



| Critical Things |

# EkkoHub Installation guide



## Copyright Notice

All rights reserved. No part of this publication may be reproduced without the expressed written permission of EkkoSense Ltd.

EkkoSense Ltd shall not be liable to the purchaser of this product or third parties for damages, losses, costs, or expenses incurred by the purchaser or third parties as a result of accident, misuse or abuse of this product or unauthorized modifications, repairs, or alterations to this product, or failure to strictly comply with EkkoSense Ltd operating and installation instructions.

## Disclaimer

This document is for informational purposes only and is provided 'as is' with no warranties whatsoever. This includes any warranty of merchantability, non-infringement, fitness for any particular purpose, or any warranty arising out of any proposal, specification, or sample.

EkkoSense disclaims all liability, including liability for infringement of any proprietary rights, relating to the use of information in this specification.

No license, express or implied, to any intellectual property rights is granted herein.

## Revision history

| Version | Notes   |
|---------|---|
| DRAFT   | First version - in progress                               |
| 0.1     | Draft with additional comment about 5V power supply added |
|         |   |

## Contents

|  |    |
|--|----|
| 1. About this installation guide.....        | 4  |
| 2. EkkoHub overview .....                    | 4  |
| EkkoHub mode (default setting).....          | 4  |
| EkkoSoft Direct mode .....                   | 5  |
| Connections and controls .....               | 7  |
| 3. Installing the EkkoHub .....              | 8  |
| 3.1. Select a location for the EkkoHub ..... | 8  |
| 3.2. Surface mounting plate .....            | 9  |
| 3.3. DIN rail mounting.....                  | 10 |
| 3.4. Power options.....                      | 11 |
| 3.5. Antenna options .....                   | 12 |
| 4. Regulatory information .....              | 15 |
| 5. Reset to defaults button.....             | 16 |

## 1. About this installation guide

This guide is aimed at installers and explains how to install the EkkoSense Critical Things® EkkoHub. Further information about configuring the data sources for use in EkkoSoft® is provided as part of the EkkoSoft Sensor Editor documentation.

## 2. EkkoHub overview

The EkkoHub is an embedded computing device with two Ethernet ports and integrated radio receiver for Critical Things® sensors. One of the Ethernet ports is compatible with IEEE 802.3af-2003 Power over Ethernet (PoE) which can power the EkkoHub. Alternatively, a 5V DC 2.5A power supply can provide power directly.

The EkkoHub operates in one of two modes:

### EkkoHub mode (default setting)

In this mode an EkkoHub connects to an EkkoLink and sends messages received from Critical Things wireless sensors to the EkkoLink. The primary Ethernet port (ETH0) is used for this. The second Ethernet port (ETH1) is used for configuring the EkkoHub.

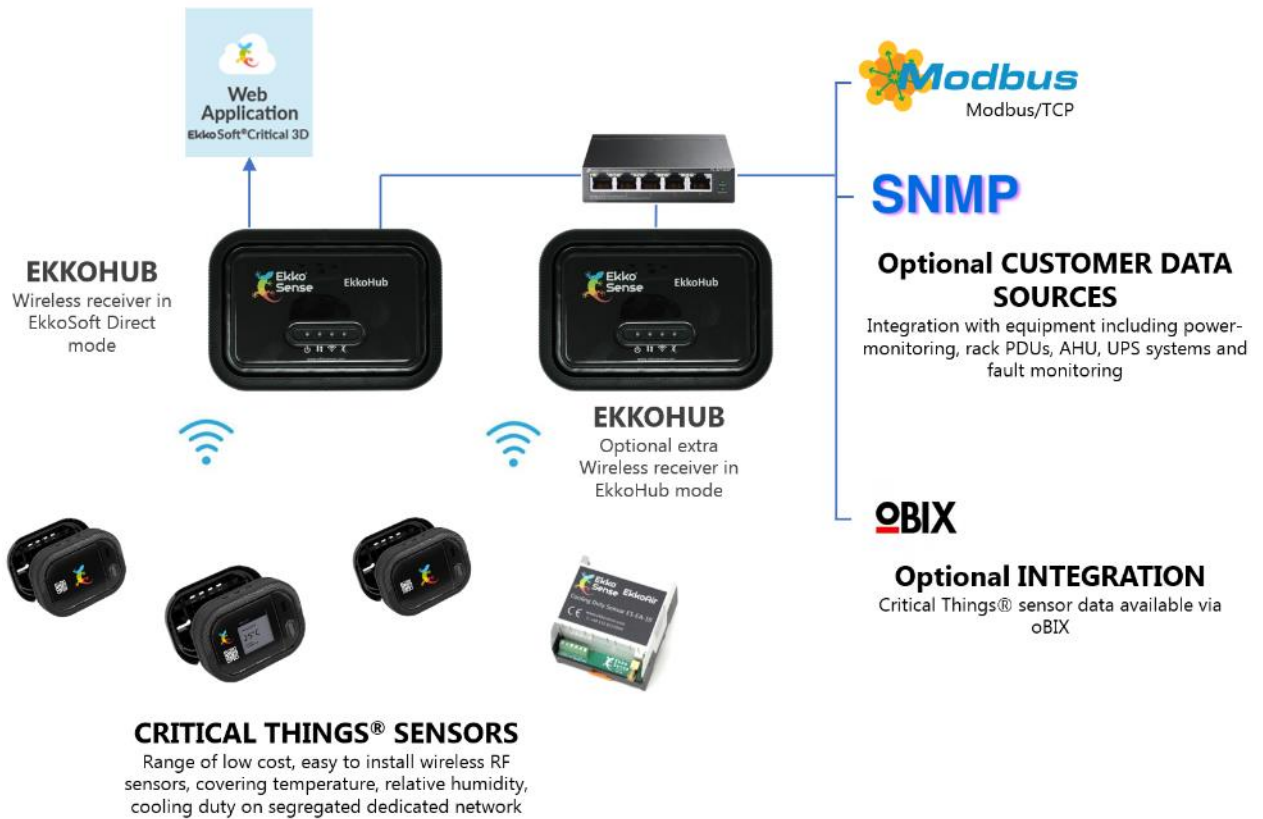
Throughout this document where reference is made to an EkkoHub connecting to an EkkoLink this EkkoLink could also be another EkkoHub configured in EkkoSoft Direct mode.



## EkkoSoft Direct mode

In this mode the EkkoHub links directly to EkkoSoft rather than to an EkkoLink. This mode is ideal for smaller installations where a smaller number of EkkoSensors are used and no, or a limited number of other wired devices are available for integration. The primary Ethernet port, ETH0 is normally used for the connection to the internet. The secondary Ethernet port, ETH1 remains the port used for configuration but can also be configured to operate with a second EkkoHub in EkkoHub mode to increase Critical Things coverage area or configured to integrate onto a customer network for data acquisition. Network configuration and security rules are applied separately for each network to provide robust segregation.

For network teams that wish to manage internet connectivity and integration with existing equipment through one port, internet connectivity can be configured via ETH1.



The EkkoHub performs data aggregation from EkkoSense Critical Things® wireless sensors and other on-site data sources such as Modbus and SNMP devices. It provides a secure link to the EkkoSoft Critical Web Application over an internet connection.

In the event of a temporary loss of external connectivity, EkkoHub buffers the site data and automatically transfers it to EkkoSoft Critical when the connection is restored. EkkoHub can also be used to make EkkoSense measurement data available to other applications via an oBIX API.

## Connections and controls



## 3. Installing the EkkoHub



**CAUTION:** Always wear appropriate Personal Protective Equipment (PPE) for the site. For details, please contact the site manager.

### 3.1. Select a location for the EkkoHub

- Ensure there is sufficient space to route cables to it and to allow it to rotate onto the mounting plate (if used).
- The EkkoHub can be mounted in any orientation but the chosen location must be within the rated temperature range of the EkkoHub (0°C to 40°C ambient).
- The EkkoHub can be mounted onto a metal surface but avoid having metal within 20cm (8") of the other faces to ensure best radio performance.
- Do not install the EkkoHub in a metal enclosure without converting it to use an external antenna.
- It is useful for quick status checking if the LEDs on the EkkoHub are visible after the unit has been installed.
- The EkkoHub (or external antenna) should be no further than 25m (27yds) from the Critical Things sensors it is working with.
- The Ethernet cable(s) should be no more than 90m (300') long.



### 3.2. Surface mounting plate

The EkkoHub has a separate mounting plate to simplify installation on walls, ceilings and other flat surfaces. The plate is fixed using two screws and then the EkkoHub attaches with a twist on action.

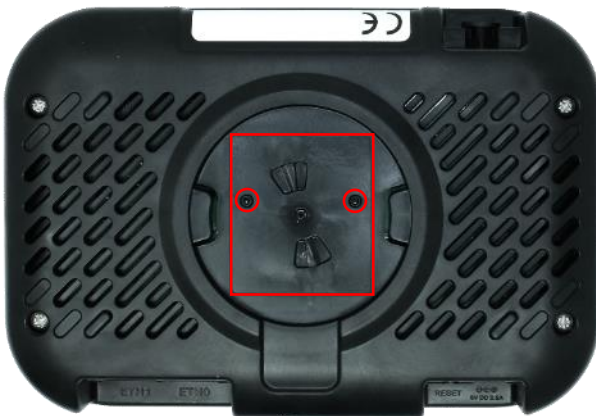


The mounting plate has two screw holes on 35mm centres providing clearance for No. 6 or M4 screws. Use suitable screws and hardware for the surface the plate is being fixed to. Mount the plate with the screw holes horizontal for horizontal EkkoHub installation.

### 3.3. DIN rail mounting

The EkkoHub can be mounted on standard 35mm DIN rail using a BOPLA TSH35 holder (BOPLA part number 22035000).

Follow the instructions supplied with the holder to move the operating latch to the longest position and then fix the holder to the back of the EkkoHub using the screws provided. If alternative screws are required then pan head No. 4 screws with thread length between 8mm and 12mm are suitable. Longer threads must not be used or there is a risk of internal damage to the EkkoHub.



DIN rail bracket mounting location and holes highlighted in red.



DIN rail bracket installed with operating latch set to longest position to that it is accessible below the EkkoHub

### 3.4. Power options

The EkkoHub can be powered directly from a 5V 2.5A DC power supply with 2.1mm or 2.5mm centre positive plug (for example XP Power ACM18US05). Alternatively, it can be powered from Power over Ethernet (PoE) on the ETH0 Ethernet port using an IEEE 802.3af-2003 (15.4W) compliant PoE injector/midspan or switch.



**CAUTION:** If a DC power supply is used then it must have a maximum output current rating of at least 2.5A at 5V and no more than 3A at 5V.

Note that a small PoE switch (for example TP-Link TL-SF1005P) could power both the EkkoHub and LX40 Modem if used.



### 3.5. Antenna options

The EkkoHub has an internal antenna which provides excellent performance in most situations. There may be installations where the internal antenna is not ideal, for example:

- If the EkkoHub is DIN rail mounted in a metal cabinet an external antenna will be required to ensure the EkkoHub receives the signals from Critical Things sensors.
- If it is impractical to install the EkkoHub centrally in the room or area to be monitored.

The EkkoHub is approved for use with a PulseLarsen W1063M antenna. Use of other antennas may invalidate the regulatory approvals.

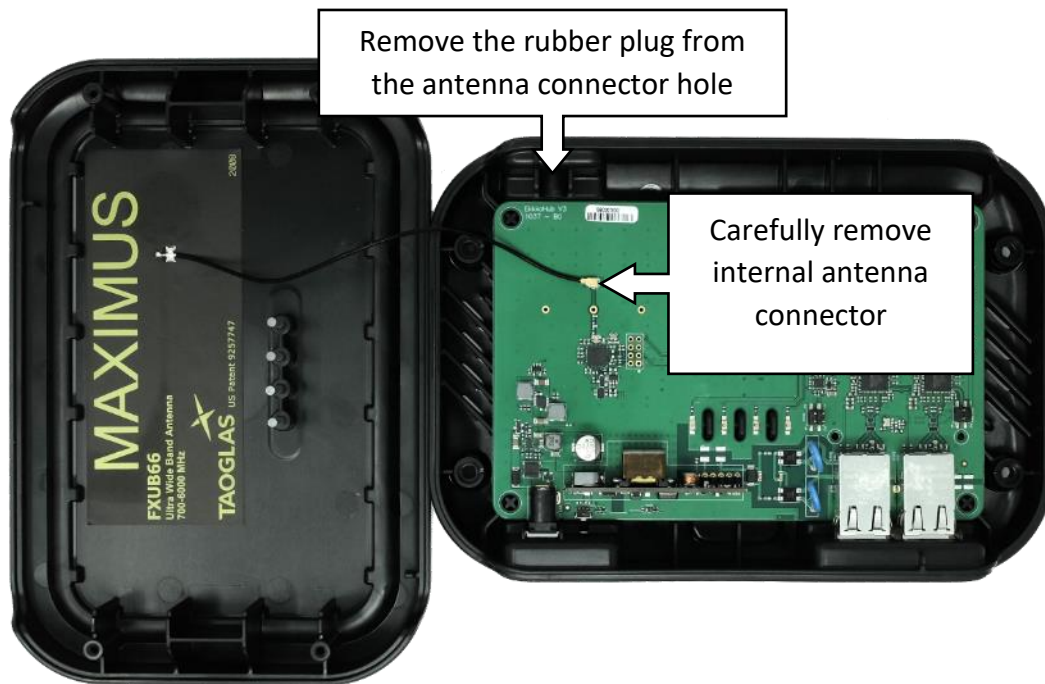
To convert an EkkoHub to use the external antenna requires a U.FL / IPEX MHF1 to SMA female cable (for example Taoglas CAB.011). This cable is available from EkkoSense as a kit including the W1063M antenna. The EkkoHub must be opened to install the cable.

|  |  |
|--|--|
|   | <p><b>CAUTION:</b> Remove all power and data connections from the EkkoHub before opening the unit.</p> |
|  | <p><b>CAUTION:</b> Work in an ESD safe environment.</p>  |

Remove the four screws in the base of the unit (circled in red below).



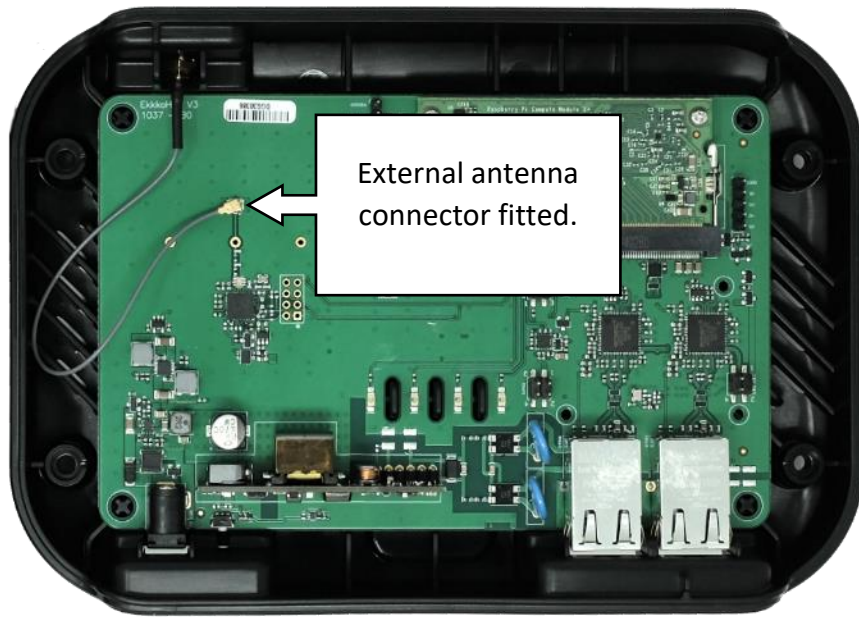
Carefully remove the lid and disconnect the internal antenna. Either remove the internal antenna, cut off the cable or fix the cable securely to the lid. Remove the rubber plug from the antenna hole in the case.



Fit the SMA connector from the inside, fit the washer and tighten the nut from the outside.



Carefully fit the U.FL connector to the PCB. Ensure the connector is lined up correctly before pushing it into place. Gently rotate the connector to ensure it has fully mated.



Refit the EkkoHub lid, ensuring the antenna cable is not trapped between the two halves and refit the four screws.

The antenna may be mounted in a suitable location using a bracket or magnetic mount (for example Taoglas CAB.X05 (1m cable), CAB.X06 (2m cable), CAB.X07 (5m cable)). Ensure that the chosen location places the antenna element in clear space.

## 4. Regulatory information

The EkkoHub must be professionally installed.

The EkkoHub is only approved for use with the internal antenna or an external PulseLarsen W1063M antenna. Use of other antennas is not permitted and invalidates the radio regulatory approval. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This FS-EH-03 device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.

The EkkoHub is for Indoor Use only.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This radio transmitter (25795-FSEH03) has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

- Internal wideband antenna, impedance 50Ω, maximum gain 2.7dBi
- External dipole antenna, impedance 50Ω, maximum gain 1dBi

## 5. Reset to defaults button

If the EkkoHub is configured in a way that prevents access to the configuration and status webpage then it can be reset to the standard default configuration. This could happen if ETH1 is configured to use DHCP to request an IP address and there is no way of finding out the address that has been assigned.

- Power down the EkkoHub
- Power up the EkkoHub
- Wait until one or more of the status LEDs lights
- In the next sixty seconds use an object with diameter less than 1mm to press the 'Reset to Default' button through the hole in the case.
- Continue to keep the button pressed for ten seconds.
- Release the button and wait whilst the EkkoHub reboots. The status LEDs go out during reboot.
- Keep the EkkoHub powered. When the status LEDs light again the EkkoHub will have returned to the default configuration.