



A4 / A4+ Asset Tag

User guide

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Ekahau tags must always be used in compliance with the user environment and instructions contained in the User Manual for the tags.

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1 Introduction

The Ekahau A4 / A4+ Wi-Fi tag is part of Ekahau RTLS (Ekahau Real-Time Location System) that consists of Ekahau Wi-Fi location tags, Ekahau RTLS Controller (ERC) software platform and Ekahau Vision end-user application. It is designed to be worn by patients, employees, children and other individuals, and it enables real-time visibility into a person's exact location – enterprise-wide, with reliable room- and sub-room level accuracy.

1.1 Software Release Level

This User Guide documents the functionality available with software release level, 1.0 onwards.

1.2 Features of A4 / A4+

The following features are included with this software release:

- Works with standard 802.11b/g/n Wi-Fi networks
- Support for 64/128-bit WEP key, WPA, and WPA2-PSK authentication
- Static and dynamic IP addressing
- Two configurable buttons for switching the tag on and resetting the tag to its factory settings
- Location reporting triggered by button, periodic timer, motion, and by Ekahau Location Beacons
- Support for associated and beaconing modes such as Cisco CCX, Aruba, Meru, Aerohive, and Motorola beaconing modes
- Two status indication LEDs for determining the tag status
- Battery monitoring and reporting (A4+ reports both external power and back up battery status)
- Ekahau Location Beacon sensor for room, sub-room, and bay level accuracy
- Activation using Ekahau Tag Activator 3, standalone tag configuration software.
- Configuration using Ekahau RTLS Controller

1.3 Features specific of A4+

- Externally powered (3 mm DC standard connector) with a built-in backup CR2-battery
- Runs on external power between 2.5V and 5.5V DC (External power supervised)
- 2.5 mm standard connector for two external programmable buttons

1.4 User Interface

Figure 1.1. A4 user interface

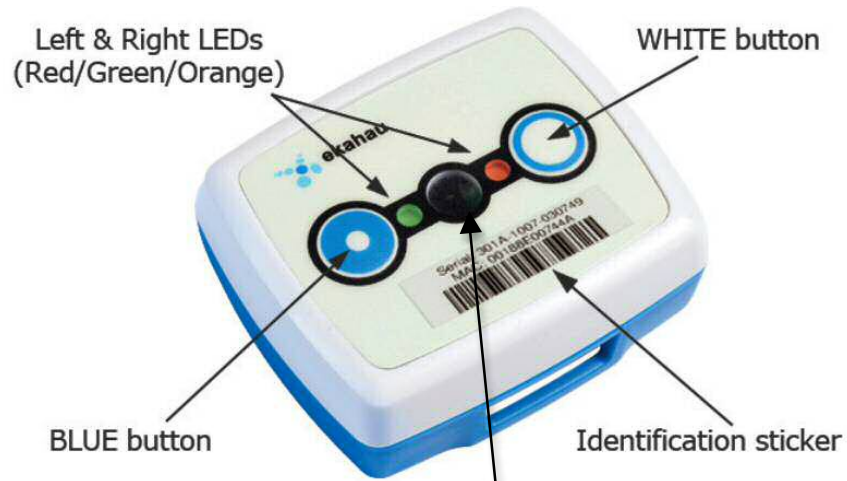
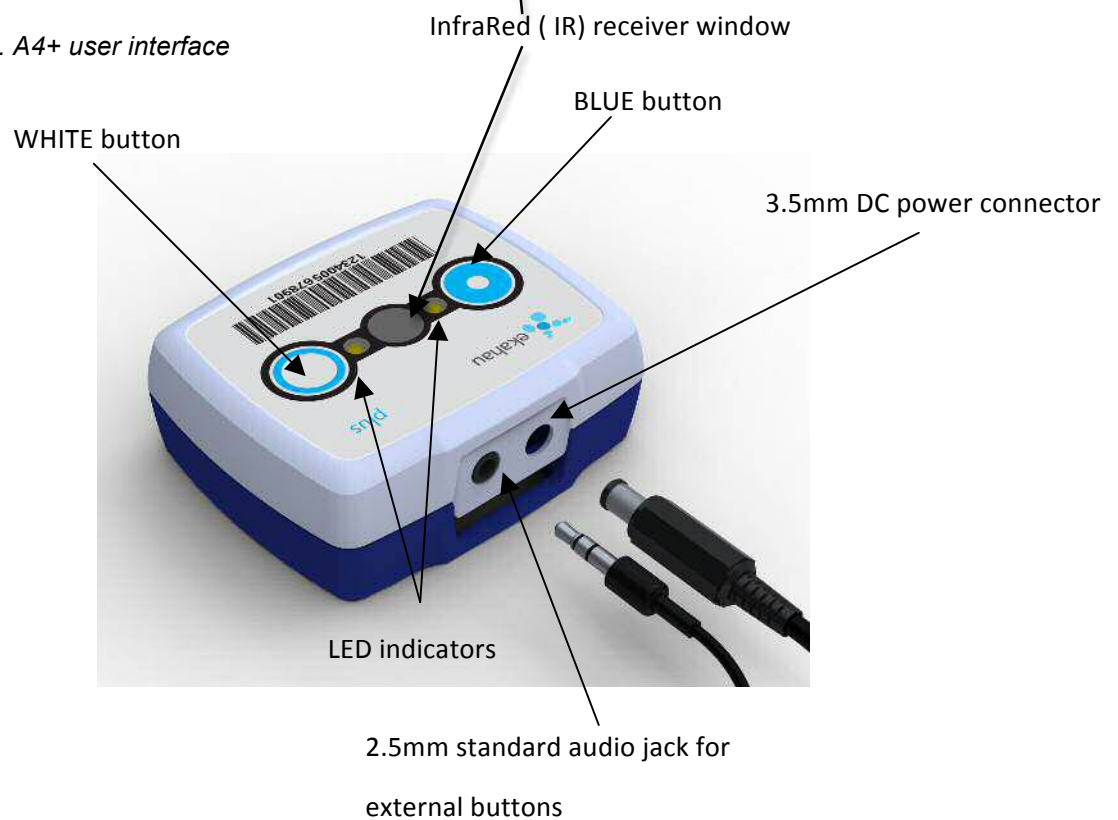


Figure 1.2. A4+ user interface



2 Tag Operation

2.1 Button Activated Location Update and Maintenance Call

In addition to periodic location updates, the tag can also be set to scan and update its location when any of the buttons is pressed. After a button press the tag scans immediately and sends the results to ERC, if **White** button (right-hand button on A4+) was pressed the tag will do a maintenance call in addition to the location update. The LEDs indicate the scan success or failure similarly as in the scan activated by the wake up interval.

2.2 Resetting to Factory Settings

The Ekahau A4 / A4+ tag can be reset to factory settings by using a button sequence as follows:

1. Press and hold the White button (right-hand button on A4+) until Left LED flashes orange. If the tag is busy this may take even 20 seconds. NOTE: Before the Left LED flashes orange, it may flash green/red depending on the success of the ELP packet which is sent when the White button (right-hand button on A4+) is pressed. Do not mind about this and keep on pressing the White button (right-hand button on A4+) until the Left LED flashes orange.
2. When the Left LED flashes orange, immediately release the White button (right-hand button on A4+) and press down the Blue button (left-hand button on A4+).
3. After approximately 2 seconds both LEDs flash orange.
4. The tag has now been reset to factory settings. The tag is in reset mode when it does not execute button scan.

2.3 Firmware Update

The tag firmware can be updated wirelessly using ERC. The firmware is uploaded to the tags from the **Tag Properties** page or directly from **Tags** page in ERC. Follow instruction in the ERC User Guide for updating the firmware.

Note

If the Tag battery level is below 10 % (applicable on A4+ only if running on internal backup battery) the FW update is not allowed. The corresponding error code in ERC is **TU**. To update the firmware, please replace the battery and try again.

2.4 Optimizing Battery Life

The A4 / A4+ Wi-Fi tag uses an ultra-low power system-on-chip architecture that lowers the power consumption to minimal. This enables running tags with same batteries for several years. However, to get the maximum lifetime from your tags you should take care that your network and tag configuration supports all possible power save features (does not concern A4+ when powered from wall adapter).

The principal in optimizing battery life is to determine the maximum interval for location updates, still sufficient for the use case, to minimize the amount of time the tag is active.

Recommendations for optimizing battery lifetime:

- Scan only channels that are in use in your network. Typically, because of overlap of channels, there are only 3 or 4 channels in use from the 11 (or 13/14) available.
- Use single SSID whenever possible. Using multiple SSIDs requires additional network scans and decreases battery lifetime.
- When using dynamic IP addressing tune the DHCP server to provide very long lease times for tags.
- A4 / A4+ tag supports roaming between sub-networks. This feature renews tag's IP address whenever the access point association changes. Since renewing IP addresses consumes large amounts of energy, it is strongly recommended not to use the network wide dynamic addressing feature if it is not needed.
- Tune the wake up settings to match your application needs. More frequent updates lower the battery lifetime.

Note that when both LEDs are blinking red the A4 / A4+ tag is either doing a self-test or indicating that the battery is low.

2.5 Turning off the A4 / A4+ Tag

The A4 / A4+ tag can only be turned off by resetting the tag to factory settings which is explained in chapter *Resetting to Factory Settings on page 3*. To continue using the tag after resetting, you have to re-activate it.

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 (LiMnO₂) batteries (only one CR2 battery in A4+)
- External DC power (2.5V - 5.5V) from battery pack or the wall adapter for A4+
- Two buttons with call button functionality (connector for two external buttons for A4+)
- Two red/green/orange status indication LEDs
- Operating Temperature: 32 to 122 °F / 0 to 50 °C, battery lifetime is lower on the low and high end of the temperature range.
- Storage Temperature: -40 to 140 °F / -40 to 60 °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 (A4 only)

3.2 Operating Ranges from an Access Point

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

3.3 Battery Replacement

Figure 3.1. Battery polarity and replacement



A4



A4+

Batteries are replaced by opening the four screws on the backside of the tag. Old batteries may be removed from the device by pulling them gently upwards. After removing old batteries a 1 minute

waiting period must happen before inserting new batteries. New batteries should be placed between the battery springs. Check that the polarity of the batteries is correct. There are battery polarity indicators on the circuit board and inner surface of the front cover. The correct polarity is also showed in photo above. Avoid touching the circuit board and the flex cable when replacing batteries as they may become damaged from static electricity or mechanical impact. Please note that when battery is empty, voltage will rise after some time and tag will try to power up. As a result, you will hear “ticking” sound from the tag and this sound will stop only when both batteries are removed and both replaced at the same time (A4).

Recommendations for choosing and replacing batteries:

- Always use only new 3V Lithium LiMnO₂ CR2 size batteries
- Replace both batteries at the same time (only one back up battery used in A4+)
- Ekahau recommends batteries from ANSMANN, EVE or VARTA as they have been tested during the development of the product. Any standard 3V Lithium LiMnO₂ CR2 could be used but the performance may vary depending on the quality of the battery.

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

NOTE

Batteries contain hazardous materials and should be disposed in accordance to disposal instructions

3.4 Care and Maintenance

- Keep the tag dry. Precipitation, humidity and all types of liquids or moisture can contain minerals that will corrode electronic circuit
- 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 0 to 50 °C. 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, cleaning solvents, 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 a soft, clean and dry cloth to clean the tag
- Use only the supplied antenna. Unauthorized antennas, modifications or attachments could damage the tag and may violate regulations governing radio devices

4 RF Interference

This device should not be co-located or operated in conjunction with another transmitter.

5 Certifications

5.1 FCC Rules

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) device may not cause harmful interference, and
- (2) device must accept any interference received, including interference that may cause undesired operation.

FCC ID of both A4 and A4+ is: **TA7-A400**

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

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

5.1.1 Réglementations FCC

Les changements ou modifications non expressément approuvés par Ekahau, Inc. peuvent annuler votre droit d'utiliser cet appareil aux termes des réglementations FCC.

Cet appareil est conforme à la section 15 des règlements FCC sur les appareils numériques de classe B.

Fonctionnement soumis aux conditions suivantes :

- (1) Cet appareil ne doit pas causer d'interférences nuisibles.
- (2) Cet appareil doit accepter toute autre interférence reçue, y compris les interférences susceptibles d'entraîner un fonctionnement non désiré.

5.2 CE Marking

These devices have been tested to meet the Electromagnetic Compatibility (EMC) and User safety requirements in accordance with following standards: EN55022, EN55024, EN301489-1, EN301489-17, EN300328 and EN60950 for the CE Declaration of Conformity (DoC).

5.3 Industry Canada Statements for Portable Devices

Section 7.1.3 of RSS-GEN

Operation is subject to the following two conditions:

- 1) this device may not cause interference, and
- 2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le fonctionnement de ce système est assorti aux deux conditions suivantes :

- 1 L'appareil ne peut causer d'interférences nuisibles, et
- 2 L'appareil doit accepter les interférences reçues, y compris celles qui pourraient nuire à son fonctionnement.

Section 7.1.2 of RSS-GEN

"Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication."

"Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante."

6 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 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.

7 Disposing

Note

The Ekahau A4 / A4+ Wi-Fi tag is non-recyclable. To dispose the tag, send it to a company that is capable of handling electronic waste. Alternatively, you can send the tag back to Ekahau who will dispose it for you.

Batteries contain hazardous substances and should be disposed only to specially designated and marked places.

Figure 7.1. The Ekahau A4 / A4+ Wi-Fi tag is non-recyclable

