

# Ultra-wideband Location System

**UBIWATCH21 watch-style location tracking tag**

User's Manual

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Revised: March 2013

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## Introduction

The UBIWATCH21 is a wireless device intended to be used for the real-time location of objects within buildings. It transmits ultra-wideband pulses which are picked up by a network of basestations (Ubisensors) placed inside the building, allowing the 3D position of the tag to be found. The use of ultra-wideband technology enables greater positioning accuracy within buildings 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 UBIWATCH21, important regulatory information concerning its use, and details on how to diagnose potential problems.

## Information to the User

The UBIWATCH21 is an ultra-wideband (UWB) wireless device certified under FCC Part 15.517 (FCC ID SEAWATCH21). Its use is subject to technical requirements for indoor UWB systems, in particular the stipulation that the devices must only be used indoors. Users should note carefully the following information:

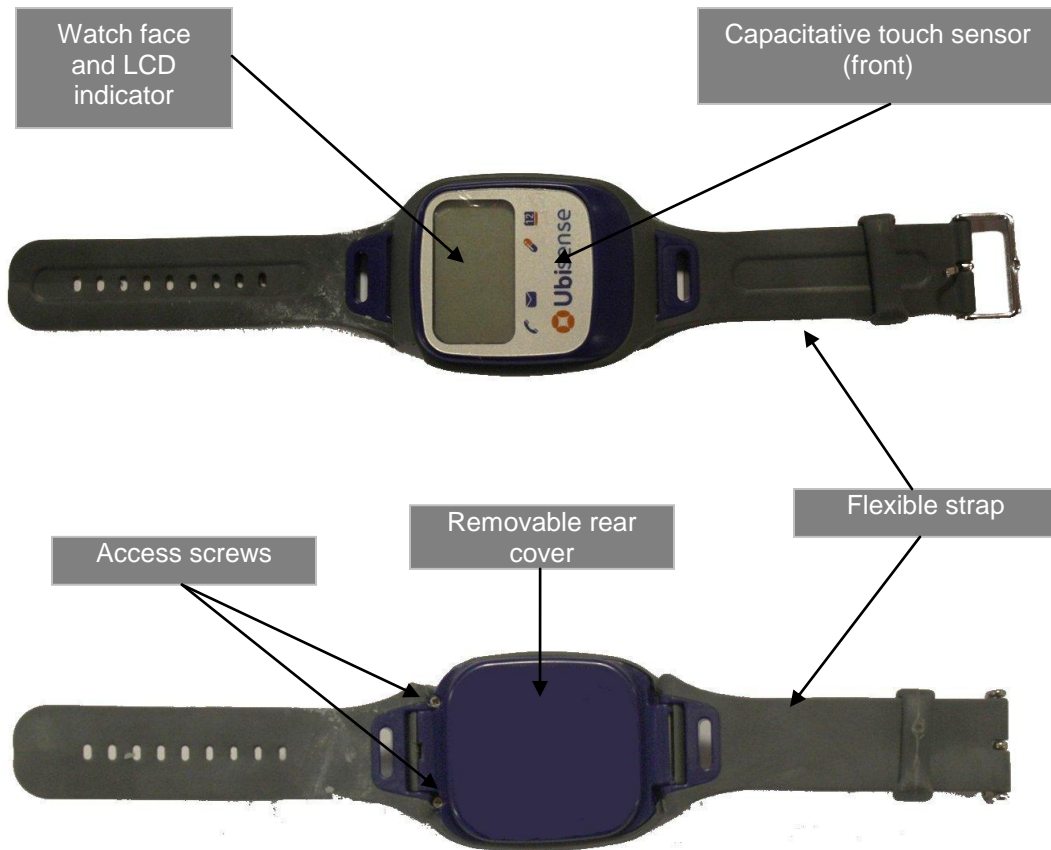
- **CAUTION:** This equipment may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious penalties.
- The UBIWATCH21 will only operate (i.e. transmit UWB signals) in conjunction with an in-building Ubisensor network, which should be professionally installed. The installed Ubisensor network will be configured to cover only the area inside the building, preventing the UBIWATCH21 from emitting UWB signals outdoors. Contact your system administrator if you are unsure as to the extent of the coverage of the Ubisense In-Building Location System in your building.
- 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.

Users should also carefully note the following information:

- **CAUTION:** Any changes or modifications made to the UBIWATCH21 device which are not expressly approved by the Ubisense Limited could void the user's authority to operate the equipment.
- **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.

## Features of the UBIWATCH21 device

The diagram below shows several important features of the UBIWATCH21 device:



## Installation and Operation Instructions

### Switching the UBIWATCH21 device on for the first time

The UBIWATCH21 is supplied with a battery, which needs to be connected prior to operating the tag. The battery is connected via an internal switch/connection which is accessed underneath the back cover. Remove the two screws in the back of the enclosure, and then remove the back cover. Next, connect the battery via the switch/connection. The LCD display of the device should illuminate to indicate correct start-up of the device. Replace the back cover, and finally tighten the two screws which hold the back cover in place.

### Fitting or replacing the batteries in the UBIWATCH21 device

The UBIWATCH21 device uses a GMB CP503742 3V lithium cell (or equivalent). The devices frequently report their battery health to the system via the Ubisensors, so system administrators should be notified by the system when the battery in a particular tag requires replacement. Follow the instructions above to access the battery compartment, then replace the battery via soldering or connection.

Should the device not indicate correct start-up via its LCD display after the battery has been replaced, remove the battery, check that it is fresh, wait for 30 seconds, and reinsert the battery. Contact your system administrator if you continue to have problems replacing the battery in the UBIWATCH21 device.

### Troubleshooting

The activity of the LCD on the UBIWATCH21 may be used to diagnose potential problems with the device:



- Illumination of the "Wireless" icon indicates that the tag is in communication with the local Ubisensor network, and that the device is emitting UWB signals enabling its position to be found.
- Illumination of the "Ubisense" icon indicates that the tag is searching for signals from the local Ubisensor network, and that tracking functionality is not available at that location. Ensure that the tag is within an area covered by the Ubisense Location System.

If you are still unsure as to whether or not the UBIWATCH21 device is operating correctly, contact your system administrator, who should be able to use Ubisense's monitoring tools to determine the extent and cause of any potential problem.

# UBIWATCH21 Specifications

## UWB transmitter section

Operates under:	FCC Part 15.517
Centre frequency:	6.866 GHz
-10dB bandwidth:	681.1MHz

## Conventional radio transceiver

Operates under:	FCC Part 15.249
Lowest channel frequency:	2402.5MHz
Highest channel frequency:	2480.5MHz

## General specifications

Dimensions (WxHxD):	264mm x 51mm x 17mm
Power supply:	1 x GMB CP503742 3V lithium cell (or equivalent)
Operating temperature range:	-20°C to +60°C

## Requirements for device operation

This section lists the technical requirements laid down in the FCC's rules which must be met by UWB devices operating indoors under §15.517 of those rules. UBIWATCH21 devices operating with a correctly-installed Ubisense location system will meet these requirements.

- (1) Indoor UWB devices, by the nature of their design, must be capable of operation only indoors. The necessity to operate with a fixed indoor infrastructure, e.g., a transmitter that must be connected to AC power lines, may be considered sufficient to demonstrate this.
- (2) The emissions from equipment operated under this section shall not be intentionally directed outside of the building in which the equipment is located, such as through a window or a doorway, to perform an outside function, such as the detection of persons about to enter a building.
- (3) The use of outdoor mounted antennas, e.g., antennas mounted on the outside of a building or on a telephone pole, or any other outdoors infrastructure is prohibited.
- (4) Field disturbance sensors installed inside of metal or underground storage tanks are considered to operate indoors provided the emissions are directed towards the ground.
- (5) A communications system shall transmit only when the intentional radiator is sending information to an associated receiver.