CORIVA

Real Time Locating System

CorivaTag Plus User Manual

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User Manual

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Version	Status	Date	Author	Modifications
2023.2	Draft	02.05.2023	Paul Balzer	Initial 2023.2 Version
2023.2	Release	31.05.2023	Silvio Reuß	Add power spectral density
2023.3	Release	21.08.2023	Paul Balzer	Add Wireless Charging Pad & Helpdesk
2023.4	Release	05.02.2024	Paul Balzer, Silvio Reuß	Add movement based ranging, updated System Overview, Change Documentation URL
2024.1	Release	17.04.2024	Silvio Reuß	Update Compliance Information (RF Exposure Notice), Label, Technical data and Conformity

Table of Contents

CorivaTag Plus

Welcome to the technical data sheet for our Ultra-Wideband (UWB) Tag, the mobile device of our Coriva Real-Time Location System (RTLS). The CorivaTag Plus is designed to send UWB signals to CorivaSats or other 3rd party "omlox air 8"-certified RTLS Satellites.

CorivaTag Plus is a cutting-edge Ultra-Wideband (UWB) device that is designed for highly accurate and reliable asset tracking. Equipped with advanced Ultra-Wideband technology, this compact and versatile device is capable of providing real-time location data with a high update rate of up to 4Hz, ensuring that you always have access to the most up-to-date position information about your assets.

> omlox is the world's first open locating standard which aims to implement flexible real-time locating solutions with elements from various manufacturers. For more information about omlox, please visit omlox.com.

One of the most innovative features of the CorivaTag Plus is its wireless rechargeability, which eliminates the need for cumbersome cables and connectors and the utilization of an acceleration sensor to detect movement.

The CorivaTag Plus is specifically designed for industrial use, and as such, it is built to be robust, shock-resistant, and waterproof with an IP67 rating. This means that it can withstand harsh environmental conditions, making it a reliable asset tracking solution for use in challenging settings.

Figure 1 – CorivaTag Plus

Legal Notice

Copyright

Proprietary Statement / Use

Product Improvements

Liability Disclaimer

Limitation of Liability

the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Safety and Compliance Information

Overheating

Excessive ambient temperatures and heat accumulation can cause overheating and thus damage the device.

- Charge, operate and store the device only within the specified ambient temperature ranges
- The device should only be charged using approved charging stations that have been authorized by the manufacturer
- Do not cover the device during charging.

Mechanical Impacts

Excessive mechanical impact can damage the device.

- Do not subject the device to excessively high loads.
- If the internal battery has been damaged or if there is a likelihood of damage, place the complete device in a metal container, seal it and place it in a non-flammable environment.

Battery deep Discharge

Protect the battery from deep discharge by switching off the device and charging it regularly during storage / non-use. Deep discharge will damage the battery.

Explosive Environment

Under unfavorable conditions, radio waves as well as technical defects of the device can cause explosions or fire in the vicinity of an explosive atmosphere. Do not operate the device near potentially explosive atmospheres. Follow the instructions in potentially hazardous environments, by e. g. Switch off the device or disconnect it from the power supply.

Radio Interference

Radio interference can be generated by a variety of different devices that actively transmit and receive electromagnetic radio waves.

- Do not use or operate the equipment in locations where the use of radio equipment is prohibited.

- Observe the regulations on air freight and carrying in the aircraft. Disconnect the device from the power supply or switch it off.
- Observe the instructions and notes in sensitive areas, especially in medical facilities.
- Consult an appropriate doctor or the manufacturer of medical electronic implants (e.g. pacemakers, hearing aids, etc.) to determine whether these will function without interference if the device is operated simultaneously.
- If necessary, observe the minimum distance recommended by the manufacturer of the medical product.

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 using 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.

This equipment may only be operated indoors

The use of this device mounted on outdoor structures, e.g., on the outside of a building, any fixed outdoors infrastructure or any moving assets outdoors is prohibited.

UWB devices may not be employed for the operation of toys

Operation onboard an aircraft, a ship or a satellite is prohibited.

Changes or modifications

Any changes or modifications not expressly approved by ZIGPOS could void the user's authority to operate this equipment. The CorivaTag Plus device should only be opened by authorized personnel.

Attempting to open the device without proper authorization may result in damage to the device and will void any warranty or support agreements.

RF Exposure Notice

This device is a radio transmitter and receiver.

CorivaTag Plus complies with FCC radiation exposure limits. The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized.

System Overview

CorivaTag only operate within a complete UWB real-time location system, which must be professionally installed. The installed system is configured to cover only the area inside the building, preventing CorivaTags 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.

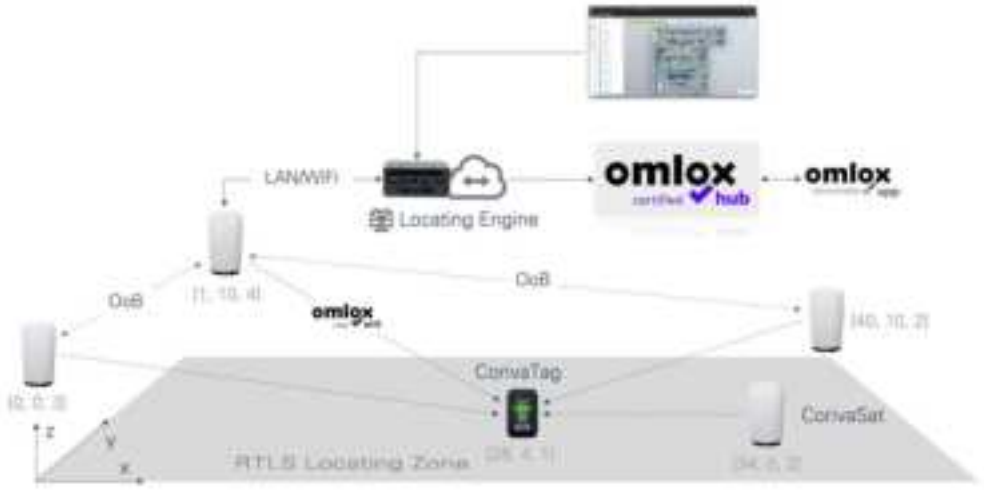


Figure 2 - Coriva RTLS Overview

Scope of Delivery

Package List

CorivaTag Plus
1 x CorivaTag Plus
1 x Mounting clip

Not included
Wireless Charging Station is not included in the Scope of Delivery.

Installation

Project Planning

For questions regarding the project planning of an RTLS and its locating precision, please use the Planning tool at https://portal.coriva.io or contact helpdesk@coriva.io

Attachment and Mounting Clip

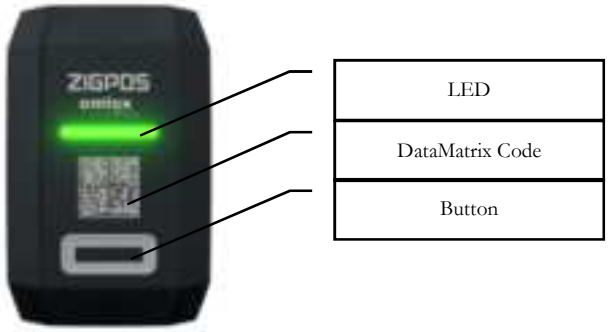
At the top of the CorivaTag Plus, there is a loop that can be used to attach a lanyard.

The CorivaTag Plus has a slide-in mechanism on its rear for a mounting clip or mounting adapters, allowing a variety of ceiling and object installations.

To remove the CorivaTag Plus from its mount, gently press the locking mechanism backward and lift the device upward. The CorivaTag Plus mount offers versatile installation options, including screw mounting, cable tie mounting, Velcro mounting, and adhesive mounting. The mount also provides additional lateral protection for the device and features a secure locking mechanism with a locking latch.

Figure 3 – Mounting Clip for the CorivaTag Plus

Operation



Optical Status

On the front side there is an optical display with which different states or feedback signals are shown via two light colors.

Situation	LED signaling
Connected with RTLS	green flashing when moving
Not connected with RTLS	red flashing when moving
Identification	green
Charging	yellow fading
Low Battery	red blink every 10s

Please note that the LED signaling as well as the states depend on the firmware implementation of the CorivaTag Plus and might change over time.

For the latest release, see: https://portal.coriva.io

Button

On the front panel there is a button with the following basic functions:

Function	Desciption	LED signaling
Switch on	To switch on the CorivaTag Plus when it is off, press the button. The CorivaTag Plus is now switched on and starts looking for a RTLS network to join.	fade to green

switch off	To switch off the Tag when it is on, hold the button for 5 seconds. The LED indicates red. After releasing the button, the LED will fade out. The CorivaTag Plus is switched off.	red then fade to off
Identify	To check the functionality of the CorivaTag Plus when it is switched on, short press the button.	green flashing

Please note that the user button functionality depends on the firmware implementation of the CorivaTag Plus and might change over time.

For the latest release, see: https://portal.coriva.io

Power Supply / Charging

The CorivaTag Plus can be charged wirelessly. Please remove the CorivaTag Plus from the mounting bracket and place it with the back side down in the center of the charger.

Inside the CorivaTag Plus, there is a rechargeable LiPo battery that provides sufficient charge for most applications. It is essential to charge the CorivaTag Plus only using charging stations that have been approved by the manufacturer. To ensure safe charging and optimal power transfer, the correct orientation of the device and the receiving coil in the CorivaTag Plus is crucial. The receiving coil is located on the back of the CorivaTag Plus, in the center under the type label.

Using a charging station from ZIGPOS ensures that the CorivaTag Plus is always correctly aligned for optimal charging. Alternatively a Qi compatible Charging Pad with a small coil size, like the TOZO W1 can be used.

The CorivaTag Plus has protective mechanisms against high temperatures.

Attention

During the charging process, the CorivaTag Plus may experience slight warming. To safeguard the battery and the device, protective mechanisms are integrated to prevent excessive heating. For uninterrupted charging, it is recommended to charge the device within an ambient temperature range of 5°C to 30°C. Charging the device outside of this temperature range may result in reduced charging performance or charging interruptions.

Vibration Actuator

The Coriva Tag Plus has an integrated vibration motor that can generate haptic signaling with different vibration patterns.

Please note that the vibration functionality depends on the firmware implementation of the CorivaTag Plus and might change over time.

For the latest release, see: https://portal.coriva.io

Sound Actuator

The CorivaTag Plus has an integrated sound module, that can generate acoustic signaling with different frequencies.

Please note that the sound functionality depends on the firmware implementation of the CorivaTag Plus and might change over time.

For the latest release, see: https://portal.coriva.io

Acceleration Sensor

An internal accelerometer can activate position determination when moving and stop it when stationary. This approach offers maximization of battery life.

The CorivaTag Plus supports multiple tracking frequencies, depending on the use-case. It has a motion-aware energy efficient ranging behavior, so that it is only ranging while moving and for some time afterwards.

Please note that the motion-aware behavior functionality depends on the firmware implementation of the CorivaTag Plus and might change over time.

For the latest release, see: https://portal.coriva.io

Nameplate

On the front side, there is also a sticker that displays the MAC address as a code and spells out the last digits of the MAC.

On the rear of the CorivaTag Plus, there is a nameplate with the following information:

Figure 4 - Example of the CorivaTag Plus nameplate

- Informations:

1. Manufacturer
2. Type label / Item No.
3. Serial Number
4. FCC-ID
5. IP safety class
6. Power Supply
7. MAC Addresses for omlox 8
8. Code
9. CE Logo
10. FCC Logo
11. omlox Air 8 ready Logo
12. Disposal information symbol

Technical Data

Parameter	
Power supply	
power source	3.7 V Lithium-Polymer Accumulator 350 mAh
Charging	
method	wireless, defined charger
Max. charging current	150 mA
Radio systems	integrated antennas
*Ultra-Wideband (**UWB**)*	7737 – 8237 MHz (UWB channel 9)
Standard	IEEE 802.15.4z
Power Spectral Density	-41.3 dBm/MHz
Max Output Power (conducted)	-3.41 dBm
ISM band	2405 - 2480 MHz
Standard	IEEE 802.15.4
Power Spectral Density	< 8 dBm/MHz
Max Output Power (conducted)	1.7 dBm in FCC regulated countries 4.7 dBm in RED regulated countries
Operation	Indoor
Button	yes
LED	yes
Vibration	yes
Sound	yes
Operation temperature	-20 °C – 55 °C 5 °C – 30 °C (charging)
Storage temperature / duration	-20 °C – 45 °C / one month
(switched off)	-20 °C – 25 °C / six month
Relative humidity	0 – 90%, non-condensing
Housing	
Dimensions (WxHxD)	45 mm x 71 mm x 18 mm
Weight (without adapter)	38 g
Material	ASA polycarbonate
IP safety class	IP 67
Color	RAL7047 back, RAL 7016 front, can be customized
Mounting	Strap or Adapter mounting
Conformity	2014/53/EU FCC Part 15

Radio Systems and Environment

The CorivaTag Plus has several integrated antennas for data transmission and Tag localization.

- IEEE 802.15.4z-compliant UWB transceiver, controller and antenna to communicate over UWB Channel 9 at ~8 GHz to enable UWB-based ("In-Band") tracking
- IEEE 802.15.4-compliant ISM transceiver, controller and antenna to enable Out-of-Band (OoB) communication to enable offloading non-tracking data communication such as discovery, device orchestration and over-the-air-updates of the firmware

For high positioning accuracy and stable data transmission, it is important to use the CorivaTag Plus where it can be seen from CorivaSats or other 3rd party "omlox air 8"-certified RTLS satellites (the fixed infrastructure of your RTLS installation) and to constantly ensure this.

Radio Systems are influenced by their environment

Ceiling structures or other obstacles made of metal, reinforced concrete, or other shielding or absorbing materials can strongly influence the radio characteristics and thus limit the function of the tracking system.

Radiation Pattern

UWB 8 GHZ

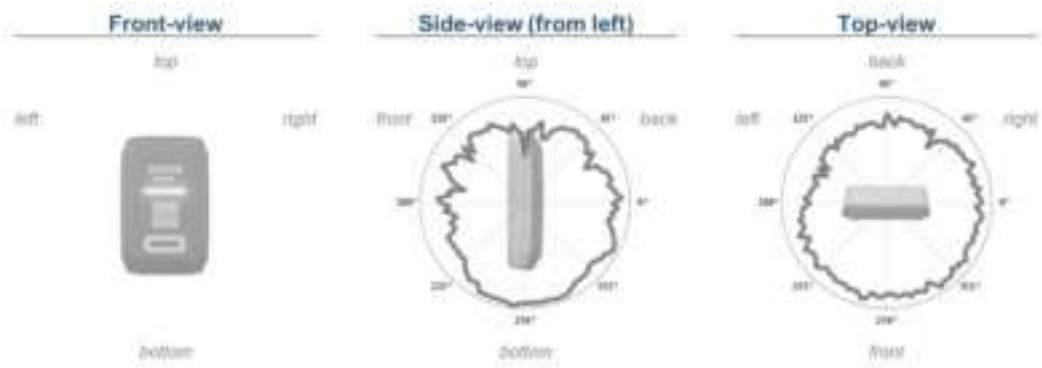


Figure 5 - Radio characteristics for 8 GHz UWB from front, side and top view

Dimensions

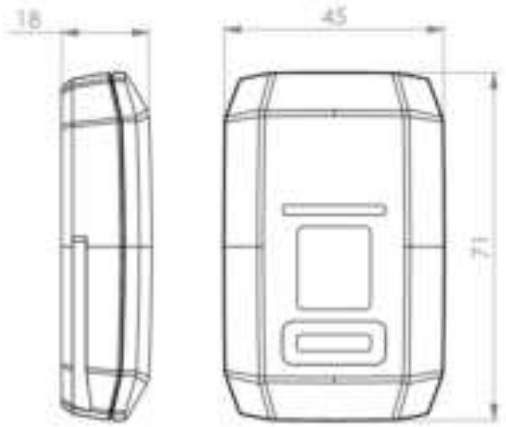


Figure 6 - Dimensions of the CorivaTag Plus

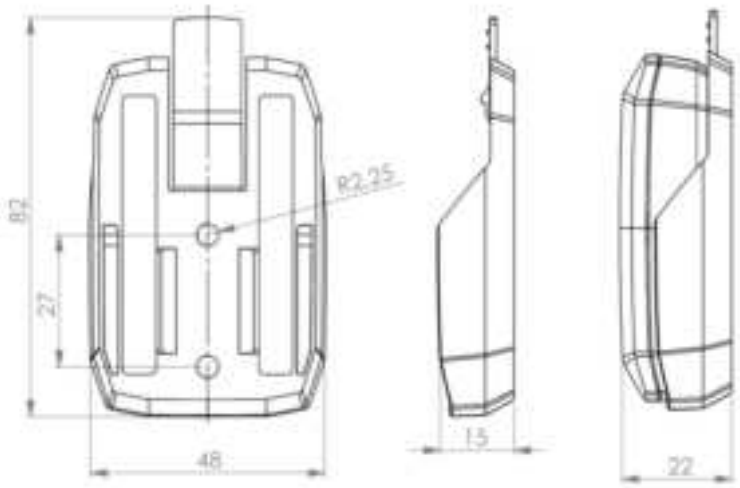


Figure 7 - Dimensions of the CorivaTag Plus with Mounting Clip

Cleaning

If the surface needs to be cleaned, please use a damp cloth with clear water or water with a mild soap.

Disposal

According to European directives and the German Electrical and Electronic Equipment Act, this device cannot be disposed of in the normal household waste.

Please dispose of the device at a designated collection point for electronic devices.

Conformity

The manufacturer hereby affirms that the requirements of the Directive 2014/53/EU are fulfilled. The declaration of conformity can be seen in detail at www.zigpos.com/conformity.

The supplier hereby declares that the device complies with Part 15 of the FCC rules, in accordance with 47 CFR § 2.1077 Compliance Information. The Supplier's Declaration of Conformity can be seen in detail at www.zigpos.com/conformity.

Ask for Support

We offer standardized as well as customized solutions. Please note that all documents may be updated without prior notice to individual customers. We provide remote assistance by email at helpdesk@coriva.io

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