Ultra-wideband Location System

Ubisensor V2.0

User's Manual

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Introduction

The Ubisensor V2.0 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 tag 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 Ubisensor, important regulatory information concerning its use, and details on how to diagnose potential problems.

Information to the User

The Ubisensor V2.0 contains a wireless transceiver certified under FCC Part 15.249.

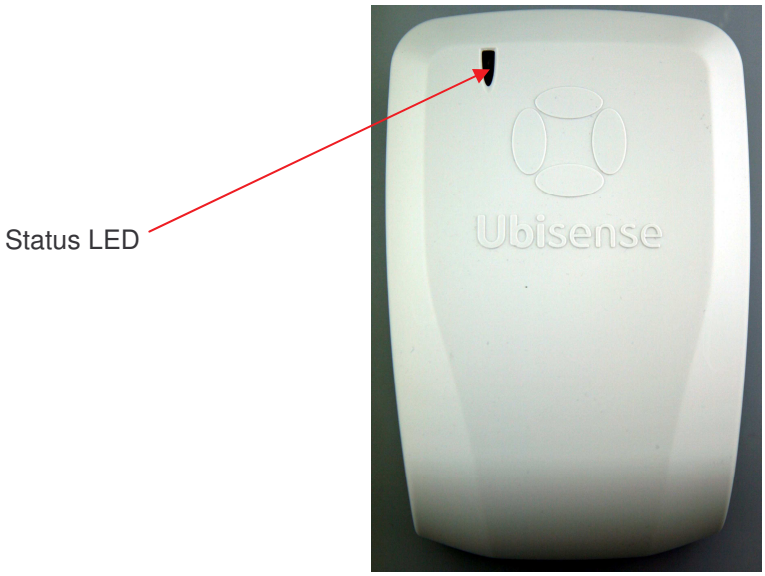
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

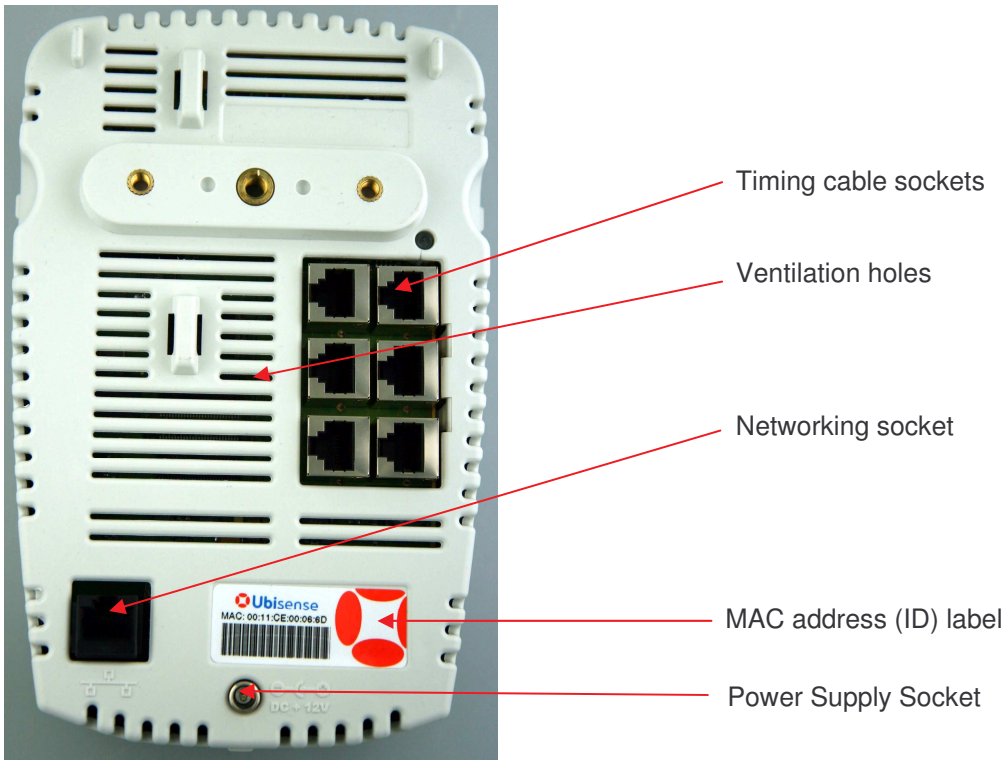
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

Features of the Ubisensor

The diagrams below show several important features of the Ubisensor:





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. Two holes are M4 size, the other hole is M6 size (and can be used in conjunction with a standard photographic camera mount).

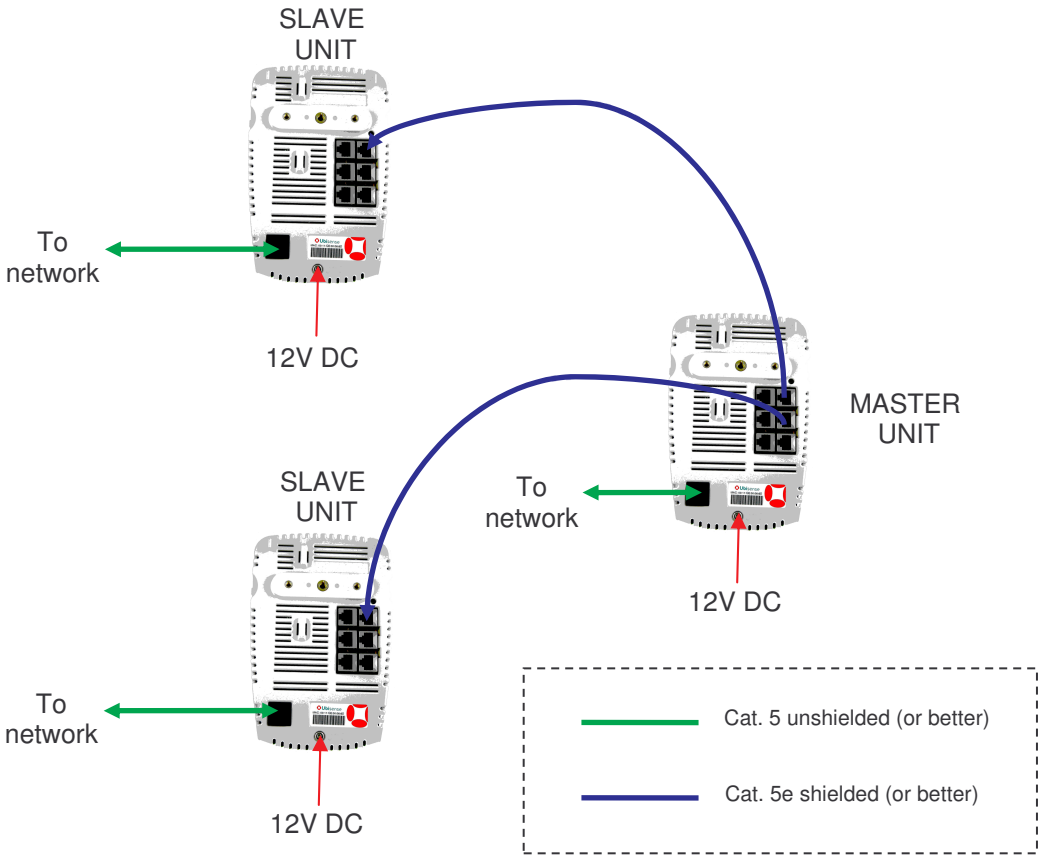
Setting up a sensor cell

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 cells, each of which (individually) covers a smaller area.

Each sensor cell has a **master** unit and number of **slave** units (usually three or more). The information provided by the Ubisense location system configuration tools will let you identify, for any particular sensor cell, which unit is the master and which are slaves, using the MAC addresses of the devices. The master unit in each sensor cell generates a timing signal which is used by the slave units of that cell. The master unit is connected to the slave units using shielded Category 5e cable (or better). A timing cable from the master to a slave can be plugged into any free timing socket on the master, but must be plugged into the top right-hand timing socket on the slave, as shown in the diagram below.

All sensors are connected to the standard network using a Category 5 unshielded cable (or better), and to a power supply (typically via a 12V DC adaptor such as the Stontronics EPA-121DA-12). The final wiring interconnection diagram for a three-member sensor cell would be as follows:



WARNING: Never plug a networking cable into a timing cable socket, or a timing cable into the networking socket!

Switching on the Ubisensor

To turn on a Ubisensor, simply turn on the power to the device. The 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 Ubisensor is connected to a power supply, and the supply is switched on.
- The networking cable is fully plugged in at both ends.
- 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: SEASENSOR20)

Number of channels:	8
Lowest channel frequency:	2402.5MHz
Highest channel frequency:	2480.5MHz
Maximum output power:	+8dBm

General specifications

Dimensions:	200mm x 130mm x 60mm
Power supply:	12V DC, centre-pin positive (or 48V PoE)
Operating temperature range:	-20ºC to +60ºC