TEKTELIC COMMUNICATIONS INC.

KONA SW UPGRADE GUIDE

Name: T0004279_SW_Upgrade
Revision: 2.0
Issue Date: 31/10/2018
Status: Released

PROPRIETARY:

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Revision History

Version	Date	Status	Author	Change Description
1.0	Apr 13, 2017	Released	P. Chu	Release Instructions for Kona_Macro_SW_Package_2.0.2 and later
1.1	Apr 27, 2017	Released	P. Chu	Updates for individual .ipk installation in Section 6
1.2	Apr 28, 2017	Released	P. Chu	Updates for Section 5, Upgrade from a local location on the Gateway
1.3	July 11, 2017	Released	P. Chu	Updated Section 2 and 3 for KonaFT upgrade and Command Line upgrade respectively
1.4	January 31, 2018	Released	P. Chu	Minor updates and corrections
1.5	April 20, 2018	Released	P. Chu	Updating to make more generic. Updated local file location to /lib/firmware
1.6	May 25, 2018	Released	P.Chu	Minor editing updates
1.7	October 22, 2018	Released	T. Danshin	Updates to include additional steps for system release 2.16 built on the new SDK
1.8	October 23, 2018	Released	T. Danshin, K. Minderhoud	Updated based on internal review
1.9	October 30, 2018	Released	T. Danshin	Added note about upgrading Micro Gateway from release BSP 1.3.0 – see section 3.3
2.0	October 31, 2018	Released	K. Minderhoud	Added detail about SSH password to section 5.2. Other minor corrections

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1 Introduction

1.1 Summary

This document describes the procedure required for SW upgrade on Kona Mega/Macro/Micro Gateways (document does not apply to the Kona Pico Gateway).

SW upgrade of the Kona Gateways require that an upgrade server be provisioned that is accessible to the Gateways through the KonaFT GUI. The KonaFT only supports upgrading of a single Gateway at a time.

If an upgrade server is not available, upgrade of the Gateways is possible using KonaFT 0.30 or later.

1.2 Requirements

The minimum requirements of the Kona Gateway for SW upgrade guide is:

- KonaFT GUI v0.30 or later
- Kona_Mega_SW_Release_Package_1.5.3 or later.
- Kona_Macro_SW_Release_Package_1.6.5 or later.
- Kona_Micro_SW_Release_Package_1.3 or later.

1.3 Definitions

Term	Definition
SW Release Package	SW provided by Tektelic that includes a BSP, FE FPGA, and GPIO FPGA. (Kona Micro does not have an FE FPGA)
BSP	Board Support Package: Collection of software installation files for the Linux OS.
Patches	Other installation files installed on top of a BSP
FE FPGA	Front-End FPGA, responsible for digital signal processing on Kona Mega and Kona Macro
GPIO FPGA	Low-level FPGA
KonaFT	Kona Field Tool GUI application used for Gateway monitoring and control (version 0.30 or later is required)

1.4 High Level Procedure

The following is the high level upgrade procedure:

1) Tektelic provides a SW upgrade package to be placed on the upgrade server. The upgrade server may be a remote location (web server), or a folder on the Gateway.
2) The network operator unpacks the upgrade package onto the upgrade web server. In the case of files locally on the Gateway, unpacks the files to a specified folder on the Gateway.
3) Point the Gateway feed file to the files locations
4) Trigger the Gateway Upgrade

1.5 External Webserver for Upgrade Files

The following web server configurations have been tested: Xubuntu 12.04 with lighttpd 1.4.28 and Xubuntu 16.04 with Apache 2.4.18. Other OS and web server variants should work as well.

The default web home directory for lighttpd and Apache is /var/www/.

1.6 Connecting to the Gateway

1) Open KonaFT
2) In the Tools Menu, select Find My Gateway

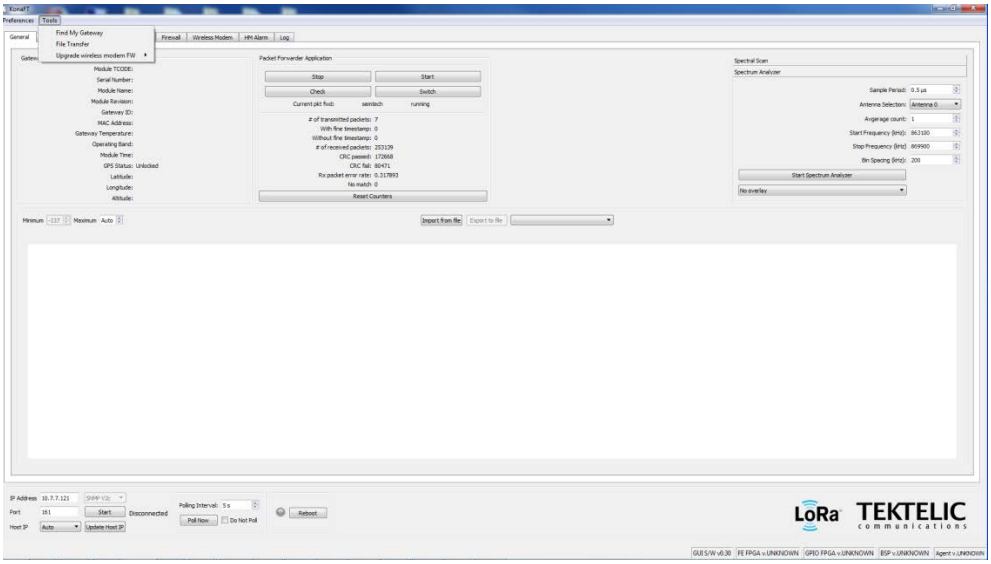


Figure 1-1 Using KonaFT to Find Gateway IP Address

3) Select an interface to use - this is the network range that the tool will scan over. Press the scan button.

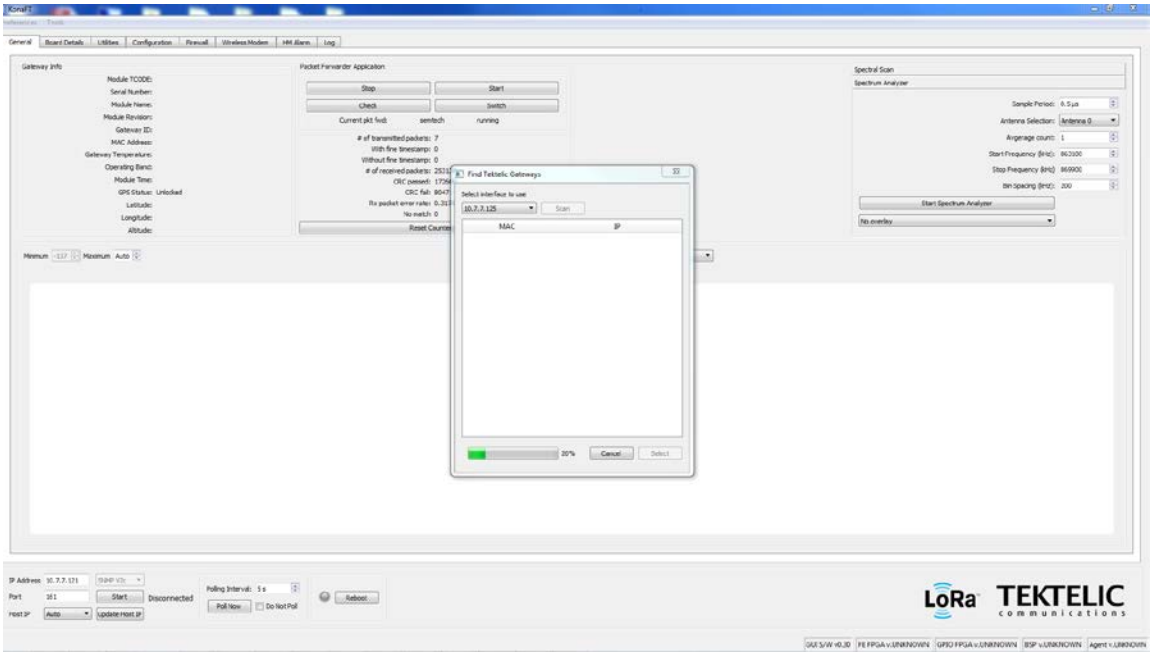


Figure 1-2 Scanning for Gateway IP Address

4) When the scan is complete, look up the MAC address of the gateway you want to connect to and highlight it by clicking on it.

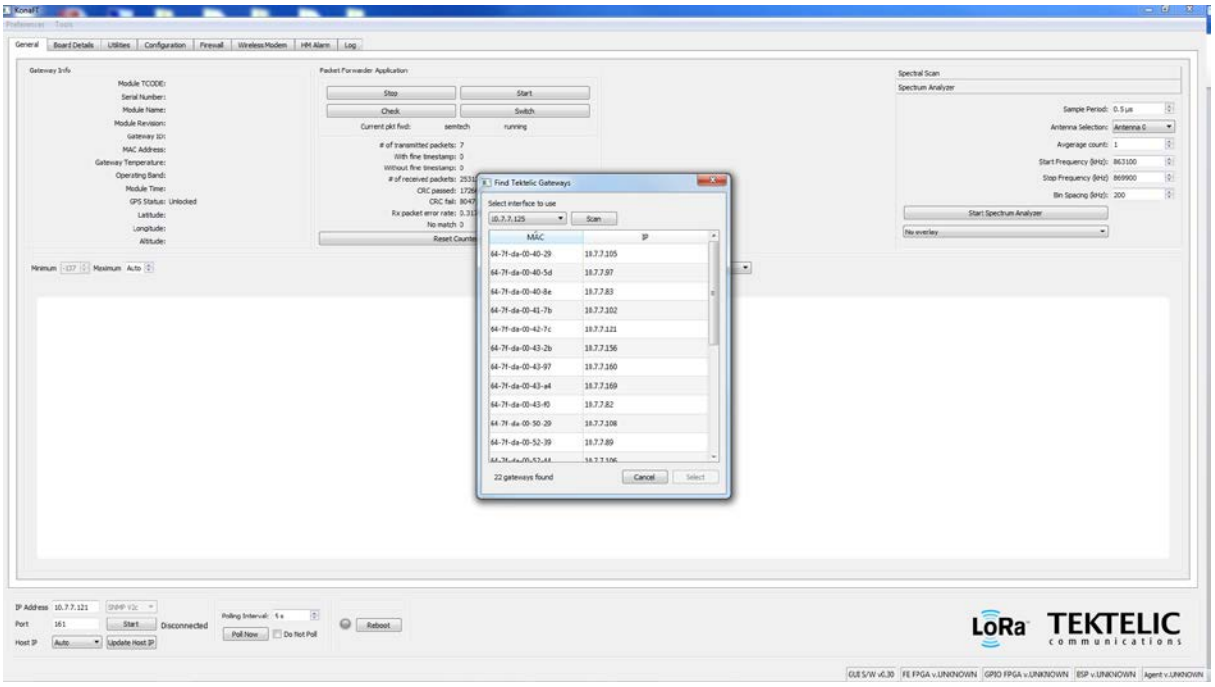


Figure 1-3 Selecting Gateway IP Address from a List

5) Press the Select Button. This will copy the IP address to the IP address field located at the bottom left of the General tab. Press the Start button to connect to the gateway. A message window may open warning of an Agent Mismatch Detected. This is expected when connecting a newer version of KonaFT to a gateway that has an older software release installed. This warning will go away once the gateway software is upgraded.

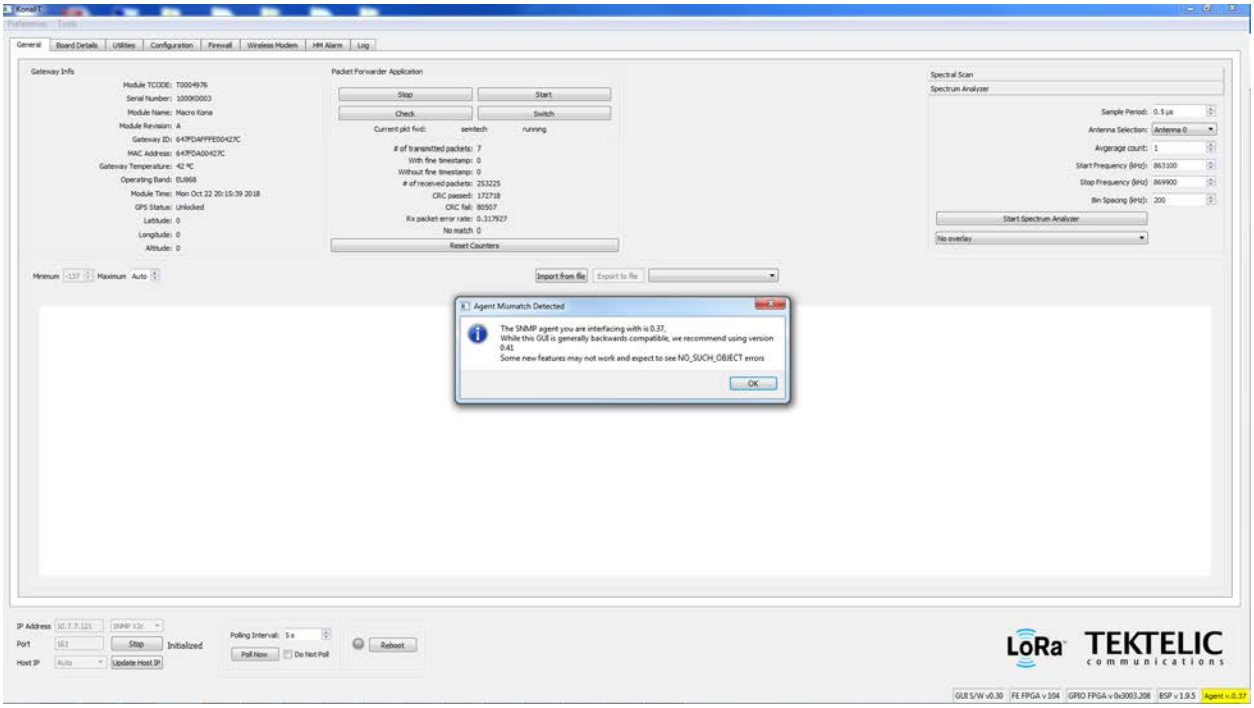


Figure 1-4 Agent Mismatch Warning

2 Unpacking the Upgrade Files

2.1 External Webserver

Tektelic will provide upgrade files in SW Release Package. The SW Release Package will contain a .zip file of all the applicable files needed for the upgrade. The SW Release Package will be in the following format:

SW_Release_Package_X.YY.zip

where X.YY is the release number.

The .zip file will contain folders for each element of the Gateway.

/bsp

/fe-fpga

/gpio-fpga

Extract the .zip file to a webserver location available to the Gateway.

For example, for lighttpd and Apache:

/var/www/bsp

/var/www/fe-fpga

/var/www/gpio-fpga

2.2 Using Files Locally on the Gateway

Extracting the upgrade files locally on the Gateway will require direct access to the Gateway. Direct access to the Gateways will require the user to know the login credentials of the Gateway.

1) Connect to the Gateway (see section 1.6 for details)
2) On the Tools menu select “File Transfer”. A dialog box will open.

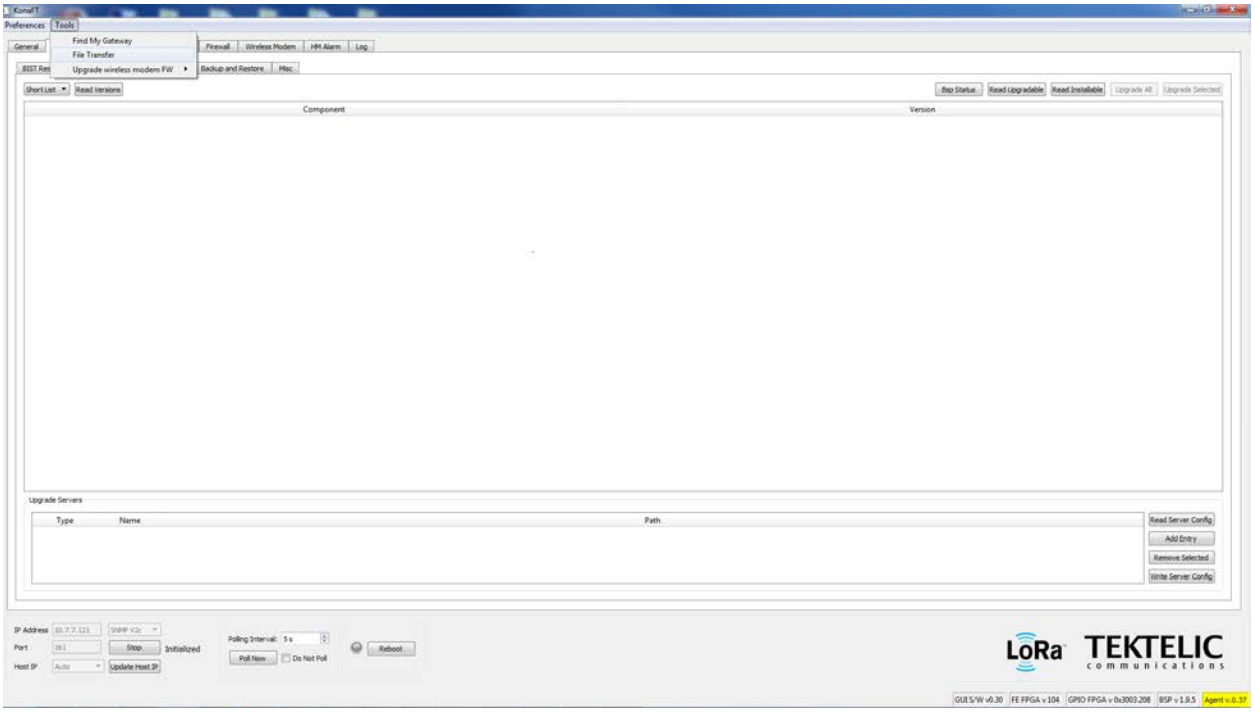


Figure 2-1 File Transfer to Gateway

3) Click the browse button to find the compressed file containing the new software release. Select the Decompress option in the check box.

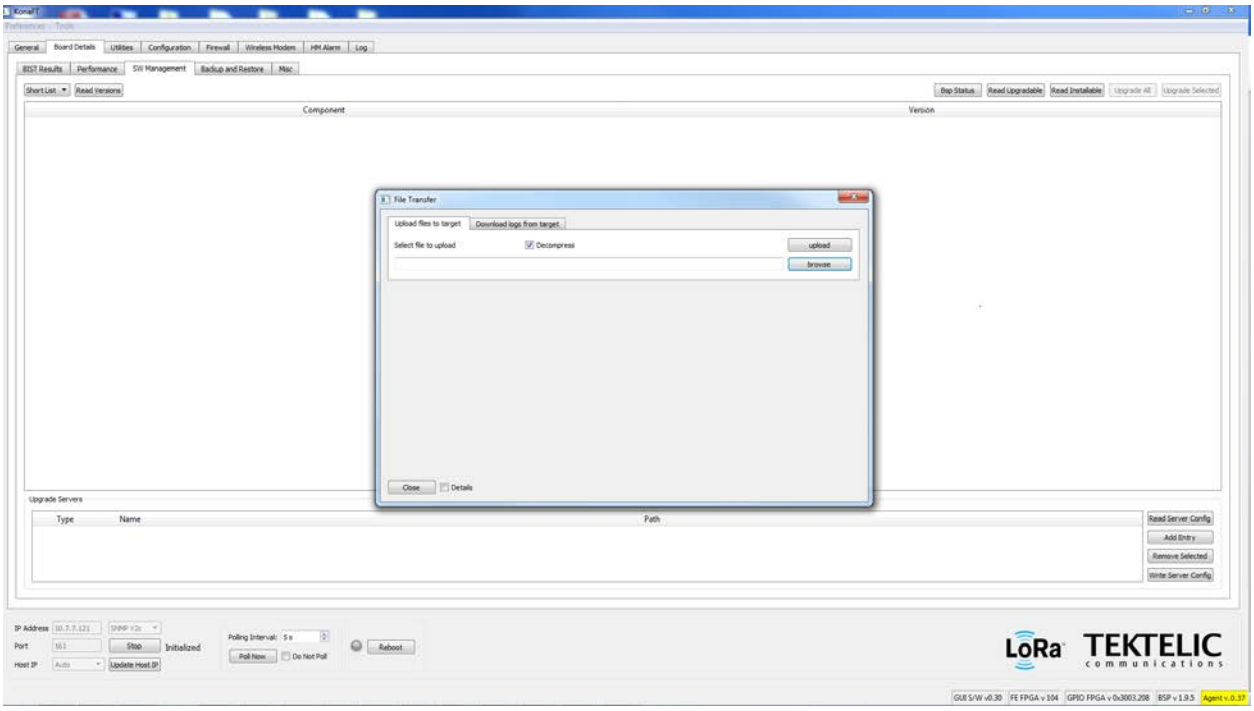


Figure 2-2 Browsing to Software Image Location

4) After selecting the file location press the “upload” button. The software image folders will be extracted to the /lib/firmware directory. The gateway is now ready for upgrade (see next section).

3 Upgrading through KonaFT

3.1 Description

KonaFT is the preferred tool to upgrade the Kona Macro Gateway. This method requires that the KonaFT be able to connect to Gateway via SNMP. KonaFT supports upgrading from an external webserver or locally on the Gateway. An external webserver is the preferred method to house upgrade files.

3.2 Edit the –feed.conf file with upgrade file locations

The Gateway –feed.conf file contains the location of the upgrade files for the Gateway. Each upgrade folder (bsp, fe-fpga and gpio-fpga) must be defined. The file can be updated using KonaFT.

1) Open KonaFT GUI and connect to the gateway (see section 1.6 for details)
2) Go to the “Board Details” – “SW Management” tab.
3) Click “Read Server Config”. The current upgrade server locations will display.

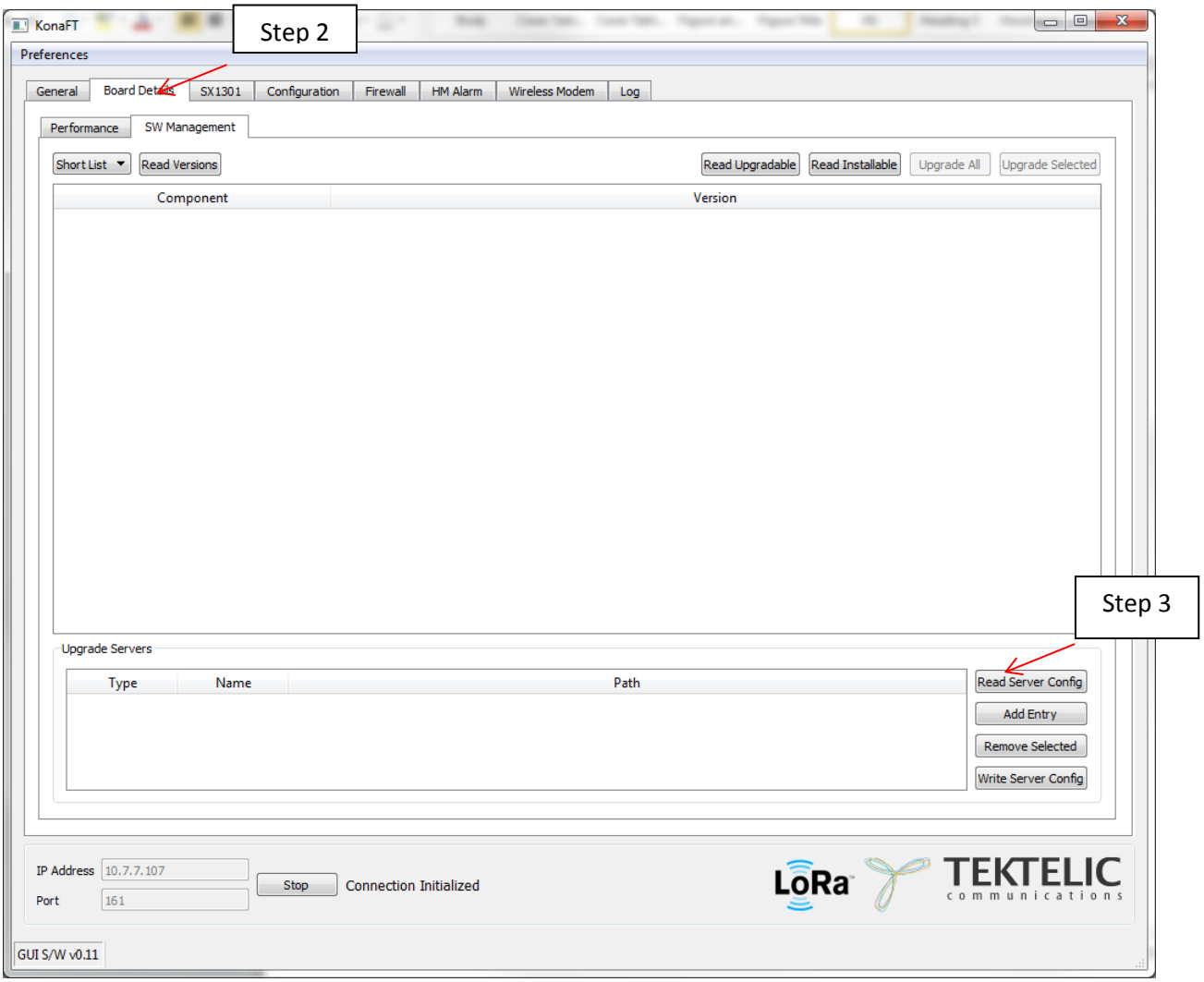


Figure 3-1: Board Details - SW Management Tab

4) Edit the server configuration fields to the location of the upgrade files. The following rules apply:

“Type”: Must be src/gz

“Name”: The folder name

“Path”: The location of the upgrade files on the web server, or the files located locally on the gateway.

For files on a web server, the “Path” fields will start with http:// or https://.

For files locally on the Gateway the “Path” fields will start with file:///.

To add additional lines for the different upgrade folders (bsp, fe-fpga and gpio-fpga), click the “Add Entry” button.

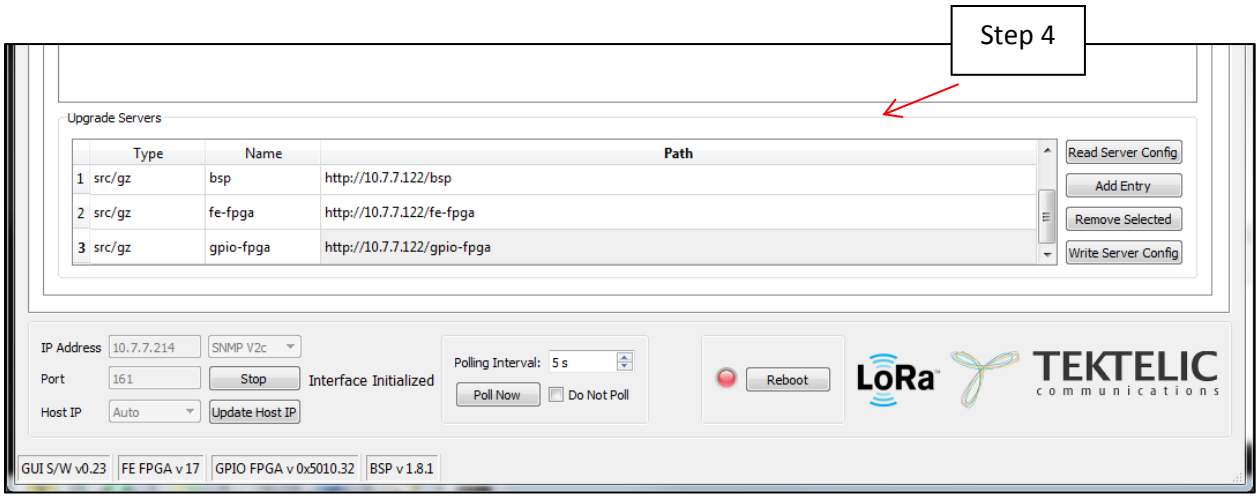


Figure 3-2: Files on a web server example

Figure 3-3: File located locally example

5) Commit the changes to the server configuration by clicking “Write Server Config”

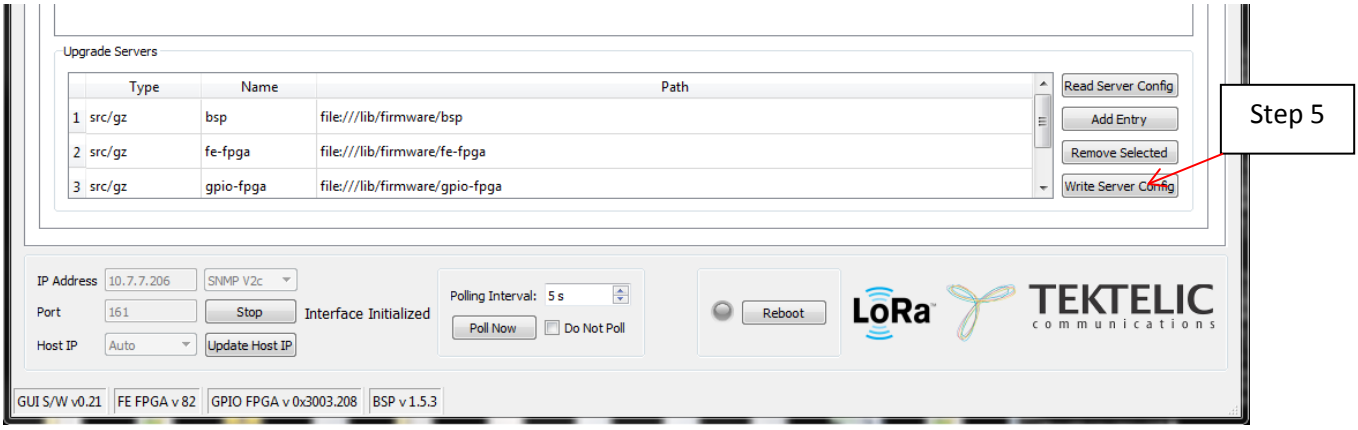


Figure 3-4: Write Server Config

6) Verify the server location was committed by clicking “Read Server Config”. The file location information will refresh.

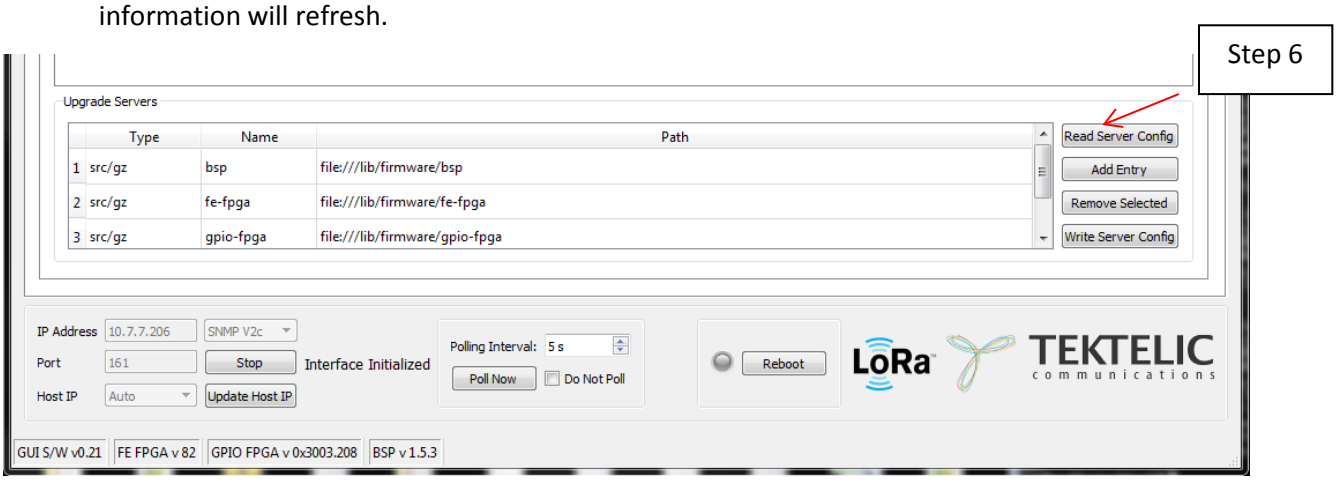


Figure 3-5: Verify Server Location

3.3 Perform the SW Upgrade

3.3.1 Description

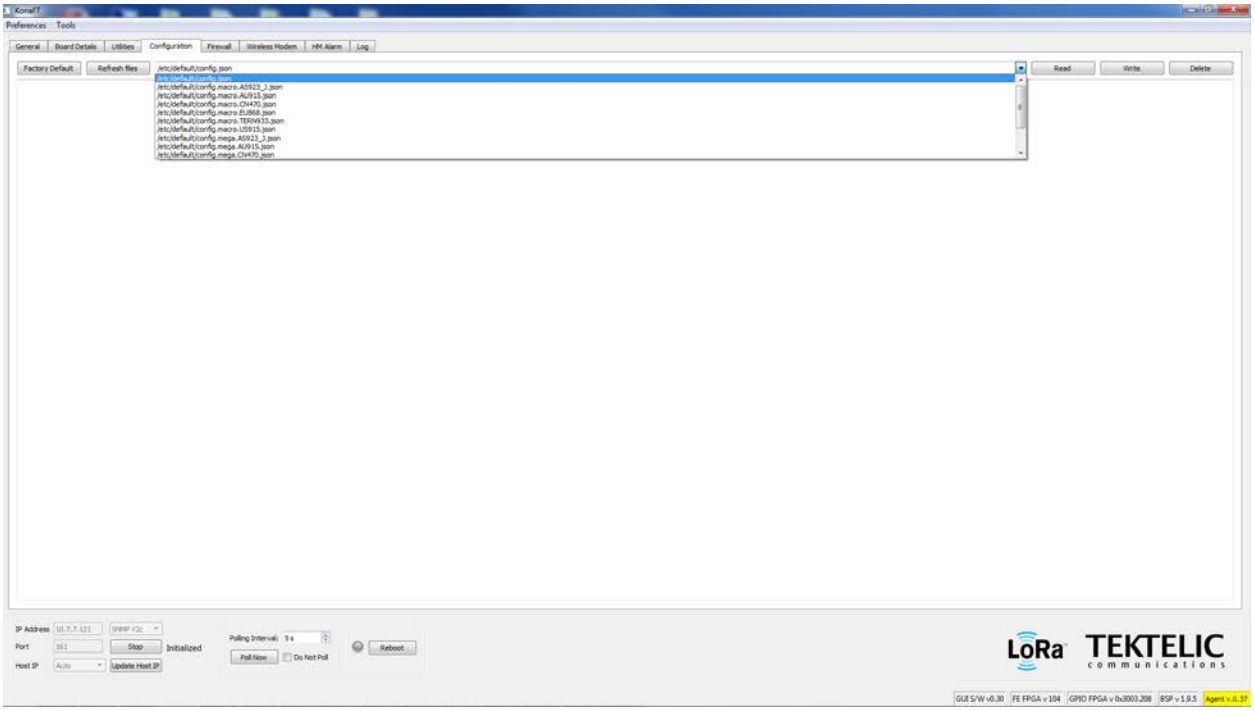
Upgrading the module SW utilizes the tektelic-dist-upgrade utility that manages the order of which packages are installed. It is not recommend to upgrade packages individually when performing a full SW upgrade (BSP, FE-FPGA and GPIO-FPGA).

Note, third party packet forwarder upgrades are not included in Tektelic SW Releases. Upgrading of third party packet forwarders are handled via their corresponding network server.

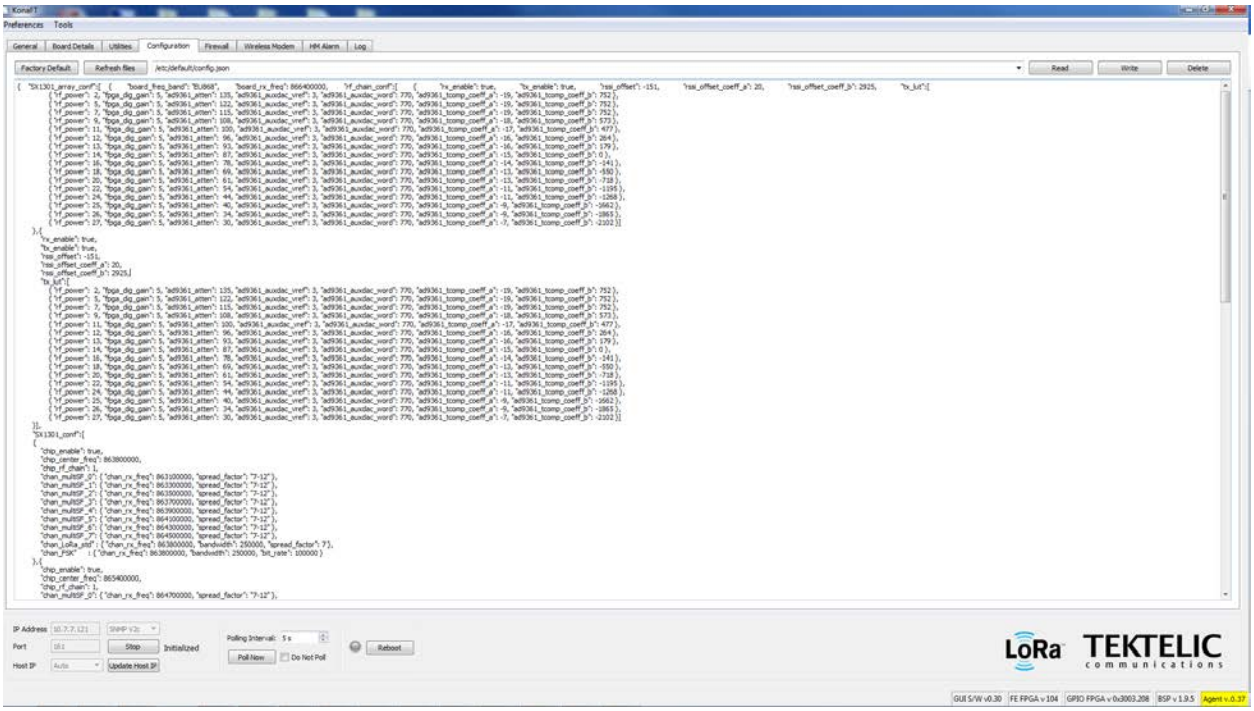
3.3.2 Prerequisites

3.3.2.1 If Starting from BSP 1.5.3 or older:

1) Backup the config.json file otherwise it will be overwritten by the packet forwarder (applies to Semech packet forwarder). Click on the "Configuration" tab, and press the Refresh files button. From the dropdown menu, select /etc/default/config.json.



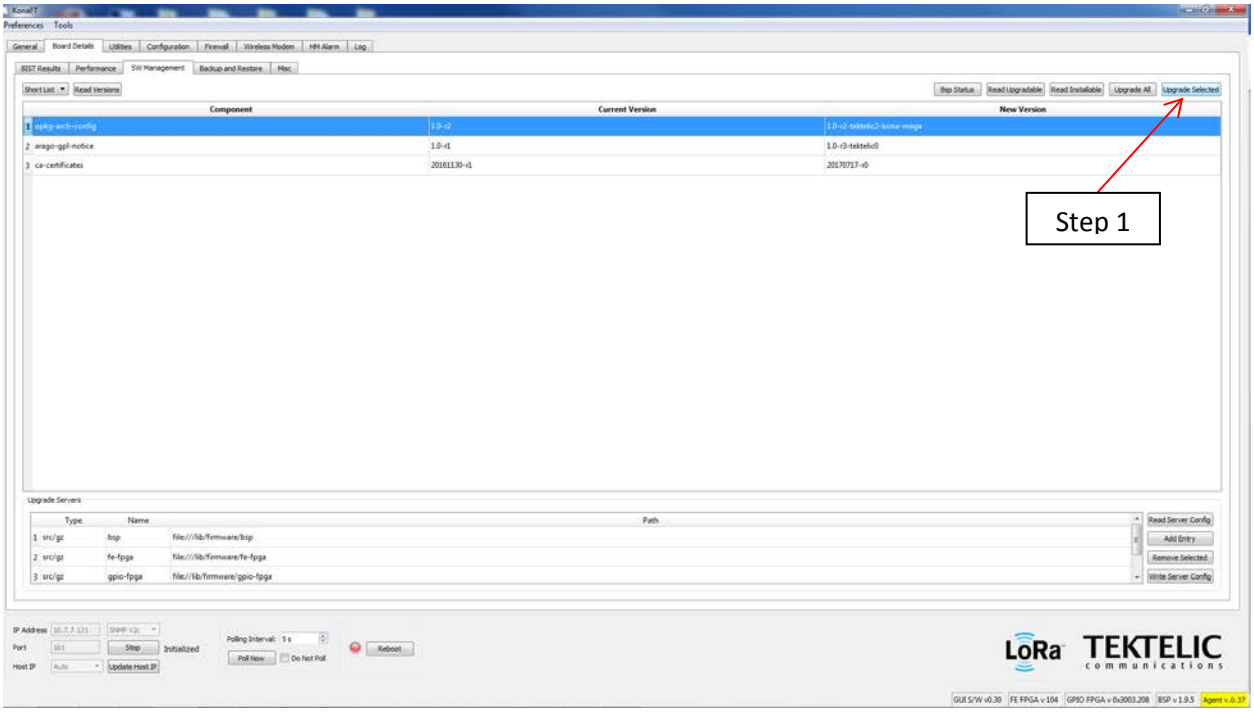
2) Press the "Read Button". Copy all the displayed text from the window and paste it to a new file on your PC using a text editor like Notepad.



3) After the upgrade, paste the text back into the same window, and for the same filename press the “Write” button.

3.3.3 Trigger the upgrade

1) In the “Board Details” – “SW Management” Tab click “Read Upgradable”. Select opkg-arch-config and press the “Upgrade Selected” button.



2) In the "Board Details" – "SW Management" Tab click "Read Upgradable". This will display all the available packages to upgrade. If a new BSP is available, KonaFT will prompt the user if they wish to trigger the full upgrade.
3) IMPORTANT: If upgrading from software release 1.9.5 (Macro or Mega GW) or 1.3.0 (Micro GW) an extra step is required. Click "No" in the "BSP upgrade selected" window. Find and select "tektelic-upgrade" from the list of components and press "Upgrade Selected". After the Upgrade is complete, click "Read Upgradeable" one more time. Proceed to the next step.

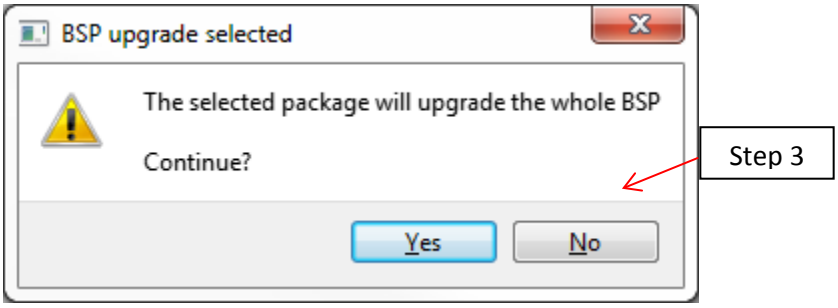


Figure 3-6: Start the Upgrade

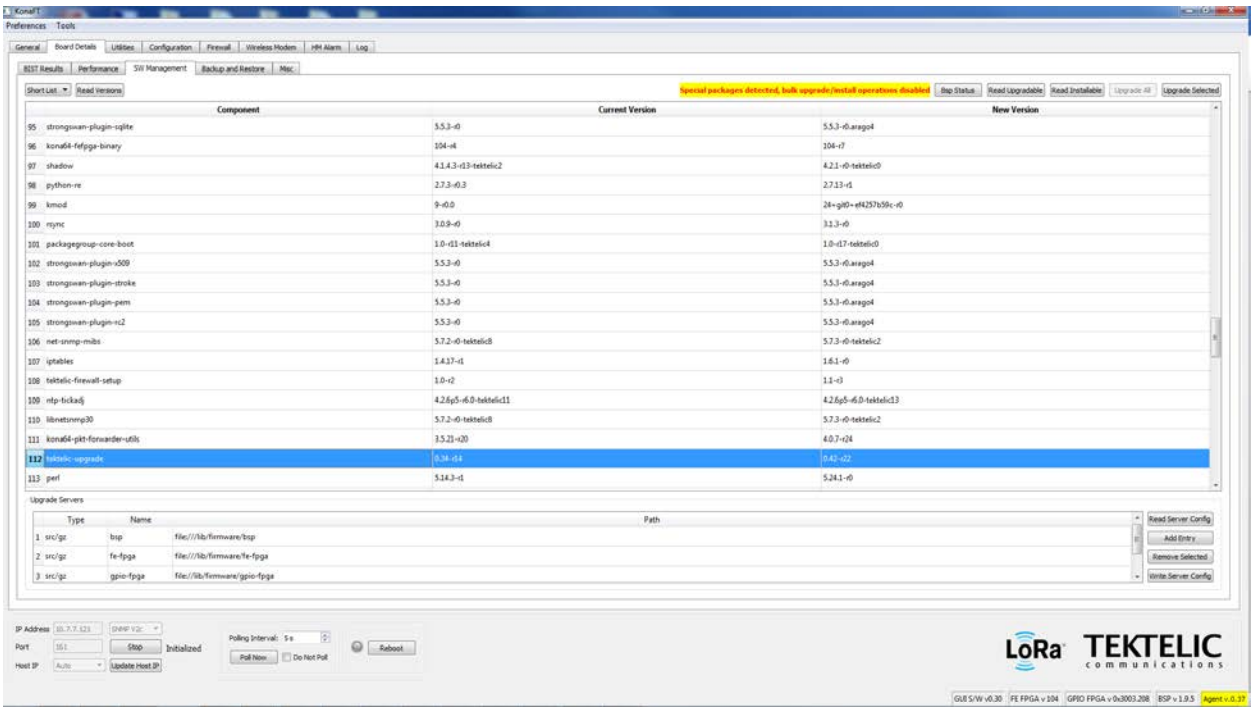


Figure 3-7 Install tektelic-upgrade

4) Start the upgrade by selecting “Yes” on the upgrade prompt displayed.

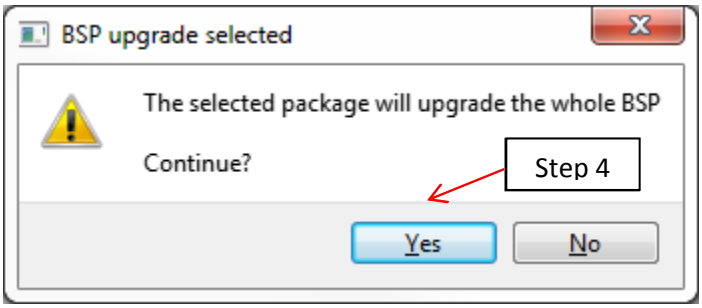


Figure 3-8: Start the Upgrade

5) Full BSP upgrades will take up to 17 minutes to complete and will trigger up to three reboots. During the time the module is rebooting KonaFT will not be able to communicate with the Gateway. Each reboot takes approximately 2 minutes. During each reboot, the module LED will flash Green.
6) After approximately 17 minutes, reconnect to the Gateway using KonaFT.
7) In the “Board Details” – “SW Management” Tab click “BSP Status”. The bottom message bar of KonaFT will show “ BSP upgrade succeeded”

4 Upgrading Individual Released Packages

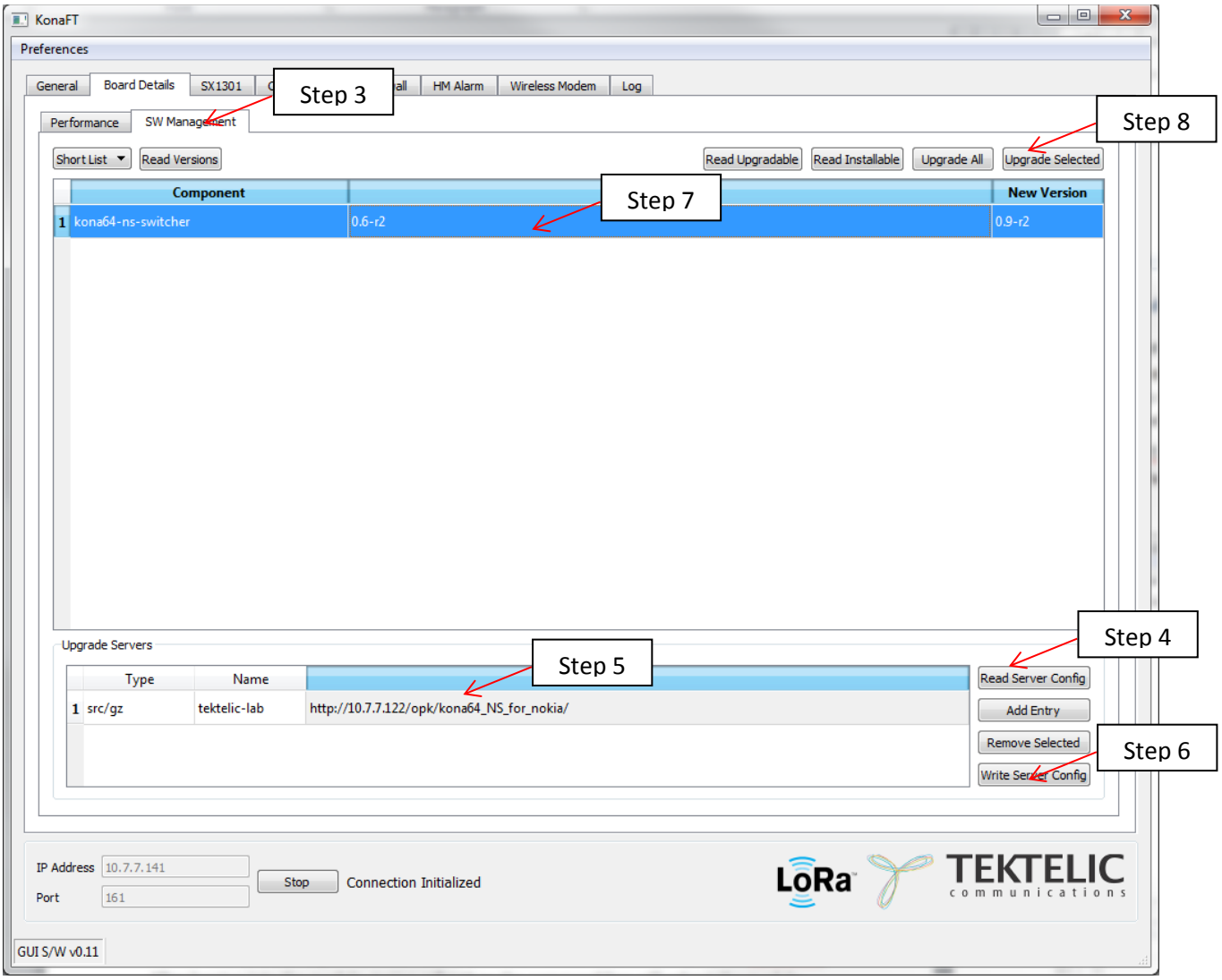
4.1 Description

Between major BSP releases, if individual packages require updating, they may be updated using the KonaFT GUI or on the SSH command line. In this case, a release folder will be provided by Tektelic containing the upgraded packages and a Packages.gz file (this file is required to be in the upgrade folder to identify to the Gateway what files are available for upgrade).

4.2 Installation Steps Using KonaFT

The following steps can be used to upgrade a single package release using KonaFT

1) Place the received upgrade folder on the upgrade server or locally on the Gateway in folder /lib/firmware
2) Open KonaFT
3) Go to the Board Details -> SW Management Tab
4) Click Read Server Config
5) Update the path to the new upgrade folder on the upgrade server or the local file on the Gateway
6) Click Write Server Config
7) Selected the package to upgrade in the central window
8) Click Upgrade Selected


KonaFT
Preferences
General
Board Details
SX1301
HM Alarm
Wireless Modem
Log
Performance
SW Management
Step 3
Step 8
Short List
Read Versions
Read Upgradable
Read Installable
Upgrade All
Upgrade Selected
Component
New Version
1
kona64-ns-switcher
0.6-r2
0.9-r2
Step 7
Upgrade Servers
Step 4
Step 5
Type
Name
1
src/gz
tektelic-lab
http://10.7.7.122/opk/kona64_NS_for_nokia/
Read Server Config
Add Entry
Remove Selected
Write Server Config
Step 6
IP Address
10.7.7.141
Port
161
Stop
Connection Initialized
LoRa
TEKTELIC
communications
GUI S/W v0.11

5 Upgrading Individual Released .ipk Package

5.1 Description

Between major BSP releases, if an individual .ipk packages requires updating, they may be updated on the SSH command line. In this case, an .ipk will be provided by Tektelic for the package that requires updating.

5.2 Installation Steps Using SSH Command Line

The following steps can be used to upgrade a single package release using SSH command line

1) Place the received .ipk in the folder /tmp using WinSCP (or equivalent)
2) Connect to the Gateway using an SSH terminal (such Teraterm or Putty) as root.
3) If prompted for a password, use the 9-character alphanumeric serial number[1] of the Gateway printed on the label affixed to the Gateway.
4) Type **opkg install /tmp/<filename>.ipk**
5) Type **reboot**

[1] Serial number format is YYWWM####, where YY is two decimal digits representing the year, WW is two decimal digits representing the week number, M is one alphanumeric character identifying the manufacturer and #### is four digit number.