EL-USB-5
Counter, Event and State USB Data Logger

FEATURES

- Functions as an event logger, state change logger and event counter
- Logging rate of up to four times per second for events, two times per second for state changes and 100 times per second when counting
- Stores up to 32,510 readings in event mode
- Stores up to 32,510 readings in state change mode
- Stores up to 32,510 timed intervals in event counter mode
- Accepts input voltages of up to 24V
- Volt free contacts option (normally open contact only)
- Rising and falling edge triggering
- LED flash on event / state change
- Connection via two screw terminals
- USB Interface for set-up and data download
- Supplied with replaceable internal lithium battery, Windows control software and measurement leads

This standalone data logger can record events (detecting an input and storing the time and date), record state changes (similar to an 'event' but also recording when the input reverts back to normal) and count events (count the number of events that happen during a timed interval). Up to 32,510 events or state changes can be recorded and up to 32,510 timed intervals in event counter mode (with 65,536 events in each interval).

Events and state changes can be triggered by either a rising edge (a voltage going from low to high) or falling edge (a voltage going from high to low). It is also possible to use volt free contacts. Instead of measuring an external voltage, the data logger applies a voltage across the screw terminals and detects when the input closes (i.e. a relay or microswitch).

Fast logging rates allow event capturing at speeds of up to two times per second and state changes at speeds of up to four times per second. Event counting can operate at speeds of up to 100 times per second (when the LEDs are turned off). The user can easily set up the logger, and download the stored data by plugging the data logger into a PC's USB port and running the purpose designed software under Windows 2000, XP, Vista & 7. Data can then be graphed, printed and exported to other applications.

The data logger is supplied complete with software, measurement leads terminated with crocodile clips and a long-life lithium battery which allows logging for up to 1 year. Functionality of the unit is indicated by flashing red and green LEDs, with an option to flash the red LED every time an event occurs.

Specifications	Minimum	Typical	Maximum	Unit
Time between events	200			Milliseconds
Time between state changes	500			Milliseconds
Time between event counts	10*			Milliseconds
Input voltage **	3		28	V d.c.
'Volt free contacts' voltage ***	2.75		3.6	V
'Volt free contacts' current		35		µA
Timing accuracy †			±3	Seconds per 24 hours
Operating temperature range	-35 (-31)		+80 (176)	°C (°F)
1/2AA 3.6V Lithium Battery Life ‡		1		Years

* 10 milliseconds can only be achieved with the LEDs disabled. If the LEDs are enabled, the time between the event counts is reduced to 50 milliseconds
** see 'Voltage input range' section for details
*** Voltage will decrease as battery is discharged
† Per day at 20ºC
‡ Assuming 1 event every 5 mins at 20ºC in Voltage input mode

EasyLog www.lascarelectronics.com **LASCAR** electronics
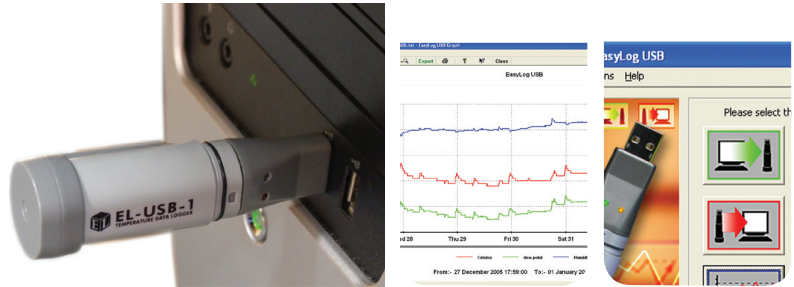
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EL-WIN-USB (CONTROL SOFTWARE)

Lascar's EasyLog USB control software is supplied free of charge with each data logger. Easy to install and use, the control software runs under Windows 2000, XP, Vista & 7. The software is used to set-up the data logger as well as download, graph and export data to Excel.

The software allows the following parameters to be configured:

- Logger name
- Record events, record state changes or count events
- Triggering on rising of falling edges (see 'Edge Triggering' section)
- Voltage or Volt free contact triggering
- Flash LED on event/state change
- Voltage range
- Time period for event counting (i.e count the number of events every 10s). Maximum number of events per time period is limited to 65,000.

The latest version of the control software may be downloaded free of charge from **www.lascarelectronics.com**

LED FLASHING MODES

EL-USB-5 features a red and a green LED to indicate the status of the data logger.

Green LED Red LED	**Green single flash (10 seconds)** Normal logging
	Green single flash (20 seconds) Low battery
	Green double flash (20 seconds) Data logger memory full
	Red single flash Event / State change / Count recorded

VOLTAGE INPUT RANGE

The logger features a selectable voltage input range, which allows the logger to operate with a wide variety of system. Each input range has a different high and low 'trigger voltage' (i.e the voltage at which the logger considers a signal to be high or low).
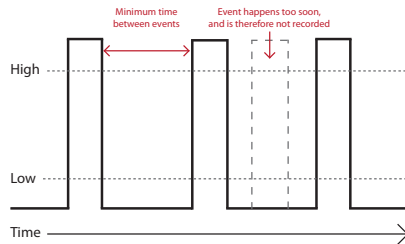
| Voltage range	Low trigger voltage	High trigger voltage
0 - 3V	0.8V	2V
0 - 5V	1.3V	3.4V
0 - 12V	3.2V	8V
0 - 24V	6.4V	16V

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EDGE TRIGGERING

If the user selects 'rising edge' triggering, then an event is recorded at the point a signal goes from low to high. This is the default setting.

If the user selects 'falling edge' triggering, then an event is recorded at the point a signal goes from high to low.
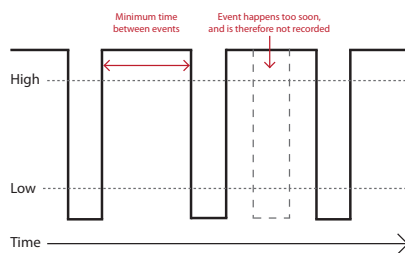
BATTERY REPLACEMENT

We recommend that you replace the battery every 12 months, or prior to logging critical data.

The EL-USB-5 does not lose its stored readings when the battery is discharged or when the battery is replaced; however, the data logging process will be stopped and cannot be re-started until the battery has been replaced and the logged data has been downloaded to PC.

Only use 3.6V 1/2AA lithium batteries. Check with your supplier that the battery you are ordering is 'press fit' and is not fitted with solder tags. Before replacing the battery, remove the EL-USB-5 from the PC.

Note:
Leaving the EL-USB-5 plugged into the USB port for longer than necessary will cause some of the battery capacity to be lost.
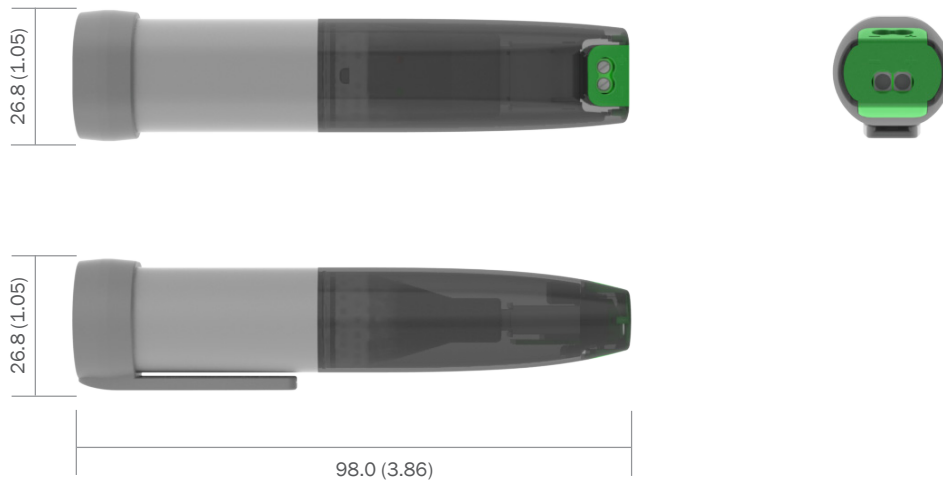
WARNING

Handle lithium batteries carefully, observe warnings on battery casing. Dispose of in accordance with local regulations.

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DIMENSIONS

All dimensions in mm (inches)

26.8 (1.05)

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98.0 (3.86)

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THE EASYLOG USB RANGE

Each EL-USB data logger features the direct-to-USB connection and easy-to-use functionality that the range is known for. The range comprises of the data loggers as detailed in the following table:

Part No	Function	Range	Accuracy (overall error) Typ.	Max.	Readings	Battery	Battery Life*
EL-USB-1	Temperature	-35 to +80°C (-31 to +176°F)	±1°C (±2°F)		16,382	3.6V ½AA	1 Year
EL-USB-1-PRO	High Temperature	-40 to +125°C (-40 to +257°F)	±0.2°C (±0.4°F)	±0.5°C (±1°F)	32,510	3.6V ⅔AA	3 years
EL-USB-1-RCG	Temperature with rechargeable battery	-20 to +60°C (-4 to +140°F)	±1°C (±2°F)		32,510	Lithium Ion	1 month (rechargeable)
EL-USB-2	Temperature, humidity & dew point	-35 to +80°C (-31 to +176°F) 0 to 100%RH	±0.5°C (±1°F) ±3%RH	±2°C (±4°F) ±6.0%RH	16,382	3.6V ½AA	1 year
EL-USB-2+	Increased accuracy temperature, humidity & dew point	-35 to +80°C (-31 to +176°F) 0 to 100%RH	±0.3°C (±0.6°F) ±2.0%RH	±1.5°C (±3°F) ±4.0%RH	16,382	3.6V ½AA	1 year
EL-USB-2-LCD	Temperature, humidity & dew point with LCD	-35 to +80°C (-31 to +176°F) 0 to 100%RH	±0.5°C (±1°F) ±3.0%RH	±2°C (±4°F) ±6.0%RH	16,379	3.6V ½AA	1 year
EL-USB-2-LCD+	Increased accuracy temperature, humidity & dew point with LCD	-35 to +80°C (-31 to +176°F) 0 to 100%RH	±0.3°C (±0.6°F) ±2.0%RH	±1.5°C (±3°F) ±4.0%RH	16,379	3.6V ½AA	1 year
EL-USB-3	Voltage	0 to 30V d.c.	±1%		32,510	3.6V ½AA	1 year
EL-USB-4	Current loop	4 to 20mA	±1%		32,510	3.6V ½AA	1 year
EL-USB-5	Counter, Event & State	N/A		±3 secs/24 hrs	32,510	3.6V ½AA	1 year
EL-USB-TC	Thermocouple (J, K and T-type) K-type probe included	-200 to +1350°C (-328 to +2462°F) (K-type) -200 to +1190°C (-328 to +2174°F) (J-type) -200 to +390°C (-328 to +734°F) (T-type)	±1°C (±2°F)		32,510	3.6V ½AA	6 months
EL-USB-TC-LCD	Thermocouple with LCD (J, K and T-type) K-type probe included	-200 to +1350°C (-328 to +2462°F) (K-type) -200 to +1190°C (-328 to +2174°F) (J-type) -200 to +390°C (-328 to +734°F) (T-type)	±1°C (±2°F)		32,510	3.6V ½AA	6 months
EL-USB-CO	Carbon monoxide	0 to 1000ppm **NOT A LIFE SAVING DEVICE**	±6ppm		32,510	3.6V ½AA	3 months
EL-USB-CO300	Carbon monoxide	0 to 300ppm **NOT A LIFE SAVING DEVICE**	±4ppm		32,510	3.6V ½AA	3 months
EL-USB-LITE	Low cost temperature	-10°C to +50°C (+14 to +122°F)	±1°C (±2°F)		4,080	CR1620 Lithium coin cell	1 month
EL-USB-RT	Real-time temperature & humidity monitor	-20 to +70°C (-4 to +158°F)	±1.5°C (±3°F) ±4.5%RH		7 days	N/A	N/A

*Depending on logging rate, ambient temperature, and use of alarm LED

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