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Qual-View
User Guide
Software for single phase network analyzers MAP 604/607
(English Version)
## User Guide’s Release Note

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Introduction

Congratulations to your choice of ENERDIS instruments and the Qual-View software. We hope that it will help you in your professional power quality analysis.

ENERDIS has specially designed the MAP604/MAP607 Series’ measuring instruments and the Qual-View software to be user friendly and flexible to work with. The software can be used to make individual settings of each measuring instrument according to customer demands. The ENERDIS MAP600 Series measuring instruments are developed to fulfil class A according to the important norm IEC 61000-4-30. This will guarantee the user to have a reliable reference instrument whenever there are questions about the power quality.

In addition all ENERDIS Power Quality measuring units can make internal report analysis according to national standards like the EN 50160 norm.

Good luck with your measurements!

Best regards

ENERDIS
# Qual View – User guide (English Version)

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I. General system information

The Qual-View software is made to be used together with the Enerdis MAP 604/607 series measurement instruments. The software is used for configuration, communication and real-time analysis plus graphical long time analysis including event viewers, graphical analysis windows and automatic report generators.

All of the Enerdis MAP 600 Series units are developed to measure voltage quality and disturbances in the electrical grid and can be permanently installed in delivery points and substations.

Enerdis has designed them to fulfil class A according to the important IEC 61000-4-30 norm. Together with a unique price/performance relation this gives the utilities new possibilities to install high performance units at all levels of the electrical grid and even in the delivery points to the end customers. It will also give industrial customers an improved possibility to monitor the internal electrical grid down to each machine.

All of the measuring units are developed according to the Enerdis IMU® concept (Intelligent Measurement Unit) which means that the units can perform intelligent analysis and calculate information direct in each unit before sending alarms to the central analysis system.

The Enerdis IMU® concept also contains the internal report analysis function according to national voltage quality norms. This minimizes the data amount that needs to be transferred from the measuring units to the central analysis system.

Below, the picture shows the different levels in the electrical distribution grid where the Enerdis measuring units can be installed.

![Electrical distribution grid diagram](image)
II. Software installation

Before you install Qual-View, make sure that the computer operating system is Windows NT/2000/XP. For the built in report generator Microsoft Word 2000 or a later version need to be installed.

To install the Qual-View software:

1. insert the CD into the CD drive unit
2. In an explorer window open the CD and run the Setup.exe file.
3. In the installation software, follow the directions.

When installation is complete, the program will start using English as default language. To select a different language, open the settings menu and select “Language”. Change language and restart the program for the changes to take effect.
III. Qual-View – Measurement Analysis

Qual-View is a powerful and user friendly tool for analysis of power quality measurements and event analysis. Qual-View is adapted to be used together with any of the different power quality measurement units developed by Enerdis.

i. Starting the program

When Qual-View is started a browser window is opened where you may select a measurement file to analyse. After selecting a file, press Open.

After the measurement file is loaded an information window, Figure 3, is opened. Here, information about the model of the measurement unit is given, together with a summary of the long time data parameters and a summary of the number of all different events.

Figure 2 - Browser starting window
In the main window of the program analysis and evaluation of the measurement files is performed. All parameters measured can be reached from here, navigating via tabs. Depending on what type of measurement unit have been used to generate the measurement file and which power quality parameters that have been measured, only those will be possible to select in the tabs.

In Figure 4, the main window is shown with a measurement file generated using a MAP604/607 measurement instrument. The MAP604/MAP607 is a 2 channel instrument and measures voltage between Phase-to-Neutral and Phase/Neutral-to-Ground. In the software the Phase-to-Neutral is represented by L1-L2 and Phase/Neutral-to-Ground by L2-Ground. When a measurement file is loaded which has been generated from a multi channel instrument (MAP 620/640) all channels are shown as in Figure 5.
Figure 4 - Main window with a MAP604/607 file loaded.

Figure 5 - Main window with a measurement file from a MAP620/640
ii. Navigation

1. Language

To select the language setting in the program, select “Language” in the Settings menu.

Select a language among the available options. The program needs to be restarted for the changes to take effect.

2. Load file

To load a measurement file directly from the main window, press the “Load data” button in the bottom left corner, Figure 8. In the browser window select the measurement file you want to open. The measurement files are always saved in the MPQ file format.
3. **Redraw**

Every time a new parameter is selected to be viewed graphically the graph needs to be redrawn. To redraw a graph, press the “Redraw” button.

4. **Unselect all**

The “Unselect all” option, Figure 9, is used to cancel all previous parameter selections in all tabs.

5. **Summary**

The “Summary” button in Figure 9, gives access to the information window in Figure 3. There is a summary of the parameter data and the number of different events during the time of the measurement.

6. **Drawing functions**

Qual-View is a tool for graphical analysis of measurement data. The program contains several different tools for simpler analysis. The tools are reached and displayed in a list by right clicking on your mouse when holding the mouse cursor over the graph. The list is displayed in Figure 10.

The different drawing functions are described in the next coming chapters.
7. Copy, Save Image as and Print

To copy, print and save a graph directly in the program is made very simple, by right clicking in the graph and select one of the functions. When copying a graph, the graph can be pasted in a text document, for example in MS Word.

When saving an image it is possible to specify the format to which the image should be saved. Normally the jpg format is recommended.

To make a printout of a graph, select the print option.

8. Axis settings

The default axis settings, in Qual-View, are set to auto scale. To manually set the axis scaling right click in the graph and select “Axis settings”, unmark the “Auto scale” box, set the axis and press “Redraw”

![Figure 11 - Axis settings (scaling of axis)](image)

To once again turn on the auto scale function, tab the “Auto scale” box and then deselect the Axis settings function.

9. Zoom

In the graphs it is possible to zoom in and out to get a better overview of the measurement period. By holding down the left mouse button and then dragging the mouse in any direction it is possible to select an area to zoom in on by making a square around this area.

![Figure 12 - Zoom In](image)
When the zoom function has been activated by zooming in on the graph, it is possible to move in the x- or y-direction by pressing the shift button and then with the mouse cursor move the entire graph. When pressing the shift button the mouse cursor will transform into a hand symbol.

To go back to normal view, right click in the graph and select "Undo All Zoom/Pan", alternatively select “Set scale to default”

10. Simultaneous zooming

In Qual-View, it is possible to display several graphs of different measurement parameters at the same time. If multiple graphs are displayed, it is very convenient to activate the function “simultaneous zooming”. When zooming in on one of the graphs, the other graphs will then automatically adapt and zoom in into the corresponding time period.

Figure 13 - Simultaneous zooming of multiple graphs.
11. Show detailed information of sample points

When right clicking in a graph it is possible to tab the function “Show Point Values”. When holding the mouse cursor over a sample point in the graph, a box with point values, containing time and magnitude will then be displayed in the graph.

![Figure 14 - Detailed information for every point sample.](image)

12. Insert comment in graph

To insert a comment into the graph, right click in the graph and select “Add/edit comment”. The comment is limited in size and to change row when editing, click on the second row in the “Comment” window.

![Figure 15 - How to insert a comment](image)
13. Show min/max and norm-limits

By tabbing the boxes “Show min/max lines” and “Show norm limits” according to Figure 16, lines will mark the norm limits and the maximum and minimum measured values. By enabling those options, it is possible to see whether the voltage is outside the norm limits or not.

![Figure 16 - Markers for min/max-values and norm limits](image)

When enabling the box “show norm limits”, it is also possible to select for which norm the limits should be shown, for example EN 50160 or FoL. In the box “Unom” the nominal voltage value of the norm can be set.

Update the graph by clicking on the Redraw button.
IV. Eventlog

Every event in a measurement data file can be studied in an eventlist. This list of events is found under the tab “Eventlog”.

It is possible to select which events should be shown in the event list in the filter section according to Figure 17. Select the event types that you want to see and then press the “Show eventlog” button to see the list. The event list is shown according to Figure 18.
The event list contains information about time of the event, name of the measurement unit, type of event, direction if sag or swell, and values of the event, and more. For those events when the Data/Graph column is marked with a “Yes”, the possibility to display the event graphically in the tab “Event analysis” exists.

The events can be sorted on the basis of the category in different columns by clicking on a column.

In the column “Values”, detailed information of each event is shown. To get an explanation of the values, tab the box “Show details” and hold the mouse cursor over an event that wish to analyse.

i. Detailed information of events

The picture below shows detailed information of an event.

![Figure 19 - Detailed information for an event](image)

ii. Event analysis

The tab “Event analysis” is used to evaluate fast disturbances (sag/swell, transients) and interruptions graphically.

![Figure 20 - Event analysis](image)
Explanation to the above picture:

A. Select the channels that you want to show in the graph. It is possible to change the colours of each channel by clicking on the colour box and selecting a colour in the palette.

B. For Sag/Swell events it is possible to record both waveform and ½ period RMS values. For transients waveforms are always recorded. In the boxes select what type of graphs that shall be displayed.

C. Detailed information is shown for each event, such as the time and the type of the event. Only the events that have recorded graphs will be shown in the event analysis window. The remaining events, such as for example report events can be observed in the event list.

D. Click on “next” to study the next event or “previous” to study the previous event.

For sag/swell events the measurement instruments can be configured for recording of both ½ period RMS values and waveforms with up to 12.8 kHz sampling velocity.

1. Voltage and current analysis

Dependent on which model of the measurement instrument that has been used to generate a measurement data file, either just voltage or both voltage and current has been measured. The MAP604/607 only measures voltage. In the tab “Voltage”, medium, minimum and maximum values will be shown for voltage for every channel. For an instrument that measures both voltage and current, the tab will be called “Voltage/Current” and medium, minimum and maximum values will be shown for both voltage and current for all channels.

Figure 21 - Voltage analysis with MAP604/607 instrument
Figure 22 - Voltage analysis with MAP620/640 instrument

The min and max values are the maximum and minimum measured ½ period RMS value for each storage interval. The storage interval can be configured manually and set down to 6 second intervals.

2. Harmonics

The tab “Harmonics” contains information of harmonics, both THD and individual harmonics up to the 50th harmonic. Select channel and press “Redraw” to draw the THD graph.

Figure 23 - Harmonics tab with THD graph
For analysis of individual harmonics press the “Harmonics” button. A list of the individual harmonics appears on the screen. Select which individual harmonics you want to analyse and press “OK”.

![Figure 24 - Selection of individual harmonics](image)

It is possible to select multiple individual harmonics at the same time by dragging the mouse cursor over the wanted numbers and holding down the left mouse button.

When analysing THD and individual harmonics at the same time the parameters will be divided into two separate graphs, one displaying the THD in % and one displaying the individual harmonics.

![Figure 25 - THD and individual harmonics](image)
3. Flicker

In the “Flicker” tab, long time flicker Pst (2h interval) and short time flicker Plt (10min interval) can be analysed for every channel. Instant flicker can be read in real time in Qual-SRT.

![Figure 26 - Flicker analysis (Pst & Plt)](image)

4. Unbalance

In the “Unbalance” tab it is possible to analyse total unbalance Ub(%), the positive sequence Ub+ (pos), the negative sequence Ub- (neg) and the zero sequence component Ub0 (zero). The “Unbalance” tab is not shown for MAP604/607.

5. Power

In the “Power” tab you can analyse active, reactive and apparent power. It is possible to either analyse each phase itself or look at the total power for all phases. Also, there is the possibility to display the cos(φ) and the power factor PF.

The three power components are represented with the following letters:

P  Active power
Q  Reactive power
S  Apparent power

This tab is not available for MAP604/607

6. Energy

In the “Power” tab there is a tool for energy calculations. Clicking on the button “Energy” opens up a window as in Figure 27, where a summary of the total energy consumption for the measurement interval is given as well as a 24 hour mean value of the energy consumption.

This tab is not available for MAP604/607
7. Frequency

Frequency is analysed from the “Frequency” tab. According to the EN 50160 norm a mean value of the frequency should be calculated each 10 seconds. The result is a large amount of measurement data which requires much memory. When downloading data from a measurement unit it is not always of interest to analyse the frequency data, which therefore is not always needed to be downloaded.
V. Report Generation

In Qual-View, there is a function to create the basis for reports according to the selected norm, for example EN 50160. In every Enerdis Power Quality instrument, the report is generated internally every week. The reports are stored as a report event which later can be displayed in the event list where it is possible to see if the report was approved or not.

i. Create a report

Using qual-View, the reports can be generated as a *.rtf document and opened in MS-Word in just a few clicks. To generate a report click the “Create Report” button in the “Tools” menu according to the picture below. To be able to generate a report the condition is that the measurement period is at least one week and that report event has been generated in the measurement data file.

In the permanent measurement units the reports are generated each Monday at 00:00. The report time interval reaches from Monday 00:00 to Monday 00:00. For the portable instruments the start time of the report is the same time as the start of the measurement, and the first report will then be generated one week after the measurement was started.

![Create Report](image1)

After clicking the “Create report” button a browser window is opened where you should select the measurement file for which you want to create a report.

![Browser window - select measurement file](image2)
The report event data is read from the selected measurement file, and the available reports are presented according to the picture below. In the information window it is possible to see if the report has passed or failed according to the norm.

By double clicking on one of the reports, the report will be generated as a *.rtf file and will automatically be opened in MS Word. The report is automatically saved on the computer hard drive at the same location as the measurement file.

If a measurement file only contains only one report event, the report will automatically be generated and opened in MS Word when clicking on the “Create report” button.

The reports are possible to edit in MS-Word after they have been generated by Enerdis Report Generator, to provide the possibility to customise the contents and design of the report.
The weekly reports contain a summary of the result of the parameters that have been analysed, with each parameter presented as passed or failed. For each parameter detailed information is presented with for example minimum and maximum values for the measurement period and also the boundary conditions of the norm. If there is customer complaints the report may serve as the basis for a discussion concerning power quality issues.
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A genuine on-site measurement service

ENERDIS is also a team of experts capable of carrying out on site all the types of measurements required for the sizing, maintenance, quality and safety of your electrical networks.