EL-IOT-CO2

Carbon Dioxide WiFi Cloud-Connected Data Logger

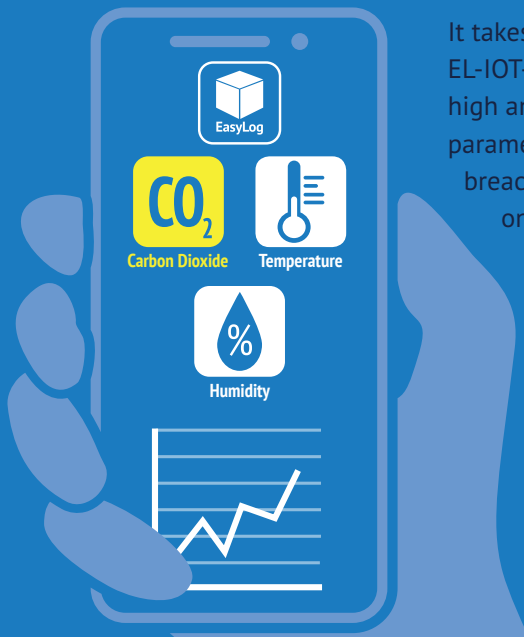
EasyLog

Your data, anytime, anywhere

- Monitor the air quality in homes, schools and offices
- Measures:
  - Carbon dioxide (CO_2)
  - Temperature
  - Humidity
- Automatically uploads data to the EasyLog Cloud
- Display shows current, maximum and minimum readings
- Status indicators and sounder
- Set up instant alarms and notifications
- Readings are recorded even if the WiFi signal is lost
- CO_2 sensor automatically self-calibrates



The EL-IOT-CO2 continuously monitors air quality and comfort levels, including CO_2, a key indicator of adequate ventilation. It automatically uploads data to the EasyLog Cloud, allowing your complete set of data measurements to be viewed, analysed and downloaded from any internet-enabled device.



It takes only a few minutes to set up your EL-IOT-CO2, and you can configure your own high and low alarms for each measured parameter. If one of your set levels is breached an instant alarm is activated on the device, and notification options include email and SMS messages to your chosen contacts.

The display shows current, maximum and minimum readings for carbon dioxide, temperature and humidity, as well as alarm and device status.

The EL-IOT-CO2 runs from a USB power supply (supplied with the product) and can use AA batteries to provide a short-term backup if the power supply is interrupted. It is also provided with a wall mountable bracket for easy installation.



Continuously monitors air quality

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EasyLog Cloud Your Data: Anytime. Anywhere.

Easily access your most important data, anywhere

Automatic emails alerts and SMS



Connect data loggers from multiple sites in one account

Remotely manage all of your data logger devices

Graph, review and analyse your data

Audits are easy with our event log system

Secure Cloud storage

Configurable user profiles

EasyLog Cloud App

Available for Android and Apple devices, the EasyLog Cloud app enables you to monitor and manage your wireless sensors on the go.

GET IT ON Google Play

Download on the App Store



Access your vital data from any internet-enabled computer, tablet or mobile device with EasyLog Cloud. From single locations to worldwide operations, the system is perfectly scalable and can run through your existing wireless networks.

Critical events are notified to specific users in seconds via an alarm system that's easily tailored to your exact requirements.

Data is accessible 24/7 and powerful online tools make it simpler than ever to view, compare and analyse readings. An audit trail is automatically created that includes both system and data events.

Starter and Professional accounts are available, always flexible and with no locked-in contracts.

If you choose not to connect your EL-IOT-CO2 to the Cloud, it will still measure and display readings, but will not record data and you won't be able to use any of the additional features of the EasyLog Cloud, including email and SMS notifications.

Issue 7 10/2022

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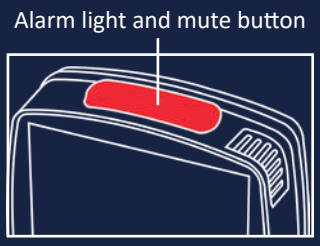
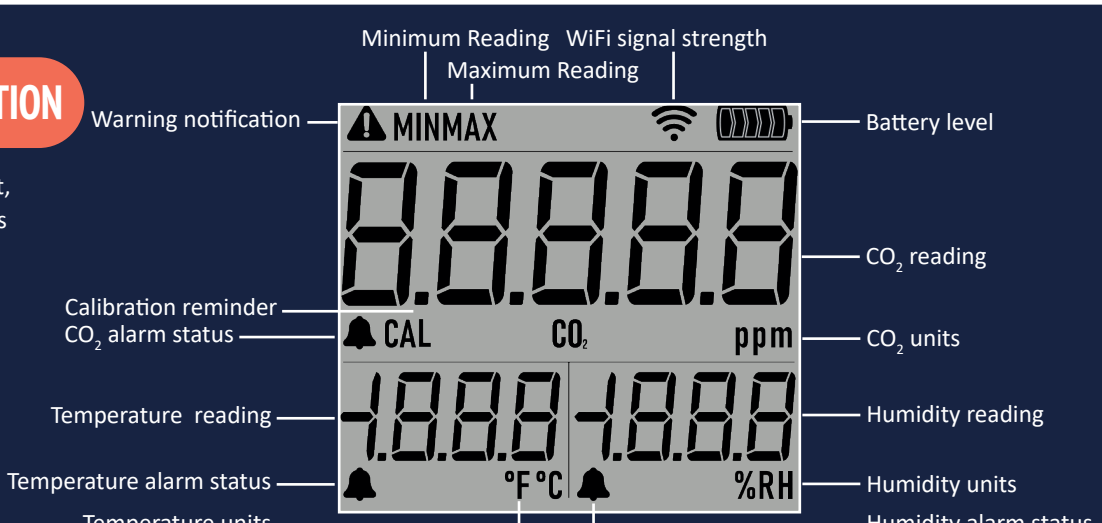
DISPLAY STATUS INDICATION

The high-contrast LCD shows current, maximum and minimum readings, as well as alarm and logger status:





Display	Logger Status	Explanation
StArt 1.0	Startup	The logger is starting up, the number displayed is the firmware version
Cloud not SEt	Not configured	The logger has not yet been connected to the EasyLog Cloud, readings will be displayed but not uploaded
SEtUP	Setup Mode	The device is in setup mode, ready to connect to the EasyLog Cloud
Conn APP	Connected to App	The device has connected to the EasyLog App as part of the setup process
Not logging	Not logging	The device has been turned on but can't connect to the Cloud, readings will be displayed but not logged. As soon as the device connects to the Cloud it will start logging
FAIL	Setup Fail	The device has been unable to complete the setup process, check the availability of your WiFi network and try again

Display	Logger Status	Explanation
ud	Firmware Update	The device is loading new firmware (you can check for updates on the EasyLog Cloud)
FAIL	Update Failed	The device has failed to load new firmware and will automatically revert to the previous version
CO2 CAL duE	CO_2 Calibration Due	You should activate the CO_2 Fresh Air Calibration process
FrESh CAL CO2 Air ---	CO_2 Fresh Air Calibration	The device is recalibrating the CO_2 sensor, leave it exposed to fresh air during this process
FAIL CO2 CAL	CO_2 Calibration Failed	The device was unable to calibrate the CO_2 sensor, you should expose it to fresh air and try again
⚠	Device warning	Press MIN/MAX to cycle through readings screens to see warning screens

- On startup, the LCD runs through a test sequence in which all elements are activated, the alarm LEDs light up and the sounder beeps.
- The CO_2 sensor may take a few minutes to self-calibrate after startup, before readings are given. During this time keep in fresh air.

Issue 7 10/2022

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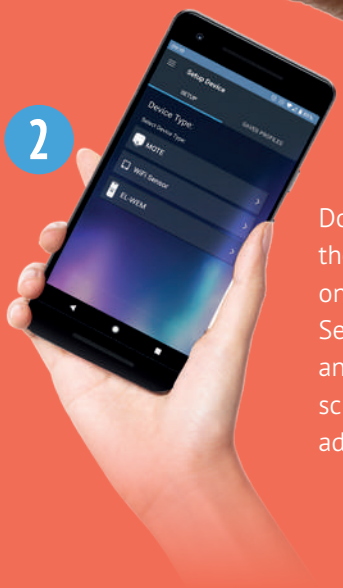
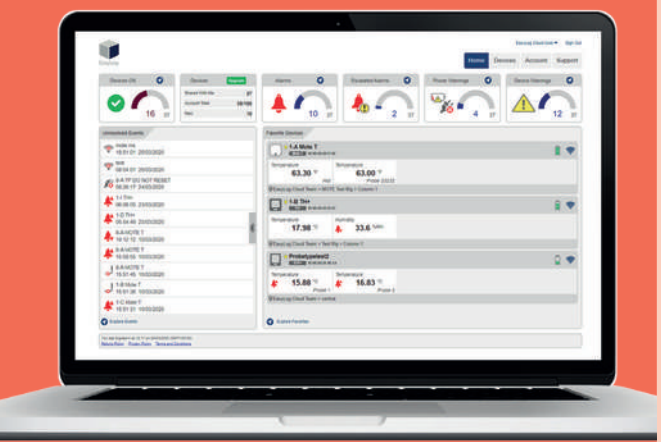
CONNECTING TO THE CLOUD



1 Connect the power supply and the device will turn itself on.



2 Download and login to the EasyLog Cloud App on your mobile device. Select "Setup Device" and follow the on-screen instructions to add your EL-IOT-CO2.



3 You can now view the EL-IOT-CO2's data and change settings either in the EasyLog Cloud App or by visiting your account at: **www.easylogcloud.com**

BUTTON FUNCTIONS



Button	Press	Function
TOP BUTTON	-	Mute alarm sounder (it will re-activate when a new alarm is activated)
MIN / MAX  CLEAR M/M	Short Press	Cycle between current, minimum and maximum readings, and any warning screens
	Long Press	Reset the maximum and minimum values for all parameters
AUDIT  CONFIG	Short Press	Create an audit mark in the data record and initiate data synchronisation with the Cloud
	Long Press	Enter Setup mode
RESET ALARM  CALIBRATION	Short Press	Reset all active alarms (they will immediately re-trigger if an alarm threshold is breached)
	Long Press	Enter CO_2 Fresh Air Calibration mode

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SPECIFICATIONS

CO_2 Measurement	
Range	0 to 40,000ppm
Accuracy 400 to 2,000 ppm	±(50 ppm +5% of reading)
Resolution	1ppm
Auto-calibration	Yes
Units	ppm
Temperature Measurement	
Range	-20 to +60°C (-4 to +140°F)
Accuracy	±0.3°C (±0.54°F) typical
Resolution	0.1°
Units	°C or °F
Relative Humidity Measurement	
Range	0 to 100%RH
Accuracy	±2% typical
Resolution	0.1%
Dew Point Accuracy*	1.5°C typical (40 to 100%RH)
Data Logging Rate	10 seconds to 12 hours (user selectable)
Transmission Interval	1 minute to 24 hours (user selectable)
Internal Memory	300,000 readings
Dimensions	97 x 87 x 33mm
Operating Temperature	
Battery Power	-18 to +55°C (0 to +131°F)
USB Power	-20 to +60°C (-4 to +140°F)
Environmental Rating	Indoor use

Manufactured and supplied by:
Lascar Electronics Ltd
Module House
Whiteparish, Wiltshire
SP5 2SJ
United Kingdom

CO_2 CALIBRATION

To maintain the accuracy of your EL-IOT-CO2, there are two calibration features on the device. Automatic self-calibration ensures the long-term stability without the need for any manual action from the user. This method of calibration assumes that the sensor is exposed to atmospheric CO_2 concentrations of ~400ppm at least once per week. Manual recalibration can be carried out to restore the accuracy of the CO_2 reading immediately; expose the device to fresh air by placing it outside or next to an open window. Press the CALIBRATE button to start the process and the display will change to show you it is under way. After a few minutes the process will finish and the display will resume showing the current readings. If there are any issues during the process, a warning screen will inform you. Ensure the supply of fresh air is adequate and try again. If your EL-IOT-CO2 ever needs you to carry out a manual calibration, it will prompt you to do so.



- *Dew point measurements are only available via the EasyLog Cloud
- This product is not for use within 20cm of the body

Issue 7 10/2022

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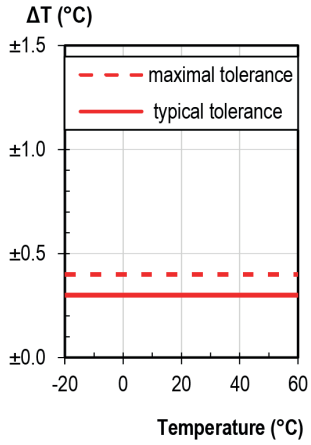
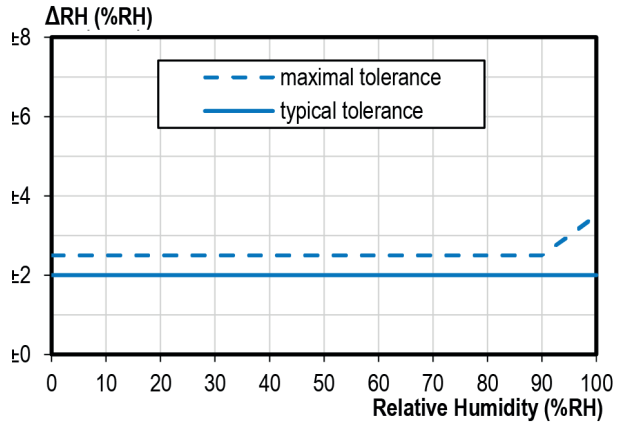
SENSOR ACCURACY AND INFORMATION

Typical and maximal tolerance for the temperature sensor in °C:



Typical and maximal tolerance for the relative humidity sensor at 25°C:



CO_2 SENSOR

Default conditions of 25°C, 50% RH and ambient pressure of 1013 mbar apply to values in the table below.

Parameter	Conditions	Value
CO_2 measurement range[1]	-	0 to 40,000 ppm
CO_2 measurement accuracy[2]	400 to 2,000 ppm	±(50 ppm +5% of reading)
Repeatability	Typical	±10 ppm
Response time[3]	$T_{63\%}$, typical	60 s
Accuracy drift per year with automatic self-calibration[4]	Typical	±(5 ppm +0.5% of reading)

[1] Exposure to CO_2 concentrations smaller than 400 ppm can affect the accuracy of the sensor if the automatic self-calibration function is used.

[2] Deviation to a high-precision reference. Accuracy is fulfilled by >90% of the sensors after calibration. Rough handling or shipping reduces the accuracy of the sensor. Accuracy is restored with the automatic recalibration feature. Accuracy is based on tests with gas mixtures having a tolerance of ±1.5%.

[3] Time for achieving 63% of a respective step function under test conditions. Response times can depend on the operating environment in the final application.

[4] For proper automatic calibration the device has to be exposed to air with CO_2 concentration 400 ppm regularly. Maximum accuracy drift per year estimated from stress tests is ± (5 ppm + 2 % of reading). Higher drift values may occur if the device is not handled according to the instructions.

OPERATING CONDITIONS

The performance of the humidity sensor can be affected by long-term exposure to operating conditions at the extents of the logger's range. The sensor shows best performance when operated within the recommended normal temperature and humidity range of 5 to 55°C and 20 to 80%RH, respectively. Long-term exposure to conditions outside the normal range, especially at high humidity, may temporarily offset the RH signal (e.g. +3%RH after 60h kept at >80%RH). After returning into the normal temperature and humidity range the sensor will slowly come back within the calibration state by itself. Prolonged exposure to extreme conditions may also accelerate ageing.

When tracking changes in ambient conditions, the response time of the humidity sensor in your data logger is approximately 20 minutes to reach 90% of the reading. However, if you are measuring step changes in humidity (for example if calibrating the product) it is advised that you leave the unit for up to four hours to ensure that it has enough time to settle at the new level.

It is worth remembering that the value of relative humidity is of course sensitive to temperature variation. As an example, at a relative humidity of ~90%RH at ambient temperature, a variation in temperature of 1°C will result in a change of up to -5%RH. Therefore when comparing multiple devices or calibrating them, any temperature variations must be considered.

The humidity measuring element in the humidity data loggers can be contaminated through exposure to a variety of compounds. These products should not be kept in proximity to volatile chemicals such as solvents and other organic compounds. Generally speaking, if a material or compound emits a strong odour you should not keep your humidity data logger in close proximity to it. If you would like more information, please contact your local Lascar Electronics office.

High levels of pollutants may cause permanent damage to the internal sensor.

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INCLUDED IN THE BOX



PSU
Power supply



3 x ADAPTORS



CABLE
Power cable



EL-IOT
WALL BRACKET
Wall mounting bracket

ACCESSORIES

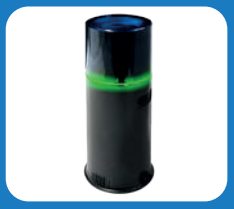


BAT 1V5 AA PK4
4 x AA 1.5V
alkaline batteries

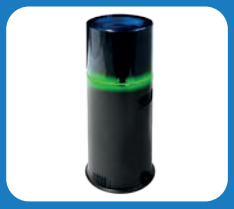


EL-IOT
WALL BRACKET
Wall mounting bracket
with magnets

ALSO IN THE RANGE



EL-WEM
WiFi Indoor Air Quality
Monitor



EL-WEM+
WiFi High Accuracy Indoor
Air Quality Monitor



EL-IOT-1
WiFi Ambient temperature
data logger



EL-IOT-TC
(Coming Soon)
WiFi thermocouple
temperature data logger



EL-IOT-TH
(Coming Soon)
WiFi temperature and
humidity data logger



EL-IOT-TH+
(Coming Soon)
WiFi High accuracy temperature
and humidity data logger

Vist lascarelectronics.com/data-loggers to see our full range of data loggers and measuring devices

BATTERY INFORMATION

This device is designed to be powered using the USB power supply provided. The logger does not lose its stored data readings when the power supply is disrupted. However, if the device has been logging, the logging process will stop and will not resume until the power supply is restored, and the device has reconnected to the WiFi network.

To provide a back-up source of power in case the mains supply is lost, you can fit four AA batteries and the product will automatically switch to using them when needed. Use only AA 1.5V alkaline batteries. We recommend you replace the batteries annually.

CALIBRATION CERTIFICATES

Lascar offers a Traceable Calibration Certificate Service for temperature and humidity sensors. Using reference equipment which has been calibrated by a UKAS/NIST accredited laboratory and using apparatus traceable to national or international standards. For more information please see www.lascarelectronics.com.

TECHNICAL INFORMATION

Power Supply Voltage	5V, 1A	
Logger Operating Environment (Power Supply)	-20 to +60°C	5% to 85% RH, 75kPa to 106kPa
Logger Operating Environment (Battery Power)	-18 to +55°C	
Power Supply Operating Environment	-20 to +40°C	
Transportation and Storage Environment	-20 to +60°C	
Net Weight	243g	
Recommended Wall Fixing Screws	3.5 x 20mm, countersunk head, cross recessed, stainless steel	