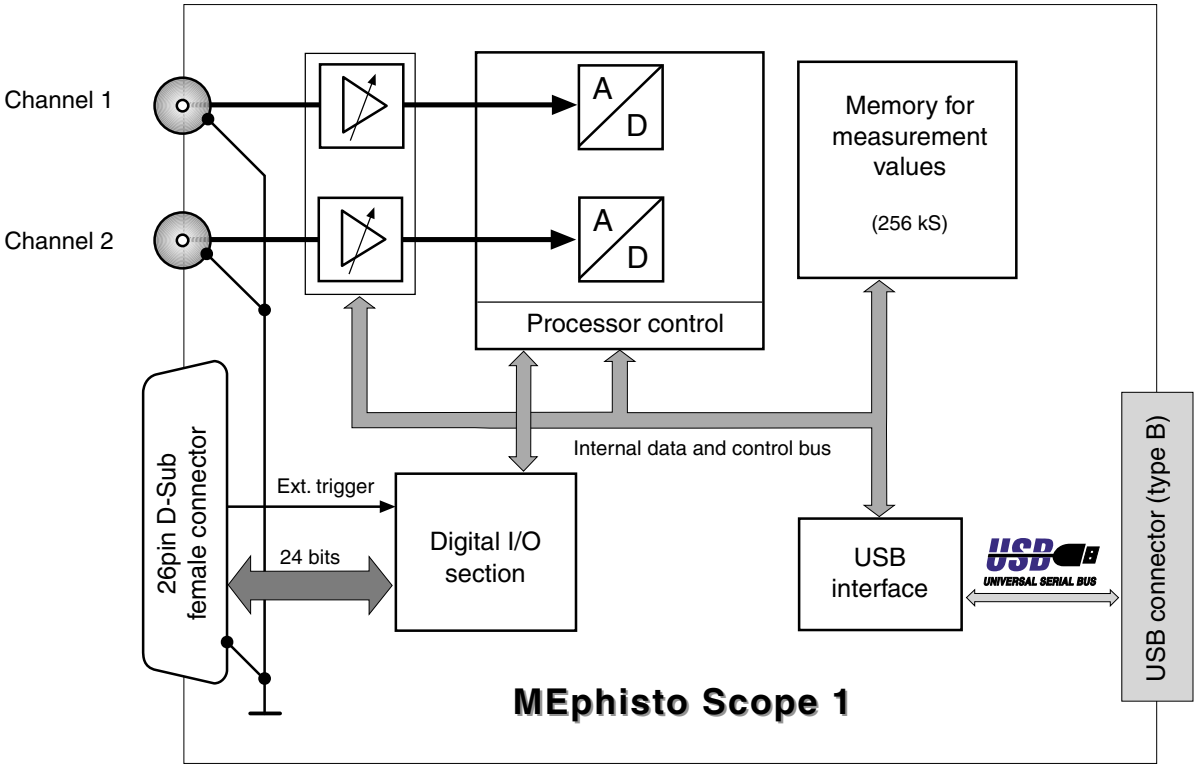
Meilhaus Electronic Data Sheet

MEphisto Scope 1 (UM 202)

Multifunctional USB module - five devices in one:

- Oscilloscope.
- Volt meter (DC, true RMS).
- Logic analyser.
- Analog and digital data logger
- Digital I/O

Block diagram



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MEsurement starts with ME.

Oscilloscope

Analog inputs	2 (BNC)
Resolution	16 bit
Non linearity, integral	±2 LSB
Sampling rate	2x 1 MS/s
Simultaneous channels	2
Input voltage range (in 1-2-5 steps)	±100 mV...±10 V
Analog bandwidth (-3 dB)	2 MHz
Automatic signal detection	
Voltage	50 $mV_{peak-peak}$...20 $V_{peak-peak}$
Frequency	0.2 Hz...500 kHz
Duty cycle, square, 100 Hz, 100 $mV_{peak-peak}$	0.2%...99.8%
Time base (1 µs/S...10 ms/S in 1 µs steps above: 10 ms/S steps)	1 µs...2.5 s
Accuracy (voltage) at 25°C	0.1% or 1 mV
Accuracy (time)	100 ppm
Over voltage protection	±300 VDC
Noise (typ.)	-66 dB (RMS) -48 dB (peak-peak)
Input impedance	850 kΩ
Input capacity	14 pF
Trigger modes	6: Threshold, window, edge, dV/dt, manual, external (26-pin D-sub female, pin 26), delay

Volt Meter

Analoge inputs	2 (BNC)
Resolution	16 bit
Non linearity, integral	±2 LSB
Sampling rate	2x 1 S/s
Simultaneous channels	2
Input voltage range (in 1-2-5 steps)	±100 mV...±10 V
Analog bandwidth (-3 dB)	
DC	40 kHz
True RMS	2.3 kHz
Accuracy (voltage) at 25°C	0.1% bzw. 1 mV
Accuracy (time)	100 ppm
Over voltage protection	±300 VDC
Noise (typ.)	-94 dB (RMS) -86 dB (peak-peak)
Input impedance	850 kΩ
Input capacity	14 pF

Analog Data Logger

Analog inputs	2 (BNC)
Resolution	16 bit
Non linearity, integral	±2 LSB
Sampling rate	2x 100 kS/s
Simultaneous channels	2
Input voltage range (in 1-2-5 steps)	±100 mV...±10 V
Analog bandwidth (-3 dB)	2 MHz
Time base (10 µs/S...10 ms/S in 1 µs steps above: 10 ms/S steps)	10 µs...2.5 s
Accuracy (voltage) at 25°C	0.1% or 1 mV
Accuracy (time)	100 ppm
Over voltage protection	±300 VDC
Noise (typ.)	-66 dB (RMS) -48 dB (peak-peak)
Input impedance	850 kΩ
Input capacity	14 pF
Trigger modes	6: Threshold, windows, edge, dV/dt, manual, external (26-pin D-sub female, pin 26), delay

Logic Analyser

Digital inputs	16 (26-pin D-sub female)
Simultaneous channels	8+8
Simultaneous trigger channels	8 of the inputs
Sample rate	100 kS/s
Delay between 8 bit groups	2 µs
Time base (10 µs/S...10ms/S in 1 µs steps above: 10 ms/S steps)	10 µs...2.5 s
Accuracy (time)	100 ppm
Logic level	5 V CMOS (1.8 V/3.3 V CMOS; 12 V/24 V; with optional converter)
Over voltage protection	+5.5 VDC/-0.5 VDC
Input impedance	50 MΩ
Input capacity	8 pF
Trigger modes	4: Pattern (low/high/edge-rising/edge-falling/ ignore) in any combination, simultaneous for 8 bit, manual, external (26-pin D-sub female, pin 26), delay

Digital Data Logger

Digital inputs	16 (26-pin D-sub female)
Simultaneous channels	8+8
Simultaneous trigger channels	8 of the inputs
Sample rate	100 kS/s
Delay between 8 bit groups	2 µs
Time base (10 µs/S...10 ms/S in 1 µs steps above: 10 ms/S steps)	10 µs...2.5 s
Accuracy (time)	100 ppm
Logic level	5 V CMOS (1.8 V/3.3 V CMOS; 12 V/24 V; with optional converter)
Over voltage protection	+5.5 VDC/-0.5 VDC
Input impedance	50 MΩ
Input capacity	8 pF
Trigger modes	4: Pattern (low/high/edge-rising/edge-falling/ ignore) in any combination, simultaneous for 8 bit, manual, external (26-pin d-sub female, pin 26), delay

Digitale Input/Output

Digital channels		24 (26-pin D-sub female); digital I/O mode not available in logic analyser mode
Resolution		1 bit (24 discrete, each bit/line programmable as input or output)
Data direction per bit		Programmable
Readback		Outputs with readback functionality
Logic level		5 V CMOS
Output level	Low	U_{OL} max. 0.6 V
	High	U_{OH} typ. 5 V ±10% (USB power)
	Sink current	I_{OL} = max. -9 mA at U_{OL} = 0.6 V
	Source current	I_{OH} = max. +5 mA at U_{OH} = 1.4 V
Input level	Low	U_{IL} max. 1.5 V
	High	U_{IH} min. 3.5 V
	Input current	±1 nA
Expandability		With relays or opto-isolation: ME-UB series

General Data

Sample memory	256 kS
Interface	USB 2.0 (full speed), USB1.1 compatible
Supply power	5 V via USB
Power consumption	Measuring mode, no loads on digital channels: 0.85 W. To guarantee a reliable operation also with high loads on the digital port, the device announces the max. power consumption of 2.5 W at the computer. Therefore it isn't possible to use the device with a passive/non-powered USB hub
Connectors	
Analog channel	2x BNC front side
Digital channels	1x 26-pin D-sub female (HD) back side
USB	USB type B female back side, USB cable included, with type A male connector on PC side
Size (mm, WxHxD)	Housing ~110 x 35 x 112; over all ~110 x 35 x 138; weight 420 g
Environmental	Operating temperature 0...70°C, storage temperature -20...85°C

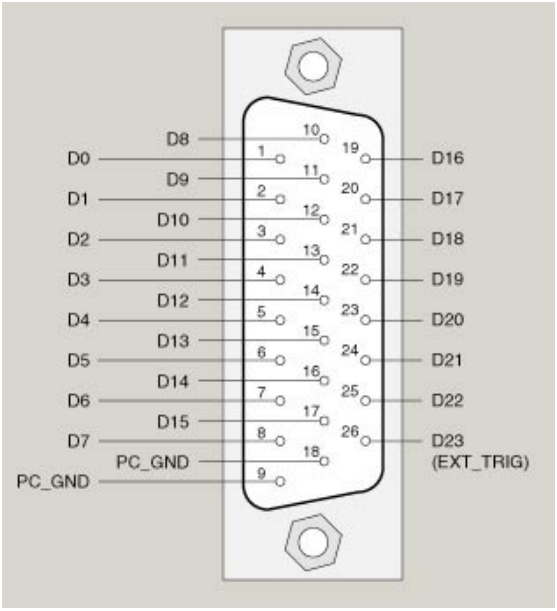
System Requirements

Software MEphistoLab	Min. Pentium II, 450 MHz, recommended: Pentium III, 1 GHz. Memory min. 128 MB, recommended: 256 MB. Free HDD space min. 700 MB (FAT32)/ 400 MB (NTFS), recommended: 1 GB. Graphic min. 1024x768 pixel (XGA), 256 colors (8 bit), recommended: 64 k colors (16 bit), 1024x768 pixel (XGA) up to 2048x1536 pixel (QXGA). Installation source min. CD-ROM drive, additional internet access recommended. Interface USB 1.1 - USB 2.0. OS min. Windows 98SE/Me, recommended: Windows XP, 2000
MEphisto Scope driver	Min. 80486, 100 MHz, recommended: Pentium II, 200 MHz. Memory min. 32 MB, recommended: 128 MB. Free HDD space: ~5 MB. Interface USB 1.1 – USB 2.0. OS Windows 98SE/Me, Windows XP, 2000; without support: Linux, Mac OS-X, Mac OS-9, Max OS-8, Windows CE.NET (>4.2)

MEphisto Scope Connector - Front

MEphisto Scope Connector - Backside

26-pin (High Density) D-Sub Female



Note: The MEphisto Scope has a max. input voltage of ±10 VDC for the analog inputs and +5 VDC for the digital inputs. To apply a higher voltage will cause damage to the device and the warranty will expire. The MEphisto Scope has no galvanic isolation, ie. the device GND is directly connected to PC GND via the USB cable. To measure higher voltages, like for example mains voltage, use a special high voltage probe. Please follow the appropriate standards, installation instructions and national safty standards. Meilhaus Electronic GmbH assumes no responsibility for damage in case of faulty installation, operation or handling.