

QUICK GUIDE: SMART MODULE LoRa

By reading this guide, you will gain the necessary knowledge to carry out the basic initial setup, the first startup, and the daily use of the Smart Module LoRa product.

Attention! First of all, it is necessary to connect the supplied antenna with the device turned off, and only after that turn it on.

Topics covered in the guide:

- Features list
- General operating principle
- Initial Configuration Management
- Startup and use

| Features list | |
|--|----------|
| MCU ESP32-S3FN8 | ■ |
| Wireless Connectivity 2.4 GHz Wi-Fi & Bluetooth 5 (LE) | ■ |
| 3,7v 2000 mA LiPo BATT | ■ |
| 0.96 inch Oled LCD | ■ |
| SX1262 LoRa Transceiver | ■ |
| External antenna, transmit power +21dBm | ■ |
| Band plan: 868 MHz | ■ |
| Band plan: 433 MHz | OPTIONAL |

General operating principle

This device allows you to transform any smartphone into a terminal for accessing the LoRa network in the 868 MHz band (optionally 433 MHz).

All you need is a smartphone and its case with the Meshtastic app installed, available from the app store, to communicate with the LoRa device via Bluetooth.

It enables access to and use of messaging and group location services using the LoRa protocol network.

Two or more LoRa technology terminals can communicate with each other without the aid of other technologies (WiFi, cellular networks, etc.) as long as they are located within their direct range (a few kilometers) or using the "Meshed" network principle.

The Meshed network is implemented by each powered-on terminal, which automatically acts as an active repeater for messages from anyone within its range.

Through this "store & forward" mechanism, the Meshed network allows for a theoretical extension of the range up to several dozen kilometers.

A key factor in achieving this coverage extension is both the antenna system used by each terminal (internal or external) and the possible presence of fixed repeater terminals located in strategic positions for this purpose (typically at high altitudes) as well as terminals already active in a given area.

The services available in this area are:

- Encrypted short messaging: the ability to exchange short messages between participants in a specific group or directly between two terminals; the messages are decrypted only by them as they hold the appropriate encryption key.
- Real-time group location: it is possible to automatically share the position of the group members and display it live on a display map

Initial Configuration Management

The Meshtastic LoRa Smart Module device comes with a standard configuration based on the bandplan used (shown below).

Tip: Depending on the region of use, the LoRa network configuration will have its own specifics, which must be known to access.

Tip: To use and configure the device, you must connect a smartphone with the Meshtastic app installed via Bluetooth

1) Install and launch the Meshtastic app  on your smartphone with Bluetooth enabled.

2) **POWER ON:** If necessary, turn on the LoRa circuit board by pressing the top left button and verify that the control LED lights up.

Tip: **POWER OFF** procedure: press the button for at least 5 seconds and release it.

3) Pair the LoRa Smart Module on your smartphone using the Meshtastic app.

Tip: The LoRa circuit board displays the password.

4) Access the configuration menus, as per the manual available at:

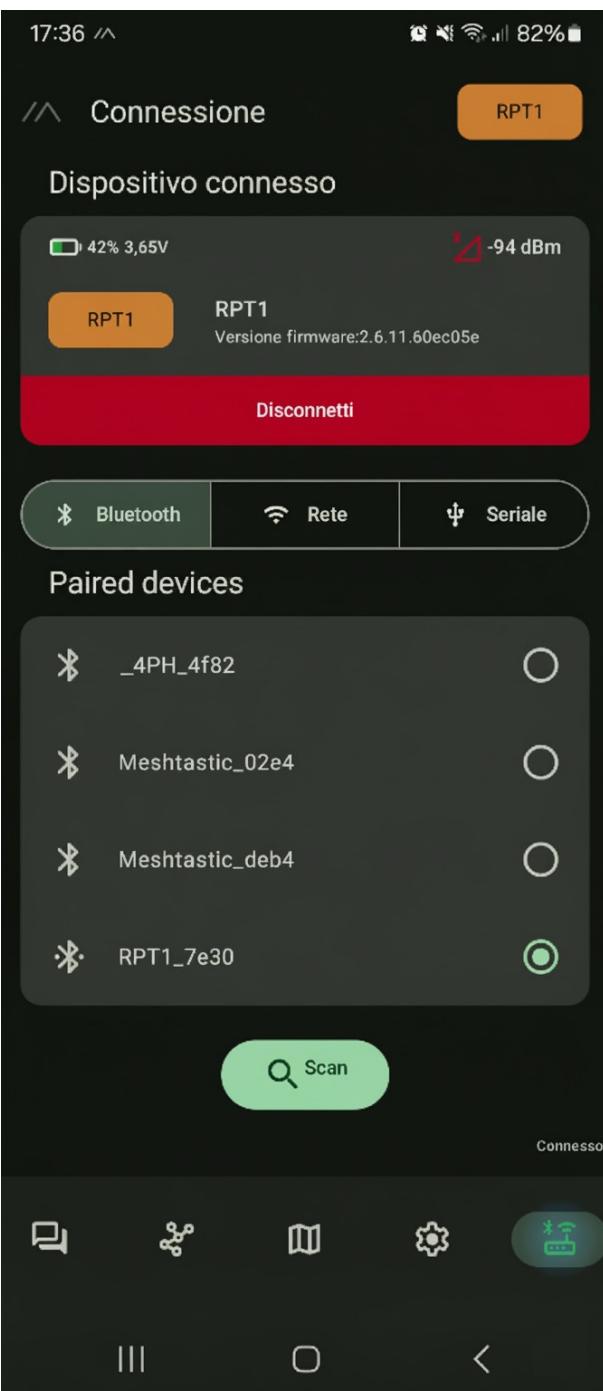
- <https://meshtastic.org/>
- <https://www.loraitalia.it/>

| Standard network configuration LoRa Meshtastic bandplan 868 MHz | | |
|---|------------------|---------------------------------------|
| userconfig | Longname | Changeable default value |
| | Shortname | Changeable default value, 4 chars max |
| | Licensed | NO |
| channels | Channel name | MediumFast |
| | PSK | AQ== |
| | position | YES |
| device | role | CLIENT |
| position | Smart enabled | YES |
| | GPS mode | ENABLED |
| LoRa | Use modem preset | YES |
| | Modem preset | MEDIUM_FAST |
| | hop | 3 |
| | TX enabled | YES |
| | TX power | 21 dBm |
| | RX boosted gain | YES |
| | slot | 1 |
| | region | EU868 MHz |

Standard network configuration LoRa Meshtastic bandplan 433 MHz

| | | |
|------------|------------------|--|
| userconfig | Longname | HAM ID |
| | Shortname | HAM ID shorted (4 chars) |
| | Licensed | YES |
| channels | Channel name | MediumSlow |
| | PSK | Cfr https://www.loraitalia.it/ FVNtESlvjcper4TmMzt4BuL9u8hWj4lrlTvCskQqOoHk= |
| | position | YES |
| device | role | CLIENT |
| position | Smart enabled | YES |
| | GPS mode | ENABLED |
| LoRa | Use modem preset | YES |
| | Modem preset | MEDIUM_SLOW |
| | hop | 3 |
| | TX enabled | YES |
| | TX power | 21 dBm |
| | RX boosted gain | YES |
| | slot | 4 |
| | region | EU433 MHz |

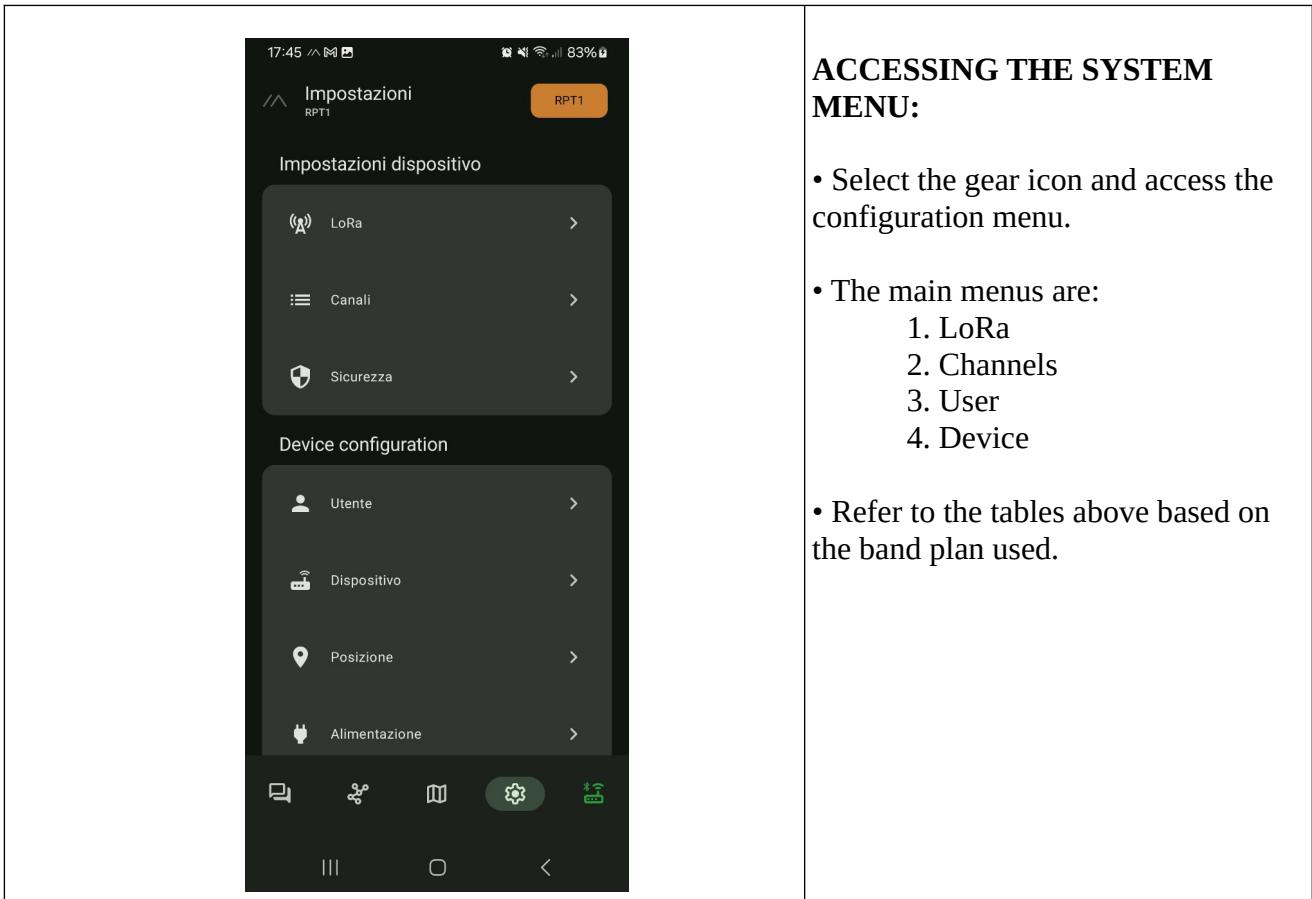
Smart Module LoRa: Startup and use



SYSTEM STARTUP:

After charging the device's internal battery and launching the Meshtastic app on your smartphone, you can now check and/or change its configuration:

- Select the Bluetooth tab and identify the device from the list after pressing the SCAN button.
- Perform pairing by selecting the device and verifying the Bluetooth connection status.
- Access the configuration (wheel) and usage menus (map, node list, messages) indicated by the icons at the bottom.



ACCESSING THE SYSTEM MENU:

- Select the gear icon and access the configuration menu.
- The main menus are:
 1. LoRa
 2. Channels
 3. User
 4. Device
- Refer to the tables above based on the band plan used.

Left Screen (General Options):

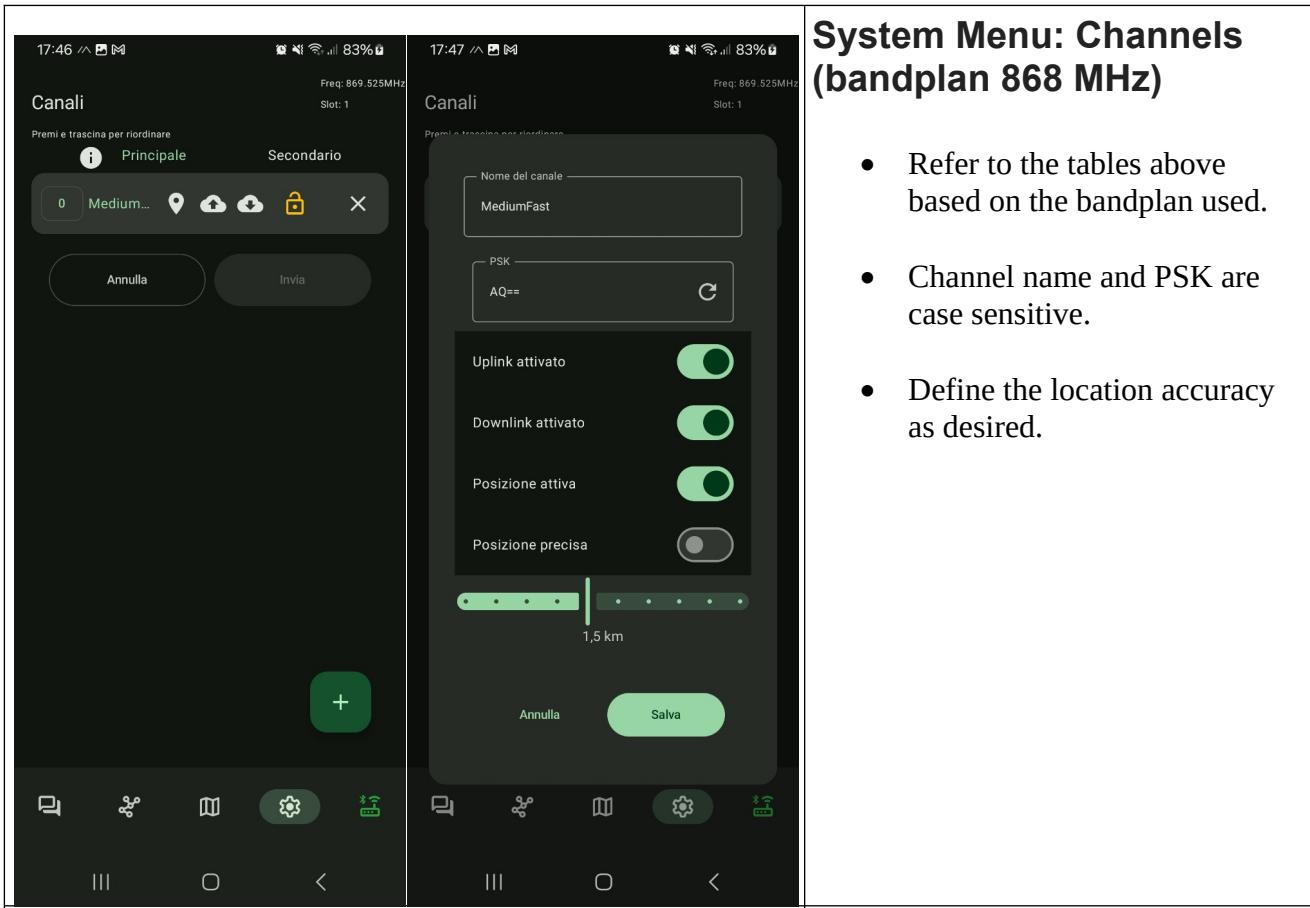
- Region: European Union 868MHz
- Usa Preset: Enabled
- Preset: Medium Range - Fast
- Advanced:
 - Ignora MQTT: Off
 - Ok to MQTT: On
 - Trasmissione Abilitata: On

Right Screen (Specific Parameters):

- Number of Hops: 5
- Slot di frequenza: 1
- RX Boosted Gain: On
- Frequency Override: 869.525
- Potenza Di Trasmissione: 27

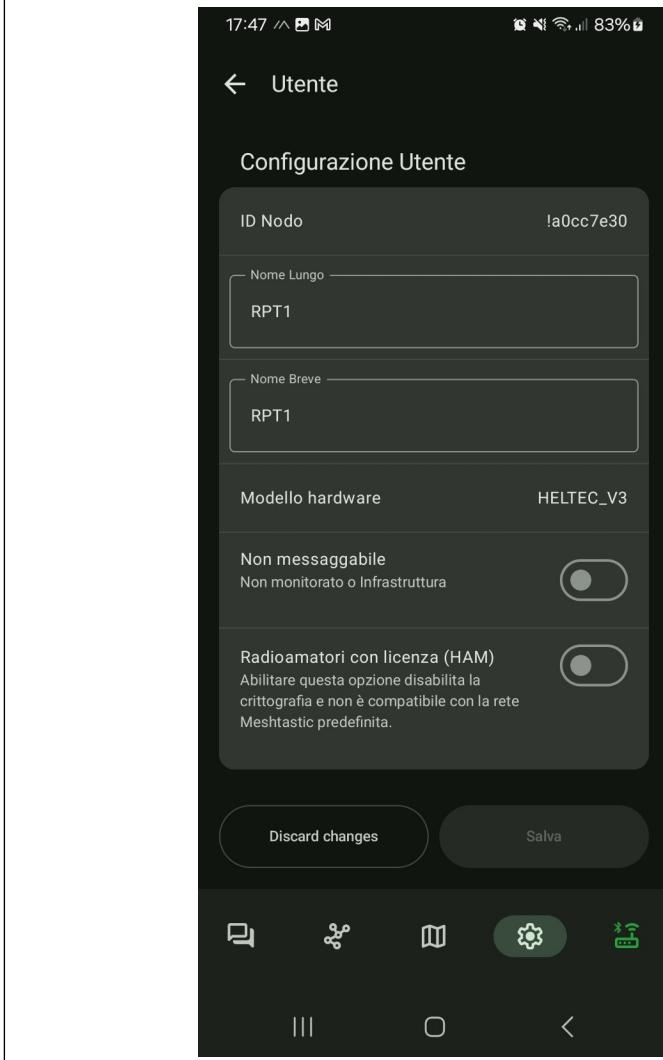
System Menu: LoRa (bandplan 868 MHz)

- refer to the tables indicated above based on the bandplan used



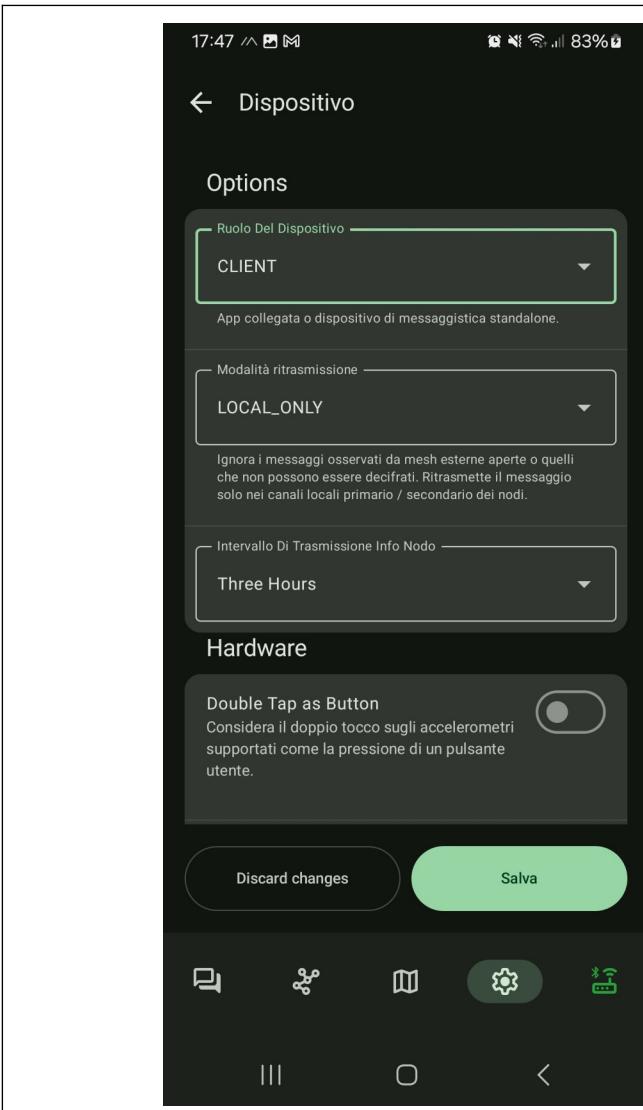
System Menu: Channels (bandplan 868 MHz)

- Refer to the tables above based on the bandplan used.
- Channel name and PSK are case sensitive.
- Define the location accuracy as desired.



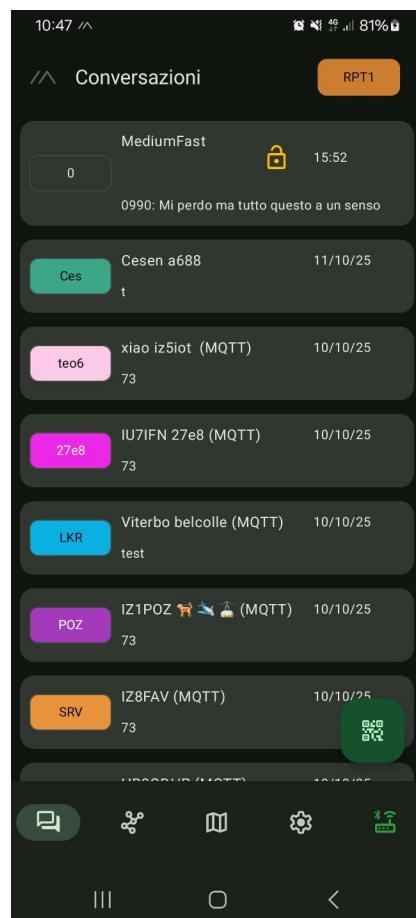
System Menu: User (bandplan 868 MHz)

- Refer to the tables above based on the band plan used.
- The Short Name is 4 characters long.



System Menu: Device (bandplan 868 MHz)

- refer to the tables indicated above based on the bandplan used



ACCESSING ACTIVE CHATS:

- Press the conversations icon from the main menu.
- The folder at the top indicates the default GROUP CHAT.
- Any folders below indicate INDIVIDUAL CHATS, if previously activated.
- Access the chats to start the conversation.
- The cloud with the V mark indicates the chat message has been forwarded correctly.
- A crossed-out cloud indicates a forwarding problem.
- To start a new individual chat: select the node from the node list and invoke the direct message.



NODE LIST:

- Press the nodes icon
- Our device is first at the top
- The nodes that are online or previously connected follow, depending on the activated filters.
- By clicking on a node, you can obtain details and perform actions, including:
 - Direct message
 - Traceroute
 - Exchange user information
 - Exchange location



MESH LIVE MAP:

- Press the map icon
- The nodes in the list that have shared their location will be displayed
- Clicking on the node displays details and actions
- Map panning and zooming