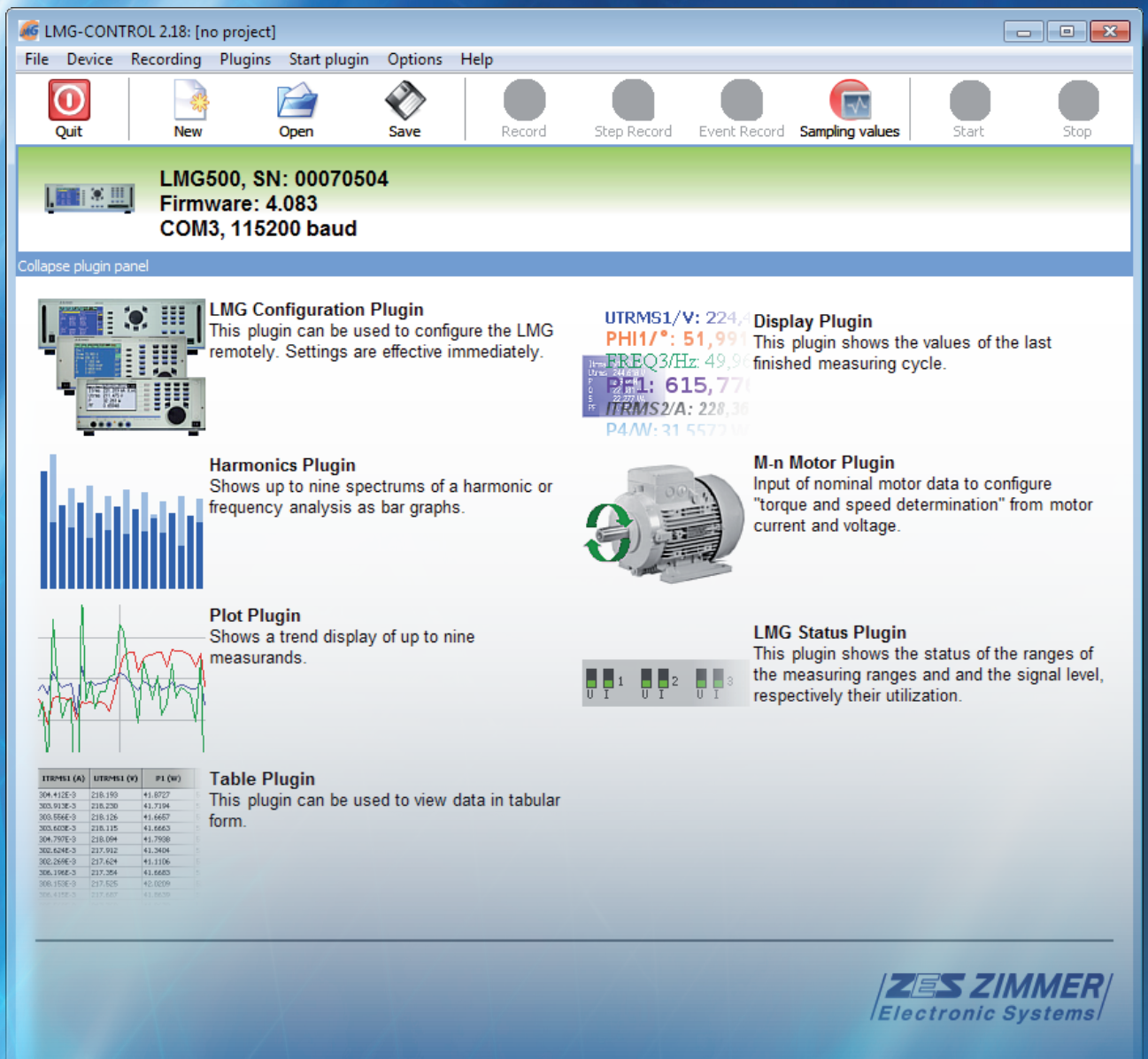
LMG-CONTROL

The LMG in your PC for configuration, logging and analysis



- Real-time display of configuration and measuring values
- Transfer of up to 3000 measuring values per second
- Timestamps with a resolution of 1 millisecond
- Versatile analysis of sampling values
- Export of measuring values to other applications

LMG-CONTROL at a glance

LMG-CONTROL is the convenient software for ZES ZIMMER® power meters of the LMG series to configure the instrument and display, analyse and log the measuring values.

The modular design of the software allows for various plugins which display the current measuring values in different ways. Any number of plugins with any measurands can be started simultaneously.

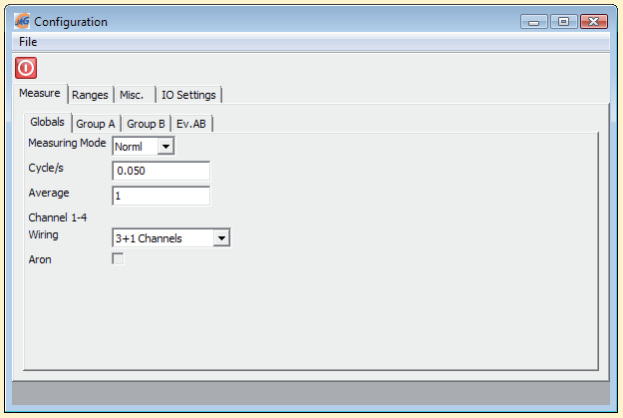
A special feature of LMG-CONTROL is the saving and loading of the instrument configuration together with the settings of the software in a single project file. The benefit is that a specific measurement task can be repeated with just one click after loading the project. Furthermore, the software features an extended editor for the scripts in the ZES ZIMMER® power meters, which add user-defined measurands to the instrument.

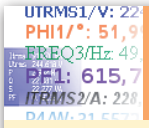
LMG-CONTROL can be used to create a report containing all configuration settings and the current measuring values of a measuring setup. This status report is especially useful for remote diagnosis and provides an overview of the actual state of the power meter during measurement for the user as well as the ZES ZIMMER® support team.

LMG-CONTROL Basic version

LMG Configuration plugin

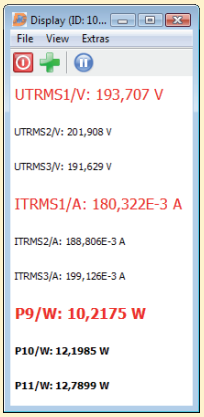
It is often difficult or undesired to operate the device manually and via software at the same time. Therefore, the LMG Configuration plugin provides a remote control functionality to completely adapt the LMG to the measuring task at hand. Changes of the settings via LMG-CONTROL are immediately visible on the display of the LMG. For easy handling the configuration menus (Measure, Ranges, etc.) from the LMGs have been recreated in the software. This allows fast switching without rethinking.

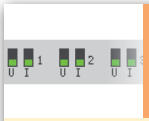




Display plugin

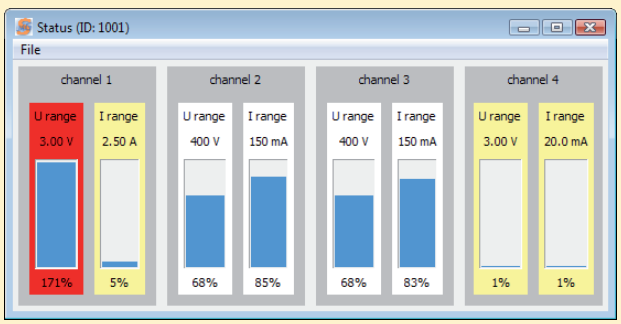
The Display plugin is a fast and efficient view of the measured values. Font type, size and colour can be customised. Thereby the measurands can be displayed clearly and the important ones highlighted.





LMG Status plugin

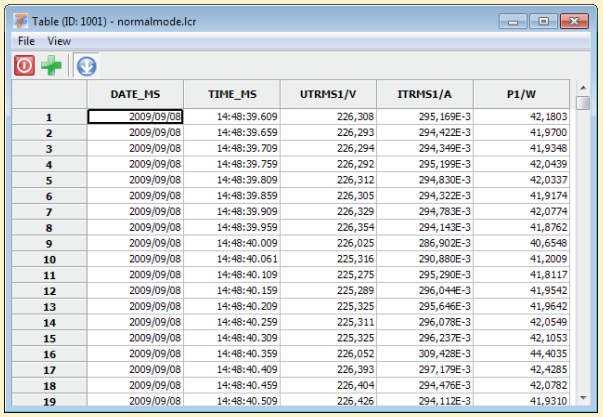
Nothing is more annoying than incorrect measurement because of measuring in overrange or underrange. If you add the LMG Status plugin to your measurement projects it will visualise the current usage of range as coloured percent bars. The percentage of measuring value to upper range value is also available, which is important to evaluate the measuring uncertainty of each measuring value afterwards.



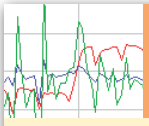
LMG-CONTROL Basic version

Table plugin

The tabular list of the measuring values shows the variation with time during measurement. This lets you observe values from previous measuring cycles and recognise correlations between the measurands.

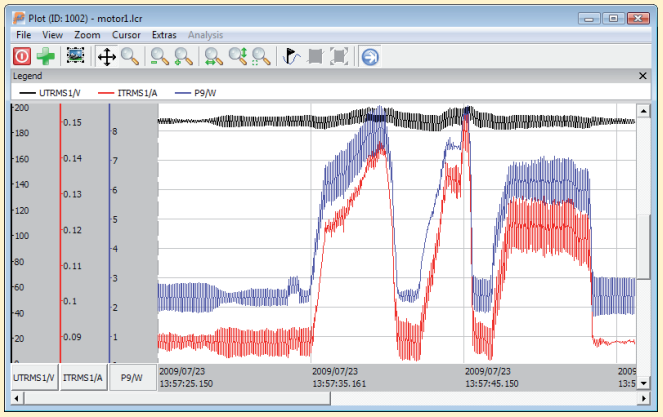


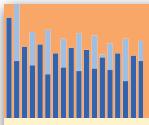
	DATE_MS	TIME_MS	UTRMS1/V	ITRMS1/A	P1/W
1	2009/09/08	14:48:39.609	226,308	295,169E-3	42,1803
2	2009/09/08	14:48:39.659	226,293	294,422E-3	41,9700
3	2009/09/08	14:48:39.709	226,294	294,349E-3	41,9348
4	2009/09/08	14:48:39.759	226,292	295,199E-3	42,0439
5	2009/09/08	14:48:39.809	226,312	294,830E-3	42,0337
6	2009/09/08	14:48:39.859	226,305	294,322E-3	41,9174
7	2009/09/08	14:48:39.909	226,329	294,783E-3	42,0774
8	2009/09/08	14:48:39.959	226,354	294,143E-3	41,8762
9	2009/09/08	14:48:40.009	226,025	286,902E-3	40,6548
10	2009/09/08	14:48:40.061	225,316	290,880E-3	41,2009
11	2009/09/08	14:48:40.109	225,275	295,290E-3	41,8117
12	2009/09/08	14:48:40.159	225,289	296,044E-3	41,9542
13	2009/09/08	14:48:40.209	225,325	295,646E-3	41,9642
14	2009/09/08	14:48:40.259	225,311	296,078E-3	42,0549
15	2009/09/08	14:48:40.309	225,325	296,237E-3	42,1053
16	2009/09/08	14:48:40.359	226,052	309,428E-3	44,4035
17	2009/09/08	14:48:40.409	226,393	297,179E-3	42,4285
18	2009/09/08	14:48:40.459	226,404	294,476E-3	42,0782
19	2009/09/08	14:48:40.509	226,426	294,112E-3	41,9310



Plot plugin

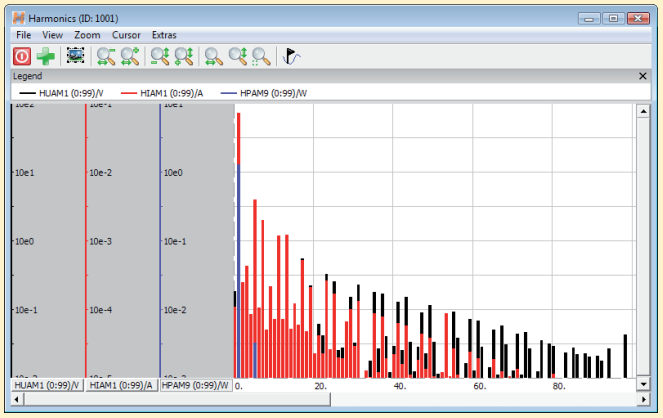
The Plot plugin displays up to nine measurands graphically in real-time, which gives an immediate overview of the developing values. The graphs can be zoomed in and out continuously and a screen-shot can be saved as a picture.





Harmonics plugin

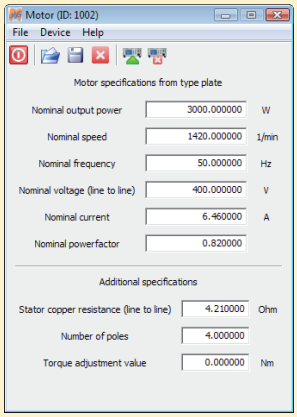
The Harmonics plugin shows the frequency spectrum of a signal as a bar chart. This makes a fast comparison between the fundamental component and the harmonic content easier.



LMG-CONTROL Extensions

M-n Motor plugin

LMGs with the option *MotorTorque* can compute torque and speed of a motor or generator from the measuring values of input current and input voltage. The option *MotorTorque* can be used with frequency converter- and mains-operated IEC-standard motors. The torque and speed values can be viewed and recorded by LMG-CONTROL like all other measurands of the LMG. The correct input of the required motor characterics is simplified by the M-n Motor plug-in which is part of LMG-CONTROL. The characteristics of different motors can be edited conveniently with this plugin and saved to the PC as well.



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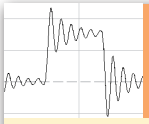
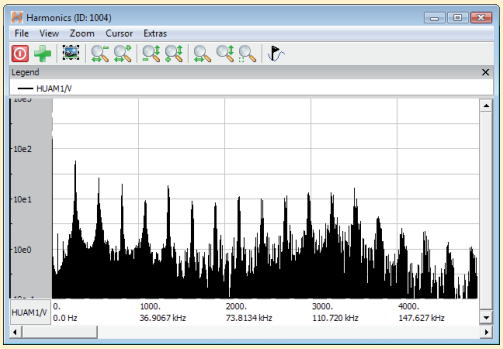
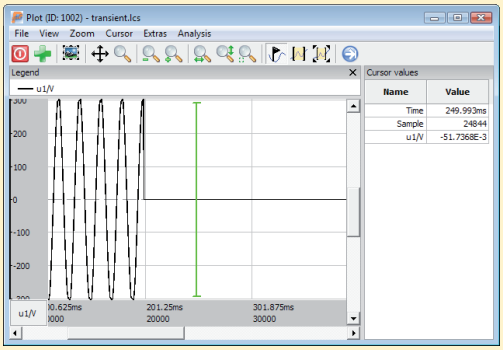


Waveform Analysis module

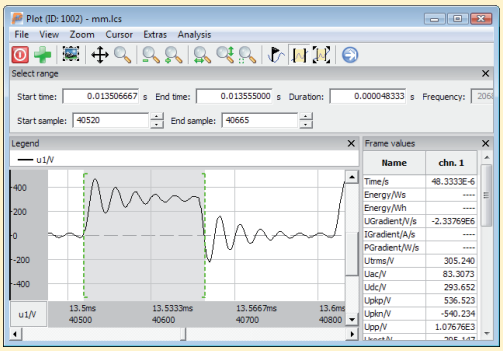
With the *Waveform Analysis* extension you can examine the measuring values in even greater detail. *Waveform Analysis* features the full and convenient access to the sampling values of the LMG. These are recorded with up to 3 MSamples/s in parallel to the rms-values and are available for analysis of momentary events of high frequency. For this a specific selection of the required sampling values is possible. For evaluation the waveform of the measured signal can e.g. be displayed in the Plot plugin. This plugin is optimised for responsive handling even with several million sampling values. Of course it is possible to display the values in the other plugins of LMG-CONTROL, e.g. in a table, and to export them in text format for spreadsheet applications or scientific software. Using the frame analysis function the recorded sampling values can also be used as a basis for further computations between two cursors.



Harmonic analysis and frequency analysis
From the sampling values an analysis of frequencies from 0.07Hz up to 1MHz can be computed in arbitrary resolution. Only the desired measurands and ranges have to be specified. The software then automatically configures the LMG, transfers the sampling values and computes the frequency spectrum. This is displayed directly in a bar chart and a table. A view of the corresponding sampling values is available at the push of a button.



Recording of transient events
Transients are events of short duration which occur during start-ups or oscillations. Power meters from ZES ZIMMER® provide a flexibly configurable transient search function. Therewith volatile changes of the signal can be detected and recorded with an accuracy of a single sampling value (i.e. a time span of less than one microsecond). *Waveform Analysis* extends the capabilities of LMG-CONTROL to enable control of the transient search of the LMG. The software automatically saves the transients with a selectable portion of their pre- and post-history to the PC harddisk and restarts the transient search. With this function a monitoring over longer periods of time can be performed and the recorded events be analysed later.



Frame analysis
While displaying the sampling values in the Plot plugin, two cursors can be used to select a frame for analysis. For this frame the rms-values of current and voltage and the power are computed from the sampling values as well as minimum and maximum values, energy and gradient. A harmonic analysis of the frame is also possible with graphical display in a bar chart. ZES ZIMMER® specially optimised FFT (Fast Fourier Transform) can compute several ten thousands of harmonics in less than a second.

LMG-CONTROL Requirements

Supported power meters: LMG95e, LMG95, LMG450, LMG500

Supported interfaces:

- RS232 serial port (for LMG95 as an option)
- IEEE488 (GPIB) interface (option)
- USB interface of LMG500 (option L50-02USB)
- USB to RS232 adapter LMG-Z316
- Ethernet/Network adapter Z318

Supported operating systems: Windows 2000, Windows XP, Windows Vista, Windows 7
Recommended hardware: CPU with at least 2 GHz, at least 512 MB of RAM (Windows 2000 and XP) or 1 GB (Windows Vista and 7)

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