

Ultra-wideband Location System

Ubisensor30v1

User's Manual

Written By

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Introduction

The Ubisensor30v1 is a basestation used by the Ubisense Location System, which supports the real-time location of objects. It detects ultra-wideband (UWB) pulses emitted by wireless tags (Ubitags), allowing the 3D position of the tags to be found. The use of UWB technology enables greater positioning accuracy than other wireless technologies, because it is much less susceptible to multipath interference effects. Applications of the system include healthcare, workplace productivity, security, retail management and manufacturing.

This document describes the features and specifications of the Ubisensor30v1, important regulatory information concerning its use, and details on how to diagnose potential problems.

Regulatory Information for the United States of America

This 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.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Regulatory Information for Europe

Hereby, Ubisense declares that this Ubisensor30v1 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. A copy of the Declaration of Conformity for this equipment may be obtained from:

Ubisense
St. Andrew's House
St. Andrews Road
Chesterton
Cambridge
CB4 1DL
United Kingdom

Regulatory Information for Canada

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This Class B digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAUTION: Any changes or modifications made to the Ubisensor30v1 which are not expressly approved by Ubisense Limited could void the user's authority to operate the equipment.

Nomenclature

To improve readability, the name Ubisensor will be used instead of Ubisensor30v1 for the remainder of this document.

Features of the Ubisensor

The diagrams below show several important features of the Ubisensor:

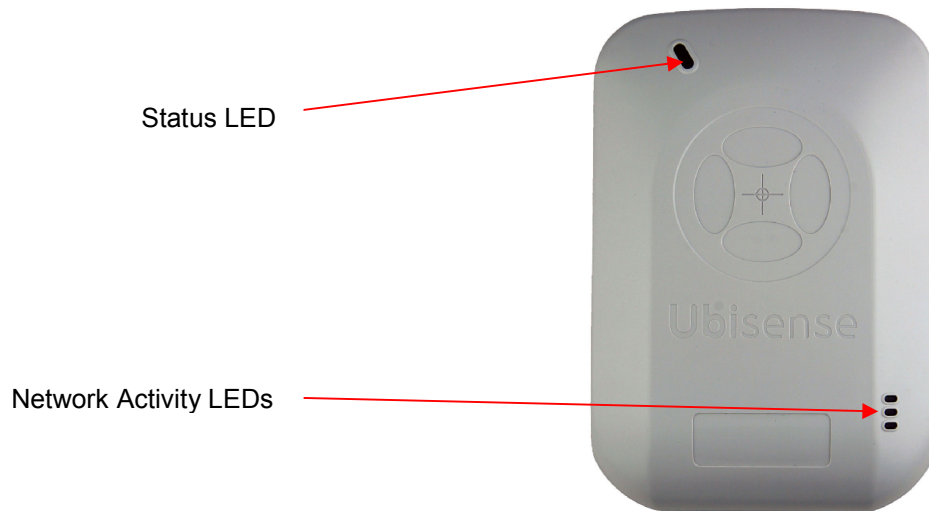


Figure 1 – Ubisensor Front

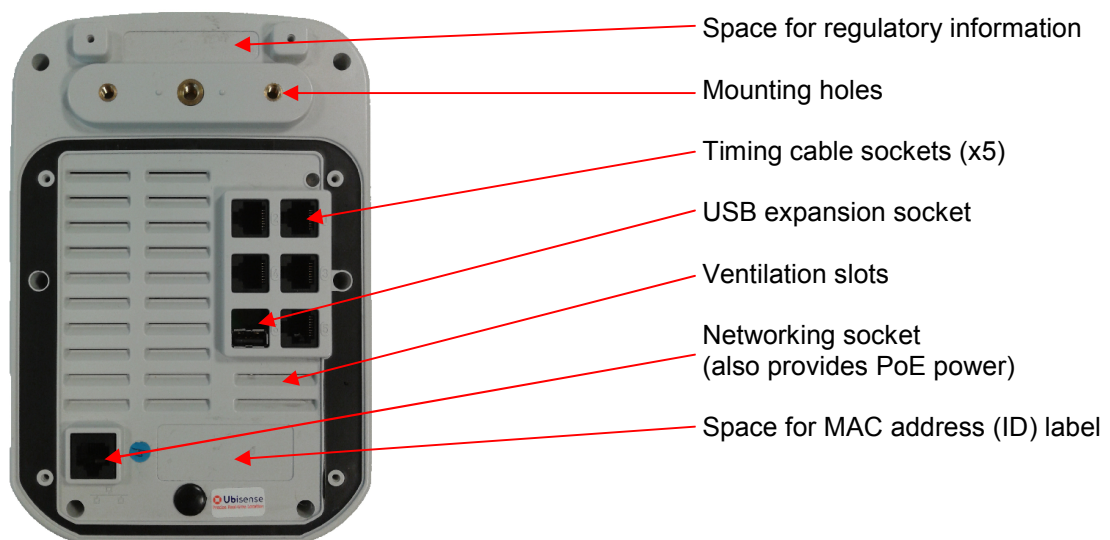


Figure 2 – Ubisensor Rear

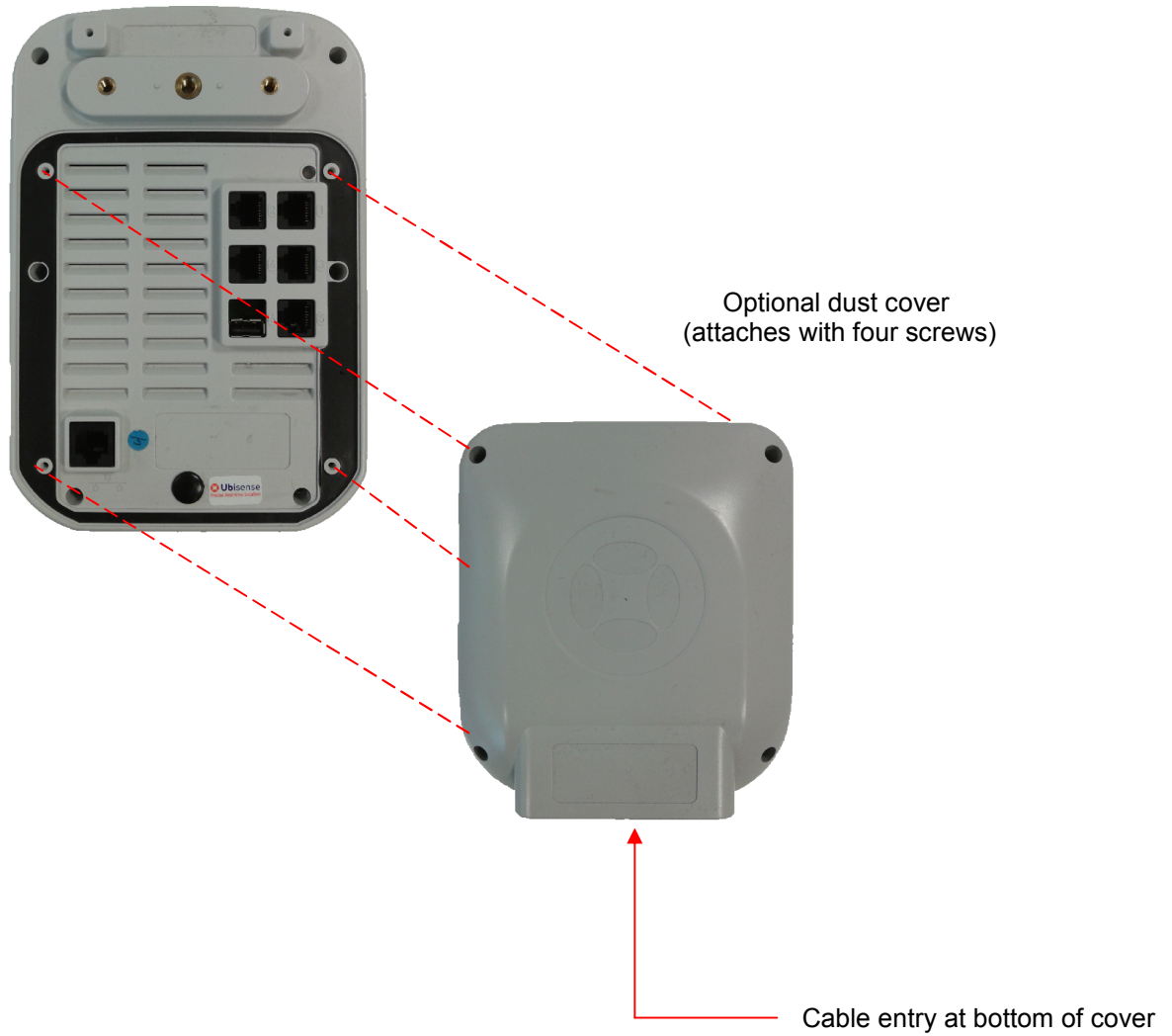


Figure 3 – Ubisensor optional dust cover

The optional rear dust cover may be used for installations where the sensor needs additional protection from the environment. The cover may be fitted with suitable cable glands where the cables exit from the cover on the bottom surface.

Installation and Operation Instructions

Mounting options

Ubisensors have three mounting holes in the back of the case, to which external clamps and brackets can be attached. The two outer holes are M4 size, the middle hole is M6 size (and can be used in conjunction with a standard photographic camera mount).

Powering the Ubisensors

Ubisensors must be powered using Power over Ethernet (PoE). This is normally done by connecting the sensors to the network using a PoE switch. However, it is also possible to use mid-span injectors if desired.

Setting up a sensor group

Ubisense will have supplied you with an updated location system database containing configuration information for the equipment you have received. At this point, it's worth checking that the MAC (Media Access Control) addresses of the Ubisensors you have received match the information in the database, using the Ubisense location system configuration tools. See the software manual for details on how to examine the contents of the configuration database – the MAC address for each Ubisensor is printed on a label affixed to the rear of the unit (see "Features of the Ubisensor").

Once you are sure you have the correct equipment to hand, the sensor cells for the system can be set up. In the Ubisense location system, a large area of space is covered by a number of sensor groups, each of which (individually) covers a smaller area.

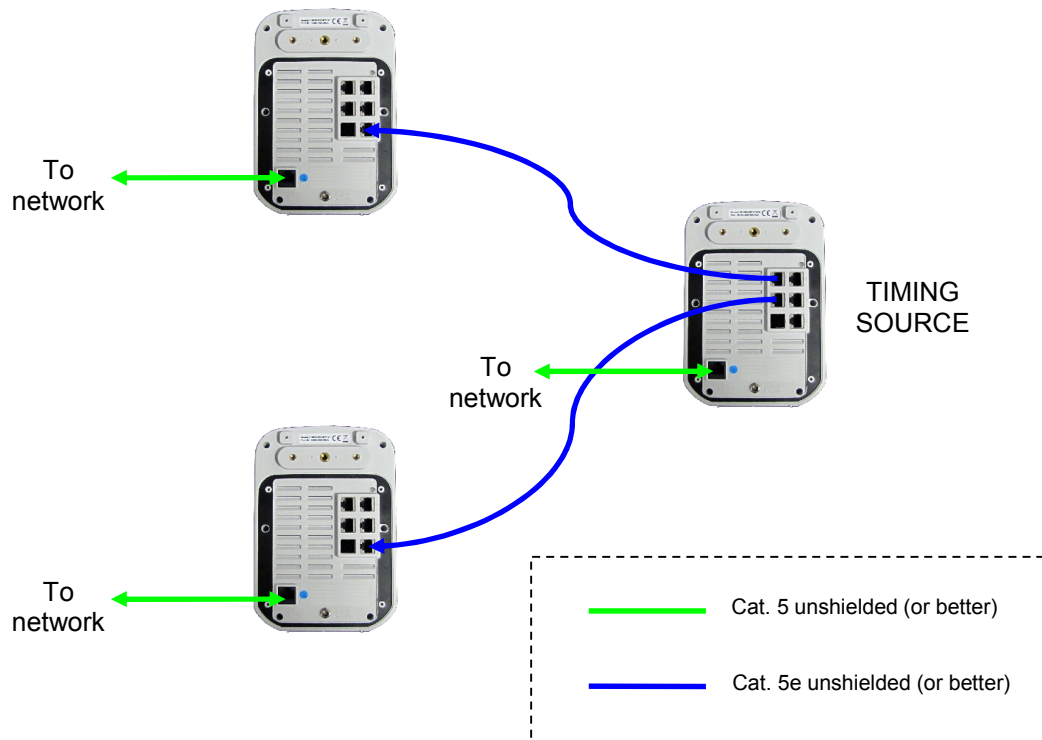
Each sensor group has a number of units which are synchronized together using a timing signal conveyed between the units by timing cables. The cables interconnecting the units are unshielded Category 5e cable (or better).

Each sensor group has one sensor which is configured as a Timing Source. The remaining sensors are configured not to be Timing Sources.

A timing cable from the Timing Source to other sensors can be plugged into any free timing socket on the Timing Source, but must be plugged into the bottom left-hand timing socket (Marked "5") on the other sensors.

All sensors are connected to the standard network using a Category 5 unshielded cable (or better). Power is supplied over the network cabling using Power over Ethernet (PoE) techniques, so the sensors must be connected to the network via a PoE switch (or alternatively to a non-PoE switch via mid-span PoE injectors).

The final wiring interconnection diagram for a three-member sensor cell would be as follows:



Switching on the Ubisensor

To turn on a Ubisensor, simply turn on the power to the device. The Status LED on the front of the Ubisensor should illuminate, and the device will begin to attempt to contact the Ubisense location system (which should already have been installed on your network – see the software manual for details). Configuration of the Ubisensor is entirely automatic, and is under the control of the Ubisense location system.

Calibrating the Ubisensor

When the Ubisensor has been installed in its final location, its position and orientation must be found and entered into the Ubisense location system's database. The Ubisense location system management tools make this calibration process simple and quick – refer to the software manual for details.

Troubleshooting

If you believe that a Ubisensor is not functioning correctly, and the Ubisense location system management tools are not able to diagnose the problem, it is likely that the Ubisensor is not communicating with the rest of the location system for some reason. Check the following:

- The networking cable is fully plugged in at both ends.
- The Ubisensor is connected to a network connection which is providing PoE power.
- Your local network port is connected to the rest of your network.
- The link light corresponding to the Ubisensor network connection is illuminated on the nearest upstream switch.

If you are still unable to determine the cause of the problem, contact your system installer or Ubisense.

Ubisensor Specifications

Conventional radio transceiver section (FCC ID: SEASENSOR30, IC: 8673A-SENSOR30)

Lowest channel frequency:	2401.750MHz (802.15.4f-2012 channel 15)
Highest channel frequency:	2481.750MHz (802.15.4f-2012 channel 56)
Maximum output power:	+9dBm

General specifications

Dimensions:	200mm x 140mm x 60mm
Power supply:	48V PoE
Operating temperature range:	-40°C to +70°C