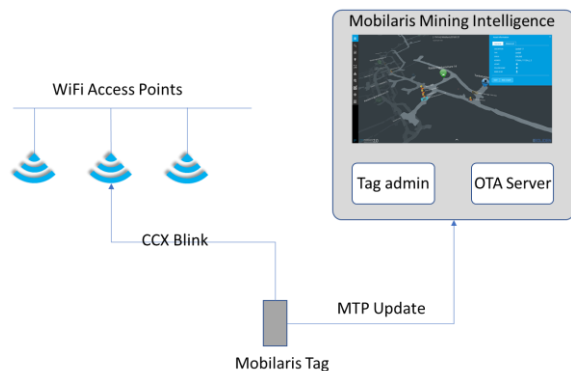


## User Manual: Mobilaris long-life personnel tag

Mobilaris offers a set of various WiFi tags that enables localization of personnel and mobile equipment (such as vehicles or machinery) within the WiFi network. These tags transmit a beacon signal (in CCX blink mode, including the MAC address of the tag) in certain intervals to the WiFi access points network. Using special algorithms, the information is used to determine the position of each tag.



Inside of a network where the Mobilaris Mining Intelligence (MMI) system is not enabled, the tag will continue to function as a standard WiFi tag, sending out CCX blink signals at a defined standard interval or at a factory configured interval.



If a tag is used within a network that supports the Mobilaris Mining Intelligence system, more functionality is enabled:

- Tags can be automatically updated over the air (OTA) with software updates or new configuration (such as blink rates, sleep times, IP address of the receiving MMI etc).
- The Tag can be configured to communicate with MMI when the tag is near an exciter (in order to increase accuracy or to open a gate or similar).
- Personnel tags can be configured to communicate with MMI when the user has pressed a dedicated button on the tag.



The long-life personnel tag is equipped with a powerful battery with a life cycle of up to three years (depending on transmission rates and other configurable parameters).

The tag has the following additional functionalities:

- Two multi-functional push-buttons (**P1** and **P2**).
- A LED light indicator that provides specific indications but can also be customized for various indications.
- An additional antenna that can sense an optional exciter (magnetic bubble) and trigger extra beacons and MTP Updates sent up to MMI.
- A battery saving mechanism that can put the tag into sleep mode by decreasing the blink rate and by that increasing the battery time. This happens if the tag has not been moving during a configurable amount of time.

Using the Mobilaris Mining Intelligence system, the tag can be configured and its firmware can be updated over the air (OTA). This can also be explicitly achieved by a short press of the P2 button in normal state or automatically over a configurable period of time (i.e. every few hours/days).

In the unusual use case where a person configures a tag erroneously so that the tag cannot reach the MMI or the OTA server, there are procedures to get it back to life:

- If a tag cannot connect to the MMI system, a preconfigured fall-back OTA server can be utilized by a long-press on the **P2** button.
- If the **P1** and **P2** buttons are being pressed together for 10 seconds, the tag is forced into a hardware reset.

Using the push-buttons or the battery saving mechanism, the tag can switch between three different states as described to the right:

### • Normal state

In this state the tag transmits beacon signals in a configurable interval of time. If the tag receives a transmission from an exciter, the tag is triggered to transmit an additional MTP Update to the MMI system with the identity of the exciter in order to increase the accuracy of the positioning.

- If the **P1** button is shortly pressed, the LED light blinks red and the tag will try to connect to the MMI for an MTP Update. This can be used for customer specific operations such as forced ventilation.
- If the **P1** button is pressed for 10 seconds, the LED light blinks red three times and the tag enters **hibernation state**.
- If the **P2** button is shortly pressed, the LED light blinks green twice and then lights red while the tag tries to connect to MMI in order to check for any new OTA software or configuration.
- If the **P2** button is pressed for 10 seconds, the LED light blinks twice and then lights red while the tag tries to contact a pre-configured fall-back OTA server for a software update/configuration.

### • Sleep state

If the tag's battery saving mechanism senses that the tag has not been moving for a configurable period of time, the tag enters the sleep state. In this state, the tag saves battery life by transmitting beacon signals less frequently using a longer interval of time between beacons (the interval time is configurable). As soon as the tag's battery saving mechanism senses a movement of the tag, the tag immediately switches back into **normal state**.

### • Hibernation state

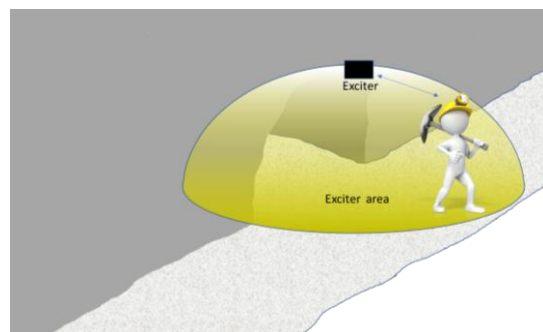
This is a state that normally is used when the tag is not in used (i.e. kept in a storage or being transported). In this state, no beacon signals or MTP Updates are being transmitted. This state can only be entered using a specific combination of the push buttons.

- If the **P1** button is shortly pressed, the LED light blinks green and nothing happens.
- If the **P1** button is pressed for 10 seconds, the LED light blinks green three times and the tag switches back to its **normal state**.
- If the **P2** button is shortly pressed, the LED light blinks red and nothing happens
- If the **P2** button is pressed for 10 seconds, the LED light blinks twice and then stays red while the tag tries to contact a pre-configured fall-back OTA server for a software update/configuration.

If a higher positioning accuracy is needed, inductive exciters can be mounted in required locations.

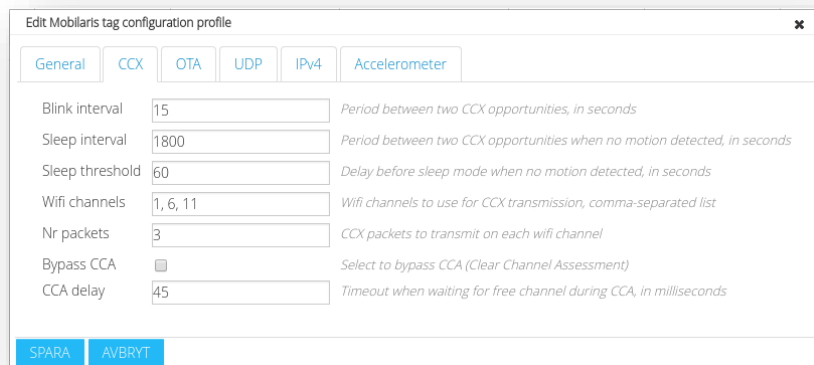


As the tag gets into the active area of the exciter, it is triggered to transmit a **Mobilaris Tag Protocol (MTP)** update to MMI with the identity of the exciter. There are exciters in various coverage area sizes, allowing the active area to be customized.



## The Tag Configuration Tool in MMI 2.3

Various tag profiles can be created/defined in the MMI GUI. Each profile has different parameter values to be defined such as: blink interval, sleep interval, sleep thresholds, WiFi channels, etc. From the MMI GUI, profiles can be applied to all tags, a subset of tags or a single tag.



Edit Mobilaris tag configuration profile

General CCX OTA UDP IPv4 Accelerometer

Blink interval: 15 Period between two CCX opportunities, in seconds

Sleep interval: 1800 Period between two CCX opportunities when no motion detected, in seconds

Sleep threshold: 60 Delay before sleep mode when no motion detected, in seconds

Wifi channels: 1, 6, 11 Wifi channels to use for CCX transmission, comma-separated list

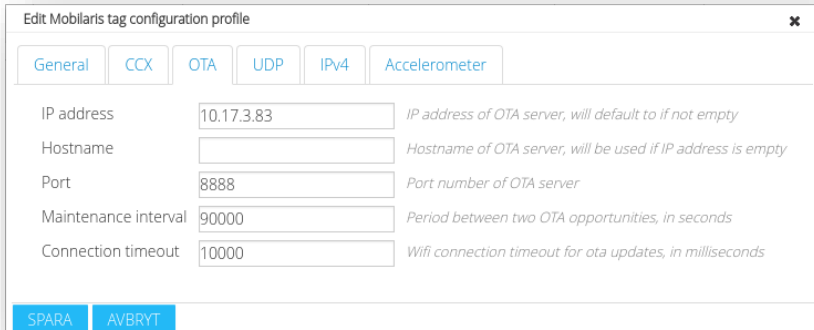
Nr packets: 3 CCX packets to transmit on each wifi channel

Bypass CCA: ☐ Select to bypass CCA (Clear Channel Assessment)

CCA delay: 45 Timeout when waiting for free channel during CCA, in milliseconds

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In addition, the OTA (over the air) server can be configured in a way that will determine from which server the tags will fetch software and configurations updates. Moreover, it is possible to define how often the tag will check for new updates.



Edit Mobilaris tag configuration profile

General CCX OTA UDP IPv4 Accelerometer

IP address: 10.17.3.83 IP address of OTA server, will default to if not empty

Hostname: Hostname of OTA server, will be used if IP address is empty

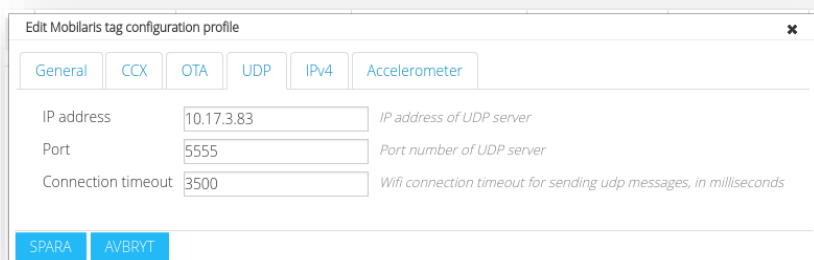
Port: 8888 Port number of OTA server

Maintenance interval: 90000 Period between two OTA opportunities, in seconds

Connection timeout: 10000 Wifi connection timeout for ota updates, in milliseconds

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It is also possible to configure the IP address/hostname of the MMI server that shall receive the tags' MTP Updates:



Edit Mobilaris tag configuration profile

General CCX OTA UDP IPv4 Accelerometer

IP address: 10.17.3.83 IP address of UDP server

Port: 5555 Port number of UDP server

Connection timeout: 3500 Wifi connection timeout for sending udp messages, in milliseconds

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## Regulatory & Safety Notices

Model Name: 466B  
FCC ID: 2AL7A-466B  
IC ID: 22755-466B

### Federal Communications Commission (FCC) statement:

The FCC and Industry Canada IDs can also be viewed on your device.

This device complies with FCC part 15 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, including interference that may cause undesired operation of the device.

### FCC Warning

Changes or modifications not expressly approved by Mobilaris could void the user's authority to operate the equipment.

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

### European Union (EU)

Declaration of Conformity with Regard to the EU Directive 1999/5/EC.

Mobilaris is authorized to apply the CE Mark on the Mobilaris long-life personnel tag, Model 466B, thereby declaring conformity to the essential requirements and other relevant provisions of Directive 1999/5/EC and other applicable Directives.

Compliant with the standard R&TTE 99/CE/05  
Conforme à la norme R&TTE 99/CE/05

### Canada: Industry Canada (IC) statement

IC Notice to Users English/French in accordance with RSS GEN Issue 3:

This device meets the FCC and IC requirements for RF exposure in public or uncontrolled environments.

Cet appareil est conforme aux conditions de la FCC et IC en matière de RF dans des environnements publics ou incontrôlée

This device complies with Industry Canada license exempt RSS standard(s).

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.

Cet appareil est conforme avec Industrie Canada RSS standard exempts de licence (s).

Son utilisation est soumise à Les deux conditions suivantes:

1. cet appareil ne peut pas provoquer d'interférences et
2. cet appareil doit accepter Toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif