BeSpoon

User Guide

OMLOX WTAG

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1. Introduction

omlox WTag is part of BeSpoon RTLS, a real-time locating system which uses Ultra-Wideband (UWB) pulses for real-time 3D location of objects in buildings in various industries.

omlox WTags are mainly used as mobile devices while omlox Satellites are used as fixed bases in BeSpoon RTLS. In this case, the omlox Satellites are synchronized with eachother. The mobile devices, such as omlox WTags or omlox SmartAntennas are tracked in two modes which can coexist: Multi-Tag Tracking (server-centric) and GPS-like Positioning (device-centric).

omlox WTags may also be provided as part of special mobile kits without omlox Satellites and without server. In this case, BeSpoon RTLS works in a particular device-centric mode, called Single Self-Positioning: only 1 omlox mobile device is tracked, the others are used as fixed bases (then, unlike in the main configuration, the fixed bases are not synchronized).

BeSpoon RTLS overview - main configuration

BeSpoon RTLS overview - omlox mobile kits

This document includes regulatory information, as well as a detailed hardware specification and a description of its features.

For detailed features and user instructions regarding the complete system, please refer to the BeSpoon RTLS documentation included in the RTLS DELIVERY Pack. The RTLS DELIVERY Pack includes documentation and the related software toolchain, to make the development processes easier. It contents evolves according to BeSpoon RTLS developments.

2. Safety and compliance information

2.1. General

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 anyinterference received, including interference that may cause undesired operation.

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 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.

CAUTION

- BeSpoon RTLS equipments are configured to cover only the area inside buildings, preventing omlox WTags and other UWB devices of the system from emitting UWB signals outdoors.
  Contact your system administrator if you are unsure as to the extent of coverage.
- **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 legal penalties.
- **UWB devices may not be employed for the operation of toys.**
- **Operation onboard an aircraft, a ship or a satellite is prohibited.**
- **omlox WTags and the real-time location system BeSpoon RTLS may only be operated by qualified adult individuals. Installation and operation in childcare facilities and other places hosting children is prohibited.**
- **Any changes or modifications not expressly approved by BeSpoon could void the user's authority to operate this equipment.**

- **Opening the casing of an omlox WTag and/or replacing any of its component, including the battery, is prohibited.**
- **omlox WTags only operate (i.e. receive and transmit UWB signals) within a complete UWB real-time location system BeSpoon RTLS, which must be professionally installed.**
- **In case omlox WTags, including their batteries, must be disposed of, they must be collected in compliance with Directive 2012/19/EU (Waste of Electrical and Electronic Equipment).**

2.2. Battery

Improper use of the battery may cause heat, fire, rupture, damage or capacity deterioration of the battery. In order to ensure a safe and efficient use of omlox WTag's battery, read the following information and apply the following instructions carefully.

Nominal capacity	240mAh
Nominal voltage	3.7V
Discharge Cut-off Voltage	2.75V
Charge method	CC / CV (Constant Current / Constant Voltage)
Max charge current	120mA
Charge voltage	4.2 ±0.03V
Max discharge current	120mA (for continuous discharging mode)
Weight	about 7.0g

Temperatures	
Charge	0°C to +45°C
Discharge	-20°C to +60°C
Storage	-20°C to +25°C

Storage relative humidity	65 ±20%

** capacity recovery rate should be more than 80%of initial Capacity*

- Charge omlox WTags with a charging station approved by BeSpoon.
- The omlox WTag was inspected carefully before shipment. However, in the case any abnormality of bad smell or heat, etc, arises after purchase, please contact BeSpoon.
- For long-term storage, please charge at 0.5C° for about one hour in advance

CAUTION

- **Do not put into a fire, or heat, do not store the in high temperature environment.**
- **Do not drive a nail in, hit with a hammer, or stamp, do not strike in other ways.**
- **Do not submerge in water, do not wet.**
- **Do not leave on a charging station or equipment if it generates any deterioration (weakening and/or heat, color and/or shape changes, electrolytes, or cause leaks, etc.) or any abnormality.**
- **Do not discharge continuously when it is not charged.**

EU Conformity Declaration

CE

DECLARATION UE DE CONFORMITE (N° ...) (1)

1. Équipement radioélectrique (numéro de produit, de type, de lot ou de série):
2. Nom et adresse du fabricant ou de son mandataire:
3. La présente déclaration de conformité est établie sous la seule responsabilité du fabricant:
4. Objet de la déclaration (identification de l'équipement radioélectrique permettant sa traçabilité; au besoin, une image couleur suffisamment claire peut être jointe pour permettre l'identification de l'équipement radioélectrique):
5. L'objet de la déclaration décrit ci-dessus est conforme à la législation d'harmonisation de l'Union applicable:

   Directive 2014/53/UE

   Autres législations d'harmonisation de l'Union, s'il y a lieu
6. Références des normes harmonisées pertinentes appliquées ou des autres spécifications techniques par rapport auxquelles la conformité est déclarée. Il faut indiquer, pour chaque référence, le numéro d'identification, la version et, le cas échéant, la date d'émission:
7. S'il y a lieu: l'organisme notifié ... (nom, numéro) ... a réalisé ... (description de l'intervention) ... et a délivré le certificat d'examen UE de type: ...
8. S'il y a lieu, description des accessoires et des éléments (y compris logiciels) qui permettent à l'équipement radioélectrique de fonctionner selon sa destination et qui sont couverts par la déclaration UE de conformité:
9. Informations complémentaires:

   Signé par et au nom de: ...

   (lieu et date d'émission):

   (nom, fonction) (signature):

PROOF FORM
TO BE UPDATED WITH FINAL SCAN

3. Specification

3.1. Datasheet

- Data connections — Bluetooth, UWB
- Technology information
  - BLE — Frequency band : [2402 – 2480] MHz
Max power (EIRP) : 4dBm
  - UWB — Frequency band : [3250 – 4750] MHz
Max Mean power (EIRP) : -41.3dBm/MHz
- Dimensions — 59 x 47 x 19 mm
- Power supply — 240 mAh Li-ion battery
Wireless charging
- Max. charging current — default: 100 mA
adjustable to user requirements
- Operating temperature range — -20° to 55°C
- IP code — 64
- Pre-programmed Unique ID — 64 bits
- Light indicators — see table below

Light indicators

Status	*LED*	*Color*	*Lighting details*
Starting	Point form LED and wave form LED	**3 colors** **(green, orange, red)**	All colors one after another, 500ms each
Supplied	Point form LED	**Orange**	Continuous
Battery critical (waiting for charge)			Slow blink (every 5s)
Temperature protection			Fast blink (every 200 ms)
Scanning	Wave form LED	**Green** **if battery > 20%**	Slow breath
Calibrating			Fast blink
Ranging		**Red otherwise**	Slow blink (every 3s)

3.2. Hardware overview

front view

side view

back view

base view

individual label

symbols

CE CE certification mark

WEEE symbol – Directive 2012/19/EU

3.3. Equipment needs

BeSpoon RTLS main configuration (omlox Satellites used as fixed bases)

- Full system equipment such as defined at section 3.4. of the document **omloxSatellite_UserGuide.pdf**
- Wireless charging devices

BeSpoon RTLS mobile kits (mobile devices as fixed bases)

- At least 5 mobile devices
- Wireless charging devices and/or USB C cables
- Android tablet or smartphone
- PC (if UART transmission only)

4. Deployment instructions

4.1. omlox WTag start

omlox WTag starts on motion.

To keep using your WTag, just ensure that the wave form led lights in green: it means the battery level is high enough to operate.

▸ *see table in section 3.1*

4.2. omlox WTag placement

One simple golden rule ensures the best results when it comes to the deployment: avoid UWB signal deterioration and reflection by maximizing Line of Sight links (LoS) among all the devices included in the system. LoS matters among omlox Satellites for the quality of synchronization. Of course, it also matters between omlox Satellites and WTags for the location precision.

Short animation sequences summarizing the points to pay attention to (online content)

UWB synchronization

Non-Line of Sight Examples

Dilution of precision

How to place fixed devices

4.3. omlox WTag control

omlox WTags are configured and controlled via the Web UI of BeSpoon RTLS or via another application based on a compatible session protocol.

For more information, please refer to the corresponding documentation. It can be either the documentation included in the RTLS DELIVERY Pack or the documentation dedicated to the compatible application.

5. Ask for support

We offer standardized as well as customized solutions. Please note that all documents may be updated without notice to individual customers beforehand.

We provide remote assistance by e-mail at **bshq@bespoon.com**.

In case of support request, please indicate your system references.

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