



SICK LOCU2 Tag Based Localization UWB Anchors User Manual

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SICK LOCU2 Tag Based Localization UWB Anchors



Product Information

The product is called LOCUs and it is a tag-based localization system that uses UWB anchors. It comes with hardware components that are necessary for the system to work. The product is designed to be installed, operated, used, and maintained by trained, authorized specialists. It is important to follow the instructions and safety guidelines provided in the user manual to ensure error-free and safe operation. The product comes with a warranty which may be voided if the device housing is opened by unauthorized personnel. The product must be cleaned with a soft, dry or slightly moistened cloth and should not be opened as it does not contain any user-serviceable parts.

Intended use

SICK LOCUs components constitute the UWB (ultra-wideband) hardware part of SICK's localization system solution. The SICK LOCUs hardware is well suited for precise indoor tracking of tagged objects of various kinds. LOCUs hardware comprises LOCUs1xx tags, which are mounted on the assets to be tracked and infrastructure-mounted LOCUs2xx antennas, called anchors. LOCUs tags can be localized in all areas covered by a set of LOCUs anchors.

SICK LOCUs hardware is a part of complete solution, SICK offers a comprehensive portfolio of services for LOC systems, from consulting to support. SICK RTLS (real-time locating system) solutions LOC facilitate full transparency of your supply chain processes by creating a digital twin of your assets – in your factory, warehouse and beyond. Key use cases include automation and optimization of processes in logistics and production, from manual to fully automated processes. With LOC, SICK provides a system solution which integrates several localization technologies and further sensors into a software platform, called Asset Analytics, which acts as middleware.

About this document

This Quickstart document describes the how-to setup LOCUs hardware components. Before starting to work with LOCUs, read this Quickstart document carefully and make sure that you are familiar with the device. The information on the correct and safe operation of the system presented here will help you avoid personal injury or damage to property. You can also obtain support from your sales partner.

For your safety

It is essential that LOCUs units are transported, stored, installed and used in accordance with its intended use in order to ensure error-free, safe operation. LOCUs hardware can only be installed, operated, used and maintained by appropriately trained, authorized specialist personnel. Specialist personnel are individuals who possess the technical training, knowledge and experience necessary in order to understand the tasks entrusted to them, evaluate these and identify possible hazards.

Precautions:

- Do not use deformed or damaged product or battery.
- Do not expose the devices to extreme heat, pressure or humidity.
- Do not charge or use the product if liquid has entered.
- Do not use or store the devices in dusty or dirty areas.
- Protect the product from excessive moisture.
- Do not expose the devices to water, rain, splashing water or spilled drinks.
- Do not spray anything on and inside the device.
- Dropping, knocking, violently shaking and any rough handling may damage the device.
- Do not transport or store flammable gas, liquid or explosives in the vehicle compartment where the device is installed.
- In case of malfunction, contact your sales partner.

- Do not modify the product.

CAUTION LOCU hardware do not contain any user-serviceable parts and are not allowed to be opened by unauthorized personnel! Opening the screws of the device housing will invalidate any warranty claims against SICK AG. For further warranty provisions, see the General Terms and Conditions of SICK AG.

WARNING

Limit human exposure to electromagnetic fields. During operation, the human exposure regulations covered by IEC/EN 62311 must be observed. Suitable safety distances must be maintained during both short-term and long-term work in the radiation range of the antennas. The minimum distance to be maintained between the device and the human body during long-term transmission is 20 cm.

NOTE: Performance of anchors might be affected by materials like metal or water in the vicinity of the anchor, shielding or absorbing signals.

Maintenance and cleaning

- **Maintenance** LOCU hardware do not contain any user-serviceable parts.
- **Cleaning** Clean the housing with a soft, dry or slightly moistened cloth. Do not use any solvents or high-pressure cleaners

Installation and commissioning

Scope of delivery

Every anchor package consists of:

- Anchor LOCU (different device models available)
- Additional accessories depending on anchor model:
 - RJ45 Feed-through lock connector is included only with LOCU212-503
 - External, non-detachable, UWB antenna and Cable Gland are included only with LOCU200-003

CAUTION Do not remove the antenna from LOCU200-003. LOCU200-003 should only be used with the original provided antenna.

NOTE: Anchors are sensitive to RF electromagnetic fields in the ranges 950 ± 20 MHz and 1900 ± 50 MHz.

Performance can be affected on exposure of anchor. To avoid that, it's recommended that minimum distance to DECT base station is 2 m and a minimum distance to UHF RFID readers is 1 m.

Only use shielded cables (CAT6 or higher) that are grounded properly. Maximum cable length is 100 m for PoE from anchor to PoE switch.

NOTE: Anchors needs to be connected to a physically separated network, separate VLAN or firewall protected network, due to security reasons and also to get the best performance and have easier management. High traffic due to the localization system could cause issues / slow down the network if the anchors are in the same network as other critical infrastructure.

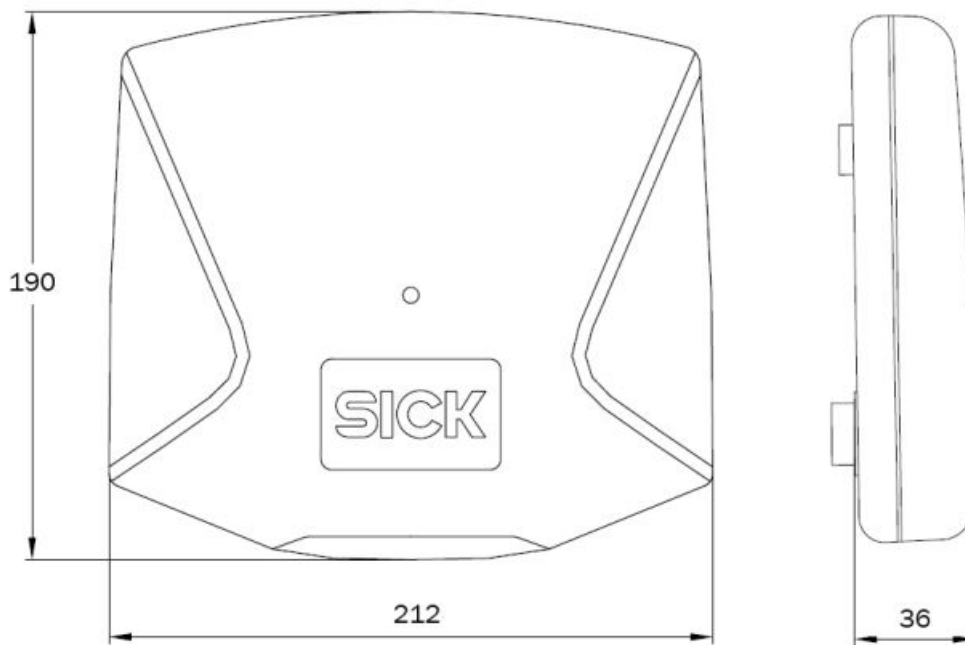


Figure 1. Dimensions of LOC212-503

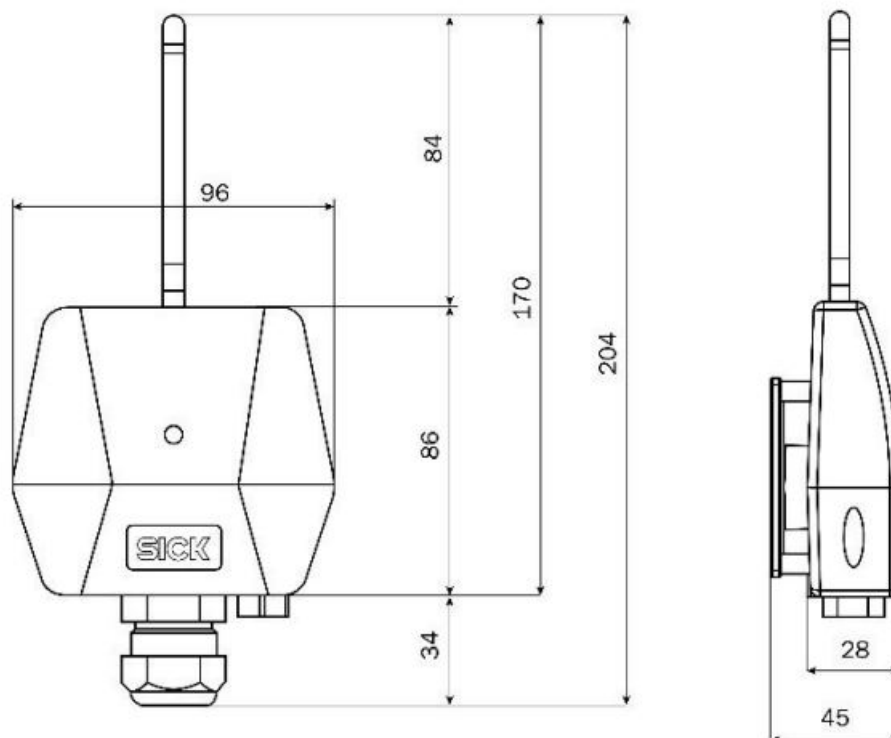


Figure 2. Dimensions of LOC200-003

Power supply options

- **Power over Ethernet**

Connect anchor to network switch supporting PoE IEEE 802.3af standard with Ethernet CAT6 cable. Once the anchor is connected to a stable power supply, a blue LED blinks several times that indicates the anchor was turned ON. Then LED is turned OFF.

- **DC 48 V, Passive PoE**

Anchor can be also powered from single or multiple port PoE injector with DC 48V output. Power supply is injected and delivered into unused Ethernet pairs (Pairs 4,5 positive terminal and 7,8 negative terminal).

NOTE: Always use galvanic isolated 48V power adaptor with short circuit protection for passive PoE injection. Never connect “Power+Data” injector ports to the computer or other network devices.

NOTE: For connecting LOC212-503 anchor, use RJ45 Feed-through lock connector (see Figure 3.). Support part is not needed if the RJ45 connector has strain relief. It is not possible to use RJ45 Feed-through lock connector with a RJ45 connector which has latch protection.

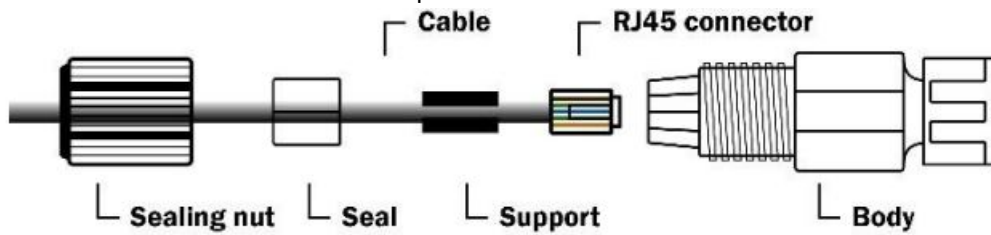


Figure 3. RJ45 Feed-through lock connector

CAUTION To ensure IP65 rating, fasten the Cable Gland/Feed-through lock connector properly using only human force. Overtightening can lead to damage of cable gland and/or anchor housing.

Mounting

To get the best anchor performance it is recommended to deploy all anchors to the same height in a given localization area and anchor position in the area should follow square geometry with distance between each anchor from 5-15 m. The ratio between the two sides of the square should not be higher than 3:1. If possible, always maintain a direct Line of Sight between the tag and the anchors. For narrow corridors zig-zag positioning is an option. This can be very useful in narrow corridors, for example in large warehouses. Be aware that this deployment decreases precision in the Y axis, so use this option as a last resort:

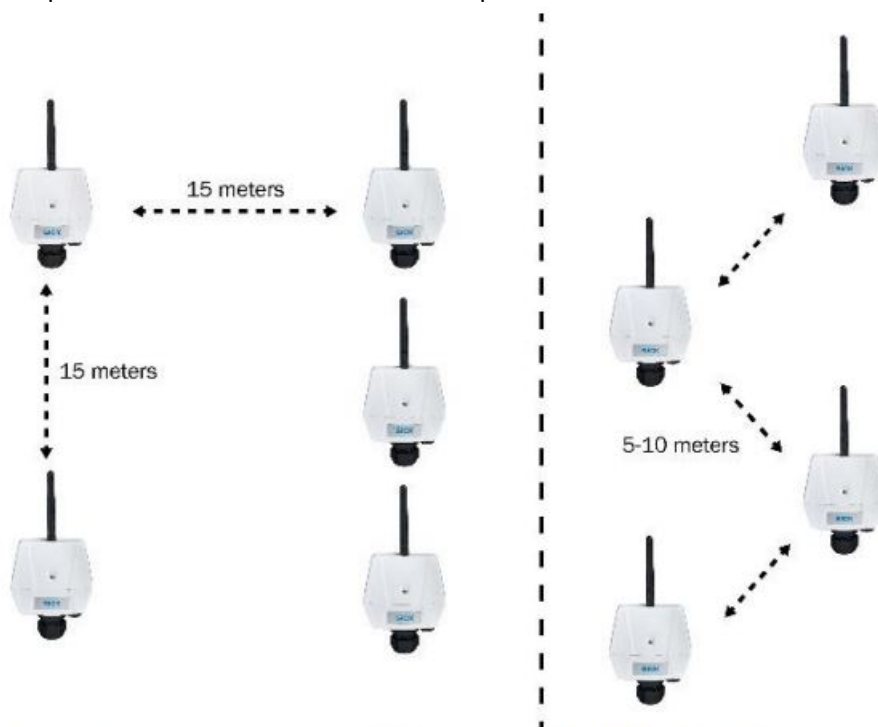


Figure 4. Square geometry deployment (left) Zig-Zag deployment (right)

Anchors are typically deployed at the height 3 – 6 meters above the floor. Recommended mounting is with LOC212 bracket available at SICK as an accessory set including four machine screws for fixing the anchor to the bracket (P/N: 2130302).

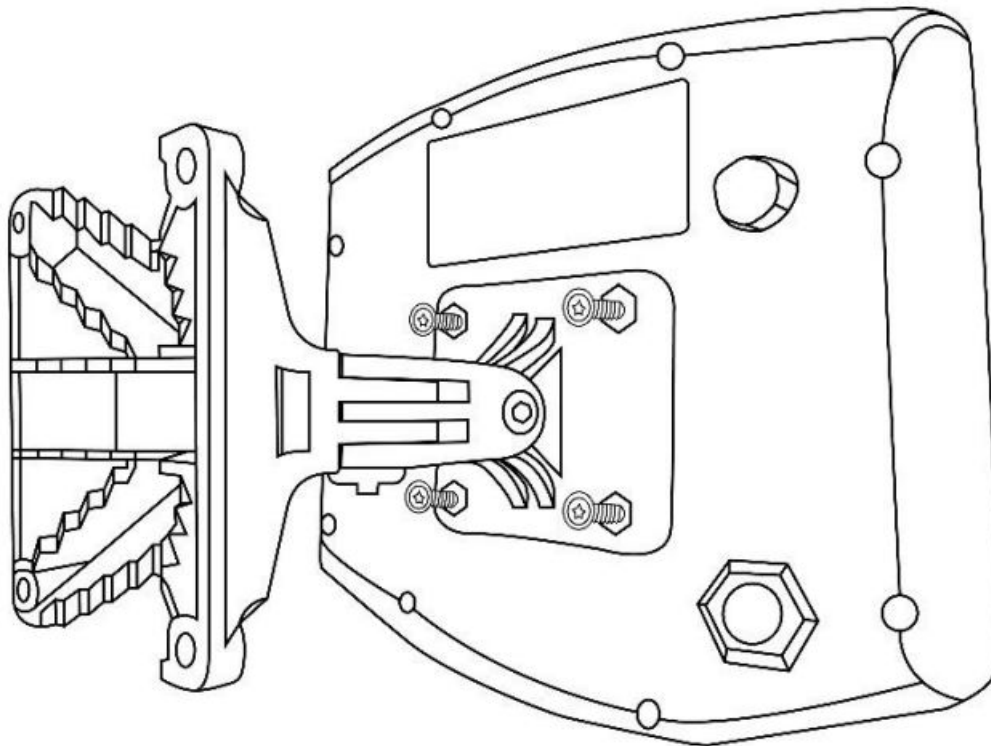


Figure 5. Fixing LOC2 bracket to LOC212-503 anchor

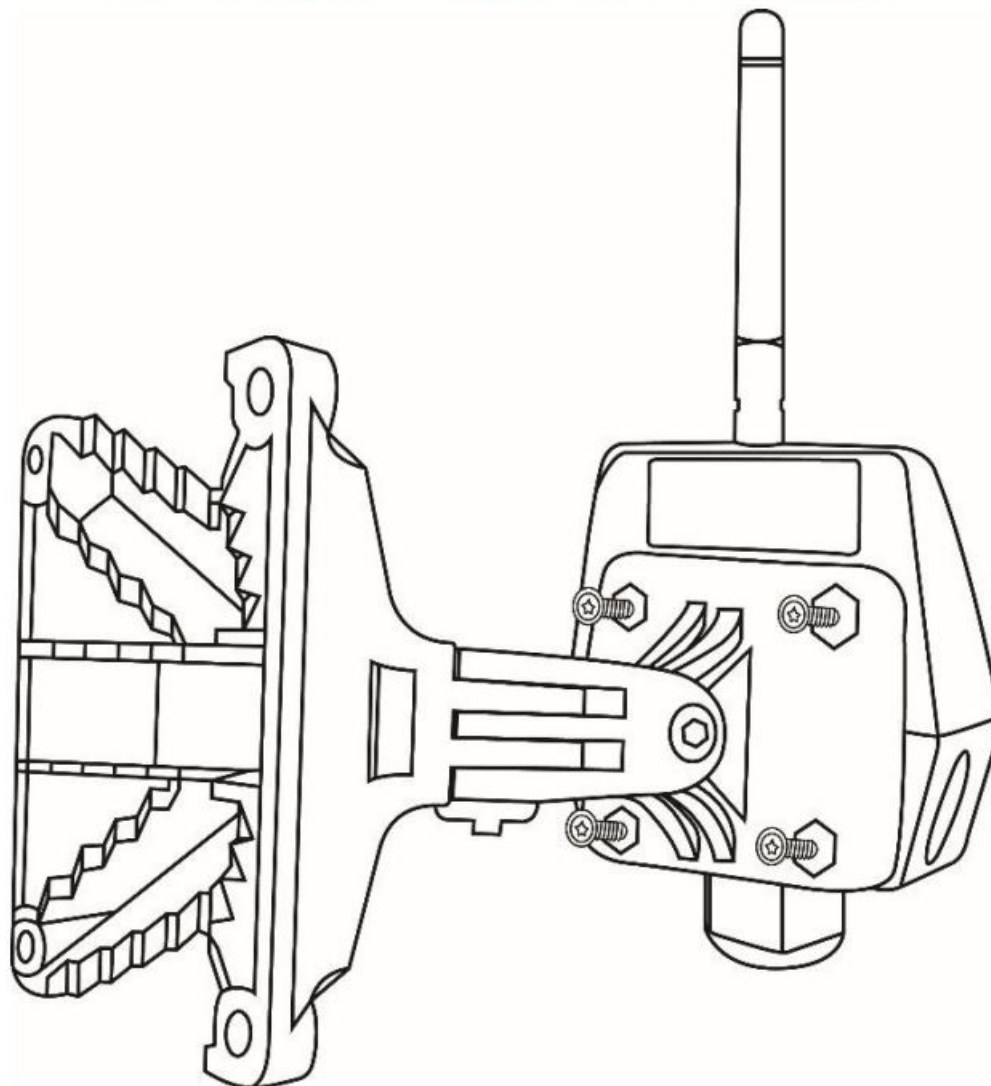


Figure 6. Fixing LOC2 bracket to LOC200-003 anchor

Mount LOC200-003 with the antenna pointing upwards in order to get maximum possible performance. Do not

bend/fold the antenna.

NOTE: Keep a distance from anchor to any walls or metal parts of at least 15 cm in all directions to avoid significant degradation of performance.

Technical data

	LOCU212-503	LOCU200-003
Dimensions	212 x 190 x 36 mm (w/o RJ45 Feed-through lock connector)	170 x 96 x 45 mm (w/o Cable Gland)
Weight	390 g	150 g
Power supply	PoE 802.3af or DC 48 V (passive PoE)	
Power requirements	2.5 W	
Operating conditions	-20°C ... +60°C	
	20 % ... 85 % humidity without condensation	
IP rating	IP65	
Warm-up time	Immediate	
Sensors	Barometer	
Placement	Indoor	
UWB antenna	Directional CH5	Omnidirectional CH5
UWB	Channel 5, Band: 6240 MHz – 6739.2 MHz Center Frequency: 6489.6 MHz	
Radiated power	-41.3 dBm/MHz	

TECHNICAL INFORMATION

All rights reserved. Subject to change without notice.

Regulatory Compliance Information

These products may only be operated in countries for which approval has been granted.

No.	Country	Type
1	European Union	LOCU212-503 LOCU200-003
2	United States	LOCU200-003

Please observe the country-specific information for operation below.

European Union

Simplified EU declaration of conformity Hereby, SICK AG declares that the radio equipment type LOCU212-503 and LOCU200-003 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <https://supportportal.sick.com/products/localization/tag-based-localization/locu/>

USA

FCC ID: WRMLOCU2A

FCC Compliance statement for LOCU200-003

For FCC compliance, the following conditions must be met:

- All units must be exclusively used indoors.
- No devices may be installed at any outdoor location.


This device is designed to be operated with the supplied antenna. The use of any other antenna with this device is strictly prohibited and may result in the voiding of the FCC authorization for this equipment's operation. It is strictly forbidden to use of any other antenna than the one SICK AG has supplied. This device is compliant with FCC Rules, part 15. Its usage is subject to the two following conditions:

1. This device may not be the cause of any harmful interference, and
2. This device shall accept any interference received, including interference that may interfere with its desired operation.

This device is also in compliance with part 15.517 of the FCC Rules. This equipment may only be used indoors. Usage outdoors violates 47 U.S.C. 301 and the operator could be subject to serious legal penalties. This equipment is only to be installed and used at a 20 cm minimum distance between the radiator and a person. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

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Documents / Resources

	<p>SICK LOCU2 Tag Based Localization UWB Anchors [pdf] User Manual LOCU2B, WRMLOCU2B, LOCU2, LOCU2 Tag Based Localization UWB Anchors, Tag Based Localization UWB Anchors, Localization UWB Anchors, UWB Anchors, Anchors</p>
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References

- [S SICK | Sensor Intelligence](#)
- [S SICK | Sensor Intelligence](#)