ekahau

Ekahau
T301
Wi-Fi tag

USER GUIDE For real-time asset and people tracking

1 INTRODUCTION

1.1 Introduction to T301-A

The Ekahau T301-A Wi-Fi tag is part of Ekahau RTLS (Real-Time Location System) that consists of the T301-A tag, Ekahau Positioning Engine 4 (EPE) software platform and Finder and Tracker end-user applications. The T301-A tags can be attached to any mobile object or asset, and can be carried by people as well. The Ekahau Positioning Engine software continuously reports the tag coordinates and logical areas within the Wi-Fi coverage area both indoors and outdoors.

1.2 Firmware release level

This user guide documents the tag firmware release level 1.0. Minor updates are documented in release notes delivered with the firmware release.
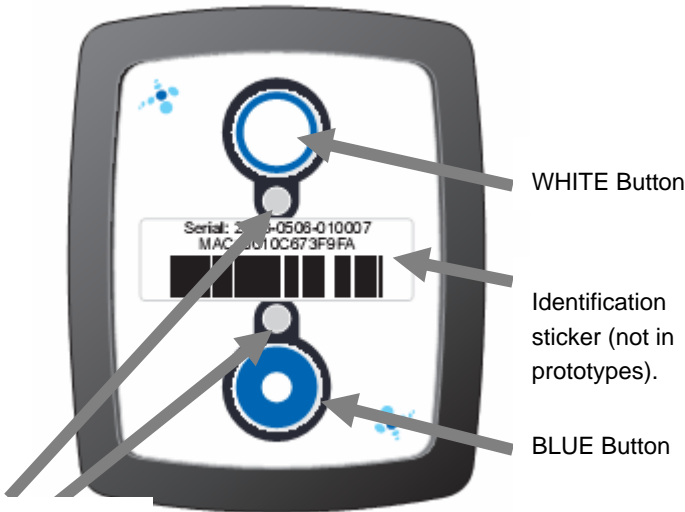
1.3 Features of T301-A

The T301-A Prototype provides the following functionality:

- Is compatible with standard 802.11b and 802.11g Wi-Fi networks
- Support for 40 or 104-bit WEP key authentication
- Static and dynamic IP addressing
- Two configurable buttons for managing the tag and use as call buttons.
- Location reporting triggered by buttons and periodic timer
- Two status indication LEDs for determining the tag status
- Configuration using Ekahau Activator T301, standalone tag configuration software
- Wireless configuration using Ekahau Positioning Engine.

2 CHAPTER 1: TAG OPERATION

2.1 User Interface

WHITE Button

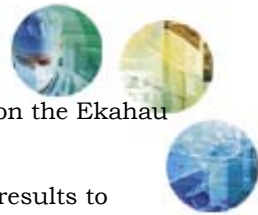Identification sticker (not in prototypes).

BLUE Button

Upper and lower status indication LEDs (red/green/orange)

2.2 Activating the tag

When delivered the tag uses factory defaults and is ready to be used. Before using the tag needs to have environment specific parameters installed to the tag. The configuration or activation is done using Ekahau Activator T301 software that configures Ekahau T301-A tags wirelessly. See more information on the Activator software from its specific User Guide.

When the tag has been activated it connects to the network when the first scanning is activated by its internal timer. After successful

Activation you see the MAC address of the tag appears on the Ekahau Positioning Engine list of tags.

The tag will now automatically wake up scan and send results to Ekahau Positioning Engine using the configured wakeup interval.

On scan, association to the network and sending results the lower LED lights red and the upper LED blinks green twice.

2.3 Button scan

The tag can also be commanded to scan by pressing the blue or white button. After button press the tag will scan immediately and send the results to Ekahau Positioning Engine. The LEDs will indicate the scan success or failure similarly as in the scan activated by the wakeup interval.

2.4 Resetting to factory settings

The tag can be reset to factory setting by pressing using a button sequence or by opening the back cover and removing the batteries. To reset the tag using buttons using button sequence do the following:

1. Press the White button for 2 seconds

2. When the lower LED flashed orange press down the blue button immediately.

3. After 2 seconds the lower LED flashes orange.

4. The tag has now been reset to factory settings. The tag is in reset mode when it does not execute button scan as defined in section 2.3.

3 TECHNICAL SPECIFICATIONS

3.1 General

- Outside Dimensions (mm): 45 x 55 x 19
- Weight: 1.7 oz / 48 g with batteries

- Power: 2xCR2 3.0V Lithium (LiMnO$_2$) batteries
- Two buttons with call button functionality
- Two red/green/orange status indication LEDs
- Operating Temperature: 32 to 140°F / 0 to 60 °C, battery lifetime is lower on the low and high end of the temperature range.
- Storage Temperature: 32 to 110°F / 0 to 45 °C, battery lifetime is lower on the low and high end of the range. Storage in room temperature is recommended.
- Humidity: From 20% to 95 % non-condensing, relative humidity
- Environmental Protection: protected against dust and spraying water

3.2 Wi-Fi

- Supported IEEE Standards: 802.11b/g
- Modulation Scheme: Complementary Code Keying (CCK)
- Media Access: CSMA/CA
- Transmit Power: +12dBm
- Receiver Sensitivity: -82dBm@11Mbps
- Frequency Range: 2.412 - 2.484 GHz
- Supported Networking Protocols: UDP/IP, DHCP or static addressing
- Security: WEP Encryption 40/104 Bit
- Antenna Type: 2 x Internal omni-directional ceramic multilayer, antenna diversity
- Average Antenna Gain: +1.5 dBi

3.3 Operating Ranges from an Access Point

- Open Space: 60m (180ft)
- Typical Office: 30m (90ft)

3.4 Battery replacement

Batteries are replaced by opening the four screws on the backside of the tag. Old batteries maybe removed from the device by pulling them gently upwards. New batteries should be placed between the battery springs. Check that the orientation of the batteries is correct. There are battery orientation indicators on the top cover and on the circuit board. The correct orientation is also showed in the image on the following page.

Recommendations for choosing and replacing batteries:

- Use always new batteries.
- Replace both batteries at the same time.
- Use only 3.0V, CR2 size batteries.
- Ekahau recommends batteries from Maxell, Sanyo or VARTA.

After batteries have been replaced close the back cover, replace and tighten the screws.

3.5 Care and Maintenance

The tag is a product of superior design and craftsmanship and should be treated with care. The suggestions below will help you to fulfill any warranty obligations and to use this product for many years.

- Keep the tag dry. Precipitation, humidity and all types of liquids or moisture can contain minerals that will corrode electronic circuits.
- Do not use or store the tag in dusty, dirty areas. Its moving parts can be damaged.
- Do not store the tag in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the tag in cold areas. When it warms up (to its normal temperature), moisture can form inside, which may damage electronic circuit boards.
- The operating temperature of the tag is 32 to 140ºF / 0 to 60 ºC. Do not operate the tag outside this temperature range.
- Open the tag only for replacing batteries.
- Do not drop, knock or shake the tag. Rough handling can break internal circuit boards.
- Do not use harsh chemicals or strong detergents to clean the tag.
- Do not paint the tag. Paint can clog the moving parts, affect the radio communication and prevent proper operation.
- Use only the supplied antenna. Unauthorized antennas, modifications or attachments could damage the tag and may violate regulations governing radio devices.

4 CERTIFICATIONS

4.1 FCC Rules

This device complies with 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.

FCC ID of this device is: TA7-T301-A1

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 into 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 RF Radiation Exposure Statement

This equipment complies with FCC Radio Frequency Electromagnetic Signal (RF) exposure limits set forth for an uncontrolled environment of portable transmission. This product has been evaluated for RF exposure at a distance of 0,5 cm (0,2 inches). Operation at a separation distance less than 0,5 cm (0,2 inches) from the radiating

element to nearby persons will expose nearby persons to RF levels that exceed the FCC rules for RF exposure.

4.2 CE Marking

This device has been tested to meet the Electromagnetic Compatibility (EMC) requirements of EN50082-1 and EN50022 for the CE Declaration of Conformity (DoC).

5 LIMITED WARRANTY

Ekahau warrants that the Tags will operate in accordance with and substantially conform to their published specifications when shipped or otherwise delivered to the end user and for a period of **1 year** thereafter, provided, however, that Ekahau does not warrant any claim or damage under this Warranty if such claim or damage results from:

1. Misuse, neglect, accident or improper installation or maintenance of the Tags,

2. Tags that have been altered, modified, repaired, opened or tampered with by anyone other than Ekahau,

3. Use of the Tags not in compliance with their respective documentation, user manuals, instructions, and any usage restrictions contained therein, including, but not limited to, the provisions relating to the environment and ranges where the tags must be used, or

4. Accident, fire, power failure, power surge, or other hazard.

Otherwise, the Tags are sold AS IS. In no event does Ekahau warrant that the Tags are error free or that end user will be able to operate the Tags without problems or interruptions.

End User is responsible for using the Tags within their specifications as contained in the Documentation.

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The enclosed software contains implementations of Ekahau's patent pending inventions.

Under no circumstances shall Ekahau or Ekahau be responsible for any loss of data, income, or any direct, special, incidental, consequential or indirect damages howsoever caused.

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