THE KINEXON ASSET TAG

3D real-time localization and motion sensing.

The KINEXON Asset Tag is the perfect tracking solution for industrial and logistics use in high quantities. The tag enables to uniquely identify and locate any object by mounting or embedding the tag. This can be used for object tracking & tracing, theft prevention, workflow monitoring and process automation.

The tag is small, robust and offers an extremely long battery lifetime.

It works best with KINEXON RIoT, the open KINEXON platform for effective real-time analysis.

POSSIBLE USE CASES

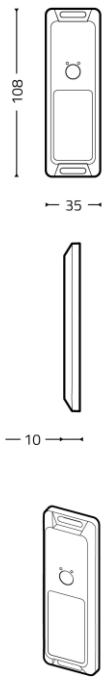
Tracking in industrial environments for following use cases:

- Material and product tracking
- Order management
- Workflow monitoring
- Stock management
- Production progress monitoring
- Process automation

More traceability, improved process reliability and particularly more efficient processes. Optimization of

- Lead time
- Dwell time
- Waiting time
- Delivery time
- Routes
- Material flow

DIMENSIONS IN MM



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KEYFACTS

RF SPECIFICATIONS

Positioning Principle	Real Time Location System (RTLS), Radio-based, Ultra-wideband (UWB)
Positioning Update Rate	Standard: 1 Hz. Configurable (0.001 - 20 Hz) and based on movement ("wake up on motion").
Positioning Data	3D (x, y, z)
Positioning Accuracy	<10 cm (depending on environment)
Connectivity	UWB Channels 3 (4.25 - 4.75 GHz)

PHYSICAL SPECIFICATIONS

Accelerometer	3-axis, +/-2g to +/-16g, up to 200Hz
Barometer	Precision up to: +/- 0.005hPa (or +/-0.05m)
Signal	Status and Action LED
Button	For manual event trigger (event sent via RF)
Battery Runtime	Lifetime up to 5 years (depending on update rate)
Material	Polycarbonate + 20% fiberglass
Weight	Appr. 40g
Dimensions	35 x 108 x 10 mm

ENVIRONMENTAL SPECIFICATIONS

Temperature	- 20 °C to + 59 °C incl. battery - 40 to + 85 °C excl. battery
Protection Class	IP67
Certification	US: FCC Part 15 subpart C (15.517) – pending European Union: EN 301489-1 / EN 301489-33, DIN EN 60950-1, EN50371, ETSI 301 489-1, ETSI 301 489-33, ETSI EN 302 500-1

SPECIFICATION

Mechanical drawing

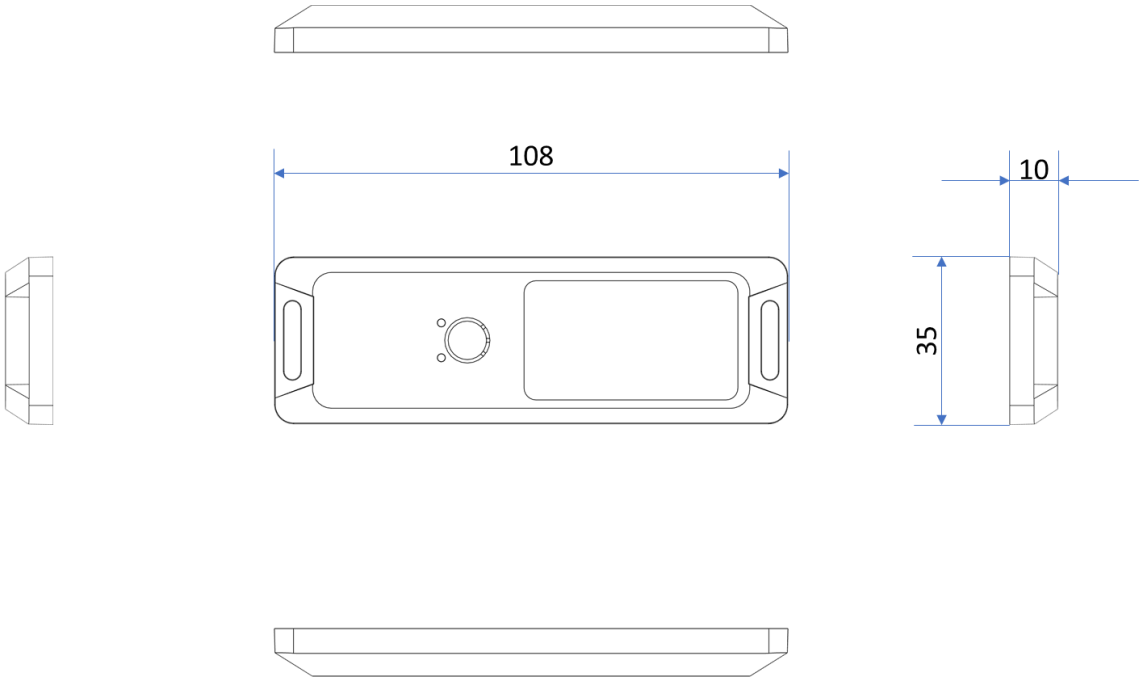

Figure 1: Mechanical drawing

Label

LABEL TOP-COVER

Figure 2: Position label top-cover

Company logo

QR code

EUI

Size: (25 x 45) mm

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LABEL BASE-PLATE

Figure 3: Position label base plate

Company logo
EUI
Device part-no.
Certification logos/signs

KINEXON
EUI : #####
Model: KNX-T4.1-1.2-2:B
FCC ID: 2ALC5-KNX-ATI1

QR code

Size: (13.8x 28.8) mm

External interfaces

WIRELESS CONNECTION

For wireless connection a Ultra-Wideband (UWB) interface according to IEEE 802.15.4 is implemented.

TAG BUTTON

Name	Duration	Effect
Short Press (Normal Press)	150 ms	Forward Event to Coordinator
Long Press	3 s	Forward Event to Coordinator
Very Long Press	10 s	*Asset Tag*: Hard Reset / HW Reset

TAG LED

Please mind that tag LED behaviour depends on the firmware use case one has selected. Most important versions are:

Chronological Behavior after power-on reset

Color	Duration	Explanation
Green	~1s	Tag bootloader is starting
Yellow	~ 7s	Tag in Bootloader and waiting for Connection
Green	< 1s	Initation of firmware
Blue	< 1s	Initation of firmware
Red	< 1s	Initation of firmware
Green flashing slowly	infinite	Tag is waiting for connection
Green flashing very fast	some seconds or infinite	Tag is trying to associate / has received beacon
Blue flashing	infinite	Tag is running (with TMDA)
Blue/Green alternating flashing	infinite	Tag is running (with Aloha)
Blue/Red alternating flashing	infinite	Tag is running (with Aloha) and low Battery
Pink flashing	infinite	Tag is running (with Aloha) and logs Data to Flash Memory
Red flashing	infinite	Tag is running (with Aloha), logs Data to Flash Memory and low Battery
Red flashing	infinite	Tag is running (with TMDA), but low battery deteced
Red cont.	infinite	Error: RTC not set (for "Memory Tag aka Mobile Tag aka IMU Tag")
Red flashing 5x	5 x off/on (200ms) = 1s	Tag is going to reset due to unrecoverable internal error detected by firmware (kerror)
Pink 1s		Tag is running (with Aloha) and starts/stops logging Data to Flash Memory

Electrical parameters

Interface	Parameter [Unit]	Min	Typ	Max	Comment
Power supply	Input voltage [V]	2.0	3.0		
	Input current [mA]			300	UWB receive

Battery

A $LiMnO_2$ primary cell battery is used.
Type: CP502440

Nominal voltage:	3.0V
Capacity:	1200mAh
Max. constant current:	120mA
Max pulse current:	400mA
Operating temperature:	-40°C to +60°C
Size:	(40.5 x 24.5 x 5.2) mm

Accessories

HOLDER

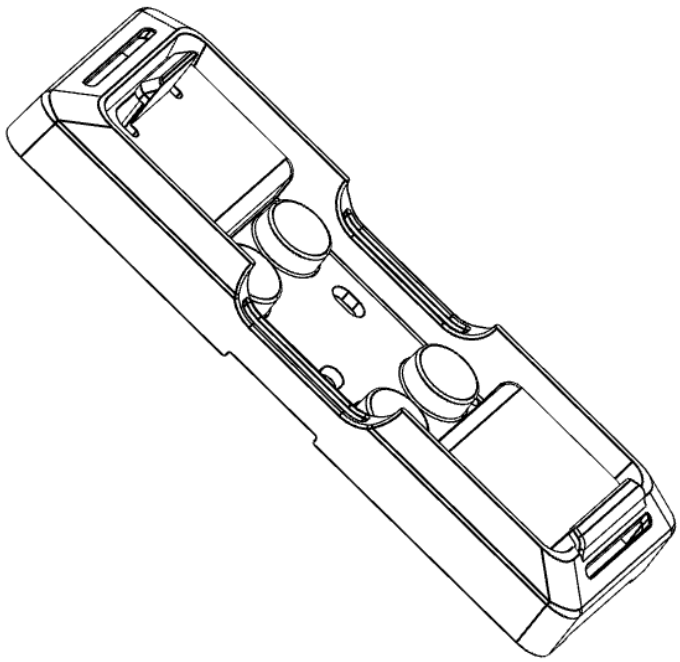

Figure 4: Asset Tag holder

Dimensions:

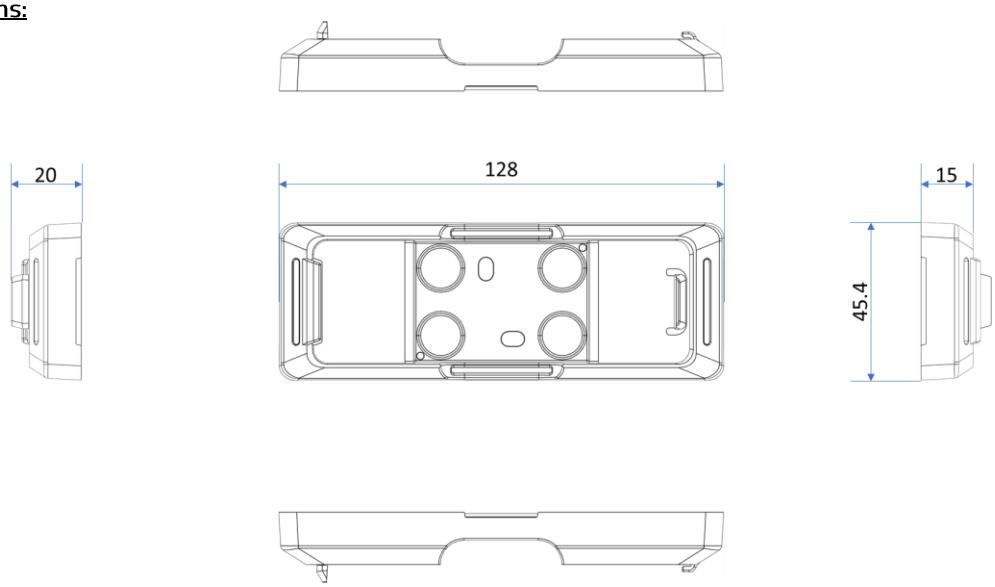

Figure 5: Dimensions Asset Tag holder

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Mounting Options

Using magnets On metallic surfaces, the tags can be attached and detached quickly and easily using magnets. 	**Using screws** To ensure maximum stability the tags can be screwed on to appropriate surfaces. 	**Using cable ties** If the mounting surface offers suitable brackets, the tag can be fixed using two cable ties. 
Using adhesive strips On flat surfaces and a strict allocation of tags to load carriers the tags can be mounted using adhesive strips. 	**Using velcro** If a tag is often attached and detached from a pool of carriers, then fixing the tag using industry-style velcro would optimize ergonomics in handling. 	**Using the delivery note pocket** If an appropriate delivery note pocket exists, the tag can simply be put inside. The front side of the tag has to face away from the load carrier, as shown in the picture. 

Regulatory and Legal Information

The Kinexon Asset Tag has been designed to be in compliance with both the U.S. FCC Part 15 subpart F regulations, sections 15.517 and 15.521 and with the European Union ETSI EN 302 065 standards. Two different versions of the Kinexon Asset Tag are available, one version supports the FCC emissions mask (Region 1) and the second supports the ETSI standard mask (Region 2).

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.

Intended Use

This manual describes the setup and use of the Kinexon Asset Tag. Use this product only for the purpose it was designed for.

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.

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. 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. This device communicates with an associated anchor which needs to be mounted indoors. To ensure indoor communication only, the tag will stop transmitting once it loses connection to the KINEXON Anchors mounted indoors and start transmitting only when a connection is re-established by the anchors.

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.

FCC Caution

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

This device is designed not to exceed the limits for exposure to radio waves adopted by the FCC. These limits include a substantial safety margin design to assure the safety of all persons, regardless of age and health. The radio wave exposure guidelines use a unit of measurement known as the Specific Absorption Rate (SAR). SAR levels have been computed for the transmitters in this device and have been found to be below FCC limits.

Safety Information

• Read and follow all instructions before using the Kinexon Asset Tag.

• Never open the case of the Kinexon Asset Tag. There are no user serviceable parts or replaceable parts inside the case.

• Do not use the Kinexon Asset Tag if it has been damaged.