

Inexpensive, complete 12 bit USB mini DAQ lab

RedLab 1008, RedPack



The RedLab 1008 is an inexpensive, complete USB mini DAQ lab in pocket size. It is the ideal alternative solution for simple DAQ and control applications with USB for a small budget. And it is a good solution vor education or experiment.

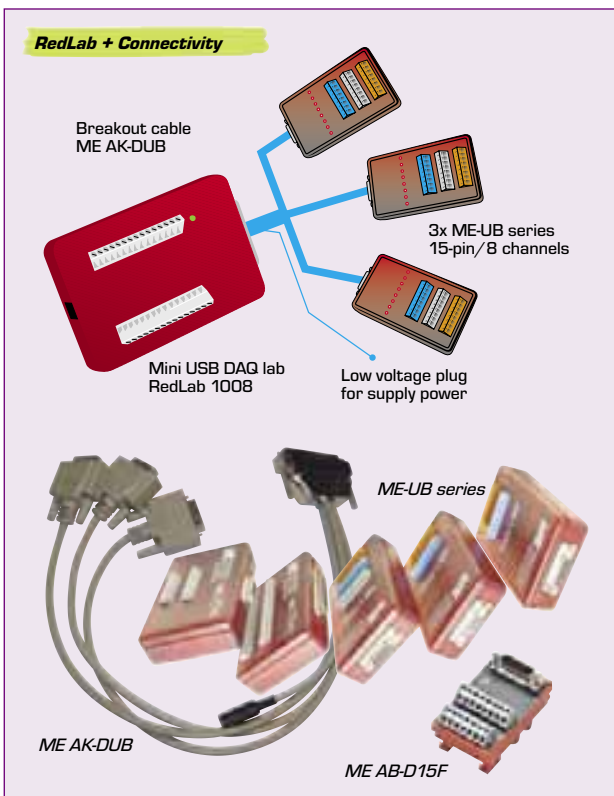
- 8 single-ended or 4 differential analog inputs.
- 12 bit A/D conversion up to 1.2 kS/s, 8 kS/s up to 4000 values.
- Input range differential: ± 20 V, ± 10 V, ± 5 V, ± 4 V, ± 2.5 V, ± 2.0 V, ± 1.25 V, ± 1.0 V, programmable.
- 2 analog outputs, 10 bit.
- 32 bit event counter.
- 24 digital I/O channels, wired to a 37-pin D-sub connector. Expandable with relays or opto-isolation using the ME-UB series.
- 4 additional discrete digital I/O channels with screw terminals.
- USB 1.1 compatible.
- Size (mm): 157 (L) x 102 (W) x 40 (H).

--- Ordering codes		RedLab 1008 ---
Model	Description	Contents:
RedLab 1008	Complete USB mini DAQ lab.	RedLab 1008, USB cable, screw driver, software and instructions for use on CD. RedPack 1008: ProfiLab-Expert ¹⁾
RedPack 1008	RedLab 1008 bundled with software ProfiLab-Expert ¹⁾ .	

--- Accessory ---	
Model	Description
ME AK-D37/2	2 m cable. 37-pin D-sub female-male, 1:1 contacted. Connects RedLab 1008 to ME AB-D37F or ME-UB37.
ME AB-D37F	Terminal block. 37-pin D-sub female connector to spring terminals.
ME-UB37	Terminal box. 37-pin D-sub female connector to spring terminals. Can be plugged directly to the RedLab.
ME AK-DUB	Cable, connects 3 ME-UB boxes to a RedLab 1008: 37-pin D-sub female connector to 3x 15-pin D-sub malle connectors + mini phone jack for external power supply for the ME-UB boxes.
ME-UB series	External expansion boxen, with relays or opto-isolation. For the digital ports. Use in any combination: ME-UB15, ME-UBRE, ME-UBOI, ME-UBOO. The ME-UB15 can also be replaced by a terminal block ME AB-D15F.
MW17-GS/6	12 V/500 mA power supply/mains adaptor for ME-UBRE, ME-UBOD, ME-UBOI.
ME AB-D15F	Terminal block. 15-pin D-sub female connector to spring terminals. Can be used instead of ME-UB15, for digital ports.
ProfiLab-Expert	Graphic software. Available as an optional accessory or included in the bundle RedPack ¹⁾ .

--- Software included in package: ---
 TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW. Optional or with RedPack: ProfiLab-Expert¹⁾.

1) ProfiLab-Expert may not support the full sample rate.



--- Specifications ---	
Analog inputs	
Channels	8, individually configurable as 8 single-ended or 4 differential channels. Connectors: Screw terminals
Ranges	$\pm 20/\pm 10/\pm 5/\pm 4/\pm 2.5/\pm 2.0/\pm 1.25/\pm 1.0$ V
Rate	Max. 8 kS/s
Resolution	12 bit differential, 11 bit single-ended
Trigger	Source programmable external DIO0...DIO3
Analog outputs	
Channels	2 voltage outputs: Screw terminals
Ranges	0...5 V
Rate	Software controlled 100 S/s (single channel), 50 S/s (dual channel)
Resolution	10 bit
Digital I/O	
Discrete I/Os	4, independently programmable as inputs or outputs (screw terminals), 5 V/TTL. Input, high: 3.0 V min., 15.0 V absolute max.; input, low: 0.8 V max.; output, no load: $V_s - 0.4$ V min., V_s typ; output, 1 mA load: $V_s - 1.5$ V. Protected with 1.5 k Ω serial resistor.
Port I/Os	24 I/O channels arranged in 4x 8 bit ports, each port programmable as inputs or outputs (type 82C55). All pins standard with pull-up to V_s via 47 k Ω . Input, high: 2.0 V min., 5.5 V absolute max.; input low: 0.8 V max., -0.5 V absolute min.; output high: ($I_{OH}=-2.5$ mA) 3.0 V min.
Counter	
Channels	1 channel, event counter. Connector: Screw terminals
Resolution	32 bit
Frequency	Input frequency max. 1 MHz
Pulse width	High/low 500 ns min.
Voltage	Input low: 0 V min., 1.0 V max.; input high: 4.0 V min., 15.0 V max.
General	
Size (mm)	~157 (L) x 102 (W) x 40 (H)
Power supply	Via USB
Interface	USB 1.1 low-speed; max. 3 m USB cable
Connector	Screw terminals, 37-pin D-sub male. USB: Type B
Environmental	Storage and operating temperature -40...85°C, 0...90% rel. humidity, non-condensing

Complete all-round pocket size DAQ labs

RedLab 1208, 1408, 1608, RedPack



The USB DAQ modules RedLab 1208, 1408 and 1608 fit into a vest pocket. At the same time they contain a complete mini DAQ lab each, either with 12, 14 or 16 bit A/D resolution and additional digital I/Os, which can be used for control or switching applications. Use the RedLabs in mobile applications or when there is shortage of space.

■ RedLab 1208 and 1408: 12 bit or 14 bit multi I/O mini DAQ lab for USB:

- 8 single-ended or 4 differential A/D channels.
- 12 bit or 14 bit A/D conversion. Ranges up to ± 20 V.
- 2 D/A channels, 10 bit (1208)/ 12 bit (1408) conversion.
- 16 TTL/CMOS digital I/O channels.
- 32 bit event counters.

■ RedLab 1608: 16 bit multi I/O mini DAQ lab for USB:

- 8 simultaneous single-ended A/D channels.
- 16 bit A/D converter per channel. Input ranges up to ± 10 V.
- 8 discrete digital I/O channels.
- 32 bit event counter.

■ Screw terminals.

- Size (mm) only ~83 x 80 x 25.4.



--- Software included in package: ---

TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW. Optional or with RedPack: ProfiLab-Expert¹⁾.

1) ProfiLab-Expert may not support the full sample rate.

--- Accessory ---

Model	Description
ProfiLab-Expert	Graphic software. Available as an optional accessory or included in the bundle RedPack ¹⁾ .

--- Ordering codes and functions

Model	Description	Analog inputs	Analog outputs	Digital I/O
RedLab 1208LS	12 bit mini DAQ lab, low-speed	8 single-ended (11 bit)/4 differential (12 bit), max. 8 kS/s (LS) or 50 kS/s (FS)	2. 10 bit	16 digital I/Os (TTL, 2x 8 bit ports)
RedLab 1208FS	12 bit mini DAQ lab, full-speed		2. 12 bit	
RedLab 1408FS	14 bit mini DAQ lab, full-speed	8 single-ended (13 bit)/4 diff. (14 bit), max. 48 kS/s	-	8 discrete digital I/Os (CMOS)
RedLab 1608FS	16 bit mini DAQ lab, full-speed	8 single-ended, simultaneous 16 bit, max. 50 kS/s	-	
Bundles with ProfiLab-Expert¹⁾:				
	RedPack 1208LS	RedPack 1208FS	RedPack 1408FS	RedPack 1608FS
Contents: RedLab 1x08, USB cable, screw driver, software and instructions for use on CD. RedPack 1x08: ProfiLab-Expert ¹⁾				

--- Specifications ---

Analog inputs	RedLab 1208	RedLab 1408	RedLab 1608
Number, Type	8 single-ended or 4 differential	8 single-ended or 4 differential	8 single-ended, simultaneous
A/D conversion	12 bit differential, 11 bit single-ended. LS: 50 S/s software controlled, 1.2 S/s continuous sampling, 8 kS/s burst scan in 4 k FIFO FS: 300 S/s software controlled, 50 kS/s continuous sampling	14 bit differential, 13 bit single-ended. 250 S/s software controlled (typ., depending on PC), 48 kS/s continuous sampling	16 bit, individual converter per channel. 0,6 S/s...50 kS/s (software controlled), 20 S/s...50 kS/s (burst scan in 32 k FIFO). 500 S/s (all channels, software controlled); max. 100 kS/s (in PC memory, depending on number of channels and depending on PC); max. 200 kS/s (burst scan in 32 k FIFO)
Input ranges	± 20 V, ± 10 V, ± 5 V, ± 4 V, ± 2.5 V, ± 2.0 V, ± 1.25 V, ± 1.0 V		
External trigger	1 TTL input	1 CMOS input	1 CMOS input
Analog outputs	RedLab 1208	RedLab 1408	RedLab 1608
Number	2	2	-
D/A conversion	10 bit. LS: 100 S/s (1 channel), 50 S/s (2 channels). FS: Software controlled 1000 S/s (1 channel), 500 S/s (2 channels); continuous 2 channels with simultaneous update 12.5 kS/s	12 bit. 250 kS/s (software controlled, 1 channel, typ., depending on PC), 10 kS/s (1 channel continuous), 5 kS/s (2 channels continuous, simultaneous update)	-
Output ranges	0...5 V		
Digital I/O	RedLab 1208	RedLab 1408	RedLab 1608
Number, type	16 TTL/CMOS channels, arranged in 2x 8 bit ports, each port programmable as input or output		8 discrete CMOS channels, independent configuration as inputs or outputs
Counter	RedLab 1208	RedLab 1408	RedLab 1608
Number, type	32 bit event counter, TTL level		
Input frequency	max. 1 MHz		
General	RedLab 1208	RedLab 1408	RedLab 1608
Size (mm)	~ 83 x 80 x 25.4		
Power supply	From PC via USB		
Interface	USB 1.1 low-speed	USB 2.0 full-speed	USB 2.0 full-speed
USB 1.1 and 2.0 compatible with Windows XP, 2000, 98SE/Me			
Connector	I/O: 2x 10 screw terminals, USB: Type B. cable to type A included in package (max. 3 m cable possible)		
Environmental	Operating temperature 0...70°C, storage temperature -40...85°C; 0...90% rel. humidity, non-condensing		

Measure and log temperatures with USB

RedLab TC and TEMP (CF), RedPack



With RedLab TC and TEMP you can connect your temperature sensors to a PC via USB. While the low-cost model TC supports thermocouples only, the TEMP variant can also be used with RTDs, thermistors or semiconductor sensors. The sensor type is selected via software. The models CF have an additional data logger functionality with CompactFlash memory.

- 8 independent, differential input channels for temperature measurement.
- RedLab TC and RedLab TC CF (5201) support: Thermocouples type J, K, T, E, R, S, B, N. Linearization of measurement values, CJC as well as conversion to °C or °F directly in the module.
- RedLab TEMP and RedLab TEMP CF (5203) support 4 types of sensors: Thermocouples (type J, K, T, E, R, S, B, N), RTDs (2-, 3-, 4-wire, eg. 4x 3-wire RTDs), thermistors, semiconductor temperature sensors. The 8 channels can also be operated with a mix of different sensor types without additional signal conditioning.
- Precise 24 bit A/D converter.
- Integrated sensor for environmental temperature (CJC/cold junction compensation).
- 8 additional digital I/O lines.
- Models CF: Data logger function incl. 64 MB CompactFlash. Configuration and data "download" to PC via USB. Otherwise stand-alone operation independently from PC (battery buffered).
- Plug'n'Play USB 2.0 (full-speed, USB cable included). Power supply via USB.

--- Software included in package: ---
 TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW. Optional or with RedPack: ProfiLab-Expert¹⁾.

1) ProfiLab-Expert may not support the full sample rate.

--- Accessory ---

Model	Description
ProfiLab-Expert	Graphic software. Available as an optional accessory or included in the bundle RedPack ¹⁾ .

--- Ordering codes and functions RedLab TC and TEMP ---

Model	Description	Unterstützte Sensoren
RedLab TC	Temperature DAQ box	Thermocouples J, K, T, E, R, S, B, N
RedLab TC CF (5201)	Temperature logger	
RedLab TEMP	Temperature DAQ box	Thermocouples J, K, T, E, R, S, B, N, RTDs (2-, 3-, 4-wire), thermistors, semiconductor temperature sensors
RedLab TEMP CF (5203)	Temperature logger	
Bundles with ProfiLab-Expert¹⁾:		
	RedPack TC	RedPack TC CF
		RedPack TEMP
		RedPack TEMP CF
Contents:	RedLab TC/TEMP (CF), USB cable, screw driver, software and instructions for use on CD. RedPack: ProfiLab-Expert ¹⁾ . Logger models "CF": 64 MB CompactFlash memory card.	

--- Specifications ---

	RedLab TC (CF)	RedLab TEMP (CF)
Analog inputs	8 differential. Integrated temperature sensor for CJC. Module warm-up time min. 30 min	
Number	8 differential. Integrated temperature sensor for CJC. Module warm-up time min. 30 min	
Input types and specs	Thermocouple J, K, T, E, R, S, B, N; ±0.080 V ¹⁾	
	-	RTDs (100 Ω PT); 0...0.5 V ²⁾ .
	-	Thermistors (standard 2,252...30,000 Ω); 0...2 V ²⁾ .
	-	Semiconductor/IC (TMP36 or equivalent); 0...2.5 V ¹⁾
A/D converter	4 dual 24 bit sigma-delta converters	
Isolation	Min. 500 VDC between DAQ connectors and USB interface	
Input data	Voltage max. ±25 V power-on, ±40 V power-off. Impedance min. 5 GΩ. Input coupling: DC	
Open TC detect	Automatically enabled when the channel pair is configured for thermocouple sensor. Max. open detection time 3 s	
Max. throughput rate	Depending on number of channels between 2 S/s (1 channel) to 2 S/s per channel, total 16 S/s (8 channels). Analog inputs run continuously. Each channel is sampled twice per second	
Digital I/O	RedLab TC (CF)	RedLab TEMP (CF)
Number	8 discrete, independently programmable as inputs or outputs	
Types and specs	CMOS. Input high: 2.0 V min./5.5 V abs. max. Input low: 0.8 V max./-0.5 V abs. min. Output high (I _{OH} =2.5 mA): 0.7 V max. Output low (I _{OH} =-2.5 mA): 3.8 V min.	
Data logger	RedLab TC CF	RedLab TEMP CF
Models CF	Configuration, data transfer to PC via USB. Stand-alone operation, independent from PC: Logging to CompactFlash	
General	RedLab TC (CF)	RedLab TEMP (CF)
Size (mm)	~127 (L) x 88.9 (W) x 35.56 (H)	
Power supply	From PC via USB, max. 100 mA; models "CF": Battery buffered	
Interface	USB 2.0 full-speed, compatible with USB 1.1, 2.0	
Connectors	I/O: 2x 10 and 2x 16 screw terminals. USB: Type B. Cable to type A included. Models "CF": CompactFlash Slot	
Environmental	Operating temperature 0...70°C, storage temperature -40...85°C, 0...90% relative humidity, non-condensing	

1) 8 differential channels.

2) 2-wires with one sensor: 4 differential channels. 2-wire with two sensors: 8 differential channels. 3-wire with one sensor per channel-pair: 4 differential channels. 4-wire: 8 differential channels.

Temperature measurement with wireless data transmission

RedLab WLS Series



USB modules are a very handy and reliable solution for data acquisition: They allow the I/O hardware to move close to the sensor. Thus only unsusceptible digital data has to be transmitted to the PC. But there may be cases where you want to get rid of any cables. With the RedLabs WLS you can choose from transmitting data to a PC via USB or via wireless USB. Simply add the wireless USB receiver RedLab WLS-IFC to the PC. You will notice the difference only in the distance of your transmission: It can be up to 730 m for wireless!

- Specifications of the DAQ modules correspond to the pure USB versions (models without "CF", see page 56):
 - RedLab WLS-TC see RedLab TC and
 - RedLab WLS-TEMP see RedLab TEMP.
- Communications functionality additional to USB:
 - **Communication also via 802.15.4 wireless protocol.**
 - Distance: Up to ~ 40 m indoor and 730 m outdoor.
- Receiver at the PC - interface modul (gateway) RedLab WLS-IFC:
 - Can be used with one or more RedLab WLS modules.
 - Supports RedLab WLS-TC and RedLab WLS-TEMP.
 - **Power supply via USB from PC**, no external power supply.
 - All configuration settings via software.
 - LED for wireless status of communication.
- Plug'n'Play USB 2.0 (full-speed, USB cable included).

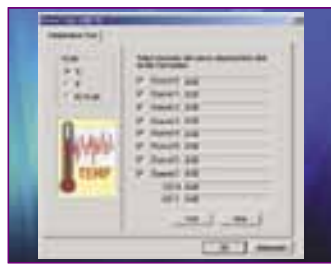
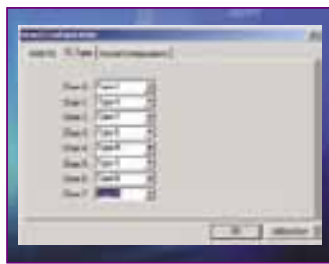
--- Software included in package: ---
 TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW.

--- Ordering codes RedLab TEMP and TC

Model	Description
RedLab WLS-TC	Wireless and USB temperature DAQ box for thermocouples J, K, T, E, R, S, B, N
RedLab WLS-TEMP	Wireless and USB temperature DAQ box for thermocouples J, K, T, E, R, S, B, N and RTDs (2-, 3-, 4-wire), thermistors, semiconductor temperature sensors
Contents: RedLab WLS-TC or WLS-TEMP, USB cable, screw driver, power supply, software and instructions for use on CD.	
RedLab WLS-IFC	Interface module (gateway) from wireless USB to USB (host side/at PC)
Contents: RedLab WLS-IFC, USB cable	
Complete bundles:	
RedLab WLS-TC+IFC	RedLab WLS-TC + RedLab WLS-IFC
RedLab WLS-TEMP+IFC	RedLab WLS-TEMP + RedLab WLS-IFC

--- Specifications ---

RedLab WRL-TC	
Functions	The technical specifications correspond to the model RedLab TC
RedLab WRL-TEMP	
Functions	The technical specifications correspond to the model RedLab TEMP
RedLab WRL-IFC	
Functions	Interface/gateway from PC USB interface to wireless. Power supply from PC via USB. Status LED for wireless communication
Wireless	802.15.4 protocol. Distance: Up to ~ 40 m indoor and 730 m outdoor
USB	2.0 full-speed.
Size IFC (mm)	~79 x 75 x 26,5



Analog output modules with digital I/O and counter

RedLab 31xx Series, RedPack



These RedLab series modules are intended for analog output. They have 4, 8 or 16 analog outputs with 16 bit resolution. A bidirectional synchronization pin allows to update the D/A converter outputs on multiple modules simultaneously. In addition there are 8 digital I/O channels and a 32 bit event counter

- Depending on model 4, 8 or 16 analog outputs.
- Resolution 16 bit.
- Output ranges ± 10 V/0...10 V, models with current outputs also 0...20 mA.
- Additional 8 discrete CMOS digital I/O channels.
- 32 bit event counter.
- Reliable screw terminals.
- Plug'n'Play USB 2.0 (full-speed, USB cable included). Power supply via USB.
- High drive models: Power supply included.

--- Software included in package: ---
 TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW. Optional or with RedPack: ProfiLab-Expert¹⁾.

1) ProfiLab-Expert may not support the full sample rate.

--- Accessory ---

Model	Description
ProfiLab-Expert	Graphic software. Available as an optional accessory or included in the bundle RedPack ¹⁾ .



--- Ordering codes and functions RedLab 31xx series ---

Model	Analog outputs	Ranges	Digital I/O	Event counter	Contents
RedLab 3101	4, 16 bit	± 10 V/0...10 V	8, CMOS	1x 32 bit	USB DAQ box, USB cable (type A-B), screw driver; CD with software/PDF user manual.
RedLab 3102	4, 16 bit	± 10 V/0...10 V, 0...20 mA	8, CMOS	1x 32 bit	
RedLab 3103	8, 16 bit	± 10 V/0...10 V	8, CMOS	1x 32 bit	
RedLab 3104	8, 16 bit	± 10 V/0...10 V, 0...20 mA	8, CMOS	1x 32 bit	
RedLab 3105	16, 16 bit	± 10 V/0...10 V	8, CMOS	1x 32 bit	
RedLab 3106	16, 16 bit	± 10 V/0...10 V, 0...20 mA	8, CMOS	1x 32 bit	
RedLab 3110	4, 16 bit	± 10 V/0...10 V, high drive	8, CMOS	1x 32 bit	High drive modeld 3110, 3112, 3114: Power supply
RedLab 3112	8, 16 bit	± 10 V/0...10 V, high drive	8, CMOS	1x 32 bit	
RedLab 3114	16, 16 bit	± 10 V/0...10 V, high drive	8, CMOS	1x 32 bit	

Bundles with ProfiLab-Expert¹⁾:

RedPack 3101	RedPack 3102	RedPack 3103	RedPack 3104	RedPack 3105	RedPack 3106
RedPack 3110	RedPack 3112	RedPack 3114			

Contents: RedLab 31xx, USB cable, screw driver, software and instructions for use on CD. High drive models RedLab 311x: Power supply. RedPack: ProfiLab-Expert¹⁾.

--- Specifications ---

Models	3101	3103	3105	3102	3104	3106	3110	3112	3114
Description	16 bit analog output modules with 4, 8, 16 channels plus digital I/O						16 bit analog output modules with 4, 8, 16 high drive channels plus digital I/O		
Analog outputs	3101	3103	3105	3102	3104	3106	3110	3112	3114
Number	4	8	16	4	8	16	4	8	16
D/A convers.	16 bit, 100 kHz (depending on system)								
Range	± 10 V/0...10 V (output current per output typ. ± 3.5 mA)			± 10 V/0...10 V (output current per output typ. ± 3.5 mA), 0...20 mA			± 10 V/0...10 V, high drive: Max. load per channel 40 mA (source/sink)		
Digital I/O	3101	3103	3105	3102	3104	3106	3110	3112	3114
Number	8 discrete, independently programmable as inputs or outputs								
Type and specs	CMOS. Input high: 2.0 V min./5.5 V abs. max. Input low: 0.8 V max./-0.5 V abs. min. Output high ($I_{OH}=2.5$ mA): 0.7 V max. Output low ($I_{OL}=2.5$ mA): 3.8 V min.								
Event counter	3101	3103	3105	3102	3104	3106	3110	3112	3114
Number; type	1x 32 bit event counter								
General	3101	3103	3105	3102	3104	3106	3110	3112	3114
Size	(in mm) ~ 127 (L) x 88.9 (W) x 35.56 (H)								
Power supply	From PC via USB						Power supply 5 V/ 10 W		
Interface	USB 2.0 full-speed, compatible with USB 1.1, 2.0								
Connectors	I/O: 2x 28 screw terminals. USB: Type B. Cable to type A included								
	- (power supply from PC via USB)						Connector for power supply		
Environmental	Operation temperature 0...50°C, storage temperature -40...85°C, 0...90% relative humidity non-condensing								

Digital acquisition, control and switching with USB

RedLab 1024, RedPack



The RedLab 1024 lets you control digitale inputs and outputs via USB. For example, you can control switching operations or relays or acquire digital states. The unbeatable benefits of the module are its small, space-saving size, its easy installation and handling as well as its low price.

- Digital interface module for USB.
- **24 TTL/CMOS digital I/O channels** (82C55), arranged in three 8 bit wide ports.
- **HLS: High drive inputs/outputs** instead of TTL/CMOS 82C55.
- **32 bit event counter.**
- Screw terminal connectors.
- Size (mm) only 83 x 80 x 25,4.

--- Software included in package: ---

TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW. Optional or with RedPack: ProfiLab-Expert¹⁾.

1) ProfiLab-Expert may not support the full sample rate.

--- Accessory ---

Model	Description
ProfiLab-Expert	Graphic software. Available as an optional accessory or included in the bundle RedPack ¹⁾ .

--- Specifications ---

Digital inputs/outputs	
Number	24 bidirectional input/output channels, arranged as 3x 8 bit wide ports or 2x 8 bit and 2x 4 bit wide ports; each port programmable as input or output
Version LS	82C55 TTL/CMOS; by default all lines are connected to V_s via a 47 k Ω resistor (standard). Optional pull-down to GND possible. Input high: 2.0 V min./5.5 V abs. max. Input low: 0.8 V max./-0.5 V abs. min. Output high: ($I_{OH}=-2.5$ mA) 3.0 V min.
Version HLS	HLS: High drive, 74ACT373 inputs/74FCT244 outputs Internal 47 k Ω resistor; user configurable for pull-up or pull-down via external connector "port x pull-up/pull-down" to USB +5 V or GND. Ports A, B and C configurable independently. Input high: 2.0 V min./5.5 V abs. max. Input low: 0.8 V max./-0.5 V abs. min. Output high: ($I_{OH}=-15$ mA) 2.4 V min. Output low: ($I_{OL}=64$ mA) 0.55 V max. Max. current = 15 mA per output
Counter	
Number, type	1x 32 bit event counter
Input frequency	Max. 1 MHz
General	
Size (mm)	~83 x 80 x 25,4
Power supply	From PC via USB
Interface	USB 1.1 low-speed, USB 1.1 and 2.0 compatible with Windows XP, 2000, 98SE/Me
Connector	I/O: 2x 10 screw terminals, USB: Type B. Cable to type A included in package (max. 3 m cable possible)
Environmental	Operating temperature 0...70°C, storage temperature -40...85°C; 0...90% rel. humidity, non-condensing

--- Ordering codes and functions RedLab 1224 ---

Model	Description
RedLab 1224LS	USB digital box, 24 TTL/CMOS digital I/O channels
RedLab 1224HLS	USB digital box, 24 high drive digital I/O channels
Bundles with ProfiLab-Expert ¹⁾ :	
	RedPack 1224LS RedPack 1224HLS
Contents: RedLab 1224, USB cable, screw driver, software and instructions for use on CD. RedPack: ProfiLab-Expert ¹⁾	

RedLab Series Designs



Design	Mini	Midi	Special form design RedLab WLS-IFC	Special design RedLab 1008
Size (mm, approx.)	83 x 80 x 25,4	127 x 88,9 x 35,56	79 x 75 x 26,5	157 x 102 x 40
Models	RedLab 1208, RedLab 1408, RedLab 1608, RedLab 1024	RedLab 4301, RedLab 4303, RedLab 3xxx, RedLab TC and TEMP (CF), RedLab WLS-TC and TEMP	RedLab WLS-IFC	RedLab 1008
I/O connectivity	2 rows of screw terminals	2 rows of screw terminals	-	2 rows of screw terminals, 37-pin D-sub

16 bit counter and timer box for USB

RedLab 430x, RedPack



Now you can build counter applications also with USB using the RedLabs 4301 and 4303. The RedLabs' 5 or 10 counters with 16 bit resolution can operate in the modes event counting, frequency measurement, frequency division, single-shot, square signal generation with symmetric or variable duty cycle (PWM/pulse width modulation).

- RedLab 4301: **5x 16 bit counters** up to 20 MHz. RedLab 4303: **10x 16 bit counters** up to 20 MHz.
- Counter chip type 9513.
- **Operating modes:** Event counting, frequency measurement, frequency division, single-shot, square signal generation with symmetric or variable duty cycle (PWM).
- **Interrupt control.**
- **8 digital inputs, 8 digital outputs.**
- Screw terminal connectors.
- Size [mm] 127 x 90 x 36.

--- Software included in package: ---

TracerDAQ (strip chart recorder and data logger). Universal Library (programming language support for Windows). InstaCAL utility (for easy installation, calibration and test). Driver for LabVIEW. Optional or with RedPack: ProfiLab-Expert¹⁾.

1) ProfiLab-Expert may not support the full sample rate.

--- Accessory ---

Model	Description
ProfiLab-Expert	Graphic software. Available as an optional accessory or included in the bundle RedPack ¹⁾ .

--- Ordering codes RedLab 4301, 4303 ---

Model	Description
RedLab 4301	Counter/digital box, 5x 16 bit counters up to 20 MHz, 8 digital inputs/8 digital output. TTL level.
RedLab 4303	Counter/digital box, 10x 16 bit counters up to 20 MHz, 8 digital inputs/8 digital outputs. TTL level.
RedPack 4301	RedLab 4301 bundled with ProfiLab-Expert ¹⁾
RedPack 4303	RedLab 4303 bundled with ProfiLab-Expert ¹⁾
Contents: RedLab 4301 or 4303, USB cable, screw driver, software and instructions for use on CD. RedPack: ProfiLab-Expert ¹⁾	

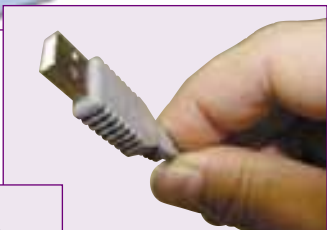
--- Specifications ---

Counters	
Number	5x (RedLab 4301) or 10x (RedLab 4303) 16 bit up/down counter (1x or 2x chip type 9513)
Level	5 V/TTL
Clock	Software selectable internal/external. Max. external input frequency 20 MHz.
Digital I/O	
Number	8 inputs and 8 outputs (74ACT373).
Level	5 V/TTL; input voltage at "1": 2.0 V min., 5.5 V absolute max., input voltage at "0": 0.8 V max., -0.5 V absolute min., output voltage at "1": min. 3.3 V at -24 mA (Vcc = 4.5 V), output voltage at "0": max. 0.8 V at 10 mA
General	
Size (mm)	~ 127 (L) x 88.9 (W) x 35.56 (H)
Power supply	From PC via USB, power consumption max. 500 mA
Interface	2.0 full-speed, compatible with USB 1.1
Connector	I/O: 2x 28 screw terminals, USB: Type B. Cable to type A included in package (max. 3 m cable possible)
Environmental	Operating temperature 0...60°C, storage temperature -40...85°C; 0...90% rel. humidity, non-condensing

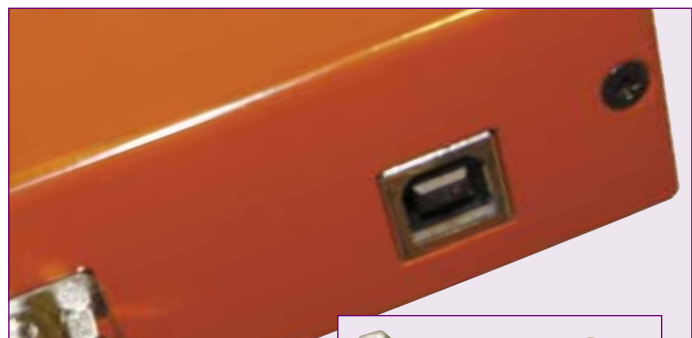
USB Connectors Type A and Type B



USB type A connector - at a PC/notebook or hub



<< USB type A "extender"



USB type B connector - at an USB device (eg. MEphisto Scope)

