



Kinexon KNX-ETAG1 UWB Tracking Tag with ePaper Display User Manual

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Kinexon KNX-ETAG1 UWB Tracking Tag with ePaper Display



Introduction

The KINEXON ePaper Tag is the Ultra-Wideband basic component for paperless material and goods handling in the industry. The ePaper solution combines high precision UWB localization technology with smart process visualization. The KINEXON ePaper Tag can be placed on workpieces and load carriers without leaving any residue to track their entire value-added process. In addition, an integrated display automatically informs about production steps that have already been completed and those that are still pending. As a result, all information is digitized, repeated and printing processes are eliminated. KINEXON ePaper solution is flexible and provides complete control and maximum flexibility for dynamic production. The combination of high-precision real-time localization and smart visualization is the key to paperless production. There are various potential use cases such as:

- ePaper-based workflow instructions for shop floor employees.
- Real-time interaction through configurable button (e.g. signal for replenishment).
- Dynamic labeling with the current status of the product or material.
- Digitization of all production & process relevant information.

Safety Information

- Read and follow all instructions before using the KINEXON ePaper Tag.
Never open the case of the KINEXON ePaper Tag. There are no user-serviceable parts or replaceable parts

inside the case.

Do not use the KINEXON ePaper Tag if it has been damaged.

Use the Tag according to the following specifications. KINEXON will not take any responsibility or liability in case of accidents caused by misuse of the battery:

- Stop using the device immediately and stay away from the battery if:
 - The battery was exposed to high temperatures (60 °C or above).
 - The battery shows signs of leakage.
 - There is a noticeable odor coming from the battery. Avoid directly hitting or dropping the battery.

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 ePaper Tag. Use this product only for the purpose it was designed for.

Key Facts

RF Specifications

RF Specifications	
Positioning Principle	Real Time Location System (RTLS), Radio-based, Ultra-wideband (UWB)
Frequency Range	UWB (IEEE 802.15.4a): UWB Channel 3 (4.25 – 4.75 GHz, Low Duty Cycle Interference Mitigation (LDC) according to EN 302 065-1) UWB Channel 5 (6.25 – 6.75 GHz) Average EIRP < -41 dBm / 1 MHz Peak EIRP < 0 dBm / 50 MHz
Update Rate	Configurable, typically 1 Hz in motion, 0.1 Hz in standstill
Positioning Data	3D (x, y, z)
Positioning Accuracy	< 20 cm (depending on environment)

Physical Specifications

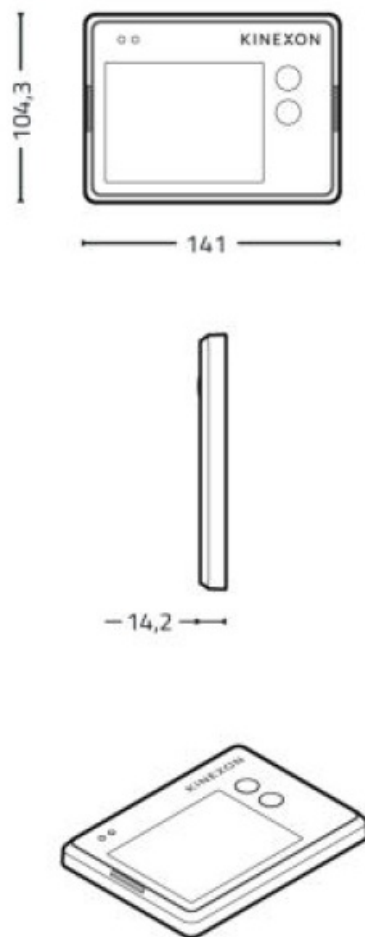
Physical Specifications	
Display	<p>4.2", 85 x 64 mm (400×300 pixel)</p> <p>2- color: black/white, display update time 3 s (25°C)</p> <p>3- color: black/white/red, display update time 14 s (25°C)</p>
Button	Two buttons for status and manual event trigger (event sent via RF)
Indicators	Two LEDs (Status and Action)
Accelerometer	3-axis, +/-2 g to +/-16g, up to 200 Hz
Battery	Built-in 10Ah replaceable Li primary battery
Battery Lifetime	Up to 5 years (depending on update rate)
System Power	3.0V / 200 mA

Physical Specifications	
Material	Acrylonitrile styrene acrylate (ASA)
Weight	197g
Dimensions	<p>Device only: (141 x 104.3 x 14.2) mm</p> <p>Incl. holder: (168.8 x 104.3 x 24.6) mm</p>

Environmental Specifications

Environmental Specifications	
Operating Temperature	0 °C to +50 °C incl. battery
Storage Temperature	-20 °C to +30 °C incl. battery
Protection Class	IP67
Regulatory Compliance (cert. ongoing)	<ul style="list-style-type: none">• FCC Part 15 subpart C• 15.250 (for indoor and outdoor use)• ETSI EN 302065-1• ETSI EN 303883• ETSI TS 103361• SRRC• Draft EN 301 489 – 1, -33• EN 61000-4-2, -4-3• EN 62479• 1999/519/EC• UN 38.3• IEC 62133

Mechanical Drawing



Label Specifications



EUI: 107429

KNX-T5.1-1 X-X

FCC ID: XXXXXXXXXXXXXXXX

CMIIT ID: XXXXYZNNNN

SRRC Product name: XXXXX



KINEXON

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External Interfaces




Wireless Connection

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

Interaction Buttons

Action Button (Upper Button)		
Description	Duration	Effect
Short (normal) press	150ms	Toggles alarm mode status (on or off). The content of ePaper display shown for each mode can be configured on the RIoT web interface
Very long press	>8s	Hardware reset
Status Button (Lower Button)		
Description	Duration	Effect
Short (normal) press	150ms	<ul style="list-style-type: none">If there is only one page configured on the RIoT web interface, the Tag refreshes the ePaper displayIf there is more than one page configured on the RIoT web interface, the Tag switches the ePaper display to the next available pageIf the last page is already shown, the Tag switches the ePaper display back to the first page

Visual LEDs

Info LED (Left LED)		
Color	Type & Duration	Explanation
Red	Constant, 1s	Either action or status button was pressed
Dynamic	Dynamic	<p>Further info LED behavior including color & b linking duration can be configured on the Rlo T web interface</p> 
Power-on reset		
Green	Constant, ~1s	Tag bootloader is starting
Yellow	Constant, ~7s	Tag in Bootloader and waiting for connection
Purple	Constant, duration depends on firm ware size	Tag is being bootloaded with new firmware
Status LED (Right LED)		
Color	Type & Duration	Explanation
Blue/Green	alternating flashing, infinite	Tag is running, the speed of flashing equals update rate of Aloha uplink
Blue/Red	alternating flashing, infinite	Tag is running with low battery, the speed of f lashing equals update rate of Aloha uplink
Red	flashing, 1s	Tag is going to reset due to unrecoverable in ternal error detected by firmware

Tag Battery

A primary soft cell non-rechargeable battery is used	
Type	CP7839109
Nominal Voltage	3.0V
Capacity	10000mAh
Size	(8.0 x 40.0 x 110) mm
Weight	63.0g

Hardware Variants

Variant	Description
KNX-T5.1-1.1-x	ePaper Tag with non-rechargeable battery, b/w/r display
KNX-T5.1-1.4-x	ePaper Tag with non-rechargeable battery, b/w display
KNX-T5.1-4.1-x	ePaper Tag with non-rechargeable battery, b/w/r display, Bluetooth
KNX-T5.1-4.4-x	ePaper Tag with non-rechargeable battery, b/w display, Bluetooth
KNX-T5.1-2.2-x	ePaper Tag with rechargeable battery, b/w/r display
KNX-T5.1-2.5-x	ePaper Tag with rechargeable battery, b/w display
KNX-T5.1-5.2-x	ePaper Tag with rechargeable battery, b/w/r display, Bluetooth
KNX-T5.1-5.5-x	ePaper Tag with rechargeable battery, b/w display, Bluetooth

Accessories

Holder

The KINEXON ePaper Tag is clipped to the holder. The holder can be mounted using the following options:

- Velcro tape: recommended width of the tape is 15mm.
- Zip-tights: maximum width of zip-tights is 15mm.
- Magnets: 18x8x4 N45 magnets hold into place with crushing ribs that can be pressed in manually.
- Screws: lateral placing using countersink screws (dmax=3.5mm, dheadmax=7.2 mm), central placing using cylinder head, pan head, button head screws (dmax=5 mm, dheadmax=9.5 mm).



Regulatory and Legal Information

The KINEXON ePaper Tag has been designed to be in compliance with both the U.S. FCC Part 15 subpart F regulations, section 15.250, and with the European Union ETSI EN 302 065 standards. Two different versions of the

KINEXON ePaper Tag are available, one version supports the FCC emissions mask (Region 1), and the second supports the ETSI standard mask (Region 2).

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 on board 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 outdoor 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:

- This device may not cause interference.
- 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 should be installed and operated with a minimum distance of 20 cm between the radiator & your body

ISED Caution



This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

- This device may not cause interference
- This device must accept any interference, including interference that may cause undesired operation of the device.

These devices are not permitted for operation onboard aircraft or satellites and shall also not be used for operating toys. The use of 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 onboard ships or land vehicles.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator & your body.

Documents / Resources

	<p>Kinexon KNX-ETAG1 UWB Tracking Tag with ePaper Display [pdf] User Manual KNX-ETAG1, KNXETAG1, 2ALC5-KNX-ETAG1, 2ALC5KNXETAG1, KNX-ETAG1 UWB Tracking Tag with ePaper Display, UWB Tracking Tag with ePaper Display</p>
	<p>Kinexon KNX-ETAG1 UWB Tracking Tag with ePaper Display [pdf] User Manual KNX-ETAG1, KNXETAG1, 2ALC5-KNX-ETAG1, 2ALC5KNXETAG1, KNX-ETAG1 UWB Tracking Tag with ePaper Display, UWB Tracking Tag with ePaper Display</p>