

ROGA DAQ16

ROGA Mobility package USB 2.0 System



HighSpeed
USB 2.0
400 MB/s

- USB 2.0 / 480MBIT
(USB 1.1/12MBIT COMPATIBLE)

- 16 analog input channels (16bit/500kHz max.)
- IEPE sensor supply (24V/4mA)
- 0.125V to 10V input range
- Individual preamplifiers



- 4 analog output channels (16bit/100kHz)
- Powerful DSP (255MIPS) for filtering, control etc.
- 24 digital I/Os
- Optional 24bit counter, timer,
- PWM, incremental encoder
- Free drivers for major application software

TECHNICAL DATA

ANALOG INPUTS

Number of inputs	16
Input impedance	1MΩ differential
Analog bandwidth	0 – 20 kHz (DC mode); 1Hz – 20 kHz/1dBAC, IEPE (low frequency version on request)
ADC sample rate	500/400kHz
Resolution	16 bit
Input voltage ranges	±0.125, ±1.25, ±2.5, ±5, ±10V
IEPE sensor supply	4 mA/24V
Maximum input voltage	±40V
Gain accuracy	0.2% typical

ANALOG OUTPUTS

Number of outputs	4
Sample rate	100kHz/ch.
Resolution	16 bit
Settling time	±20V / 10μ, ±1V / 1μ
Output ranges	0 – 10V, ±10V
Maximum current	5mA
Impedance	0.2Ω

DIGITAL INPUTS / OUTPUTS

Number of inputs / outputs	24
Type	LVC MOS, 5V tolerant
Maximum current	2.5mA
Number of counters	2
Resolution	24 bit
Modes	up/down, frequency, period
PWM channels	1
Resolution	24 bit
Frequency range	2Hz – 2.5MHz
Incremental counters	24 bit incremental 16 bit time stamp
Interpolation	1 / 2 / 4
Maximum frequency	20MHz
Dimensions	180mm (w) x 167mm (d) x 80mm (h)
Weight	2kg
Power Supply	Adapter 100V – 230V AC/ 5V DC (included)

With the introduction of the RogaDAQ 16 USB 2.0 data acquisition system, a new age of measurement technology begins.

The RogaDAQ 16 is an affordable multichannel IEPE solution. The USB 2.0 interface permits unrivalled portability. Hotplugging the data acquisition unit during operation has now become a reality. The compact and rugged measurement unit with its BNC connectors breakout boxes obsolete. Downward compatibility to USB 1.1 also permits to run this high performance measuring system with older hardware. Simplicity of integration, whether mobile or stationary, has reached a new level.

ANALOG INPUTS

The input signals are digitized using the multiplex method. All 16 channels may be used as differential or single-ended inputs. The maximum sampling rate is 500 kHz at 16 bit resolution (400 KHz for multiple channels). The maximum bandwidth per channel is DC to 22 KHz (higher bandwidth on request). In single-ended mode, AC coupling is also available and constant current sensor supply for IEPE-type sensors can be provided.

The input circuitry consists of a software programmable precision amplifier with gain 1/2/4/8/10/20/40/80.

The input voltage ranges are 0.125 V to 10 V in eight steps, either bipolar or unipolar. The highly flexible signal conditioning and connectivity make the RogaDAQ 16 the perfect choice for the majority of measurement applications.

Along with the analog lowpass filters the system can make use of integrated oversampling filters (up to 16x, depending on channel count and sampling rate) in order to improve rejection of noise, distortion and out of band signals
DSP-filters suppress undesired frequencies and distortions. Therefore the user gets clean data.

There is no need for any additional hardware. Signal degradation caused by cabling, contacts and add-on signal conditioners is avoided. The RogaDAQ 16 is a truly affordable and powerful platform for multichannel IEPE-sensor applications.

ANALOG OUTPUTS

RogaDAQ 16 offers four analog outputs. The output sampling rate is 100 kHz per channel at 16 bit resolution. The output voltage ranges are 0 V–10 V und ± 10 V. They can be used as generator outputs, monitoring outputs or for control loops. It is also possible to download data to RogaDAQ 16 and output it to the D/A converters time synchronized by the DSP.

TRIGGERS

There are several trigger options available: Level, edge, limit or window conditions. It is even possible to use mathematically processed data for triggering (e.g. steepness of slope). Trigger conditions can start or stop a measurement, set digital outputs or control analog outputs. Several trigger conditions can activate or deactivate each other. So a network of dynamic triggers is possible, automatically adjusting to the current condition.

DIGITAL INPUTS/OUTPUTS

There are 24 digital inputs / outputs available. Any of these ports may be individually controlled by the DSP as input or output.

The digital inputs optionally support counter, pulse width, period length or frequency counter. Incremental encoders can also be supported on request.

The outputs can optionally be used for PWM signals with a resolution of 100ns and output frequencies between 2 Hz and 2,500,000 Hz with zero pulse discontinuities. Modulation of frequency and pulse width is supported at the same time and independently. It is fully transparent to the user, who only specifies a frequency and pulse width in percent.

SOFTWARE

One of the most important criteria for modern measurement systems is software support. Even the most powerful hardware is useless without respective drivers.

RogaDAQ 16 uses an optimized concept which ensures extensive application software support and easy adoption to new software environments.

Besides free of charge drivers for most common measurement applications like EVApro, DIAdem, LabView or DasyLab, further application programs are available. Custom driver support is possible on request.

SOFTWARE AND DRIVER UPGRADES

The most recent versions of drivers, programming interface and software are obtainable through ROGA-Instruments.



DASYLab[®]

Data Acquisition System Laboratory



DASY-Lab is a versatile application system for all tasks in measurement, control, regulation and automation .

Equipped with a wide range of software and hardware interfaces you only need DASYLab to reliably record, analyze, visualize and further process signals of all types.

DASYLab stands out due to its strikingly simple method of use: measurement engineering applications are intuitively and interactively designed and displayed graphically in the form of a dataflow diagram without any programming at all.

The function modules required for a specific task are placed in the circuit diagram, linked to other modules and adapted to the current task using structured configuration dialogues.

Boundless flexibility due to more than 120 default modules for creating your specific application.

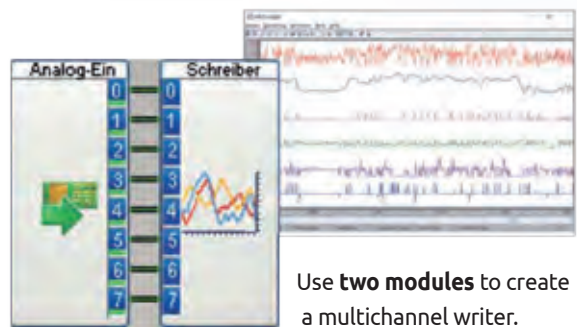
A wide spectrum of analysis, control and visualization modules are available for creating the application, these range from measurement engineering single functions up to preconfigured standard sequences. These include analog and digital inputs and outputs, triggers, mathematics, statistics, digital filters, FFT analyses, buttons, switches and much more.

On top of this, you can comfortably develop and incorporate your own extensions using the integrated Python interface. Everything is possible.

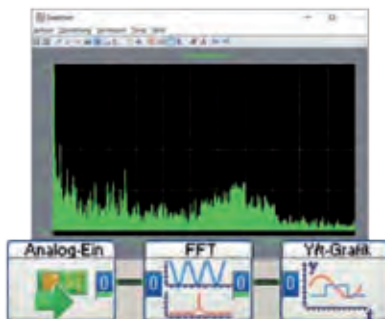
DASYLab is available in four extension levels, so that both beginners and experienced users can implement measurement and test sequences to meet their requirements.



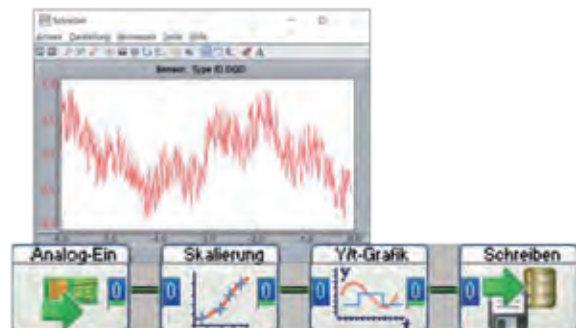
Use just one **single module** to create a datalogger.



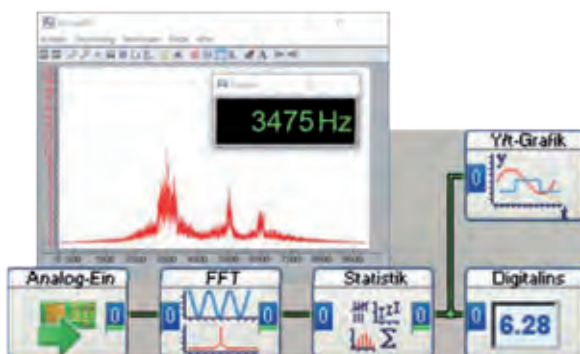
Use **two modules** to create a multichannel writer.



Use **three modules** to create an oscilloscope with FFT signal evaluation.



Four modules are required for a measurement sequence, which fulfils the basic requirements on almost any measuring task.



Five modules are required for data acquisition with FFT signal evaluation, statistics function and results presentation.

Its simplicity and its wide applicability make DASYLab since 1993 one of the leading applications in education, research and engineering for industry, production and quality management.

With DASyLab you are not only capable of capturing and visualization of measured data ...

Your PC interface is turned into the measuring instrument interface each time, and it can be individually configured and designed. DASyLab supports data acquisition hardware from numerous manufacturers and offers a wide range of established software interfaces and protocols. External measuring devices are contacted and configured in a simple manner directly via function modules. Up to 512 channels per measured value acquisition are possible depending on the hardware used..

DASyLab can read or write data which has either been processed by the measX **X-frame** application or by the National Instruments **DIAdem**.

DASyLab supports:

- analog and digital inputs and outputs, counter input and frequency output
- CAN bus and LIN bus
- RS-232
- IEEE-488
- ModBus/RTU
- OPC-DA
- SPS
- ODBC

... you are also up to a powerful online signal analysis!

DASyLab offers a wide range of functional modules for signal processing, mathematics and to statistics in order to work out the properties of the recorded signals simply yet precisely.

Even specific modules for third and octave analysis and for convoluting and weighting signals are offered by DASyLab.



Automating measuring sequences without programming

Automation tasks are solved graphically with DASYLab without programming. To do this, the software provides a range of function modules such as signal generators, switches, controllers and function generators. The corresponding modules are placed and configured in the circuit diagram so that logic switches, controls and analyses can be implemented.

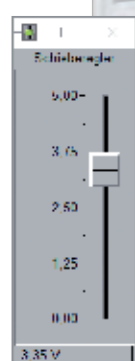
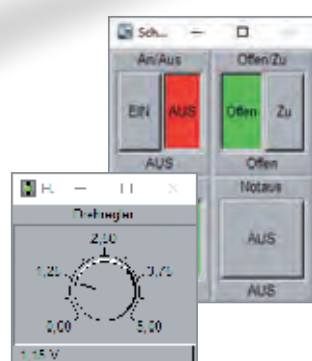
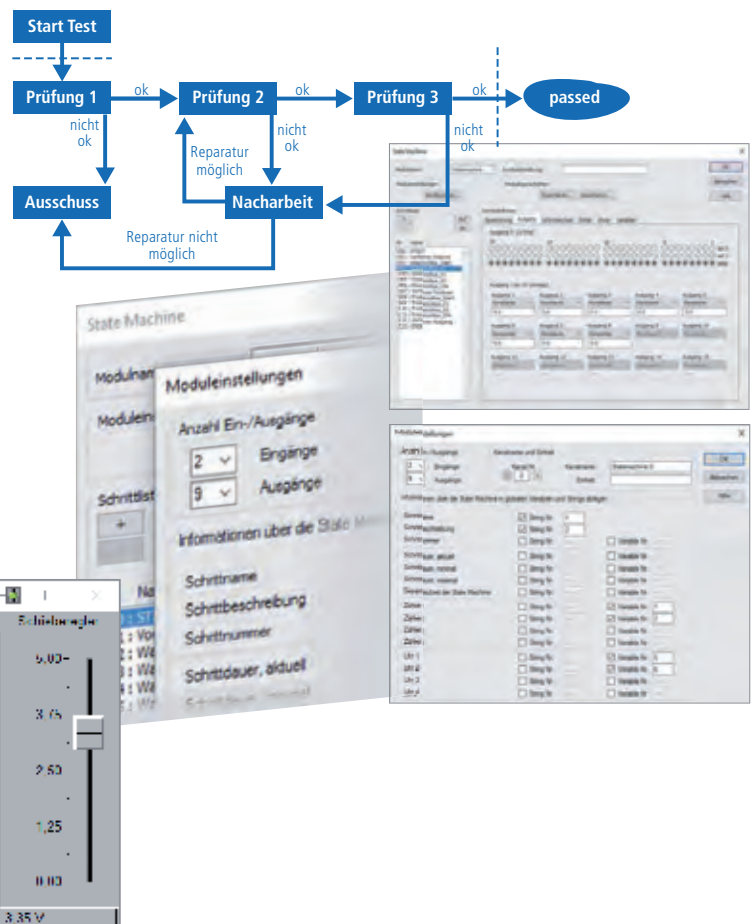
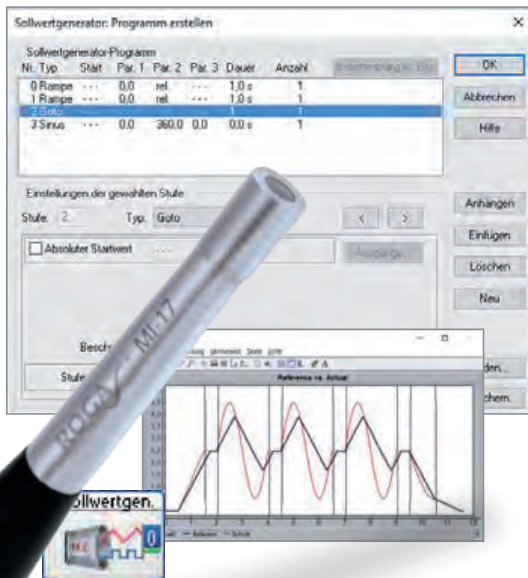
DASYLab can read or write data for further analysis which can either be processed by the measX **X-frame** application or by the National Instruments **DIAdem**.

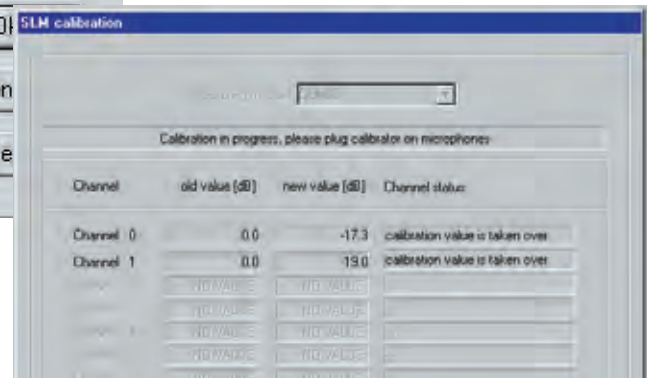
Sequence Generator as highlight

A configurable sequence generator is provided for precise time-dependent controls with complex control signals. It creates the sequence profile using simple parameterization of the individual program stages, which, for example, you use for controlling your test bench. This means that switching processes are implemented synchronously with this control profile.

State Machine as highlight

Complex test sequences, which can be set up using a combination of action modules, trigger modules, relays and links as an alternative can be compiled to form fewer modules using the state machine module. These sequences are particularly simple to create and maintain since stages within the module can be added, deleted or changed in their sequence as required. When setting up a step sequence conventionally in DASYLab, all the modules are always processed simultaneously in parallel – especially the parts of the step sequence which are not actually needed at that moment. In comparison, only the active parts of the step sequence are processed in the state machine module since all decisions about the work stage are made using one single module. This results in a considerable decrease in computing time and memory requirement.



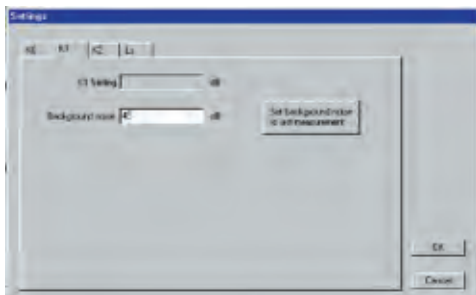
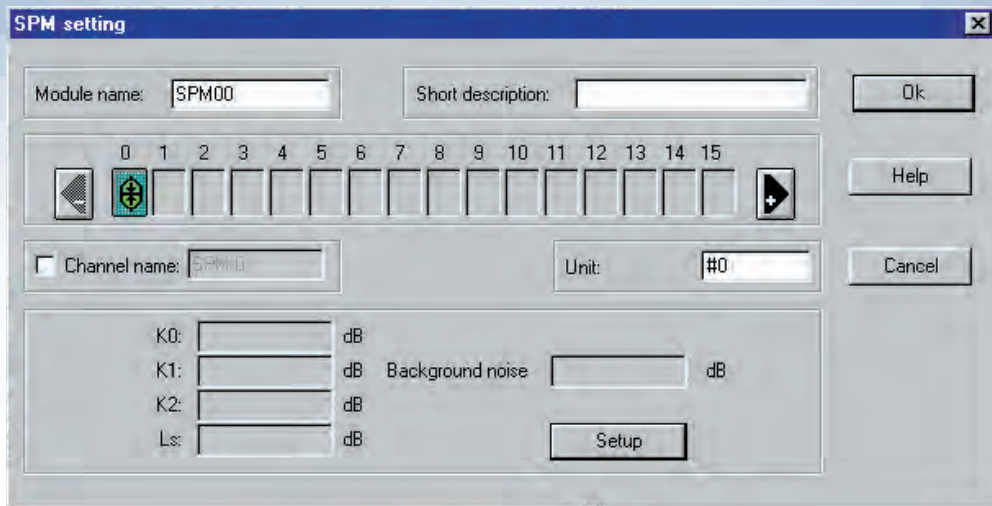


RogaDAQ16 in combination with MI-17 as a recommended hardware.

Sound Level Measurement Modul

The sound level measurement module has the following features:

- Time weighting: fast, slow, impulse, leq following DIN IEC 651 and DIN IEC 804.
- Easy microphone calibration with a pistonphone; in calibration mode, DasyLAB 6 detects the channel/microphone to calibrate and calculates the correct values.
- The correction values are stored with the worksheet.
- The module has 16 inputs and 16 outputs for the weighted and dB scaled sound levels.
- We recommend a 16 bit AD-converter with microphone power supply.



Sound Power Measurement Module

The sound power measurement module can calculate the sound power for a maximum of 16 input channels (from the sound level measurement module) 1 output channel, switchable to:

- Measurement surface sound power.
- Sound power level (SPL) of all active channels.

The module properties allow you to set the four corrective values in dB or use the "wizards" to determine them:

K0: Correction value for air pressure and temperature. Direct input of the dB value or pressure and temperature. (Only necessary for class 1 measurements according to DIN 45 635.)

K1: Correction value for extraneous noise correction (background noise, signal-to-noise-ratio). Direct input of the dB value or taken from last measurement.

K2: Correction value for environment feedback (reflections). Direct input of the dB value or input of the room's metrics:

- volume
- reverberation time ...

Ls: Correction value for for the enveloping surface. Direct input of the dB value or input of the surface metrics (guided with graphics). Like DIN (2a, 2c, b)

- Spherical, hemisphere, quarter globe
- Cuboids (detached, at a wall, at a wall and ceiling)

The module works according the following standards: DIN 45 635, DIN EN 23 741, ISO 3741, DIN EN 23 742, ISO 3742, DIN EN 23 744, EN ISO 3744, DIN EN 21 680, ISO 6395



Creating your own DASyLab modules

Right from the start DASyLab provides a wide range of modules for different measurement, control and analysis tasks. If functionalities, hardware or software components over and above this are necessary for an application, these can be integrated by any (program-experienced) user at reasonable expense using the integrated Python interface.

These could be additional input modules or modules for data output, and also special mathematical functions which are not included even in DASyLab despite its wide range of function modules.

Basic settings, for example the number of inputs or outputs and the data flow properties, which are accepted by the module, can be conveniently specified in a presetting wizard. Only the script code needs to be entered in the dialogues for each individual interface in order to specify the functionality of a new module. Module parameters which are to be freely configurable later on are selected from a stock of stipulated dialog elements, and then made editable and compiled to form a simple configuration dialog using a script.

Python script modules can be implemented and managed in all DASyLab versions. Users of the Full and Pro version can also create, process and export Python script modules.

Look & Feel to your own specifications

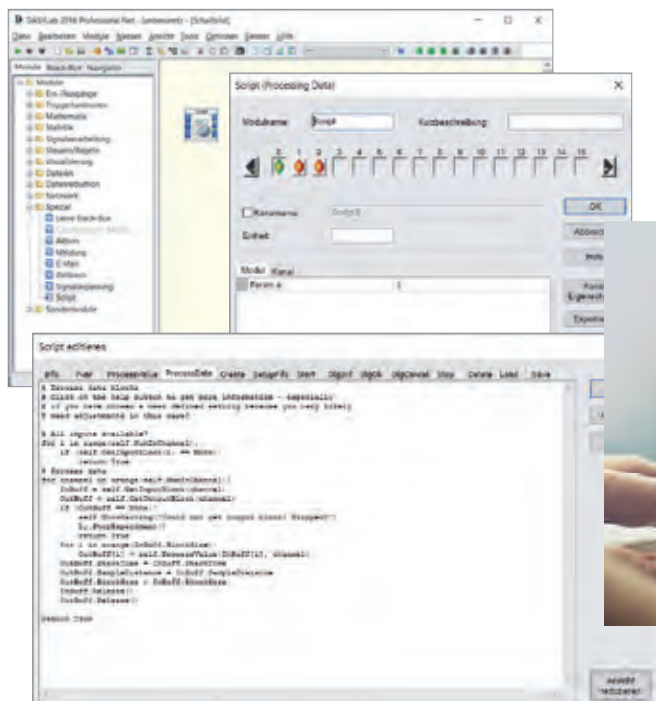
DASyLab offers users a wide range of facilities for designing the working environment to meet their own personal requirements. This applies both to the user interfaces (the so-called layouts) and user guidance through individual applications, and also to the reports and protocols which can be generated.

Online visualization

A wide range of control and display modules are available for interface design: these range from standard functions such as the magnified display of graphical signal sequences up to color-coding of numerical display on limit value infringements. You can quickly and simply configure all operating elements and display windows to meet your own requirements by specifically placing the visualization and control modules and providing them with texts and graphics. Up to 200 different layout pages can be defined with the aid of the integrated layout tool. You can display your measured data as curves using the writer, Y/t chart and X/Y chart modules. The table and digital instrument function blocks display the recorded measured data numerically. Freely scalable analog instruments, bar and state displays are especially suitable for the presentation of process and test controls.

Reports and documentation

DASyLab can also support you in professional results presentation. The design of log sheets and reports can be flexibly drawn up and configured.



4 DASyLab program versions – the adequate one for each requirement

You can select from four DASyLab program versions:

Lite Version* for newbies contains all the basic functions required for PC-supported measurement data acquisition.

Basic Version with additional mathematical and statistical analysis functions.

Full Version provides you with additional modules for solving basic analysis and automation tasks.

Pro Version provides modules for complex further professional analysis, control and automation tasks.

in addition we offer a standalone **runtime version** that allows execution of existing circuit diagram files (.dsb) but not their change.

DASyLab provides you with an interactive tutorial and more than 150 example files.

MODUL GROUPE / MODUL	LITE	BASIC	FULL	PRO
TRIGGER				
Pre/Post trigger	●	●	●	●
Start/stop trigger	–	●	●	●
Combi-trigger	–	●	●	●
Sample trigger	–	●	●	●
Gradient trigger	–	●	●	●
Relay	●	●	●	●

MATHEMATICS				
Formula interpreter	–	●	●	●
Arithmetic	●	●	●	●
Comparator	●	●	●	●
Trigonometry	–	●	●	●
Scaling	●	●	●	●
Differentiation/integration	–	●	●	●
Logical operations	–	●	●	●
Bit mask	–	●	●	●
Flipflop	–	●	●	●
Gray code	–	●	●	●
Slope limit	–	●	●	●
Create reference curve	–	●	●	●

STATISTICS				
Statistical values	–	●	●	●
Select values	–	●	●	●
Histogram classification	–	●	●	●
Rainflow classification	–	–	○	●
Two-channel classification	–	–	○	●
Regression	–	●	●	●
Numerator	–	●	●	●
Pulse analysis	–	●	●	●
Minimum/maximum	–	●	●	●
Channel sorting	–	●	●	●
Check reference curve	–	●	●	●



MODUL GROUPE / MODUL	LITE	BASIC	FULL	PRO
SIGNAL ANALYSIS				
Digital filter	–	●	●	●
Correlation	–	●	●	●
Data window	–	●	●	●
FFT	–	●	●	●
Polar/cartesian	–	●	●	●
FFT Filter	–	–	○	●
FFT maximum	–	–	○	●
nth harmonic	–	–	○	●
Electrotechnical parameters	–	–	●	●
Harmonic distortion	–	–	●	●
Periodic calculation	–	–	●	●
Third/octave analysis	–	–	○	●
Resample (order analysis)	–	●	●	●
CONTROLLING AND REGULATING				
Sequence generator	–	–	○	●
Generator	●	●	●	●
Switch	–	●	●	●
Handset control	–	●	●	●
Position switch	–	●	●	●
PID controller	–	●	●	●
Two-point controller	–	●	●	●
Time delay	–	●	●	●
Latch	–	●	●	●
Signal router	–	●	●	●
TTL pulse generator	–	●	●	●
Stop	–	●	●	●
Write global variables	●	●	●	●
Read global variables	●	●	●	●
Write block time in string	●	●	●	●
State machine	–	–	●	●
VISUALIZATION				
Y/t chart	●	●	●	●
X/Y chart	–	●	●	●
Chart recorder	●	●	●	●
Polar plot	–	●	●	●
Diagram	●	●	●	●
Analog display	●	●	●	●
Digital display	●	●	●	●
Bar graph	●	●	●	●
Status display	●	●	●	●
List	●	●	●	●

- included
- not included or available
- included in additional analysis toolkit
- △ available as optional add-on
- ↔ available in NET add-on for the Full Version

MODUL GROUPE / MODUL	LITE	BASIC	FULL	PRO
FILES				
Read/write data	●	●	●	●
Backup data	–	–	●	●
ODBC input/output	–	–	●	●
DATA REDUCTION				
Average	●	●	●	●
Block average/peak hold	●	●	●	●
Separate	–	●	●	●
Multiplexer/demultiplexer	–	●	●	●
Shift register	●	●	●	●
Cutout	–	●	●	●
Signal switch	–	●	●	●
Circular buffer	–	–	●	●
NETWORK				
Network input/output	–	–	↔	●
Reports input/output	–	–	↔	●
DataSocket import/export	–	–	●	●
SPECIAL				
Empty black box	–	●	●	●
Action	–	–	●	●
Message	–	–	●	●
Send e-mail	–	–	●	●
Time basis	–	●	●	●
Signal adaptation	–	●	●	●
Create script module	–	–	●	●
ADD-ON MODULES				
Convolution	–	–	○	●
Weighting	–	–	○	●
Transmission module	–	–	○	●
Universal filter	–	–	○	●
Save universal file	–	–	○	●
OPTIONAL ADD-ONS				
Human vibration (ISO 8041)	–	–	△	△
Sound level	–	–	△	△
Sound power	–	–	△	△
PROGRAM PROPERTIES				
Sequencer Number of layout pages	–	–	●	●
	1	1	200	200