TEKTELIC COMMUNICATIONS INC.

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Table of Contents

1 Introduction

This guide provides step by step instructions and troubleshooting tips to users to setup their Gateway quickly and correctly with a Network Server.

2 What is in the Box

2.1 Product and installation material

For different Kona Micro models and field installation, refer Kona Micro User Guide T0005281_UG [1].

- Kona Micro Gateway
- AC-DC power adapter
- LoRa Antenna
- Ethernet Cable
- Documentation: User Guide and Declaration of Conformance (EU versions only)

Figure 1: Equipment inside the Box

3 Quick Start Setup

3.1 Required Equipment

The following equipment is required for commissioning and monitoring the Kona Micro Gateway.

1. Laptop running Windows XP/Vista/7

2. KonaFT self-extracting installer (software)

3. Kona Micro Gateway

4. Cat5 or better Ethernet cable

5. RF antenna for LoRa communication

3.2 Quick Start Procedure

1. Gateway Setup:

Follow the below diagram to setup Micro gateway. Make sure that the Ethernet cable, and LoRa antenna are connected to their respective ports properly on the Gateway.
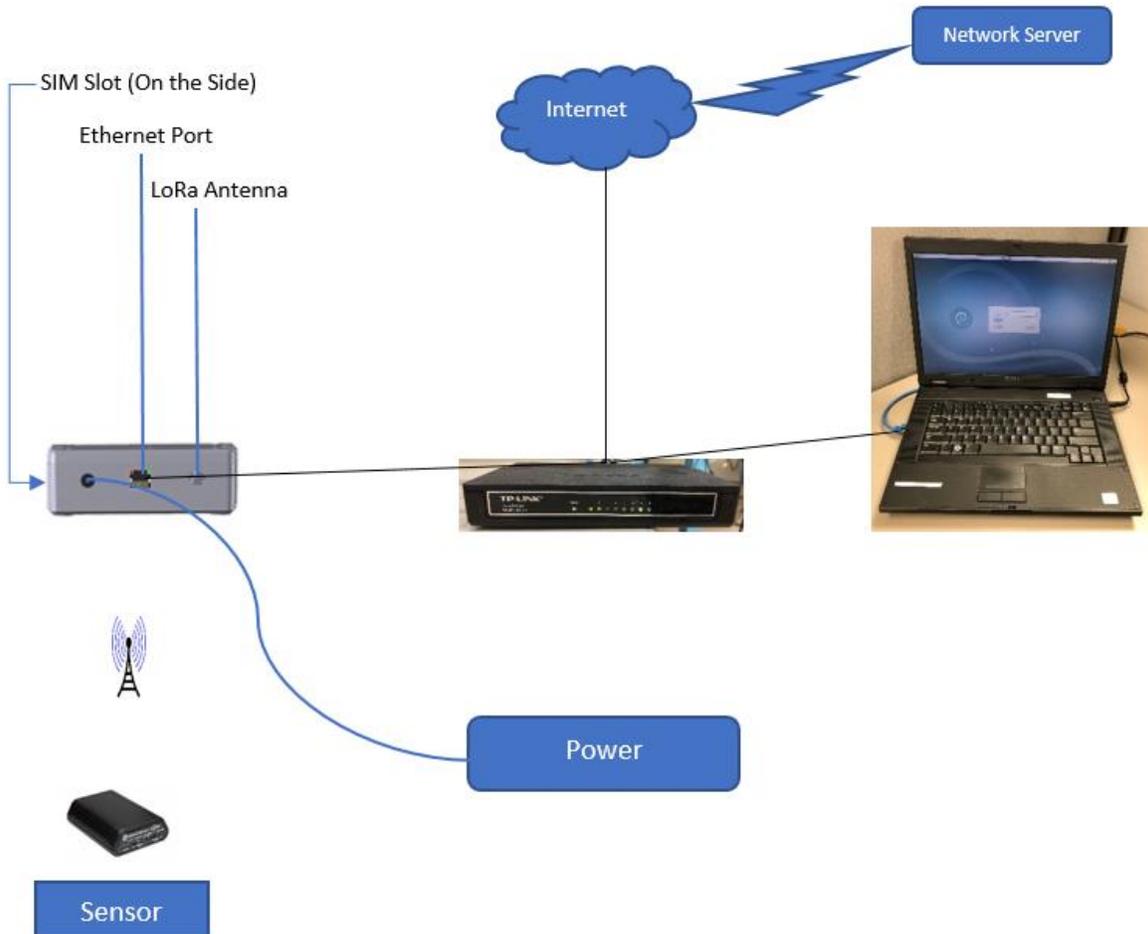
Figure 2: Gateway Setup

2. Install KonaFT on Windows laptop or PC. Copy the KonaFT self-extracting installer software onto the computer then double-click on the installer icon to start the installation process.

3. Register Gateway and Sensor on Network Server:

   Register your Sensor (with OTAA) and Gateway on the Network Server. (Follow the Tektelic Network Server Guide T0005281_NS.)

4. Apply power to the Gateway using the supplied AC-DC adapter:

5. Module Bootup:
   Bootup time of the Gateway is approximately 2 minutes. During bootup, the LED status is Flashing Green.

6. Module LED status:
   After bootup, LED status will be Flashing Green[1]. The LED will remain flashing green until the Gateway receives a downlink packet from the Network Server. Upon reception of a downlink packet from the Network Server, the LED will change to Solid Green. (Refer table 1 for different LED states).

7. Retrieve Module IP address:

   KonaFT supports a "Find my gateway" feature that can find a list of all the Tektelic GWs connected to the local network. From this list the IP of your particular GW can be identified using the MAC address. The Gateway MAC address is printed on the Gateway label.
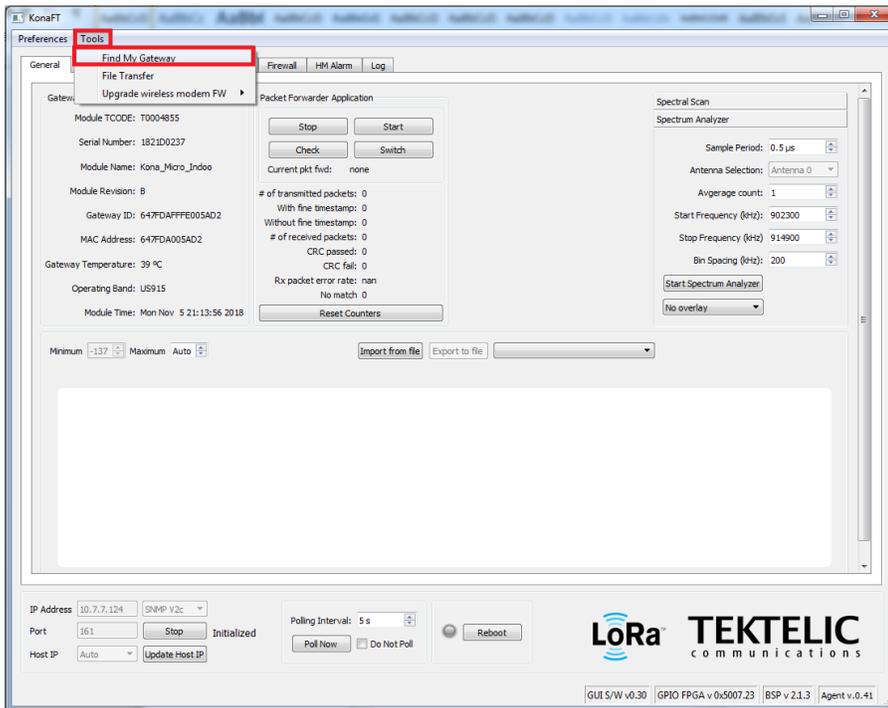
8. Enter your gateway's IP address and port number 161 (default) on KonaFT then Select Start Button.

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[1] In SW versions older than 2.1.3, lack of downlink packets is indicated by Flashing Red
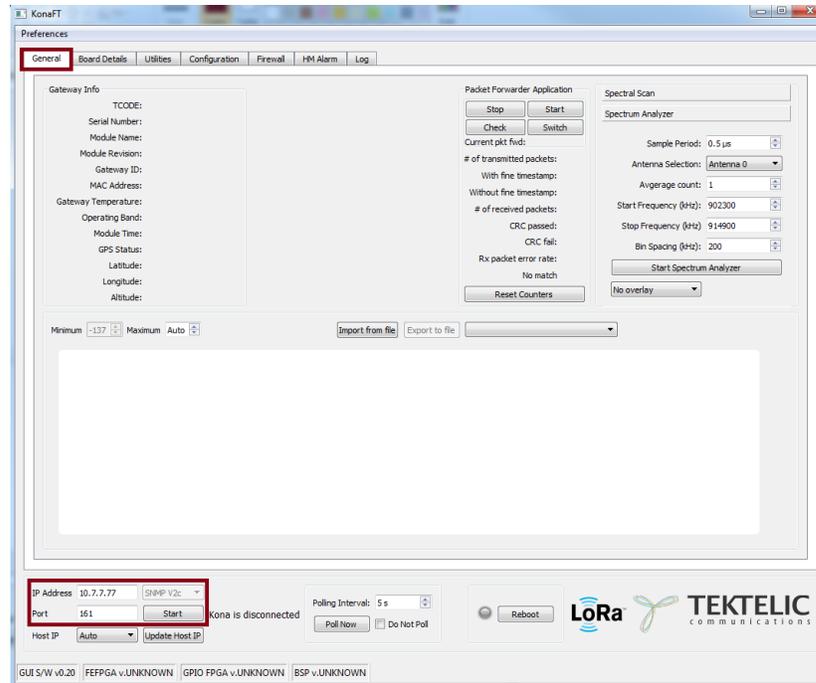
Figure 3: Start KonaFT

9. Verify 3G/4G Connectivity (on applicable modules only):

The Wireless Modem tab in KonaFT is only displayed on modules with a modem and provides LTE modem information, Network provider information, APN information, RF information, call statistics and IP address.

- Select the "Wireless Modem" tab and click "Poll Now" button in each section

- Verify a public IP is assigned in the top window

- Verify Session State is CONNECTED in the Home Network window

- Verify Call Status is CONNECTED in the Call Statistics window

- The APN setting of the modem can be viewed in the Active Profile Parameters window

- Signal Strength (RSSI) of the cellular connection is displayed in the RF Information window

Note: To change the APN setting from KonaFT see detailed instructions in the application note [2]
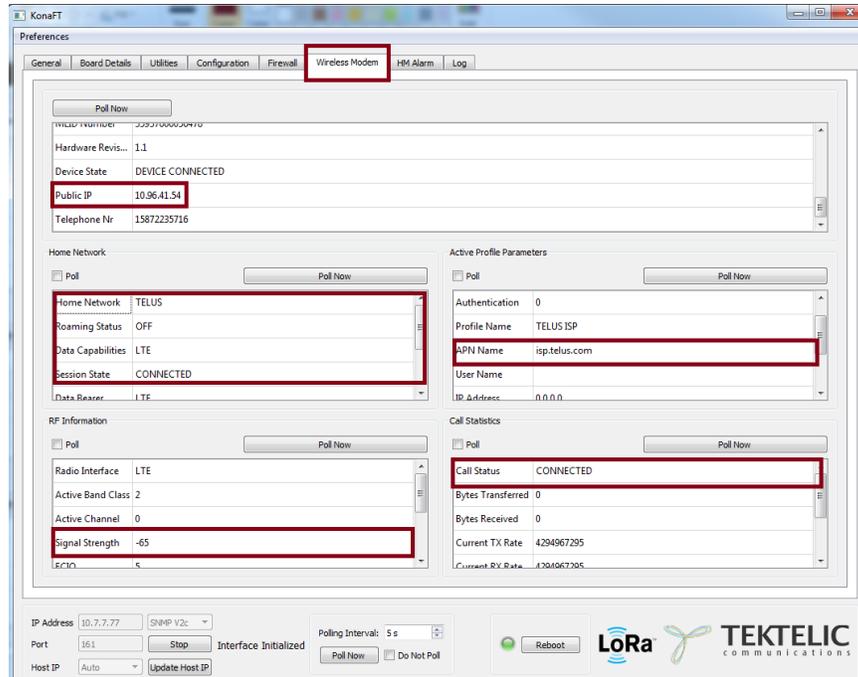
Figure 5: Wireless Modem Information

10. Verify Firewall configuration:
- Select Firewall tab on KonaFT, then select "Read Firewall Configuration". The existing firewall rules will be displayed.
- Default Firewall rules will allow SSH connectivity from any address.
- Please contact Tektelic if pre-loaded Firewall rules are required from the Factory.
- The Firewall tab allows users to edit, create or delete Firewall rules for the Gateway.
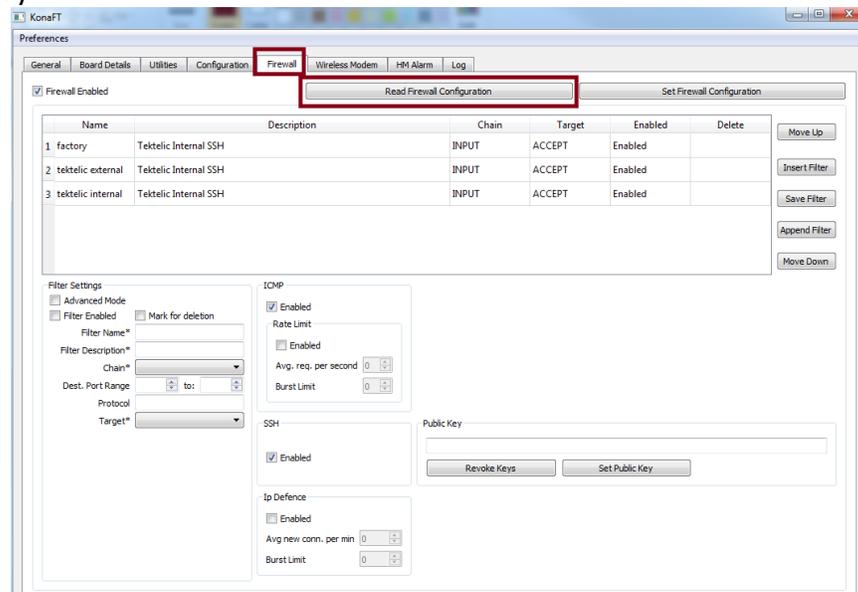
Figure 6: Firewall Information

11. Verify LoRa traffic:

LoRa operation can be confirmed by using an OTAA sensor and joining with a Network Server.

- Ensure that both Gateway and Sensor is registered on the network server.
- Power on the sensor to initiate the join request.
- When the Gateway receives an uplink packet (the join request from the Sensor), the CRC passed and #of received packets fields in KonaFT will increment.
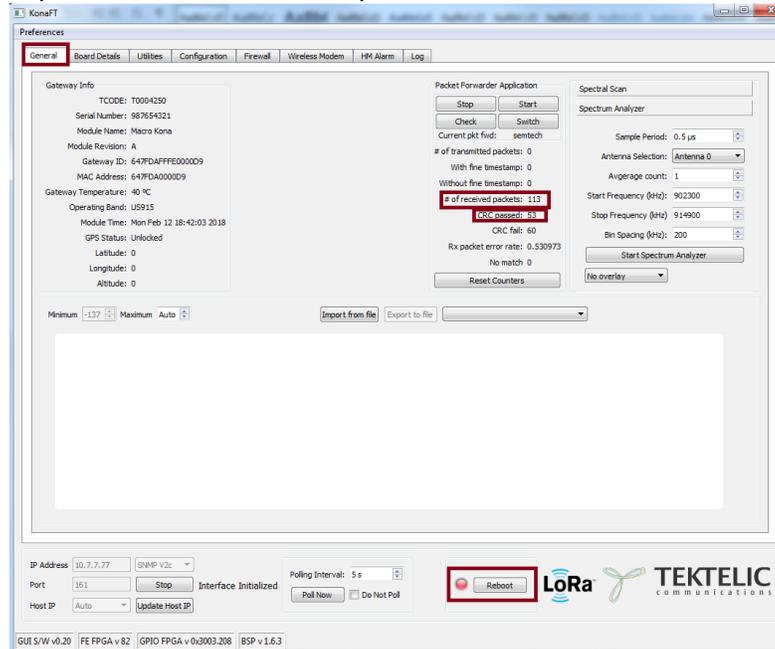
Figure 7: # of received packets and CRC information

- A join response from the Network Server will transmit a downlink packet to the sensor. This will increment the #of transmitted packets in KonaFT and LED status will change to Solid Green. (Refer table 1 for different LED states).
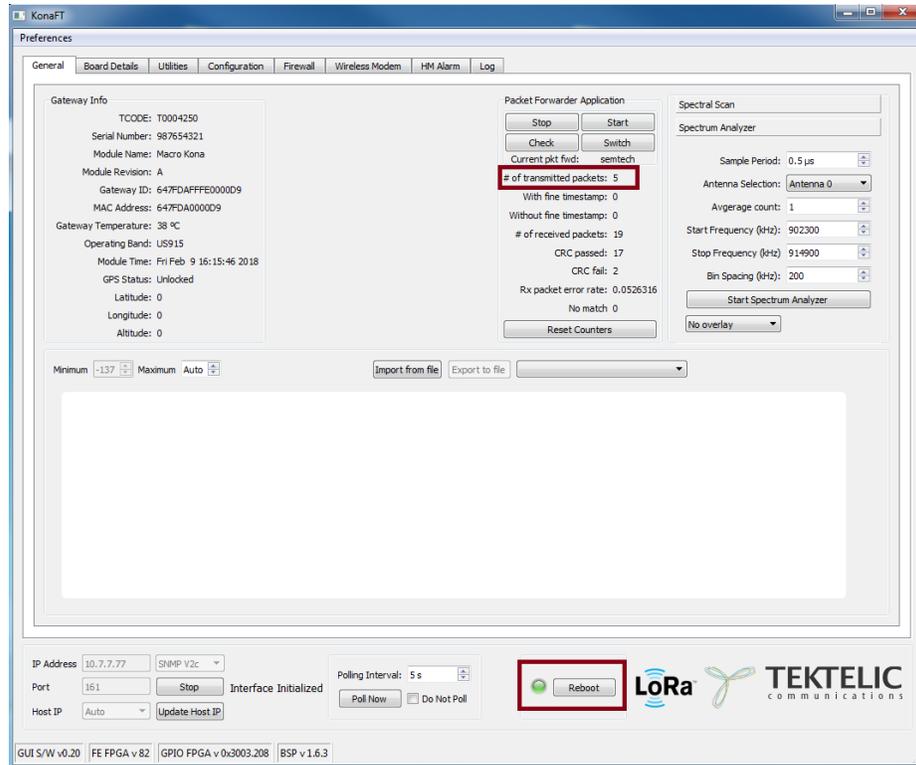
Figure 8: # of transmitted packets

Note:

At this point of time, you can check on NS that gateway is online and view the uplink and downlink packets. (Follow the Tektelic Network Server Guide T0005281_NS.)

3.3   LED States

The following table describes different LED behaviours.

LED States	Functional Description	How long is it reasonable to stay in this state
No LEDs	No Power to gateway.	Until power is applied.
Solid Green	Gateway is operational with a packet forwarder running. LoRaWAN packet transmission and reception functions are operating normally.	It should stable in this state.

Flashing Green[2]	Module is Initializing Or No downlink packets have been transmitted by the gateway in the last 10 minutes.	Up to 15 minutes – Includes time for software upgrade or recovery. Typical boot time is < 2 minutes. Or Until the gateway starts transmitting packets. (downlink packets)
Solid Green	Gateway is operational with a packet forwarder running. LoRaWAN packet transmission and reception functions are operating normally.	It should be stable in this state.
Solid RED	Unit is in fault condition and requires service	Undesired stable state. Power cycle the gateway. If the condition persists, contact customer support.

Table 1: Different LED States

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[2] In SW versions older than 2.1.3, lack of downlink packets is indicated by Flashing Red

4   Reconfiguring the Gateway

4.1   Static IP

Gateway is setup to use DHCP by default. A static IP can be assigned manually through Kona FT.

1. Connect KonaFT to the gateway usin the IP assigned via DHCP
2. Open the Miscellaneous tab in KonaFT (Board Details ->Misc)
3. Set a valid IP address, IP mask and Gateway in the network configuration section
4. After verifying the values entered, press the set button to apply the change to the GW
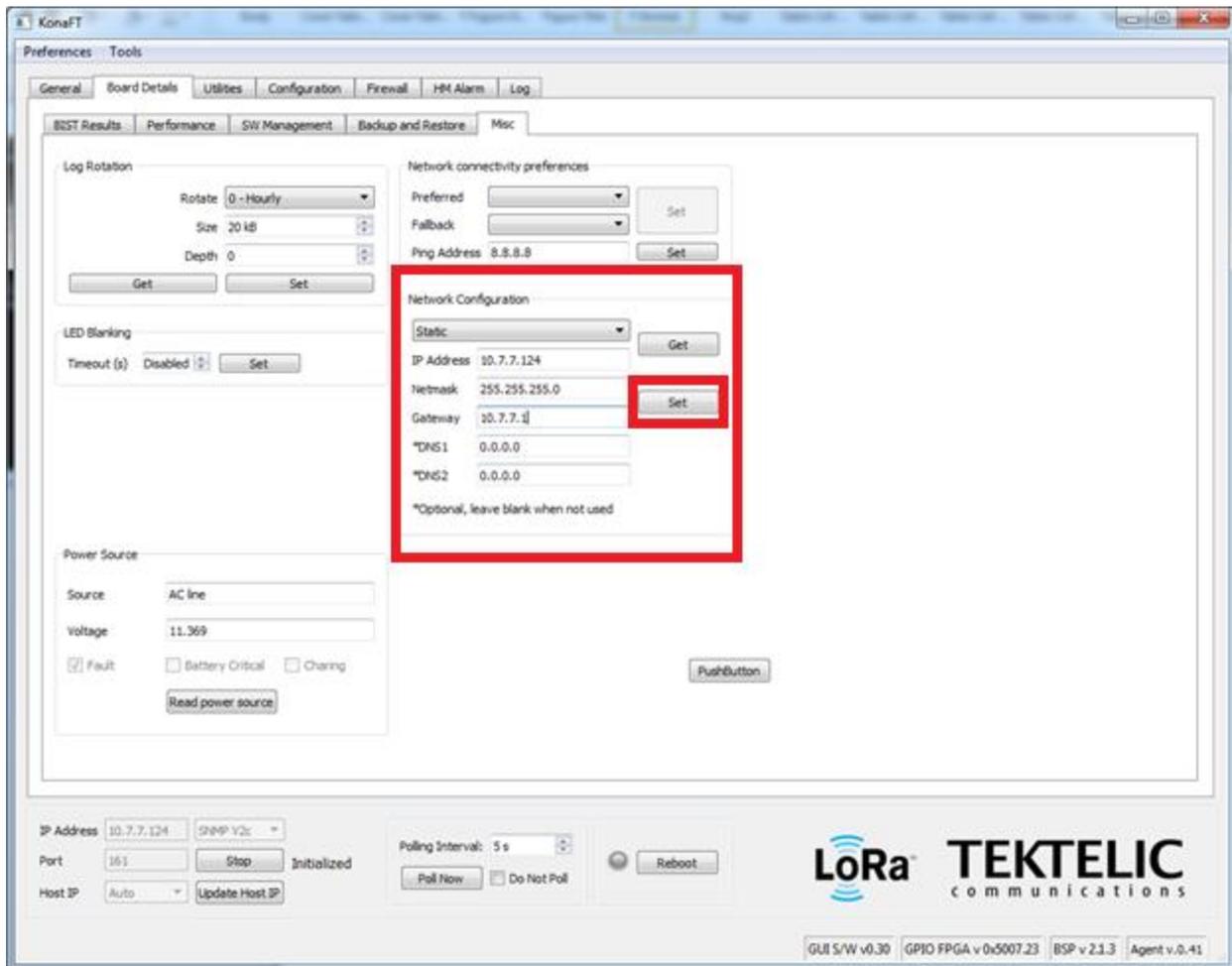

Figure 8: Static IP cofigurtaion

Note: It is not recommended to edit the *interfaces* file directly through the terminal as there is a risk of making the unit inaccessible through the network interface.

4.2 Updating config.json

4.3 Connecting to various network servers

Network Server	Packet forwarder	Packet format
TEKTELIC	Tektelic packet forwarder	Semtech UDP protocol V2.0
Actility	Actility LRR	Proprietary
LORIOT	LORIOT packet forwarder	Proprietary
TTN	Tektelic packet forwarder	Semtech UDP protocol V2.0
LoRa Server (open source LoRaWAN network-server)	Tektelic packet forwarder	Semtech UDP protocol V2.0
Orbiwise	Orbiwise packet forwarder	Proprietary

5   Troubleshooting Tips

5.1   KonaFT can't connect with Micro Gateway

Check if the IP address of the Micro gateway is correct.

5.2   Finding out Gateway's IP address

Use 'Find my gateway' feature of KonaFT. It can be accessed from the menu bar, Tools -> Find my gateway

5.3   3G/4G modem

5.3.1   SIM not detected

Standard Micro-SIM (3FF) form factor is recommended for the gateway. Nano-SIM (4FF) form factor (and "punch-out" styles that are the same thickness as nano) do not have their insertion reliably detected because the SIM cards are thinner (0.7mm instead of 0.8mm).

The easiest temporary solution is to add a piece (or two) of scotch tape to the top of the SIM to increase the thickness

5.3.2   APN settings

Check APN settings via KonaFT (refer to Figure 5). Check if SIM is activated by checking with your provider. You need to know ICCID from the label on the gateway before talking to your provider.

6 Bibliography

[1] "Kona Micro User Guide T0005281_UG," Tektelic, 2018.

[2] "Tektelic Network Server Guide T0005281_NS," Tektelic, 2018.

[3] "Kona Micro FAQ T0005281_FAQ," Tektelic, 2018.

[4] "Kona software upgrade guide T0004279_SW_Upgrade," Tektelic, 2018.

[5] "APN update from KonaFT," Tektelic, 2018.