

User Guide

OMLOX SATELLITE





© 2020 TRUMPF

The copyrights in this user guide and the system described therein are owned by the company TRUMPF Werkzeugmaschinen GmbH + Co. KG (hereafter also referred as "TRUMPF"). TRUMPF, the TRUMPF logo, omlox and the omlox logo are registered trademarks. All other brand names, product names, or trademarks belong to their respective holders.

TRUMPF Werkzeugmaschinen GmbH + Co. KG, Johann-Maus-Str.2; 71254 Ditzingen, Germany

Contact information: [see back cover](#).

Proprietary Statement/Use

This document contains proprietary information of TRUMPF which may not be used, reproduced, or disclosed to any other parties for any other purpose without the express, written permission of TRUMPF. This document has been made available as part of the license that has been granted to an authorized user of TRUMPF software. It is intended solely for the information and use of parties operating and maintaining the equipment described herein. Use of this documentation is subject to the terms and limitations of that license agreement. This document describes all functionality that can be licensed for this product. Not all functionality described in this document may be available to you depending on your license agreement. If you are not aware of the relevant terms of your license agreement, contact sales at TRUMPF.

Product Improvements

Continuous improvement of products is a policy of TRUMPF. All specifications and designs are subject to change without notice.

Liability Disclaimer

TRUMPF takes steps to ensure that its published documentation is correct; however, errors do occur. TRUMPF reserves the right to correct any such errors and disclaims liability resulting therefrom.

Limitation of Liability

In no event shall TRUMPF, any of its licensors or anyone else involved in the creation, production, or delivery of the accompanying product (including hardware and software) be liable for any of the following (collectively referred to as "Injuries"): injuries (including death) or damages to persons or to property, or damages of any other kind, direct, indirect, special, exemplary, incidental or consequential, including, but not limited to, loss of use, lost profits, lost revenues, loss of data, business interruption, replacement costs, debt service or rental payments, or damages owing by you to others, whether arising out of contract, tort, strict liability or otherwise, arising from or relating to the design, use (or inability to use) or operation of these materials, the software, documentation, hardware, or from any services provided by TRUMPF (whether or not TRUMPF or its licensors knew or should have known of the possibility of any such Injuries) even if a remedy set forth herein is found to have failed of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.



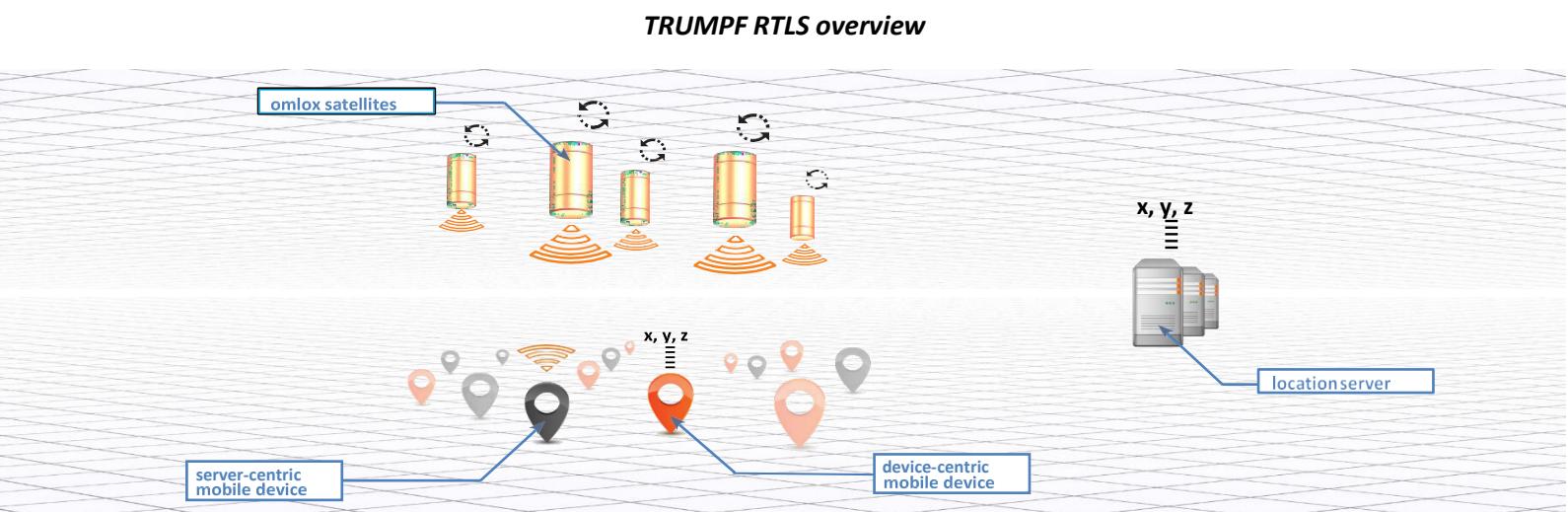
Table of contents

1. Introduction	1
2. Safety and compliance information	2
3. Specification	4
3.1. Datasheet	4
3.2. Hardware overview	5
3.3. Antenna radiation patterns	7
3.4. Equipment needs	8
4. System configurations	9
4.1. IP assignment for omlox Satellites	9
4.2. omlox Satellite used as Wi-Fi access point	9
5. Deployment instructions	10
5.1. omlox Satellite start	10
5.2. omlox Satellite placement	10
5.3. omlox Satellite control	10
6. Ask for support	11

1. Introduction

omlox Satellite is part of TRUMPF 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 Satellites are used as fixed bases in TRUMPF RTLS. They are synchronized with each other and interface with mobile devices such as WTags and SmartAntennas. The mobile devices are tracked in two modes which can coexist: Multi- Tag Tracking (server-centric) and GPS-like Positioning (device-centric).



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 TRUMPF 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. Its contents evolves according to TRUMPF RTLS developments.

2. Safety and compliance information

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.

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: 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.

CAUTION: this equipment may only be operated as a fixed installation. Mobile operation is in violation of 47 U.S.C. 301 and could subject the operator to serious legal penalties.

CAUTION: UWB devices may not be employed for the operation of toys. Operation onboard an aircraft, a ship or a satellite is prohibited.

CAUTION: Any changes or modifications not expressly approved by TRUMPF could void the user's authority to operate this equipment.

omlox Satellites only operate (i.e. receive and transmit UWB signals) within a complete UWB real-time location system TRUMPF RTLS, which must be professionally installed. The installed system is configured to cover only the area inside the building, preventing omlox Satellites 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.

To comply with FCC RF Exposure requirements the device must be installed to assure a minimum separation distance of 20 cm between the device and any human body during normal operating conditions.



EU Conformity Declaration

CE

DECLARATION UE DE CONFORMITE (UE 2014/53)

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 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 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, équivalentes 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 nommé ... (nom, fonction) ... 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 en fonction 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):

TO BE UPDATED WITH FINAL SCAN

3. Specification

3.1. Datasheet

• Data connections	Wireless: Wi-Fi, Bluetooth, ZigBee, UWB Wired: Ethernet RJ45 cable
• Technology information	
– Wi-Fi	Frequency band: [2400 – 2483.5] MHz Max power (EIRP): 17.5dBm
– BLE	Frequency band: [2402 – 2480] MHz Max power (EIRP): 4dBm
– Zigbee	Frequency band: [2405 – 2480] MHz Max power (EIRP): 4dBm
– UWB	Frequency band: [3250 – 4750] MHz Max Mean power (EIRP): -41.3dBm/MHz
• Antenna	omni-directional, internal
• Dimensions	h 237 mm Ø 92 mm
• Power supply	RJ45 PoE, USB C
• Operating temperature range	50° max.
• IP code	54
• Pre-programmed Unique ID	64 bits
• Light indicators	see table on next page

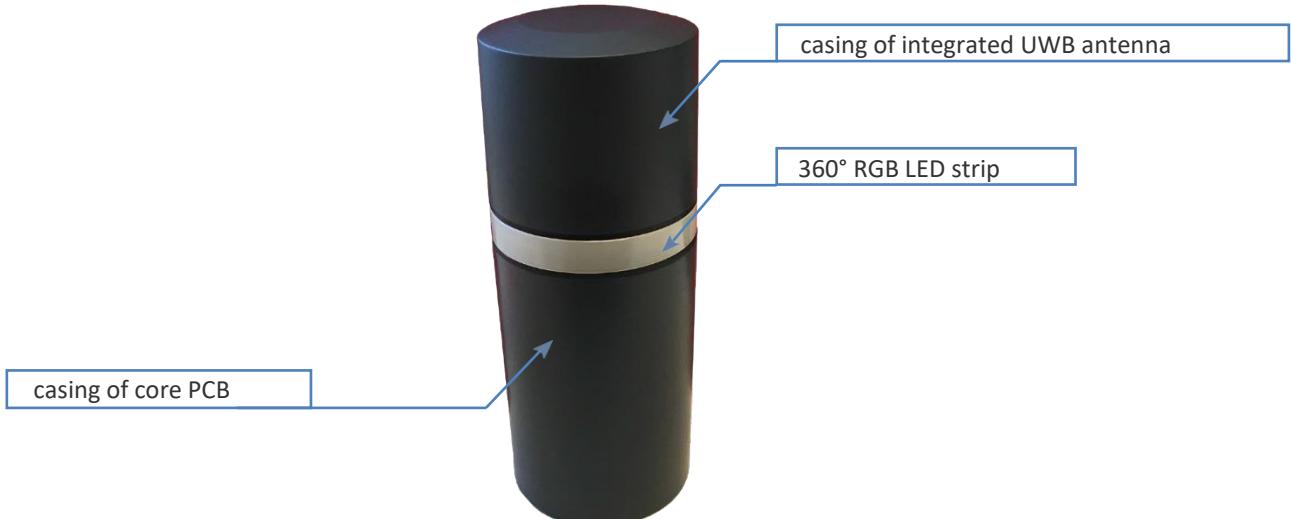


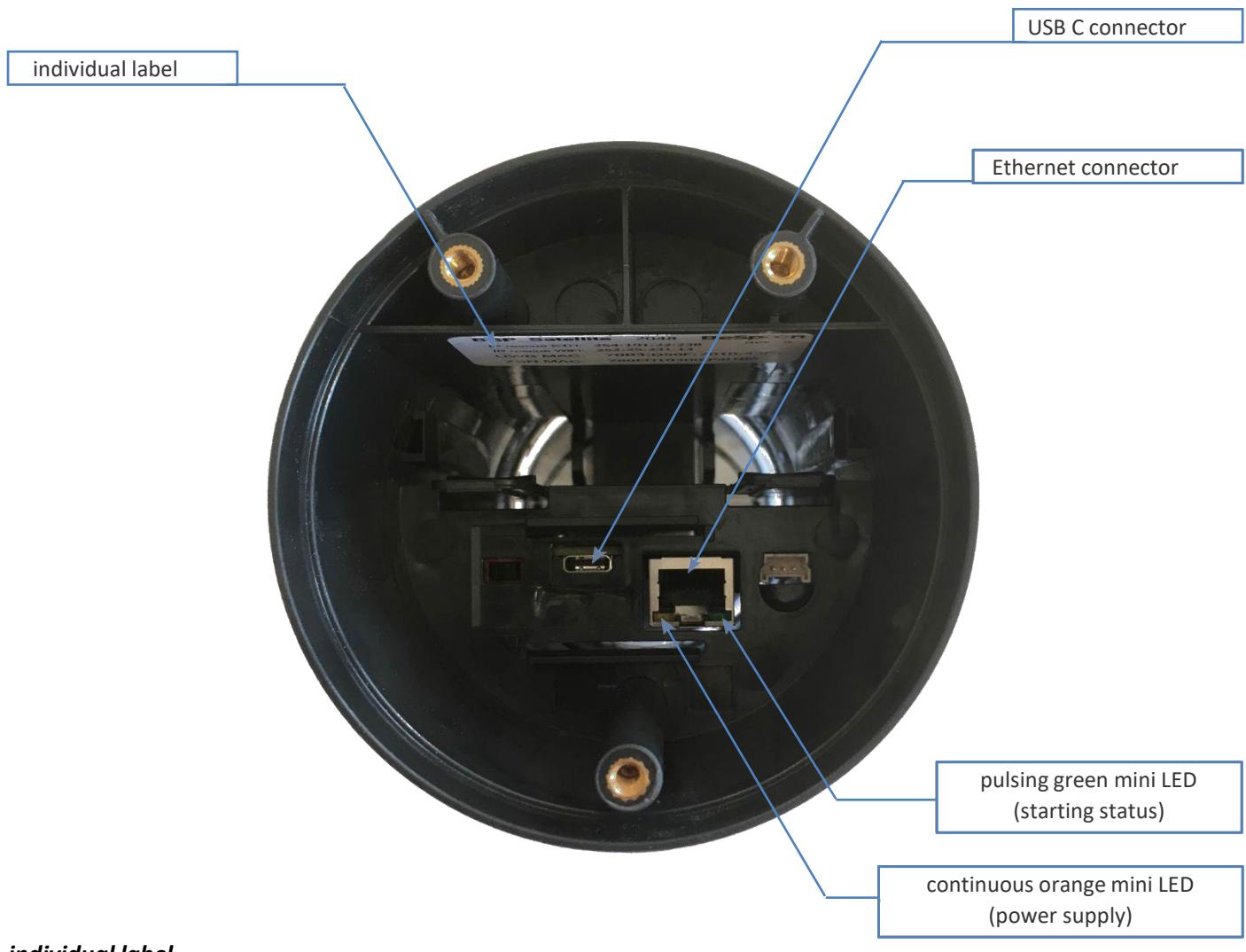
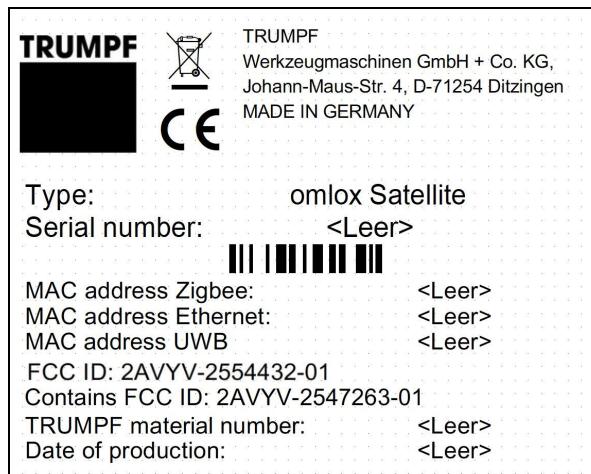
Light indicators

<i>Status</i>	<i>Color</i>	<i>Position</i>	<i>Lighting details</i>
Starting	Green	Mini led on Ethernet connector	1Hz pulsing
Supplied	Orange		Continuous
Supplied	Green	Mini led inside of device casing	1Hz pulsing
Waiting for server	Blue	Central 360° RGB LED strip	Continuous
Identify	Green		~1Hz heart beat
Connected and muted	White		Continuous Lighting level 30%
Connected, unmuted and scanning	White		~1Hz heart beat
Connected, unmuted and ranging	White		Continuous Lighting level 100%
On error	Red		Continuous

3.2. Hardware overview

front view

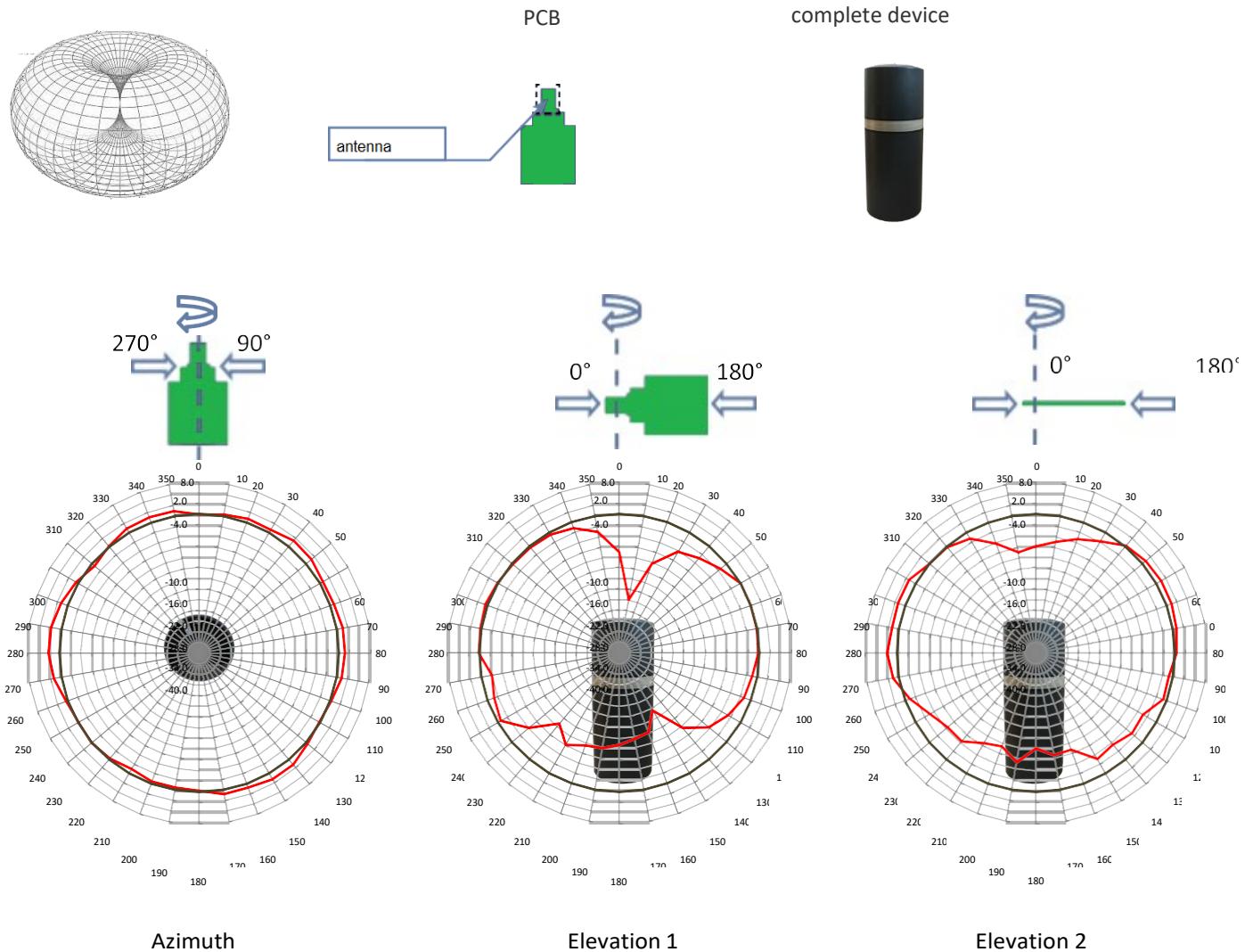


base view**individual label**

3.3. Antenna radiation patterns

The 3D radiation pattern of omlox Satellite's omni-directional antenna is similar to a thick torus shape.

Radiation pattern and diagrams following different planes



3.4. Equipment needs

- A device which hosts the location server (industrial PC such as TRUMPF LocBox, pre-configured for TRUMPF RTLS)
- A PC with an Ethernet connection to access the Web UI of TRUMPF RTLS as well as the maintenance application of the system
- Accessories for power supply and connection to location server:
 - RJ45 PoE cables, PoE switch or USB external power pack connection
 - Power supply adapter for the device used as location server host (country-specific)
- In case of repeated power failures or power shutdown procedures, your installation must include an uninterruptible power supply (UPS).
- Holders (optional)

Example of standard wired installation



4. System configurations

4.1. IP assignment for omlox Satellites

Within TRUMPF RTLS, every omlox Satellite is given an own IP address by a DHCP server.

The DHCP server role depends on the networks in the installation environment:

- Either the device which hosts the location server is used as DHCP server for omlox Satellites
- Or the DHCP server for omlox Satellites is embedded in the user's network

For more information about the network configurations, please refer to the RTLS DELIVERY Pack documentation.

4.2. omlox Satellite used as Wi-Fi access point

Small-scale pre-configured wireless kits can use one omlox Satellite as Wi-Fi access point, while the other omlox Satellites of the installation are Wi-Fi clients.

The omlox Satellite used as Wi-Fi access point is used as UWB device as well.

The access point is pre-configured and marked as such on its casing. It is supplied with PoE, while the other omlox Satellites (Wi-Fi clients) are supplied by external power packs connected with USB C cables.

For more information about the network configurations, please refer to the RTLS DELIVERY Pack documentation.



5. Deployment instructions

5.1. omlox Satellite start

To start omlox Satellite, just connect the corresponding cable: PoE or USB C.

If you plug a PoE cable, the green and orange LED on the Ethernet port light on. If you plug a USB cable, a green LED inside the casing lights on.

► *see table in [section 3.1](#)*

5.2. omlox Satellite 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 mobile devices 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 omlox Satellites](#)

5.3. omlox Satellite control

omlox Satellites are configured and controlled via the Web UI of TRUMPF 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.



6. 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 sven.futschik@trumpf.com.^{[WJ1][WE2]} In case of support request, please indicate your system references.

TRUMPF



Johann-Maus-Str. 2
71254 Ditzingen
Germany
Telephone +49 7156 3030
Fax +49 7156 30330309
<mailto:info@de.trumpf.com>