TEKTELIC COMMUNICATIONS INC.

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Product name:	**Kona Macro Gateway**

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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 Macro models and field installation, refer Kona Macro User Guide T0005158_UG.

- Kona Macro Gateway
- Wall Mounting Bracket and Screws
- Power Connector
- Ground Cable
- RJ-45 Cable Weatherproof Adaptor
- Test Certificate (Includes Shortened Declaration of Conformance on 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 Macro Gateway.

1. Laptop running Windows XP/Vista/7

2. KonaFT self-extracting installer (software)

3. Kona Macro Gateway

4. Cat5 or better Ethernet cable

5. RF antenna(s) for LoRa communication

6. DC Power Supply (48VDC and Current Should be 1A or greater) or POE++ (support 56VDC output and can supply 0.8A or greater of current.)

3.2   Quick Start Procedure

1. Gateway Setup:

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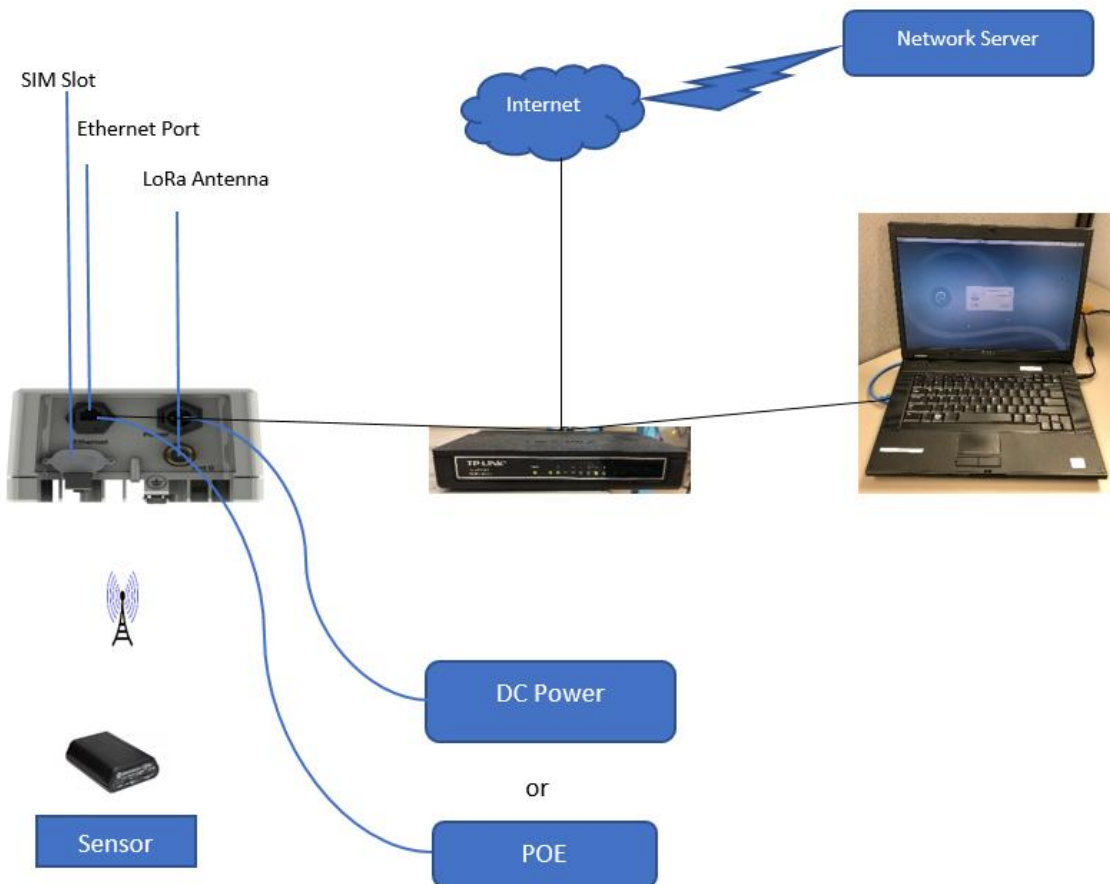

Figure 2: Gateway Setup

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 T0005158_NS.)

4. Apply power to the Gateway using either DC power or POE:

    a. For DC power, apply **48VDC** power to the Kona Macro Gateway. Ensure that current limit of power supply is set for **1A** or greater. Current draw is approximately 0.2A during initialization and 0.5A when initialization is complete. If there is no current, the polarity of the DC power cable connection may be reversed, or the power source may not be configured properly.

    b. If using POE, the injector must support **56VDC** output and can supply **0.8A** or greater of current.

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 RED. The LED will remain flashing red 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:

   The Kona Macro Gateway supports DHCP on the Ethernet port. The Gateway MAC address is printed on the Gateway label. Using the MAC address and your local DHCP tools, determine the IP address of the Gateway.

8. Start KonaFT:
   Launch KonaFT. Enter your gateway's IP address and port number 161 (default) on KonaFT then Select Start Button.
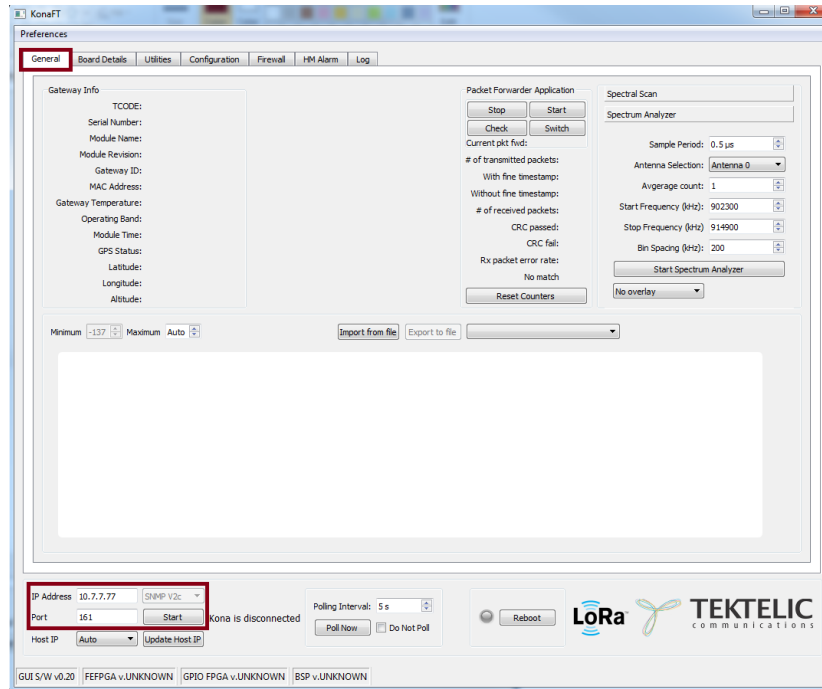
Figure 3: Start KonaFT

9. Verify GPS:

    The Kona Macro gateway should be placed such that there is a clear view of the sky from the top face of the module. When GPS lock is achieved, a GPS status of "Locked" will appear on KonaFT along with its GPS coordinates.
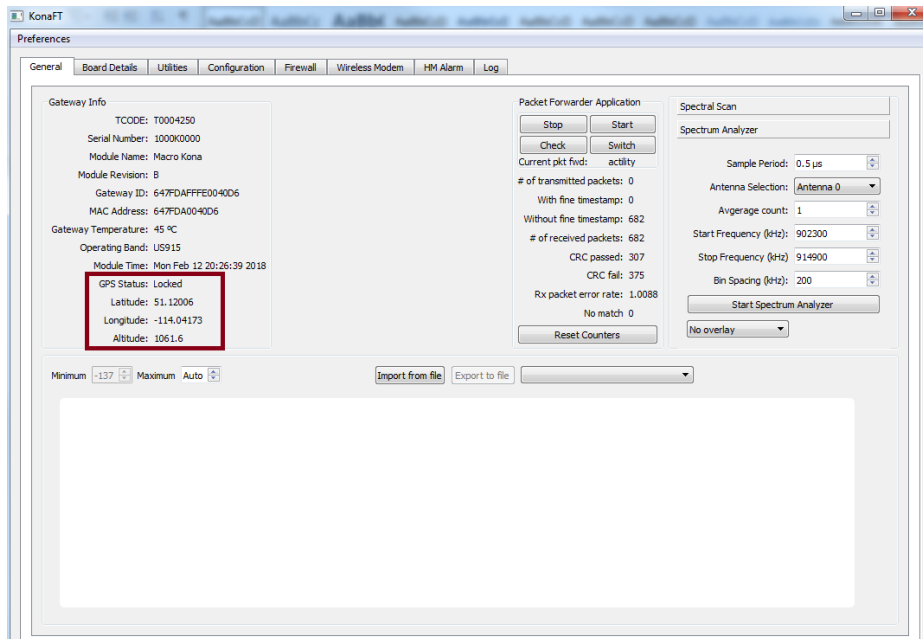

Figure 4 : GPS Information

10. 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

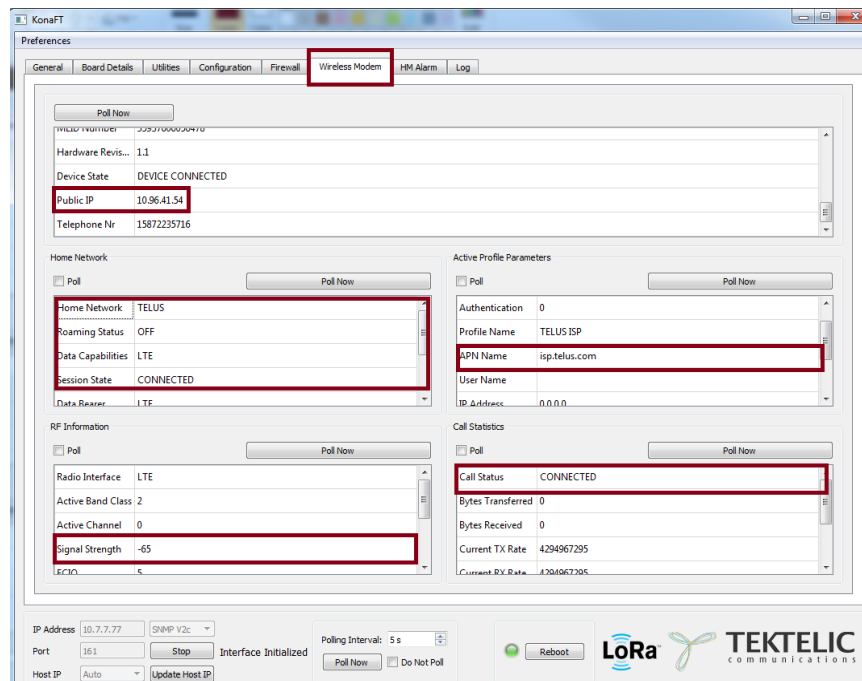- Signal Strength (RSSI) of the cellular connection is displayed in the RF Information window

Figure 5: Wireless Modem Information

11. 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.
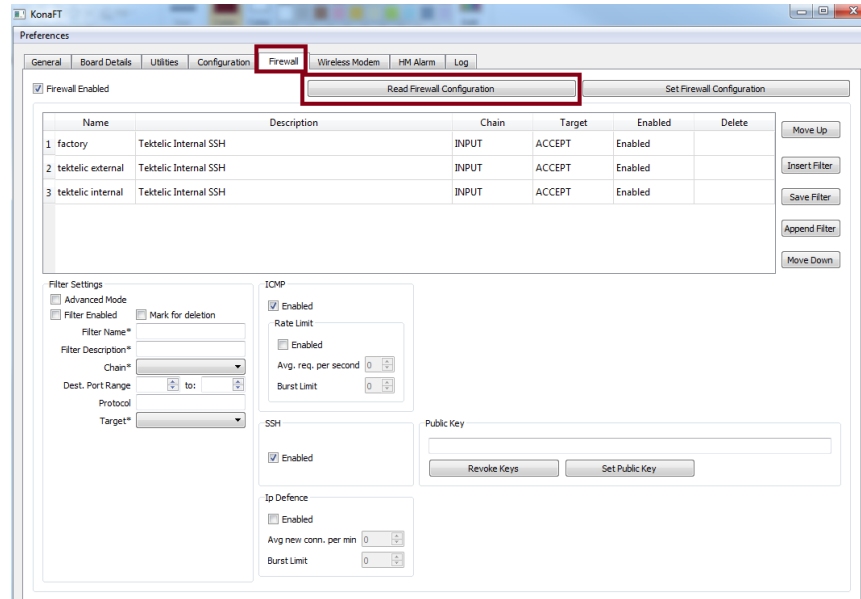- The Firewall tab allows users to edit, create or delete Firewall rules for the Gateway.

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Figure 6: Firewall Information

12. 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.
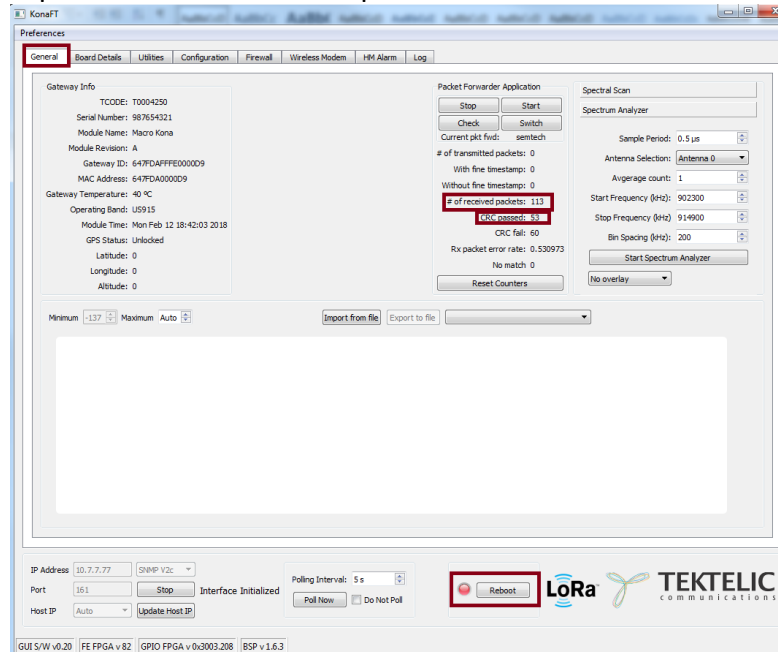

Figure 7: # of received packets and CRC information

- 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).
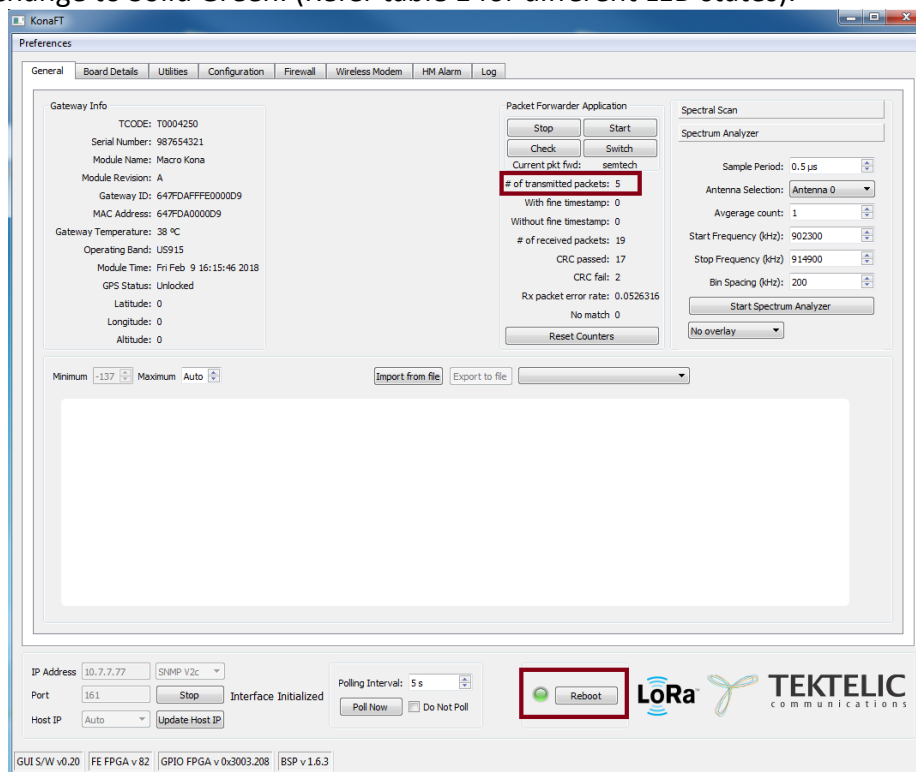

Figure 8: # of transmitted packets

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 T0005158_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.
Flashing Green (Start-Up)	Module is Initializing	Up to 15 minutes – Includes time for software upgrade or recovery. Typical boot time is < 2 minutes.
Flashing Green (Operation)	No downlink packets have been transmitted by the gateway in the last 10 minutes. When GPS signal is unlocked from locked state for 24 hours.	Until the gateway starts transmitting packets. (downlink packets) Until GPS is locked again.
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.
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

4 Troubleshooting Tips

4.1 Can't install/launch the KonaFT

Missing LIBAY32.dll - Check whether open SSL is installed or not.

4.2 KonaFT can't connect with Macro Gateway

Check the IP address of the Macro gateway is correct. Check network connection is available.

4.3 LED remains Flashing Green

Check power supply capabilities. If the current is < 0.5V then radio won't start, and the gateway will start continuously.

4.4 Finding out Gateway's IP address

Check router logs or use IP scanner tools to look for gateway's MAC address and associated IP address.

4.5 GPS – No Lock

Check antenna cable and antenna location. GPS Antenna should support 5V to active antenna. Make sure that your antenna support this.

4.6 3G/4G

Check APN settings via KonaFT (refer 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.

5 References

[1] Kona Macro User Guide T0005158_UG, 2018.

[2] Tektelic Network Server Guide T0005158_NS, 2018.

[3] Kona Macro FAQ T0005158_FAQ, 2018.