WIREPAS RANGE LOCATION 2.X.X – USER GUIDE

Table of contents

1   GENERAL INFORMATION ON MESH NETWORKS

Mesh networks

A mesh network is a network topology (wired or wireless) in which all hosts are connected "peer-to-peer" without a centralized hierarchy, thus creating a net-type structure. With this architecture, every node can send, receive, and relay data. This eliminates the presence of "backbone" points that can isolate parts of the network in case

of malfunction. If a host stops working, data simply takes another route to its destination. A mesh network can relay data via "flooding" (broadcasting data so that it is received by all nodes within direct wireless range). It can also use predefined routes, in which case the network must plan for uninterrupted connections or alternative routes.

Wirepas Mesh

The Wirepas Mesh protocol is a wireless network protocol that uses a multi-jump, self-organizing, and decentralized design. Decentralized network topology enables extremely dense network deployment.

Wirepas focuses on providing a connectivity solution that is highly **reliable**, **optimized**, **scalable**, and **easy to deploy**.

This solution was specifically designed to meet two major challenges facing wireless mesh networks: network reliability regardless of its size and density; and low energy consumption by router devices in the network.

Information about Wirepas Mesh technology is available here:

www.wirepas.com

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3/32

2   BLUE ID MESH BEACONS

BLUE ID MESH BEACONS

Blue LITE **ID+ MESH**

Blue SLIM **ID+ MESH**

Blue COIN **ID+ MESH**

Aero **ID+ MESH**

Blue PUCK **ID+ MESH**

Blue PUCK **BUZZ+ MESH**

Blue ANCHOR

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4/32
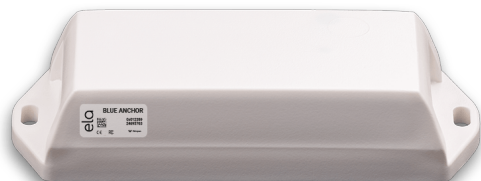
3   BLUE ID MESH GATEWAY

Raspberry Pi Gateway and Wirepas Mesh Wireless Dongle (2.4 GHz)

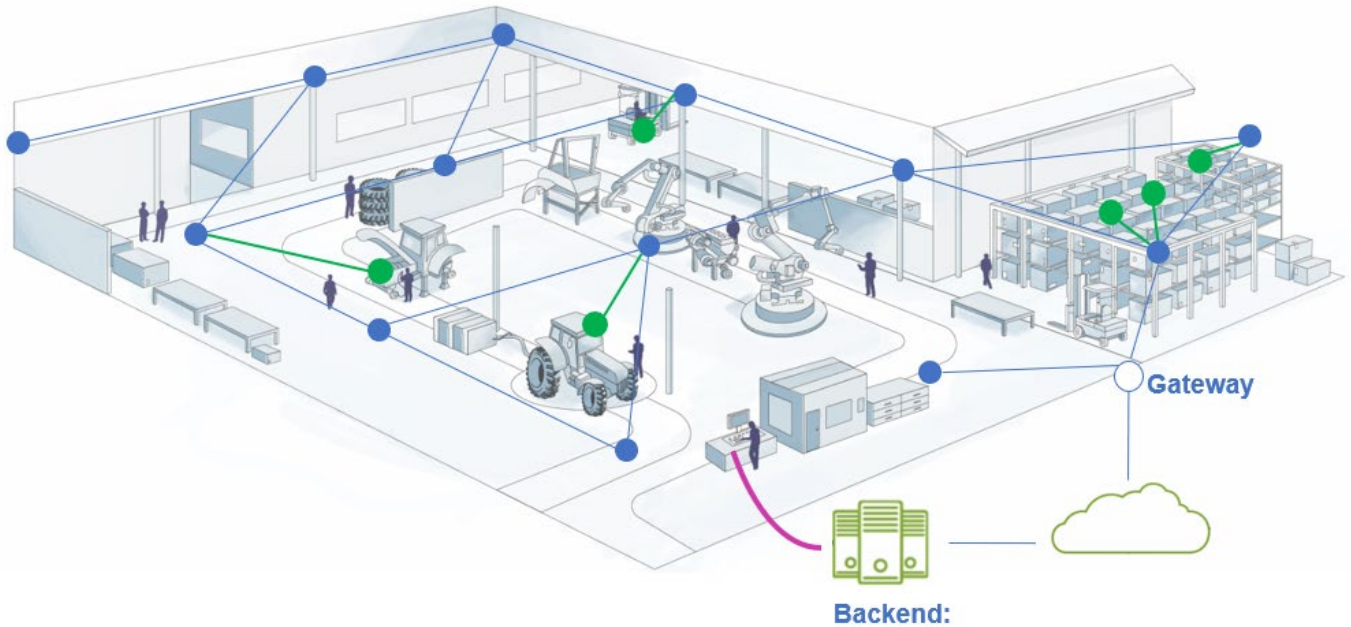*Raspberry Pi3 B+ or Pi4*

Wirepas Mesh 2.4 GHz wireless dongle

SolidRun Gateway

SolidSense N6

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5/32

4   BLUE ID MESH OPERATION

Location network diagram

Network components	Products
🔵 **ANCHOR**	BLUE PUCK **ID MESH** / Blue ANCHOR
🟢 **MOBILE Beacon**	BLUE PUCK/COIN/SLIM/LITE **ID+ MESH**
⚪ **GATEWAY**	ELA Innovation **MESH** Gateway

The mesh network comprises three different types of devices: anchors, mobile beacons, and one or more gateways. Each device can be added to an existing network to extend the covered surface area, increase location accuracy, or reinforce coverage in difficult zones. Adding new devices to an existing network is made easier with automatic connection and integration into the mesh network.

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ANCHOR

BLUE PUCK and BLUE ANCHOR are anchor devices, tags with a defined and fixed position in the Wirepas mesh network. Anchors have two main functions:

- Anchors are fixed points that serve as reference points for the location application. The anchors' predefined locations enable the application to accurately position mobile beacons on a map.

- Anchors forward information to a gateway. Mobile beacons relay location information to the closest anchors. The anchors then transmit the information to the gateway.

MOBILE Beacon

Mobile beacons are localized tags for the configured period. The main purpose of mobile beacon models BLUE PUCK, COIN, LITE, SLIM, and WATCH is to send information regarding their position.

GATEWAY

A software gateway links the BLUE Mesh tag network and server. The gateway receives a stream of data sent by anchors and forwards it to an MQTT broker. The data is then processed by a centralized location agent in order to be able to display mobile beacon locations in an application.

5 MOBILE BEACON OPERATING MODES

Mobile beacons have two operating modes for location. A mobile beacon can either be in Mobile or Mobile+ NRLS (Non-Router long sleep) Tag mode with longer lifespan thanks to the use of periodic extended sleep functionality; or Mobile HC (High Consumption in Autoscan Tag mode) without a sleep phase or disconnection from the network, offering a much shorter lifespan.

A- Long-life Mobile or Mobile+ Beacon – NRLS Tag (Non Router Long Sleep)

In this mode, the mobile beacon remains in standby mode and only wakes up at the configured moment to scan for location and send its data to the nearest anchors. location data is sent to MQTT topic 238.

This mode extends the tag's operating lifespan. During standby, the mobile beacon is disconnected from the network. It does not provide any diagnostic information and cannot receive commands via the network, such as to turn on its LED or activate its buzzer.

To further increase the lifespan of mobile beacons, some models contain an accelerometer that can bring the beacon out of standby mode when movement is detected, or to prolong standby if there is no movement. When movement is detected, the tag exits standby mode and immediately runs a location scan. This functionality is available on all "ID+" models in the Blue Mesh location product line

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7/32

Description of ID+ functionality in Mobile+ Role

ID+ functionality in BLUE PUCK ID+ MESH, BLUE COIN ID+ MESH, BLUE SLIM ID+ MESH, BLUE LITE ID+ MESH, and BLUE WATCH ID+ MESH products enable you to define two data transmission periods via NFC configuration in Mobile+ Role. Configuring these two periods in Mobile+ Role automatically activates ID+ functionality. The switch between the two periods occurs when movement is detected or over an extended period of immobility.

- Movement detected → immediate update of location, and upon the period defined for Fast Period.
- Absence of movement → update of location upon the period defined for Slow Period.

This functionality is deactivated if Fast Period is equal to Slow Period in Mobile Role. In that case, the threshold parameter used by the accelerometer is not taken into account and ID+ functionality is not activated.

An ID+ movement detection frame is sent to MQTT Endpoint 160 with immediate update of location.

Functionality	Endpoint source/ destination	Data			Results		
		Type	Length	Received data	Interpreted data	Value	
ID+	160/ 160	08	06	01 00 B6 00 00 00	00 01 00 00 00 B6	Movement present: 01	
						MOV counter: 182	
				00 00 B6 00 00 00	00 00 00 00 00 B6	Movement absent: 00	
						MOV counter: 182	

Usage example:

Fast Period   = 60 seconds   → 1 minute

Slow Period   = 7200 seconds   → 2 hours

Threshold: 500 milliG (adjustable by the user based on the application scenario).

- If the tag moves: location data is sent immediately and 1 minute later just once.
- If the tag moves constantly over a period of 4 hours: location data is sent every minute.
- If the tag does not move within a period of 1 minute: location data is sent every 2 hours periodically.

This functionality enables you to manage and optimize mobile beacon lifespan by modifying these two transmission periods in case movement is detected, or to receive less location data to process.

When using this functionality, you should take into account the original factory settings and usage recommendations in order to avoid impacting mobile beacon lifespan.

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B- Fast response Mobile HC Beacon – High Consumption Autoscan Tag

In this role (Mobile HC), the mobile beacon is connected continuously to the network without ever switching to standby mode. The beacon runs a location scan upon the configured period and does not go to sleep between location phases. Location data is sent to MQTT topic 238. Diagnostic information is sent periodically.

This means that mobile beacons can receive commands and instructions at any time. The trade-off is that lifespan is much shorter. This mode is not recommended for mobile beacons running on batteries with faster location. It is more suitable for beacons with an external power supply or for slower location.

Important information

In this role, Mobile beacon is already connected to a Mesh Network. An anchor (Router) can have maximum of 14 nodes attached to them. Also in this configuration, a Mesh Network with Mobile beacon in *Mobile HC* role needs more anchors than Mesh Network with Mobile beacon in *Mobile* or *Mobile+* role (NRLS Tag).

6   CONFIGURATION VIA NFC

A. Connect NFC reader to PC (ELA reference: NFC R/W 01 - ref. ACIOM177).

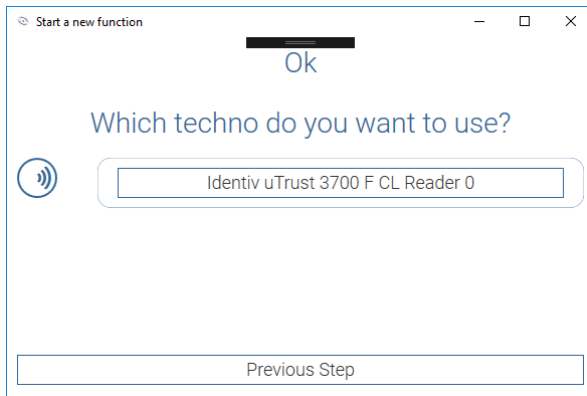**B.** Start the **Device Manager** application (installed prior to use).

The application can be downloaded from the elainnovation.com website, in Support → Downloads

C. Launch the **NFC widget**.

D. Click on the button to select the proposed **NFC reader**.
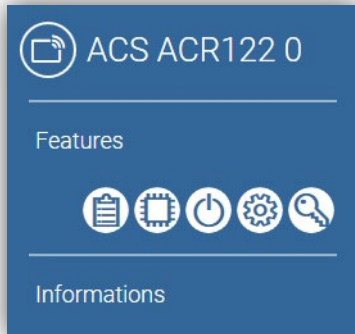

E. Place the tag on the NFC reader as shown below.

F. Click on the **Configuration** icon to read tag parameters.

 Display raw configuration data.

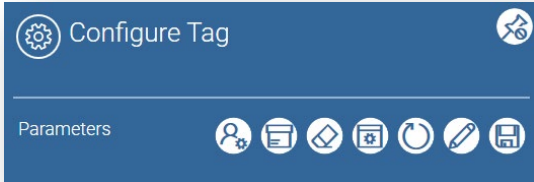 NFC memory information.

 Write configuration operation locked.

 Display configuration data.

 Activate / deactivate Tag.

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11/32

G. Configuration: example of parameters read

 Read parameters.

 Write parameters.

 Clear the entire configuration (attention, automatically writes default parameters).
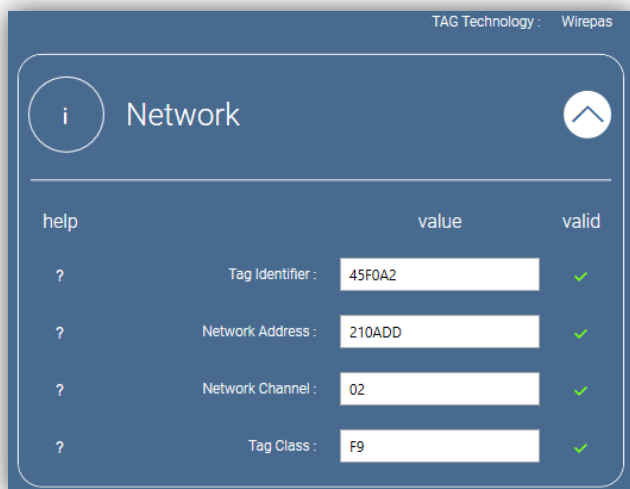
 Display Wirepas network fields in hexadecimal or decimal format.

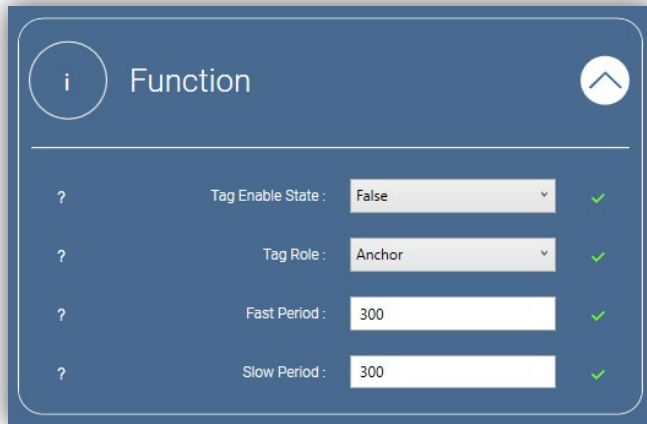 Display all configuration parameters, including limits.

 Factory settings (default parameters).

 Save configuration.

Parameters	Description	Default values
Tag identifier	Unique Tag identifier (24 bits, modifiable)	Assigned at tag startup
Network Address	Wirepas Network Address (24 bits)	0x210ADD
Network Channel	Wirepas Network Channel (8 bits)	0x02
Tag Class	Tag group management (8 bits) [0xF9-0xFF]	0xF9

Parameters	Description	Default values
Tag Enable State	Tag activation and deactivation: True/False	False: Deactivation
Tag Role	Tag role in Wirepas network:[1] Anchor: Anchor with location function Mobile: Long-life mobile beacon with location function Mobile+: Long-life mobile beacon with ID+ location function Mobile HC: Mobile beacon, fast response with location function Sensor: Automatic management of sensor function role	Anchor
Fast Period	Period for sending location and/or sensor data (***Fast used in ID+**)	300
Slow Period	Period for sending location and/or sensor data (***Slow used in ID+**)	300

* Fast Period and Slow Period are different than when using ID+ functionality reserved for Mobile Beacons in "Mobile+" Tag role. For all other roles, Fast Period and Slow Period must be equal. See Chapter 5 for more information. If these periods are not equal, the beacon will automatically rewrite the same value in Fast and Slow Period by the value entered in Slow Period.

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[1] The Tag Roles available depend on the Firmware version. A complete list of the roles available for each version can be found in the annex of this document.
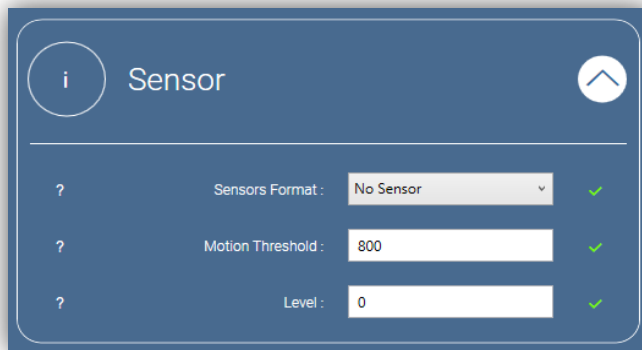
Parameters	Description	Default values
Sensors format	Choice of format associated with sensor reading if tag is equipped: [No Sensor – T – RHT – MAG – MOV – ANG – AI – Digi IN – Digi OUT – AT – PIR – Touch]	**No sensor***
Motion Threshold	Acceleration limit in milliG [32 – 8000] Used by ID+ location function and by MOV sensor function.	1000 milliG
Level	4 level used only for PIR Sensor, Sensibility of presence detection.	0 (Less sensitive)

* An Anchor or Mobile Beacon used in location application and not equipped with a sensor must have Sensor Format set to "No sensor".

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14/32
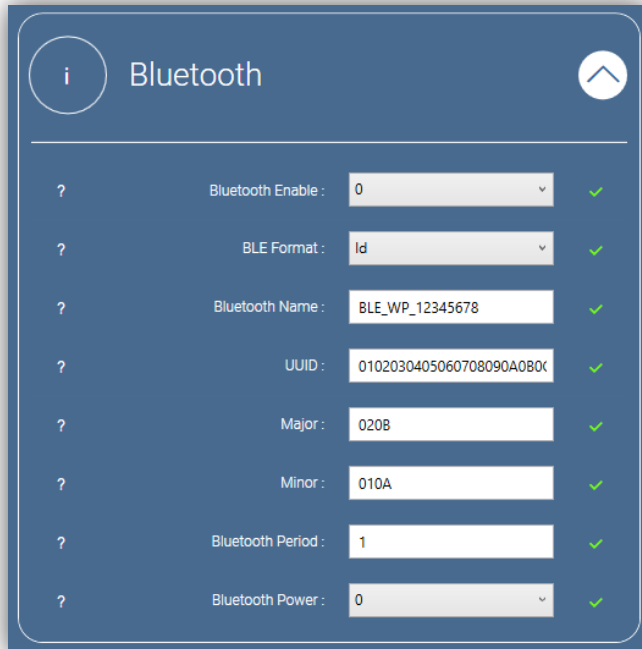
Parameters	Description	Default values
Bluetooth Enable	0: BLE frame deactivated. 1: BLE frame activated. 2: BLE frame activated when tags are offline (disconnected from mesh network)	0
BLE Format	Id: Advertising with Bluetooth Name. iBeacon: Advertising in Apple format with UUID – Major – Minor information.	Id
Bluetooth Name	15 Characters maximum.	BLE_WP_12345678
UUID (iBeacon format)	16 bytes in hexadecimal value	01020304050607080 90A0B0C0D0E0F10
Major (iBeacon format)	2 bytes in hexadecimal value	020B
Minor (iBeacon format)	2 bytes in hexadecimal value	010A
Bluetooth period	Advertising period in seconds [1 to 10]	1
Bluetooth power	Power [-8, -4, 0, 4]	0

H. Versions

ELA Firmware	WIREPAS Stack	Positioning Application	WIREPAS stack version compatibility	GATEWAY
v0.0.6	v3.4.47	v3.40	Incompatible with 4.x.x versions	v1.1.0
v1.0.0	v4.0.50	v4.0.0	Compatible with all 4.x.x versions	v1.3.0
v1.0.3	v4.0.70	v4.0.0	Compatible with all 4.x.x versions	v1.3.0
v2.0.0	v4.0.70	v4.0.1	Compatible with all 4.x.x versions	v1.3.0
v2.1.0	v4.0.70	v4.0.1	Compatible with all 4.x.x versions	v1.3.0
v2.1.1	v4.0.70	v4.0.1	Compatible with all 4.x.x versions	v1.3.0
v2.2.0	v4.0.70	v4.0.1	Compatible with all 4.x.x versions	v1.3.0
v2.2.1	v4.0.70	v4.0.1	Compatible with all 4.x.x versions	v1.3.0
v2.2.2 (PIR only)	v4.0.70	v4.0.1	Compatible with all 4.x.x versions	v1.3.0

The latest version (at the time of this writing) is v2.2.2.

There is no incompatibility between the gateway version and the firmware version in tags on the network. The software environment for the Wirepas gateway evolves according to customer requests as well as general bug fixes and improvements.

Details regarding parameters for other versions are available in the Annex of this document.

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7   COMMANDS VIA THE NETWORK: APPLICATION CONFIGURATION DATA

Command syntax:

[Class] [Type] [Length] [Value]

→   to send multiple commands at once the syntax is as follows:

[Class] [Type$_1$] [Length$_1$] [Value$_1$] [Type$_2$] [Length$_2$] [Value$_2$] … [Type$_N$] [Length$_N$] [Value$_N$]

Command field details:

[Class]: This parameter enables you to differentiate and address tag groups.

Sent commands are addressed to one or more Classes. It is important to know the tag class when sending commands.

[Type]: The type identifies the chosen functionality or parameter to modify.

* see complete list on next page.

[Length]: Data size (length).

[Value]: Value to be updated or activation / deactivation data.

* If "Length" is greater than 1, the value must be written with the least significant byte first.

Information and good practices

- The application configuration data can be up to 80 bytes.

- The class indicated in the following tables is provided as an example. You must enter the class corresponding to your tags when sending commands. Possible values are from 0xF9 to 0xFF.

- The identifier 0x00FA1221 indicated in the following tables is provided as an example. You must enter the identifier for your tag for an individual command addressed to a tag. For a general command addressed to all tags, simply replace the identifier with 0x00000000.

- When [Value] is larger than 1 byte, bytes must be in order with the least significant byte first (little endian).

- A sent command is persistent in the network. Each tag in the network receives this command, and each new tag entering the network also receives the command.

- However, only one command is persistent in the network at a time. As soon as a new command is sent, the previous command is overwritten. A tag that has not yet received the previous command will therefore never receive. It is therefore important to wait a sufficient amount of time, when sending multiple commands in a row, to ensure for message propagation in the entire network. This is especially important in a network with tags in Mobile/Mobile+ mode (NRLS), because these tags only receive commands upon wakeup.

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16/32

- A broadcast or unicast "ON" command to activate the LED and/or buzzer, either ontinuous or timed, must be followed by an "OFF" deactivation command of the same type to cancel that same command.

- If a tag is configured for Mobile Mode or Mobile+ "TAG NRLS" Long-life Mobile Beacon, it will receive the command and apply it upon wakeup. Its maximum standby time is equal to the configured data transmission period.

- No information is returned by tags in the network to know whether the command was properly received. You must calculate and wait the necessary time to be sure that all your tags receive the command.

- The commands available and examples are presented in the table below:

Configuration commands

Command	Class	Type	Length	Identifier	Data *example	Information
Fast Period	0xF9	0x10	0x08	0x2112FA00	0x20FD0000	[0x01 – 0xFD20] from 1 to 64800 seconds
Slow Period	0xF9	0x12	0x08	0x2112FA00	0x20FD0000	[0x01 – 0xFD20] from 1 to 64800 seconds
Acceleration limit	0xF9	0x14	0x08	0x2112FA00	0x401F0000	[0x20 – 0x1F40] from 32 to 8000 milliG
Activate BLE	0xF9	0x16	0x08	0x2112FA00	0x01000000	[0x00 – 0x02] OFF – ON – Specific ON
BLE period	0xF9	0x18	0x08	0x2112FA00	0x01000000	[0x01 – 0x0A] From 1 to 10 seconds
BLE power	0xF9	0x20	0x08	0x2112FA00	0x01000000	[0x01 – 0x04] -8, -4, 0, +4 dBm
Deactivate tag	0xF9	0x91	0x08	0x2112FA00	0x01000000	Reactivate only via NFC

Diagnostic commands

Command	Class	Type	Length	Identifier	Data *example	Information
Sequence Number	0xF9	0xA0	0x08	0x2112FA00	0x01000000	Returns the value of "Sequence Number"
Hardware version	0xF9	0xA1	0x08	0x2112FA00	0x01000000	Returns hardware version
Firmware version	0xF9	0xA2	0x08	0x2112FA00	0x01000000	Returns firmware version
Battery level	0xF9	0xA3	0x08	0x2112FA00	0x01000000	Returns the battery level

LED and buzzer activation commands

Command	Class	Type	Length	Identifier	Data *example	Information
LED	0xF9	0xE0	0x08	0x2112FA00	0x01000000	LED activation / deactivation
BUZZER	0xF9	0xE1	0x08	0x2112FA00	0x01000000	BUZZER activation / deactivation
LED & BUZZER	0xF9	0xE2	0x08	0x2112FA00	0x01000000	LED & BUZZER activation / deactivation

Data:

1st byte: 01 ➔ Activation – 00 ➔ Deactivation

2nd byte and 3rd byte: 0000 for infinite period.
May be replaced by a value to activate for a few seconds or minutes, for example:

C8 00 ➔ Activation for **200** seconds (0x00C8) (little endian)

10 0E ➔ Activation for **3600** seconds (0x0E10) (little endian)

4th byte: Not used.

Commands described here correspond to version v2.0.0 and above. Commands for versions previous are provided in the Annex of this document.

Examples:

In the following some examples are provided to demonstrate the functionality:

- Deactivate LEDs of an entire class (0xF9):

    F9 E0 08 00 00 00 00 00 00 00 00

- Activate the LED of a tag with ID 16388641 (=0xFA1221) in class 0xF9 for 30 s (=0x1E):

    F9 E0 08 21 12 FA 00 01 1E 00 00

- Multi command: Change Fast Period to 12s (=0x0C) and Slow Period to 3600s (0x0E10) for class 0xFB:

    FB 10 08 00 00 00 00 0C 00 00 00 12 08 00 00 00 00 10 0E 00 00

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18/32

Sending a command via the Wirepas Network Tool Client

- Open the **Settings** menu and select the **Network** tab.
- Choose your network.
- Enter the command in the "Application Data" field and then click on "Apply network data".

The command sent above activates the LED on a tag whose identifier is 0x00FA1221 (little endian), with a Class of 0xF9.

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19/32

8 CONFIGURATION OVER THE NETWORK: MQTT TOPIC

These commands can only be used for devices that are always connected to the network (Anchor, Mobile HC and Sensor). Mobile beacons in NRLS mode (Mobile or Mobile+) cannot receive these commands due to the network disconnection during their sleep phase between two measurement updates.

LED and buzzer activation commands

Functionality	Product	Endpoint source	Endpoint destination	Description	
				Command	**ACK**
LED ON	BLUE PUCK ID MESH BLUE PUCK BUZZ MESH BLUE COIN ID MESH BLUE ANCHOR	20	20	LED_ON	OK: 00 NOK: 01
LED OFF		20	20	LED_OFF	OK: 00 NOK: 01
LED ON Time * "Time" in seconds		20	20	LED_ON 10 *10 seconds	OK: 00 NOK: 01
BUZZ ON	BLUE PUCK BUZZ MESH	20	20	BUZZ_ON	OK: 00 NOK: 01
BUZZ OFF		20	20	BUZZ_OFF	OK: 00 NOK: 01
BUZZ ON Time * "Time" in seconds		20	20	BUZZ_ON 10 *10 seconds	OK: 00 NOK: 01
LEDBUZZ ON	BLUE PUCK BUZZ MESH	20	20	LEDBUZZ_ON	OK: 00 NOK: 01
LEDBUZZ OFF		20	20	LEDBUZZ_OFF	OK: 00 NOK: 01
LEDBUZZ ON Time * "Time" in seconds		20	20	LEDBUZZ_ON 10 *10 seconds	OK: 00 NOK: 01

Diagnostic commands

| Functionality	Product	Endpoint source	Endpoint destination	Description	
				Command	**Information**
Battery level	BLUE PUCK ID MESH BLUE PUCK BUZZ MESH BLUE COIN ID MESH BLUE ANCHOR	50	50	GET_BATT_VOLTAGE	Returns the battery level
Hardware version		50	50	HW_VERS	Returns hardware version
Firmware version		50	50	FW_VERS	Returns firmware version
Sequence Number		50	50	SCRATCHPAD_INFO	Returns the value of the scratchpad sequence number

Response diagnostic commands

Functionality	Topic	Data			Results	
		Type	**Length**	**Received data**	**Interpreted data**	**Value**
Battery level	11	01	02	BD 0B	0x0BBD	3.005 v
Hardware version	50	-	-	13 05 24 10	0x10240513	(used for internal diagnostics)
Firmware version	50	-	-	02 00 40 70 04 01	0x0200 0x4070 0x0401	FW version 200 Stack version 4.0.70 PosApp version 4.0.1
Sequence Number	50	-	-	03 00 01 00	0x00 03 0x00 01	Scratchpad sequence number: 3 Processed scratchpad sequence number: 1

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21/32

9   VIEWING TOOLS

Wirepas Network Tool (WNT)

- Run the provided **WNT** software installation tool.

- Run the **WNT** application.

- Fill in the field "**LOGIN SERVER ADDRESS**" with your "login server" provided with your kit. This information corresponds to your "instance".

  <u>Example:</u> **wss://yourcompanywpewnt.extwirepas.com:8813**
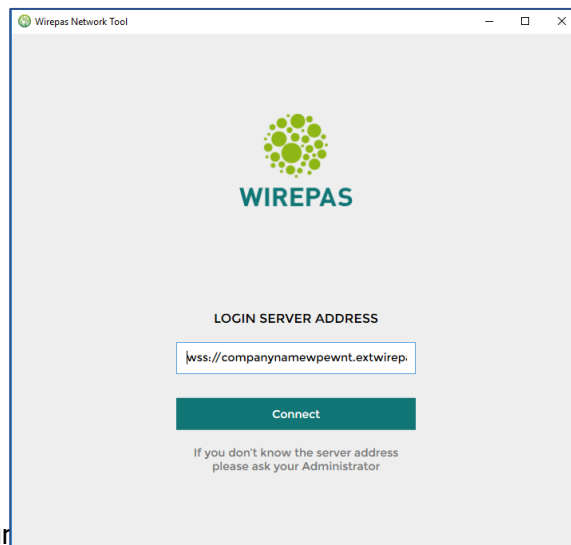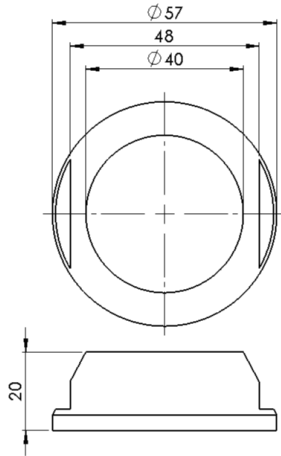

- Enter your [...] click on **Log in**.

This application enables you to monitor your network(s), view specific data for your objects and to view your locatable objects.
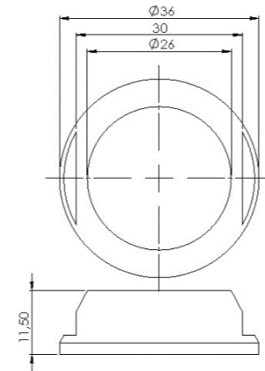
For more information about using the Wirepas Network Tool application, please see the user guide available upon request from Wirepas Support.

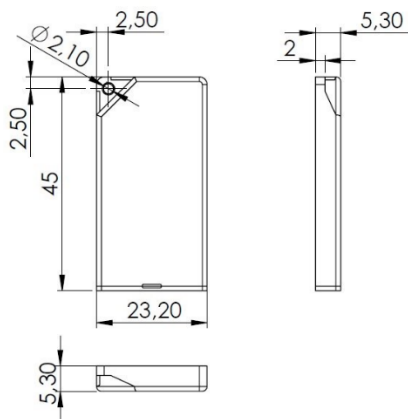*WP-UG-421 - Wirepas Network Tool - Client User Guide*
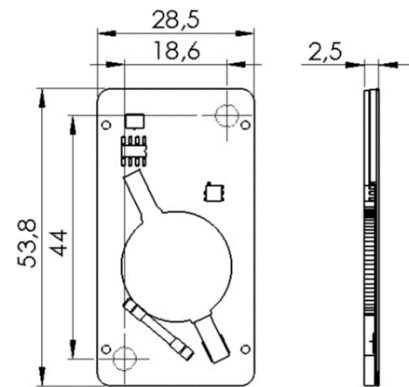
10 HARDWARE SPECIFICATIONS

- **PUCK module**

- **COIN module**

- **LITE module**

- **SLIM module**

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11 SALES REFERENCES

DESCRIPTION	PRODUCT REFERENCE	DESCRIPTION
Blue PUCK **ID MESH**	IDF25440X	**ID MESH** location tag
Blue PUCK **ID+ MESH**	IDF25451X	**ID+ MESH** location tag
Blue PUCK **BUZZ MESH**	IDF31445X	**BUZZ MESH** location tag
Blue PUCK **BUZZ+ MESH**	IDF25449X	**BUZZ+ MESH** location tag
Blue COIN **ID MESH**	IDF10440X	**ID MESH** location tag
Blue COIN **ID+ MESH**	IDF10451X	**ID+ MESH** location tag
Blue SLIM **ID MESH**	IDF03440X	**ID MESH** location tag
AERO **ID+ MESH**	IDF10651X	**ID+ MESH** location tag
Blue SLIM **ID+ MESH**	IDF03451X	**ID+ MESH** location tag
Blue LITE **ID MESH**	IDF28440X	**ID MESH** location tag
Blue LITE **ID+ MESH**	IDF28451	**ID+ MESH** location tag
Blue ANCHOR	IDF32450X	**ID MESH** location tag

12 STANDARDS AND CERTIFICATIONS

- CE logo

- FCC mark

- IC Mark

- RoHS certified

- Wirepas Mesh

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13 ANNEX

The Annex provides a complete list of the Tag Roles available for the different Firmware version 2.x.x as well as the settings for BLUE MESH versions, and the LED and buzzer command set for versions prior to v2.0.0.

Tag Roles – v2.x.x

v2.0.0	v2.1.0/ v2.1.1	v2.2.0/ v2.2.1/ v2.2.2
ANCHOR	Anchor	Anchor
TAG NRLS	Mobile	Mobile
-	Mobile+ (new)	Mobile+
TAG AS	Mobile HC	Mobile AS
AUTOROLE	Sensor	Sensor AR
-	-	Sensor R (new)
-	-	Sensor NR (new)

Parameters for version v1.0.3 – Wirepas stack 4.0.70

Parameters	Restrictions	Default values	Description
Tag identifier	6 characters (required): [0-9] [A-F] * hexadecimal value	24-bit identifier Ex: 52A6F9	Tag identifier in MESH network, user modifiable.
Tag activation	True/False	False	Tag activation / deactivation (storage mode)

Mode	NRLS tag: 1 *Non-router Long Sleep*
	Autoscan tag: 2
	Autoscan anchor: 3
	Opportunistic anchor: 4
	
	* decimal value
		3	Tag mode in Wirepas network:
			
			- location function
			    Anchor: 4
			    Mobile tag, NRLS: 1
			
			- Sensor function
			    Autoscan anchor: 3
			
			- Sensor and location function
			    Anchor: 4
			    Mobile tag, NRLS: 1

Class	Possible values from 0xF9 to 0xFF * hexadecimal value	FA	Creation of tag groups Example: - PUCK: class 0xFA - COIN: class 0xFB - SLIM: class 0xFC

Node role	0x01: Router
	0x02: Non-router
	0x41: Router with Autorole mode
	0x42: Non-router with Autorole mode
	
	* hexadecimal value
		41	Tag function in Wirepas network
			
			- location function
			    Anchor: 01
			    Mobile tag: 02
			
			- Sensor function
			    Autorole: 41

Network channel	2 characters (required): [0-9] [A-F] * hexadecimal value	04	MESH network channel (8 bits)
Network address	6 characters (required): [0-9] [A-F] * hexadecimal value	123ADD	MESH network address (24 bits)
Minimum location period	Period of rapid location frame emission From 15 seconds to 64800 seconds (18 hrs.)	300 (seconds)	Period of rapid tag position updates, in seconds: automatic change of slow/rapid period possible only with **ID+ MESH** models.

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Maximum location period	Period of slow location frame emission From 15 seconds to 64800 seconds (18 hrs.)	300 (seconds)	Period of slow tag position updates, in seconds: automatic change of slow/rapid period possible only with **ID+ MESH** models.
Threshold	Possible values from 0001 to 07FF	0050	Threshold used by accelerometer when Min Period is different from Max Period. Min Period must always be less than Max Period.
BLE beacon name	BLE beacon tag name	BLUETAGID ELAWP	BLE tag name: 15 characters
BLE BEACON activation	Activation of BLE Beacon mode 0: deactivation, BLE BEACON OFF 1: activation, BLE BEACON ON 2: activation, BLE BEACON ON WHEN OFFLINE	0	Activation / Deactivation of BLE Beacon function 0: deactivation, BLE BEACON OFF 1: activation, BLE BEACON ON 2: activation, BLE BEACON ON WHEN OFFLINE, the BLE Advertising Beacon is activated only when the tag is in OFFLINE mode, that is, when the tag is activated but not connected to its mesh network.
BLE transmission interval	BLE Beacon advertising period	1 (second)	BLE advertising period in seconds, range 1 to 10
BLE power	BLE Beacon tag power:	0	BLE transmission power: [-8, -4, 0, 4]
Format	Tag format	ID	Available formats: ID – T – RHT – MAG – DI – DO - AT
location activation	True/False	False	Activation / deactivation of location function Anchors and mobile tags in a location network must have this parameter set to "True". This parameter must be set to "False" for a sensor network that does not use the location function.

Parameters for version v1.0.0 – Wirepas stack 4.0.50

Parameters	Restrictions	Default values	Description
Tag identifier	6 characters (required): [0-9] [A-F] * hexadecimal value	24-bit identifier Ex: 52A6F9	Tag identifier in MESH network, user modifiable.
Tag activation	True/False	False	Tag activation / deactivation (storage mode)
Class	Possible values from 0xF9 to 0xFF * hexadecimal value	FA	Creation of tag groups Example: - PUCK: class 0xFA - COIN: class 0xFB - SLIM: class 0xFC

Node role	0x01: Router
	0x02: Non-router
	Not used for location function:
	0x41: Router with Autorole mode
	0x42: Non-router with Autorole mode
	0x11: Router with low latency mode
	0x12: Non-router with low latency mode
	* hexadecimal value
		01	Tag function in Wirepas network
			
			- location function
			  Anchor: ROUTER, value 01
			  Mobile tag: NON-ROUTER, value 02

Mode	NRLS tag: 1 *Non-Router Long Sleep*
	Autoscan tag: 2
	Autoscan anchor: 3
	Opportunistic anchor: 4
	
	* decimal value
		4	Tag mode in Wirepas network:
			
			- location function
			  Anchor: ROUTER, value 4
			  Mobile tag: NON-ROUTER, value 1

Network channel	2 characters (required): [0-9] [A-F] * hexadecimal value	04	Mesh network channel
Network address	6 characters (required): [0-9] [A-F] * hexadecimal value	001234	Mesh network address
Minimum location period	Emission period of location frame From 15 seconds to 64500 seconds	300 (seconds)	**Required:** The minimum period must be the same as the maximum period
Maximum location period	Emission period of location frame From 15 seconds to 64500 seconds	300 (seconds)	**Required:** The minimum period must be the same as the maximum period
Threshold	Possible values from 0001 to 07FF	0050	**Not used**
BLE beacon name	BLE beacon tag name	BLUETAGID ELAWP	BLE tag name: 15 characters

BLE BEACON activation	Activation of BLE Beacon mode	0	Activation / Deactivation of BLE Beacon function

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	0: deactivation, BLE BEACON OFF 1: activation, BLE BEACON ON 2: activation, BLE BEACON ON WHEN OFFLINE		0: deactivation, BLE BEACON OFF 1: activation, BLE BEACON ON 2: activation, BLE BEACON ON WHEN OFFLINE, the BLE advertising beacon is activated only when the tag is in OFFLINE mode, that is, when the tag is activated but not connected to its mesh network. **Not operational for this version** **Recommendation: do not activate this functionality**
BLE transmission interval	BLE Beacon advertising period	1 (second)	BLE advertising period in seconds, range 1 to 10
BLE power	BLE Beacon tag power:	0	BLE transmission power: [-8, -4, 0, 4]

Parameters for version v0.0.6 – Wirepas stack 3.4.47

Parameters	Restrictions	Default values	Description
Tag identifier	6 characters (required): [0-9] [A-F] * hexadecimal value	24-bit identifier Ex: 52A6F9	Tag identifier in MESH network, user modifiable.
Tag activation	True/False	False	Tag activation / deactivation (storage mode)

Node role	0x01: Router
	0x02: Non-router
	Not used for location function:
	0x41: Router with Autorole mode
	0x42: Non-router with Autorole mode
	0x11: Router with low latency mode
	0x12: Non-router with low latency mode
	* hexadecimal value
		01	Tag function in Wirepas network
			
			- location function
			    Anchor: ROUTER, value 01
			    Mobile tag: NON-ROUTER, value 02

Flag	0x00: Low energy 0x40: Autorole 0x10: Latency mode * hexadecimal value	40	Tag function in Wirepas network
Network channel	2 characters (required): [0-9] [A-F] * hexadecimal value	04	Mesh network channel
Network address	6 characters (required): [0-9] [A-F] * hexadecimal value	001234	Mesh network address
Location function	True/False	True	Activation / deactivation of location function

Mode	NRLS tag: 1 * Non-Router Long
	Sleep
	Autoscan tag: 2
	Autoscan anchor: 3
	Opportunistic anchor: 4
	* decimal value
		4	location tag mode in Wirepas network
			
			- location function
			    Anchor: ROUTER, value 4
			    Mobile tag: NON-ROUTER, value 1

Location period	Emission period of location frame From 15 seconds to 1800 seconds	300 (seconds)	Tag position update period in seconds
BLE BEACON activation	Activation of BLE Beacon mode True/False	False	Activation / Deactivation of BLE Beacon function **Not operational for this version** **Recommendation: do not activate this functionality**
BLE name	BLE beacon tag name	BLUE TAG ID WPE	BLE tag name: 15 characters
BLE power	BLE Beacon tag power	0	BLE transmission power: [-8, -4, 0, 4]
Transmission interval	BLE Beacon advertising period	1000 (milliseconds)	BLE advertising period in milliseconds, range 100 to 10000

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Commands for Data Configuration Application version [v1.0.0 - v1.0.3]

Configuration commands

Not taken into account for NFC tag configuration and global commands addressed to all tags.

Command	Class	Type	Length	Data	Example
Scan period	0xF9	0x01	0x02	0x0258	0258 → 5802 = 600 seconds
Mode	0xF9	0x02	0x01	0x01	NRLS tag mode: 01
Class	0xF9	0x0A	0x01	0xFB	Class changes from F9 to FB

Global LED and buzzer activation commands (a.k.a. "Broadcast")

Command	Class	Type	Length	Data	Information
LED	0xF9	0xE0	0x04	0x01000000	The two bytes shown in red enable you to enter a time in seconds for LED and/or buzzer activation.
BUZZER	0xF9	0xE1	0x04	0x01000000	300 seconds: 0x012C0100 *Little endian*
LED & BUZZER	0xF9	0xE2	0x04	0x01000000	

Individual LED and buzzer activation commands (a.k.a. "Unicast")

ID example → 0x1215FA

Command	Class	Type	Length	Data	Information
LED	0xF9	0xE3	0x08	0x01FA151200000000	The two bytes shown in red enable you to enter a time in seconds for LED/ buzzer activation.
BUZZER	0xF9	0xE4	0x08	0x01FA151200000000	300 seconds: 0x012C0100 *Little endian*
LED & BUZZER	0xF9	0xE5	0x08	0x01FA151200000000	

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