

- ▶ N.8 (N.16 single-ended) analog inputs, N.4 digital inputs, N.1 RS232 input
- ▶ Input extension using MASTER/SLAVE configurations
- ▶ Extremely low power consumption
- ▶ N.99 measurements considering channels for sensor acquisition and derived quantities
- ▶ Internal library for calculating derived quantities and mathematical calculations
- ▶ 8 MB Flash Memory
- ▶ Modbus-RTU Master/Slave, TTY protocols
- ▶ Transmission (push) of data in ASCII format with FTP protocol
- ▶ N.2 RS232 ports (ELO3305)
- ▶ N.1 RS232 port and N.1 RS485 port (ELO3305.1)
- ▶ Digital outputs to implement external devices with programmable logics or events
- ▶ Acquisition and elaboration rate from 1 s to 12 h
- ▶ Connection to the PC via RS232 (USB /Ethernet/Modem GPRS with external accessories)
- ▶ Display and keyboard

E-Log has been explicitly designed for environmental applications; it is equipped with specific inputs for a wide range of sensors and calculations of derived quantities. E-Log stores the data from the connected sensors and supports different communication protocols both in input and output. Robust and reliable, E-Log makes measurements possible even in the most severe environments, while the 16-bit A/D converter ensures accurate and reliable data in classic meteorological, hydrological and air quality applications and, more generally, in any environmental application.



▶ E-Log is featured by the flexibility of its signal acquisition and data processing system allowing to produce data and make them available to LSI LASTEM or third-party applications. This allows it to be used in a wide range of applications. It was born as a data logger for fixed or portable meteorological applications, but it is also used for indoor or industrial uses. E-Log is a powerful data logger but also easy to use, where its configuration and management does not require specific skills.

It is designed to work for years without specific interventions from outside.

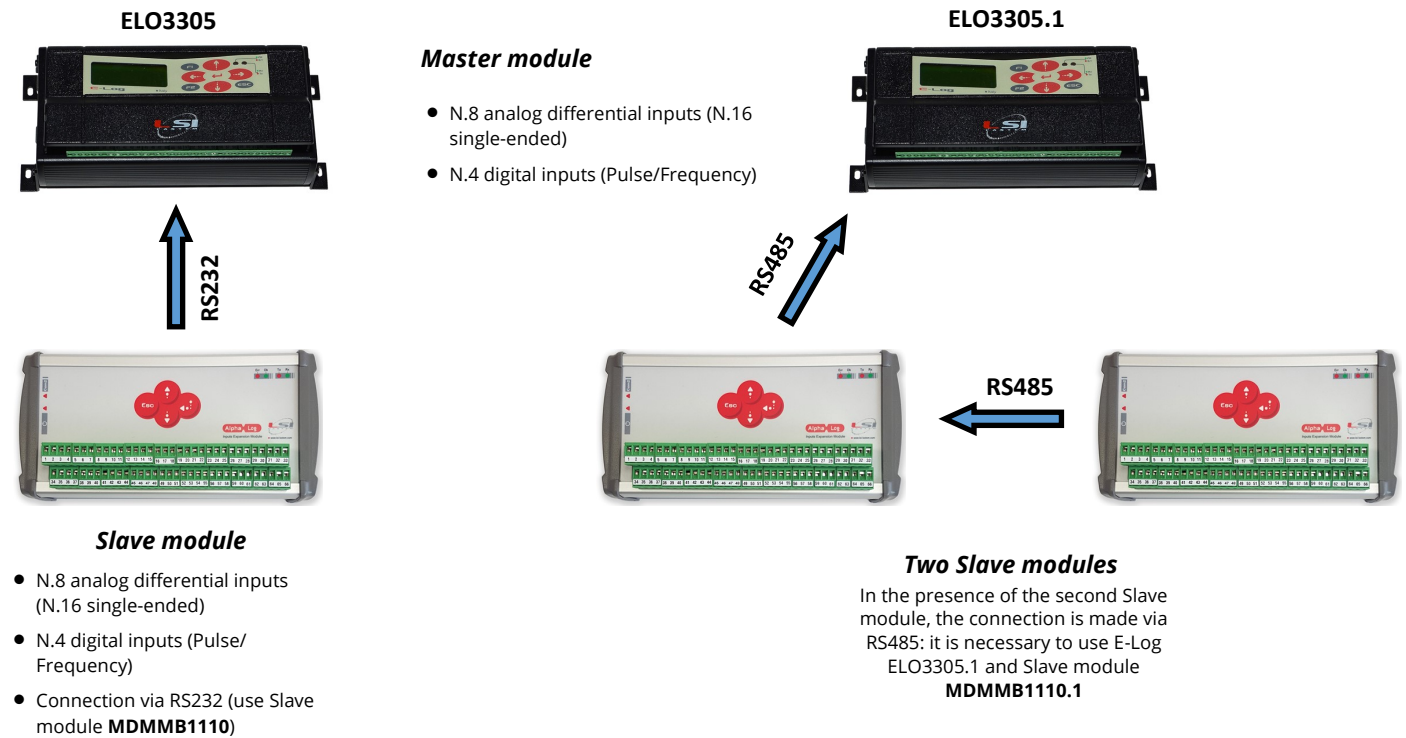
▶ **Inputs for analog and digital sensors**

Free terminal inputs:

- N.8 analog differential inputs (N.16 single-ended)
- N.4 digital inputs (Pulse/Frequency)

To increase the number of inputs, two E-Log units can be joined together using a **Master & Slave** using a RS232 (ELO3305) or RS485 (ELO3305.1) connection.

(See ALIEM Module MW9008-ITA-05 data sheet)

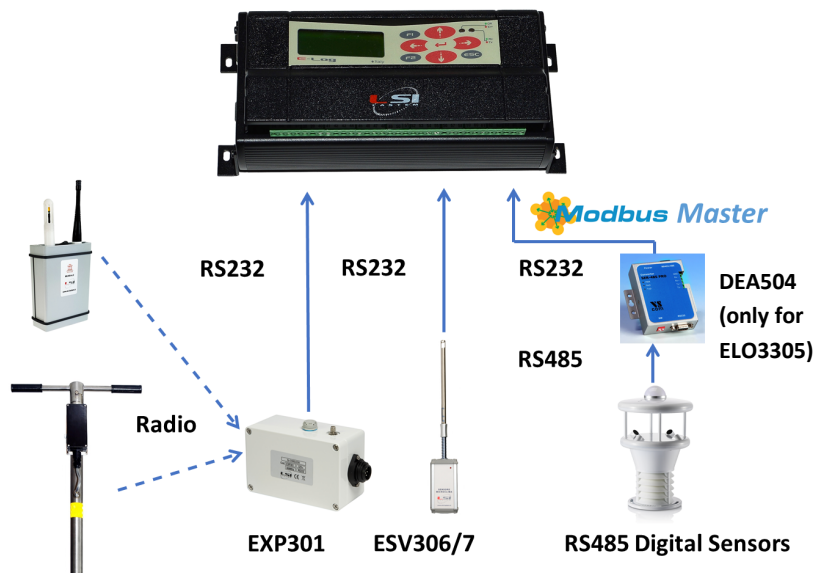


▶ **Inputs for Serial sensors**

The E-Log COM-2 port can be connected to sensors with different protocols:

- Modbus-RTU on RS232 or RS485 (with adapter external DEA504 for model ELO3305, directly for model ELO3305.1)
- GILL (Gill format, polar, continuous)
- BIRAL (SWS050 – SWS100, SWS200 –SWS250)
- LUFFT (UMB binary)
- BOSCHUNG

E-Log can also be connected via RS232 to EXP301 radio receiver to receive signals from LSI LASTEM's radio sensors (EXP line).



▶ Sensors acquisition rate

Acquisition rate is programmable for each input (from 1 second to 12 hours).

E-Log manages 12 channels from analog sensors and 8 derived quantities in 1 second.

To limit energy consumption from sensors requiring power supply, it is possible to set an advanced power supply from the acquisition event, (warm-up) that is interrupted immediately after the acquisition itself.

▶ Statistical elaboration time base

The raw measured values can be stored directly as instantaneous values, or be stored as statistical processing (from 1 second to 12 hours):

- Average/Minimum/Maximum/Standard Deviation
- Wind elaborations
- Totals

▶ Derived and calculated quantities

Internal library of derived environmental quantities. These calculations use acquired quantities, constant values and other calculated quantities. The library also includes mathematical functions. (See Derived Quantities table). E-Log manages up to 99 channels between acquired, derived and calculated quantities.

▶ Data memory

Internal memory (8 MB) allows to store data typically for several weeks. The registration structure is circular.

Storage autonomy is a function of the number of connected sensors and of the configured processing rate.

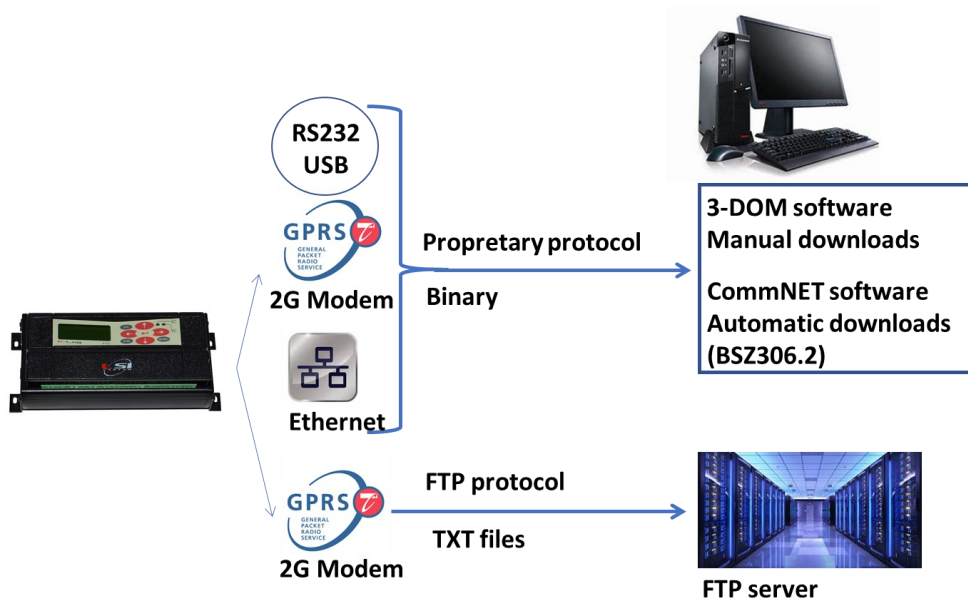
▶ Data communication (devices)

It is possible to transfer data to a PC via:

- RS232, USB (with adapter included)
 - RS485 with external adapter (DEA504 / 504.1) for model ELO3305, directly with ELO3305.1
 - Modem GPRS (DEA718.3)
 - Radio (DEC015.1)
 - Ethernet (DEA553)
- (see Accessories)*

▶ Data communication protocols

Via GPRS modem, data are sent (push mode) to the IP address of a remote PC/Server in ASCII format and FTP protocol. Alternatively, via GPRS or Ethernet, E-Log uses a proprietary binary protocol to transmit data using the LSI LASTEM communication programs: 3DOM, CommNET.



▶ Data communication protocols (Modbus)

In the E-Log models it is possible to send data to Modbus Master devices via:

- Modbus RTU: on RS232 or RS485
- Modbus Encapsulated TCP on Ethernet (using DEA553 adapter)
- Modbus TCP over Ethernet (using DEA509 adapter)

The data transmitted with the Modbus protocol can concern instantaneous values, but also mobile statistical values*.

*Mobile data are values whose statistical basis corresponds to the last observation period. Example: mobile temperature average over 10 minutes (each minute the value is updated always considering the average value of the last 10 minutes).

▶ Communication time rate

When data are sent via GPRS modem (push mode) to the IP address of a remote PC or server, it's possible to set a sending rate from 3 minutes to 24 hours.

▶ Switched power supply outputs

N.7 independent electrical outputs to supply external sensors and devices that can be activated with configurable logics depending on the data acquired. These outputs become relay outputs with a special external module (MG3023).

▶ Built-in Temperature sensor

Built-in Temperature sensor (accuracy 0.5°C).

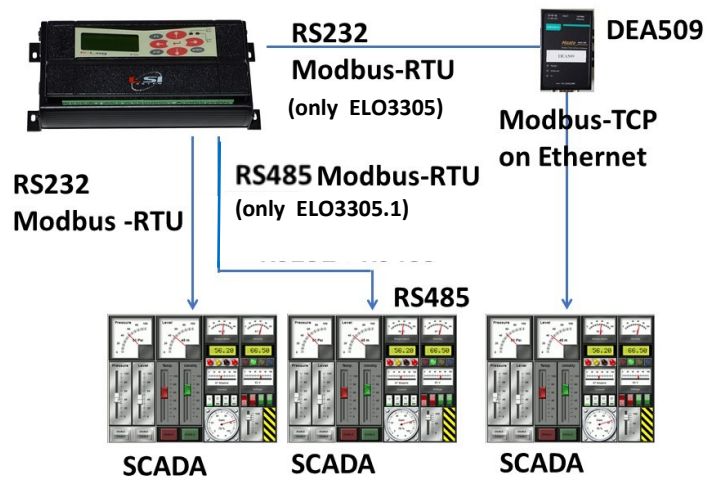
▶ Firmware update

E-Log has a function (Boot loader) that allows you to send, via RS232, a firmware update from a PC directly connected via RS232, USB.

▶ Peripherals

E-Log is equipped with the following peripherals:

- N.2 RS232 DCE port
- N.1 porta RS485 (ELO3305.1)



▶ Data Logger configuration

The configuration is carried out by means of the 3DOM program on PC. The configuration file is sent to the instrument via RS232, USB, RS485 or Ethernet with external optional devices.

▶ Display

E-Log is equipped with a back-lit LCD display (4x20 chrs). The following information are listed:

- Real-time measurement list
- Dignostic

▶ Clock synchronization

The internal clock (accuracy 30 seconds/month) is updated through the 3DOM configuration program, or via the CommNET data communication program that updates the clock at each connection.

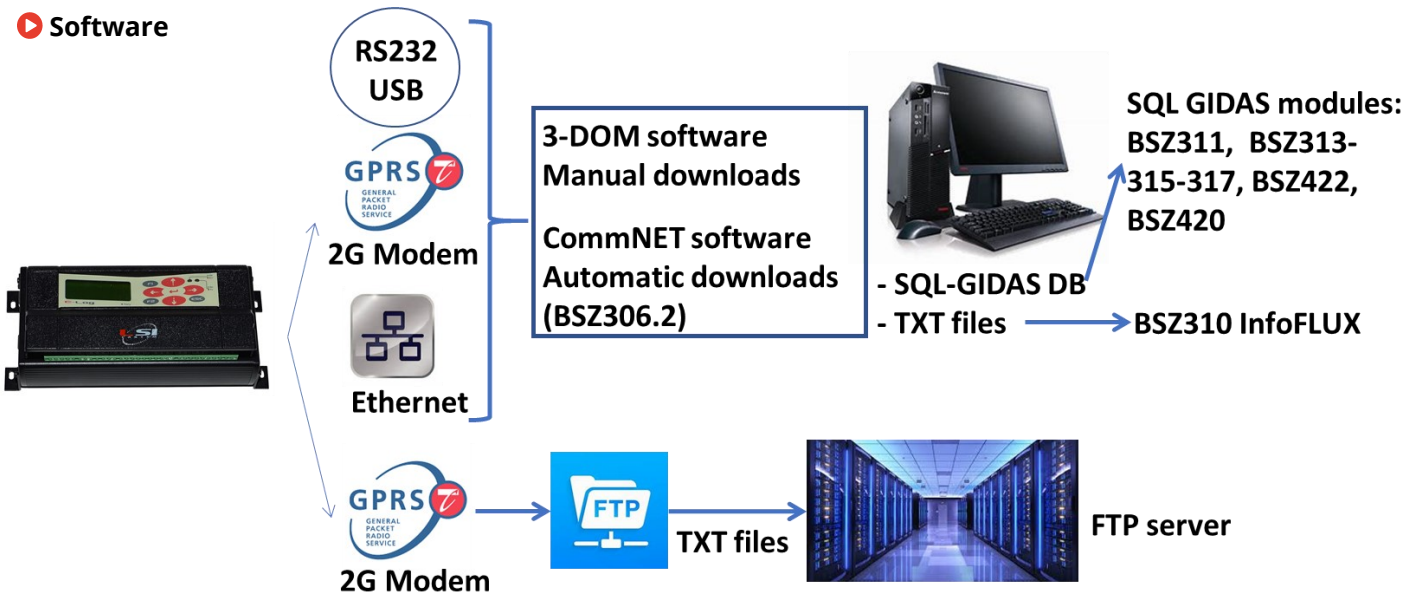
▶ Power supply

E-Log runs at 10...14 Vcc. The batteries are external and are housed in the available ELF boxes. (see Accessories).

▶ Power consumption and battery duration

E-Log has a very low power consumption (standby < 4 mW), 140 mW during measurements. Without powering external sensors or communication devices, using a 15 Ah battery, it has several months power autonomy.

Software



The data acquired by E-Log are downloaded to a PC using two types of programs:

- 3DOM in manual mode. 3DOM saves the data in TXT text format, or in SQL-Gidas format.
- CommNET in automatic mode also via modem. CommNET saves data in TXT text format, or in SQL-Gidas format.

Once the data is saved in SQL-Gidas format, they can be managed with all the LSI-LASTEM applications that use this type of database (see Software catalog). Through the X-Panel program it is possible to view the data in dynamic form in real-time. LSI LASTEM also offers a cloud service to manage data from web-based applications. E-Log also can push ASCII data by GPRS modem to FTP server.

Installation

E-Log can be placed inside IP66 enclosure (ELF series). LSI-LASTEM offers a selection of ELF enclosures (see Accessories) against shock, water, dust and atmospheric agents. Depending on the ELF's models, the enclosure can also accommodate power systems, communication devices and batteries.





IP66 enclosure for fix monitoring applications



IP66 enclosure for portable monitoring applications

Models E-Log

Code	ELO3305	ELO3305.1
		
Description	E-Log data logger. N.12 inputs by terminal block	
Inputs type	Terminal block	
Analog inputs	N.8 differential (N. 16 single-ended)	
Digital inputs	N.4 (on/off or frequency/counter)	
Serial Ports	N.2 RS232	N.1 RS232 N.1 RS485
Sensor's auto-recognition	NO	
On/off outputs	YES	
Back-lit display	NO	
Threaded slot for tripod fixing	NO	
Internal battery	NO	
Plug for power battery charger	YES	
Included accessories	RS232/USB adapter, RS232 cable, DIN-bar mounting	RS232/USB adapter, RS232 cable, DIN-bar mounting, adapter for RS485 cable wires

Technical features E-Log

Analog inputs		Range	Resolution	Accuracy (@ 25°C)	
Analog inputs	Volt	-300...1200 mV	40 μ V	\pm 100 μ V	
		\pm 78 mV	3 μ V	\pm 35 μ V	
		\pm 39 mV	1.5 μ V	\pm 25 μ V	
	Pt100	-50...125°C	0.003°C	\pm 0.05°C	
		-50...600°C	0.013°C	\pm 0.11°C	
	Resistances	80...140 Ω	0.0013 Ω	\pm 0.02 Ω	
		80...320 Ω	0.005 Ω	\pm 0.05 Ω	
		0...6000 Ω	0.19 Ω	\pm 1.5 Ω	
	Thermo-couples	E-IPTS 68 -200...1000°C	<0.1°C	\pm 1.5°C	
		J-IPTS 68 -50...600°C	<0.1°C	\pm 1.2°C	
		J – DIN -50 ... 600°C	<0.1°C	\pm 1.2°C	
		K-IPTS 68 -150...1350°C	<0.1°C	\pm 1.9°C	
		S-IPTS 68 0...1600°C	0.22°C	\pm 4.9°C	
		T-IPTS 68 -200...200°C	<0.1°C	\pm 1.4°C	
	Inputs number	N.8 differential (N.16 single-ended)			
	Voltage clamping	\pm 2.5 V			
	ESD protections (complies standards)	IEC 61000-4-2 Contact Discharge \pm 12 kV IEC 61000-4-2 Air-Gap Discharge \pm 15 kV IEC 61000-4-5 Surge 3.0 A (8/20 μ s)			
	EMC filter	X2Y filters on all inputs			
	Channel to Channel crosstalk	-80 dB			
	Temperature error (@-10...30°C)	-300...1200 mV < \pm 0,01% FS \pm 39 mV < \pm 0.01% FS \pm 78 mV < \pm 0.01% FS			
Digital inputs	Inputs number	N.4			
	Mode	<ul style="list-style-type: none"> N.2 input for sensors with optoelectronics (freq. max 10 kHz) N.2 Frequency input (freq. max 5 kHz) N.4 Logic state input ON/OFF (they acquire signals 0 ... 3 Vdc) 			
	Max input freq.	5 kHz			
	Accuracy	3 Hz @ 5 kHz			
	Protections (power)	Peak pulse power: <ul style="list-style-type: none"> 600 W (10/1000 μs) 4 kW (8/20 μs) 			
	Protections (complies standards)	IEC 61000-4-2 level 4: <ul style="list-style-type: none"> 15 kV (air discharge) 8 kV (contact discharge) IEC 61000-4-5 MIL STD 883G, method 3015-7: class 3B <ul style="list-style-type: none"> 25 kV HBM (human body model) 			

Switched power supply outputs	Number	N.7 (with programmable switching-on time before sensor acquisition)
	Max total current	On a single output: 1.1 A Total for all outputs: 7.7 A
	Voltage clamping	+33 V
	Protections	On each output: PTC overcurrent protections (resettable) max 1.1 A
	Protections (power)	Peak pulse power: <ul style="list-style-type: none"> • 600 W (10/1000 μs) • 4 kW (8/20 μs)
	Protections (complies standards)	IEC 61000-4-2 level 4: <ul style="list-style-type: none"> • 15 kV (air discharge) • 8 kV (contact discharge): IEC 61000-4-5 MIL STD 883G, method 3015-7: class 3B <ul style="list-style-type: none"> • 25 kV HBM (human body model)
Power supply	Power supply	8...30 Vdc
	Power consum. (@ 12 V)	During acquisition: 115 mW Stand-by: <4 mW
	Voltage clamping	+33 V
	Protection	From reverse polarity
	EMC filter	YES (AEC-Q200)
	Protections (power)	Peak pulse power: <ul style="list-style-type: none"> • 600 W (10/1000 μs) • 4 kW (8/20 μs)
	Protections (complies standards)	IEC 61000-4-2 level 4: <ul style="list-style-type: none"> • 15 kV (air discharge) • 8 kV (contact discharge): IEC 61000-4-5 MIL STD 883G, method 3015-7: class 3B <ul style="list-style-type: none"> • 25 kV HBM (human body model)
RS-232-485 ports	Number/type PN:MDMMB1110	N.2 RS-232 ports (N.1 for system setup and data display by PC, N.1 for Modbus-RTU output)
	Number/type PN:MDMMB1110.1	N.1 RS-232 for system setup and data display by PC N.1 RS-485 for Modbus-RTU output (with isolated 12V@160 mA)
	Speed	1200...115200 bps
	Type	Db-9 pin/male/female/DCE
	Voltage clamping	\pm 15 V
	Protections (power)	Peak pulse power: <ul style="list-style-type: none"> • 600 W (10/1000 μs) • 4 kW (8/20 μs)
	Protections (complies standards)	IEC 61000-4-2 level 4: <ul style="list-style-type: none"> • 15 kV (air discharge) • 8 kV (contact discharge): IEC 61000-4-5 MIL STD 883G, method 3015-7: class 3B <ul style="list-style-type: none"> • 25 kV HBM (human body model)

Others	Standard	EN 61326-1 2013 , EN 61010-1 2013, EN 50581 2013
	Watch	Accuracy: 30 s/month (@ 25°C)
	Keyboard	N.4 keys
	Processor	2 RISC 8 bit, clock 16 MHz
	A/D converter	18 bit resolution (rounded to 16 bit)
	Sample duration	(rejection 50/60 Hz): 80 ms@rejection 50 Hz
	Data memory	Flash EEPROM 8 Mb
	Environm.limits	-30...70°C, 15...100 % RH (without water condensation)
	Physical protection	Conformal coating on the electronic board to protect the board's components against moisture, dust, chemicals, and temperature extremes
	Protection grade	IP 40
	Weight	720 g
	Dimensions	242 x 108 x 80 mm