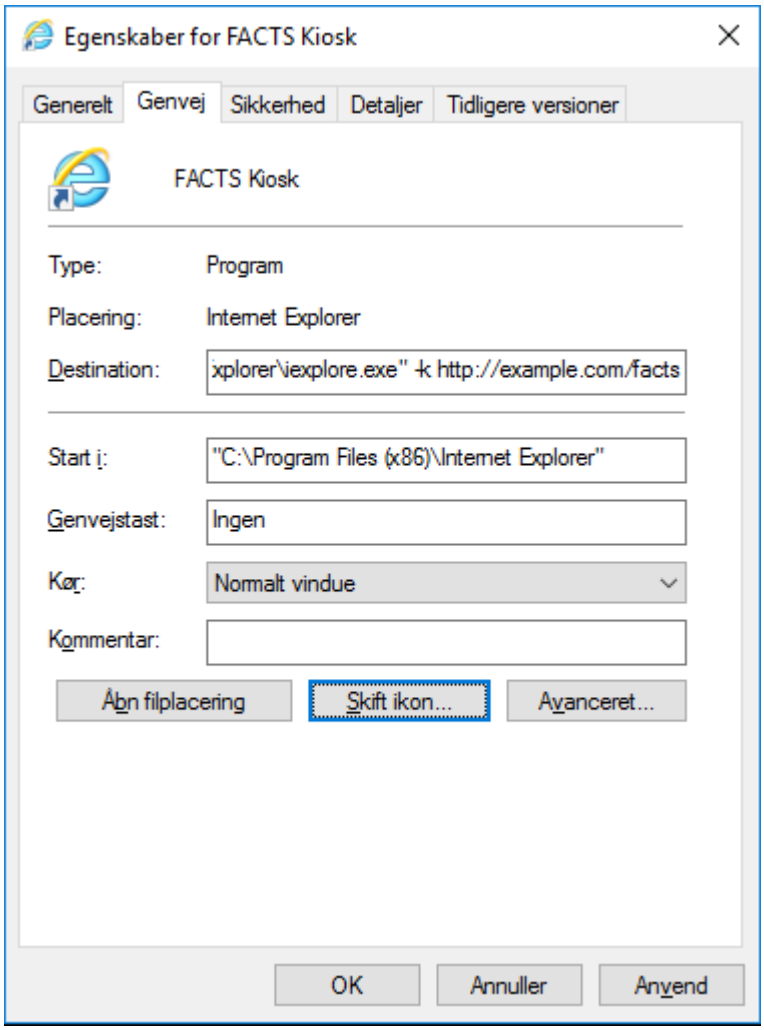
If you want to have a closer look on a specific view while the kiosk views are rolling, you can simply pause the carousel view, by clicking the pause button in the upper-right corner.



5.1.5.4 Automatically open kiosk URLs

It is possible to open a kiosk URL in full screen mode, using either Internet Explorer or Google Chrome. Microsoft Edge does not support full screen at the moment, but kiosk URLs will still work with it.

5.1.5.4.1 Internet Explorer

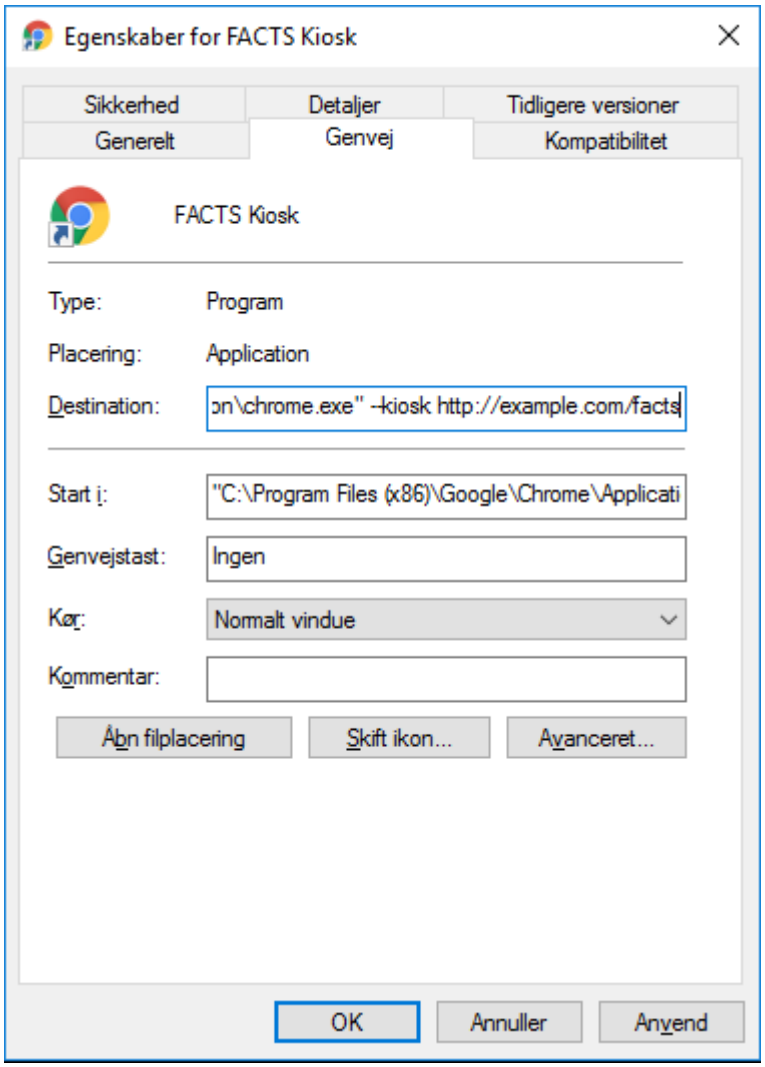


To automatically open a page in full screen, using internet explorer, create a shortcut with the following destination:

*"C:\Program Files (x86)\Internet Explorer" -k **http://example.com/facts***

Be sure to keep quotes intact and modify the path to internet explorer in case you are using a pc with a 32-bit OS installed. Change http://example.com/facts to be the kiosk url you configured in the web interface.

5.1.5.4.2 Google Chrome



To automatically open a page in full screen, using Google Chrome, create a shortcut with the following destination:

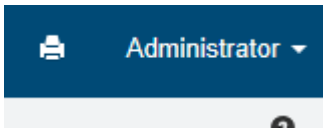
*"C:\Program Files (x86)\Google\Chrome\Application\chrome.exe" --kiosk **http://example.com/facts***

Be sure to keep quotes intact and modify the path to Google Chrome in case you are using a pc with a 32-bit OS installed. Change http://example.com/facts to be the kiosk url you configured in the web interface.

5.2 Dashboard

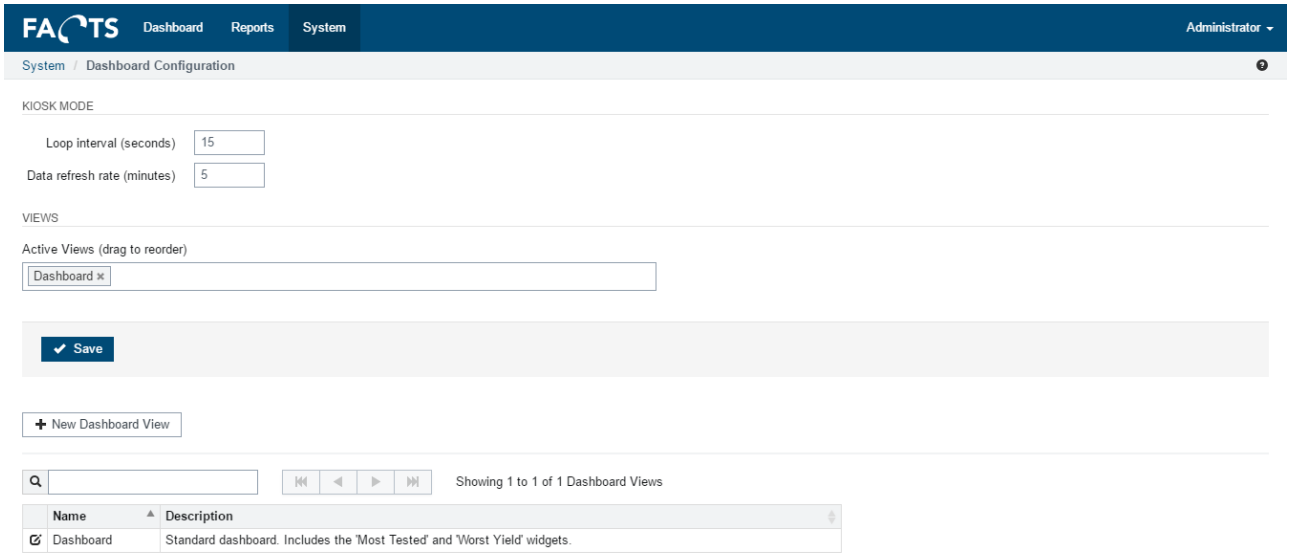
The personal dashboard requires some configuration by a user, but allows quick overview of what is going on in FACTS.

The personal dashboard is printable, but not exportable to excel. A small in the top-right corner, left of the users name, allows users to print their dashboard.



5.2.1 Settings

The settings page contains settings that are used for the dashboard and when in kiosk mode.



5.2.1.1 Kiosk mode

Loop interval is the time (in seconds) between views, when logged into kiosk mode. This time is a minimum value, as the actual time is (time taken to load any data, if needed) + value.

Data refresh rate defines how long FACTS caches any results loaded in both the ordinary dashboard and in kiosk mode. While data is cached and within the refresh rate, the loop interval between views, will remain the value specified.

5.2.1.2 Views

Views allows specifying which views are shown on the dashboard and in which order the kiosk will switch between them.

To remove a view from the list, click the “X”.

To add a view to the list, click it and pick from the available views.

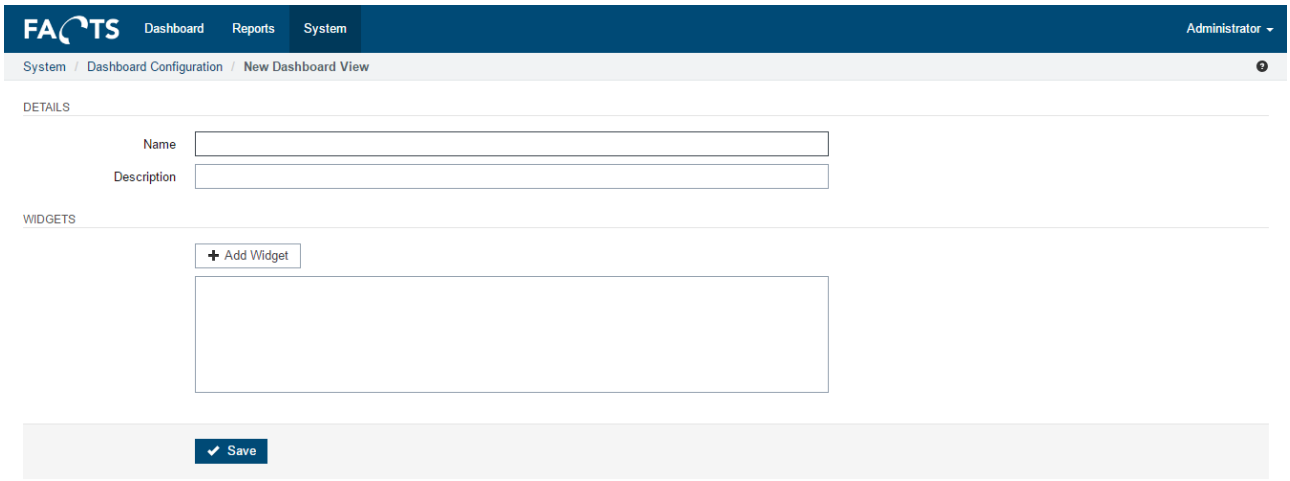
Items can be arranged by drag and drop to select the order in which they are shown.

5.2.2 Dashboard Views

Dashboard views specify a logical grouping of widgets. They allow users to create their own personal dashboards. By default, a user will have a single dashboard view, with 2 widgets, “Most Tested” and “Worst Yield”. This can be customized.

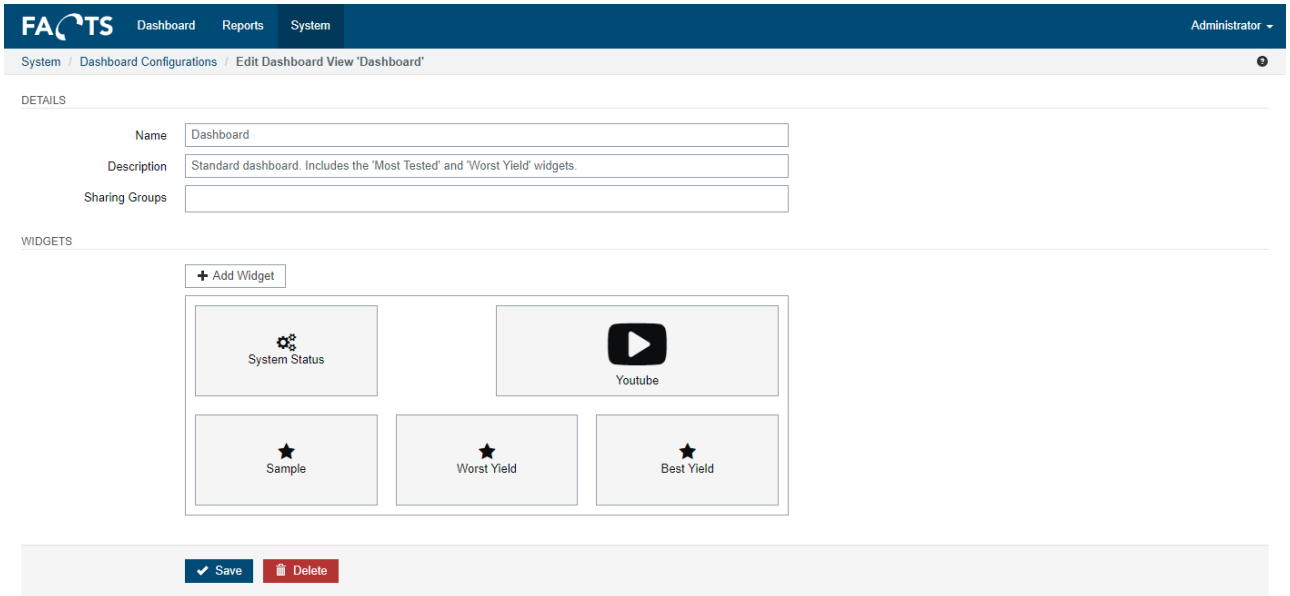
5.2.2.1 Add new dashboard view

To add a new dashboard view, click the “New Dashboard View” button. Fill out the fields on the page and click Save.



5.2.2.2 Edit dashboard view

To edit an existing dashboard view, click the edit icon in the item list.



5.2.2.3 Sharing dashboard view

To add the selected view in one or more sharing groups, click in the sharing group field to get a list of groups. Note that only the groups you are attached to will appear in the list. Select the groups you want to share with, and click save.

New users created, with the selected sharing groups, will get the shared views as their default views.

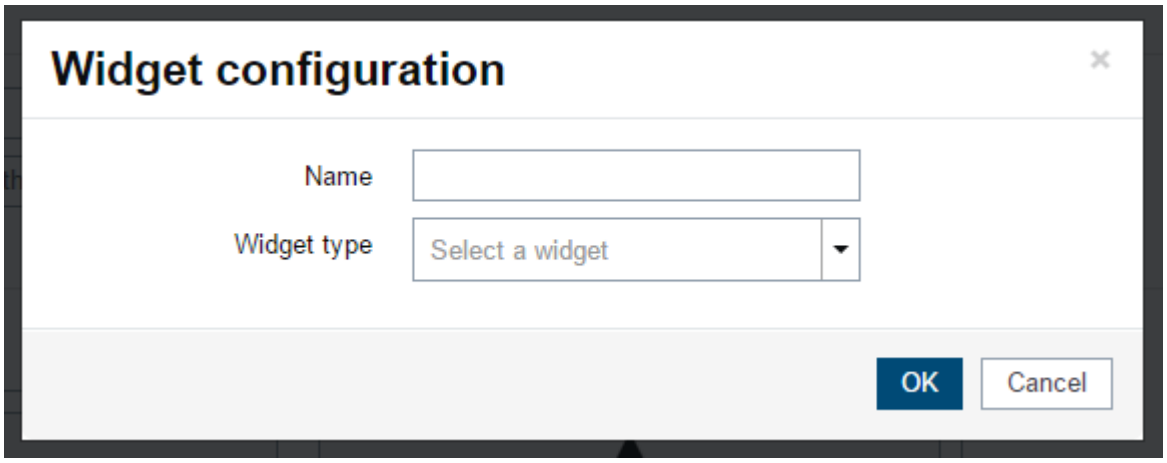
OBS. The shared views will not appear in the dashboard view list for the members of the groups. This functionality is only for pre-generating a set of views, for new users.

5.2.3 Widgets

Widgets display information and can be arranged in many different configurations. Each widget is its own little container of information.

5.2.3.1 Add new widget

To add a new widget, edit an existing dashboard or create a new one, and click the “Add Widget” button.



Fill in the fields. The available fields, change depending on the selections done to “Widget type”.

5.2.3.2 Edit existing widget

To edit an existing widget, hover over it and click the edit icon. This will open the configuration dialogue.

Changes to widgets are only saved, when the view is saved.

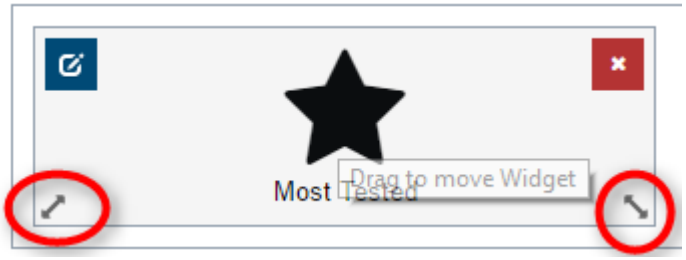
5.2.3.3 Deleting an existing widget

To delete an existing widget, hover over it and click the delete icon. This will remove the widget from the view.

Widgets removed, are only saved when the view is saved.

5.2.3.4 Arranging widgets

Widgets are layed out in a grid with 6 columns. Widgets can be resized to take up between 1 and 6 columns. A single row can contain widgets that total up to 6 columns. This allows for multiple configuration options, such as 1 widget of 6 columns, 2 widgets of 3 columns each or 1 widget of 2 columns, 1 widget of 3 columns and a single widget of 1 column.
A row does not need to be filled. Rows cannot be skipped.
To resize a widget, click the handles in the bottom corners of it.



To move the widget to a new location, click the widget and drag and drop to the new location. Dragging downwards, outside the box, will add a new empty row to add the selected widget to.

5.2.3.5 Widget types

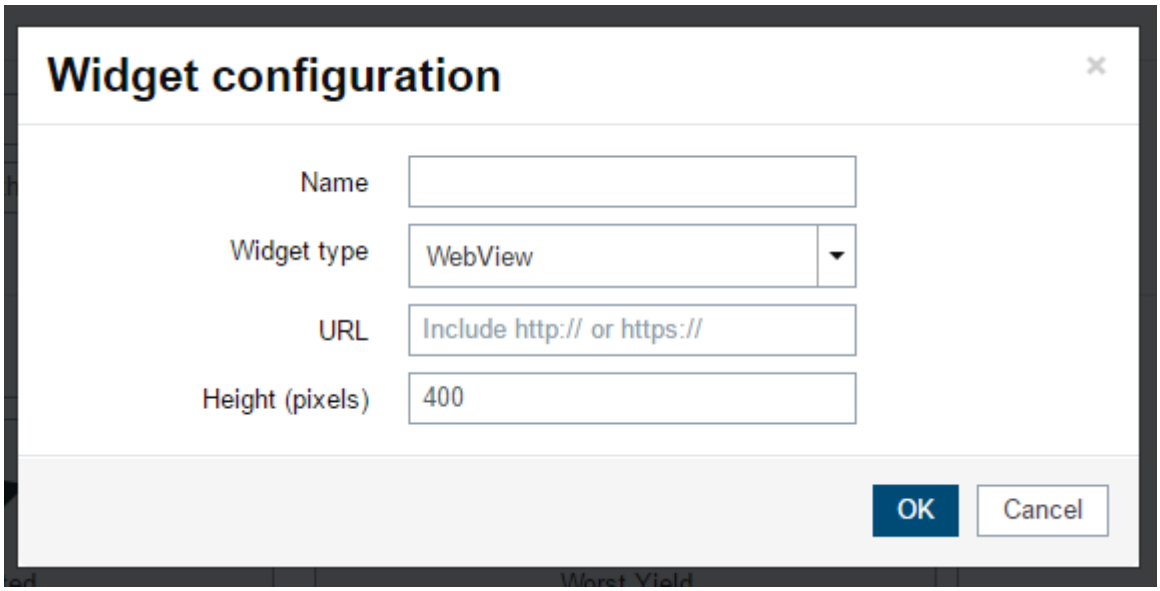
There are 10 widget types. Each serves a different purpose.

5.2.3.5.1 WebView

The WebView type allows embedding an external web page into FACTS.

Typical use:

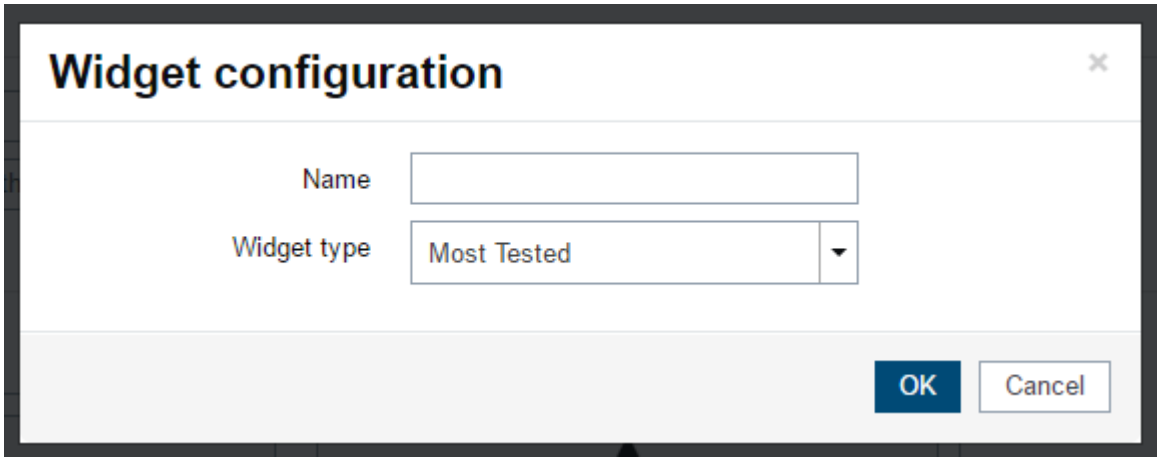
Embed external search or adding information from other systems.



URL is the address of the page that is to be embedded
Height specifies the height on the dashboard. If the height of the widget is less than the webpage, a scrollbar will be visible. If it is larger than the webpage, blank space will be shown. This is the only widget that allows specifying a height.

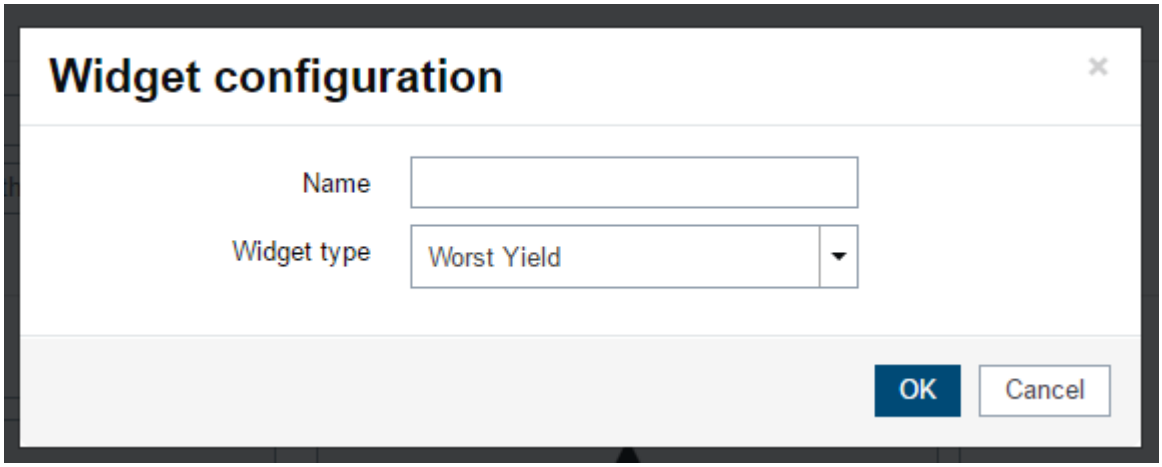
5.2.3.5.2 Most Tested

Displays the most tested items. Users can specify the number of required tests and the time period in their user settings.



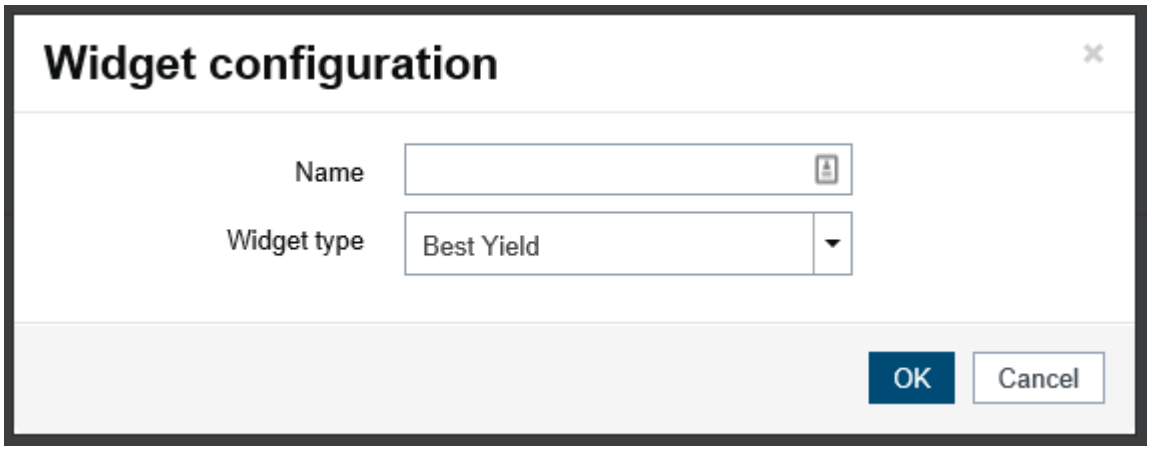
5.2.3.5.3 Worst Yield

Displays the worst yields. Users can specify the number of required tests and the time period in their user settings.



5.2.3.5.4 Best Yield

Displays the best yields. Users can specify the number of required tests and the time period in their user settings.

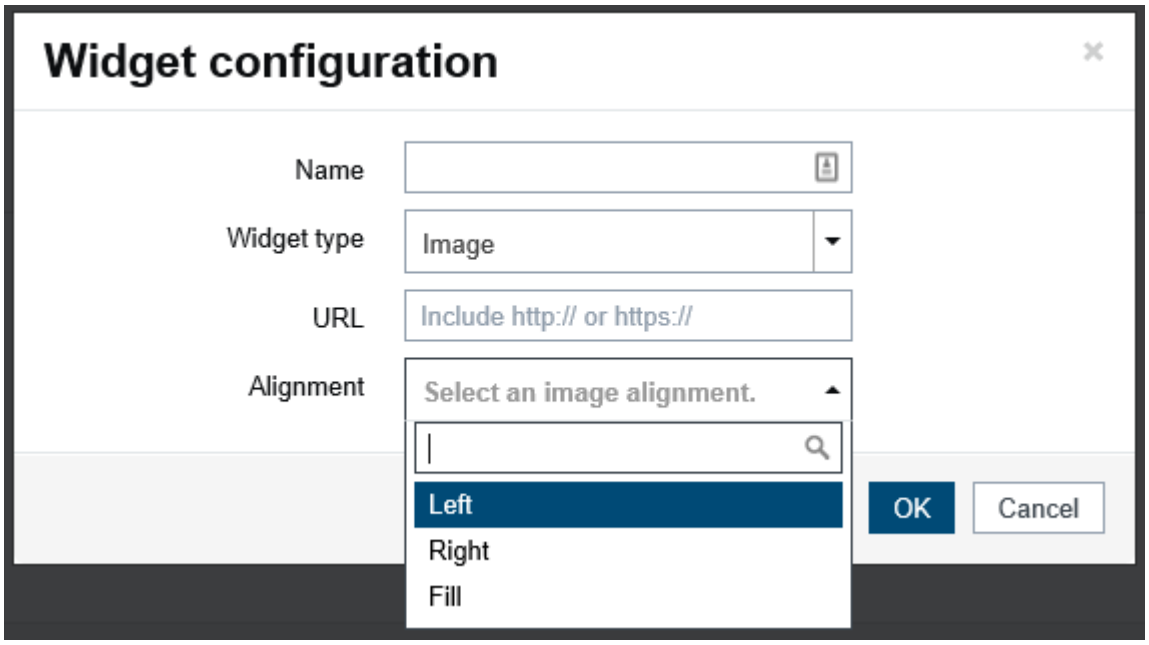


5.2.3.5.5 Image Widget

Allows for adding a custom image to a dashboard.

Images can be aligned to the left or to the right, or be set to fill the space available.

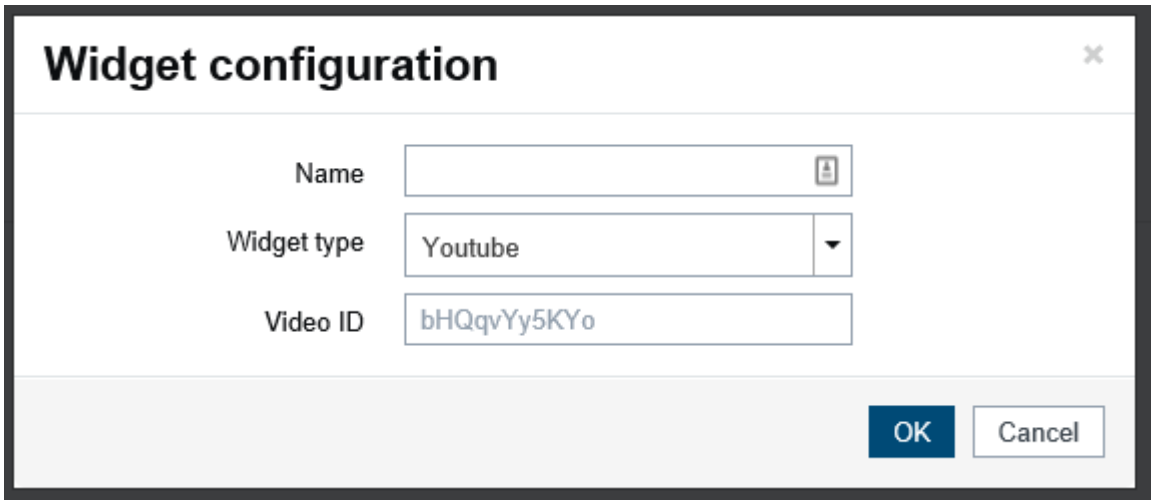
Typical use: insert company logo for printed reports/dashboards.



5.2.3.5.6 Youtube Widget

Displays a youtube video. Videos are automatically paused in kioskmode, while they are offscreen.

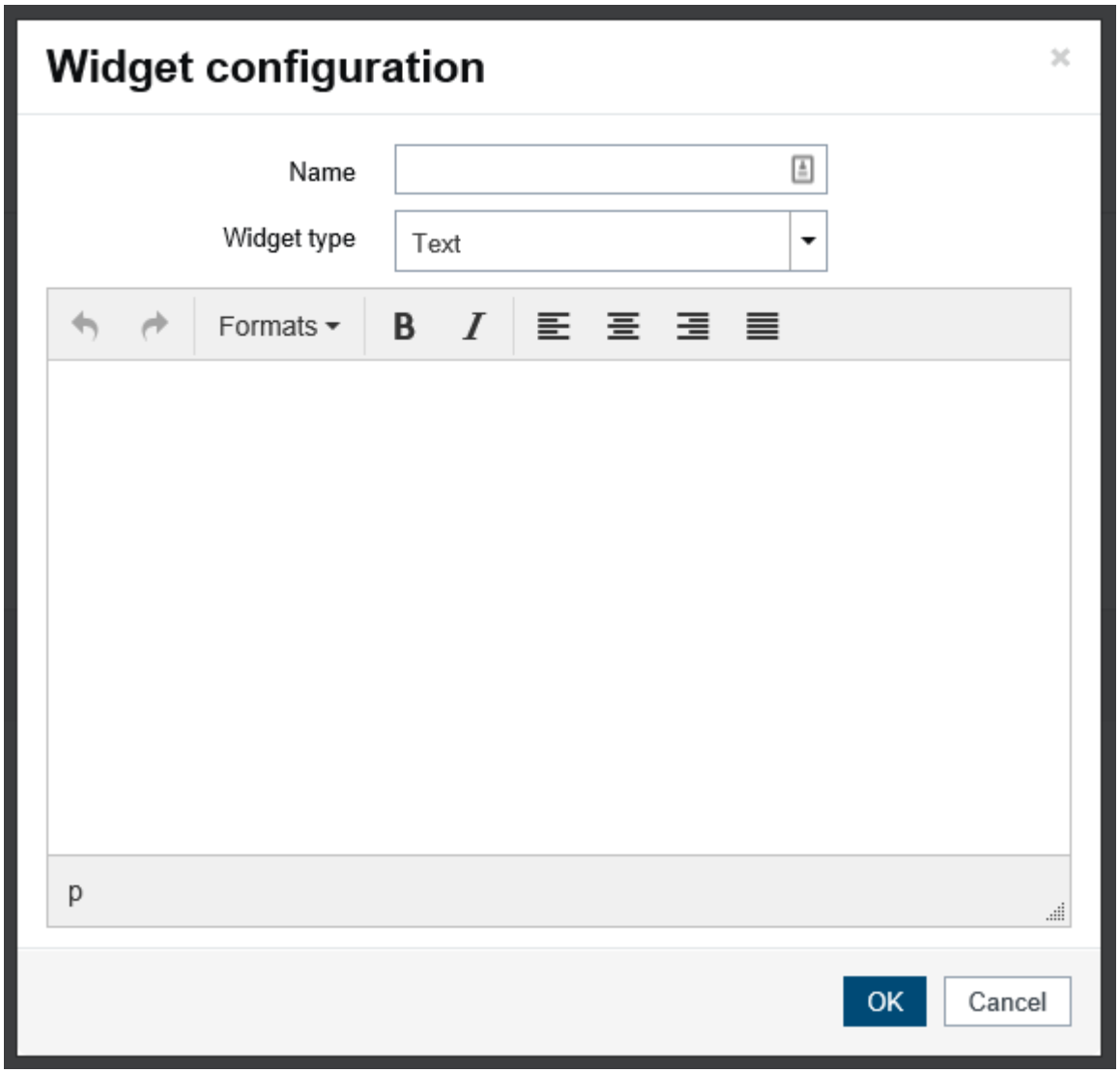
Simply copy the video ID from the youtube page and past it in the Video ID field, to add a video to the dashboard.



5.2.3.5.7 Text Widget

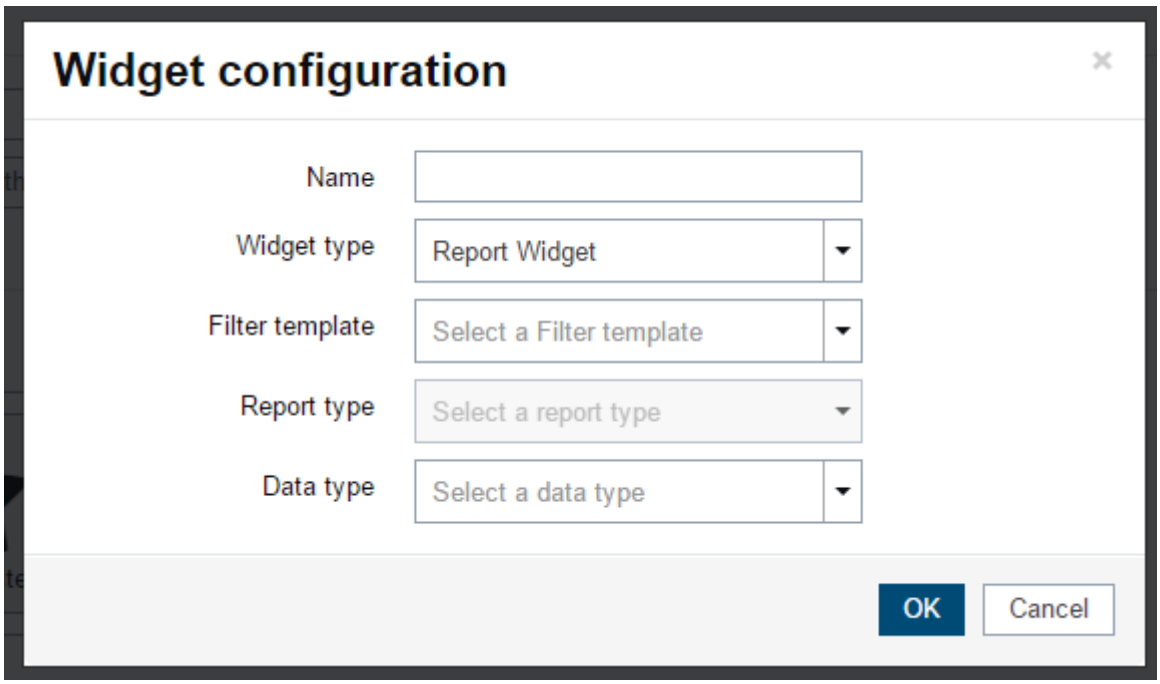
Allows for adding custom, formatted text to the dashboard.

Typical use: insert standard text for a printed report/dashboard.

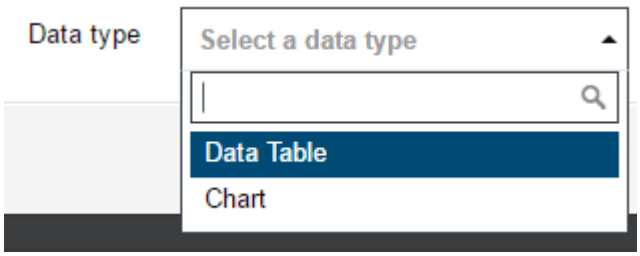


5.2.3.5.8 Report Widget

Report widgets are based on a user's filter templates. They allow embedding reports on the dashboard.



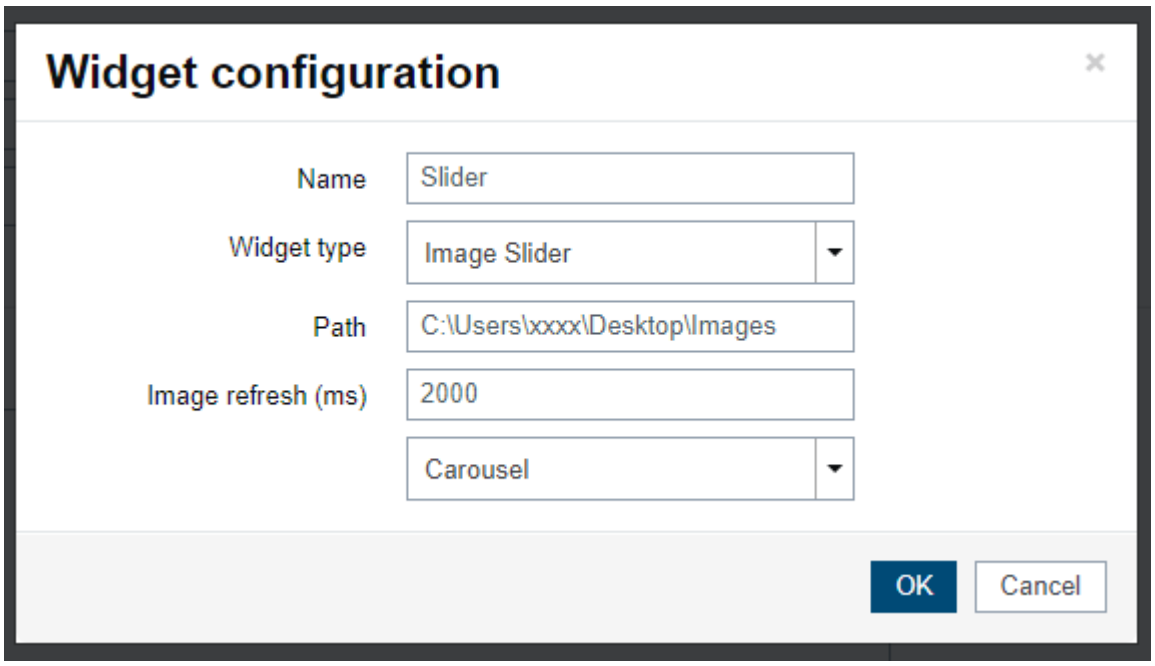
Depending on the type of filter used, different Data type options will be available.



Report	Datatable	Chart	Distribution Chart	Series Chart	Test Overview	Test Step Results
SPC	X					
Time Series	X		X	X		
Test Result	X					
Repair Pareto	X	X				
Test Yield	X	X				
Test Step Yield	X	X				
Test Step Error Pareto	X					
Test Duration		X				
Test Step Duration	X					
Unit Overview					X	X
DPU	X	X				

5.2.3.5.9 Image Slider Widget

The Image slider widget are made to read and display images from a folder.



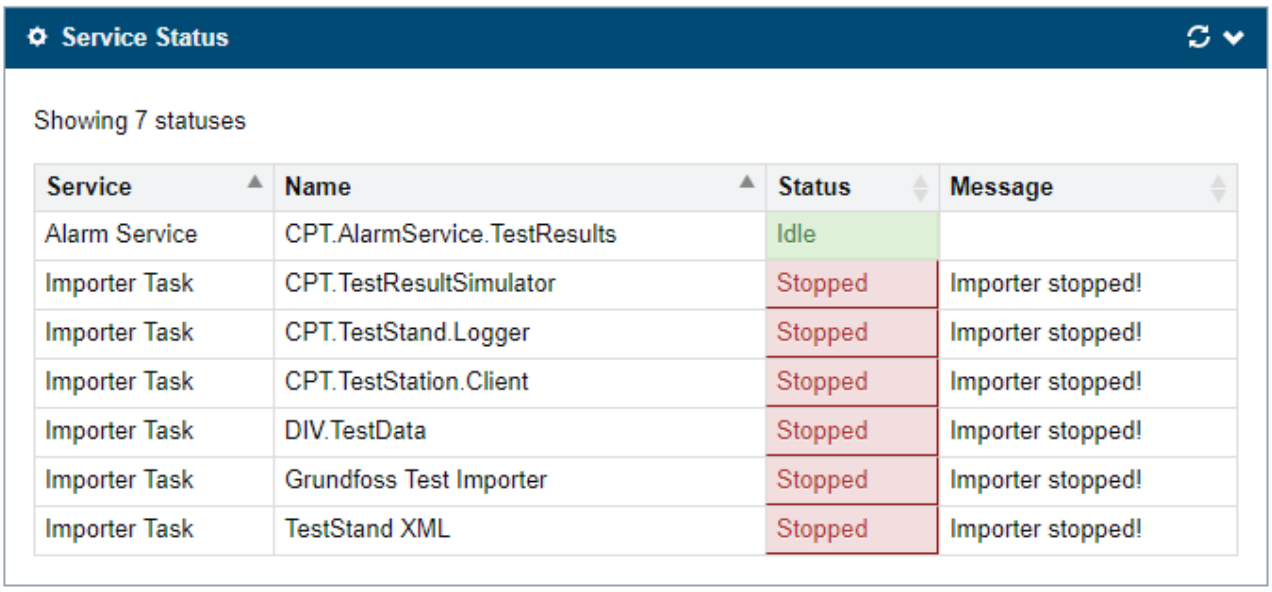
The widget has two display types (*Latest, Carousel*), and a refresh interval that defines how often you want the widget to read and update from the defined path.

The *Latest* mode, always shows the latest created image in the folder.

The *Carousel* mode will automatically show the images in a loop, when the last image is shown.

5.2.3.5.10 Service Status Widget

The service status gives you a status overview of the FACTS services.



Service	Name	Status	Message
Alarm Service	CPT.AlarmService.TestResults	Idle	
Importer Task	CPT.TestResultSimulator	Stopped	Importer stopped!
Importer Task	CPT.TestStand.Logger	Stopped	Importer stopped!
Importer Task	CPT.TestStation.Client	Stopped	Importer stopped!
Importer Task	DIV.TestData	Stopped	Importer stopped!
Importer Task	Grundfoss Test Importer	Stopped	Importer stopped!
Importer Task	TestStand XML	Stopped	Importer stopped!

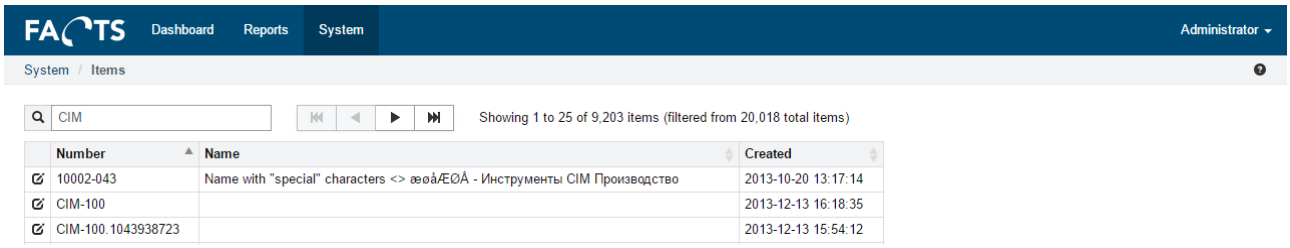
The widget will simply list the different services with a message and status. The service requires no configuration but a widget-name.

5.3 Data management

Provides functions to control and manage items.

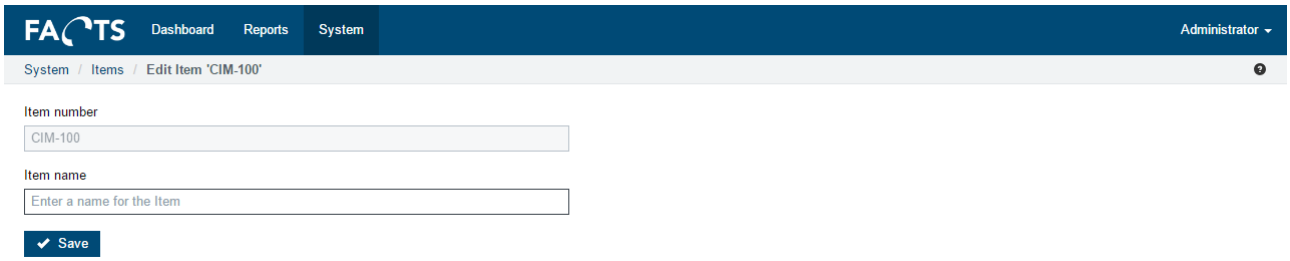
5.3.1 Items

Define the relations between item numbers/identifiers and their item names. Item names are used as an alias for item numbers to make items easier to recognize and filter out.



5.3.1.1 Edit items

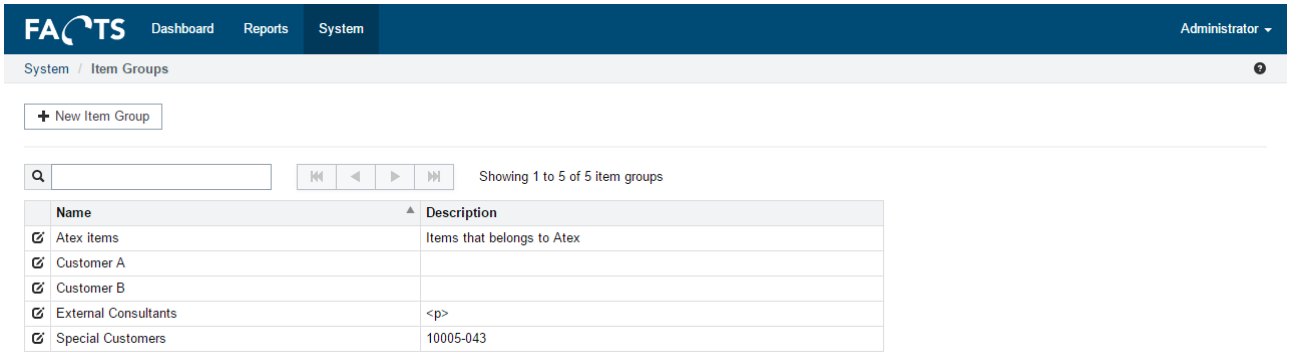
To edit an existing item number / name relation, click the edit icon in the Item list.



Save stores the changes to the item name.

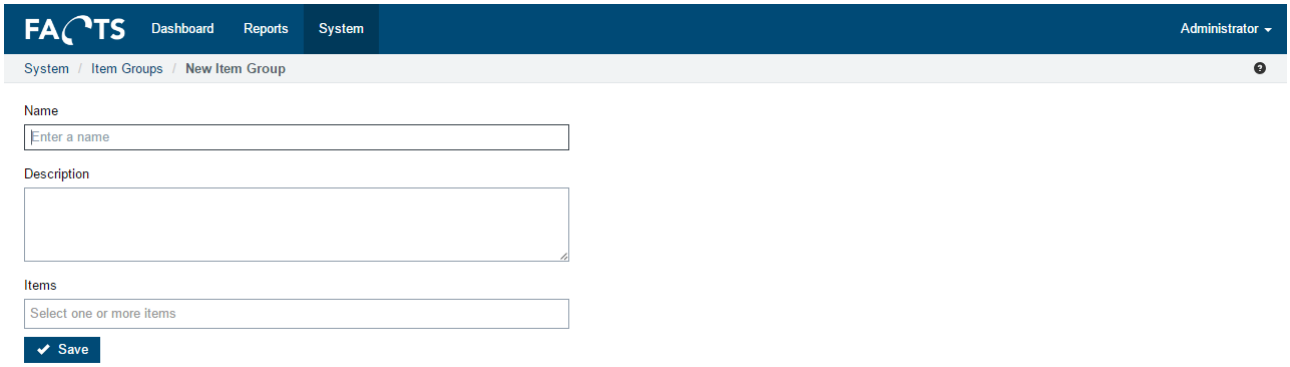
5.3.2 Item Groups

Defines the grouping of items. Item groups can be used to control item access rights for user groups.



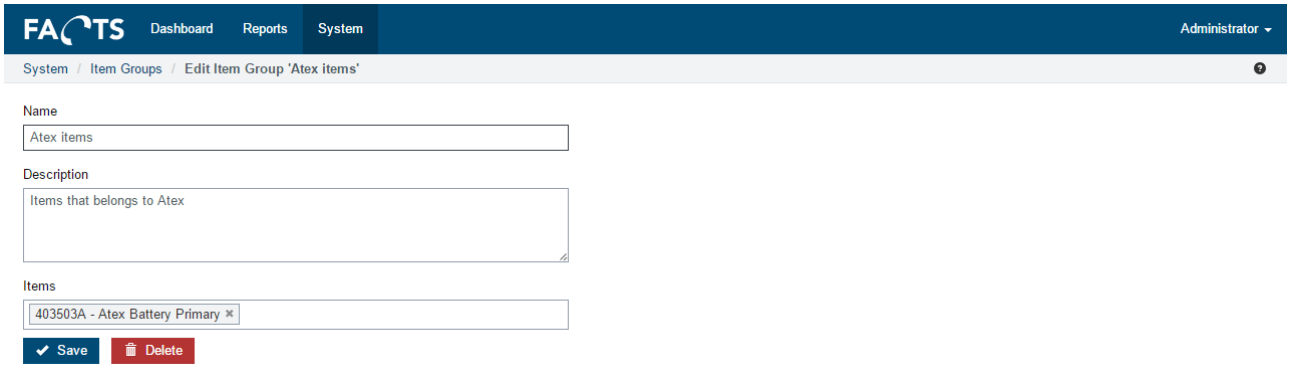
5.3.2.1 Add item groups

To add a new item group, click the “New Item Group” on the “Item Groups page”. Fill in the fields on the page and click Save.



5.3.2.2 *Edit item groups*

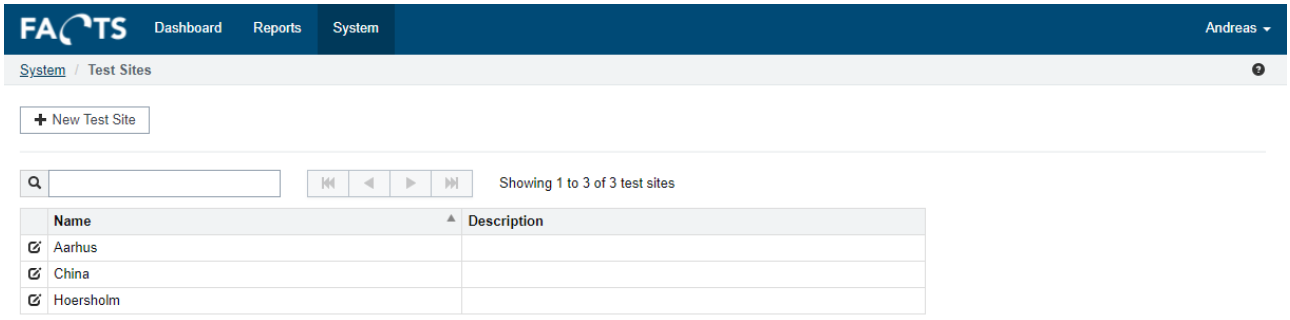
To edit an existing item group, click the edit icon in the Item Group list.



Save stores the changes to the item group.

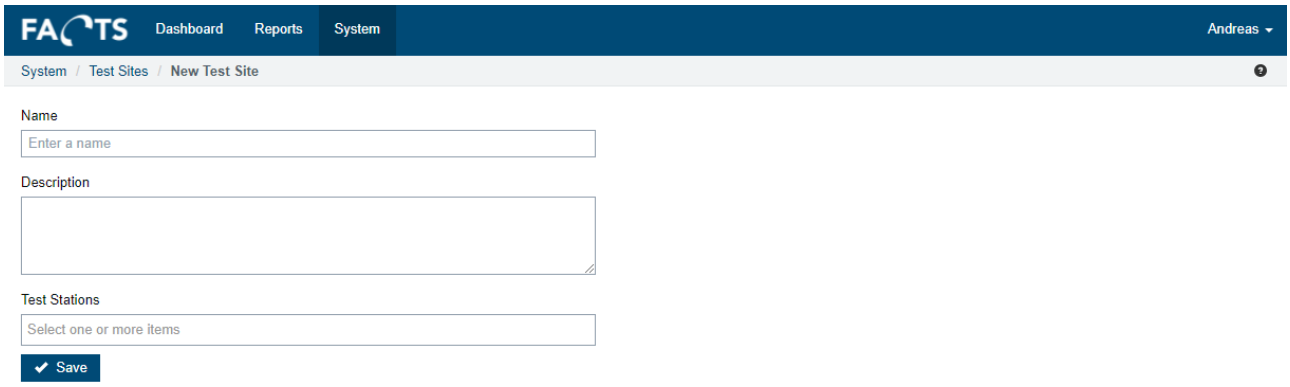
5.3.3 Test Sites

Defines a grouping of test stations. Test Sites can be used as an advanced filter in relevant reports.



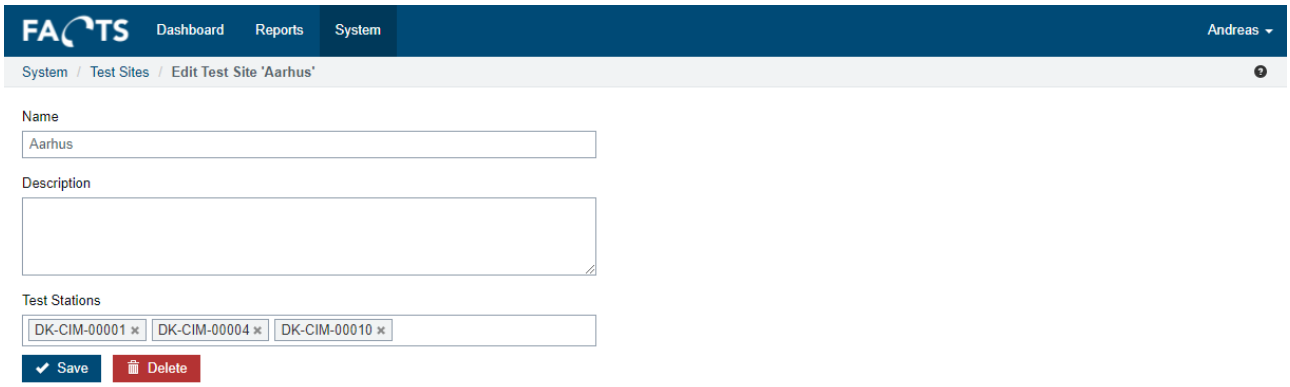
5.3.3.1 Add Test Site

To add a new test site, click the “New Test Site” on the Test Sites page. Fill in the fields on the page and click save.



5.3.3.2 Edit Item Groups

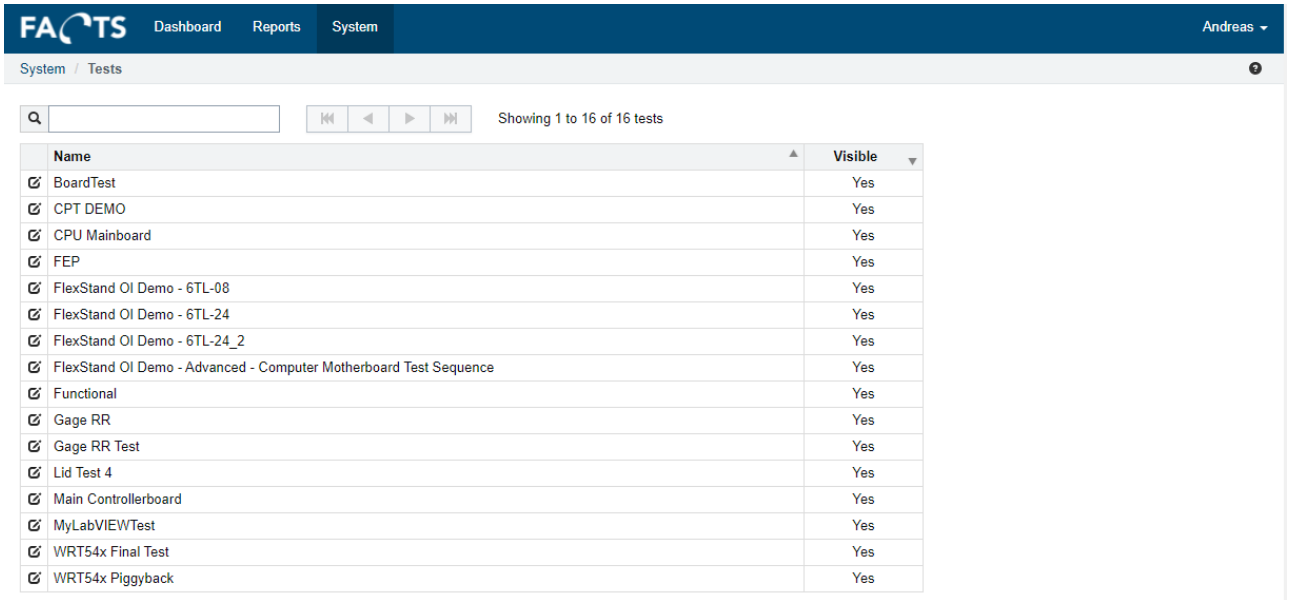
To edit an existing test site, click the edit icon in the Test Sites list.



Save stores the changes to the Test Site.

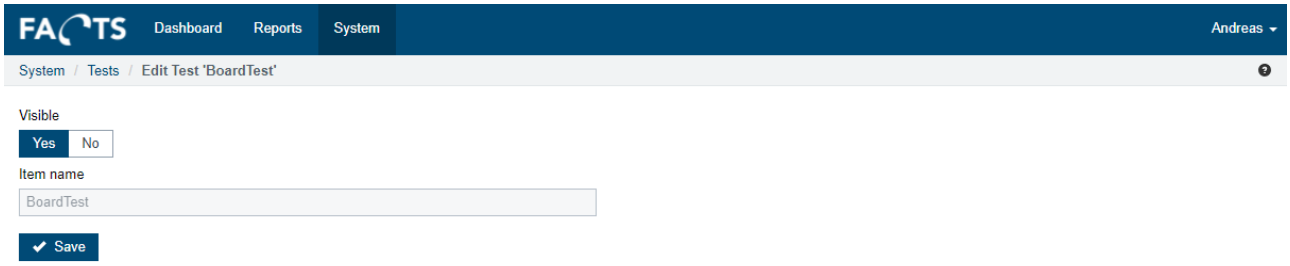
5.3.4 Tests

Tests pages is used to show or hide tests in the system.



5.3.4.1 Edit Tests

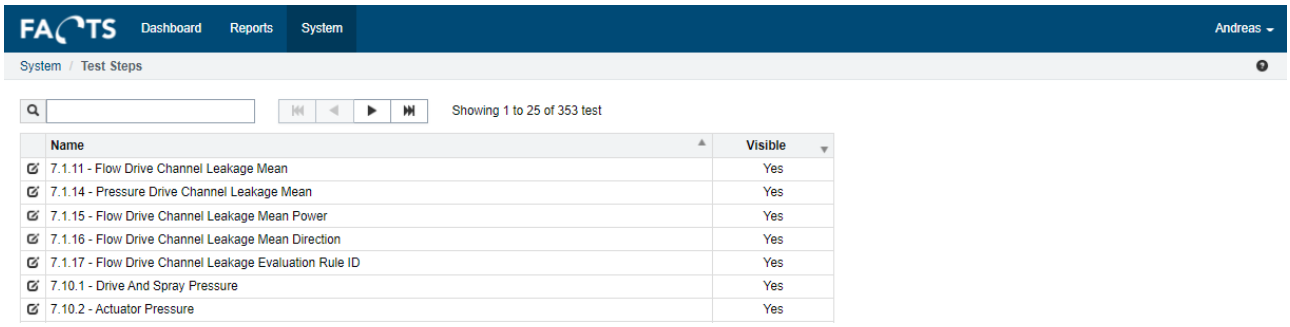
To edit a test, click the edit icon in the Test list.



Save stores the changes to the test.

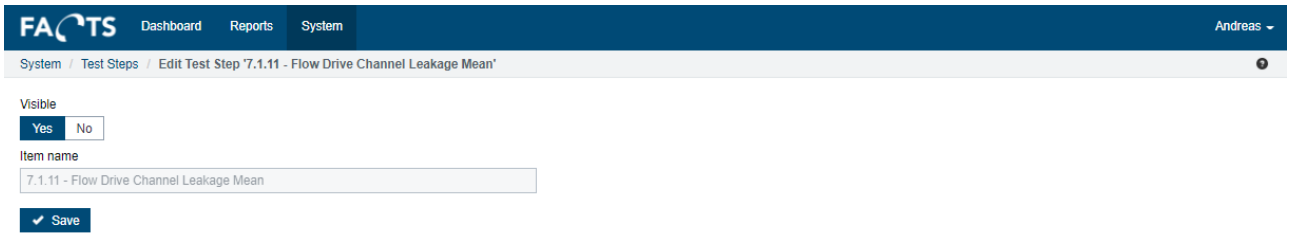
5.3.5 Test Steps

Test Steps is used to show or hide test steps in the system.



5.3.5.1 Edit Test Steps

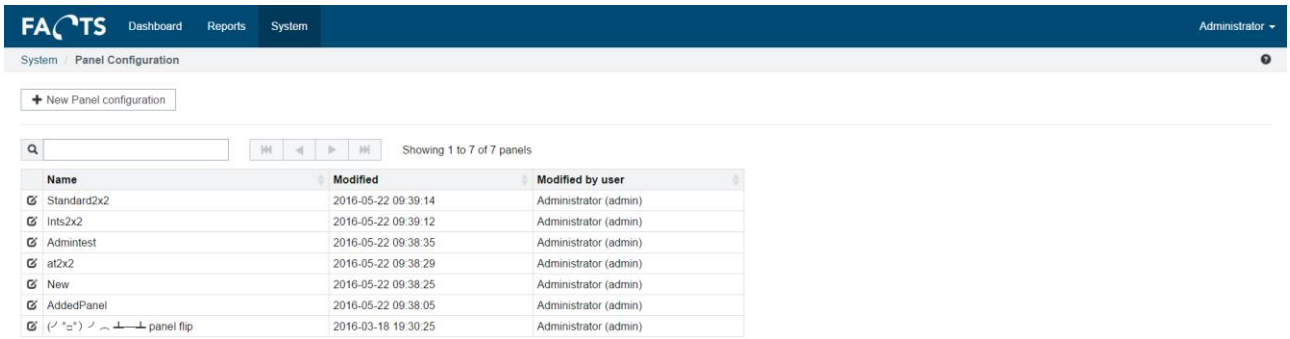
To edit a test step, click the edit icon in the Test Steps list.



Save stores the changes to the test step.

5.3.6 Panel configuration

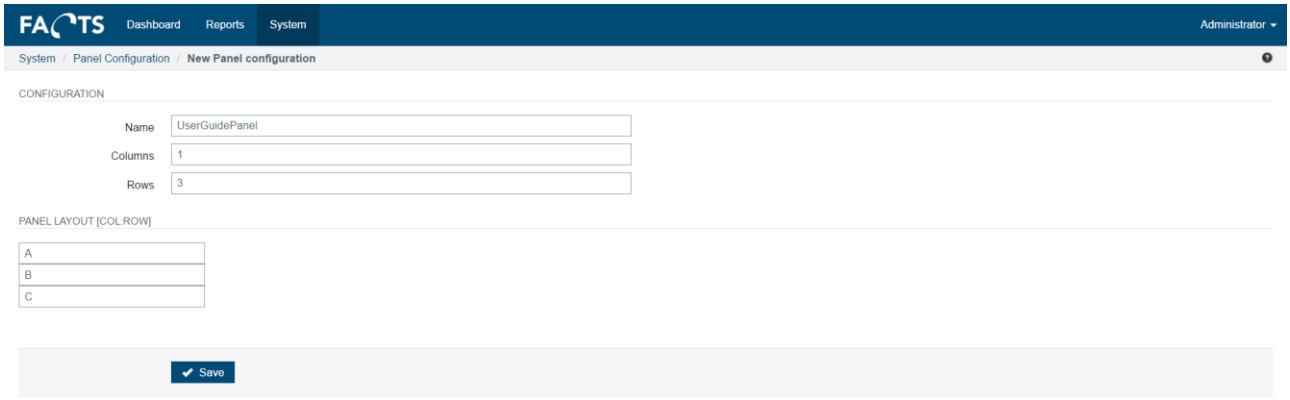
Used to configure the layout of panels. Panels are used to group several DUTs under one barcode in PLR (Paper less repair).



5.3.6.1 *Add panel configuration*

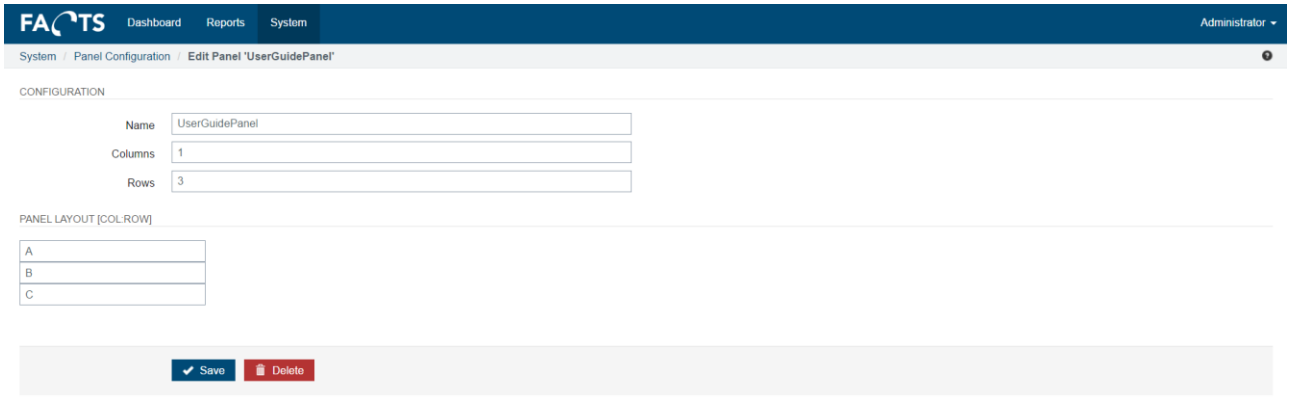
To add a new panel configuration, click the “New Panel configuration” on the “Panel configuration page”. Fill in the fields on the page and click Save.

Changes to the “Columns” and “Rows” fields will redraw the panel layout and default the value of the layout fields.



5.3.6.2 *Edit panel configuration*

To edit an existing item group, click the edit icon in the Item Group list.

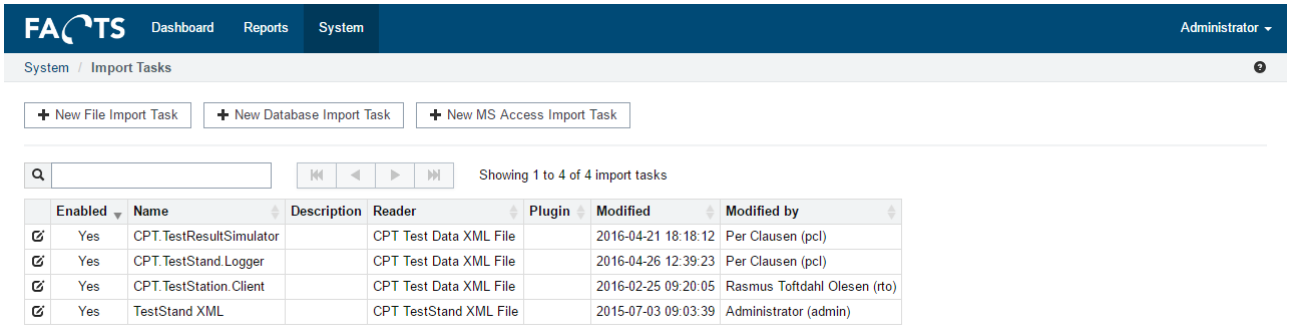


Save stores the changes to the item group.
Delete is only enabled if no DUTs has been connected to the panel configuration.

5.4 Service management

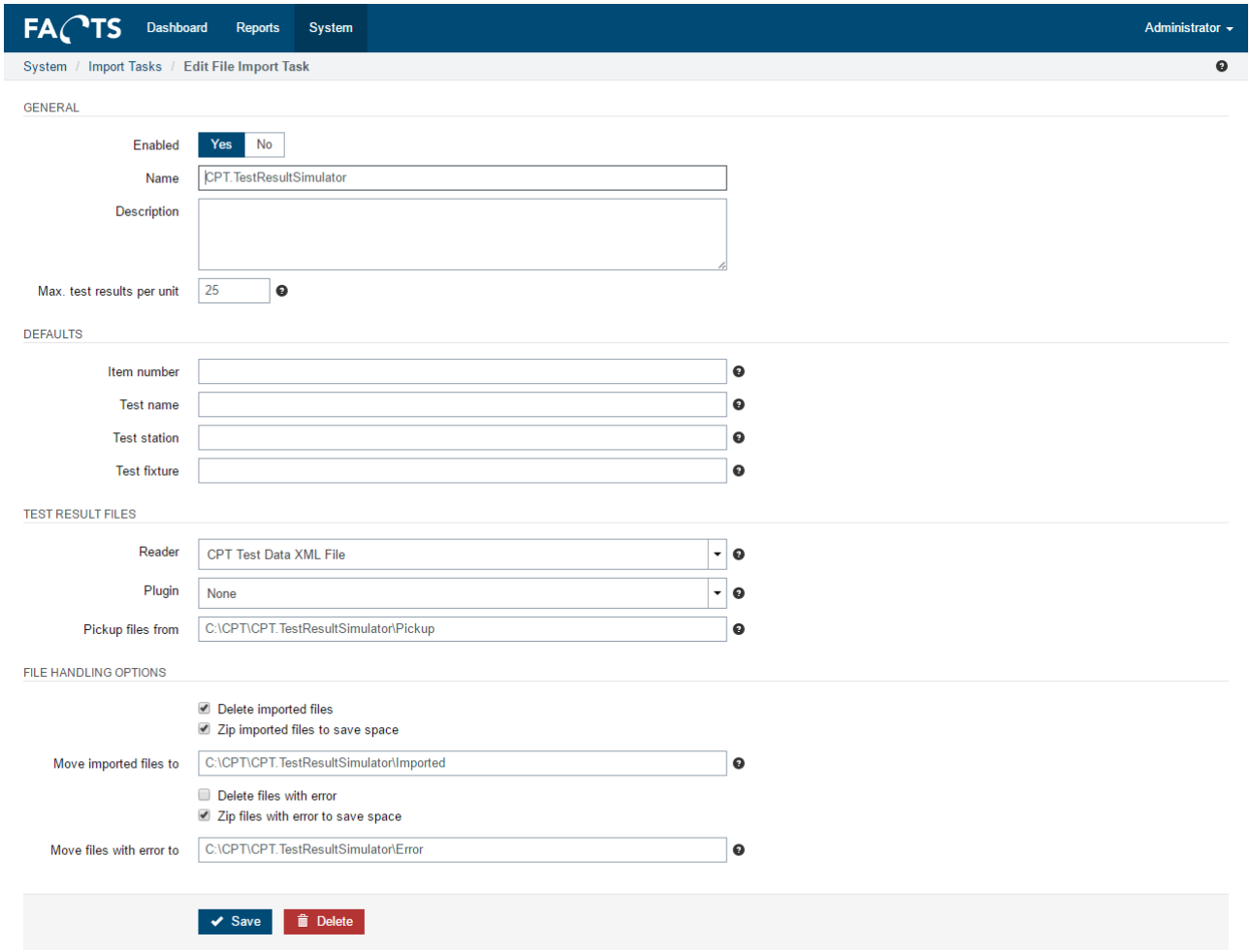
5.4.1 Import Tasks

By default, the SPC system supports TestStand XML format. Additional import readers can be implemented to support the specific customer needs and business models. In general, test data imports originate either from files like TestStand XML, CSV files etc., or from some different kinds of databases, like MySQL, MS Access, MS-SQL etc. Additional import read can be implemented for both new file formats and data stored in databases.



5.4.1.1 Edit an existing import task

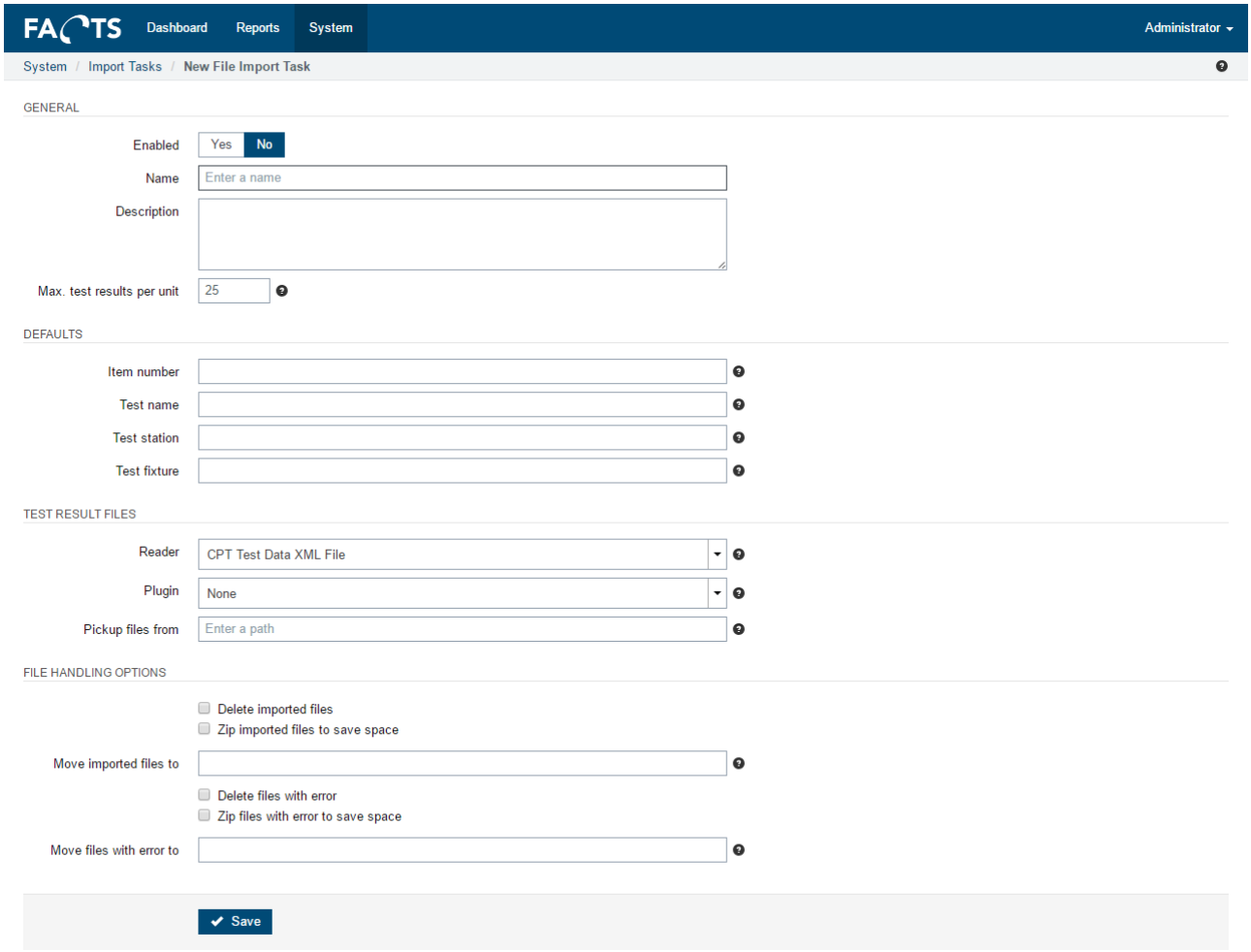
To edit an existing data importer task, click the edit icon in the importer task list.



"Save" stores the changes to the importer task.
"Delete" deletes and disables the importer task permanently (all parameters will be lost)

5.4.1.2 Creating a new file import task

To setup the necessary parameters for importing test data from a file, the button "New File Import Task" should be clicked.

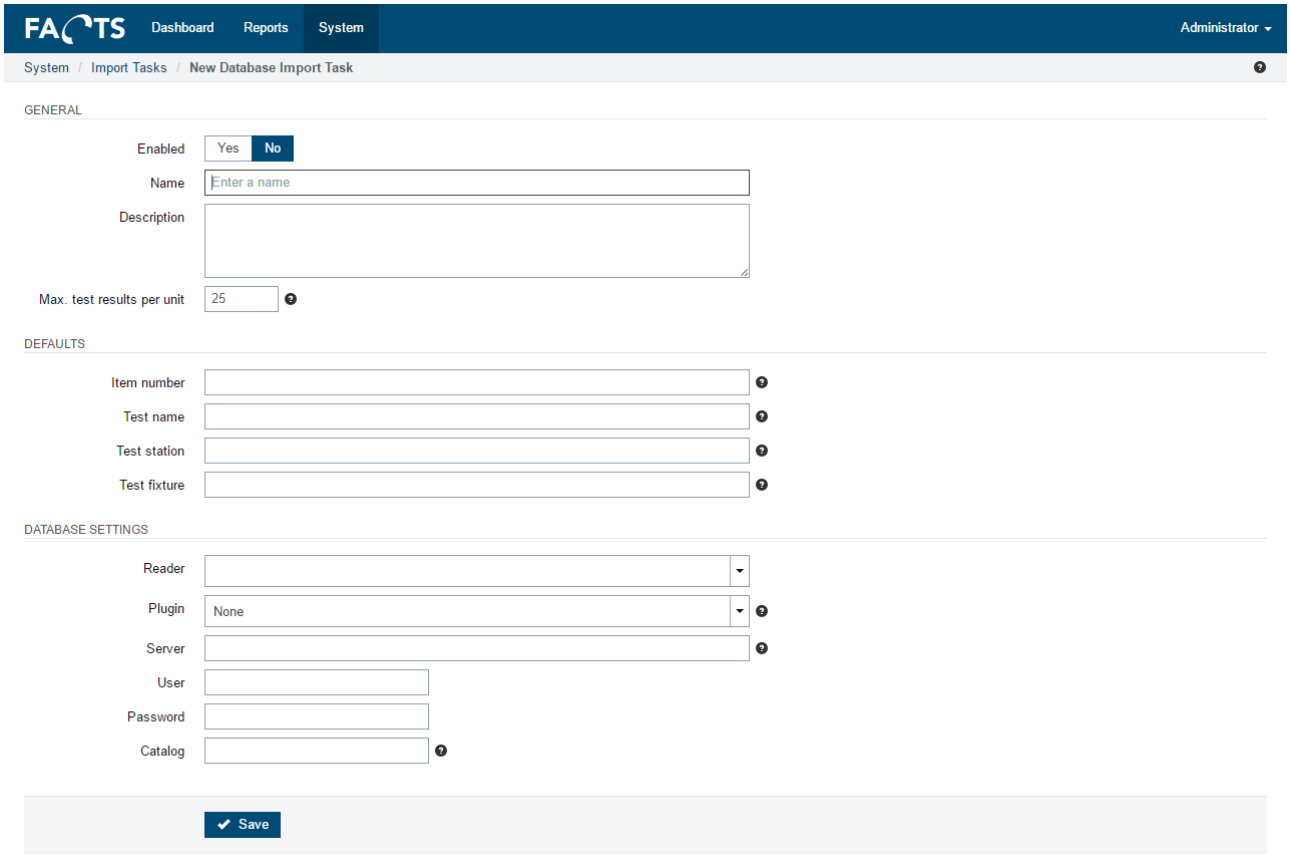


All necessary parameters should be filled out before saving and enabling the new file importer task.

Additional help for each parameter is displayed when moving the mouse pointer over the question mark to the right of each parameter field.

5.4.1.3 Creating a new database import task

To setup the necessary parameters for importing test data from a database, the button “New Database Import Task” should be clicked.

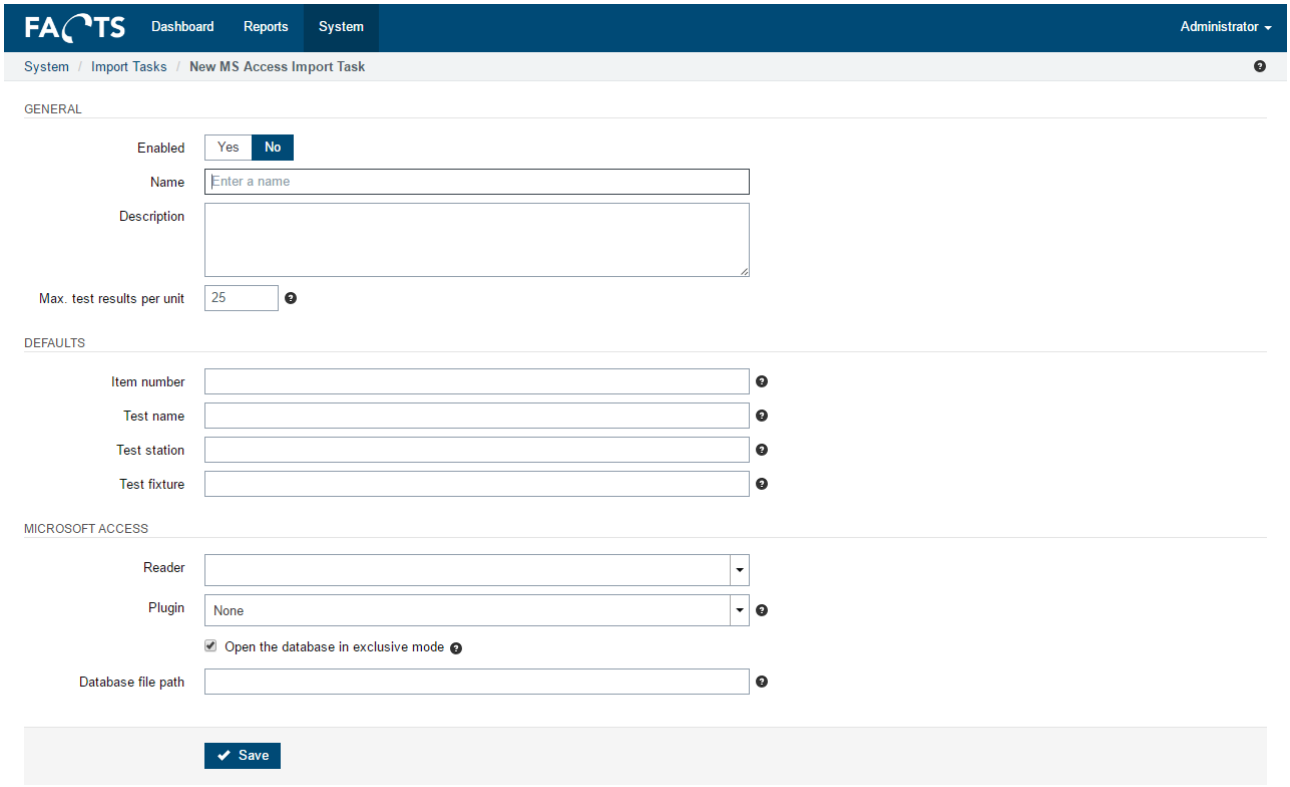


All necessary parameters should be filled out before saving and enabling the new database importer task.

Additional help for each parameter is displayed when moving the mouse pointer over the question mark to the right of each parameter field.

5.4.1.4 Creating a new MS Access import task

To setup the necessary parameters for importing test data from a Microsoft Access database, the button "New MS Access Import Task" should be clicked.

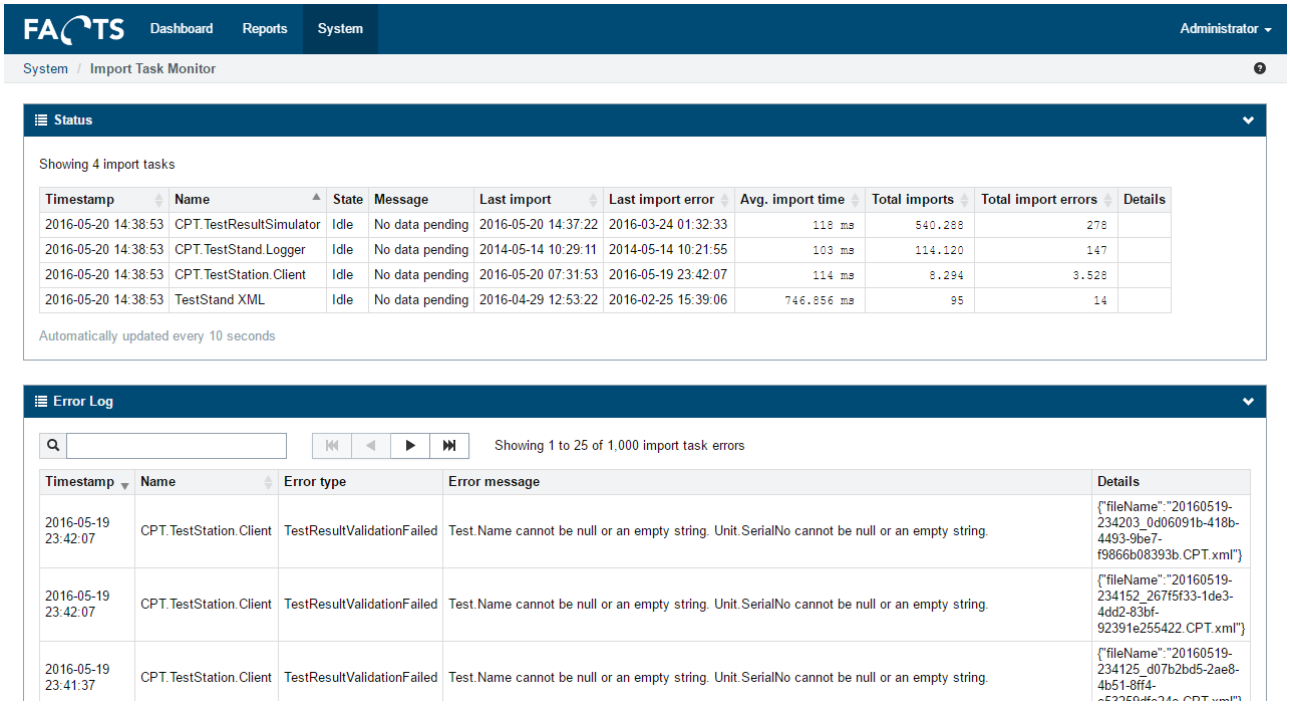


All necessary parameters should be filled out before saving and enabling the new MS Access importer task.

Additional help for each parameter is displayed when moving the mouse pointer over the question mark to the right of each parameter field.

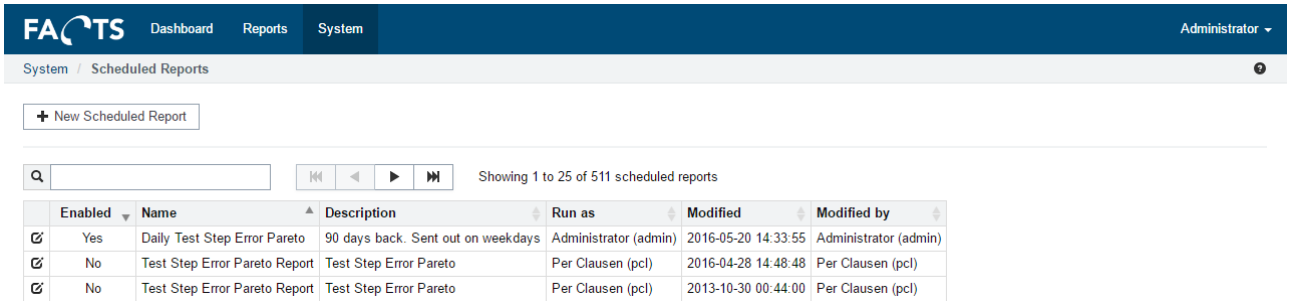
5.4.2 Import Task Monitor

This screen is used to investigate the status and error log of the enabled data importers. It contains relevant information and performance indicators to provide an overview to the health of the data import into the system. The information in the screen is automatically updated every 10 seconds.



5.4.3 Scheduled Reports

Scheduled reports are used to send out predefined reports at a specified time and with a specified frequency. Reports are sent out by e-mail to predefined receivers. The layout of the scheduled reports is chosen among the existing reports (Test Yield report and Test Step Error Pareto report).

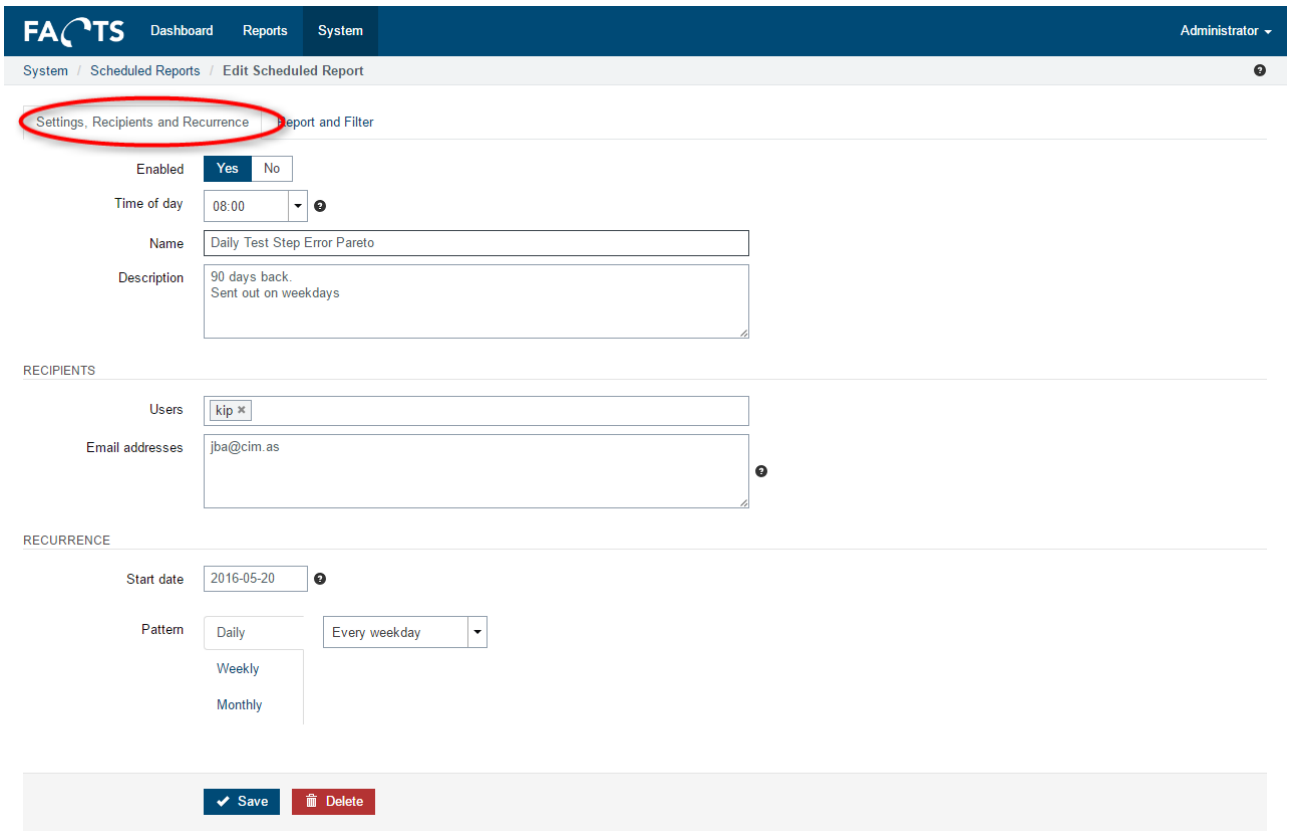


5.4.3.1 Adding and Editing scheduled reports

To edit an existing scheduled report, click the edit icon in the scheduled report list. To add a new scheduled report, click “New Scheduled Report”

“Save” stores the changes to the importer task.
“Delete” deletes and disables the scheduled report permanently (all parameters will be lost). “Delete” is only available when editing an existing scheduled report.

5.4.3.1.1 Settings, Recipients and Recurrence



General Settings:

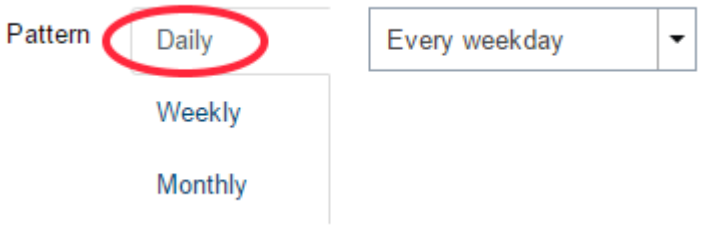
Enabled:	Used to enable or disable the scheduled report generation
Time of day:	The time of day to send out the report
Name:	Descriptive name of the report
Description:	Further detailed description for the report

Recipients:

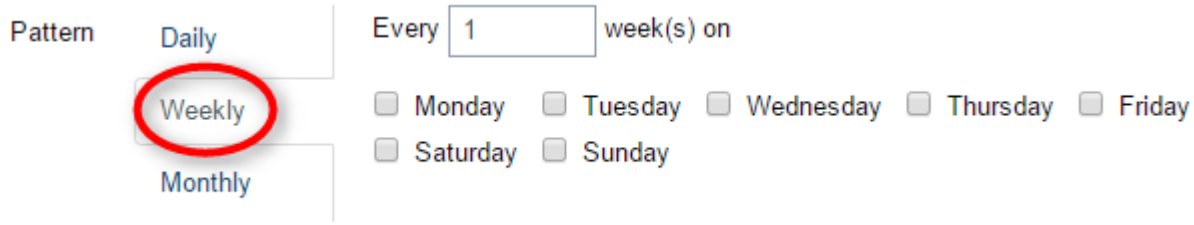
Users:	List of system users to receive the report
E-mail addresses	Additional recipients of the report (unknown to the system)

Recipients:

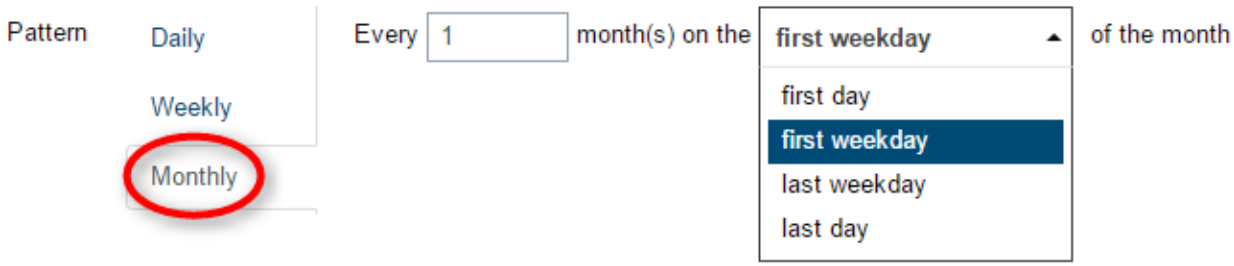
Start date:	The begin date for the scheduled reports
Pattern:	See further descriptions below



The “Daily” pattern is used if the report should be sent out on a daily basis (every day or every weekday)

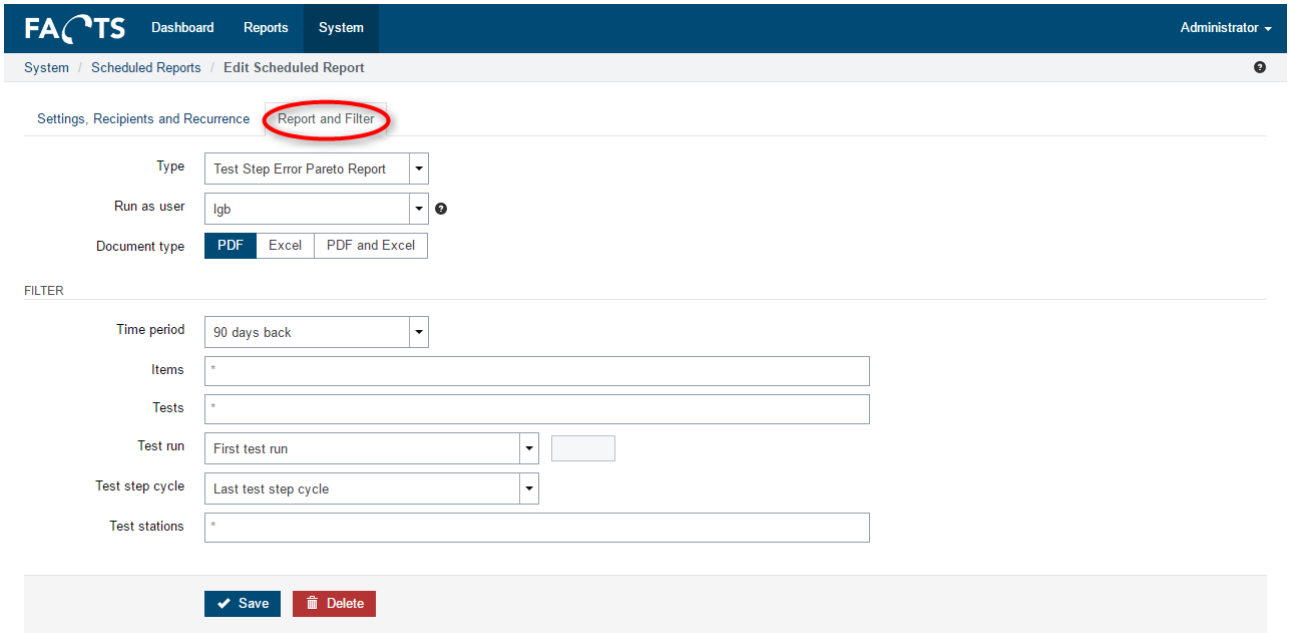


The “Weekly” pattern is used if the report should be sent out on certain days of the week.



The “Monthly” pattern is used if the report should be sent out on certain days of the month.

5.4.3.1.2 Report and Filter



General Settings:

Type: The layout of the report to send out (Test Yield or Test Step Error Pareto)

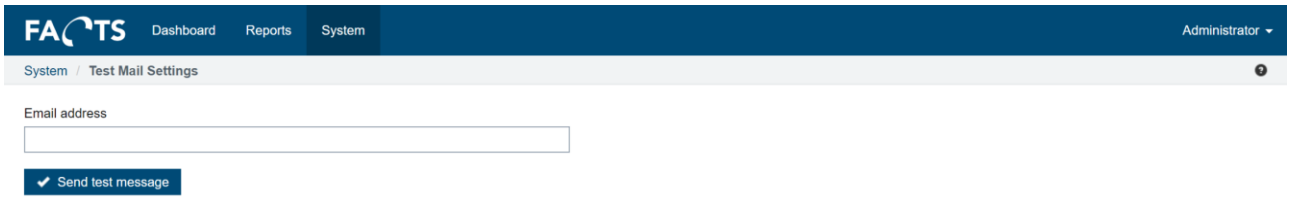
Run as user: The user profile to be used when generating the scheduled reports
Document type: Send out the report as PDF, Excel or both

Filter:

Set all parameters for the selected report type to obtain the required data in the scheduled reports. Please refer to the sections describing the reports (section 3.9 or section 3.11)

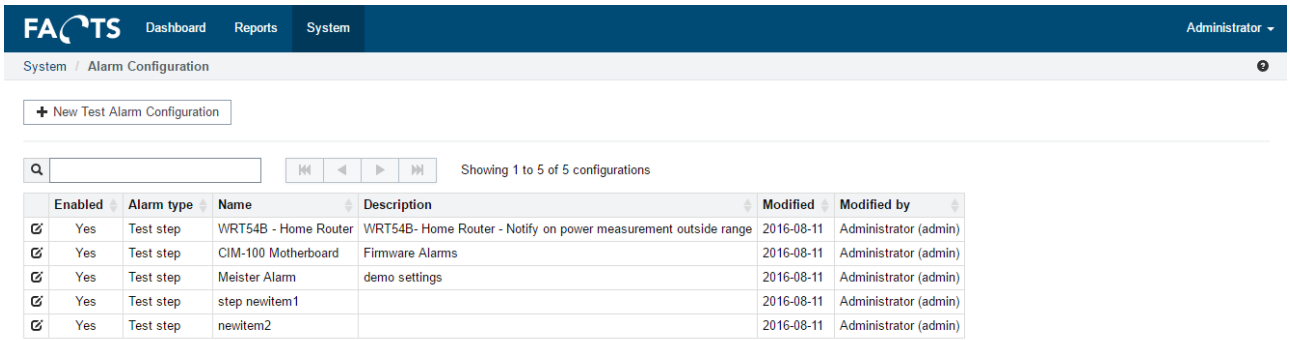
5.4.4 Test Mail Settings

Test Mail Settings can be used to verify the mail settings are correct in the config file.
The mail settings are used by the scheduler service.



5.4.5 Alarm Configuration

Alarm configuration is used to setup notifications when events that are generally considered bad, occurs. These events can be based on different criteria, such as following the WECO rulesets or custom limits for test results. Notifications are sent to distribution groups according to the configured frequency.



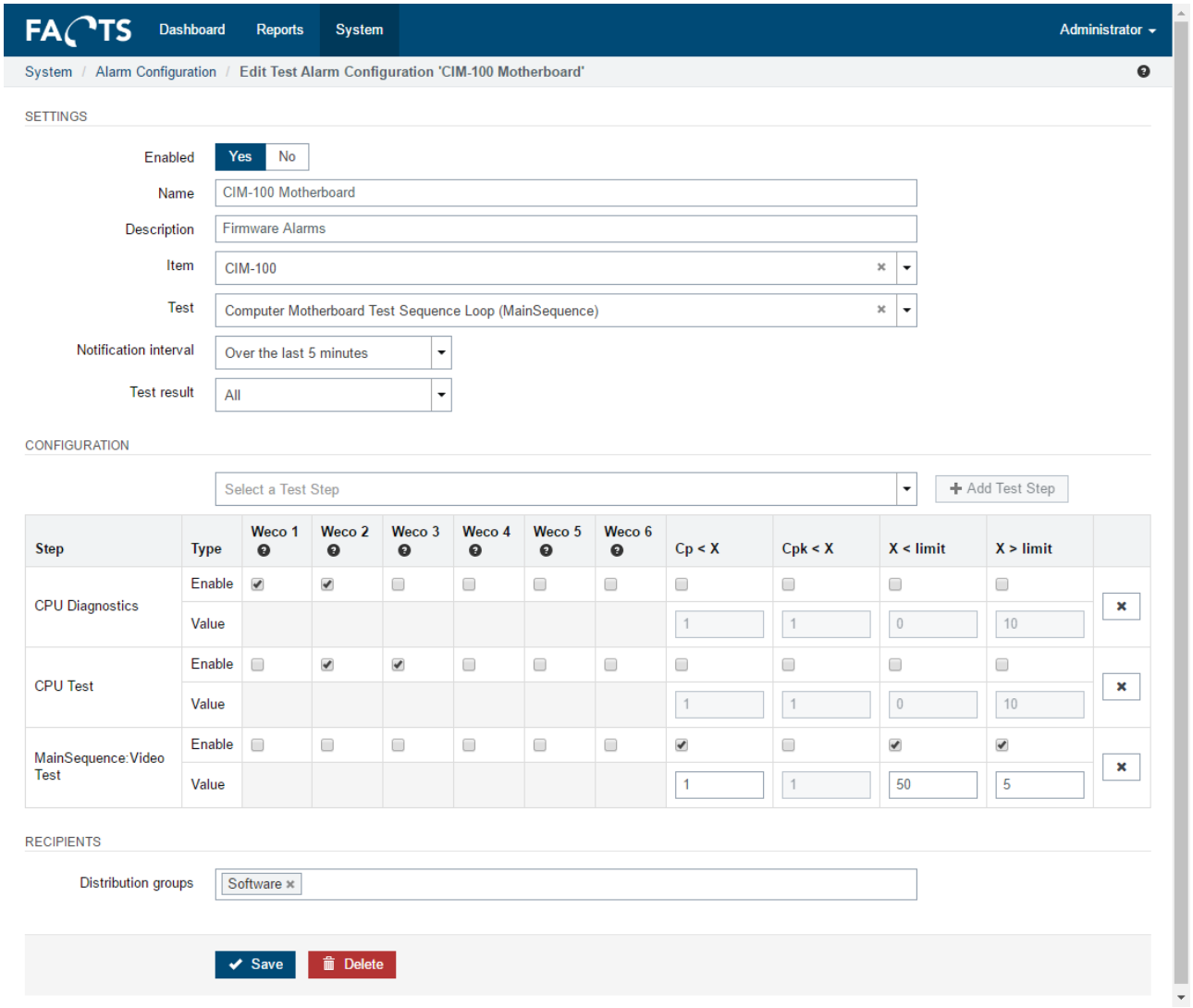
Enabled	Alarm type	Name	Description	Modified	Modified by
Yes	Test step	WRT54B - Home Router	WRT54B- Home Router - Notify on power measurement outside range	2016-08-11	Administrator (admin)
Yes	Test step	CIM-100 Motherboard	Firmware Alarms	2016-08-11	Administrator (admin)
Yes	Test step	Meister Alarm	demo settings	2016-08-11	Administrator (admin)
Yes	Test step	step newitem1		2016-08-11	Administrator (admin)
Yes	Test step	newitem2		2016-08-11	Administrator (admin)

5.4.5.1 Adding and Editing alarm configurations

To edit an existing alarm configuration, click the edit icon in the alarm configuration list. To add a new alarm configuration, click “New Test Alarm Configuration”. “Save” stores the changes to the alarm configuration task. “Delete” deletes and disables the configuration permanently (all parameters will be lost). “Delete” is only available when editing an existing alarm configuration.

5.4.5.2 Test Alarm Configuration

Test Alarm Configuration is a type of alarms configured on a test level.
They require an item and a test to be specified, before allowing you to added specific criteria on each test step.

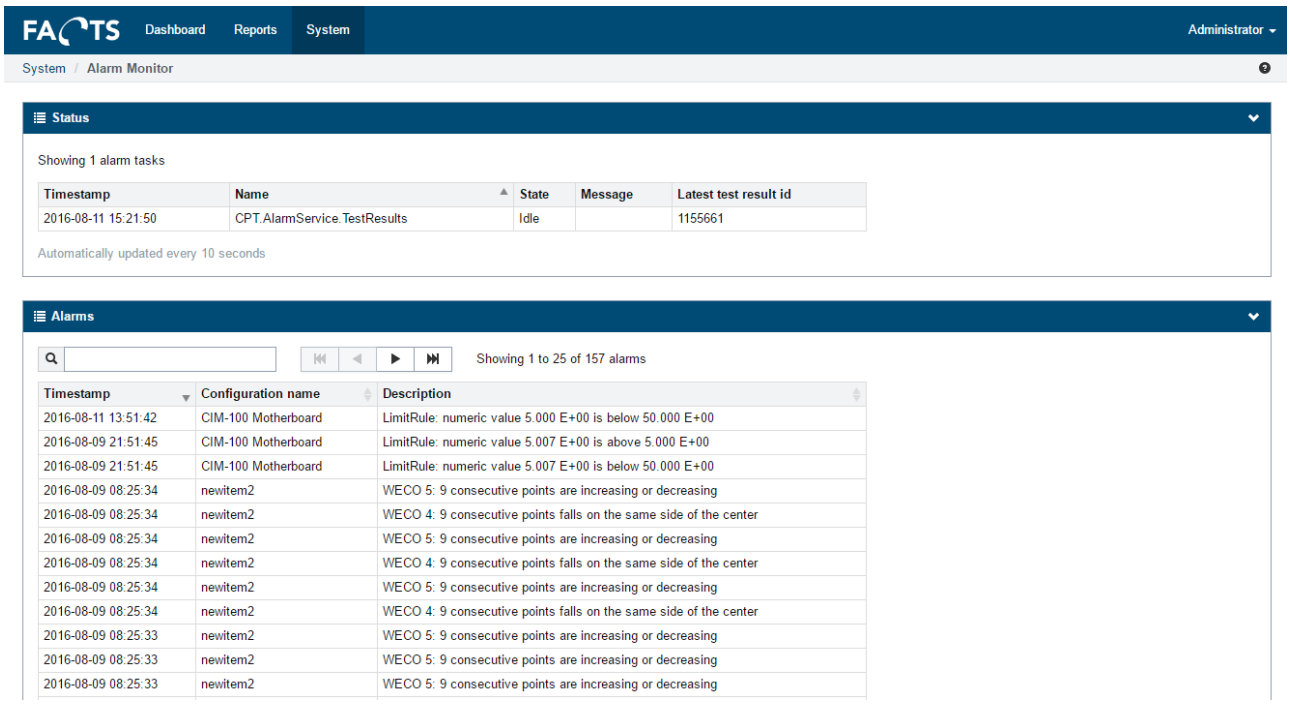


After an item and a test has been selected, individual test steps can be added to the list of checks. Each test step can then have their own set of rules.

- **WECO 1**: An alarm will be generated if value is outside 3σ
- **WECO 2**: 2 out of 3 consecutive points fall beyond the 2σ limit
- **WECO 3**: 4 out of 5 consecutive points fall beyond the σ limit
- **WECO 4**: 9 consecutive points fall on the same side of the center
- **WECO 5**: 9 consecutive points are increasing or decreasing
- **WECO 6**: An alarm will be generated if 9 consecutive points shift between increasing and decreasing
- **Cp < X:** An alarm will be generated if the calculated Cp is less than the specified value
- **Cpk < X**: An alarm will be generated if the calculated Cpk is less than the specified value
- **X < Limit**: An alarm will be generated if the tested value is less than the specified limit
- **X > Limit**: An alarm will be generated if the tested value is greater than the specified limit

5.4.6 Alarm Monitor

The Alarm monitor is used to track the status of the Alarm service and shows a log of up to 1000 alarms.

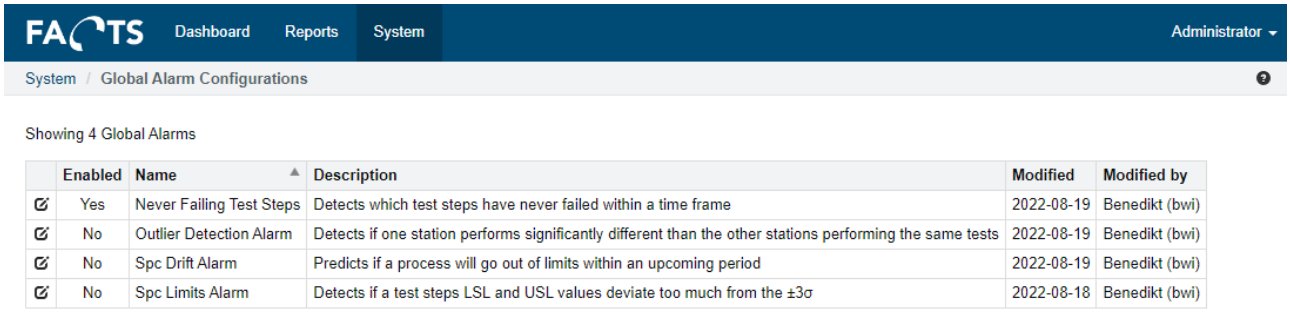


5.4.7 Global Alarm Configuration

Global alarm configuration for setting up global monitoring functions that works across all selected test / test steps. To disable the monitoring for a test step, a user can either go into the settings menu and disable the monitoring for individual test steps, or the user can press on a “Do not show again for this test step” button when a notification appears. As default the check is enabled on all test / test step combinations.
All alarm pages consist of three sections which can be configured individually. A settings section where the alarm specific configuration can be set, a recipient section where distribution groups can be assigned and a test / test step list where the individual test steps can be enabled / disabled.
Common settings for all alarms settings sections are:

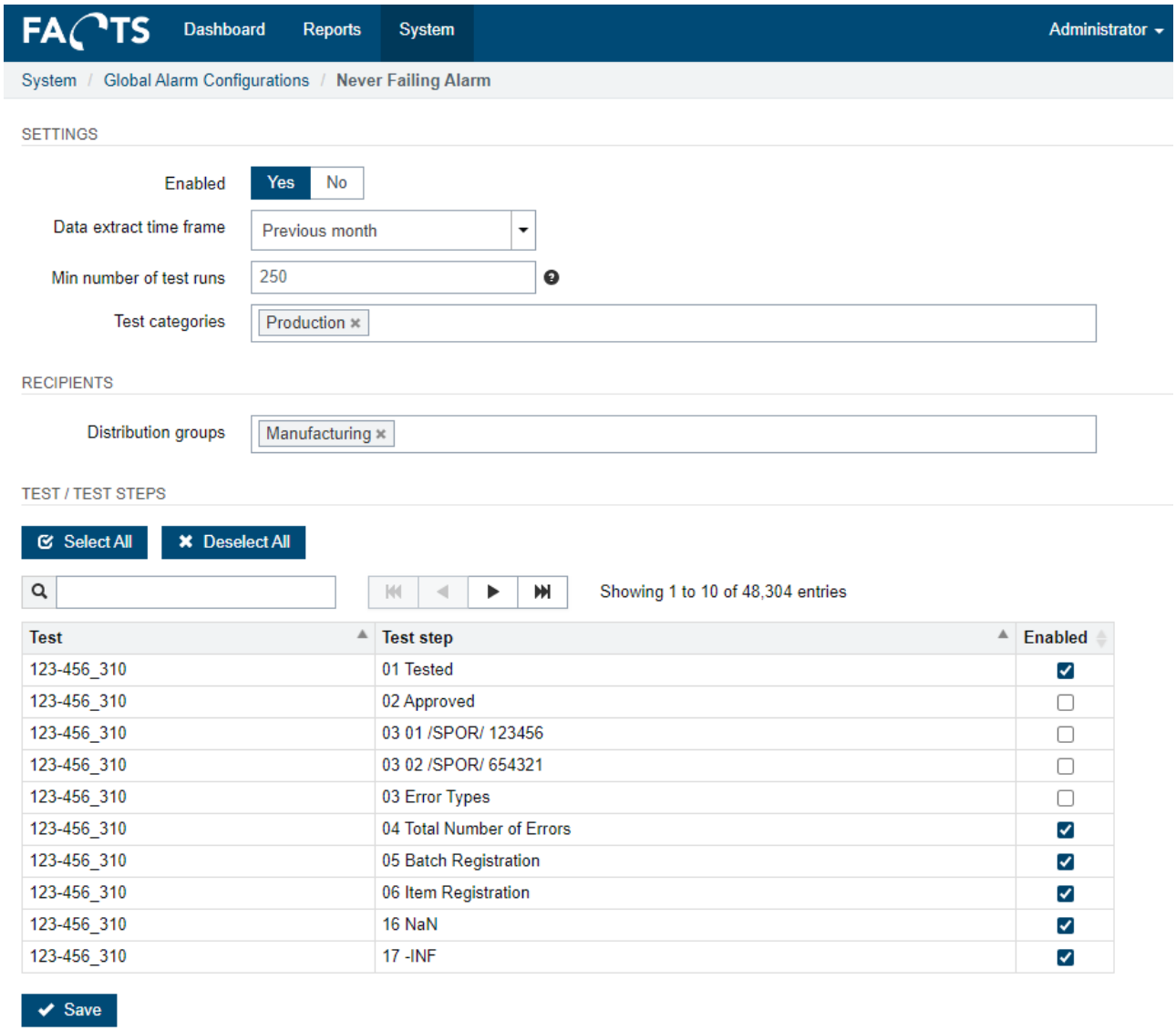
- **Enabled** – Set if the alarm should be enabled or disabled and the description.
- **Data extract time frame** – The interval of time where the alarm will search back in time from ‘now’ time.
- **Min number of runs** – The minimum number of times a test step must have run within the time frame for it to be processed.
- **Test categories** – The test categories to include in the data extraction.
- **Distribution groups** – Recipients of alarm emails.

To edit a global alarm configuration, click the edit icon in the global alarm configuration list.



5.4.7.1 *Never failing test steps*

The never failing alarm will detect if a test steps (belonging to a specific test) had never failed within a time frame.

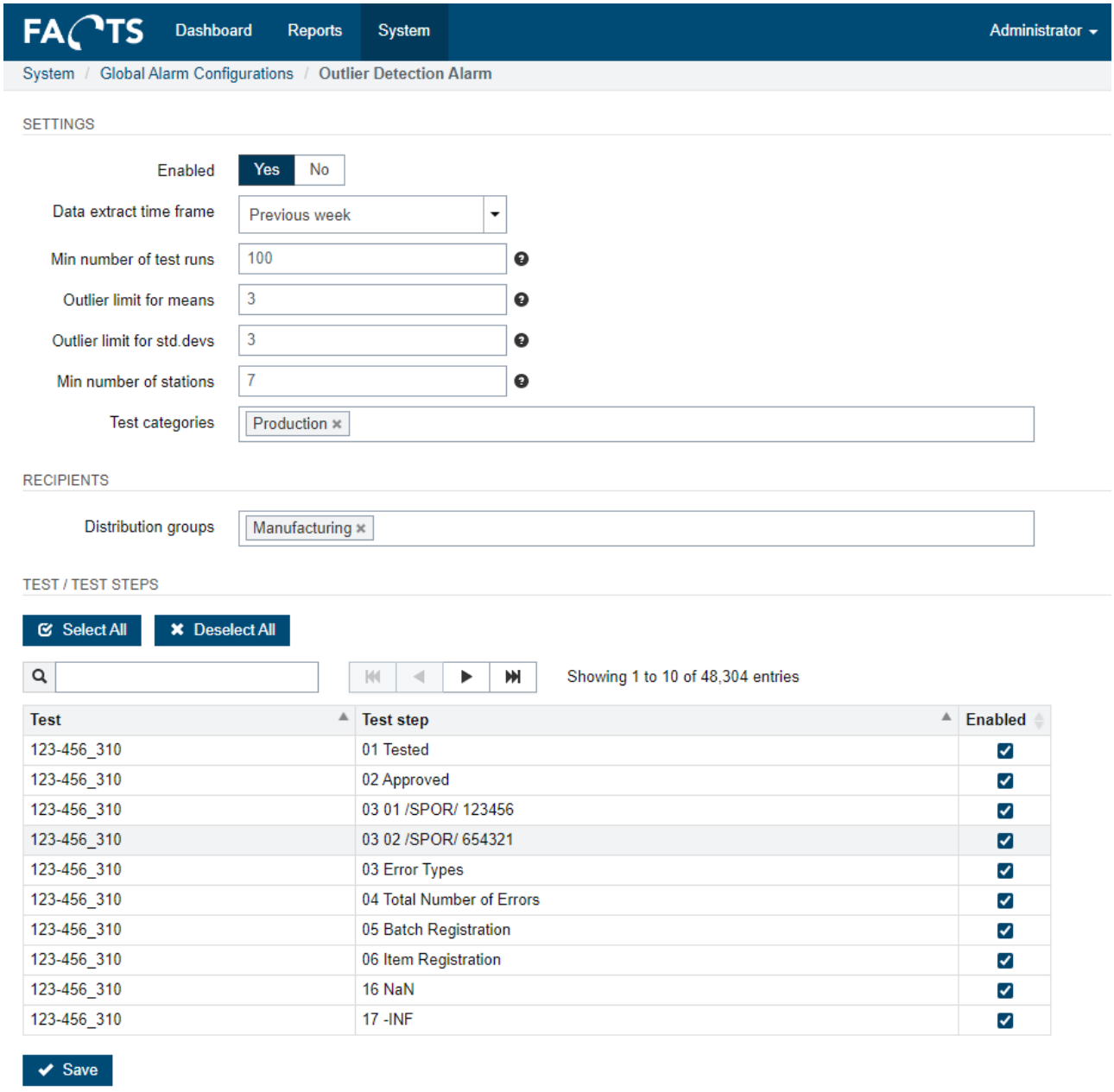


5.4.7.2 *Outlier detection*

The outlier detection will trigger if one station performs significantly different than the other stations performing the same tests.

The outlier detection will group data within a window (configurable by time frame) by station and calculate the mean and std. dev for each station. Afterwards the mean of means, mean of std. devs, std. dev of means and std. dev of std. devs are found. An alarm is raised if one of the stations "mean of means or mean of std. devs is outside the X*±σ limit (X is the **Outlier limit** configuration parameter).

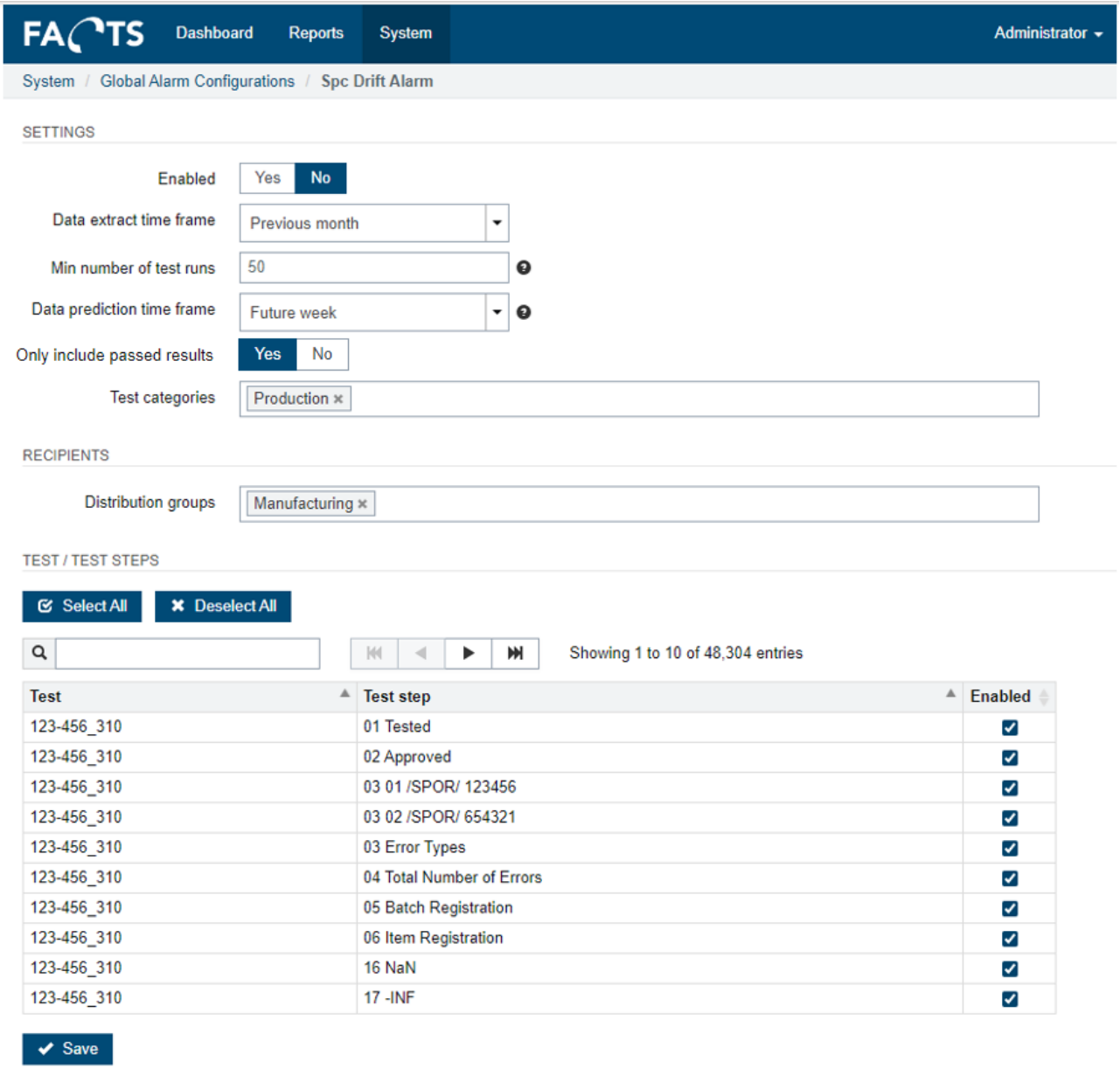
- **Outlier limit for means** – Factor that defines when a stations mean value is considered an outlier: Triggers if mean is outside of (μ ± (σ * limit)), where μ = mean of means and σ = std dev of means. 0 will disable.
- **Outlier limit for std. devs** – Factor that defines when a stations std. dev value is considered an outlier. Triggers if std. dev is outside of (μ ± (σ * limit)), where μ = mean of std. devs and σ = std dev of std devs. 0 will disable.
- **Minimum number of test stations** – Number of test stations that must have executed a test- / test step combination. Minimum is 3.



5.4.7.3 SPC drift

Spc drift alarm module and creates a linear regression model based on the test step results. If the regression model predicts that the process will go out of limits (usl/lsl) within a given period, an alarm is triggered.

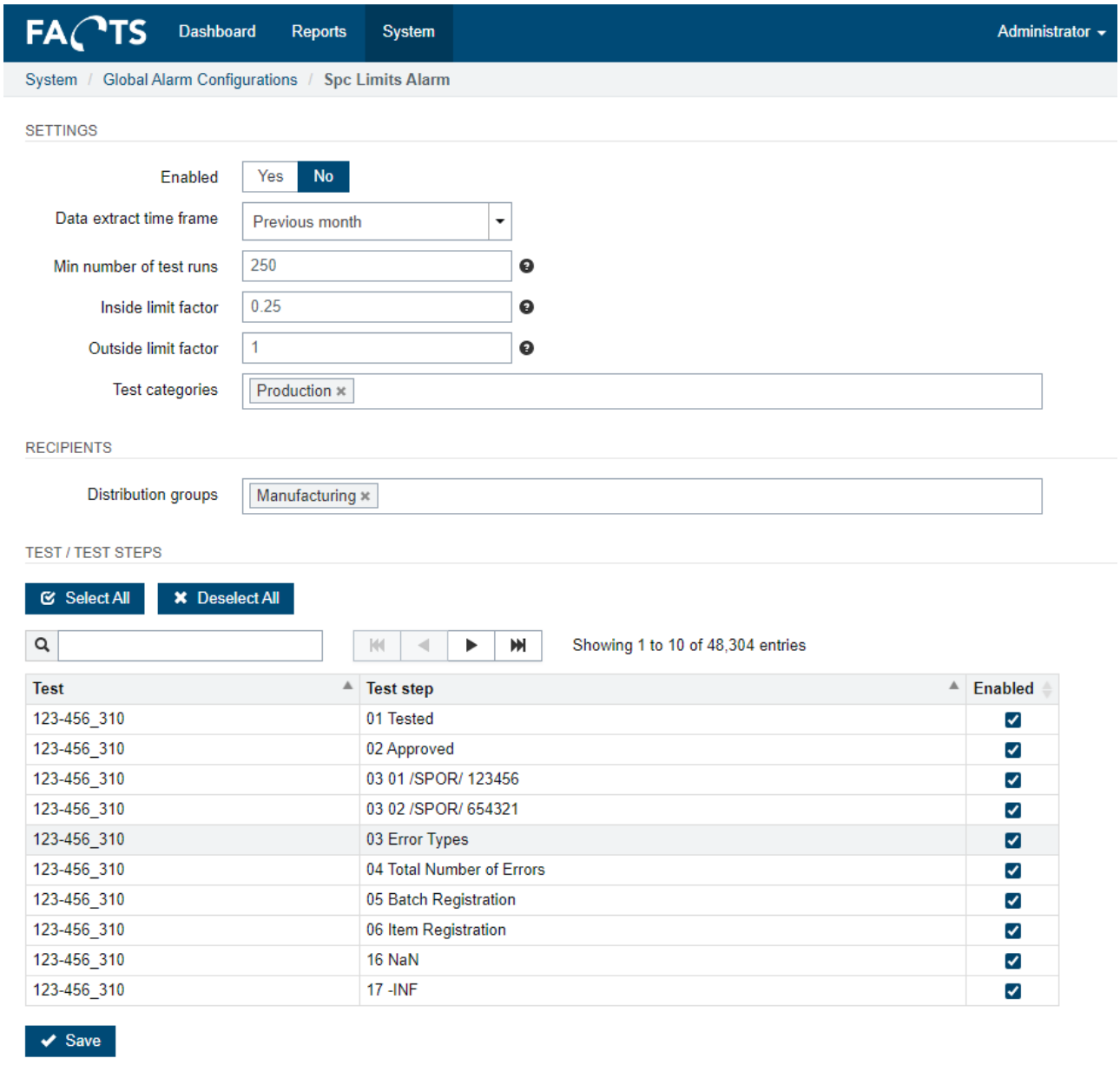
- **Data prediction time frame** – If the regression model predicts that the SPC value would exceed the usl or lsl limit within this time frame, an alarm is triggered
- **Only include passed results** – If set to Yes, the algorithm will only include test step results in the regression model that have passed the test.



5.4.7.4 SPC limits

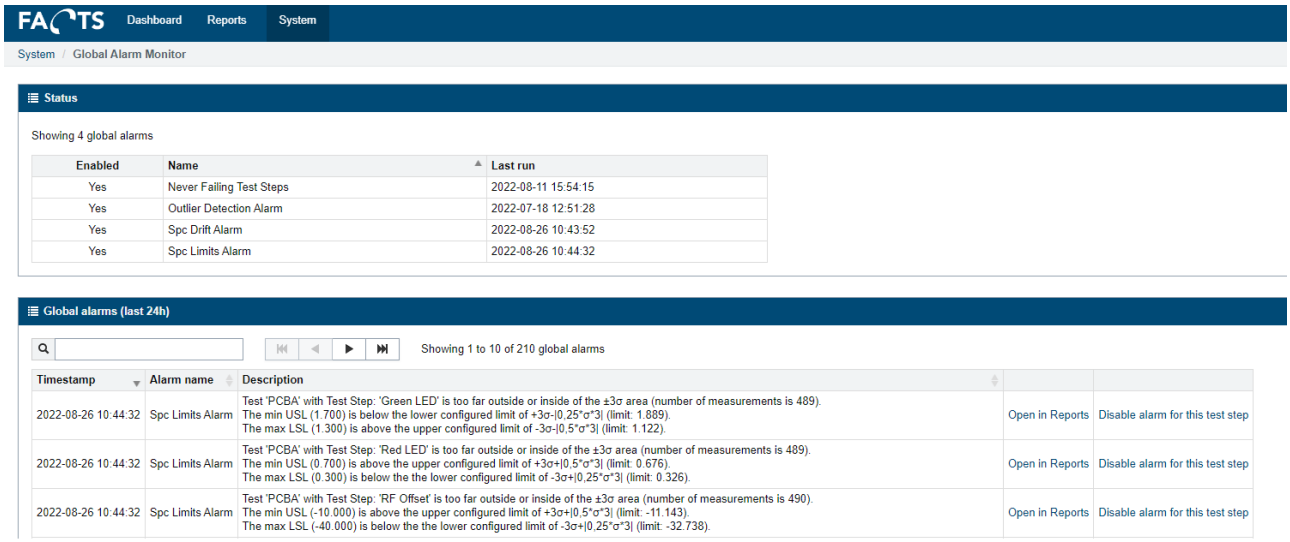
Spc limits module takes two parameters that defines how much, the ±3σ is allowed to deviate from the corresponding usl/lsl limit. If a limit deviates too much, the operator is notified and can access the report by clicking on the notification, with the suggested USL and LSL simulated.

- **Inside limit factor** – How much narrower than the usl/lsl limits are the 3*±σ values allowed to be before an alarm is triggered.
  Triggered if (USL < (μ+3σ) - |3σ *factor|) or (LSL > (μ-3σ) + |3σ *factor|).
- **Outside limit factor** – How much wider than the usl/lsl limits are the 3*±σ values allowed to be before an alarm is triggered.
  Triggered if (USL > (μ+3σ) + |3σ*factor|) or (LSL < (μ-3σ) - |3σ*factor|).



5.4.8 Global Alarm Monitor

The Global Alarm monitor is used to track the status of the Global Alarm service and shows a log of all alarms from the last 24h.

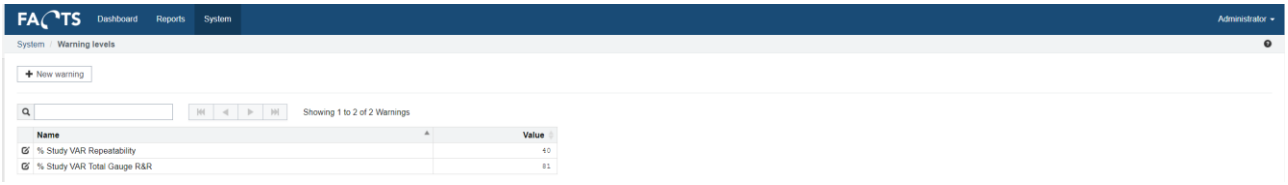


5.5 GAUGE R&R

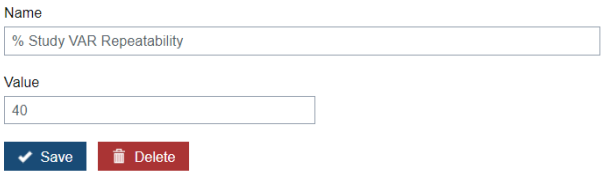
GAUGE R&R configuration is used to setup color warnings on the Gauge R&R main page. Color warnings are set up per column.

5.5.1 Warning levels

It is possible to set color warnings on each column (‘% Study VAR Total Gauge R&R’, ‘% Study VAR Repeatability’ and ‘% Study VAR Reproducibility’). These warnings are triggered if the value exceeds the value set up in the Warning levels settings. If there is no warning value set on a column (‘% Study VAR Total Gauge R&R’, ‘% Study VAR Repeatability’ or ‘% Study VAR Reproducibility’), then warning for the column is disabled.



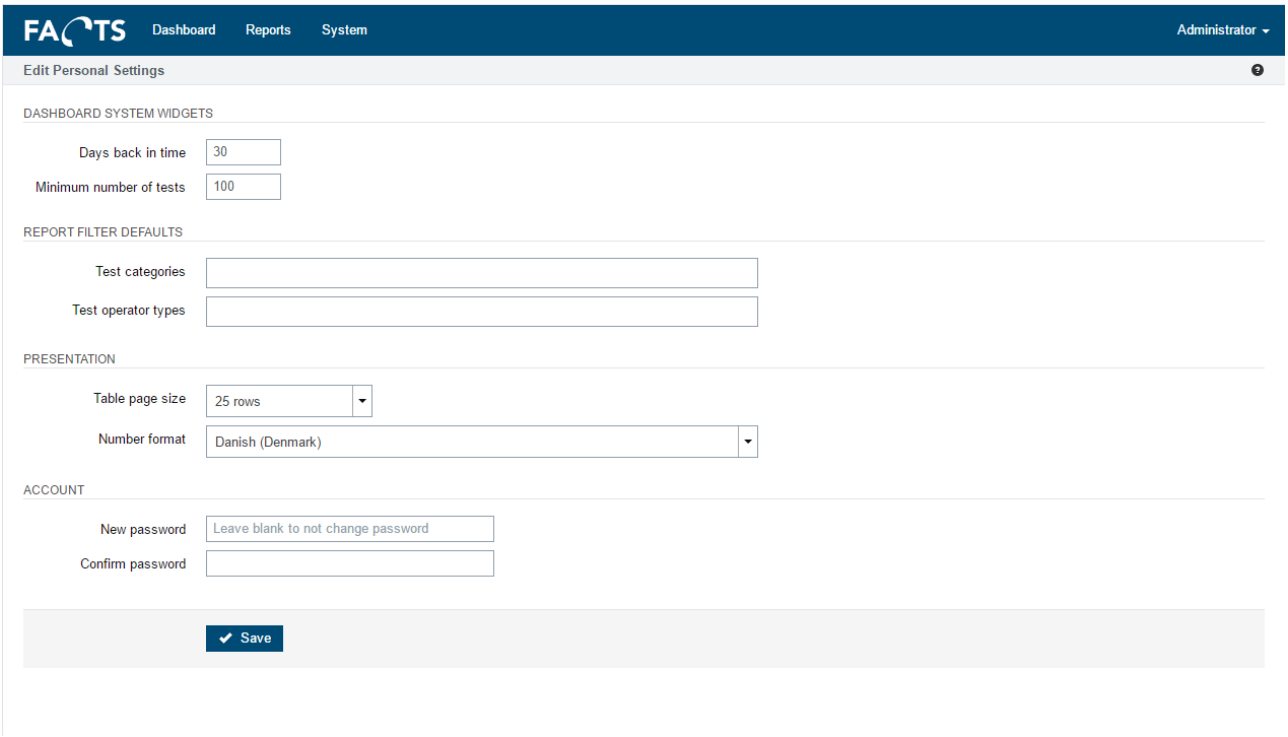
Each color warning can be edit or deleted via this icon .



6 Personal settings

6.1 Settings

To edit personal settings, select ‘User name’ to the right in the menu bar and click Settings. (In the example below, the user name is “Administrator”)



Dashboard Settings:

Days back in time:	Number of days to look back in Dashboard reports
Minimum number of tests:	The number of tests required to qualify for appearance on the dashboard

Presentation Settings:

Table page size:	Specifies the number of rows per page in reports presenting data in grids (tables).
Number format:	Specifies how numeric measurements are presented

Account Settings:

New password:	Used to set a new user password
Confirm password:	Used to set a new user password. Must be identical to “New password”

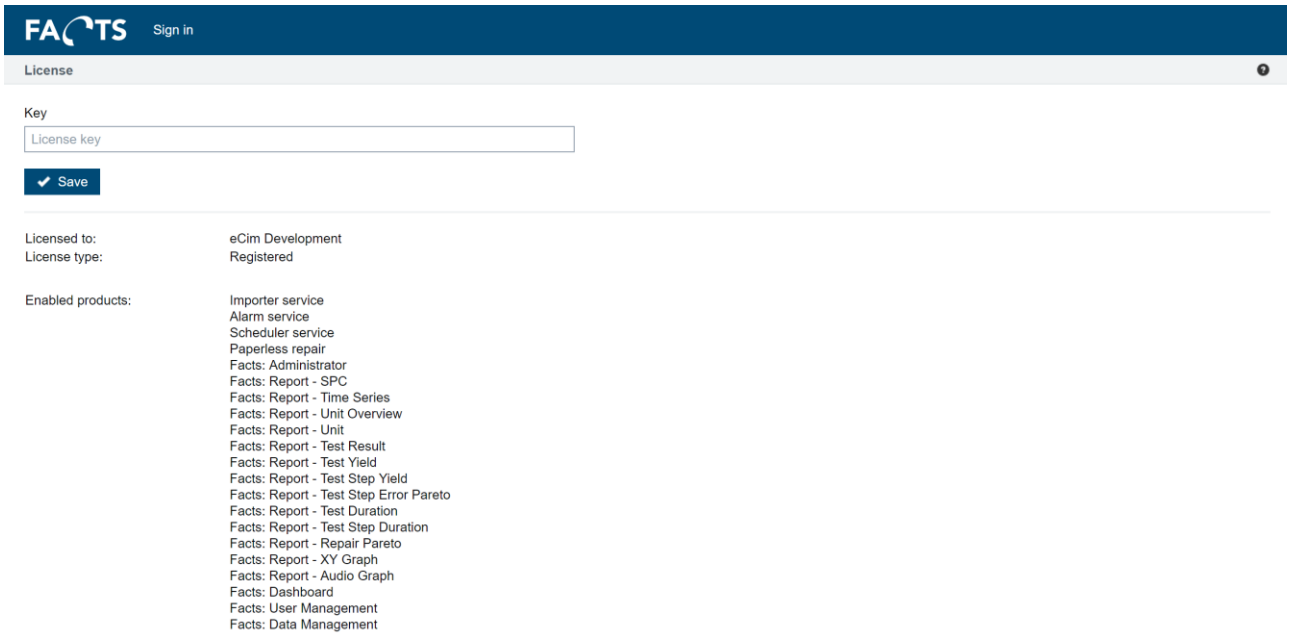
Save button stores changes.

6.2 Sign out

Sign out, and present the sign in page.

7 License

FACTS requires a license to run. This license is used to determine which products are enabled for the installation. To edit the license select the FACTS logo in the upper left and click “License Management”. The window shows an input field to type in the license key, and information about the current license.



8 Statistical calculations

In the SPC report, a number of statistical values are calculated and used for presentation. This section shows the formulas used to calculate these values. The formulas are shown for reference only. Please refer to special articles and literature regarding the practical use and limitations of the calculated values.

In the formulas below, USL and LSL denotes the upper specification limit and the lower specification limit.

8.1 Formulas

8.1.1 Mean value ($\bar{X}$)

$$Mean = \bar{X} = \frac{1}{n}\sum_{i=1}^{i=n} X_i$$

8.1.2 Standard deviation (σ)

$$\sigma = \sqrt{\frac{1}{n-1}\sum_{i=1}^{i=n}(X_i - \bar{X})^2}$$

8.1.3 Capability (Cp)

$$C_p = \frac{USL - LSL}{6\sigma}$$

8.1.4 Capability Index (Cpk)

$$C_{pk}USL = \frac{USL - \bar{X}}{3\sigma}$$

$$C_{pk}LSL = \frac{\bar{X} - LSL}{3\sigma}$$

$$C_{pk} = \frac{Min[\,(USL - \bar{X}), (\bar{X} - LSL)\,]}{3\sigma} = Min[\,(C_{pk}USL), (C_{pk}LSL)\,]$$

8.2 Special value handling

In order to avoid misleading values for any of the capability values (Cp, Cpk, Cpk USL and Cpk LSL) in case of special circumstances in the test data, a special “error value” is used. In case any of the mentioned capability values are less than -999.999 or greater than 999.999, the resulting value will be set to -999.999 or 999.999 respectively.

9 Revision History

Revision	Date	Initials	Description
0.1	2013-04-29	LDI	First version
1.0	2013-05-01	LDI, RD	Review
1.1	2013-05-23	PCL	Dashboard minimum number of tests
1.2	2013-12-17	RD	Updated screen shots and filter options availability (most pages)
1.3	2014-05-11	PCL	Removed obsolete Test completion filter and added Test categories filter.
1.4	2016-05-20	KIP	Added information on Alarm Service, distribution groups, panel config and dashboard configurations.
1.4.1	2016-06-02	KIP	Updated images; renamed CPT to FACTS
1.4.2	2017-08-03	KIP	Added new Widgets
1.4.3	2018-08-12	RBN	Added Gauge R&R
2.2	2021-06-18	ACB	Added section for Test steps, test and test sites.
2.4	2022-07-14	BWI	Added sections for DPU report and Final tests report filters
2.5	2022-07-15	BHA	Added sections for trend line and simulated limits in report filters Added section for Global alarm configuration and station comparison report.