

Data Acquisition and Control Interface 594499 (9063-RC)

FESTO

LabVolt Series

Datasheet



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Festo Didactic
en 230 V - 50 Hz
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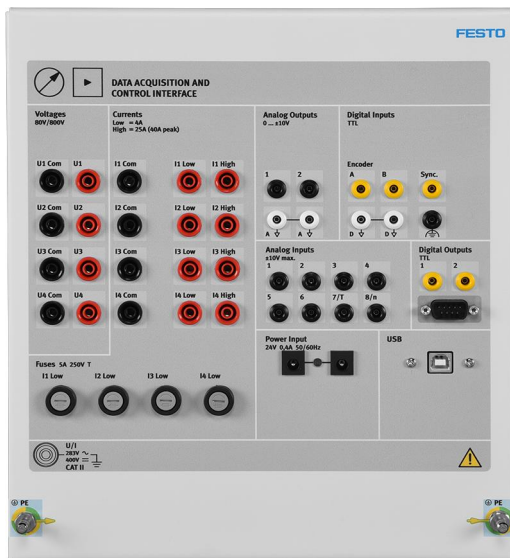
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General Description

The Data Acquisition and Control Interface (DACI) is a versatile USB peripheral used for measuring, observing, and analyzing electrical and mechanical parameters in electric power systems and power electronics circuits. For these purposes, a set of computer-based instruments are available for the DACI. These instruments are accessed through the LVDAC-EMS software. The LVDAC-EMS software, as well as all available upgrades, is free and can be downloaded anytime on the Festo Didactic website (www.labvolt.com).

Together, the DACI and the LVDAC-EMS software allow training in various areas such as electric power technology, ac/dc machines, renewable energy, transmission lines, and power electronics using modern and versatile measuring instruments.

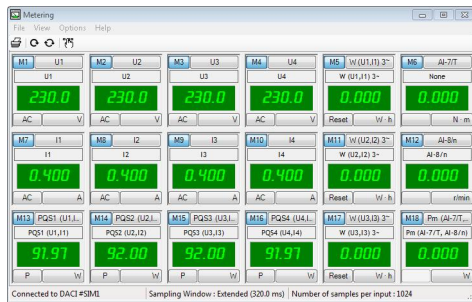


LVDAC-EMS

The LVDAC-EMS software is a freeware which can be downloaded anytime from the Festo Didactic website (www.labvolt.com). The LVDAC-EMS software is a user-friendly tool that facilitates the use of the various functions which can be implemented with USB peripherals such as the Data Acquisition and Control Interface (DACI) and the Four-Quadrant Dynamometer / Power Supply.

The LVDAC-EMS software also includes a firmware update for the DACI. When a DACI is connected to a newer version of LVDAC-EMS, the user can easily update the module using a simple update wizard.

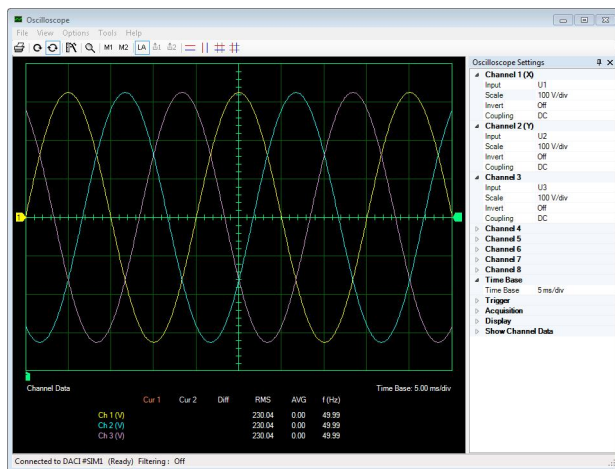
Metering



Metering window.

The Metering window displays up to eighteen meters that can be configured to measure a multitude of parameters (e.g., voltage, current, active power, reactive power, apparent power, efficiency, impedance, power factor, frequency, energy, torque, speed, mechanical power, phase angle, phase shift). The name of each meter can be edited to identify the measured circuit parameter. The voltage and current meters have several modes of operation that allow measurement of the mean (DC) value, RMS value, crest factor, RMS value of a particular harmonic (up to the 15th), RMS value of the harmonics, and total harmonic distortion (THD). The layout of the meters in the Metering window can be customized by the user.

Oscilloscope



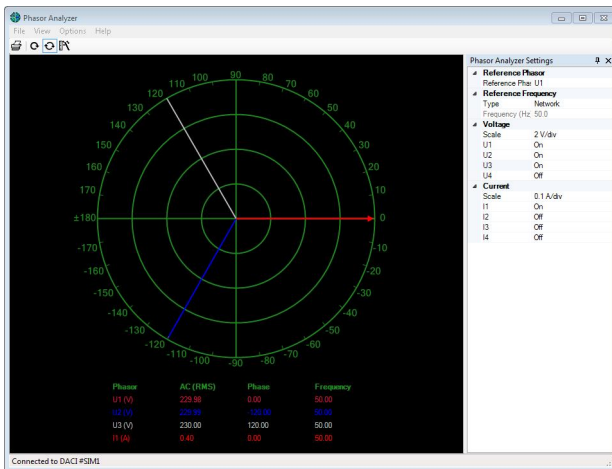
Oscilloscope window.

The Oscilloscope can display up to eight waveforms simultaneously. Each waveform is of a different color for easy identification. Each channel has independent vertical controls similar to those found on conventional oscilloscopes. An automatic scale setting function allows the sensitivity of each channel to be set automatically according to the magnitude of the observed parameter. The time base and trigger controls are similar to those found on most oscilloscopes. The RMS value, average value, and frequency of each of the observed parameters can be displayed in a table in the Oscilloscope window. Two vertical cursors can be activated to perform precise measurements at particular points on the displayed waveforms. The Oscilloscope has two memory channels for saving the displayed waveforms.

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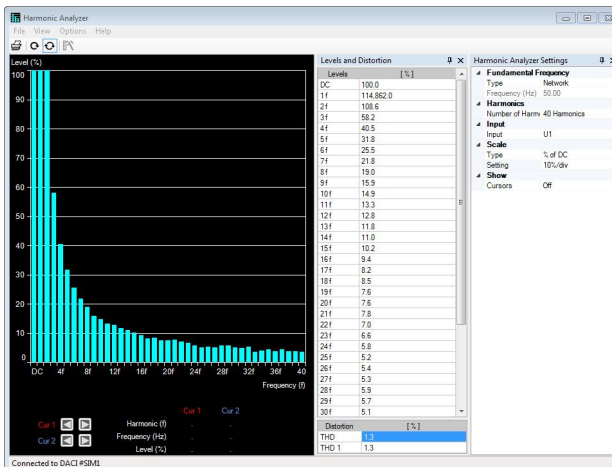
Phasor Analyzer



Phasor Analyzer window.

conventional instruments. The RMS value, phase angle, and frequency of the voltage or current related to each phasor are displayed in a table in the Phasor Analyzer window.

Harmonic Analyzer



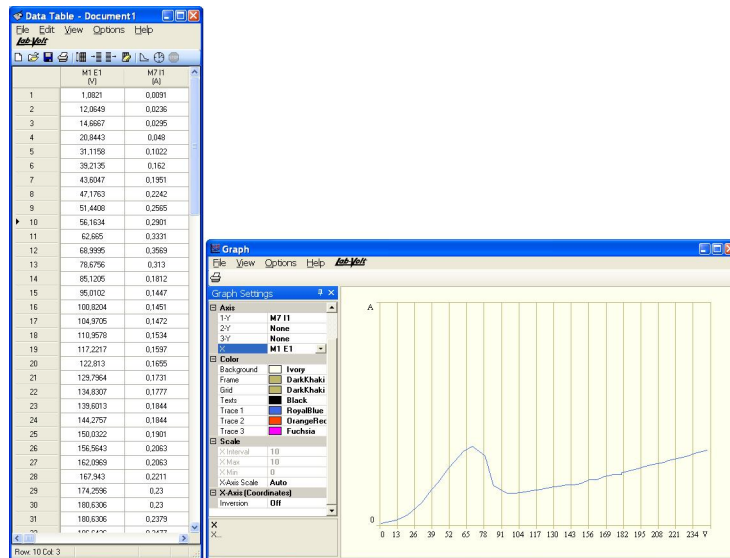
Harmonic Analyzer window.

vertical scale graduated in either absolute or relative values. Various vertical scale settings are available. A group of data displays in the Harmonic Analyzer indicates the values of the dc component, fundamental component, and harmonic components of the selected voltage or current, as well as the total harmonic distortion (THD). Vertical and horizontal cursors can be activated to perform precise measurements at particular points on the display.

The innovative Phasor Analyzer displays the phasors related to measured voltages and currents instead of the values and waveforms related to these voltages and currents. The Phasor Analyzer allows circuit voltages and currents to be monitored easily for relative amplitudes and phase differences simply by looking at their respective phasors. This produces a unique and dynamic display of the voltages and currents in a circuit (especially in three-phase circuits) that cannot be obtained with

The Harmonic Analyzer allows observation and analysis of the harmonic components in the measured voltages and currents. The fundamental frequency can either be set to the ac power network frequency, manually by the user, or automatically to the frequency of the fundamental component of the selected voltage or current. The number of harmonic components displayed can be varied between 5 and 40. The harmonic components of the selected voltage or current can be displayed using a

Data Table and Graph



Data Table and Graph.

The values indicated by the meters or indicators of all computer-based instruments and control functions (see later in this section for more detail about control functions) in LVDAC-EMS can be recorded in the Data Table window. A timer option is provided to help record data at specific time intervals. The values recorded in the Data Table can be saved to a file. The recorded data can also be used to plot graphs by selecting which parameter(s) to plot in the Graph window. This allows lab results to be plotted quickly and easily. More complex graphs can be created by exporting the contents of the Data

Table window to any popular spread sheet program, such as Microsoft® Excel®.

Specifications

Parameter	Value
Power Requirements	
Voltage	24 V
Maximum Current	0,4 A
Frequency	50/60 Hz
Insulated Voltage Inputs (4)	
Range (Low / High Scales)	-80 to +80 V / -800 to + 800 V (user-selectable through software)
Impedance (Low / High Scales)	326,6 kΩ / 3,25 MΩ
Bandwidth	DC to 65 kHz (-3 dB)
Accuracy	1% (dc to 10 kHz)
Insulation	800 V between input channels, 400 V versus ground
Maximum Voltage (Any Terminal vs GND)	283 V ac / 400 V dc
Measurement Category	CAT II (283 V ac/400 V dc versus ground)
Insulated Current Inputs (4)	
Range (Low / High Scales)	-4 to +4 A / -25 to +25 A (40 A peak)
Impedance (Low / High Scales)	50 mΩ / 5 mΩ
Bandwidth	DC to 65 kHz (-3 dB)
Accuracy	1% (dc to 10 kHz)
Insulation	800 V between input channels, 400 V versus ground
Maximum Voltage (Any Terminal vs GND)	283 V ac / 400 V dc
Analog Inputs (8)	
Voltage Range	-10 to +10 V
Impedance	> 10 MΩ
Bandwidth	DC to 125 kHz
Measured Parameters	User-selectable through software
Parameter-to-Voltage Ratio	User-determined through software
Measurement Category	CAT II (283 V ac/400 V dc versus ground)
A/D Converter for Insulated and Analog Inputs (16)	
Type	Successive approximation
Resolution	12 bits
Integral Non-Linearity	≤ ±1,5 LSB
Differential Non-Linearity	≤ ±1 LSB

Parameter	Value
Maximum Sampling Rate	600 ksamples/s (one channel)
FIFO Buffer Size	16 ksamples
Analog Outputs (2)	
Voltage Range	-10 to +10 V
Operational Load Impedance	> 600 Ω
D/A Converter for Analog Outputs (2)	
Type	Resistor string
Resolution	12 bits
Integral Non-Linearity	$\leq \pm 8$ LSB
Differential Non-Linearity	-0,5 to +0,7 LSB
Digital Inputs (3)	
Types	Encoder (2), synchronization (1)
Signal Level	0-5 V (TTL compatible)
Maximum Input Frequency	50 kHz
Impedance	5 k Ω
Digital Outputs (9)	
Types	Control (6 on a DB9 connector and 2 on 2 mm banana jacks), synchronization (1 on a DB9 connector)
Signal Level	0-5 V (TTL compatible)
Maximum Output Frequency	20 kHz (software-limited)
Impedance	200 Ω
Control Functions	
Activated Set	Two-Phase Computer-Based Instrumentation Function
	Extension Mode
Communication Port	
Type	USB 2,0
Accessories	
Included Accessories	2 m USB interconnection cable (1), 24 V power cable (1)
Conformity / Directives	CE and RoHS
Physical Characteristics	
Dimensions (H x W x D)	297 x 266 x 140 mm
Net Weight	4,6 kg

Reflecting the commitment of Festo Didactic to high quality standards in product, design, development, production, installation, and service, our manufacturing and distribution facility has received the ISO 9001 certification.

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