KINEXON Mesh Anchor (Model-No.: A040001) - User Manual

Product Management

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1 KINEXON Mesh Anchor

Position references for precise location and IIoT mesh data transmission

The KINEXON Mesh Anchors are the reference points for all KINEXON Tags deployed at the facility.

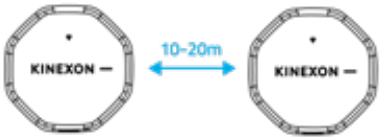
They send and receive signals to/from the sensors and transmit the position measurements wirelessly through the BLE mesh to gateways that are connected to the cloud backend.

The Mesh Anchors are part of the KINEXON Mesh solution. For reliable tracking, a 10-20 meter distance from anchor-to-anchor is required. A higher density of anchors renders more robust positioning results.

The Mesh Anchors are fully battery-powered and last between 3-6 years, depending on the position update rate.

Anchor deployment

Depending on accuracy requirements and characteristics of the facility



Typical anchor deployment every 10-20 m

Increased anchor density in non-Line-of-Sight conditions required

Dimensions in [mm]

2 Keyfacts

2.1 RF specification

RF Specification	
Positioning Principle	Real Time Location System (RTLS), Radio-based, Ultra-wideband (UWB)
Positioning Update rate	Configurable, typically 1x/minute

Frequency range	• Bluetooth low energy (BLE 5, IEEE 802.15): 2.4 GHz
	• UWB (IEEE 802.15.4a):
	  • Channel 3: 4.25 – 4.75 GHz (only EU/US)
	  • Channel 5: 6.25 – 6.75 GHz

Positioning Data	2D (x, y)
Measuring precision	< 50 cm depending on the used technology and environment

2.2 Physical specification

Physical Specification	
Indicators	Status RGB LED
Battery	Internal replaceable Li primary battery (19 Ah)
Battery Lifetime	3 - 6 years (position update rate dependent
External Power Supply	USB-C interface

Physical Specification	
Weight	Appr. 320 g
Dimensions	(110 x 110 x 57) mm

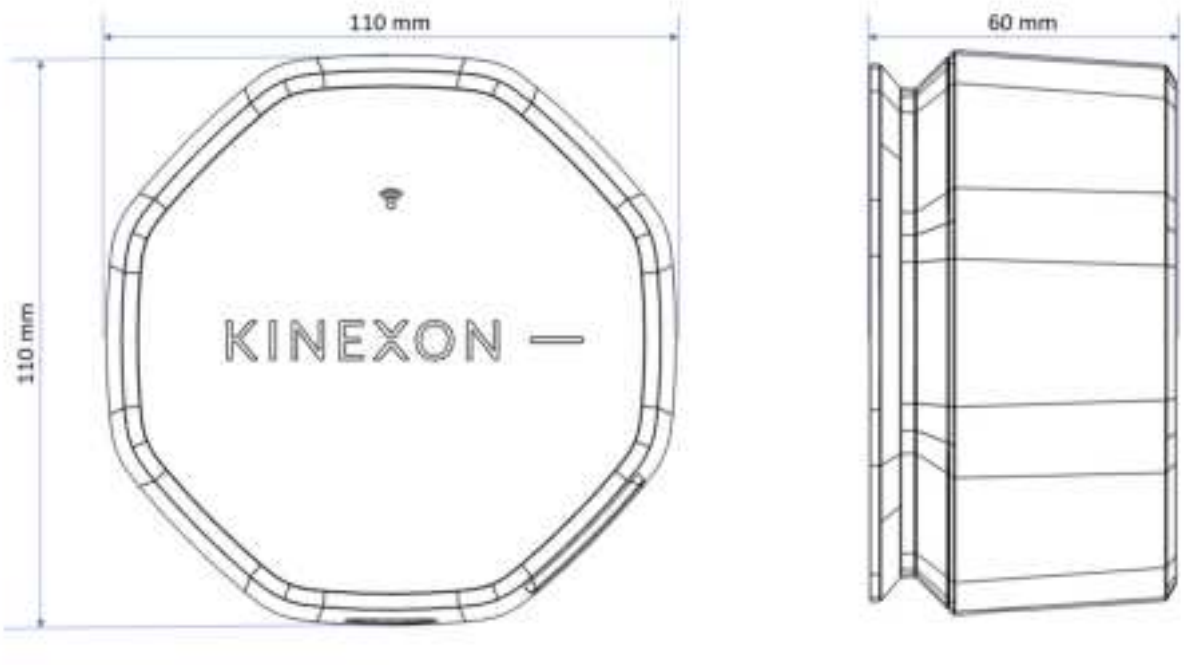
2.3 Environmental specification

Environmental Specifications	
Operating Temperature	-25°C to +60°C
Storage Temperature	+20°C
Protection Class	IP 54 if USB-C closed

Environmental Specifications	
Regulatory Compliance	**EU:** • EN 301 489-33 V2.2.1 (2019) • EN 301 489-17 V3.2.4 (2020) • EN 301 489-1 V2.2.3 (2019) • ETSI EN 302 065-1 V2.1.1 (2016) • ETSI EN 303 883 V1.1.1 (2016) • ETSI TS 103 361 V1.1.1 (2016) • ETSI EN 300 328 V2.2.2 (2019) • EN 62479 (2010) • EN62311 (2008) • 1999/519/EC (1999) • EN 61000-4-2 (2009) • EN 61000-4-3 (2006 + A1: 2008 + A2: 2010) • **FCC/ISED:** • Part 15, Subpart A, Section 15.31 • Part 15, Subpart A, Section 15.33 • Part 15, Subpart A, Section 15.35 • Part 15, Subpart C, Section 15.203 • Part 15, Subpart C, Section 15.204 • Part 15, Subpart C, Section 15.205 • Part 15, Subpart C, Section 15.207 • Part 15, Subpart C, Section 15.209 • Part 15, Subpart C, Section 15.247 • ANSI C63.10:2013 • ETSI TR 100 028 V1.3.1: 2001-03 • KDB 558074 D01 v05r02 • Part 15, Subpart F, Section 15.517 • Part 15, Subpart F, Section 15.521 • KDB 393764 D01 v02r01 (April 25, 2022) • RSS-Gen, Issue 5 + A1 + A2, March 2019 • RSS-220, Issue 1 + A1, July 2018 **Safety:** IEC 62368-1

3 Specification

3.1 Mechanical drawing

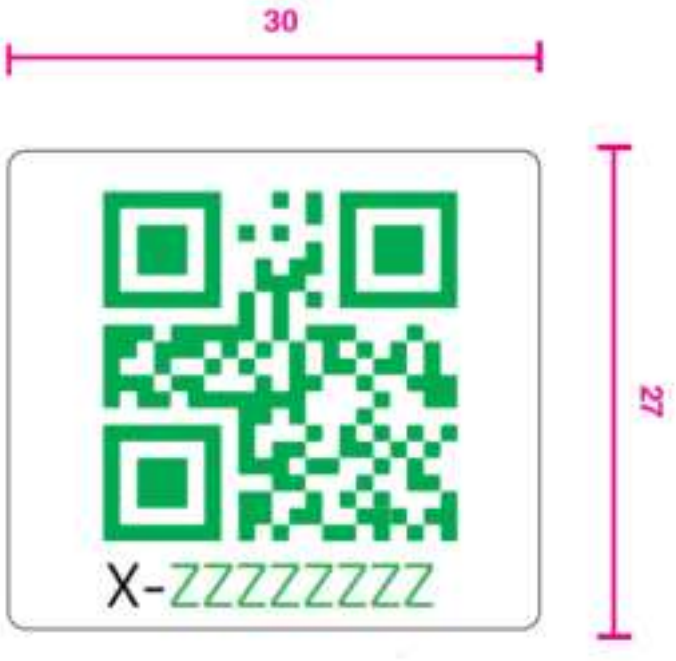


1 Dimensions incl. mounting plate

3.2 Label

3.2.1 Label size

Front label



30 mm x 27 mm

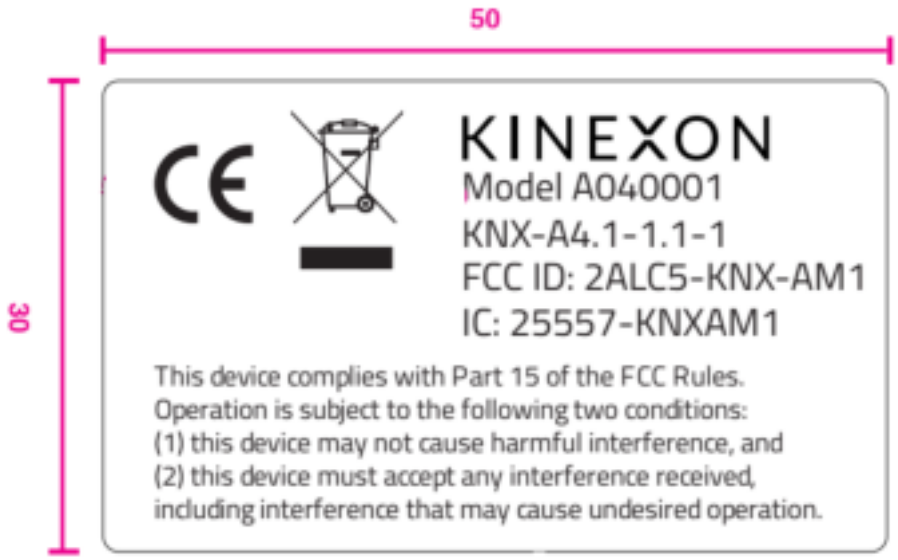
Label content:

- QR code
- EUI

Position:

3.2.2 Label size

Back label



50 mm x 30 mm

Content:

- Trademark / Brand
- Model-No.
- KINEXON-No
- Certification marks and IDs
- Recycling mark

Position:

3.3 External interfaces

3.3.1 Wireless interfaces

- Bluetooth low energy (BLE) according to IEEE 802.15
- Ultrawideband (UWB) according to IEEE 802.15.4

3.3.2 LED

- One RGB LED is implemented

3.3.3 Wired interfaces

- one USB-C interface primary for external power supply is implemented

3.4 Electrical Parameter

Interface	Parameter [Unit]	Min	Typ	Max	Comment
Battery	Input voltage [V]		3.6		
USB-C	Input voltage [V]		5.0	6.5	
	Input current [mA]			250	UWB receive

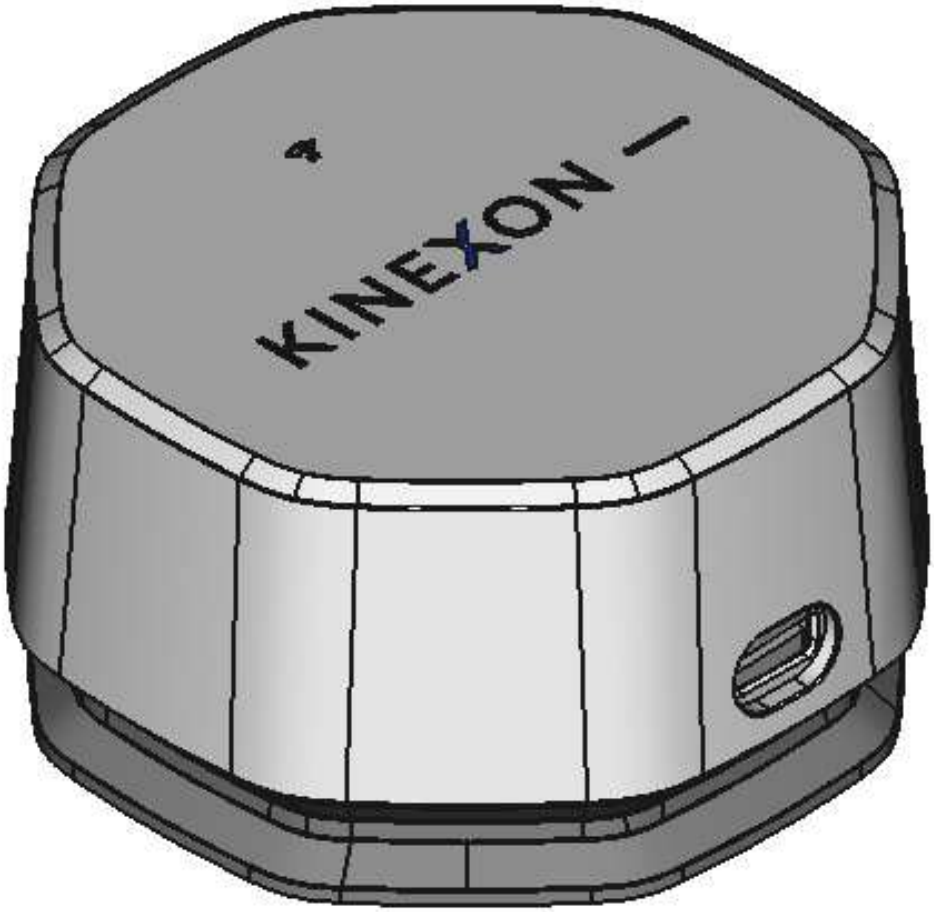
3.5 Battery

3.5.1 Battery - technical parameter

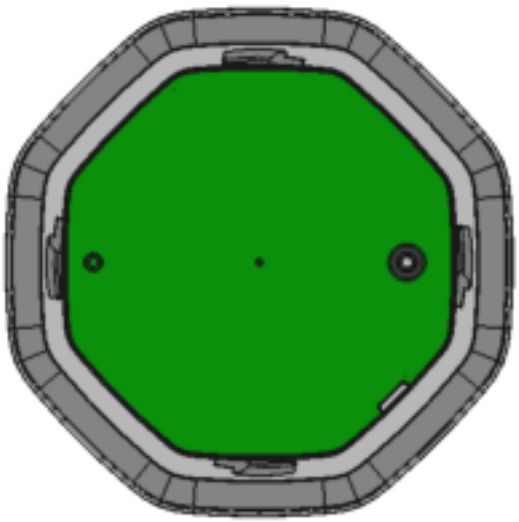
Type	ER34615
Nominal voltage	3.6 V
Capacity	19 Ah
Max. cont. discharge current	150 mA
Operating temperature discharge	-55°C to 85°C

Size	Diameter: max. 34.2 mm, height: max. 61.5 mm

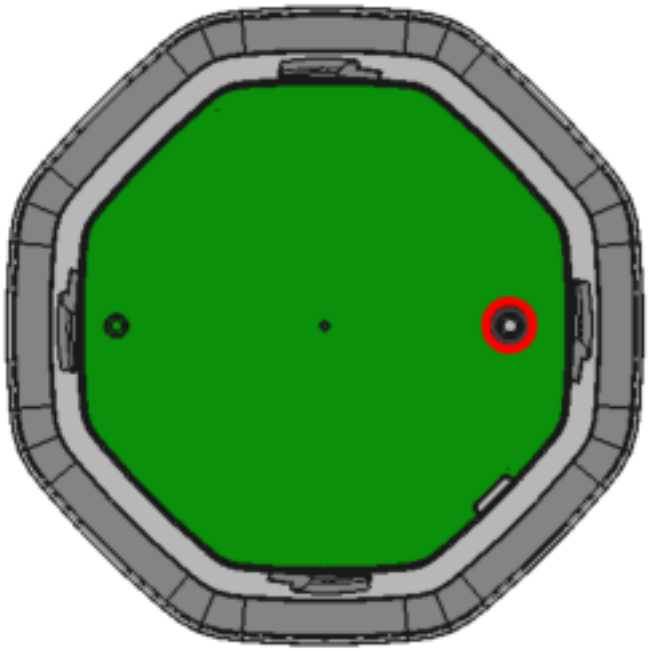
3.5.2 Battery exchange



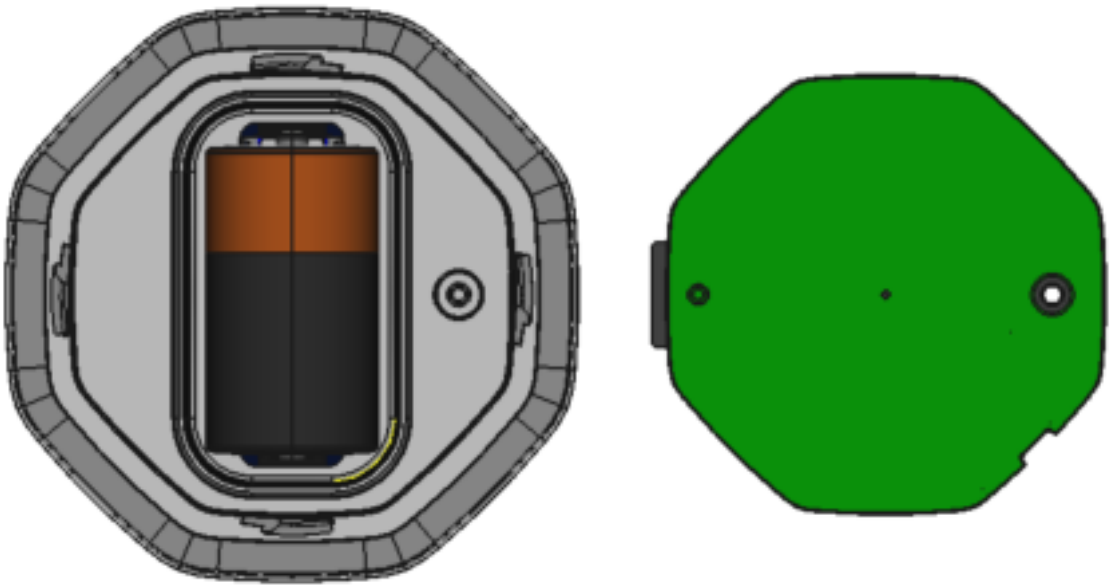
- Remove “Holder” by turning the holder against the rest of the Mesh Anchor (“bayonet closing”)



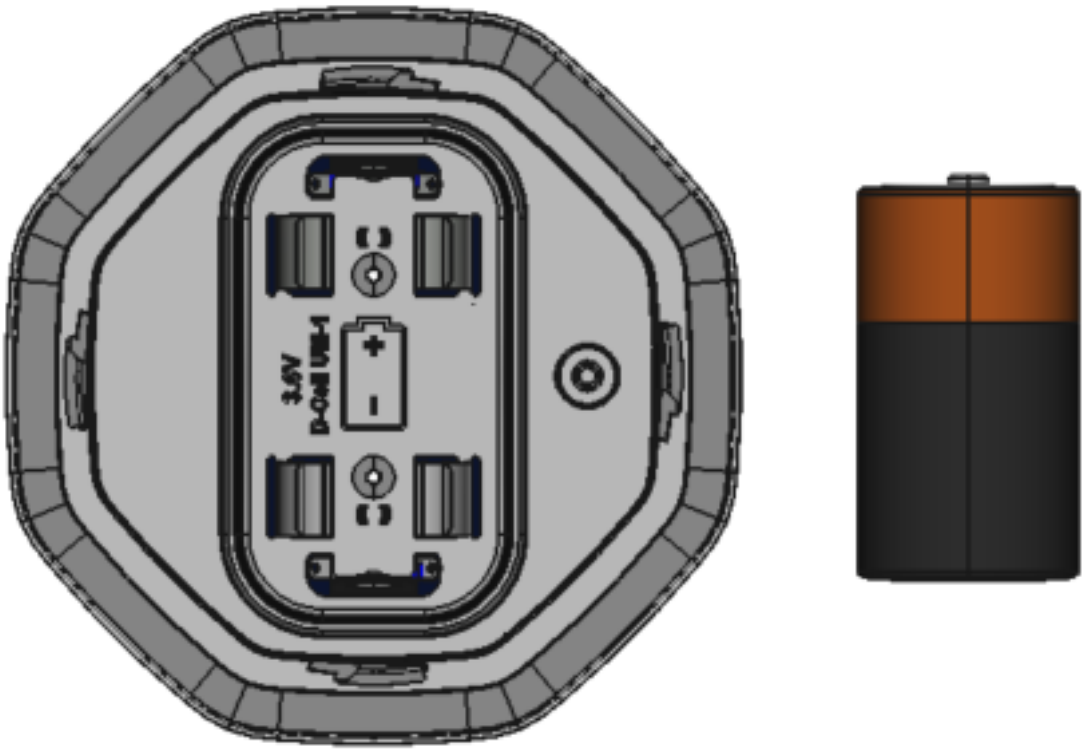
- Unscrew red marked screw



- Remove base-plate



- Replace empty battery - pay attention for the correct polarity ⚠️

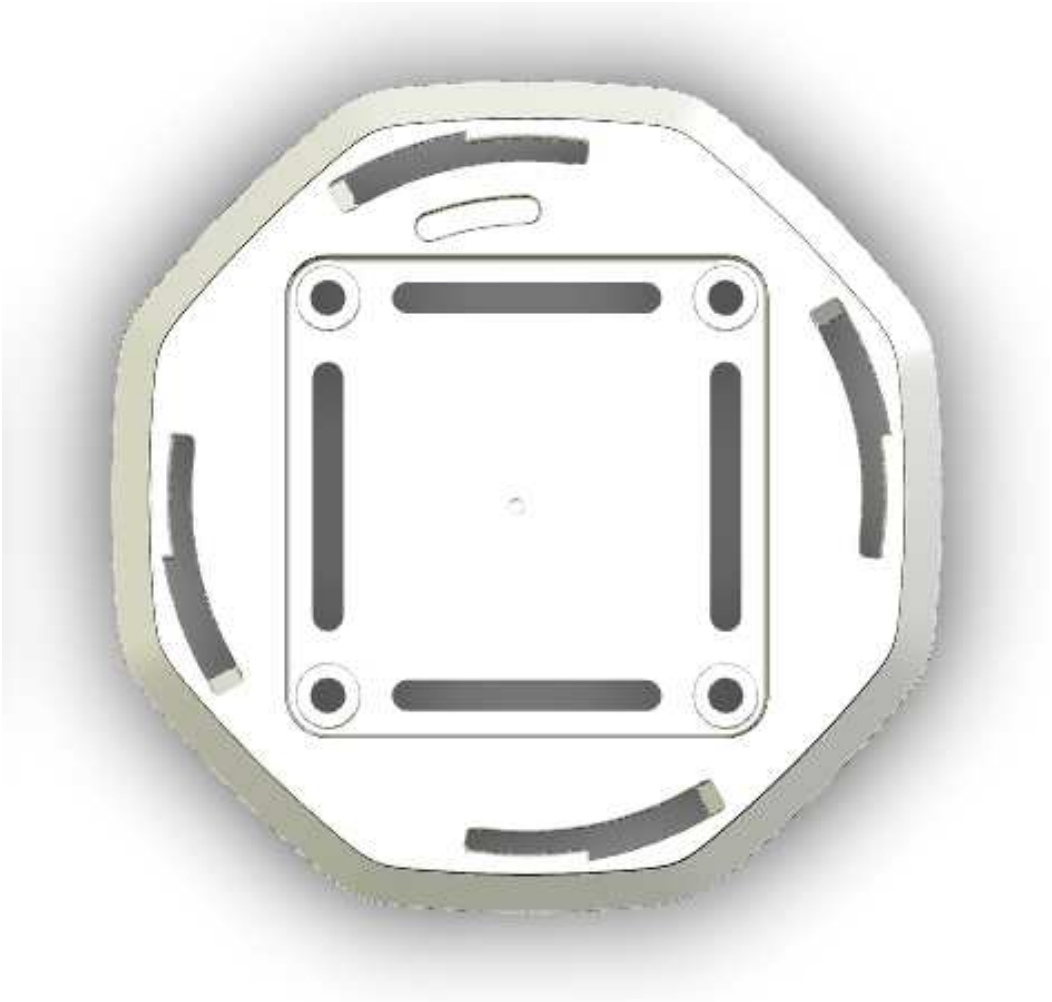


- Insert the mounting plate and tighten the screw
- Add the holder if necessary

4 Accessories

4.1 Holder:


KINEXON



5 Regulatory and legal information

The KINEXON Mesh Anchor has been designed to be in compliance with both the U.S. FCC Part 15 subpart F regulations, section 15.247 and with the European Union ETSI EN 302 065 standards.

5.1 Disclaimer

The information in this document is subject to change without notice. KINEXON GmbH assumes no responsibility for inaccuracies or omissions and specifically disclaims any liabilities, losses, or risks, personal or otherwise, incurred as a consequence, directly or indirectly, of the use or application of any of the contents of this document. For the latest documentation, contact KINEXON GmbH.

5.2 Intended Use

This manual describes the setup and use of the KINEXON Mesh Anchor. Use this product only for the purpose it was designed for.

5.3 FCC compliance

This device complies with 47 CFR 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. The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device may not be employed for the operation of toys. Operation onboard an aircraft, a ship or a satellite is prohibited. The use of this device mounted on outdoor structures, e.g., on the outside of a building or on a telephone pole, or any fixed outdoors infrastructure is prohibited.

Moreover, the following statements apply:

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 to 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.

User information according to FCC 15.19

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation.

User information according to FCC 15.21

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment may only be operated indoors. Operation[1] outdoors is in violation of 47 U.S.C. 301[2] and could subject the operator to serious legal penalties.

5.4 ISED caution

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

These devices are not permitted for operation on board aircraft or satellites and shall also not be used for operating toys. The use this device mounted on a fixed outdoor infrastructure, including antennas mounted on outdoor structures such as poles or buildings, is not permitted, except for operation on board ships or land vehicles.

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes:
(1) Cet appareil ne doit pas causer d'interférences
(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

Les appareils ne peuvent pas être utilisés à bord d'aéronefs ou de satellites et ils ne peuvent pas être utilisés pour faire fonctionner des jouets. L'utilisation de cet appareil monté sur une infrastructure fixe d'extérieur, comprenant les antennes montées sur des structures externes telles que des poteaux ou des bâtiments, n'est pas autorisée, sauf lorsque les structures en question sont des bateaux ou des véhicules terrestres.

5.5 Safety information

- Read and follow all instructions before using the KINEXONX Mesh Anchor.
- Do not use the KINEXON Mesh Anchor if it has been damaged.

1 https://www.law.cornell.edu/definitions/index.php?width=840&height=800&iframe=true&def_id=ec0f841baebb6ddab3bb9ff7e69ad5e9&term_occur=999&term_src=Title:47:Chapter:I:Subchapter:A:Part:15:Subpart:F:15.517
2 https://www.law.cornell.edu/uscode/text/47/301

6 Abbreviations

Abbreviation	Description
BLE	Bluetooth Low Energy
CFR	Code on Foreign Relations
EUI	Extended Unique Identifier
FCC	Federal Communication Commission
IIOT	Industrial Internet of Things
IP xx	International Protection
LED	Light Emitting Diode
QR	Quick-Response
RF	Radio Frequency
RGB	Red-Green-Blue
RSS	Radio Standard Specification
RTLS	Real Time Localisation System
SAR	Specific Absorption Rate
tbd	to be defined
USB	Universal Serial Bus
USB-C	Universal Serial Bus type C

Abbreviation	Description
UWB	Ultra Wide Band