KINEXON MESH TAG

Cost-efficient, precise localization and motion sensing

The KINEXON Mesh Tag is the perfect sensor for indoor localization in industrial and logistics environments. By mounting or embedding the tag on the object, it enables precise and robust localization of all assets on the shop floor.

The Mesh Tag provides the basis for searching and finding objects, workflow monitoring, and process automation.

Due to its small size, low weight, robustness, long battery life, replaceable battery option and the low cost, the Mesh Tag meets all requirements for area-

wide usage in industrial environments.

The Mesh Tag works best with the KINEXON platform, KINEXON OS: the open IIoT platform for real-time localization and analysis.

The Mesh Tag comes with an optionally available, providing permanent and non-permanent mounting options, for agile use cases.

USE CASES

Search & Find and optimized material handling of moving assets in industrial environments such as:

- Material & Goods
- Load Carrier (Barred box, pallet etc.)
- Manufactured products

Real-time location data is the enabler for improved process reliability and efficiency through process automation and optimization such as:

- Instant Search & Find
- Storage Automation
- Elimination of manual scanning
- Full transparency over material flow (cycle times, idle times etc.)
- Process Monitoring
- Process Mining

TAG HOLDER

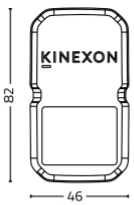
A tag holder for non-permanent attachment solutions to assets offers high flexibility. Tags can either be mounted directly to assets permanently using:

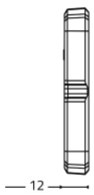
- Double-sided tape
- Zip tie

Or non-permanently with the tag holder, which itself can be mounted with:

- M4 screws
- Double-sided tape
- Zip tie

DIMENSIONS [mm]





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KEY FACTS

RF SPECIFICATIONS

Positioning Principle	Real Time Location System (RTLS), Radio-based, Ultra-wideband (UWB)
Frequency range	UWB (IEEE 802.15.4a): 4.25 – 4.75 GHz, 6.25 – 6.75 GHz BLE5 (IEEE 802.15): 2.4 GHz
Positioning Update Rate	Configurable, typically 1x/minute in motion, 1x/15min in standstill
Positioning Data	2D (x, y)
Positioning Accuracy	< 50 cm (depending progress on environment), MAE

PHYSICAL SPECIFICATIONS

Indicators	Status RGB LED
Accelerometer	3-axis, +/-2 g to +/-16 g
Battery	Internal replaceable Li primary battery (1200mAh)
Battery Lifetime	Up to 4 years (position update rate dependent)
Material	Luran 358N Styrene Acrylonitrile (SAN)
Weight	35 g
Dimensions	82 x 46 x 12 mm
Mounting options	M4 screws, Velcro, zip tie, double side tape

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20 °C to +60 °C incl. battery
Storage Temperature	-20 °C to +30 °C incl. battery
Protection Class	IP67
Regulatory Compliance	US: FCC Part 15 subpart C 15.250 (for indoor and outdoor use) - in progress European Union: ETSI EN 302065-1 (HF) - in progress ETSI EN 303883 (HF) - in progress ETSI TS 103361 (HF) - in progress Draft EN 301 489 - 1, -33 (EMC) - in progress EN 61000-4-2, -4-3, (EMC) - in progress EN 62479 (Human Exposure) - in progress 1999/519/EC (Human Exposure) - in progress ISED RSS-210. - in progress IEC/EN 62368-1- in progress

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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.

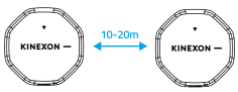
They send and receive signals to/from the sensors and transmit the position measurements wirelessly through the BLE mesh to gateways that are connected to the cloud backend.

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

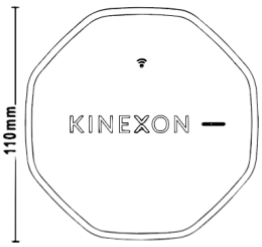
Depending on accuracy requirements and characteristics of the facility

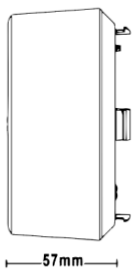


Typical anchor deployment every 10-20 m

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

DIMENSIONS IN [mm]





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KEY FACTS

RF SPECIFICATIONS

Positioning Principle	Radio-based, Ultra-Wideband (UWB)
Positioning Methods	Time Difference of Arrival (TDoA)
Frequency range	UWB (IEEE 802.15.4a): 4.25 – 4.75 GHz, 6.25 – 6.75 GHz BLE5 (IEEE 802.15.4): 2.4 GHz

INTERFACES & POWER SUPPLY

Data interface	BLE5 (IEEE 802.15.4): 2.4 GHz
Battery power	Internal battery ER34615H – 19Ah Li-SOCl2 battery (replaceable) Battery lifetime: 3-6 years (position update rate dependent)

PHYSICAL SPECIFICATIONS

Indicators	RGB front LED
Weight	320 g
Dimensions	110 x 110 x 57 mm
Mounting options	Wall-mounted

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-25 °C to +85 °C
Protection Class (cert. ongoing)	IP54
Regulatory Compliance	US: FCC Part 15 subpart F - in progress 15.517 (for indoor use only) - in progress 15.519 (for outdoor use only) - in progress European Union: ETSI EN 302065-1 (HF) - in progress ETSI EN 303883 (HF) - in progress ETSI TS 103361 (HF) - in progress Draft EN 301 489 -1, -17, -33 (EMC) - in progress EN 55032 Class B (EMC) - in progress EN 61000 -3-2, -3-3, -4-2, -4-4, --4-5, -4-6, -4-11 (EMC) - in progress EN 62311 (Human Exposure) - in progress 1999/519/EC (Human Exposure) – in progress

KINEXON MESH GATEWAY

Internet communication device between the Mesh hardware and cloud backend

The KINEXON Mesh Gateway transfers all data from the KINEXON Mesh network via LTE to the cloud.

The gateway uses a secure connection to the KINEXON Mesh cloud, which is hosted in the region which complies to local data privacy regulations.

The gateways preferably use LTE-M1 for the data connection, and support Ethernet and Wi-Fi as fallback options.

GATEWAY DEPLOYMENT

Preferable place the gateway at a location with LTE/2G coverage and power socket.

RF SPECIFICATIONS

Cloud Data Transfer	LTE-M1, 2G, NB-IOT, Wifi, Ethernet
RF Data Interface	BLE5
Frequency range	BLE5 (IEEE 802.15.4): 2.4 GHz

INTERFACES & POWER SUPPLY

Data interface	BLE5 (IEEE 802.15.4): 2.4 GHz
Power	Power supply 5V DC

PHYSICAL SPECIFICATIONS

Indicators	Front LED
Weight	150 g
Dimensions	95 x 95 x 18.3mm

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-25 °C to + 85 °C
Protection Class (certification in progress)	IP54
Regulatory Compliance	CE, FCC, ISED

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