Cobalt X1 / X2

OCEAView

User guide for firmware version 2.10



DICKSON
Environmental Monitoring + Compliance Experts

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- 2014/30/EU EMC Directive
- 2014/35/EU Low Voltage Directive
- 2011/65/EU Restriction of Hazardous Substances Directive

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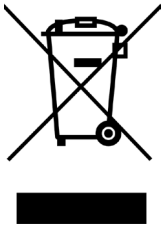
기자재명칭(모델명): Cobalt X Data Logger

제조자: DICKSON

인증번호: R-R-TES-CobaltX

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December 2023 Ref: ING-INS-180-EN Rev. 11

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1 Introduction

Congratulations and thank you for choosing Cobalt X, a powerful and flexible wireless data logger created by Dickson.

> Starting with firmware v2.9, Cobalt X data loggers can connect to the DicksonOne Cloud monitoring solution.
>
> For more details, please check the appropriate DicksonOne Cloud documentation.

This User Guide presents an overview of Cobalt X, along with practical instructions to get your data logger(s) up and running quickly as part of the OCEAView monitoring solution. This document focuses primarily on the data logger's physical and hardware aspects.

Detailed configuration instructions and software settings are provided in related documentation, notably:

- OCEAView, a complete Cloud and On-premises sensor monitoring solution by Dickson
- Dickson LoRaWAN-enabled gateway
- Dickson OCEABridge Bluetooth-enabled gateway

1.1 Note regarding compatible sensors

> For details regarding supported sensors, please see the Dickson OCEAView Sensor Reference Guide.
>
> Click here for PDF

1.2 About this User Guide

1.2.1 Terminology

Here are some terms and references that are used regularly throughout this User Guide.

Alarm	An alarm occurs when the system observes a sensor reading that is outside programmed range limits, such as a temperature reading that is too high or too low (also referred to as an excursion). When an alarm occurs, the system can notify users by sending an alert.
Alert	The OCEAView solution alerts users when an alarm occurs. Alert notifications can be sent to users via e-mail, voice message, or SMS/text. The system can also trigger Dickson alert devices.
Bluetooth®	Short-range wireless communication protocol, generally used in point-to-point connections (i.e. between a smartphone and a data logger). Wireless range with Bluetooth Smart reaches up to about 100 feet (~30 meters).
Data logger	Refers to Cobalt X data logger device.
Dry Contact input	Binary state detection, also known as "open/closed" detection.
Equipment	Refers to the equipment or space (such as a refrigerator, freezer, incubator, cold room, etc.) for which you wish to monitor one or more physical parameters.
LoRaWAN®	Very-long-range wireless communication protocol offering line-of-sight range up to nearly 10 miles (about 15 km).
OCEAlert™	International Internet-based platform that delivers alerts to cellular phones via SMS/text messages and voice calls. The OCEAView platform includes e-mail alerts by default.
OCEAView™	Web platform monitoring solution that allows you to configure, manage, and monitor your Cobalt X data loggers.
Smart-Sensor™	Dickson technology that simplifies sensor management, notably by storing calibration and sensor information to provide plug-and-play operation.

1.3 OCEAView / Cobalt X solution overview

Cobalt X data loggers monitor temperature, humidity, and other physical parameters that may be critical in life science, pharmaceutical, and agri-food sectors. Combined with the OCEAView web application, Cobalt X data loggers provide a flexible solution for monitoring parameters simultaneously on several pieces of equipment in your lab or storage facilities. Cobalt X1 supports two active data logging sessions; Cobalt X2 supports up to four active data logging sessions. The two products are otherwise identical.

1.3.1 LoRaWAN vs Bluetooth wireless topologies

The OCEAView / Cobalt X solution implements both Bluetooth and LoRaWAN wireless technologies, offering a nearly identical usage model in both cases.

- LoRaWAN is a long-range wireless technology (with range up to about 10 mi./15 km) whose architecture is based on a "star" topology in which wireless data loggers connect to a gateway communicating bi-directionally with a server that collects and analyzes information collected by sensors (either on the Cloud or on-site). LoRaWAN's long range connectivity greatly simplifies installations on geographically large sites, where a single gateway is often sufficient to cover entire complexes and campuses.

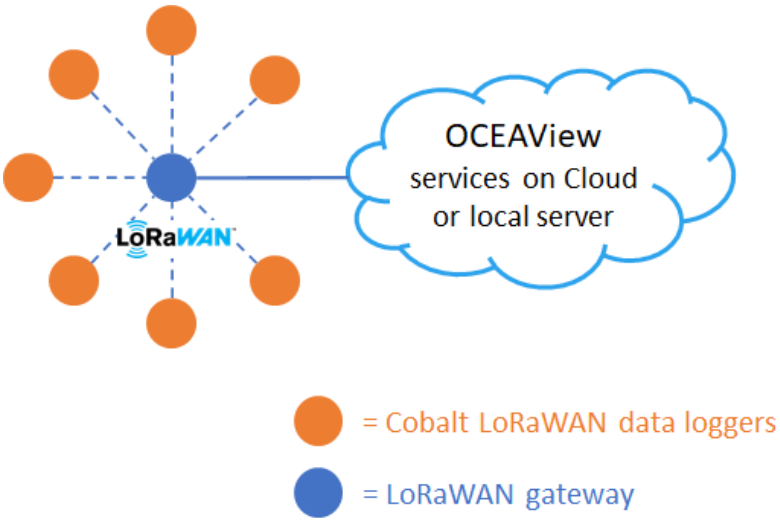


Figure 1 – Data loggers in LoRaWAN mode communicate with a LoRaWAN gateway connected to the OCEAView web platform

- Bluetooth is a shorter-range wireless technology (with range up to about 100 feet/30 m) commonly found in mobile and low-energy devices. Bluetooth architecture is generally based on a "point-to-point" connection between two devices directly. However, the OCEABridge Bluetooth Gateway simulates a star network topology by collecting data contained in Bluetooth advertising frames emitted by Cobalt X data loggers and sending the data to the server automatically. This solution notably enables sensor

read times as low as 5 seconds (in specific cases) and cost-effective coverage in areas with a low number of sensors.

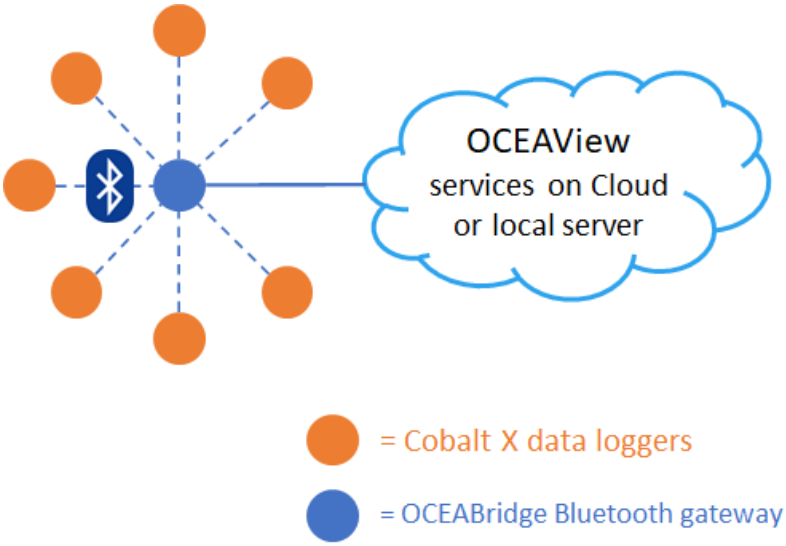


Figure 2 – Data logger in Bluetooth mode with OCEABridge gateway

The usage model described in the OCEAView User Guide is identical for both LoRaWAN and Bluetooth operation.

1.3.2 Cobalt X data logger features

Monitoring

- Multi-parameter sensor monitoring, with support for a variety of Dickson Smart-Sensors, digital and Pt100 sensors, and Dickson Atlas and Emerald Bluetooth-enabled wireless sensors
- Automatic recognition of connected sensors
- Configurable high/low alarm and warning limits, delays, alerts, reading and transmission intervals
- **New in firmware version 2.10**: pause alarms and warnings from 30 minutes to 72 hours, before or after excursion occurs
- Calibration parameters embedded directly in Smart-Sensors for ease-of-use and standard exchange for periodic calibration, with parameters taken into account automatically
- Unlimited data storage on OCEAView web platform
- Internal data logger memory for up 4,000 readings per sensor channel (8,000 total on Cobalt X1; 16,000 total on Cobalt X2)

  Note: memory capacity for the dry contact sensor channel is 1,800 readings
- Immediate alarm transmission
- ISO 17025 (COFRAC) calibration, Dickson certified laboratory calibration, or NIST traceable calibration

Wireless connectivity

- LoRaWAN long-range, low-power wireless connectivity
  - Automatic wireless connection to LoRaWAN enabled gateway
- Bluetooth Low Energy for shorter range wireless connectivity
  - Automatic data collection by OCEABridge Bluetooth enabled gateway

Data logger highlights

- 2.4-inch color resistive LCD touch screen (usable with gloves)
- Runs on two LS17500 batteries or optional 5V USB adapter
- Integrated alarm buzzer
- Translucent outer ring lights up to provide visual alert
- Dry contact sensor cable input (available as of firmware version 2.6.x)

1.3.3 Information flow

The diagram below summarizes the information flow between Cobalt X data loggers and the OCEAView platform.

Remember, Cobalt X data loggers can be used with either LoRaWAN or Bluetooth wireless connectivity. Your choice of technologies depends on your specific needs and site requirements.

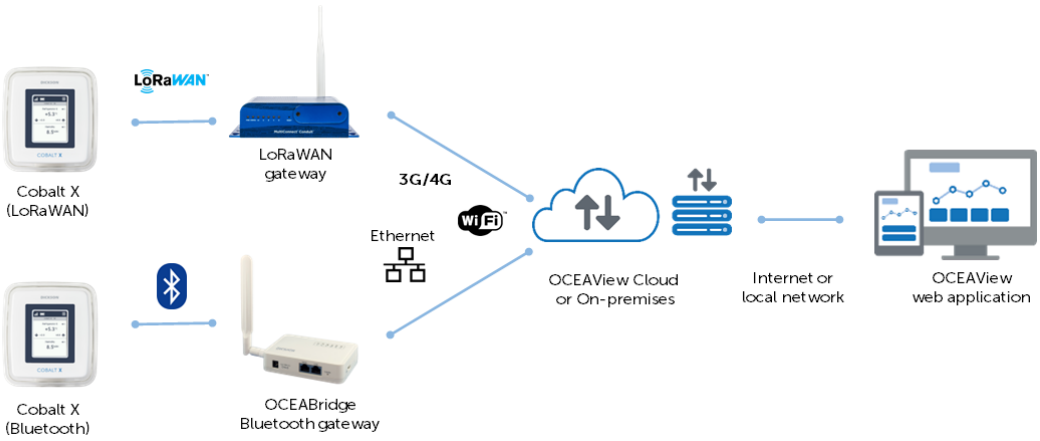


Figure 3 – Data loggers communicate with the web platform via a LoRaWAN or Bluetooth gateway within wireless range

1.3.4 LoRaWAN operation overview

Step	Process	Comments
1	Place your Cobalt X data logger as required to monitor your equipment.	For best wireless performance, follow recommendations when physically placing your data logger, as described in section *4 - Placing your Cobalt X data logger, p. 34.*
2	Plug in wired sensors (recognized automatically) and/or pair Bluetooth sensors. Use the data logger's touch screen to connect wirelessly to your LoRaWAN gateway.	
3	Login to the OCEAView web application Set up your data logger and configure data logging settings, such as upper and lower limit alarm and/or warning values. Push the configuration to your Cobalt X data logger. The data logger is updated, and data logging begins.	The OCEAView application enables you to control every aspect of your system, including user authentication, alarm settings, data logging, data analysis, reports, and more.
4	The data logger data logger collects data from its sensors and transfers the information wirelessly to the LoRaWAN network.	Installed at your site, your LoRaWAN gateway transmits locally collected sensor data via the Internet to the web platform or your server as programmed.
5	Uploaded data logging details are accessible in the OCEAView web application and recorded in an audit trail.	You may use personal computers with web browser to access readings and alarms.

1.3.5 Bluetooth-only operation overview



The steps described here require the presence of a properly configured OCEABridge Bluetooth enabled gateway to communicate with OCEAView on the Cloud.

Step	Process	Comments
1	Place your Cobalt X data logger as appropriate to monitor your equipment.	Remember that Bluetooth connectivity is limited to about 30 meters. Keep the data logger in an area that is as unobstructed as possible.
2	Use the data logger's touch screen to deactivate LoRaWAN connectivity (**Menu ➔ Advanced ➔** [PIN code] **➔ OK ➔ LoRaWAN ➔ On/Off ➔ Off ➔ Save**) Plug in wired sensors (recognized automatically) and/or pair Bluetooth sensors.	Bluetooth remains active when you deactivate LoRaWAN functionality.
3	Login to OCEAView web application Set up your data logger and configure data logging settings, such as upper and lower limit values. Push the configuration to your Cobalt X data logger. The data logger is updated, and data logging begins.	The OCEAView application enables you to control every aspect of your system, including user authentication, alarm settings, data logging, data analysis, reports, and more.
4	The data logger data logger collects data from its sensors and continually transmits Bluetooth advertising frames containing information, which is collected and forwarded to the web platform by the OCEABridge gateway.	A Bluetooth gateway installed at your site transmits locally collected sensor data via the Internet to the web platform.
5	Uploaded data logging details are accessible in the OCEAView web application and recorded in an audit trail.	

1.4 Hardware overview

1.4.1 Front view

The front of the Cobalt X data logger is comprised of a touch screen LCD and a translucent LED status ring around the casing. The touch screen shows data collected by the sensor(s) and gives you access to the setup menus. The status/alarm LED provides visual indications of the data logger status. For LED color indications, see section 7.1 – *LED status indications, p. 76*.



Figure 4 – Cobalt X2 data logger with two external sensors

1.4.2 Rear view

The battery compartment is located on the back of the data logger. The rear of the data logger has a slot to attach the data logger to the plastic holder using a small padlock (optional). See Chapter 4 – *Placing your Cobalt X data logger, p. 34*, for mounting information.



Figure 5 – Rear view of the Cobalt X data logger

1.4.3 Side view

The right side of the Cobalt X data logger features a USB port to power your data logger using the 5V micro-USB adapter (optional).

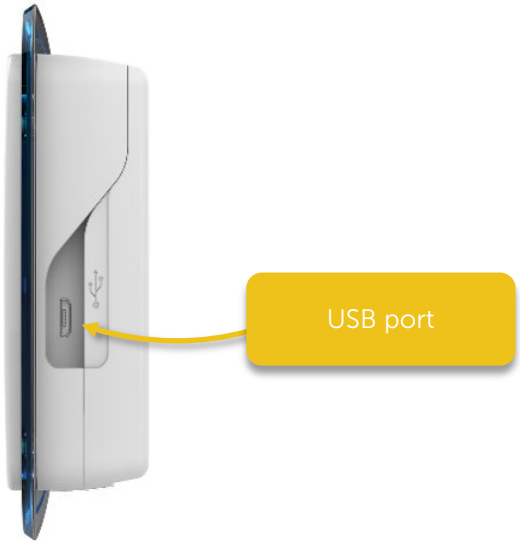


Figure 6 – Side view of the Cobalt X data logger

1.4.4 Bottom view

Cobalt X data loggers supports a combination of wired or wireless sensors:

- Up to four simultaneous sensor channels on Cobalt X2
- Up to two simultaneous sensor channels with Cobalt X1

Plugs for connecting wired sensors are located at the bottom of the unit (two physical connectors on the X2 model and one physical connector on the X1 model). These plugs support both single and multiple sensor probes.

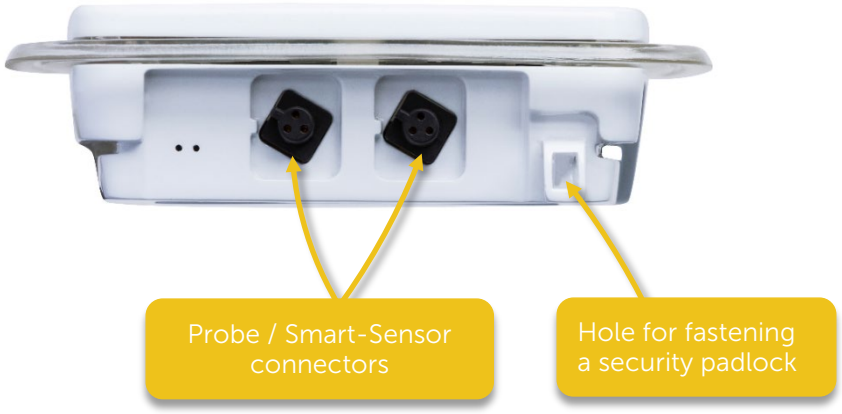


Figure 7 – Bottom view of Cobalt X2 (with two connectors)

1.4.5 Compatible sensors

For details regarding supported sensors, please see the Dickson OCEAView Sensor Reference Guide (click here for PDF).

Cobalt X data loggers support a range of Dickson external digital temperature sensors, Smart-Sensors, and Bluetooth wireless sensors:

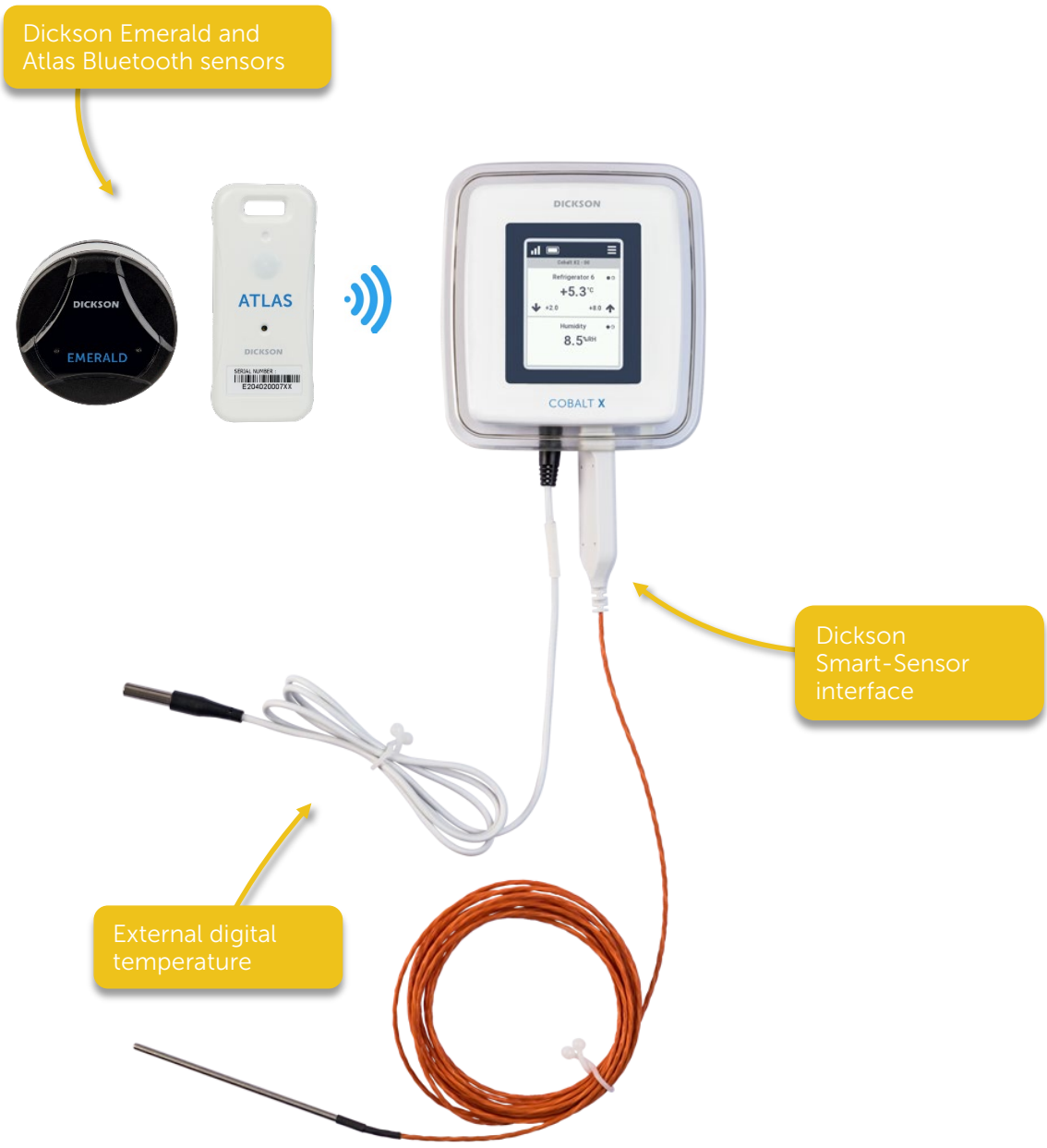


Figure 8 – Cobalt X data logger with Dickson wired and wireless sensors.

1.5 Package contents

- 1 Cobalt X1 or Cobalt X2 wireless data logger with antenna
- Two 3.6V LS17500 batteries (with screw for battery cover)
- Mounting kit
    - Plastic mounting cradle with screw holes
    - Adhesive-backed magnet (already attached)
    - Plastic ties and adhesive hooks for arranging cables
- Safety instructions

Optional

- 5V AC/DC adapter with micro-USB cable
- Sensor calibration services (please contact us)
- Round cable / flat ribbon cable for external digital temperature sensor

2 Technical specifications

2.1 Characteristics

2.1.1 General

- Color LCD display: 2.4”
- Touch screen: Resistive
- Number of sensor channels (simultaneous data logging sessions):

  X1: 2 channels, X2: 4 channels
- Number of sensors (wired and/or wireless):

  X1: One physical plug (supports 1 single, dual, or triple sensor) and up to four Bluetooth wireless sensors. For a triple sensor connected to a Cobalt 1 data logger, only two sensors can be used simultaneously.

  X2: Two physical plugs (supports 2 single, dual, or triple sensors) and up to four Bluetooth wireless sensors

  NOTE: *It is important to distinguish between the number of sensors assigned to a given data logger, and the number of simultaneous data logging sessions you can have. For example, you could physically plug two triple-sensors AND pair up to four wireless sensors on an X2 data logger. In that case, the data logger has ten total available sensors, but you can only use four of them at a time for data logging.*
- Audible alarms: buzzer
- Power Supply: batteries or micro-USB (5V)

  Please note that the AC power adapter (5V DC/1.2A) is provided separately. Batteries must be replaced by qualified technicians only.

2.1.2 Wireless technologies

- LoRaWAN® wireless connectivity for data transmission
- Bluetooth Low Energy (BLE, also referred to as Bluetooth Smart) technology for use with Bluetooth-enabled wireless sensors and OCEABridge Bluetooth gateway

2.1.3 Monitoring

- Read interval:

  Bluetooth operation: 5 seconds minimum on Cobalt X1 or 15 seconds minimum on Cobalt X2, up to 12 hours maximum.

  LoRaWAN operation: 1 minute to 12 hours (depending on the transfer interval configured in OCEAView)

- Data storage:
  - Unlimited on OCEAView web platform
  - 4,000 readings per sensor channel stored in internal data logger memory

    Note: internal memory capacity for the dry contact sensor channel is 1,800 readings
- 1, 2, or 4 sensor tiles displayed simultaneously
- Color LED indicator for alarm status or Bluetooth communication

2.1.4 Operating and storage conditions

- Indoor use only in non-harsh environments (IP30 standard; optional IP67 external case for protection against shocks, vibrations, cleaning operations)
- Maximum mounting height under 2 meters (about 6.5 feet) from the floor
- Data logger operating range:

  Standard data logger: 0 °C to +50 °C (+32 °F to +122 °F); 0 to 90% RH (non-condensing); with optional IP67 casing: -10 °C to +50 °C (+14 °F to +122 °F); 0 to 99.9% RH (non-condensing)
- Data logger storage conditions: -10 °C to +60 °C (+14 °F to +140 °F); 0 to 90% RH (non-condensing); optimal storage around 25 °C (77 °F)
- Pollution degree: 2 (normally only non-conductive pollution is supported; temporary conductivity caused by condensation is to be expected)

2.1.5 Casing and dimensions

- Product protection: designed for indoor use only
- Casing: ABS plastic
- Weight with batteries: 180 g (6.4 oz.)
- Dimensions: 100.8 x 110.8 x 296 mm (4 x 4.4 x 1.1 in.)

2.2 Dimensions

2.2.1 Data logger (in mm)

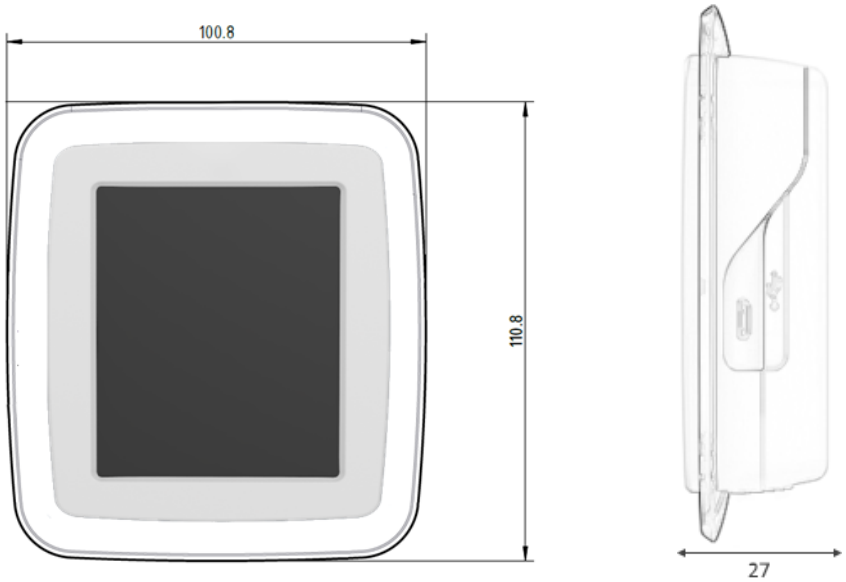


Figure 9 – Cobalt X data logger dimensions

2.2.2 Mounting kit (in mm)

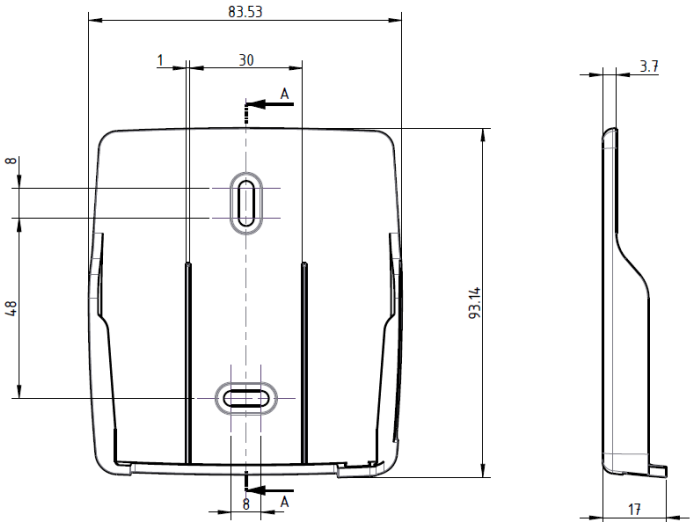


Figure 10 – Cobalt X mounting kit details

2.3 Power options

The Cobalt X data logger can be powered by two replaceable internal batteries (3.6 V) located on the back, or by AC power using the optional 5 Volt DC adapter.

2.3.1 Battery specifications

- 2 x SAFT LS17500 batteries: Lithium thionyl chloride, A-size bobbin cell
- Nominal voltage: 3.6 V
- Nominal capacity: 3600 mAh
- User-replaceable: Yes
- Battery life up to 2 years depending on usage.

  See section *8 –Maintaining your Cobalt X data logger, p. 85* for battery replacement instructions.

2.3.2 AC adapter (optional – provided separately)

- Input: 100 – 240 VACS (auto-switching)
- Output: 5VDC – 1.2A
- Cable: Micro USB



Use appropriate AC power supply in compliance with regulatory requirements and safety practices.



If plugged into AC power, your Cobalt X data logger will switch automatically to battery operation in the event of a power outage.

If that happens, an alert is sent immediately to the appropriate contact or alert device as configured the OCEAView web platform.

3 Getting started

3.1 Prerequisites

- An operational gateway:
  - For **LoRaWAN** operation: Dickson LoRaWAN gateway installed and setup to connect to the OCEAView web platform
  - For **Bluetooth** operation: OCEABridge Bluetooth gateway installed and setup for web platform connectivity
- 110 – 240 V AC power source and/or batteries installed in data logger
- Desktop or laptop computer with a supported web browser application (see OCEAView web application user documentation for details)
- Access to the OCEAView Cloud or On-premises platform
- OCEAView web account with at least one configured user

3.2 Attaching the antenna

The Cobalt X data logger requires an antenna to connect properly to your LoRaWAN network. The antenna is provided in the package with your data logger.

Attach the antenna to the data logger as shown here:

1. Place the antenna on the metal connector on the Cobalt X data logger.

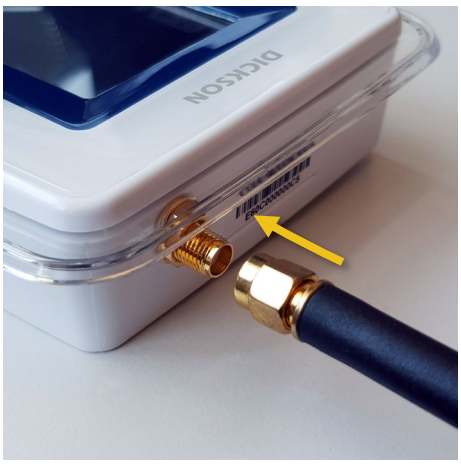


Figure 11 – Place antenna on connector

2. Turn the ring clockwise and hand-tighten to attach the antenna firmly.



Figure 12 – Turn ring to secure the antenna to the data logger

3.3 Using the mounting cradle

The Cobalt X data logger includes a mounting cradle with a pre-attached magnet for adhering to metal surfaces. It is imperative to thoroughly clean the mounting surface before placing the data logger cradle.

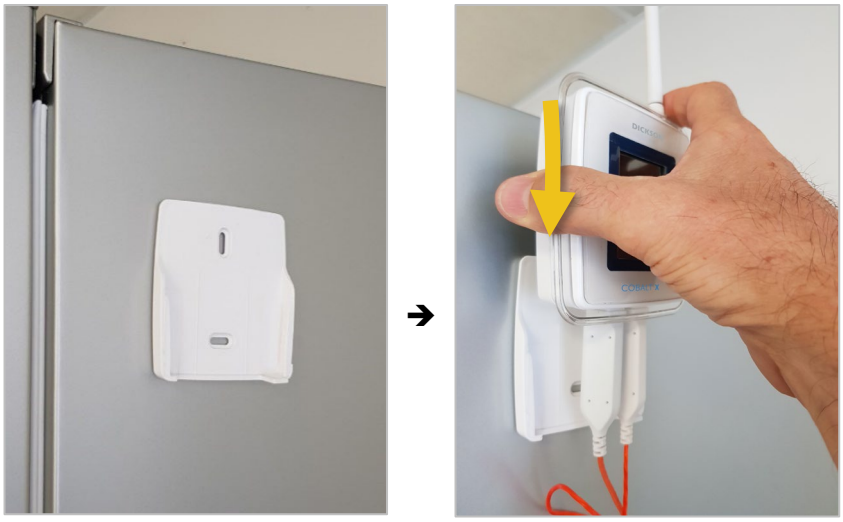
The cradle may also be mounted with screws.

3.3.1 Using the magnet

1. Clean and dry the surface on which you will be mounting the data logger.



2. Place the mount on the cleaned metal surface, then slide the data logger down into position until it sits firmly in the cradle.



3.3.2 Mounting the cradle with screws

Please make sure any screws and anchors you use are compliant with local regulatory requirements and safety practices.

1. Insert the screws through the holes in the mounting cradle on the desired surface.
2. Hand-tighten the screws firmly (overtightening the screws may break the cradle).



3. Slide the data logger down into position until it sits firmly in the cradle.



To prevent removal, you may attach the data logger to the holder using a small padlock (not included):



3.4 Activating your Cobalt X data logger

To activate your Cobalt X data logger and enable it to communicate with the web platform, follow these steps:

1. Locate the Lithium batteries provided in the product box.
2. Insert the provided batteries in the battery compartment, making sure to respect polarity (+/-) as indicated on the printed image inside the compartment):



Figure 13 – Respect battery polarity indications inside battery cavity

3. Put the battery cover in place.

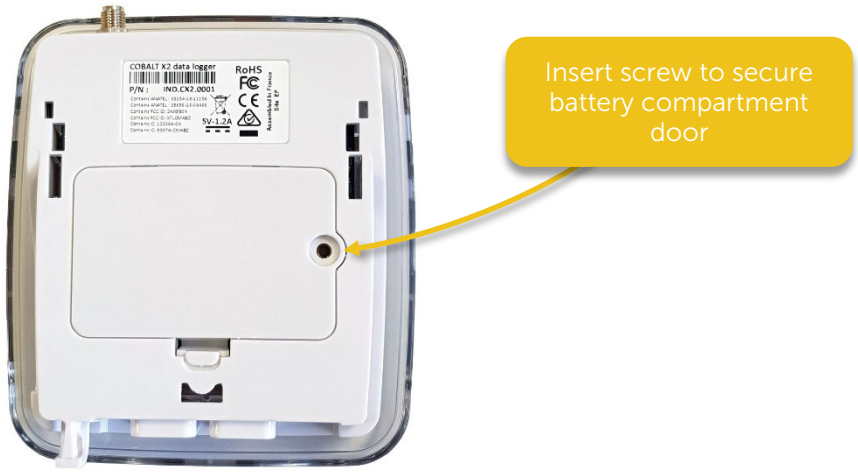


Figure 14 – Install the battery cover

4. Insert the provided screw to hold the battery cover in place, being careful not to over-tighten it.
5. Wait during the boot sequence.

To power your data logger using the AC adapter:

1. Plug the AC adapter into an electrical power outlet.
2. Insert the adapter's cable into the USB port located on the side of the Cobalt X data logger, keeping the 3.6V batteries installed as back-up.

Do not remove batteries from your data logger even when using the AC adapter. The batteries serve as a backup, with the power supply switching automatically to the batteries in case a power failure occurs. You may change the batteries without losing any data as long as the AC adapter remains plugged in. *You may also change batteries one after the other to maintain power during the process.*

Using the AC adapter to provide power to the Cobalt X enables the data logger to use "full power" mode for wireless connectivity, instead of the "low power consumption" mode used to optimize battery usage. This means that communication – such as updating data logging parameters on the data logger from the server – may be faster when using AC power.

3.5 LoRaWAN network selection

This section assumes that your LoRaWAN-enabled gateway is up and running and within wireless range of the Cobalt X data logger you are trying to connect.

After powering up the Cobalt X data logger:

1. Select the server platform you want to use:

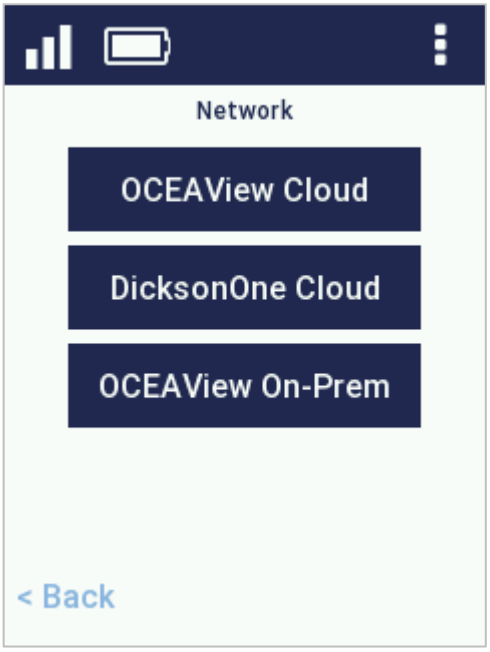


Figure 15 – Select the appropriate monitoring solution platform

The options available here are:

OCEAView Cloud	Public Cloud solution
DicksonOne Cloud	Public Cloud solution
OCEAView On-prem	On-premises solution (requires you to enter a customer key)

> As of firmware v2.9, Cobalt X data loggers can connect to the DicksonOne Cloud monitoring solution. For details, please check the appropriate DicksonOne Cloud documentation.

Select the option that corresponds to your situation.

2. Tap on **Save** to continue.

3. The Cobalt X ready screen is displayed as shown below, pending configuration via the monitoring application. This screen is displayed whenever data logging is not running on the data logger.

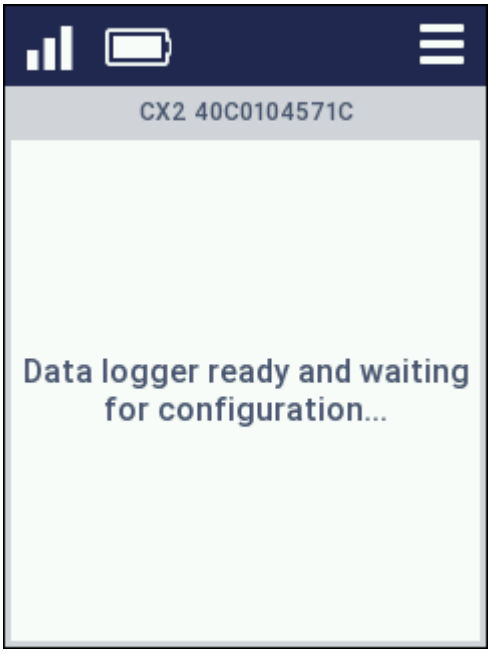


Figure 16 – Cobalt X ready screen

4 Placing your Cobalt X data logger

4.1 Optimizing wireless performance

4.1.1 General recommendations

For optimal performance, follow these recommendations when physically placing your Cobalt X data logger:

- Do not place the data logger within 40 cm (16 in.) of another data logger.
- Make sure the data logger is not placed on an electrical conduit or cable tray (such as those used for computer network cables).
- Keep about 20 cm (8 in.) of clear space around the data logger. For example, a data logger that is "stuck" between two refrigerators may not communicate effectively.

Make sure all cables, if any, are rigidly attached and that sensors are properly inserted in the appropriate space being monitored.

4.1.2 LoRaWAN

A typical LoRaWAN wireless installation involves one or more Cobalt X data loggers and a LoRaWAN-enabled gateway. Your gateway must be up and running and within wireless range of the Cobalt X data loggers you are trying to connect.

If necessary, see the Dickson LoRaWAN Gateway User Guide for requirements and details on the gateway component.

Long-range wireless connectivity enables Cobalt X data loggers to be placed nearly anywhere in your building or site. If you are using a Dickson LoRaWAN gateway and the signal is not strong enough, a second LoRaWAN-enabled gateway may be required. Please contact your authorized representative for support if you are having issues with connectivity.

- For best results, place the data logger so that it faces the general direction of the gateway (i.e. antenna vertical and not laying down on a table).

4.1.3 Bluetooth Low Energy (BLE, Bluetooth Smart)

As Bluetooth wireless technology is used to provide "short-range" connectivity (up to about 50 meters line-of-sight), the most important consideration is to keep the unit as clear as possible from surrounding obstruction.

5 Cobalt X user interface

The Cobalt X data logger offers a highly visible color LCD screen and a simple menu system. Using the data logger's touch screen, you can navigate easily through data logging pages and menu settings, even while wearing most types of protective gloves.

Depending on your data logger's firmware version, the screen color on your display may differ from that shown in this user guide.

5.1 Using the touchscreen

The Cobalt X touchscreen responds to a light touch from your finger. Do not use excessive force or sharp objects when pressing the touch screen or you may damage your data logger.

Action	Description	Gesture
Tap to activate	Briefly touch the Cobalt X screen surface with your fingertip to select a menu item, navigate, press a button, or enter your PIN code using the on-screen keypad.	

5.2 Entering your PIN code

Some actions on your Cobalt X data logger require the user to enter a PIN code to continue. Only users authorized to use a PIN code are allowed to enter into the Advanced menu or acknowledge alarms directly on the data logger screen.

If the data logger has never been used with OCEAView, the default PIN code is 000000 (six zeros).

The PIN code is contained in the user's profile on the OCEAView web application, where the Application Manager has an option to activate or deactivate PIN code use. In OCEAView, the user chooses 4 digits of the PIN code and the system adds 2 digits to create a unique 6-digit PIN code.

Enter the PIN code when prompted by the data logger display, then tap on **OK** to continue:

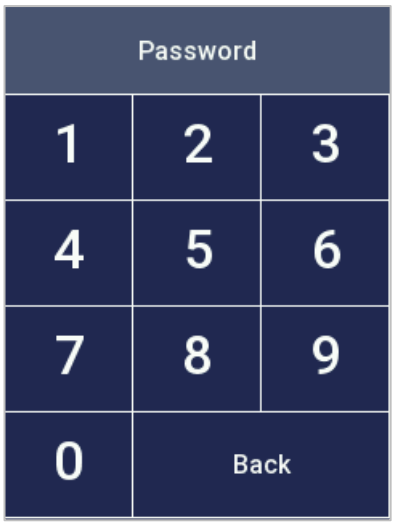


Figure 17 – PIN code keypad

5.3 Sensor display and control

Cobalt X allows you to connect a variety of different sensors that can be configured to meet your needs. With the X1 data logger, you may monitor up to two physical parameters simultaneously (2 sensor channels); with the X2 data logger, you may monitor up to four physical parameters simultaneously (4 sensor channels).

The data logger display features distinct areas to simultaneously display the latest temperature readings, minimum and maximum values, and alarm status as appropriate.

The bar at the top of the screen shows status icons and useful reference information, as explained in the following sections.



Figure 18 – Cobalt X with active two data logging sessions

5.3.1 Status bar

The **Status** bar across the top of Cobalt X screen includes the menu icon, wireless status, and battery level. The status bar remains visible on all screens, except when the data logger is in screen saver mode. It is slightly different in LoRaWAN and Bluetooth modes.

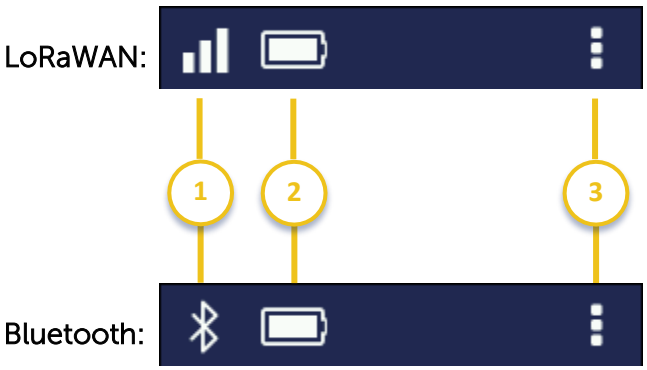


Figure 19 – Cobalt X status bar

The icons in the menu bar are as follows:

1		**LoRaWAN network status**: Indicates wireless network status with signal strength bars (3 bars for best signal, 1 bar if signal is weak).
		A warning triangle is displayed if the data logger is disconnected from the wireless network.
		Indicates that the data logger is in Bluetooth-only mode. That is, LoRaWAN connectivity is turned off.
2		Battery level indicator displays how much power the Cobalt X battery has.
3		Opens the menu. The icon changes to three vertical dots when sub-menus are open ()

5.3.2 Data logging

The Cobalt X data logger shows the currently programmed data logging cycle(s). Data is shown on a single screen or splits into distinct areas when two or more configurations are defined.

Single data logging session (one sensor)



Figure 20 – One active data logging session

The Cobalt X display always shows the most important information about the sensor:

1. Sensor name
2. Equipment name
1. Latest reading
2. Programmed low limit (if applicable)
3. Programmed high limit (if applicable)
4. Indicates the physical plug on which the sensor is connected (left or right position on Cobalt X2 models)

Multiple data logging sessions

The display can show details for up to four sensors at the same time on the main screen. To adjust the display:

1. Select **Menu ➔ Settings ➔ Items per page**:



Figure 21 – Setting the number of displayed data logging sessions

2. Tap on **1**, **2**, or **4** to adjust the number of displayed sensors.
3. Tap on **Save** to apply the setting, or **Back** to return to the previous screen.
4. The screens below show multiple data logging sessions:

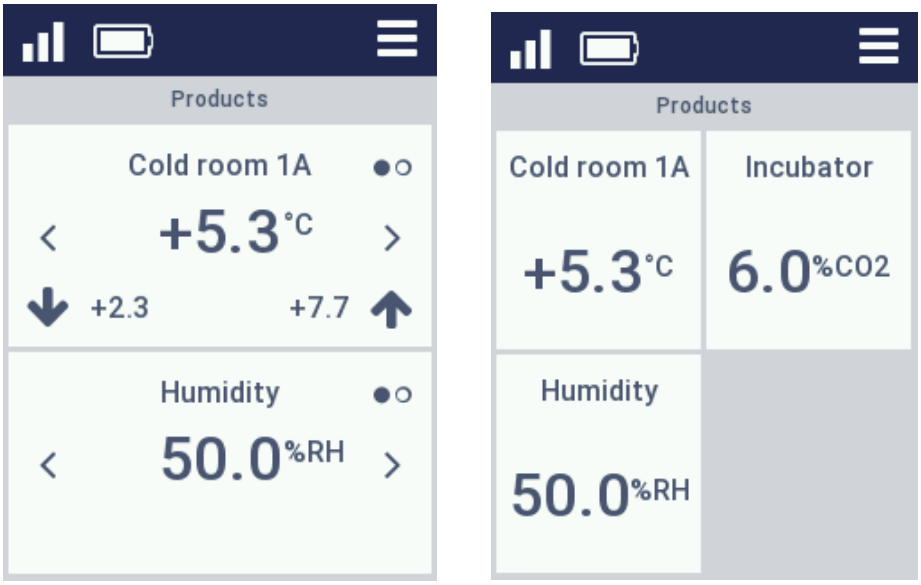


Figure 22 – Main display showing simultaneous data logging sessions

More than two data logging sessions (three or four sensors)

If you set the display to show two sensors, and more than two sensors are currently activated for data logging (on a Cobalt X2 data logger), right and left arrows (1) are present on the screen so you can access the other sensors:

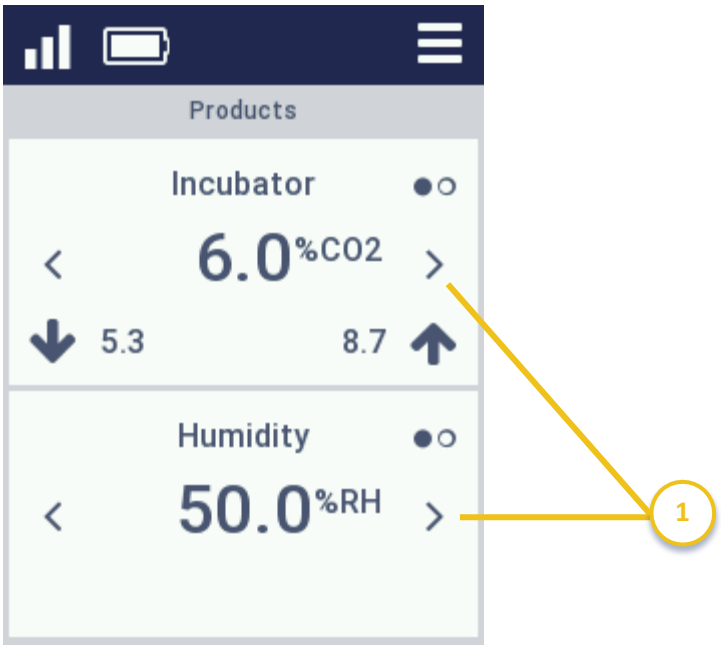


Figure 23 – Screen with more than two active data logging sessions

Press these arrows to switch to the next data logging screen (on Cobalt X2, which supports up to four simultaneous data logging sessions).

Wireless sensor indicator

As mentioned earlier, Cobalt X supports wired and wireless sensors. Wired sensors are plugged directly into the data logger; wireless sensors communicate via Bluetooth and are "paired" with the data logger (pairing process described in section *6.2.3 – Using remote sensors, p. 55*).

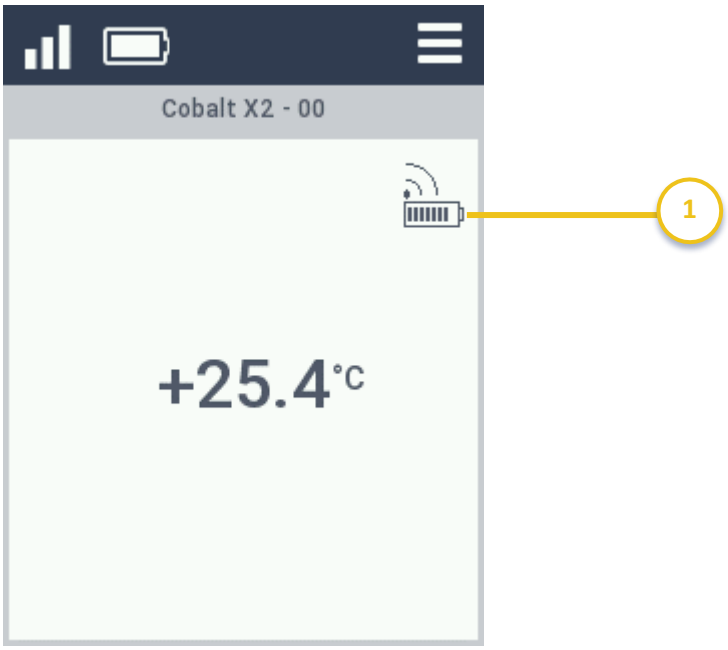


Figure 24 – Display showing one of the sensors as a remote (wireless) sensor

The remote sensor is indicated by the icon 1 on the right-hand side of the screen.

If any of the data logger's data logging sessions are in an alarm state, the Cobalt X screen background color turns red for both high and low limit alarms, as described in section *7 – Alarms and warnings, p. 74*.

5.3.3 On-demand reading

Data on the Cobalt X screen is refreshed periodically. As a result, the temperature in the monitored environment may be different than the reading currently displayed on the unit itself.

You may check the current reading at any time without affecting stored information.

To perform an on-demand read

1. Tap on the current sensor value on the screen.
2. The background turns blue and the current sensor reading is displayed.

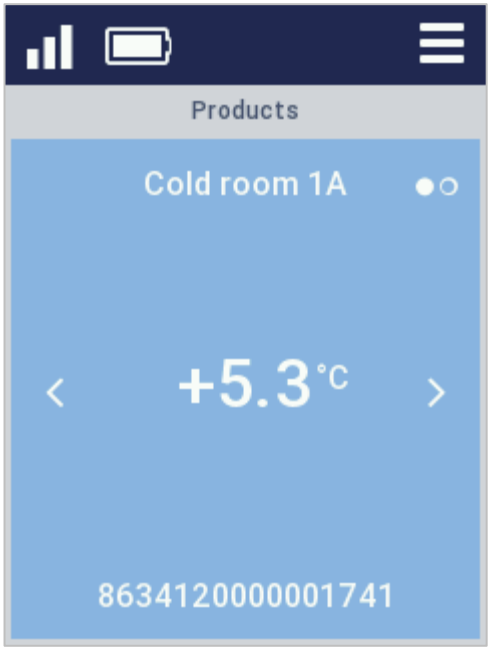


Figure 25 – Screen during on demand-reading (background turns blue temporarily)

On-demand reading is for your information only and not stored in the database. Only readings taken at the programmed interval are stored.

5.4 Screen backlight

When the Cobalt X is on battery power, the backlight is managed to preserve battery life. The backlight turns off after 30 seconds of inactivity following the last user action.

When the display is turned off, simply touch the Cobalt X screen to turn it back on. By default, the screen backlight remains on when the data logger is plugged in using the AC power adapter (USB).

If the screen does not turn on when you touch it, it is possible that the batteries are low, but the data logger is still functioning properly. In that case, the best action is to plug in the AC adapter and replace the batteries.

5.5 Screen saver

The Cobalt X data logger also features a screen saver that is enabled when using AC power (via the USB charger) and there are no alarms in progress.

After 30 seconds of inactivity, the Cobalt X screen goes dark and the screen saver shows the sensor name and the last temperature reading. This information scrolls around the Cobalt X screen until you wake up the data logger by tapping on the screen.

If the data logger is connected to several sensors, the text switches to the next sensor every 10 seconds. Tap the screen to wake up your Cobalt X data logger.

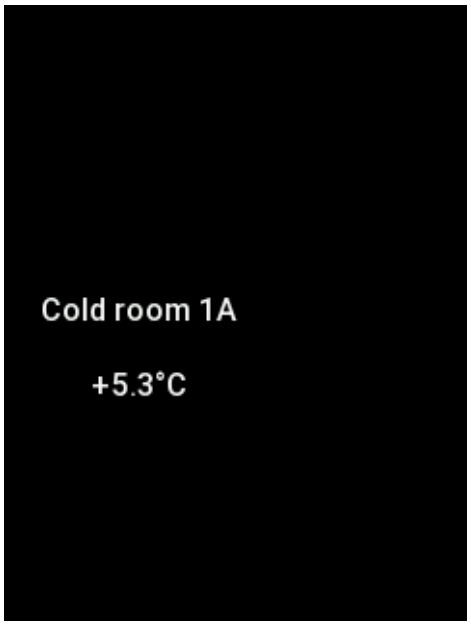


Figure 26 – Cobalt X display with active screen saver

6 Configuration menus

The Cobalt X data logger includes configuration menus for interacting with the data logger and setting specific parameters.

Tap on the menu bars to open configuration menus.

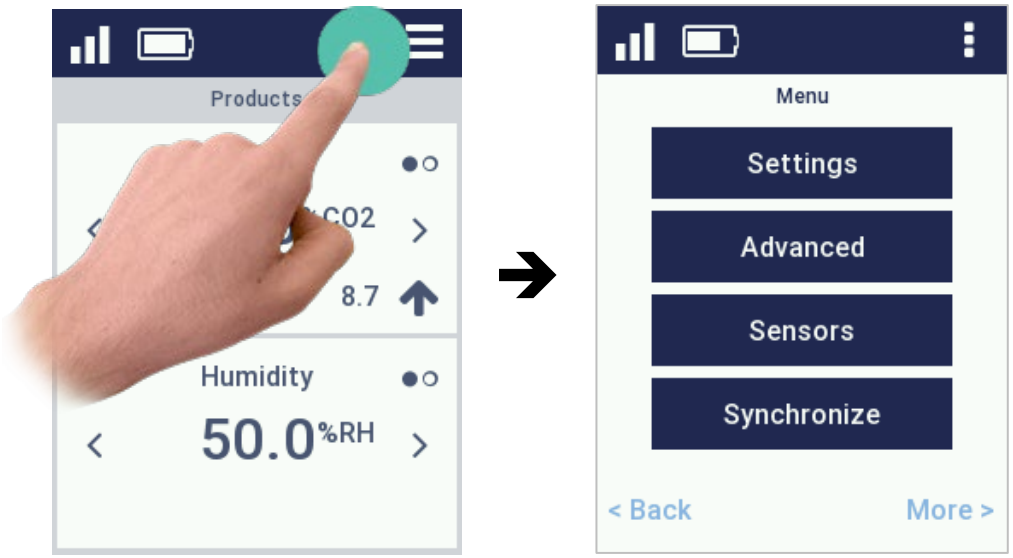


Figure 27 – Accessing Cobalt X configuration menus

The following diagrams shows the menu structure according to whether the data logger is being used with LoRaWAN or Bluetooth wireless communication. Features are described in the following sections:

Menu structure for LoRaWAN use

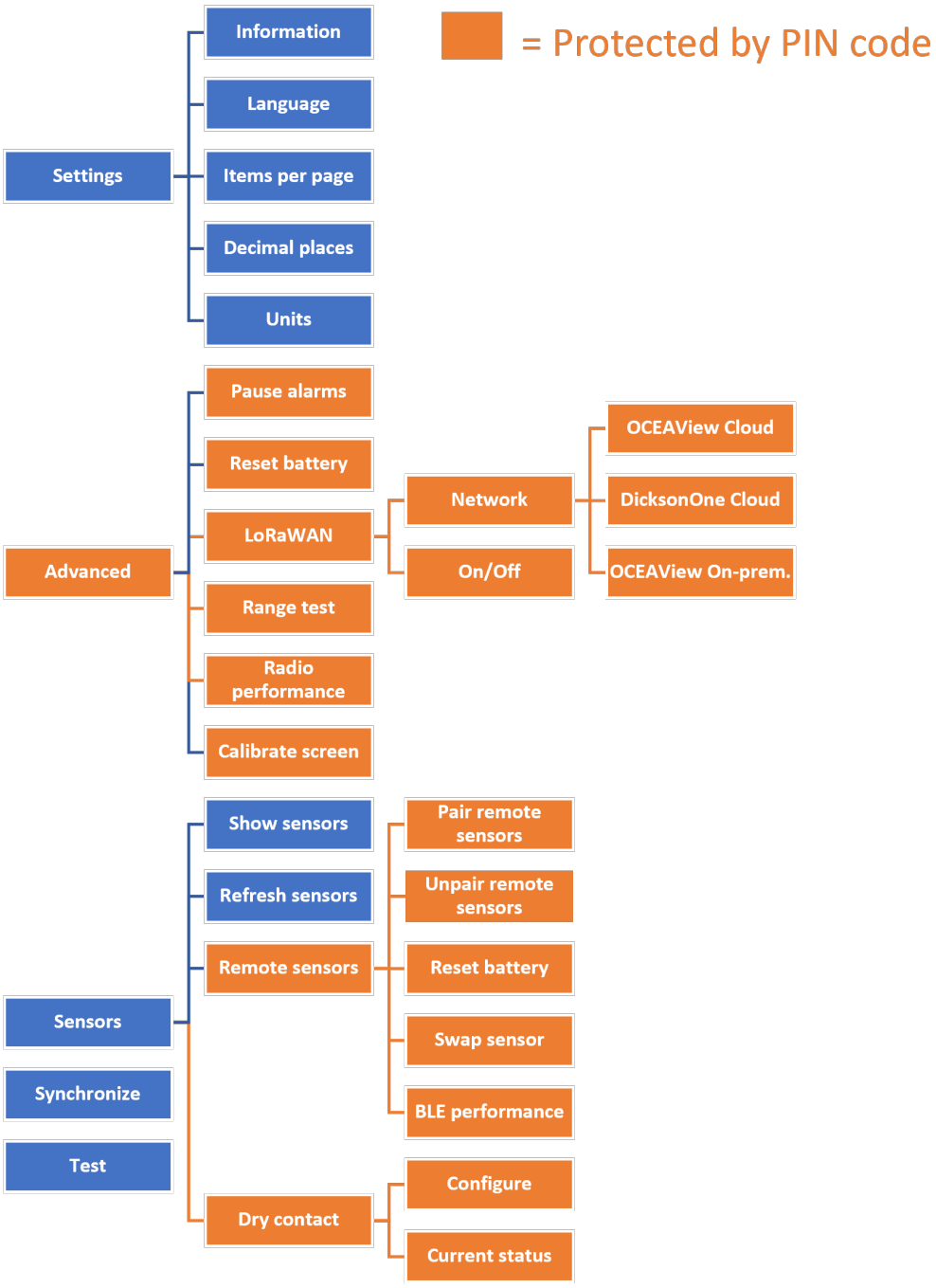


Figure 28 – Menu structure when using LoRaWAN wireless operation

Menu structure for Bluetooth use

The structure is the same as for LoRaWAN operation, but some options are grayed out in the interface and not available in Bluetooth mode.



Figure 29 – Menu structure when using Bluetooth wireless operation

6.1 Settings

Tap on **Menu** ( ) ➔ **Settings** for the following options:

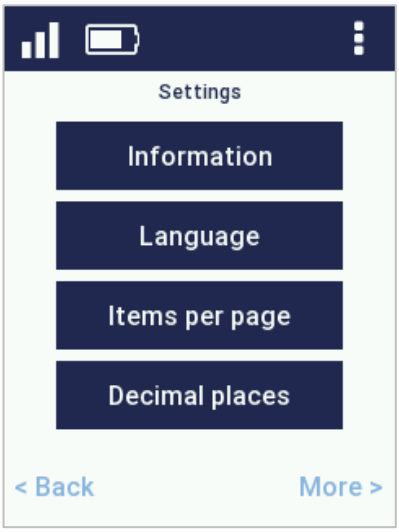


Figure 30 – Options in the Settings menu

6.1.1 Setting Cobalt X language

The **Language** option allows you to change the display language of your Cobalt X.

To change the language:

1. Tap on **Menu** ( ) ➔ **Settings** ➔ **Language**

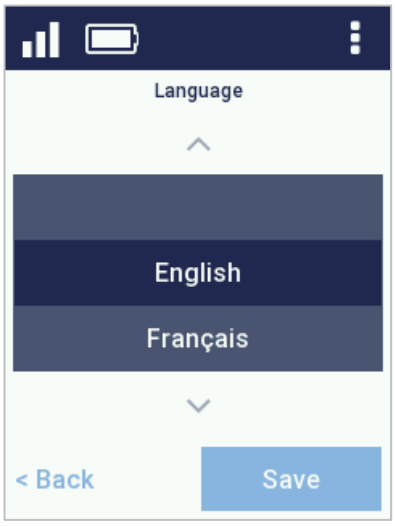


Figure 31 – Choosing the display language

2. Tap on the up/down arrows (or) to select the display language.
3. Tap on **Save** to confirm the selected language and return to the previous menu.
4. Tap on the menu icon ( ) to return to the home screen.

6.1.2 Changing the temperature unit

Temperature readings can be displayed in degrees Celsius (°C) or Fahrenheit (°F). To change the temperature unit shown on your Cobalt X data logger:

1. Tap on **Menu** ( ) ➔ **Settings** ➔ **More** ➔ **Units**
2. Tap on the up/down arrows (or) to select the desired unit.

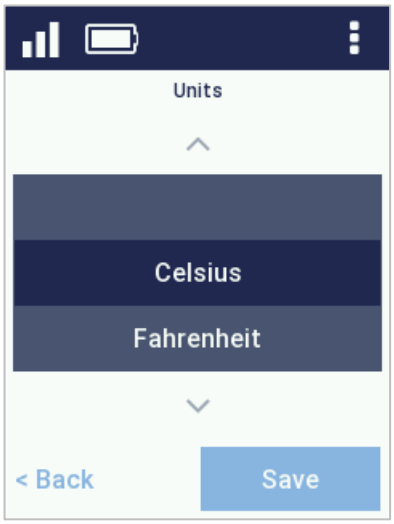


Figure 32 – Choosing temperature unit (C or F)

3. Tap on **Save** to confirm the selected unit and return to the previous menu.
4. Tap on the menu icon ( ) to return to the home screen.

6.1.3 Decimal places

You may choose to display sensor readings on the home screen with either one or two decimal places, as shown here:

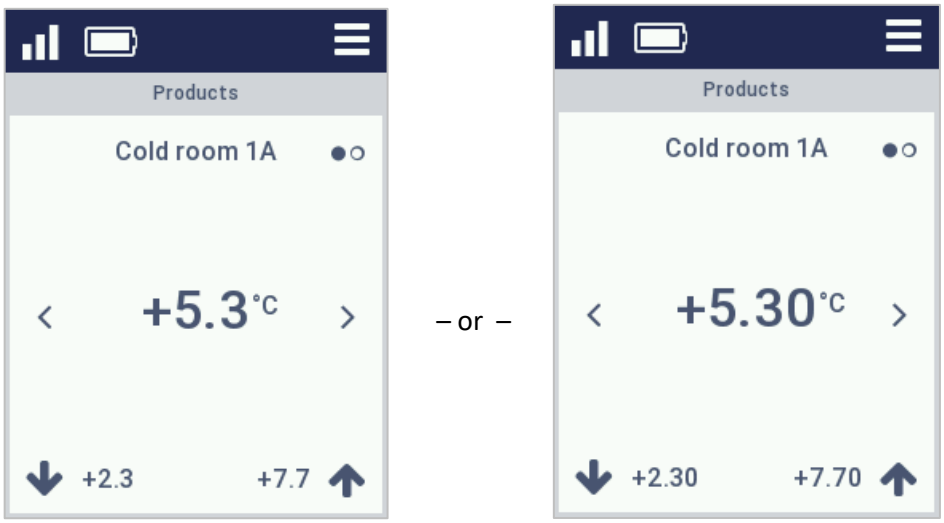


Figure 33 – Values displayed with one or two decimal points

1. Tap on **Menu** ( ) ➔ **Settings** ➔ **Decimal places**



Figure 34 – Choosing one or two decimal points to display values

2. Tap on the up/down arrows (or) to select the desired number of decimal places.
3. Tap on **Save** to confirm the selected value and return to the previous menu.
4. Tap on the menu icon ( ) to return to the home screen.

6.1.4 Information

System information such as the firmware version, LoRaWAN wireless frequency, and remaining battery capacity can be found in the **Information** screen. This information is mostly useful in case you need technical support and are asked to provide specific details.

1. Tap on **Menu** ( ) ➔ **Settings** ➔ **Information**
2. Tap on **Back** or **More** button to return to the menu.



Figure 35 – Accessing detailed data logger information

3. Tap on the menu icon ( ) to return to the home screen.

6.2 Sensor management

6.2.1 Showing sensors

When several sensors are connected to your Cobalt X data logger, you may display the readings and parameters of each sensor using the **Show sensors** feature. The display shows each sensor for about ten seconds before cycling on to the next.

Tap on **Menu** ( ) ➔ **Sensors** ➔ **Show sensors**



Figure 36 – Sensor information

The following sensor information is displayed on the screen:

1. Sensor serial number
2. Latest reading
3. Physical position of the sensor on your data logger (left or right connector on Cobalt X2 only)
4. Sensor calibration parameters
5. Progress bar shows how long the screen will be shown before displaying the next sensor
6. Counter shows total number of sensors and which sensor is currently displayed.

The screen returns to the **Sensors** menu once the display has cycled through all sensors. You may interrupt the process at any time by tapping on the **Menu** icon ( ).

6.2.2 Updating sensors on OCEAView

When you physically plug a sensor into the connector on the Cobalt X data logger, the unit automatically recognizes the sensor and sensor type. That information is then transmitted to the OCEAView web application. If a sensor is not present or not up to date in the web application, you may use the **Refresh sensor** option to force it to detect the new sensor and update the configuration.

To update sensors in OCEAView:

1. Tap on **Menu** ( ) ➔ **Sensors** ➔ **Refresh sensors**
2. Wait while the system updates data in OCEAView.
3. When the process is complete, a confirmation message is shown on the screen:

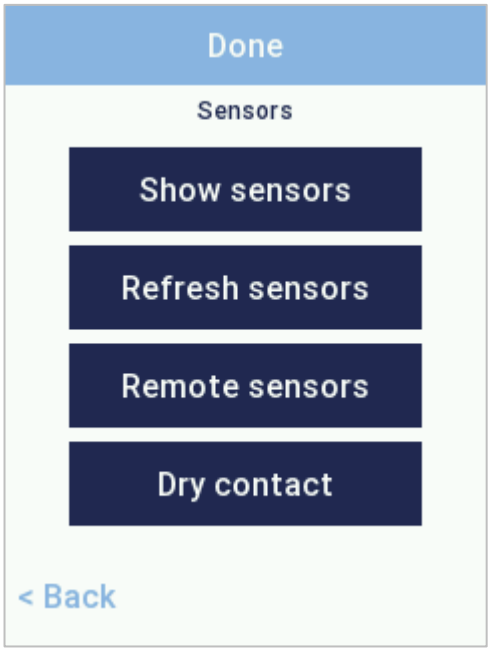


Figure 37 – Confirmation that sensors are updated on the web application.

4. Tap on **OK** ➔ **Menu** ( ) to return to the home screen.

6.2.3 Using remote sensors

6.2.3.1 Pairing a Bluetooth wireless sensor

The Cobalt X data logger supports both wired and wireless sensors. As mentioned previously, wired sensors are detected and configured automatically by the data logger as soon as they are physically plugged into the unit.

Pairing the Cobalt X data logger with a Dickson wireless sensor is simple and guided through the touch screen.



This section covers supported Dickson Bluetooth-enabled data loggers (firmware version 2.3.0 or higher; please check with your authorized representative if you need more information).

To pair your wireless sensor

1. Tap on **Menu** ( ) ➔ **Sensors** ➔ **Remote sensors**
2. Enter your PIN code as configured in the OCEAView web application (described in section *5.2 – Entering your PIN code, p. 36*) and tap **OK**.
3. Tap on **Pair remote sensors**
4. The Cobalt X data logger searches for compatible sensors within wireless range. If no sensors are found, this message is displayed:

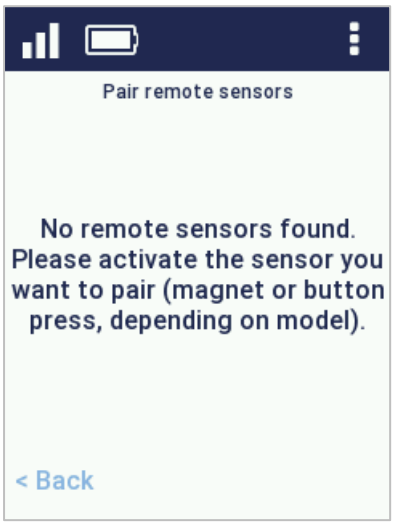


Figure 38 – Message pending Bluetooth sensor discovery

Only "activated" sensors can be discovered. If your wireless sensor does not appear in the list or if you do not know how to activate it, please refer to the instructions in the Dickson OCEAView Sensor Reference Guide (click here for PDF).

5. When discovered, your sensor is displayed on the screen.

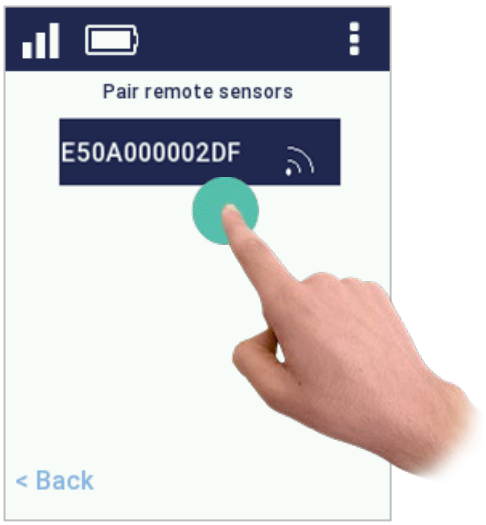


Figure 39 – Tap to pair the wireless sensor

Note: Sensors with data logging currently activated or already connected to another Cobalt X data logger cannot be paired.

6. Tap on the sensor and confirm the connection by tapping on **OK**.
7. Wait until pairing is complete, which may take a few seconds. Once pairing is successful, tap on **OK**. The wireless sensor is now paired with your data logger and shown just like any other sensors connected to the data logger (➔ **Sensors** ➔ **Show sensors**).



Figure 40 – Wireless sensor indicated by battery counter and wireless icon

8. Repeat the above steps if you want to pair additional Bluetooth data loggers.
9. Tap on the menu icon ( ) to return to the home screen.

Once in paired with a Cobalt X data logger in "remote" mode, the wireless sensor is no longer visible as a data logger itself in the OCEAView Mobile application and will not be detected by the OCEABridge Bluetooth gateway. Sensor configuration will now be controlled exclusively by your OCEAView web application.



Unpairing an Atlas or Emerald wireless sensor from the remote sensor list or removing the sensor battery disables the Bluetooth connection with the Cobalt X data logger and switches the sensor back to "standard" mode for use with OCEAView Mobile or OCEABridge.

Note: Version 2 of the OCEABridge gateway supports Atlas and Emerald only; version 3 supports Cobalt X data loggers only.

If a problem occurs during the pairing procedure, check the instructions in *chapter 10 – Appendix 2 – FAQ* / troubleshooting*, p. 89* before attempting to pair again.

6.2.3.2 Unpairing a Dickson wireless sensor

To unpair your Dickson wireless sensor:

1. Tap on the menu icon ( ) ➔ **Sensors** ➔ **Remote sensors**
2. Enter your PIN code and tap **OK**.
3. Tap on **Unpair remote sensors**
4. Choose the sensor you want to unpair and press **OK** confirm unpairing:

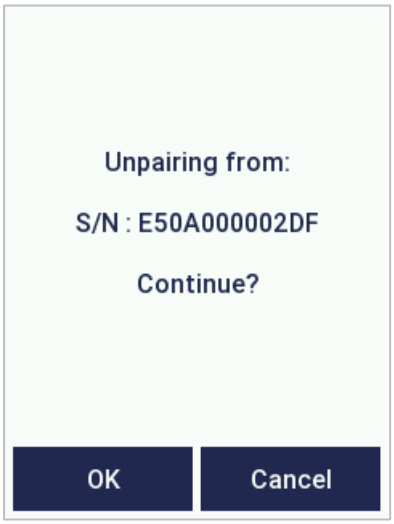


Figure 41 – Unpairing a wireless sensor

5. Wait until the unpairing process is complete, which may take a few seconds, then tap on **OK**. The wireless sensor is removed from the list and automatically switches back to "standard" mode.

6.2.3.3 Resetting a remote sensor's battery counter

To reset the Emerald wireless sensor's battery counter (only after removing or replacing batteries), use the **Reset battery** option on your Cobalt X data logger.



Only perform this action if you really install new batteries in your Emerald wireless data logger.

You may not reset the battery in Atlas products, as the battery is not replaceable.

To reset the wireless sensor's battery counter:

1. Tap on the menu icon ( ) ➔ **Sensors** ➔ **Remote sensors**
2. Enter your PIN code and tap **OK**.
3. Tap on **Reset battery**
4. Sensors that are currently paired with the Cobalt X data logger are displayed. Tap to select the serial number of the sensor whose battery you have changed and wish to reset:

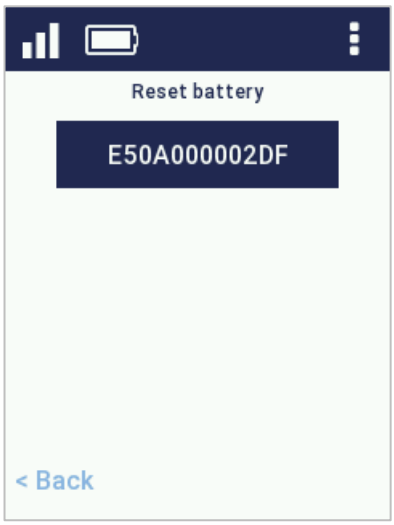


Figure 42 – Resetting a wireless sensor's battery counter

5. Tap on **OK** to confirm that you want to reset the battery counter.
6. Tap again on **OK** to return to the **Remote sensors** menu when done.



The above instructions only affect the battery contained in Emerald wireless sensors, not the Cobalt X unit itself.

6.2.3.4 Checking Bluetooth wireless signal strength

You may check Bluetooth wireless signal strength between your Cobalt X data logger and paired remote sensors to make sure that connectivity is strong and reliable between the devices.

1. Tap on the menu icon ( ) ➔ **Sensors** ➔ **Remote sensors**
2. Enter your PIN code and tap **OK**.
3. Tap on **Next** ➔ **BLE performance**

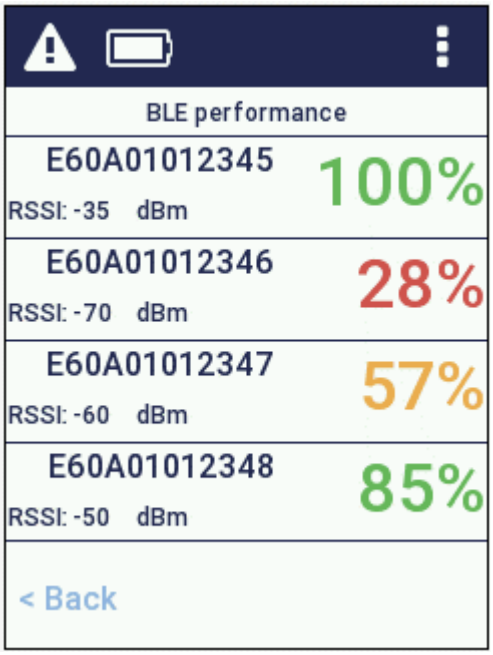


Figure 43 – BLE performance test with four connected remote sensors

The color coding corresponds to signal quality

Values	Color
Above 65%	Green
From 30% to 64%	Orange
Below 30%	Red

The signal strength should be at least 65% to ensure optimal connectivity.

6.2.4 Swapping sensors

Wired sensors

With your Cobalt X data logger, you may directly swap wired sensors that are **physically connected** to your data logger, such as for recalibration or to replace damaged cables. Wired sensors may be replaced on-the-fly whether data logging is running or not. All you have to do is make sure that you replace the sensor with an identical type of sensor. The process is completely transparent and guarantees continuity while avoiding down-time or interruptions.

Wireless sensors

With wireless sensors connected via Bluetooth, you must use the data logger interface to swap wireless sensors. To do this, the following conditions must be met:

- The wireless sensor you want to replace must currently be configured in an active data logging session.
- The new wireless sensor must also be paired with the Cobalt X data logger.
- The two wireless sensors must be of the same type (for example, both must be Atlas data loggers or Emerald data loggers).



The purpose of the **Swap sensor** feature is to replace a Bluetooth wireless sensor while it is currently being used for data logging.

To swap sensors:

1. Tap on the menu icon ( ) ➔ Sensors ➔ Remote sensors
2. Enter your PIN code and tap OK.
3. Tap on Swap sensor
4. Tap to select the sensor to replace and tap OK to confirm:

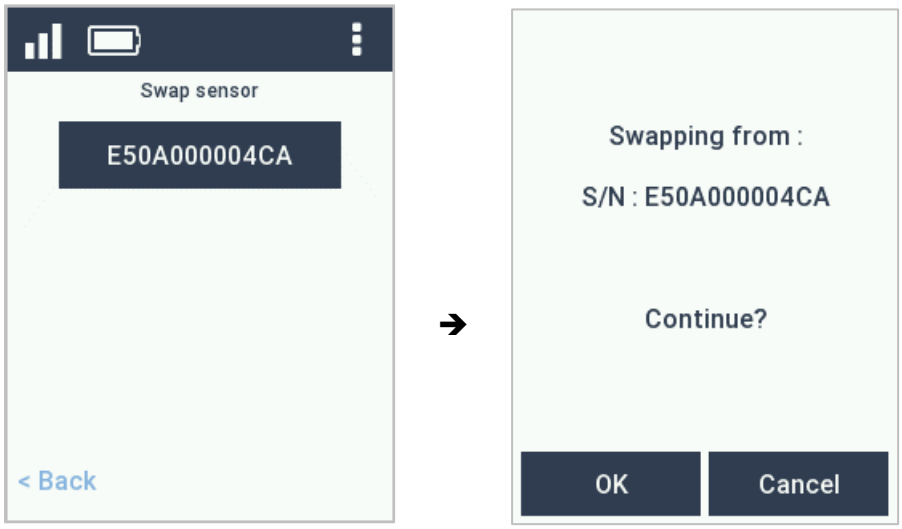


Figure 44 – Choose the current wireless sensor you want to replace

5. Tap to highlight the sensor to use (which must already be paired with your Cobalt X data logger) and tap on OK to confirm.

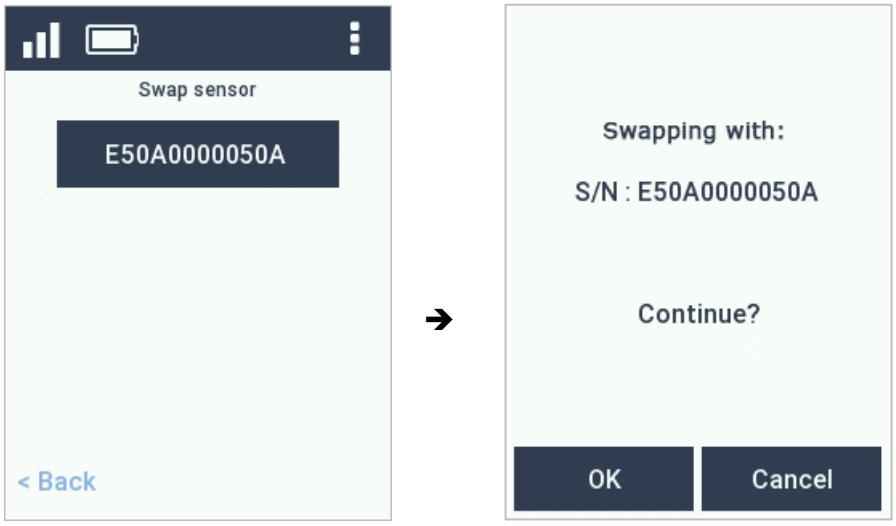


Figure 45 – Choose the new wireless sensor

6. A confirmation message is shown when the process is complete.

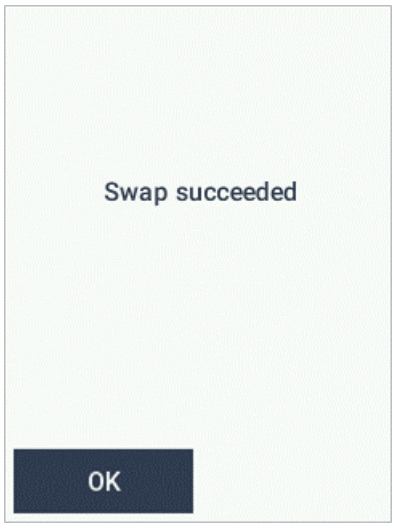


Figure 46 – Confirmation message that the swap process is complete

7. Tap on **OK** ➔ menu icon ( ) to return to the home screen.

You may unpair the first sensor if you do not expect to use it again on the same Cobalt X data logger. If data logging is not currently running, you may simply unpair the previous sensor and pair the new one.

6.3 Advanced menu

The Cobalt X data logger includes an **Advanced** menu that you can use for troubleshooting and to confirm that your data logger is working properly.

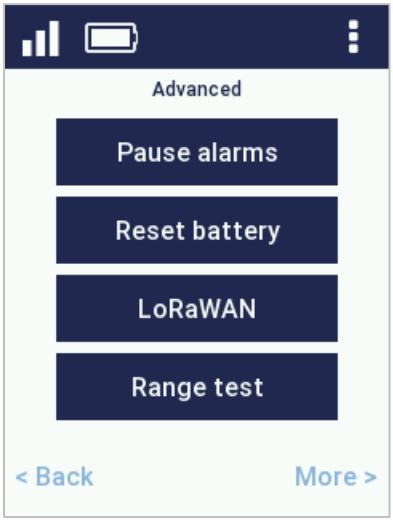


Figure 47 – Features in the Advanced menu

To limit access to the Cobalt X parameters and prevent unwanted changes, the **Advanced** menu is protected by your personal access code as configured in the OCEAView web application and is recommended for qualified personnel only.

1. Select **Menu** ( ) ➔ **Advanced**
2. Enter your PIN code and tap on **OK** to continue. If you forgot your PIN code, you can look in your user profile in OCEAView of contact your system administrator for assistance.

Features in the **Advanced** menu should only be used when needed and by qualified technicians.

6.3.1 Calibrating the Cobalt X screen

If your Cobalt X data logger screen does not respond accurately to your touch, the touch screen may require calibration to position touch point coordinates correctly.

Proceed as follows to calibrate screen alignment:

1. Tap on **Menu** ( ) ➔ **Advanced**
2. Enter your PIN code and tap **OK**.
3. Tap on **More** ➔ **Calibrate screen** and follow the instructions on the screen. Starting in the upper-left corner, press and hold your finger on the screen – or use a pencil eraser to hug the edges more easily. Still pressing the screen, slide around the edges to all four corners of the screen, as shown on the image below:

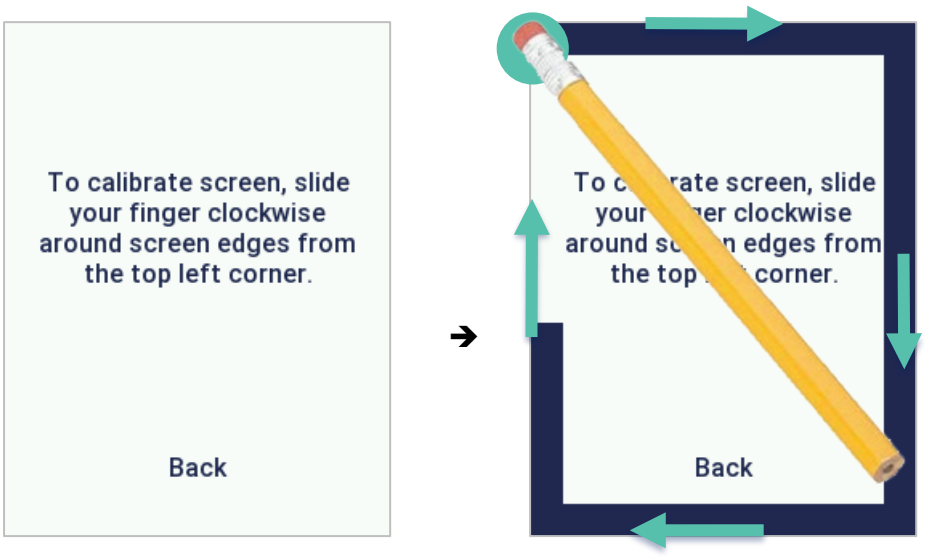


Figure 48 – Slide your finger or an eraser around the screen for best accuracy

After you pass through each calibration point sequentially, the screen returns to the **Advanced** menu.

6.3.2 Resetting the Cobalt X data logger battery counter

It is imperative to replace Cobalt X data logger batteries when the battery indicator is down to one bar, before data logging becomes unreliable. To install new batteries, see *section 8.1 **Replacing batteries**, p. 85*.

After replacing batteries, you must reset the battery counter so that your data logger displays the correct battery status.



This function should only be used if you replace your data logger's batteries with reliably new batteries.

To reset the battery counter:

1. Tap on **Menu** ( ) ➔ **Advanced**
2. Enter your PIN code and tap **OK**.
3. Tap on **Reset battery** ➔ **OK** to continue
4. Tap on **OK** ➔ **Menu** ( ) to return to the home screen
5. The battery icon in the status bar should indicate a full battery:



Figure 49 – Battery counter showing 100% charge

6.3.3 LoRaWAN network setup

LoRaWAN wireless technology offers the flexibility to deploy your monitoring solution with different types of access architecture. Your network selection must reflect the license or subscription you choose for your system.

To configure your data logger:

1. Tap on **Menu** ( ) ➔ **Advanced**
2. Enter your PIN code and tap **LoRaWAN** ➔ **Network**

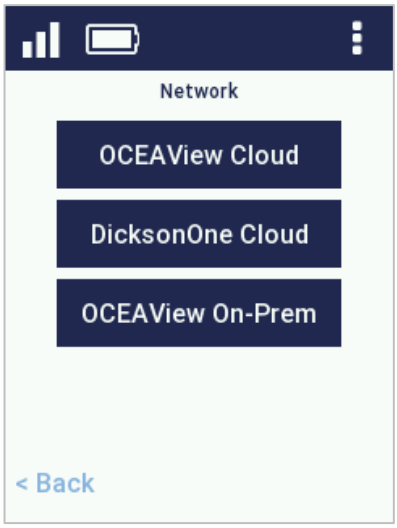


Figure 50 – LoRaWAN network options

3. Tap to select the desired installation type:

OCEAView Cloud	Public Cloud solution
DicksonOne Cloud	Public Cloud solution
OCEAView On-prem	On-premises solution (requires you to enter a customer key)

> As of firmware v2.9, Cobalt X data loggers can connect to the DicksonOne Cloud monitoring solution. For details, please check the appropriate DicksonOne Cloud documentation.

4. Tap on **Save** to continue.

6.3.4 LoRaWAN wireless range test

You may use the range test feature in the **Advanced** menu to ensure that your Cobalt X data loggers are within wireless range of the configured LoRaWAN network (i.e. your LoRaWAN gateway). This feature is useful for system installers, as it can help you prepare your environment before deploying Cobalt X data loggers.

Confirming signal quality also allows you to identify optimal locations for your data loggers within the wireless coverage area.



This section assumes that your LoRaWAN-enabled gateway is installed, configured, and running properly. This test also performs an end-to-end test of the Cobalt X solution and verifies the connection to the server.

To test your LoRaWAN wireless coverage

1. Tap on **Menu** ( ) ➔ **Advanced**
2. Enter your PIN code and tap **OK** ➔ **Range test**
3. On the screen that appears, tap on **Test**.
4. The system performs a series of wireless communications test (notably using a technique known as "spreading factor modulation") to determine wireless signal quality. If reception is strong, the result is indicated in green; if it is not strong enough, the result is indicated in red.

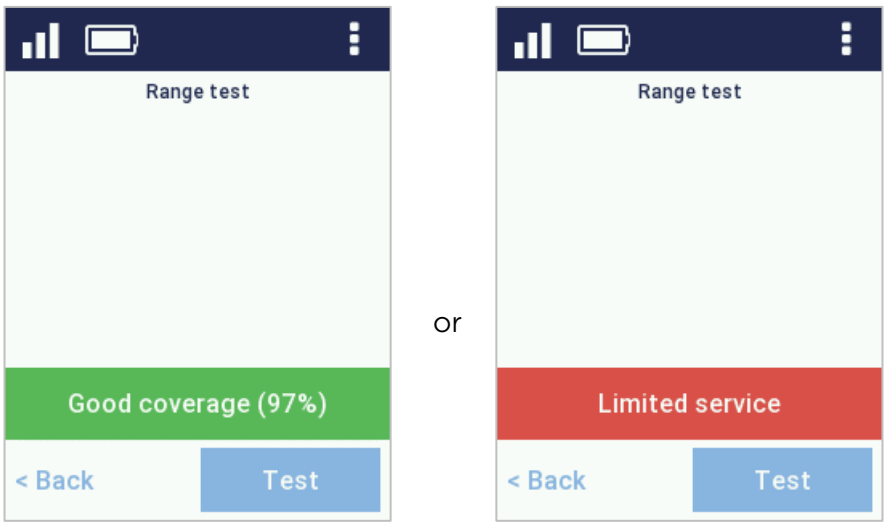


Figure 51 – LoRaWAN wireless coverage test



We recommend not setting up your data loggers if signal level is weak. Poor signal quality can result in inadequate coverage and cause system performance or reliability problems.

The wireless signal may be affected by excessive obstruction, RF/radio interference, or harsh environmental conditions. Make sure the data logger in question is placed optimally long-term operation.

Please contact support services if you are having difficulties connecting to the LoRaWAN network.

5. Tap on the menu icon (⋮) when you are done with this test.

6.3.5 LoRaWAN radio performance

You may check to see how well your data logger's wireless radio is performing. Based on results, you may choose to adjust placement or positioning of the data logger.

1. Tap on **Menu** ( ) ➔ **Advanced**
2. Enter your PIN code and tap **OK** ➔ **More** ➔ **Radio performance** ➔ **Test**



Figure 52 – LoRaWAN radio performance test

In this screen:

RSSI	**Received Signal Strength Indicator:** [Min: -140 / Max: -20] This is for information only. Generally speaking, the higher the value the better.
SNR	**Signal-to-Noise ratio**: [Min: -20 / Max: +20] A positive SNR value indicates a strong transmission. The transmission is less strong as the number descends. Generally speaking, SNR values down to -10 are acceptable.
GW	**Gateway (gateway)**: Indicates the values received by the gateway from the data logger.
Dev	**Data logger**: Indicates the values received by the data logger from the gateway.

6.4 Quick server connection test

Without using the **Advanced** menu, you may perform a simple **Test** command to make sure that your Cobalt X data logger is able to communicate with the server. This function sends a request to the server and waits for a response to determine whether the server is reachable.

To test LoRaWAN communication:

1. Tap on the menu icon ( ) ➔ **More**

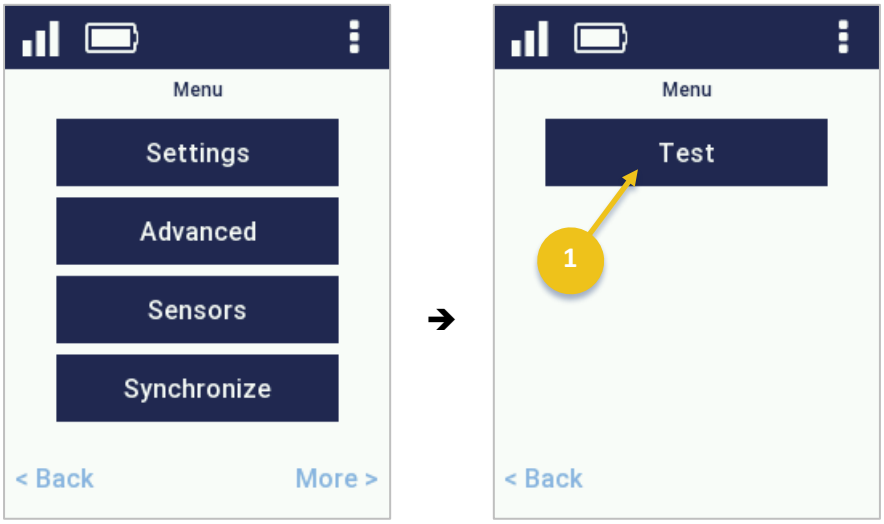


Figure 53 – Quick server connection test

2. Tap on **Test** (1)
3. Wait while the system tries to reach the server.
4. Results are displayed in the header bar:

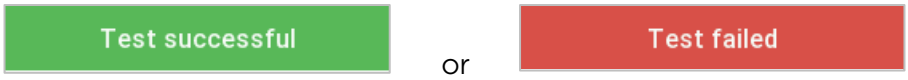


Figure 54 – Server connection test results

The only possible results are **Test successful** or **Test failed**. If the test fails, it generally means that the outside network cannot be reached from either your Cobalt X data logger or your local LoRaWAN gateway. If you are using a local gateway, make sure that it has a working Internet connection and check your installation. Contact technical support if you are unable to resolve the problem on your own.

Tap on the menu icon ( ) or **Back** to return to the home screen.

6.5 Data synchronization

The OCEAView monitoring solution enables you to force synchronization of your Cobalt X data logger with the server. This may be useful to speed up certain operations, notably:

- When adding a new sensor to a Cobalt X data logger: if you use the **Synchronize** function, the new sensor is updated on the server right away, otherwise the update occurs at the next programmed data transfer.
- If you make data logging configuration changes on the server, using the **Synchronize** function on the data logger causes those changes to be taken into account right away.
- You can also use this option to send the latest data logging information on-demand, without waiting for the transfer interval (this refreshes the information for the web application display but does not affect data logging graphs and records).

To synchronize your data logger data:

1. Tap on the menu icon ( ) ➔ **Synchronize**
2. If the data logger's network connection is up and running (which you can test as described in the previous section), information is updated bidirectionally.
3. Tap on the menu icon ( ) to return to the home screen.



When using the Synchronize feature, please wait about one minute between presses. Due to the nature of LoRaWAN communications, it may take a moment for information to be updated completely.

6.6 Using your data logger in Bluetooth-only mode

The Cobalt X data logger may be used in "Bluetooth-only" mode, that is, without any LoRaWAN functionality. In that case, the data logger behaves exactly as it does with LoRaWAN connectivity, but data transmission is handled via Bluetooth wireless "advertising frames" containing data, which can then be collected by a OCEABridge Bluetooth gateway and forwarded to the OCEAView web platform.

This operating mode is described in more detail in section *1.3.1 – LoRaWAN vs Bluetooth wireless topologies, p. 11*.

To deactivate LoRaWAN and use your data logger in Bluetooth-only mode:

1. Make sure that data logging is not currently running using LoRa connectivity, then tap on the menu icon ( ) ➔ **Advanced**
2. Enter your PIN code ➔ tap **OK** ➔ **LoRaWAN** ➔ **On/Off**
3. Tap on the up/down arrows (or) or tap **Off** for Bluetooth use. You may reactivate LoRaWAN by selecting **On**.
4. Tap on **Save** to apply the change or on Back or the menu icon ( ) to cancel.
5. If you turn off LoRaWAN, Bluetooth is the only active wireless communication, as indicated in the upper left-hand corner of the screen.



Figure 55 – Bluetooth icon in status bar

7 Alarms and warnings

One of the Cobalt X data logger's most important features is its ability to detect alarm conditions and work in tandem with the OCEAView server platform to notify designated users when problems occur.

An alarm condition can be one of the following:

- An **excursion**, where the read sensor value is outside the programmed target range. Excursions may be set up in OCEAView to be treated either as warnings (which do not require acknowledgment) or alarms (which require acknowledgment).

  For dry contact sensors, which detect a binary "open" or "closed" state, the alarm condition arises when the sensor is in the opposite of its "normal" state.
- A **technical alarm**, generated directly by the Cobalt X data logger:
  - Low battery (when the battery reaches 10% of its full charge)
  - Unexpected stop (if the data logger stops functioning for some reason, such as when the battery is removed)
  - Sensor failure (if the data logger was unable to read the sensor)
  - Invalid sensor type (if an incompatible or unknown sensor type was plugged in)

  Two other technical alarms concerning data loggers are visible in OCEAView but are not generated by the data logger. "Communication lost" and "Power lost" are generated by the server, according to your data logger configuration. Please see the OCEAView User Guide for more information.



Regardless of the programmed data transfer interval, alarms generated by the data logger are always transmitted spontaneously to the server as soon as they are detected.

When an alarm or warning occurs, the translucent outer ring on the Cobalt X casing flashes for as long as the data logger remains in excursion. The light stops flashing if, at the next programmed sensor read, the alarm condition has ended.

Two colors are used for alarms:

- Red for limit alarms and technical alarms, which require acknowledgment either on the data logger or in OCEAView.
- Orange for warnings, which are recorded in the audit trail like alarms but do not require acknowledgement.



Figure 56 – Data logger with alarm (left) and warning (right)

In either case, the color reverts to normal and the light stops flashing when the sensor value returns to its normal range, or when the technical alarm is resolved.

Alarms and warnings both trigger alerts (user notification or alarm device) if programmed in OCEAView. The only difference is that warnings do not need to be acknowledged by entering a PIN code.

7.1 LED status indications

The color ring on the Cobalt X casing indicates data logger status and offers simple patterns based on status, as described below:

General (● = short flash)	
Data logger is booting	● ● ●
Bluetooth connected	●● ●● (every 6 seconds)
Bluetooth listening	● (every 10 seconds for 1 minute)

Data logging status (● fixed for 1 second)	
Alarm in progress	
Warning in progress	



When the Cobalt X data logger is running on batteries, the outer ring will continue flashing in case of an alarm, even if the data logger screen has gone dark. In that case, tap to wake up the screen and handle the alarm.

7.2 Managing alarms

When the Cobalt X data logger is running on external power (using the optional AC adapter), the buzzer is activated to notify users in case of event on the data logger itself or at any point during data logging, such as when the temperature or humidity is above or below programmed limits.

> To preserve data logger battery life, the buzzer is not activated when the data logger is running on batteries.

7.2.1 Snoozing an alarm

If an alarm condition is encountered and the buzzer is activated, the Cobalt X display shows an alarm icon (bell) in the upper left-hand corner of the screen:

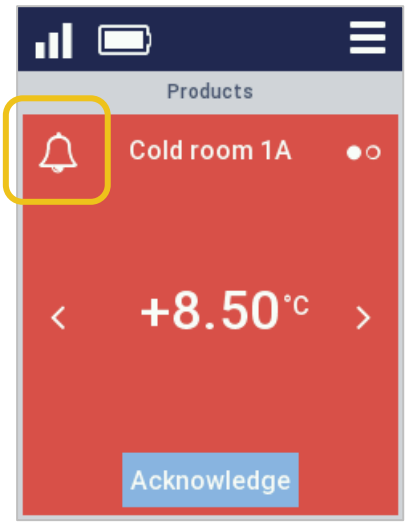


Figure 57 – Bell icon indicating that alarm sound is active

In some cases, or certain known situations, you may want to mute alarms temporarily.

To snooze an alarm:

1. Tap once on the alarm icon (1).
2. A "mute" symbol appears in the left-hand corner of the screen:

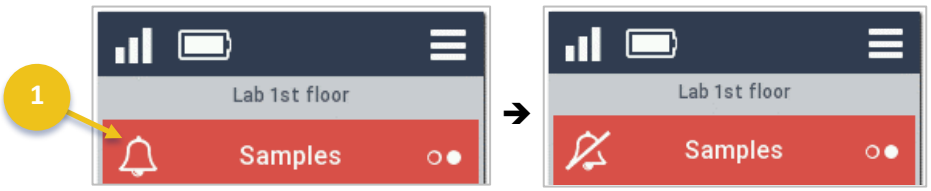


Figure 58 – Bell icon indicating that alarm sound is active

3. The alarm sound is silenced for one hour and the LED stops blinking. After that time, if alarm condition is still present, the alarm sound automatically plays again and the LED blinking resumes.
4. Even if an audio alarm is cleared, a visual alarm remains on the Cobalt X screen as long as the alarm condition is still present.

The OCEAView web application provides access to measurements and alarms recorded by data loggers.

7.2.2 Acknowledging an alarm

When an alarm is in progress, the Cobalt X data logger remains in an alarm state as long as the alarm conditions are present.

If data logging was programmed with a delay to trigger an alarm only after a specified period of time, a stopwatch icon is displayed on the data logging screen (as described in the next section) and the alarm is activated when the limit is reached.

It is important for you to acknowledge data logger alarms and take care of any problems so that further alarms do not continue to occur. The problem may persist even if you have acknowledged the alarm on the Cobalt X display or in OCEAView.

Acknowledging alarms requires specific permissions, assigned in the OCEAView web application. Only authorized users with appropriate rights and access codes can acknowledge alarms.

The web application interface is updated when you acknowledge an alarm on the data logger screen and its status will be indicated as "Ongoing" until the problem is resolved, then "Ended"

If you acknowledge the alarm in the web application, the data logger will still show the alarm as long as the alarm condition persists.

To acknowledge alarms:

1. Tap the **Acknowledge** button (1).

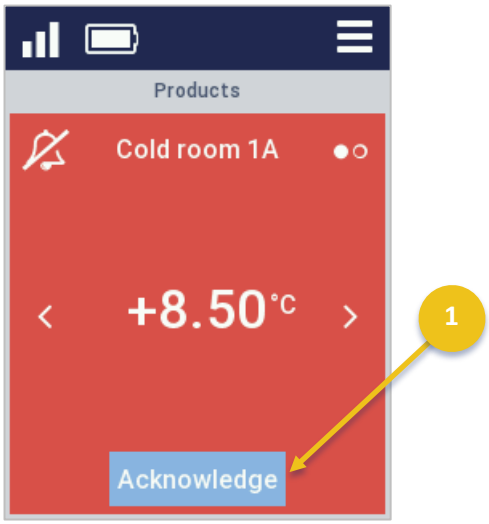


Figure 59 – Tap on Acknowledge button to clear alarm

2. Enter your PIN code as assigned in the OCEAView web application and tap **OK**.

3. Tap on the up/down arrows (^ or v) to select a reason for the acknowledgement:

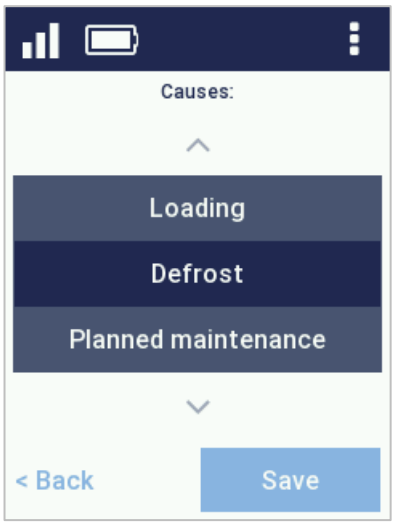


Figure 60 – Choose a reason for acknowledging the alarm

4. Once the alarm is acknowledged, the alarm icon is no longer shown on the Cobalt X data logger screen. The alarm status is also updated in the OCEAView web application.

7.2.3 Alarm delay indicator

When setting up data logging, you may program a delay before the alarm is triggered.

For example, you could set a 5-minute delay for the data logger to wait 5 minutes before triggering an alarm in case the temperature rises above, or drops below, the programmed limit.

In that case, if a reading on your Cobalt X data logger exceeds a programmed limit value, a stopwatch 1 is displayed in the upper left-hand corner to indicate that the data logger is in a "pre-alarm" state.

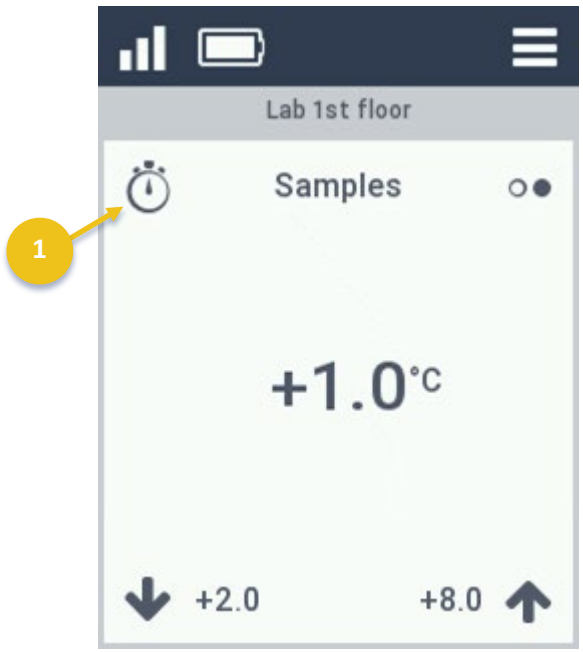


Figure 61 – Pre-alarm indicator on data logger display

The presence of the stopwatch icon indicates that the data logger has encountered an alarm condition but that the end of time delay has not yet reached.

7.2.4 Pausing alarms

Cobalt X allows you to pause alarms for a period ranging from 30 minutes to 72 hours. This feature is typically used to avoid generating alert notifications when an alarm or warning occurs due to a planned action such as preventive maintenance or an equipment move.

For example, if you plan to defrost a freezer, you could simply pause alarms for 24 hours rather than having to acknowledge the alarms the would inevitably occur during the operation. You may resume regular alarm management at any time.

To pause alarms:

1. Tap on the menu icon ( ) ➔ **Advanced** ➔ enter your PIN code ➔ **Pause alarms**
2. Select the sensor for which you would like to pause alarms and warnings, then press **OK**.
3. Select the duration, from 30 minutes to 72 hours, then press **Save**



Figure 62 – Using the Pause alarms feature

4. Press **OK** to confirm or **Cancel** to return to the previous screen without applying a pause.
5. You may repeat this operation for other currently active sensors on the data logger.
6. Tap on **Back** or the menu icon ( ) to return to the home screen.



While alarms and warnings are paused, the data logger will continue to take sensor readings and send them to the server.

The following types of alarms/warnings are not generated during the pause:

- Limit alarms
- Dry contact alarms
- "Invalid sensor" alarms
- "Sensor fail" alarms

Specific alarms related to the data logger device itself will still be sent to the server:

- Low battery
- Power loss (Cobalt X disconnected from AC power)
- Communication lost

To resume alarms/warnings:

1. When your data logger is set to show one or two items per page, the main screen indicates clearly when alarms are paused:

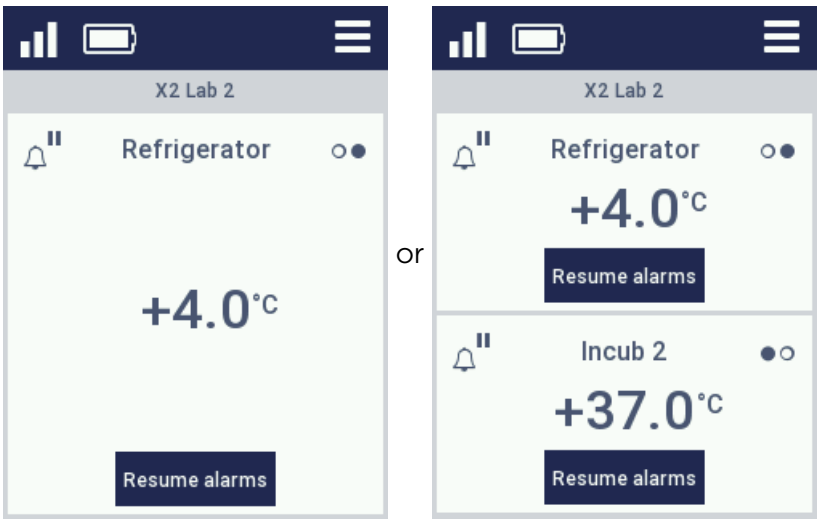


Figure 63 – Resuming alarm/warning functionality

The **Resume alarms** button is not displayed if your data logger is set to show four items per page, as shown here:



Figure 64 – Screen set up to display four items per page

2. To resume regular alarm/warning behavior, simply press **Resume alarms** and enter your PIN code if the button is displayed. Otherwise, if your screen is set to show four items per page and you want to resume alarm/warning functionality, you must go into **Settings ➔ Items per page** and select one or two items per page, then press **Resume alarms**.

8 Maintaining your Cobalt X data logger

8.1 Replacing batteries

The Cobalt X data logger runs on batteries and/or AC power (via an adapter plugged into the USB port). Batteries are not installed prior to delivery.

If data logging is currently running, we recommend that you not take any risks by removing both batteries at the same time. A single battery is sufficient to maintain power during the change.

We recommend plugging the Cobalt X data logger into AC (USB) power, such as a power bank, when changing batteries to avoid any risk of data loss.

To replace batteries:

1. Remove the data logger from its mounting bracket if necessary. If possible, keep the data logger plugged into the AC (USB) power source.



Figure 65 – Optional: plug in USB power to avoid losing data

2. Use a manual screwdriver to remove the screw from the battery cover on the back of the data logger by turning the screw counterclockwise (1), then push the plastic tab (2) open and remove the battery cover.

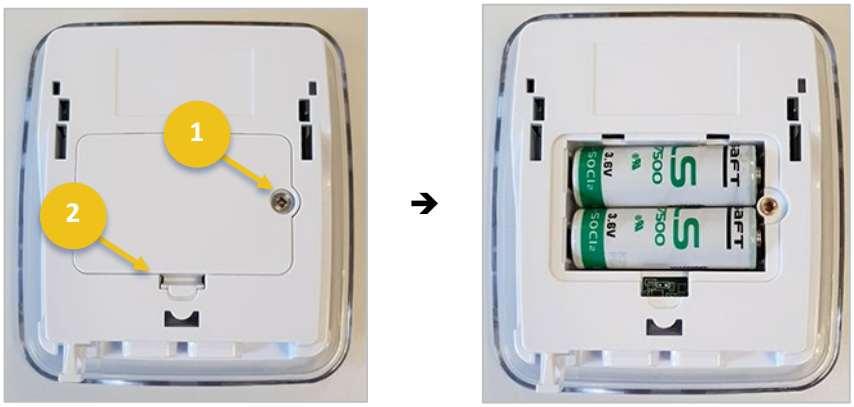


Figure 66 – Remove battery cover

3. A single battery will ensure continued operation so you can replace the other battery without interrupting data logging:
   - Remove one used battery from the data logger and replace it with a new one, making sure to respect battery polarity (see image printed inside battery slot).
   - With the first new battery firmly in place, remove and replace the second used battery.



Figure 67 – Replace one battery after the other (and/or keep AC power on)

If you remove both batteries simultaneously, the data logger will shut down and data logging currently in progress will be stopped (readings in memory are not lost).

4. Clip the battery compartment cover back onto the unit and replace the screw, being careful not to over-tighten it.
5. Wait during the boot sequence.

After replacing batteries, the battery counter must be reset to recognize the new battery status. See section *6.3.2 – Resetting the Cobalt X data logger battery counter, p. 66*.

8.2 Cleaning instructions

You may occasionally need to clean your Cobalt X data loggers depending on conditions at your site.

Here are some recommendations and guidelines for cleaning your data loggers:

1. Clean the data logger using a soft cloth lightly moistened with water, a detergent or isopropanol alcohol.
2. Do not use any aggressive cleaning agents or scratching cleansers that might damage your data logger.
3. Do not submerse the data logger in any liquid, as the casing is not waterproof.

9 Appendix 1 – Cobalt X battery life

Cobalt X data logger battery life varies depending upon many factors:

1. **Ambient temperature**: battery capacity is diminished when subject to very cold or extreme heat conditions.
2. **Wireless communication**: LoRaWAN and Bluetooth wireless communication consume battery power. Therefore, battery life depends on factors such as the connection frequency and signal quality.
3. **Screen backlight**: the backlight is activated each time you press the Cobalt X screen but also when the data logger enters into an alarm condition. Extended use of the screen backlight reduces battery life considerably when the data logger is running on battery power.
4. **Alarm indicator** (LED): when the system triggers an alarm, the outer ring around the Cobalt X casing flashes as long as your data logger remains in an alarm condition. Prolonged use of the LED consumes power and reduces the data logger's battery life.
5. **Remote sensors** (wireless): When using Cobalt X with remote sensors, Bluetooth® communication consumes battery power. The more remote sensors used, the higher the battery consumption on the Cobalt X data logger.



These considerations do not apply when using Cobalt X on AC (USB) power.

9.1 Estimated battery life

The estimated Cobalt X operating lifetime on batteries is about 2 years, based on:

- Starting with new batteries
- A Cobalt X data logger equipped with 1 digital sensor and 1 Pt100 sensor
- 1 reading every 10 minutes
- LoRaWAN wireless transmission every 20 minutes
- 1 touchscreen press per day

10 Appendix 2 – FAQ / troubleshooting

If you are having difficulties with your configuration, have a look at these frequently asked questions before contacting technical support.

Where can I find information about compatible sensors ?

For details regarding supported sensors, please see the Dickson OCEAView Sensor Reference Guide.

Click here for PDF

I swapped a sensor and received a Sensor Fail error. But then everything seemed OK. What happened?

Most likely, you performed the swap as the sensor was being read by the data logger. This generates an alarm concerning that precise moment. If the new sensor is working correctly, that problem can be considered as being very temporary and you can simply acknowledge the alarm to close it.

The Cobalt X data logger screen is black. When I tap the screen, nothing is displayed and there does not seem to be any reaction. What should I do?

Is your data logger running on battery only?

If so, the batteries might be low, and the screen is turned off because the data logger is in power saving mode. Try plugging in the AC (USB) power supply. If the screen comes back on, then simply install fresh batteries (i.e. one after the other) and/or leave it plugged in.



Remember to use the “Reset battery” function when you install fresh batteries, but never use that function unless you actually change the batteries!

Are the batteries inserted correctly?

First, check to make sure the batteries are installed and inserted in the right direction (+/- according to the image in the battery slot). Try testing the unit with batteries that are known to be of the correct size and voltage (non-rechargeable, 3.6V Lithium, 3600 mA). Contact technical support if the batteries are OK and still nothing is displayed on the screen.

The Cobalt X data logger is properly connected to the web platform. Why don't I get any temperature readings?

The Cobalt X wireless protocol is based on LoRaWAN technology. The data logger connects wirelessly to your LoRaWAN-enabled gateway and transfers data periodically, but not at every reading. If you modify data logging settings in OCEAView, the values on the Cobalt X screen will be updated when the next transfer interval occurs. Wait for the next transfer interval to get your data updated.

This could also be due to a loose cable or improperly connected temperature sensor. Check the cable between the Cobalt X data logger and the sensor. Unplug the sensor and plug it back in. Make sure there are no exposed wires. Try a different sensor.

In Bluetooth mode using an OCEABridge gateway, my Cobalt X does not upload data to my OCEAView application. What should I do?

Check to make sure your OCEABridge gateway and Cobalt X are correctly registered for the same company in OCEAView.

The wireless sensor I wish to pair does not appear on the Cobalt X data logger screen. What should I do?

To make a wireless sensor visible to your Cobalt X data logger, make sure Bluetooth is enabled on the sensor as described in the Dickson OCEAView Sensor Reference Guide (click here for PDF), then follow the instructions in section *6.2.3.1 Pairing a Bluetooth wireless sensor, p. 55* to proceed.

I cannot pair a wireless sensor that was previously discovered by my Cobalt X data logger. What should I do?

During pairing, the wireless sensor may enter "remote" mode but cannot be detected by your Cobalt X data logger. This can happen in case of a radio communication failure or when a factory reset is performed.

To pair the wireless sensor with your Cobalt X, follow these instructions:

1. Remove the battery from the Smart-Tracker data logger (to deactivate "remote" mode)
2. Wait for the Cobalt X data logger to automatically pair the sensor.

My wireless sensor's calibration parameters are incorrect in the OCEAView web application. What should I do?

During pairing, the Cobalt X data logger downloads calibration parameters from the remote sensor. If wireless communication fails during the pairing process, the calibration parameters may be invalid in the web application. To fix this issue, use the **Settings ➔ Sensors ➔ Refresh sensors** function on the Cobalt X data logger to update sensor calibration parameters.

The unit or temperature range for my sensor is not displayed correctly in the OCEAView web application. What should I do?

Under rare conditions, it may happen that the sensor's physical parameter (unit) or temperature does not appear properly in the OCEAView web application. If that occurs, resynchronize the information by unplugging the sensor from the Cobalt X data logger and pressing **Settings ➔ Refresh Sensors**. Then plug the sensor back into the data logger and press on **Settings ➔ Refresh Sensors** again to push updated information to the web application.

Can external sensors be submerged in glycol?

Yes, for all metal-tipped sensors, but not the dual temperature/humidity sensor (with the white Teflon/PTFE casing). To "absorb" sudden variations in temperature, such as those caused by opening and closing the chamber door, you may submerge the metal part of the sensor in glycol or glycerol. This limits inconsequential temperature variations recorded by the sensor. Check your laboratory's Quality guide for recommendations and make sure to use a volume of glycol that corresponds to the volume of product(s) you are monitoring. To achieve the same results, you may also delay the transmission of alarms via the software and leave the sensors exposed.



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