# KONA PHOTON GATEWAY

## QUICK START GUIDE

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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

The Kona Photon Gateway is comprised of the Kona Photon Radio Module (radio module) and the Kona Photon Solar Panel Assembly (solar panel), which are shipped in separate boxes.

## 2.1   Kona Photon Radio Module

The radio module is available in two frequency variants and can be ordered with LTE (default) or satellite backhaul modem. The Kona Photon Radio Module product variants are listed in Table 1.

**Table 1: Kona Photon Radio Module Product Variants**

| T-Code | Product Descriptions | Region |
|---|---|---|
| T0008479 | LORA GATEWAY MODULE, KONA PHOTON, 900 MHZ, CELLULAR MODEM | NA |
| T0008551 | LORA GATEWAY MODULE, KONA PHOTON, 860 MHZ, CELLULAR MODEM | EU |
| T0008552 | LORA GATEWAY MODULE, KONA PHOTON, 920 MHZ, CELLULAR MODEM | APAC |
| T0008746 | LORA GATEWAY MODULE, KONA PHOTON, 900 MHZ, SATELLITE MODEM | NA |
| T0008747 | LORA GATEWAY MODULE, KONA PHOTON, 800 MHZ, SATELLITE MODEM | EU |

The contents of the box containing the Photon Radio Module include:

- Kona Photon Radio Module
- Ground Cable
- RJ-45 Cable Weatherproof Adaptor
- Mounting Bolts
- Test Certificate (Includes Shortened Declaration of Conformance on EU versions only)
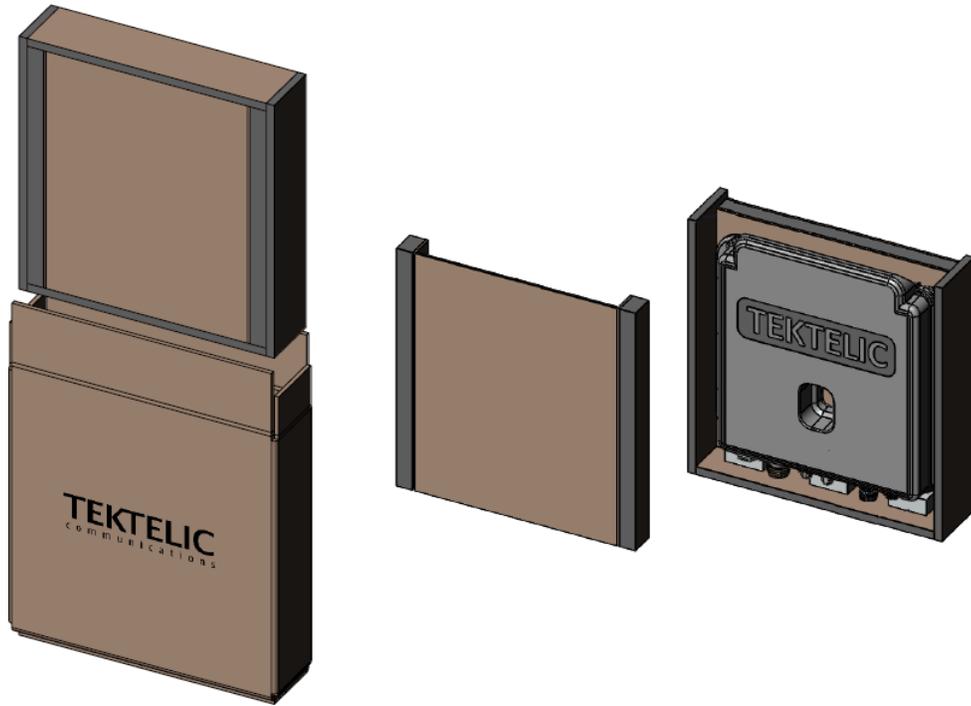
**Figure 1: Solar Gateway Packaging**

## 2.2 Kona Photon Solar Panel Assembly

The Kona Photon Solar Panel Assembly is available in two sizes, 50 and 95 W, as list in Table 2.

**Table 2: Kona Photon Solar Panel Assembly Product Variants**

| T-Code | Product Descriptions |
|---|---|
| T0008623 | SOLAR PANEL MECHANICAL ASSEMBLY, 95 W, KONA PHOTON |
| T0008624 | SOLAR PANEL MECHANICAL ASSEMBLY, 50 W, KONA PHOTON |

The contents of the box containing the Photon Solar Panel Assembly include:

- Kona Photon Solar Panel Assembly
- Mounting Knuckle
- Mounting Arm
- Mounting Bracket
- Mounting U-bolt hardware
- Ground Cable
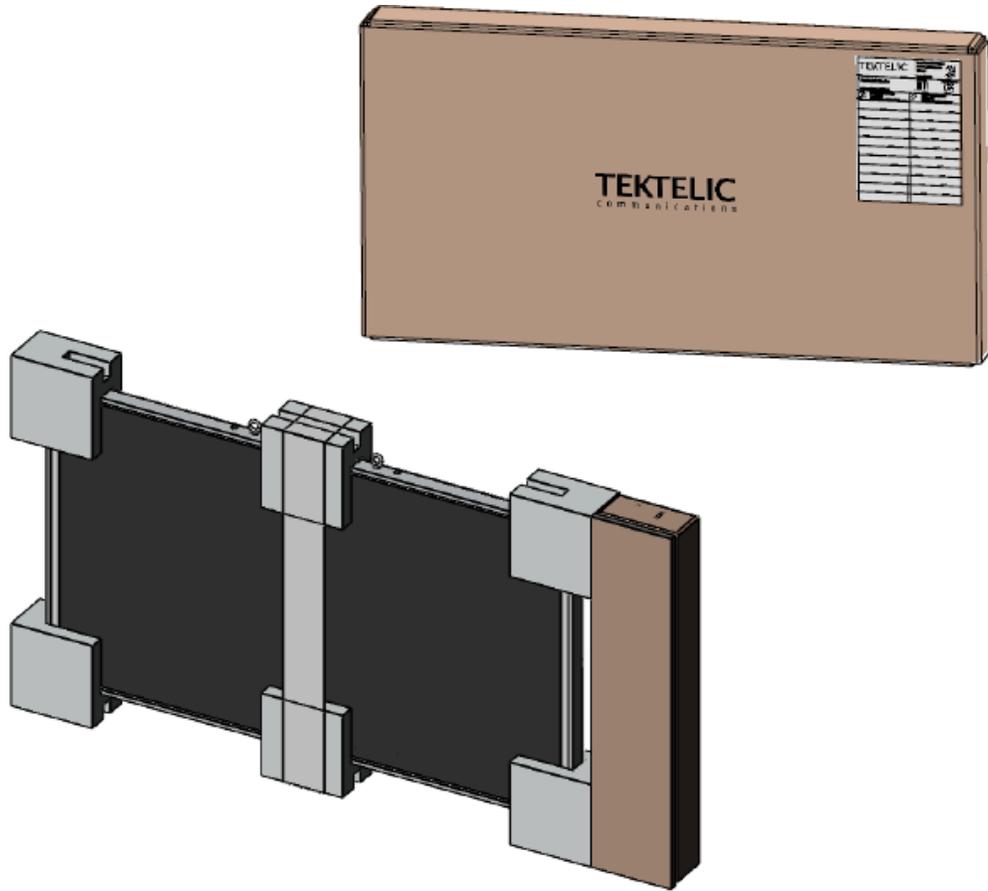
Figure 2: Solar Panel Packaging
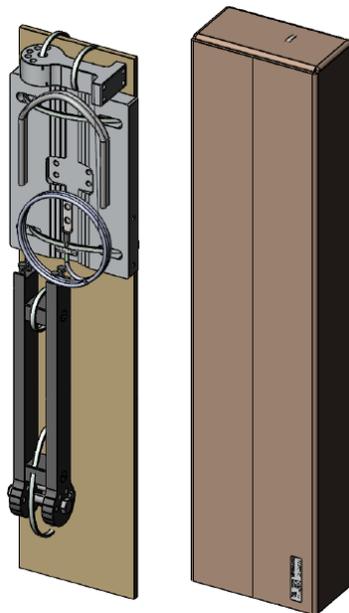


Figure 3: Solar Panel Mounting Accessories

# 3   Quick Start Setup

## 3.1   Tools Required for Commissioning

The following tools and/or equipment are required for commissioning and monitoring the Kona Photon Gateway.

1. Laptop running Windows 10/11
2. KonaFT self-extracting installer (software)
3. Kona Photon Gateway
4. Cat5 or better Ethernet cable
5. RF antenna for LoRa communication
6. PoE injector (PoE 802.3af or better)

## 3.2 Gateway Commissioning Procedure

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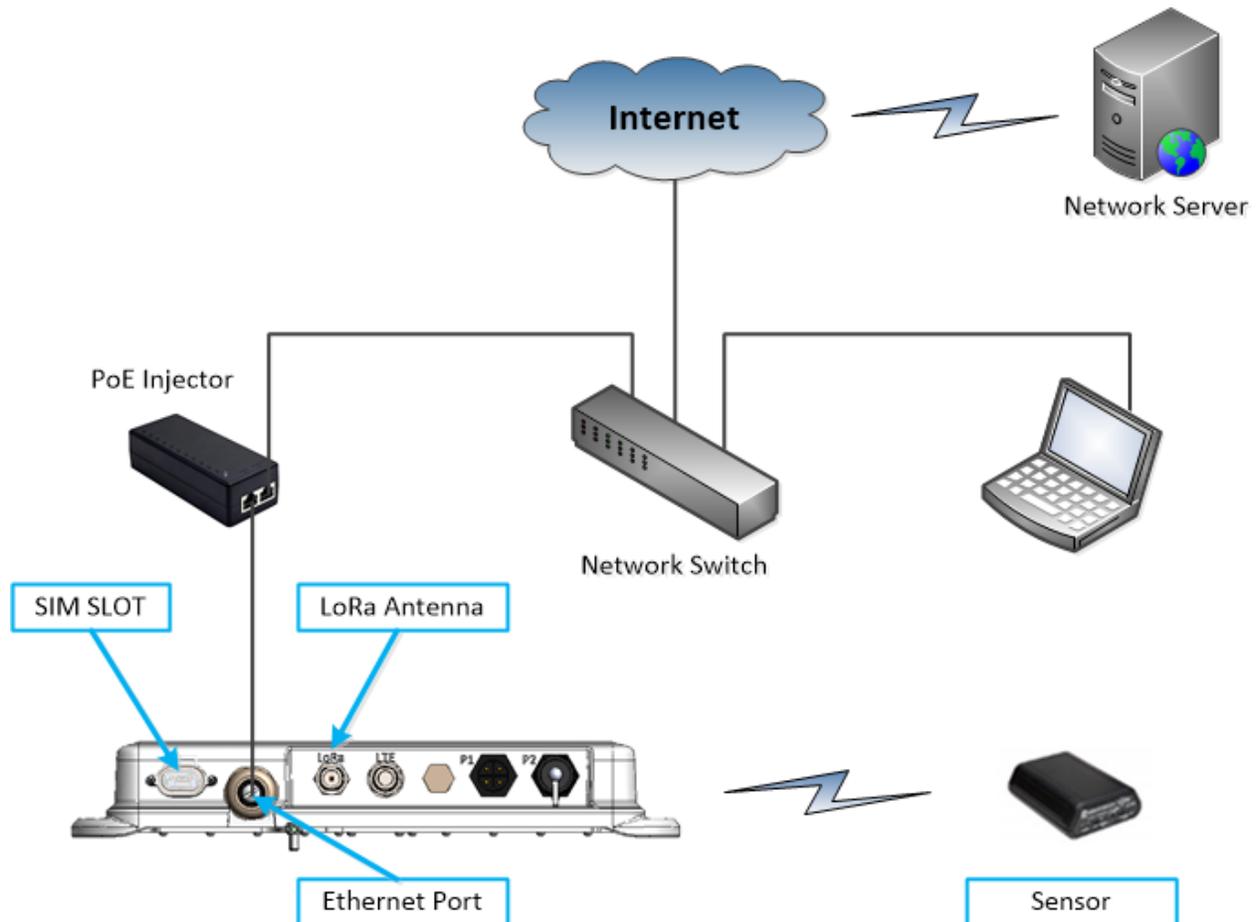


**Figure 4: Gateway Setup**

2. Kona Field Tool:
   Install KonaFT on Windows PC.  Copy the KonaFT self-extracting installer software onto the computer then double-click on the installer icon to start the installation process.
3. Network Server:
   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. Install SIM card:
   - Remove cover from access port. Use pull tab to remove the SIM tray.

- Insert SIM into Slot 0 and re-insert SIM tray.



PULL TAB
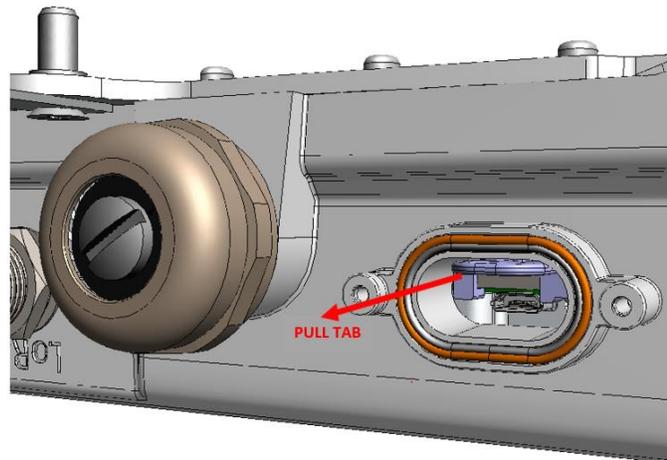
**Figure 5: SIM Tray Removal**

5. <u>Apply Power:</u>
Use PoE injector to power Gateway.  Minimum requirement for PoE injector is PoE 802.3af.

6. <u>Module Bootup:</u>
Bootup time of the Gateway is approximately 2 minutes. During bootup, the LED status is Flashing Green.

7. <u>Module LED status</u>:

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).

8. <u>Retrieve Module IP address:</u>
The Kona Enterprise 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.

9. <u>Start KonaFT:</u>
Launch KonaFT. Enter your gateway's IP address and port number 161 (default) on KonaFT then Select Start Button.
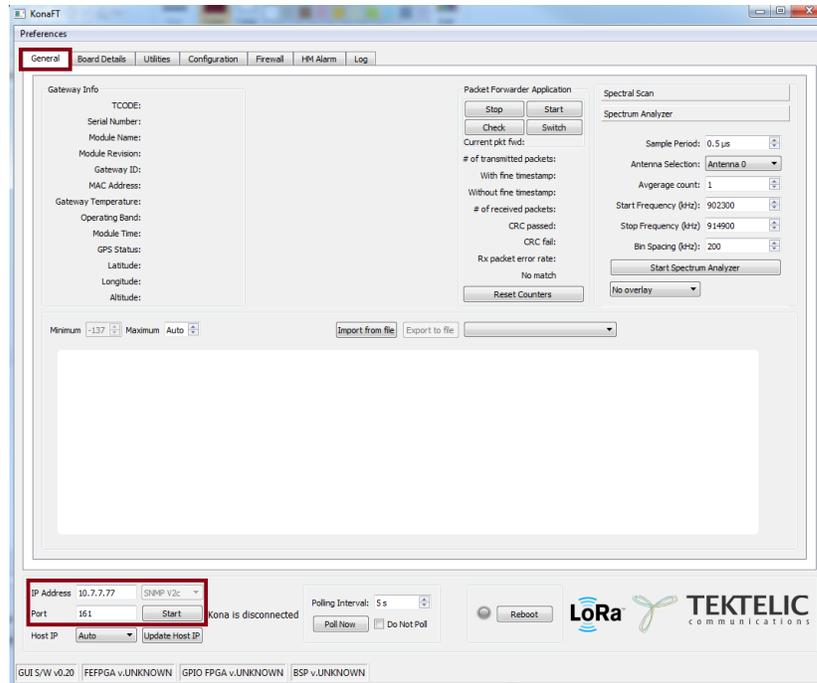
**Figure 3: Start KonaFT**

10. <u>Verify GPS:</u>

The Kona Enterprise 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.
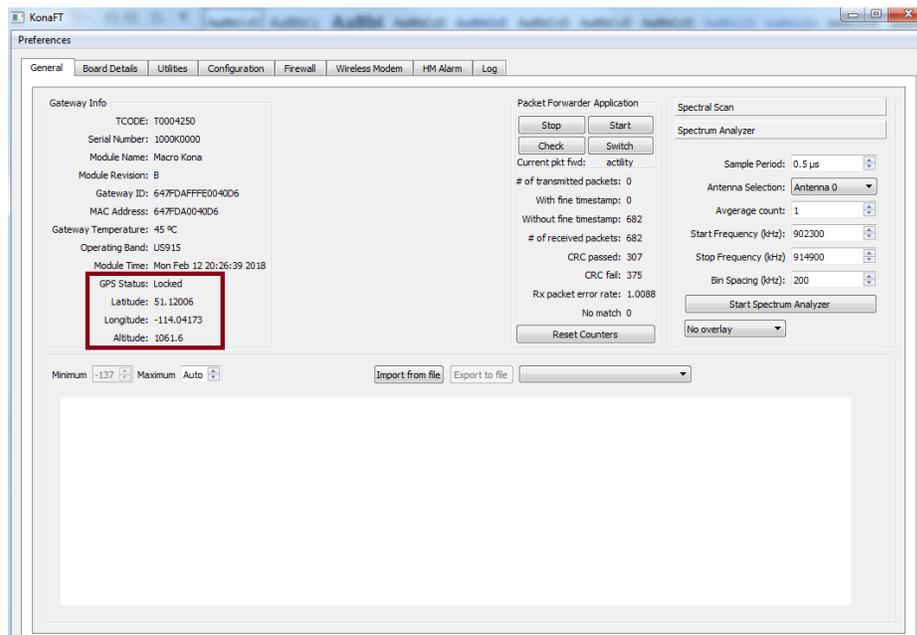


**Figure 4 : GPS Information**

11. Verify 3G/4G Connectivity:

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
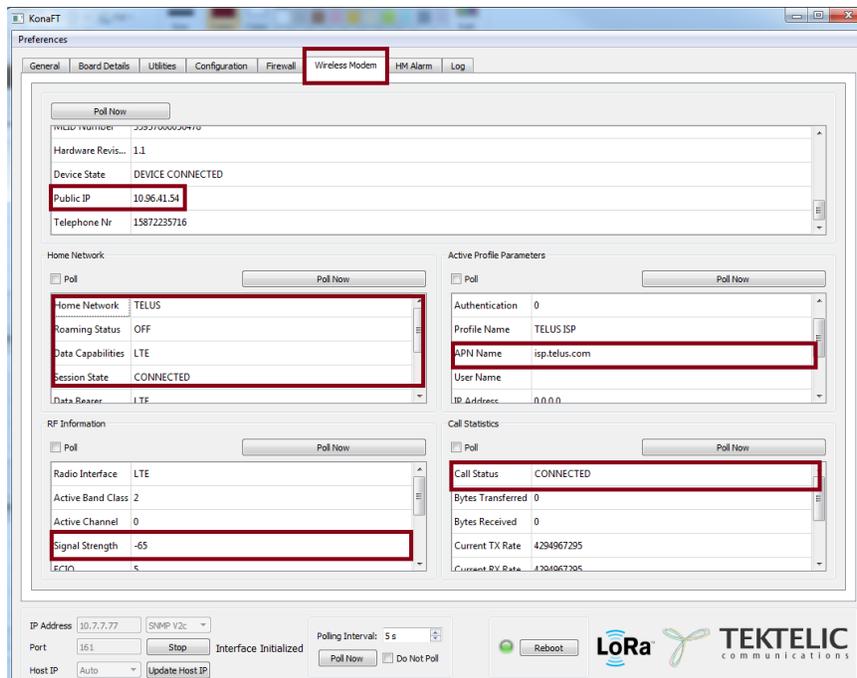


**Figure 5: Wireless Modem Information**

12. 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.
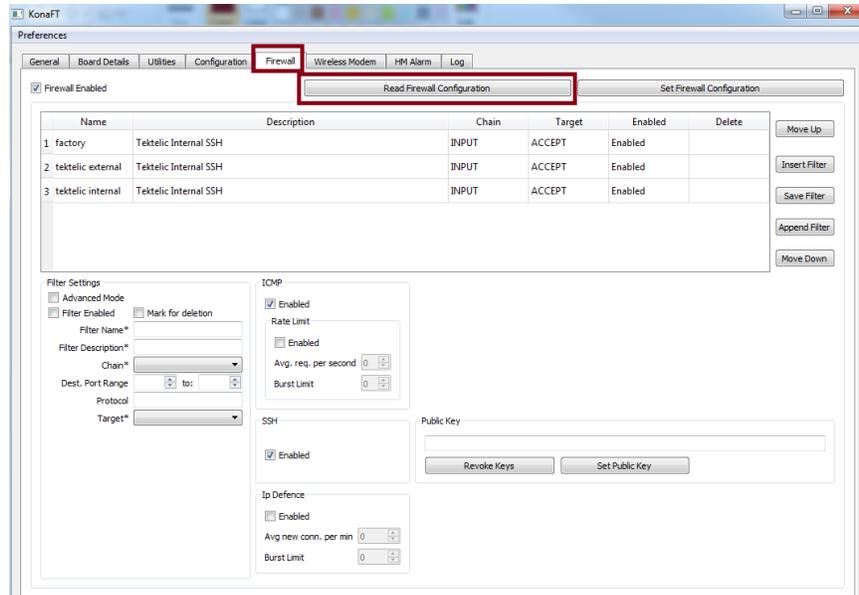
**Figure 6: Firewall Information**

13. <u>Verify LoRa traffic:</u>

    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.
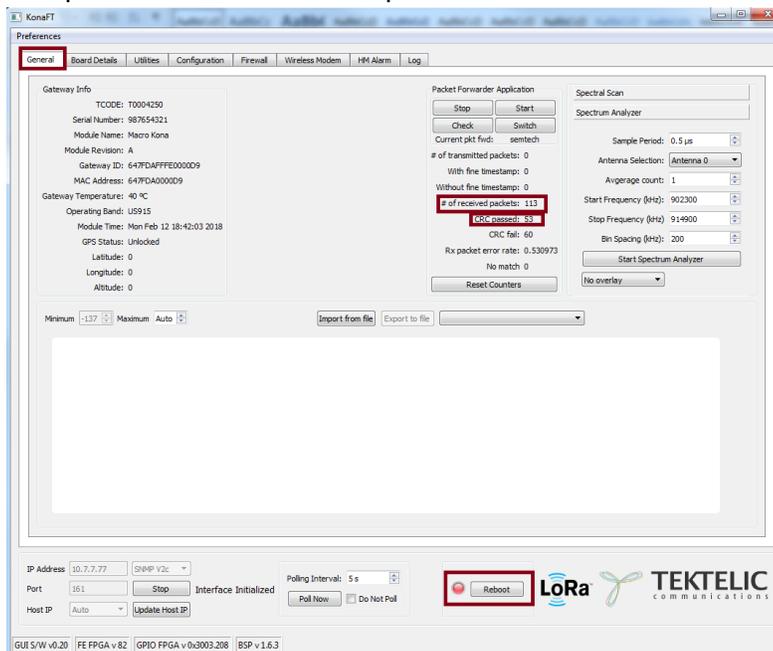


**Figure 7: # of received packets and CRC information**

- 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).
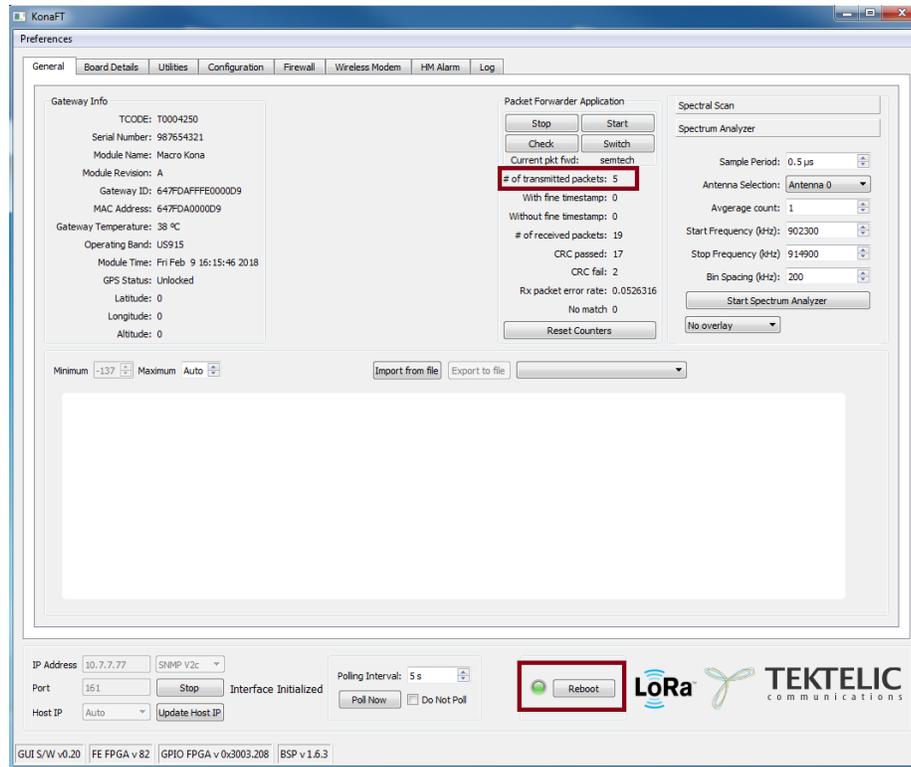


**Figure 8: # of transmitted packets**

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 Gateway Installation

Please refer to details contained in the User Guide, T0008479_UG.

# 4    Troubleshooting Tips

## 4.1    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. |
| Alternating Red/Green | Safe-Shutdown Mode | Gateway will reboot after 5 minutes. |

**Table 1: Different LED States**

## 4.2    Can't install/launch the KonaFT

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

## 4.3    KonaFT can't connect with Enterprise Gateway

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

## 4.4    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.

## 4.5    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.

## 4.6   GPS – No Lock

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

## 4.7   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 Photon User Guide T0008479_UG

[2] Tektelic Network Server Guide T0005158_NS, 2018.