EL-USB-ACT
AC and DC Millivolt Data Logger with Current Clamp Input

FEATURES

- Compatible with a.c. and d.c. current clamps
- Energy monitoring mode (to calculate power, cumulative energy and cumulative cost)
- a.c. and d.c. millivolt measurement mode
- Logging rates between 1s and 12hr
- Stores 127,000 readings
- 4mm banana plug inputs (19mm spacing)
- USB interface for set-up and data download
- User-programmable alarm thresholds
- High contrast LCD, with 4 digit current, power, cumulative energy and cumulative cost
  display functions, battery status, alarm indicators and measurement units
- Immediate, delayed and push-to-start logging
- Supplied with user replaceable AA batteries (2) and Windows control software

The EL-USB-ACT (and attached current clamp) should only be used by a competent engineer, and usage must comply with all relevant Local & International Health & Safety Regulations & Guidelines.

This standalone data logger measures and stores up to 127,000 a.c. or d.c. current readings. This logger must be used with an appropriate current clamp to take readings over a 0 to 1000 amp d.c. measurement range (0 to 723 amps for a.c.). In 'energy monitoring' mode, this data is converted into power, energy (using a user defined voltage value) and cost (using a user supplied energy unit cost). The millivolt measurement mode allows for direct measurement of voltage, up to 1V d.c. (707mV a.c.).

The user can easily set up the logger and view downloaded data by plugging the data logger into a PC's USB port and using the supplied software. The software has provision for a clamp scaling factor (the clamp input-output ratio of amps to millivolts). Stored data can then be graphed, printed and exported to other applications. The high contrast LCD can show a variety of current, power, energy and cost information. At the touch of a button, the user can cycle between the most recent, maximum and minimum measurement values. The data logger is fitted with 2 replaceable AA batteries.

Ensure the connector(s) from your current clamp are pushed fully home into the 4mm sockets of the EL-USB-ACT. Note: some designs of 4mm plugs require a noticeably higher force to be applied during the last 5-10mm of travel during insertion.

Also be aware that it is normal for the logger to show a small spike in the reading when either connecting or disconnecting to the current clamp, although this should decay to close to zero after a few seconds. You may wish to make use of either the delayed start, or push to start modes in the software – if you want to avoid this effect appearing in your logged data.

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Specifications	Minimum	Typical	Maximum	Unit
Measurement range (a.c.)	0		707	mV a.c. RMS
Equivalent clamp measurement range (a.c.)	0		723	A a.c.
Accuracy (a.c.)		5		% (±2 count)
Frequency			100	Hz
Measurement range (d.c.)	-1000		1000	mV d.c.
Equivalent clamp measurement range (d.c.)	0		1000	A d.c.
Accuracy (d.c.)		2		% (±1 count)
Measurement resolution		1		mV
Display resolution*	1			mV
Logging rate (Current measurement)	Every 1s		Every 12hr	-
Logging rate (Energy measurement)	Every 1s		Every 10s	-
Operating temperature range	-10 (-31)		+50 (176)	°C (°F)
Battery life**			6	Months

* Display resolution will change, depending on the number of digits in use. The display will auto range to make the best use of available space
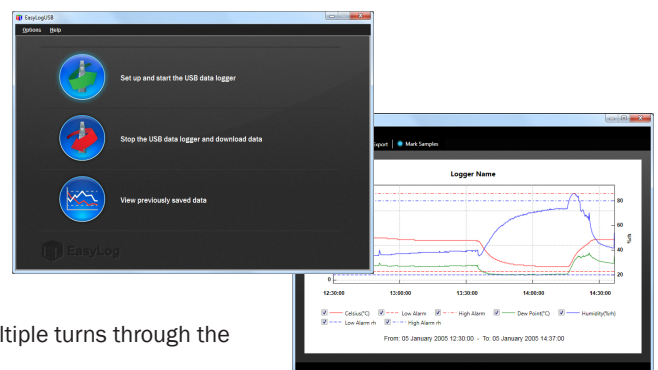
** Depending on sample rate, ambient temperature and use of LCD

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 (up to 16 characters)
- Measurement mode (current, energy, power or voltage)
- Logging rate (1s, 10s, 10s average 1m, 5m, 30m, 1hr, 6hr, 12hr). Energy monitoring is limited to 1s and 10s average.
- Signal type (a.c. or d.c.)
- Supply voltage (energy monitoring only)
- Cost per kWh (energy monitoring only)
- High and low alarm levels
- Scaling factor (when using a current clamp only, to accomodate multiple turns through the clamp or different mV/A ratios)
- Immediate, delayed and push-to-start logging
- Display off, on for 30 seconds after button press, or permanently on
- Data rollover (allows unlimited logging periods by overwriting the oldest data when the memory is full)

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

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DIMENSIONS

All dimensions in mm (inches)

BATTERIES

The EL-USB-ACT uses 2 x 1.5V AA batteries. Battery life will vary depending on the usage profile of the data logger. For example:

Sample rate	LCD mode	Expected battery life
1 second	On at all times	5 days
1 minute	On for 30 seconds after battery press	2 weeks

To achieve the best possible battery life choose the lowest sample rate suitable for your application and where acceptable choose for the LCD to turn off after 30 seconds. It is also advisable to use the best quality batteries available. We recommend that you replace the battery every month, or prior to logging critical data.

The EL-USB-ACT 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 a PC. When replacing batteries, ensure the EL-USB-ACT is not connected to the PC.

Note: Leaving the EL-USB-ACT plugged into the USB port for longer than necessary will cause some of the battery capacity to be lost.
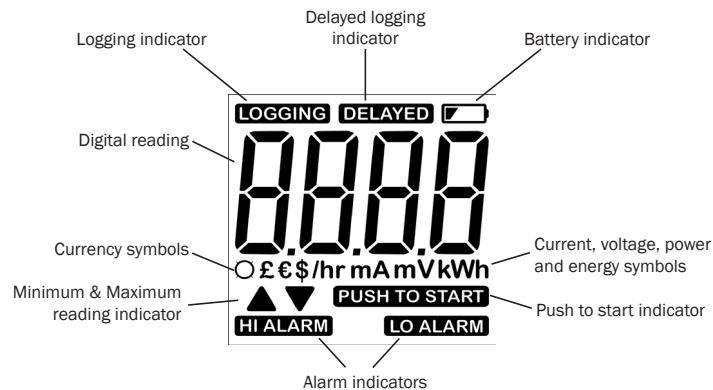
WARNING
Handle batteries carefully, observe warnings on battery casing. Dispose of in accordance with local regulations.

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DISPLAY AND STATUS FUNCTIONS

The EL-USB-ACT features a high contrast LCD. The LCD shows logged values using seven segment numbers and corresponding symbols. The LCD also shows information regarding the logger status.

The EL-USB-ACT has three different modes:

- In 'current mode', three different functions are available on the display – most recent logged current, maximum logged current and minimum logged current.

- In 'millivolt mode', three different functions are available on the display – most recent logged voltage, maximum logged voltage and minimum logged voltage

- In 'energy monitoring mode', five different functions are available on the display – most recent logged power, maximum logged power, minimum logged power, cumulative energy consumption and cumulative cost (only available if a cost per kWh is entered in the software during setup).

The push button is used to cycle through the functions in each mode.

LCD INDICATION

All Modes:

Display	Logger Status	Explanation
DELAYED	Delayed Start	This is shown when the logger is set to start at a specific data and time*
PUSH TO START	Push to Start	This is shown when the logger is setup for "Push to start" logging
LOGGING	Logging	This is shown when the logger is running in "LCD off" mode, and the button is pressed. The display clears again after three seconds
HI ALARM	High alarm	This is shown when the input goes above a user specified value **
LO ALARM	Low alarm	This is shown when the input goes below a user specified value **
StOP	Stopped	If the logger has not been set to log and the button is pressed, 'Stop' is displayed for three seconds

* If the logger is set to "LCD off" or "LCD on for 30 seconds" mode, then this will only be shown after the button is pressed. Otherwise the display will remain blank.
** Not available in 'energy monitoring' mode.

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Current Mode:

Display	Explanation
26.8 A	Latest stored 'current' reading Push button to view minimum stored 'current' reading
8.5 A ▼	Minimum stored 'current' reading Push button to view maximum stored 'current' reading
100.0 A ▲	Maximum stored 'current' reading Push button to view latest stored 'current' reading

Energy Monitoring Mode:

Display	Explanation
186 kW	Latest stored power reading Push button to view minimum stored power reading
549 kW ▼	Minimum stored power reading Push button to view maximum stored power reading
1349 kW ▲	Maximum stored power reading Push button to view cumulative energy consumption
9.017 kWh	Cumulative energy consumption Push button to view cost per hour
2.13 € /hr	Cost per hour Push button to view cumulative cost
3.84 €	Cumulative cost Push button to view latest stored power reading

Millivolt Mode:

Display	Explanation
295 mV	Latest stored 'millivolt' reading Push button to view minimum stored 'millivolt' reading
81 mV ▼	Minimum stored 'millivolt' reading Push button to view maximum stored 'millivolt' reading
872 mV ▲	Maximum stored 'millivolt' reading Push button to view latest stored 'millivolt' reading

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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 following data loggers:

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-LCD	Temperature with LCD	-35 to +80°C (-31 to +176°F)	±0.5°C (±1°F)	±1.5°C (±3°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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