RAK2171 Quick Start Guide

Prerequisites

What Do You Need?

Before going through each and every step in the guide of the RAK2171 WisNode TrackIt, make sure to prepare the necessary items listed below:

- RAK2171 WisNode TrackIt
- WisGate Edge gateway
- An Android or iOS device with Bluetooth

What's Included in the Package?

- 2pcs RAK2171 WisNode TrackIt
- 2pcs Charging cable with magnetic plate
- 2pcs Protective silicone case

Figure 1: Inclusion list

Product Configuration

WisNode TrackIt supports three working modes:

1. LoRaWAN Mode
2. P2P Mode
3. Third-party LNS

the TrackIt App in this mode, you need to use RAK WisGate Edge

nfigured via the TrackIt application on your phone. The TrackIt application
ckers in the WisGate Edge gateways' Built-in Network Server.

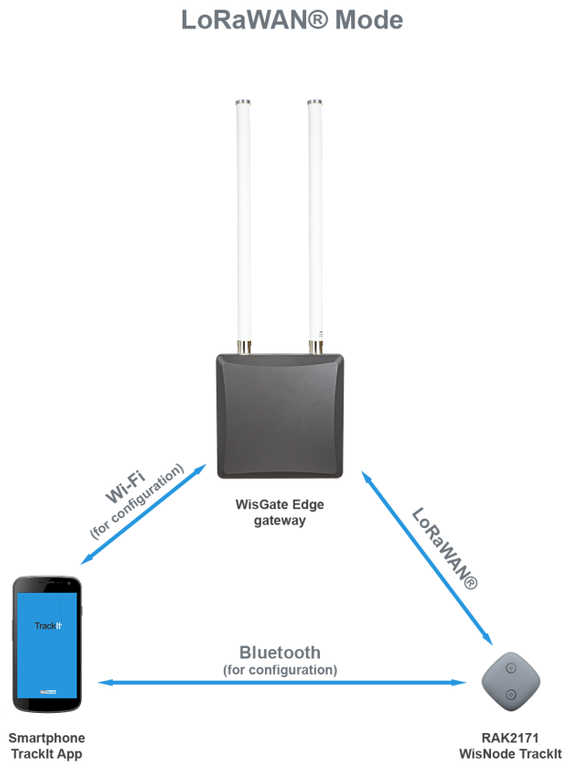

Figure 2: LoRaWAN mode

1. Download and install the **TrackIt App** on your smartphone.
2. Turn on the Bluetooth on tour smartphone.
3. Start the **TrackIt App**. Location permission may be requested, allow it.
4. Agree with the **Terms and Conditions** and the **Privacy Policy**, and press the **Sign in with RAK ID** button.

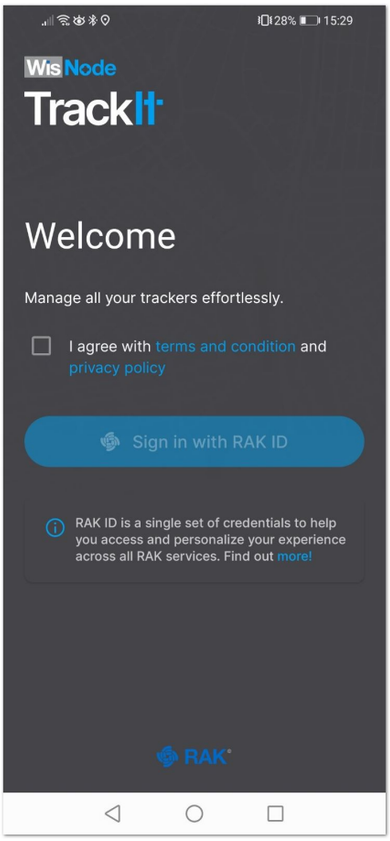

Figure 3: Welcome screen

5. Sign in with your RAK ID or sign up for a new RAK ID if you don't have an account. If you do not have a RAK ID, press the **Create new** link and fill the needed information.

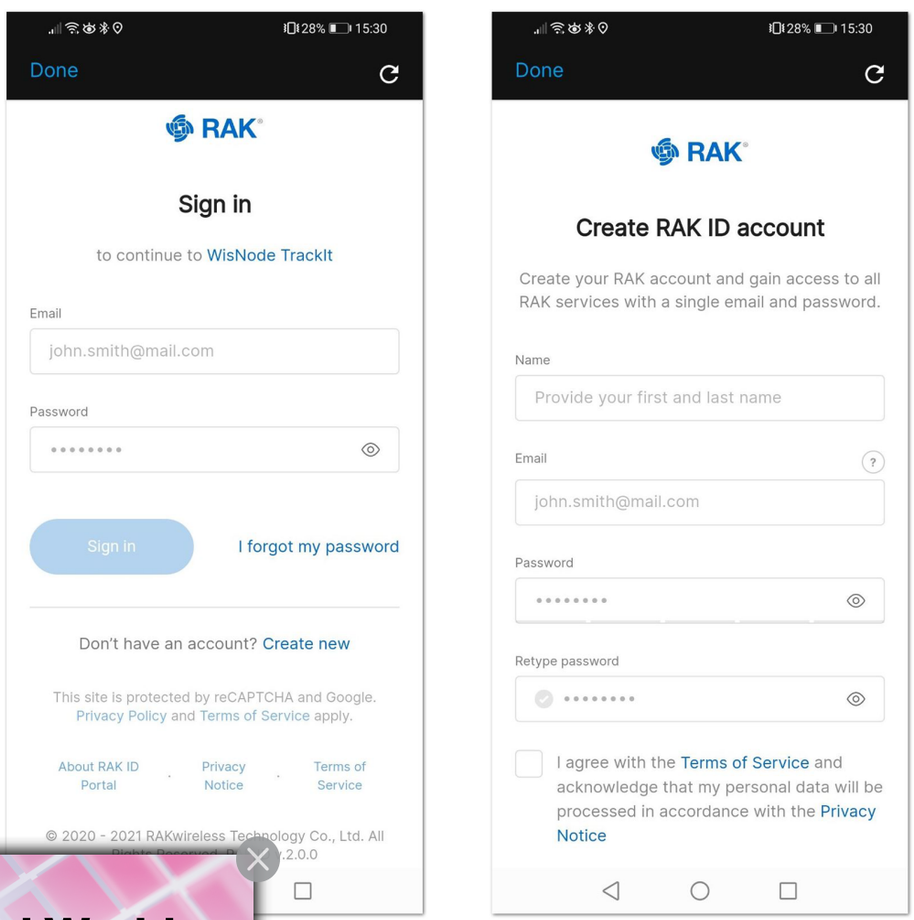

Figure 4: Sign in screen

you to add a tracker. To start the pairing process, press the **+ ADD**

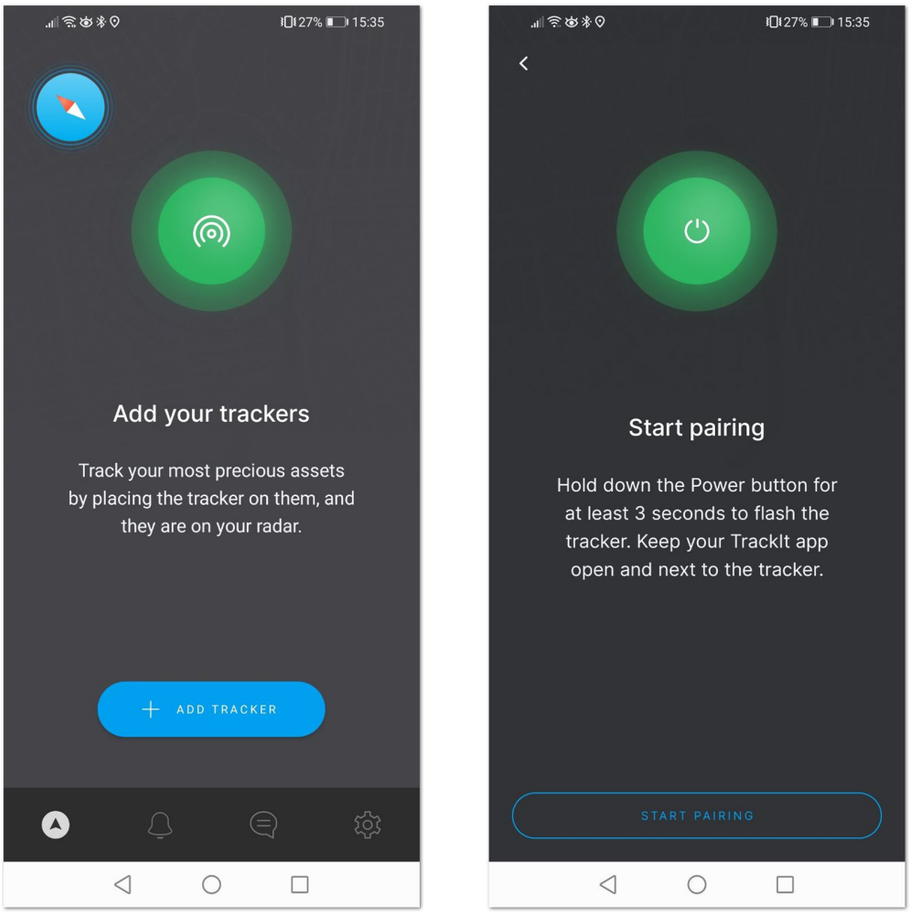

Figure 5: Add tracker and Start Pairing screen

7. Hold the **Power button** of your RAK2171 for 3 seconds to turn it on. If the device was turned on previously, you may need to restart it, as the Bluetooth is available for pairing for 3 minutes.

8. Press the **Start Pairing** in the app. An information screen will be displayed to inform you of the process.

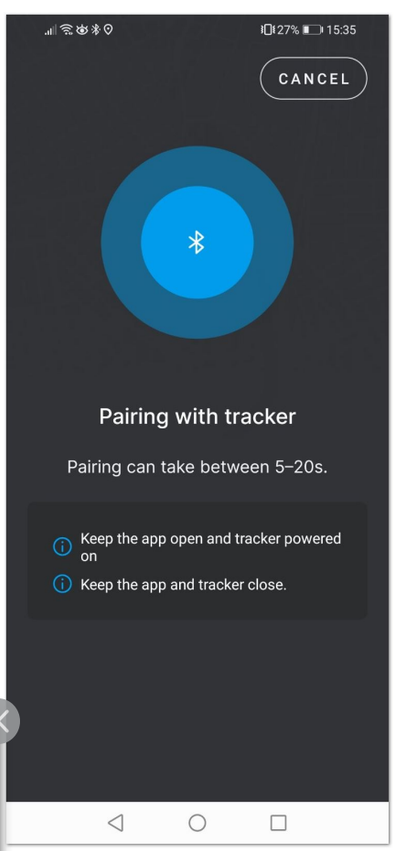

Figure 6: Pairing screen

th pair period has expired, you will see a **Tracker not found** message.

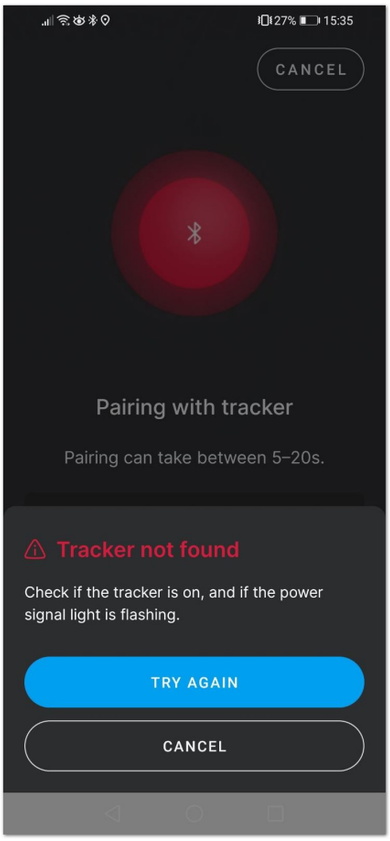

Figure 7: Pairing screen

9. After successful pairing, you will see a configuration screen, where you will be able to change the tracker's default name and the working mode. This section is for the LoRaWAN mode, so press the LoRaWAN button to change the mode from LoRa P2P to LoRaWAN.

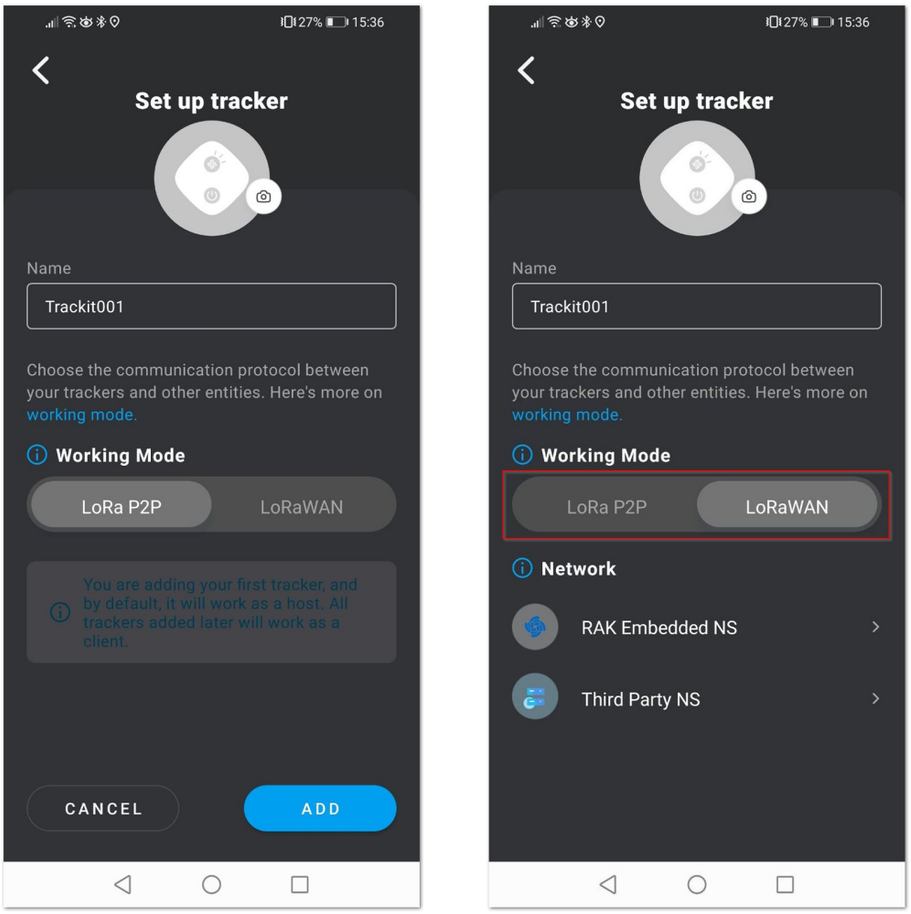

Figure 8: Set up screen

10. You will see two options: **RAK Embedded NS** and **Third Party NS**. For this mode, press **RAK Embedded NS**.

11. Confirm that the gateway is powered and ready by pressing the **GATEWAY ON** button.

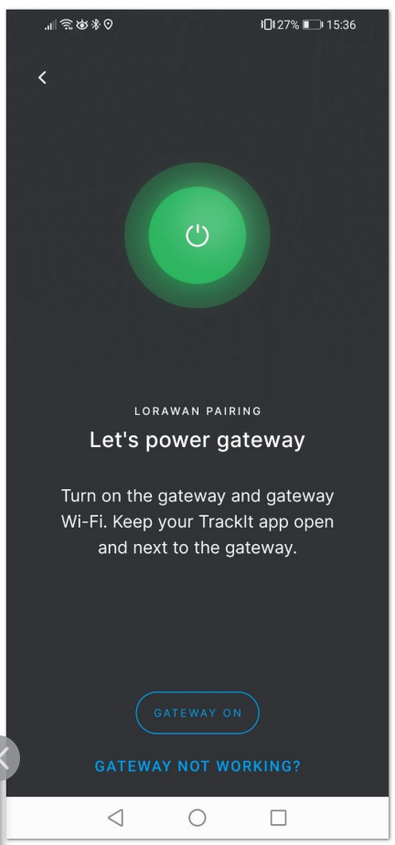

Figure 9: Gateway on confirmation

e Wi-Fi AP of your RAK gateway. Press the **GO TO WI-FI SETTINGS**
phone's Wi-Fi settings, where you need to find the RAK WisGate Edge
You will be promoted for the gateway's login credentials.

- By default,
  - Username: **root**
  - Password: **root**

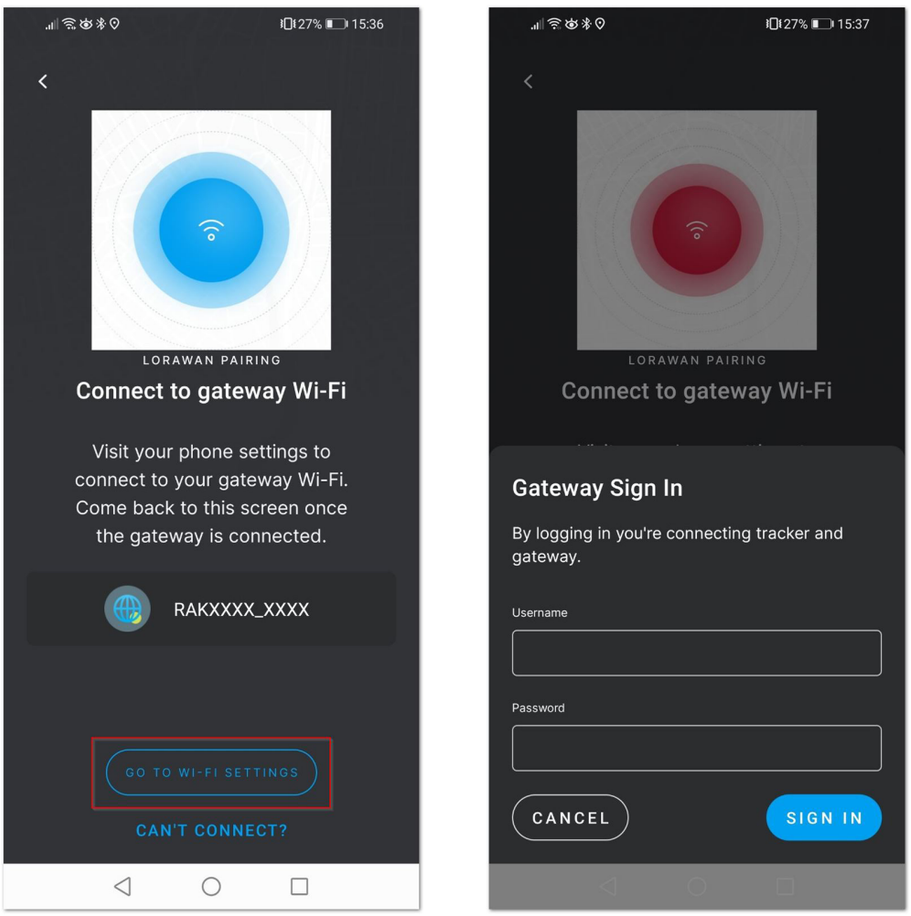

Figure 10: Connect to the gateway's Wi-Fi screen

13. After successful login, the TrackIt app will create an application in the gateway's built-In NS and will register the TrackIt device automatically. Once you are done, press the **VIEW ON MAP** button to see the WisNode TrackIt location on the application map.

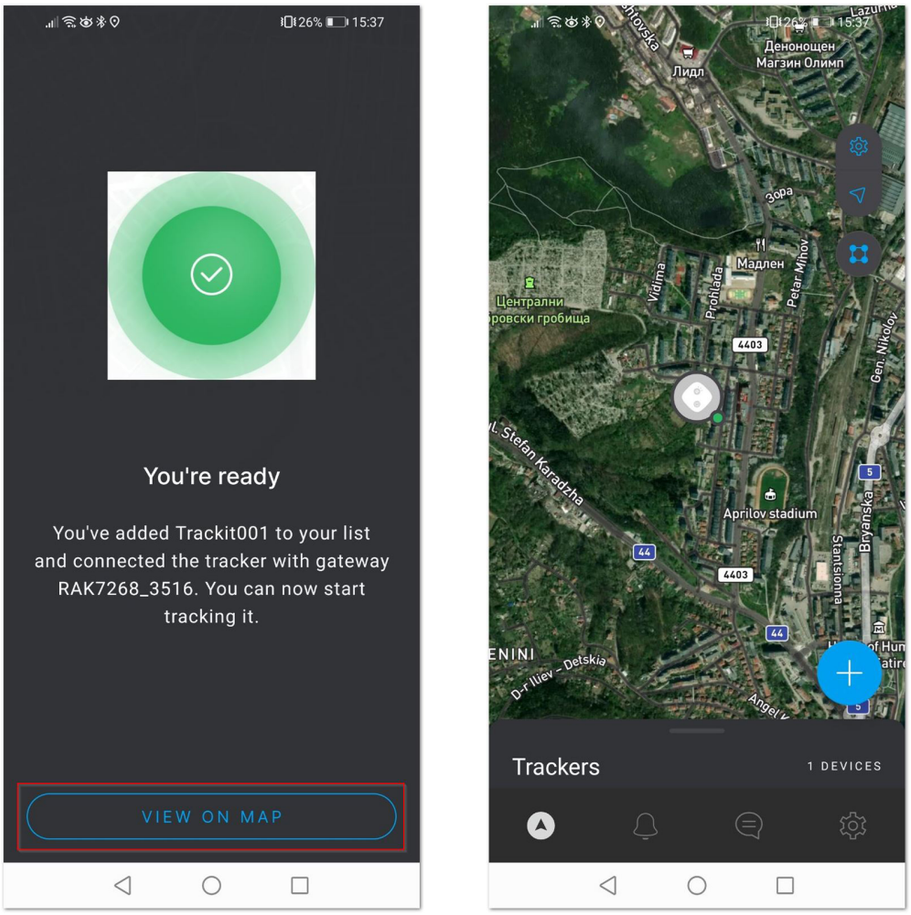

Figure 11: Successful connection screen

LoRa Peer-to-Peer (P2P) Mode

In this mode, no LoRaWAN gateway is needed, but you need at least two RAK2171 devices. One of the trackers is permanently connected via Bluetooth to the TrackIt App on your smartphone and acts a **Host**. The other tracker/s is/are registered as **Client** and send their data to the Host tracker.

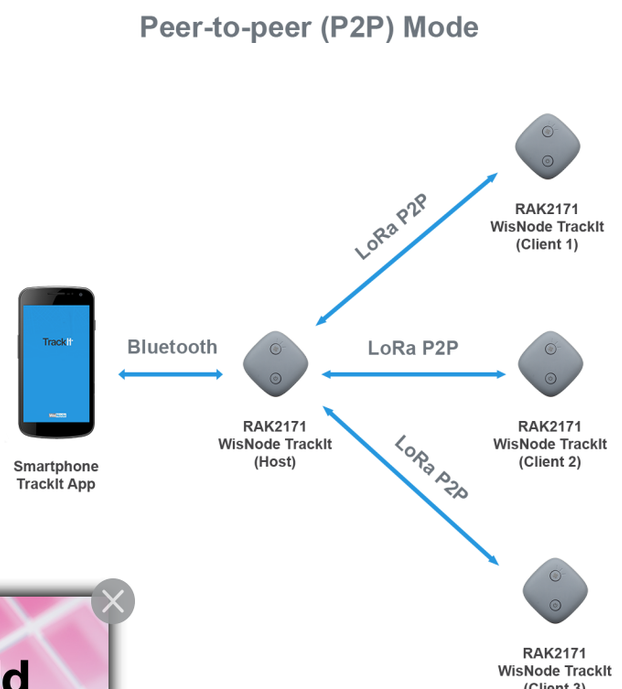

Figure 12: P2P mode

on your smartphone.

hone.

3. Start the **TrackIt App**. Location permission may be requested, allow it.
4. Agree with the **Terms and Conditions** and the **Privacy Policy**, and press the **Sign in with RAK ID** button.

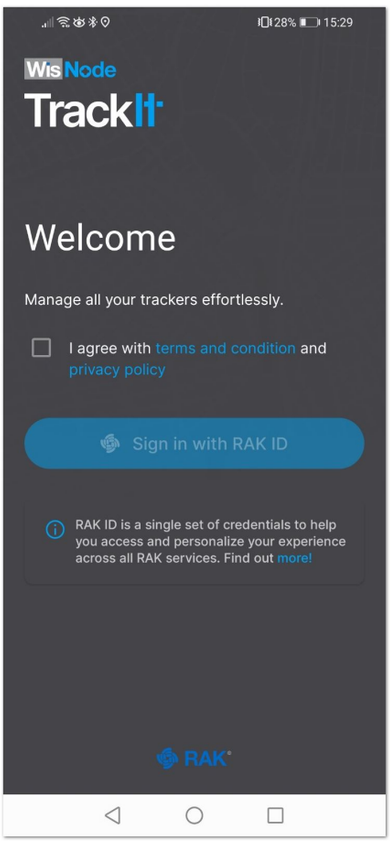

Figure 13: Welcome screen

5. Sign in with your RAK ID or sign up for a new RAK ID if you don't have an account. If you do not have a RAK ID, press the **Create new** link and fill the needed information.

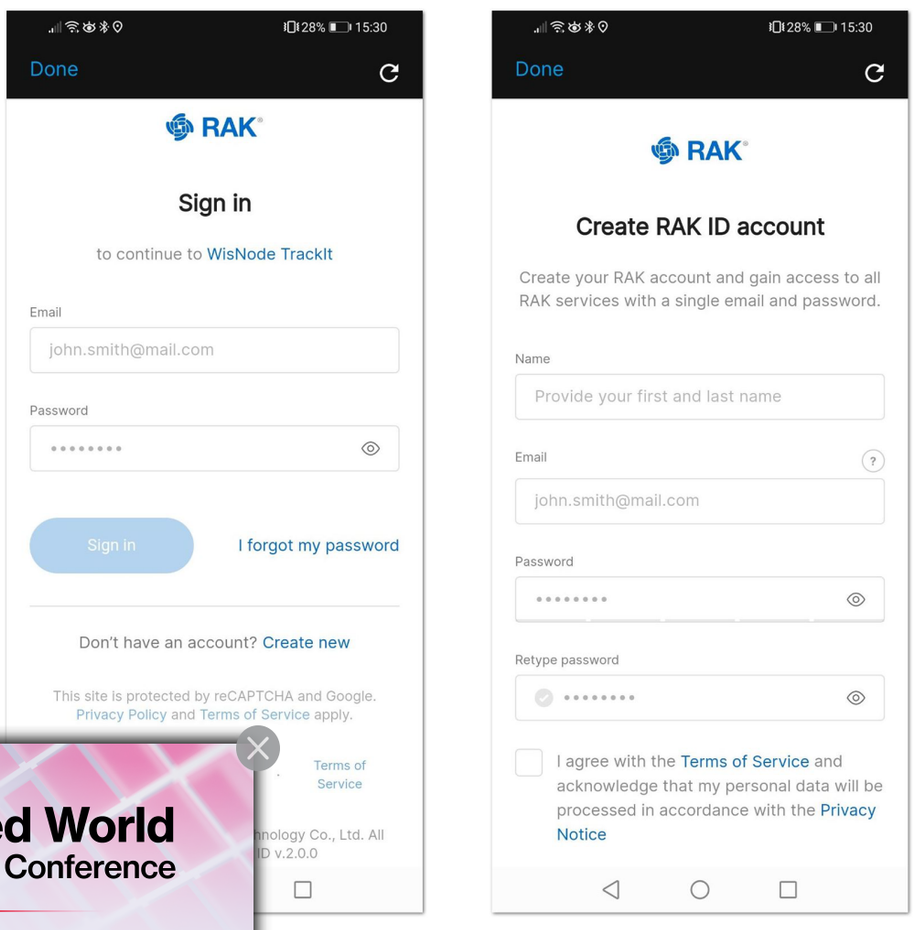

Figure 14: Sign in screen

6. After you log in, the App will prompt you to add a tracker. To start the pairing process, press the **+ ADD TRACKER** button.

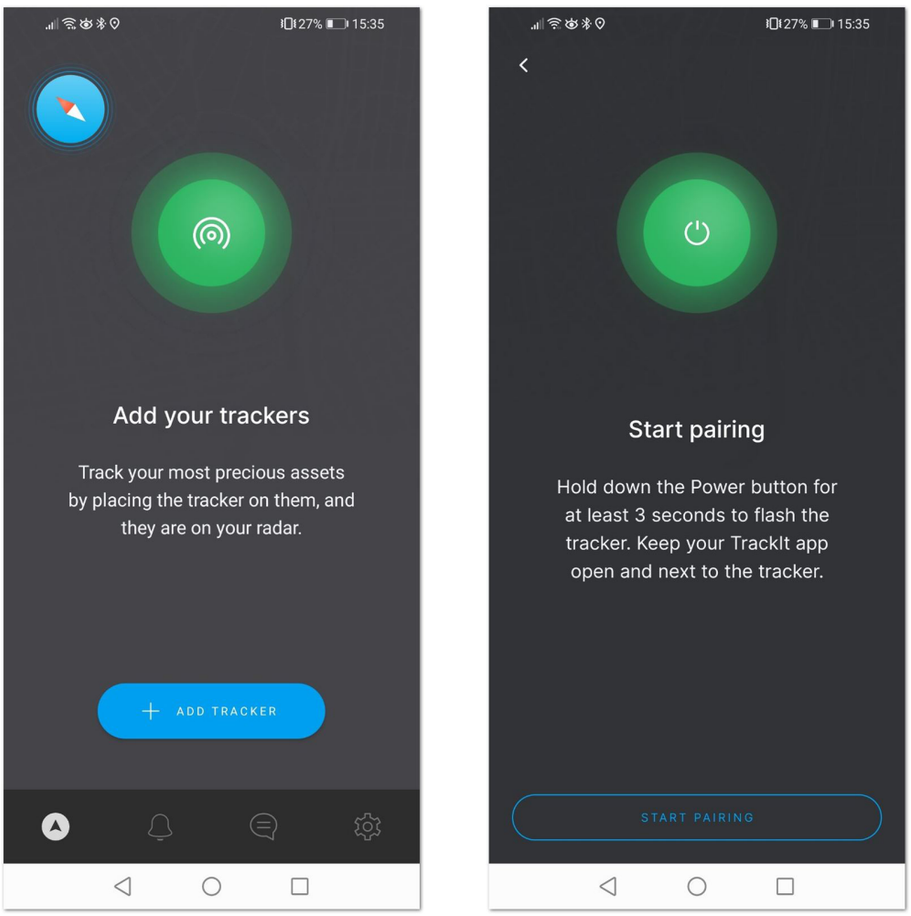

Figure 15: Add tracker and Start Pairing screen

7. Hold the **Power button** of your RAK2171 for 3 seconds to turn it on. If the device was turned on previously, you may need to restart it, as the Bluetooth is available for pairing for 3 minutes.

8. Press the **Start Pairing** in the app. An information screen will be displayed to inform you of the process.

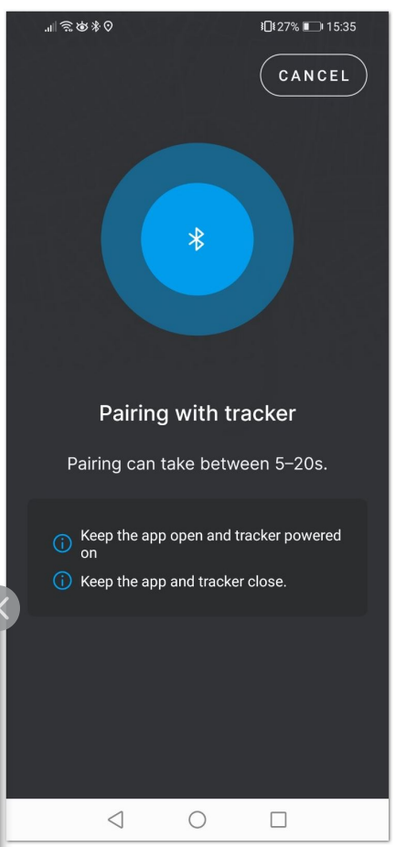

Figure 16: Pairing screen

If the tracker is turned off or the Bluetooth pair period has expired, you will see a **Tracker not found** message. Restart the tracker and try again.

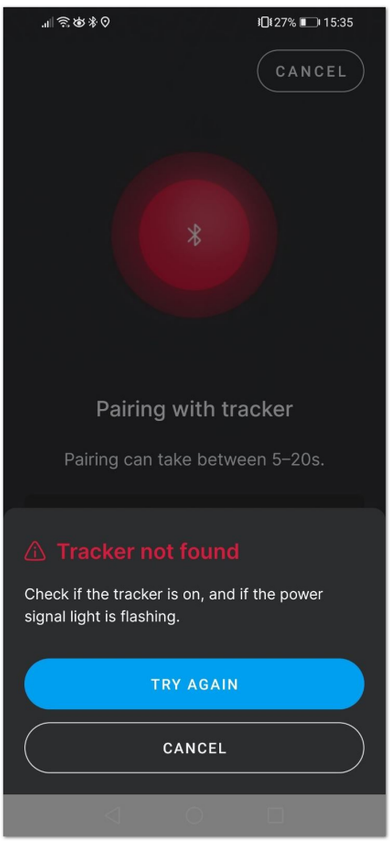

Figure 17: Pairing screen

10. After successful pairing, you will see a configuration screen, where you will be able to change the tracker's default name and the working mode.

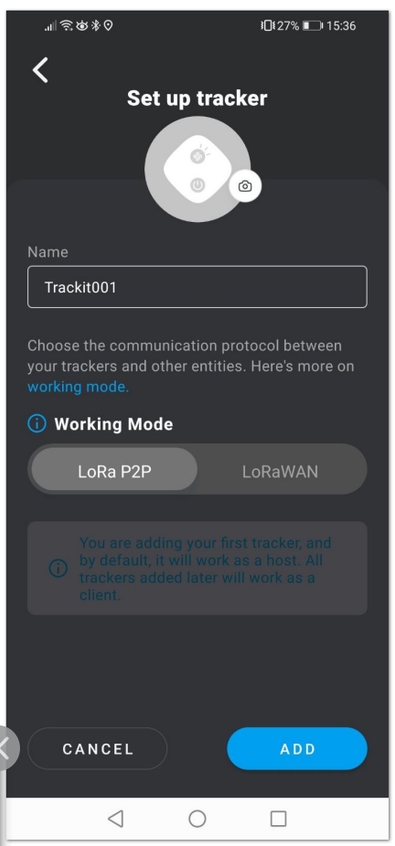

Figure 18: Set up screen

s **ADD**. Your tracker is now added as a **Host**, then press the **VIEW ON**
e Host should be always connected to your smartphone, this is also your

> 📝 **NOTE:**
>
> The first Tracker you add will act as a **Host**. All other trackers added will be **Clients**.

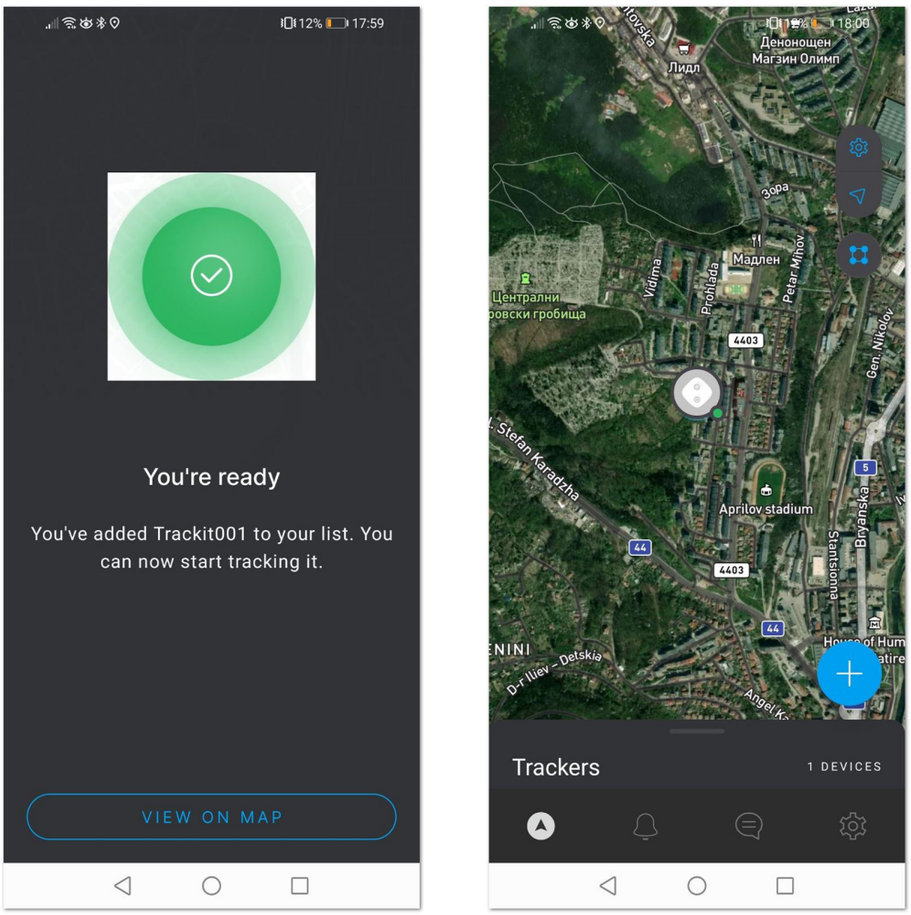

Figure 19: Host tracker is added

12. To add a **Client** tracker, press the **+** button on the map. The adding process is the same as for the **Host**. If you go to the map and slide up the menu at the bottom, you will see the registered trackers, their role, and battery status.

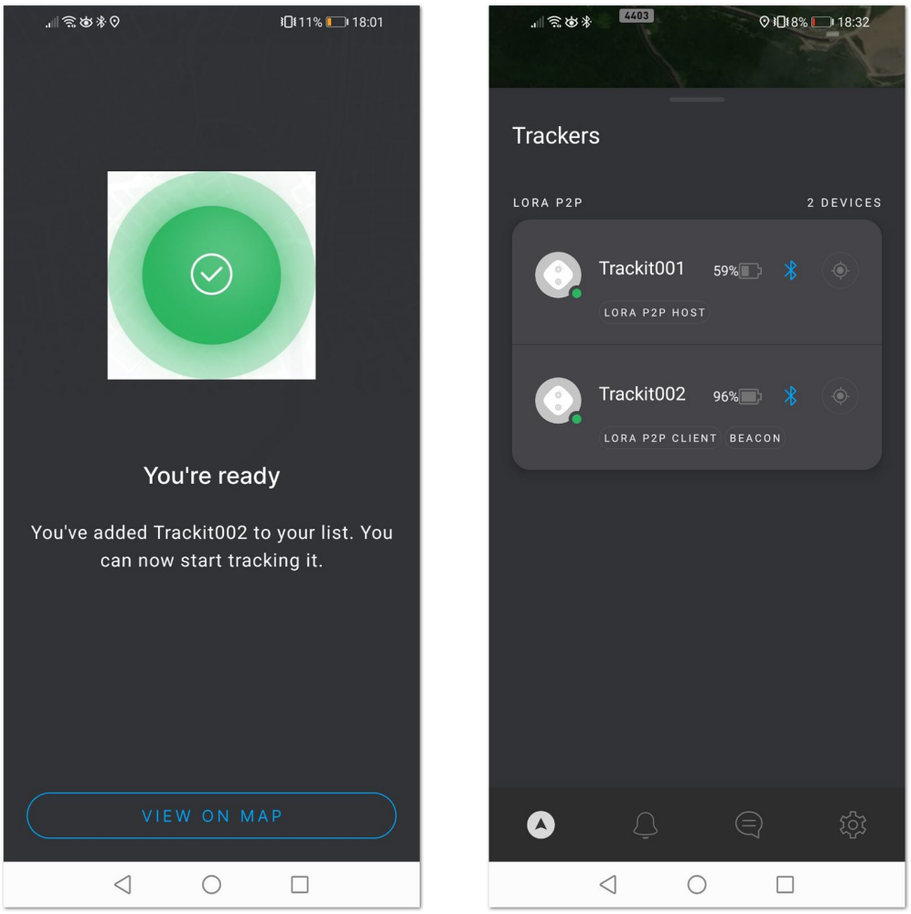

Figure 20: Client tracker is added and Registered Trackers List

Third-Party LoRaWAN Network Server (LNS) Mode

In this mode, any LoRaWAN NS can be used (TTN, Helium, or other). The RAK TrackIt App acts only as a configuration tool for the trackers, no map or location data is available in the App.

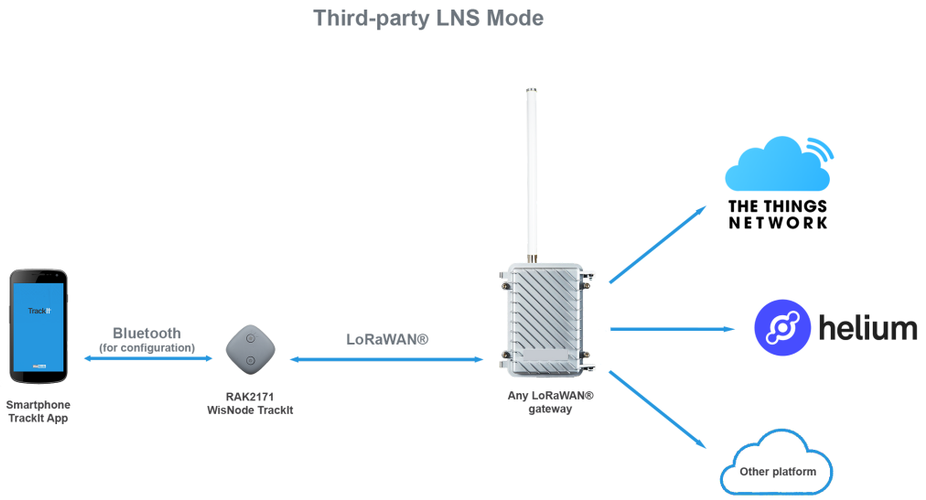

Figure 21: Client tracker is added and Registered Trackers List

on your smartphone.
hone.
ission may be requested, allow it.
ns and the **Privacy Policy**, and press the **Sign in with RAK ID** button.

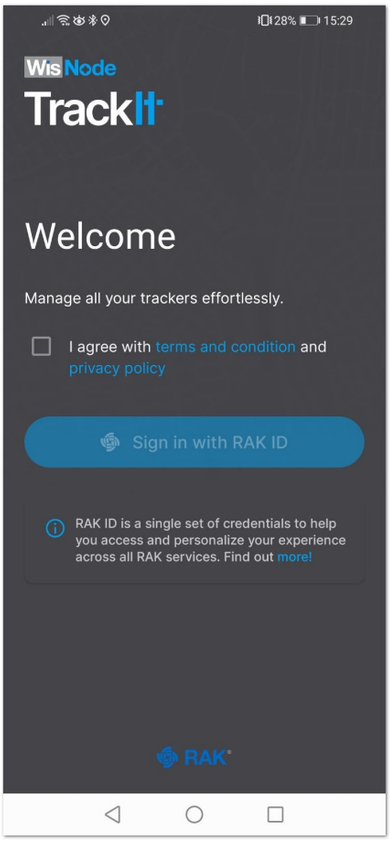

Figure 22: Welcome screen

5. Sign in with your RAK ID or sign up for a new RAK ID if you don't have an account. If you do not have a RAK ID, press the **Create new** link and fill the needed information.

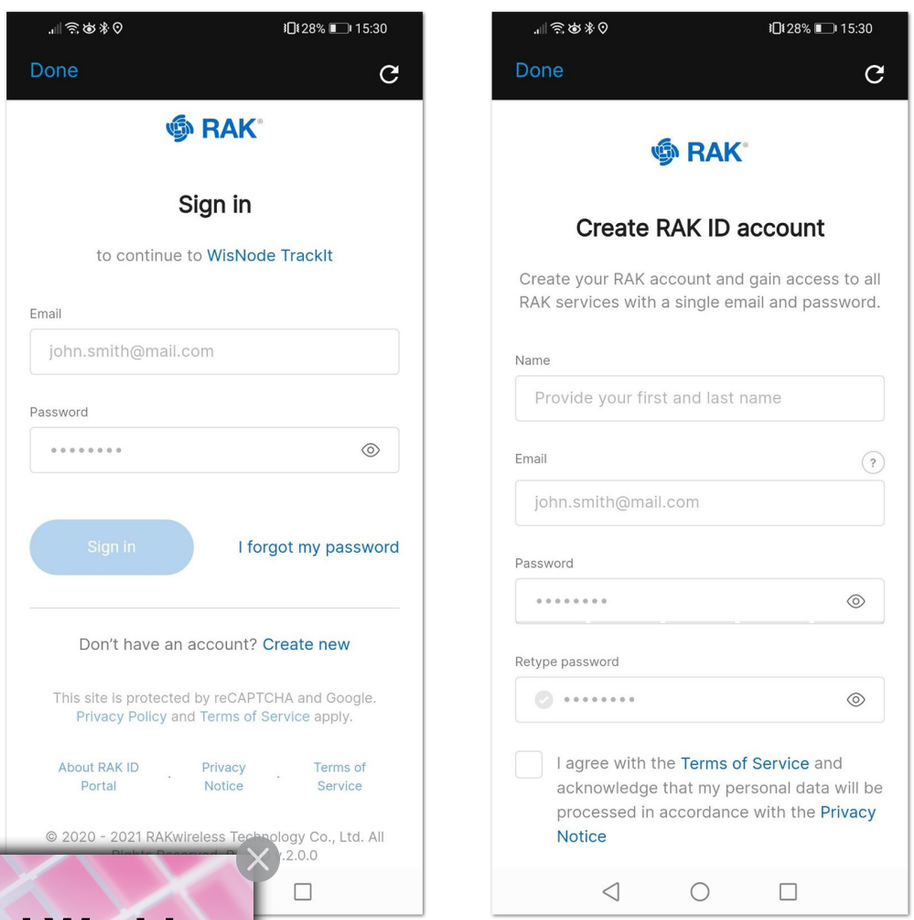

Figure 23: Sign in screen

you to add a tracker. To start the pairing process, press the **+ ADD**

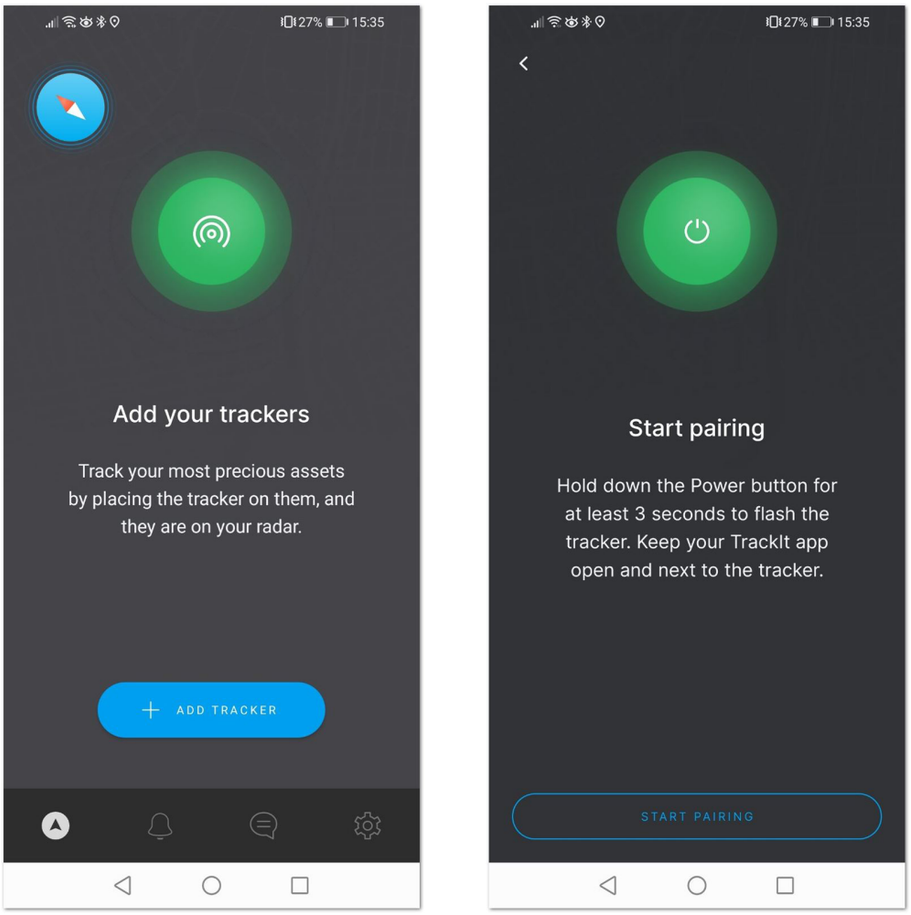

Figure 24: Add tracker and Start Pairing screen

7. Hold the **Power button** of your RAK2171 for 3 seconds to turn it on. If the device was turned on previously, you may need to restart it, as the Bluetooth is available for pairing for 3 minutes.

8. Press the **Start Pairing** in the app. An information screen will be displayed to inform you of the process.

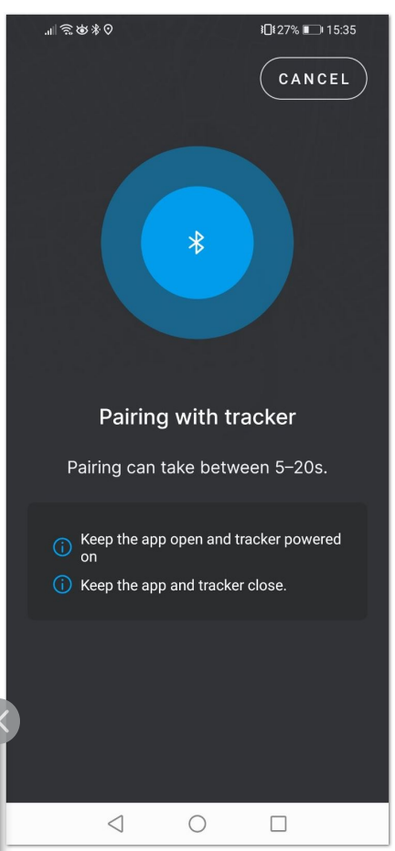

Figure 25: Pairing screen

th pair period has expired, you will see a **Tracker not found** message.

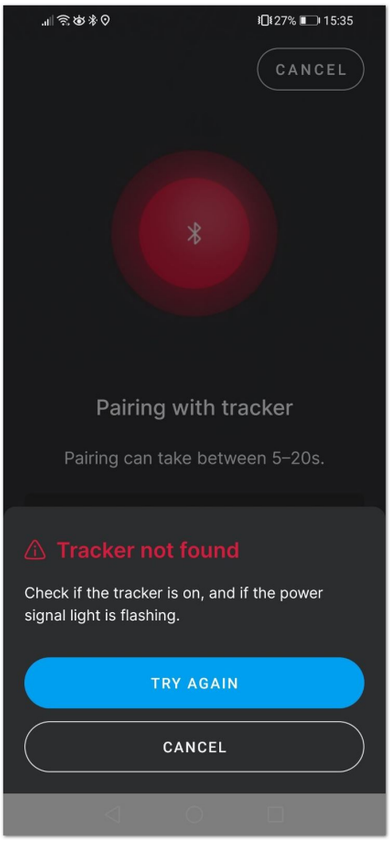

Figure 26: Pairing screen

9. After successful pairing, you will see a configuration screen, where you will be able to change the tracker's default name and the working mode. Press the LoRaWAN button to change the mode from LoRa P2P to LoRaWAN.

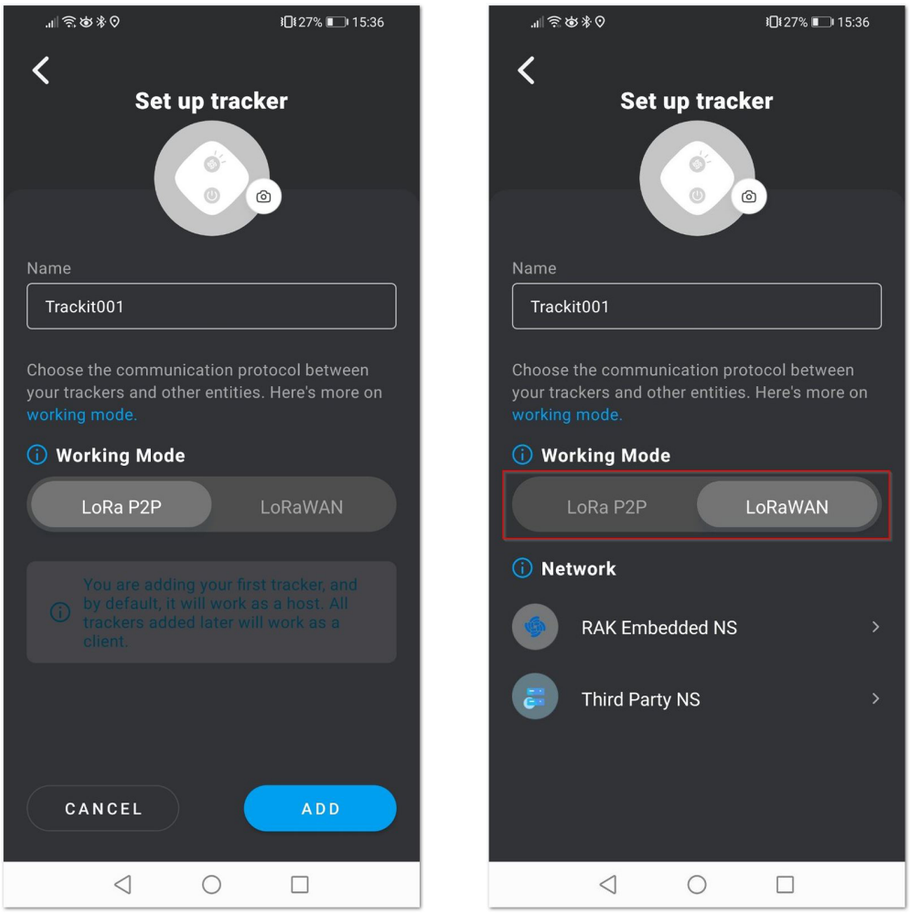

Figure 27: Set up screen

10. You will see two options: **RAK Embedded NS** and **Third Party NS**. For this mode, press **Third Party NS**.

11. You can see the RAK2171 **Device EUI**, **Application EUI**, **Application Key**, **Class**, and **Join mode**. From the **Region** menu, you can select the LoRaWAN band to be used.

> 📝 **NOTE:**
>
> - For now, the Class and Join mode can't be changed.
> - All LoRaWAN bands will be added with next firmware updates.

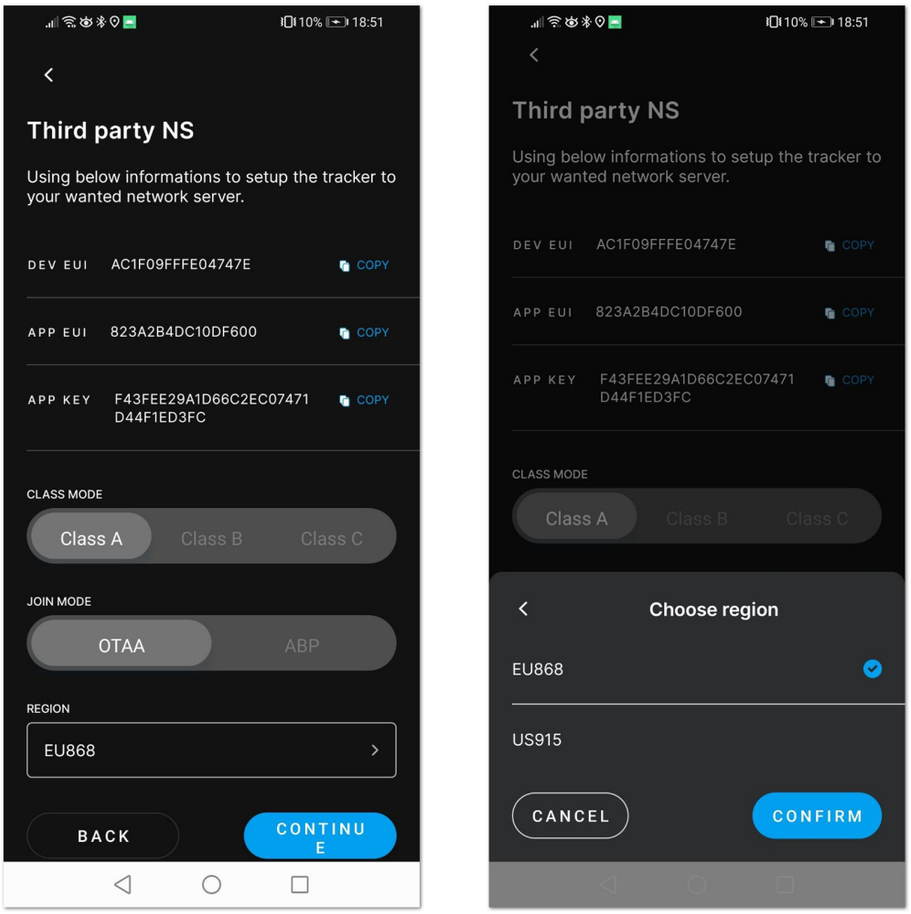

Figure 28: Third Party NS Set up screen

12. Press **CONFIRM** to choose the selected LoRaWAN region. Then, press **CONTINUE**.
13. A notification will be displayed, that in Third-party LNS mode the device's position data will be not available on the TrackIt App's map as the data will be sent to the Third-party Network Server directly.

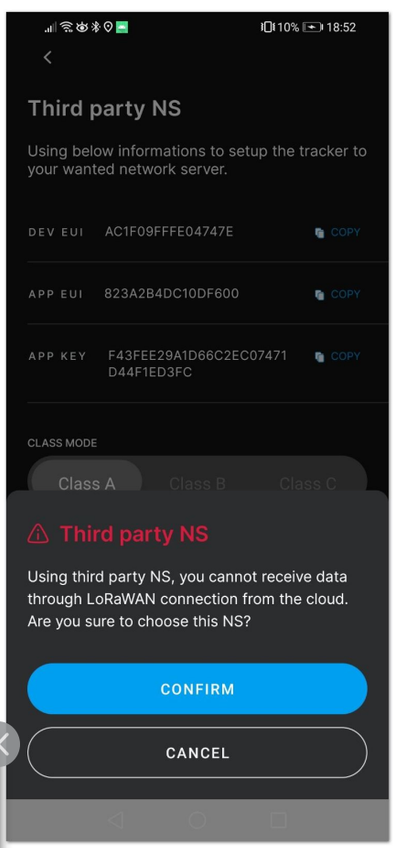

Figure 29: Third Party NS Confirmation

Payload

TrackIt is the latest GPS LoRaWAN tracker by RAKwireless. The name hints what is the device's purpose – to track something, whether it is a person, an asset, an animal, or anything else. In addition to the tracking application, the device can be used to send SOS or a 6-level alarm signal, based on movement, vibration, fall, etc. The different payloads of the device are explained in this section.

Header/Payload Type/Message ID

1 byte		**1 byte**	
HEADER	Payload time	Reserved	Message ID
2 bit	6 bit	3 bit	5 bit

- **Header** - by default, the Header is 11.
- **Payload type** – different payload types are explained in this table above.
- **Message ID** – an internal counter for the message. The first 5 bits are for the message ID. The other 3 are reserved.

Header/Payload Type

The different payload types that TrackIt can send are explained below. If the GPS has a fix, it will send data of the location. If a 6-level alarm is activated in the application, the device will send a message when the working pattern is activated.

With 5 clicks on the power button, the device will start sending SOS messages. When the SOS is canceled, a message will also be sent.

0b'1100 1010	No Location	0xCA
0b'1100 1011	Location	0xCB
0b'1100 1100	Send SOS	0xCC
0b'1100 1101	Cancel SOS	0xCD
0b'1100 1110	6-level alarm	0xCE

Working Patterns in 6-level Alarm

1. Mild Vibration
2. Violent Vibration
3. Movement
4. Mild Shaking
5. Violent Shaking

ad

ad when the GPS has no fix.

1 byte	2 byte	3-6 byte	7-10 byte	11 byte	12-16 byte	16 byte
Header/Payload Type	Message ID	Application ID	Device ID	Battery Level	Time	Status

1. Header/Payload Type: 1 byte
2. Message ID: 1 byte (3 reserved bits + 5 bits to be used for the ID)
3. Application ID: 4 bytes
4. Device ID: 4 bytes
5. Battery: 1 byte
6. Time: 4 bytes
7. Status: 1 byte – 8 bits

- Bit 0 – shows if Extended Prediction Orbit (EPO) worked. This allows the device to predict where satellites will be in the sky.
- Bit 1 – shows if the device is charging.
- Bit 2 and 3 show if there is GPS fix:
  - 00: Open the GPS fix
  - 01: Locating
  - 10: Successful
  - 11: Failed

Location Payload

The device will send **Location payload** when the GPS has a fix.

1 byte	2 byte	3-6 byte	7-10 byte	11-14 byte	15-18 byte	19 byte	20 b
Header/Payload Type	Message ID	Application ID	Device ID	Longitude	Accuracy	GPS Start Number	Batt

1. Header/Payload Type: 1 byte
2. Message ID: 1 byte (3 reserved bits + 5 bits to be used for the ID)
3. Application ID: 4 bytes
4. Device ID: 4 bytes
5. Longitude: 4 bytes
6. Latitude: 4 bytes
7. Accuracy: 1 byte
8. GPS Start Number: 1 byte
9. Battery: 1 byte
10. Time: 4 bytes
11. Status: 1 byte

- Bit 0 – shows if Extended Prediction Orbit (EPO) worked. This allows the device to predict where satellites will

Send SOS Payload

SOS type payload has two subtypes of payload – SOS without user data and SOS with user data. The user has the option to set information about themselves via the application in the payload – **Name**, **Phone Number**, and **Country code**. To activate the SOS, the user needs to press 5 times the power button of the TrackIt.

Payload Without User's Data

1 byte	2 byte	3-6 byte	7-10 byte	11-14 byte	15-18 byte
Header/Payload Type	Message ID	Application ID	Device ID	Longitude	Latitude

Payload With User Data

1 byte	2 byte	3-6 byte	7-10 byte	11-14 byte	15-18 byte	19-28 byte	29-39 byt
Header/Payload Type	Message ID	Application ID	Device ID	Longitude	Latitude	Contact Name	Count Code

1. Header/Payload Type: 1 byte
2. Message ID: 1 byte (3 reserved bits + 5 bits to be used for the ID)
3. Application ID: 4 bytes
4. Device ID: 4 bytes
5. Longitude: 4 bytes
6. Latitude: 4 bytes
7. User’s name: max length is 10 bytes
8. Country code: max length is 11 bytes
9. Phone number: max length is 11 bytes

Cancel SOS Payload

This payload will be sent when the SOS is canceled. To cancel the SOS, the user needs to press 5 times the power button of the TrackIt.

1 byte	2 byte	3-6 byte	7-10 byte
Header/Payload Type	Message ID	Application ID	Device ID

1. Header/Payload Type: 1 byte
2. Message ID: 1 byte (3 reserved bits + 5 bits to be used for the ID)
3. Application ID: 4 bytes
4. Device ID: 4 bytes

Alarm Payload

ed in the application of the TrackIt. The device will send data only when a
These are the different **Working Patterns** in 6-level alarm:

3. Movement
4. Mild Shaking
5. Violent Shaking
6. Fall

1 byte	2 byte	3-6 byte	7-10 byte	11 byte
Header/Payload Type	Message ID	Application ID	Device ID	Level

1. Header/Payload Type: 1 byte
2. Message ID: 1 byte (3 reserved bits + 5 bits to be used for the ID)
3. Application ID: 4 bytes
4. Device ID: 4 bytes
5. Level: 1 byte

Last Updated: 1/12/2023, 5:01:18 AM