

BSP Upgrade using KonaFT

Introduction

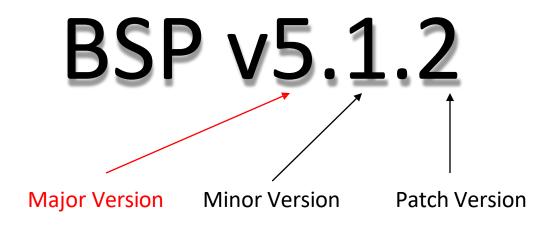
- Reference guide to upgrade BSP on Kona Gateways (Enterprise, Micro, Macro and Mega) using KonaFT
- Requirements:
- 1. The latest release of KonaFT
- 2. Gateway (on which BSP needs to be upgraded) and KonaFT must be connected in the same computer sub-network
- 3. FTP program such as FileZilla or WinSCP

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Intermediate Upgrades

- Depending on the BSP version, you may have to upgrade your Kona Gateway multiple times. You would upgrade to the **Intermediate BSP versions**, then to the Final BSP version.
- Intermediate upgrades are *always* between each Major Version released.



Intermediate Upgrades (Continued)

- This slide outlines the process for **determining intermediate BSP upgrades.**
- Each intermediate upgrade should be in-between Major BSP versions.
- For a baseline reference, please see the next slide.
- You may choose to upgrade to the latest Major version and Minor version. (i.e. BSP v2.1.3 -> v3.3.7 on Micro)



The above graphic outlines the intermediate upgrade process:

- 1. BSP upgrade from v4.X.X to v5.X.X
- 2. BSP upgrade from v5.X.X to v6.X.X

NOTE: When performing multiple BSP upgrades, <u>the upgrade files and package will need to be removed before</u> <u>each upgrade.</u> This will ensure the gateway will have enough space for each upgrade.

Intermediate Upgrades (Continued)

• This slide shows the intermediate BSP upgrades as a baseline reference.

Gateway	Initial BSP Version	Intermediate BSP versions	Final BSP Version
Kona Micro	Older than v2.1.x	v2.1.3	v3.x.x and newer
Kona Micro PoE	v2.x.x	v2.5.1	v5.x.x and newer
Kona Macro	Older than v3.1.x	v3.1.5	v4.x.x and newer
Kona Mega	Older than v3.1.x	v3.1.4	v4.x.x and newer
Kona Enterprise	v1.x.x	v2.0.1	v3.x.x and newer

Table-1 Intermediate upgrades for Older BSPs

For example, if your Kona Macro has BSP v1.6.5 and you wish to upgrade it to a later version i.e. v5.X.X, the upgrade process must follow the below steps:

- 1. BSP Upgrade from v1.6.5 to v3.1.5
- 2. BSP Upgrade from v3.1.5 to v4.0.3
- 3. BSP Upgrade from v4.0.3 to v5.X.X

Download Upgrade Package

All BSP upgrade packages can be found on the TEKTELIC FTP server. You can find out <u>the latest</u> <u>releases here</u>. Instructions to access the FTP are as follows:

1. Configure your FTP client (such as <u>FileZilla</u> or <u>WinSCP</u>) to "Use explicit FTP over TLS if available".



Figure-1 FTP client settings

- 2. Use the following credentials to access the server.
 - Site: **74.3.134.34**
 - Username: customer
 - Password: vU6_ATR3
- 3. Navigate to the correct directory and download the BSP package of your choice.

Connecting to your Gateway

Ensure that the computer and gateway are on the same computer network. Then follow the steps below:

- 1. In the top left corner, click on Tools and select Find my Gateway
- 2. Then select the interface that corroborates to the gateway's network. When ready, click Scan.
- 3. When your gateway appears, click on the entry and finalize by clicking Select.
- 4. On newer versions of KonaFT, select SNMPv2 from the drop-down menu indicated.
- 5. Below the SNMP drop-down menu in step 4, click **Start** to connect to your gateway.

A pop-up with the title "AGENT MISMATCH DETECTED" may appear. This can be ignored.

Connecting to your Gateway (Cont.)

Gateway Info			Packet Forwarder A	Application	Spectral Scan		
Module TCODE:			Char	Start	Spectrum Analyzer		
Serial Number:	Find Tektelic Gateways	;	×		Sample Period:	0.5.00	÷.
Module Name:	Select interface to use			Switch tektelic running			Y
Module Revision:	10.7.7.141 💌	Scan		-	Antenna Selection:		
Gateway ID:	MÂC	IP	^	tkets: 1 tamp: 0	Avgerage count:		*
MAC Address:	64-7f-da-00-00-d9			tamp: 0	Start Frequency (kHz):		-
Gateway Temperature:	64-7f-da-00-40-71	10.7.7.86		:kets: 6904 ssed: 6646	Stop Frequency (kHz)	924600	-
Operating Band:				C fail: 282	Bin Spacing (kHz):	200	*
Module Time:	64-7f-da-00-40-8e	10.7.7.156		rate: 0.0405562 natch 0	Start Spectrum Analyzer		
No of Lora Antennas:	64-7f-da-00-40-d3	10.7.7.101		et Counters	No overlay		
	64-7f-da-00-51-65	10.7.7.107					
Minimum -137 🖨 Maximum Auto	64-7f-da-00-52-39	10.7.7.114			-		
	64-7f-da-00-54-12	10.7.7.163					
	64-7f-da-00-55-32	10.7.7.164					
	64-7f-da-00-57-60	10.7.7.191					
	64-7f-da-00-58-41	10.7.7.168					
	64-7f-da-00-59-be	10.7.7.182					
	64-7f-da-00-5b-c4	10.7.7.219	3				
	43 gateways found	Cancel	Select				
	is gateria is round	Curren	bucct				
Address 10.7.7.216 SNMP V2c		erval: 5 s 🜩		\sim	Ra [®] TEK		10
t 161 Start	Disconnected		Reboot		Da≊ I⊢K	1 - 1	1(

Figure-1 Find My Gateway

Connecting to your Gateway (Cont.)

top	Start Switch running	Spectral Scan Spectrum Analyzer Sample Period: Antenna Selection:		-
eck tt fwd: tektelic tted packets: 1 e timestamp: 0 e timestamp: 0	Switch	Antenna Selection:		÷
ct fwd: tektelic tted packets: 1 e timestamp: 0 e timestamp: 0		Antenna Selection:		Ŧ
tted packets: 1 e timestamp: 0 e timestamp: 0	running		Antenna 0	
e timestamp: 0 e timestamp: 0				Y
e timestamp: 0		Avgerage count:	1	*
		Start Frequency (kHz):	902299	+
		Stop Frequency (kHz)	924600	*
CRC passed: 6646 CRC fail: 282	5	Bin Spacing (kHz):	200	*
	05562			
No match 0				
Reset Counters	s	No overlay		
	No match 0	vet error rate: 0.0405562 No match 0 Reset Counters	No match 0	No match 0

Figure-2 SNMP Drop-down menu

Uploading Upgrade Files

- 1. Go to Tools → File Transfer
- 2. Click on Browse and select the upgrade package.
 - *a.* **<u>DESELECT</u>** the decompress checkbox if you access the gateway via admin account.
- 3. Upon selecting the file to be uploaded to the Gateway, click Upload
- 4. A prompt will ask for a username and password. See below for details.

Username	Password	Notes
root	9-Digit Serial number of the Gateway (i.e. 1618B0052)	 Applies to gateways with serial numbers that start with 21 and below.
admin	9-Digit Serial number of the Gateway (i.e. 1618B0052)	Commonly found on older ENTERPRISE gateways.
admin	Random string of characters provided on the test report. <u>Contact Support</u>	 Applies to gateways with serial numbers that start with 22 and above. Some units in this category may still have root as the user and the serial number as the default password.

Table-2 Username and Password

NOTE: If the password is not on the test report, <u>contact Tektelic Support</u> and provide the following:

• T-code (i.e. **T000XXYY**) and serial number (i.e. **1212A3434**)

Uploading Upgrade Files (Continued)

- 5. As upgrade file will start uploading on the GW, you can monitor the status of upload shown in Figure-3.
- 6. After upload finishes, wait for 2-3 minutes as the uploaded zip file will be unzipped on the Gateway.

File Transfer		
Upload files to target	Download logs from target	
Select file to upload	✓ Decompress	upload
	Kona_Micro_SW_BSP_5. 1. 1. zip	browse
	a"-bat, ja 1 all." a ll." pital product of the second k kktttttt eeeee ll ii cocco product for the second k kk tt eee ll ii coc tt eeeee kk kk tt eee ll ii coc tt eeeee kk kk tt eeeee ll ii coc tt eeeee kk kk tt eeeee ll ii coc c o m m u n i c a t i o n s ons Inc http://tektelic.com monitored and logged Ly if you are not an authorized user may take a while loaded, unzipping	
Close 🗸 Detai	S	

Figure-3 File Transfer

Uploading Upgrade Files (Continued)

Gateways that use the **admin credentials** to access the gateway have additional steps to perform, as **the admin account does not have sufficient permissions** to administrate and maintain the gateway.

- 1. Login to the gateway via SSH.
- 2. Create a new folder: **sudo mkdir /lib/firmware/bsp**
- Unzip the uploaded upgrade package: sudo unzip /dev/shm/<upgrade-package-name>.zip -d /lib/firmware/bsp
- 4. (Optional) Remove the upgrade package to conserve space: sudo rm /dev/shm/<upgrade-packagename>.zip

Editing Configuration File

- 1. Once the package has been successfully uploaded, go to **Board Details → SW Management** tab
- 2. Find **Upgrade Servers** as shown in Figure-4.
- 3. Click on **Read Server Config** to see if the configuration file has any existing entries.
- 4. Verify the existing entries according to the following slides, or add them if they do not exist via **Add Entry**.
- 5. Click on Write Server Config to save these changes
- 6. Click on **Read Server Config** to verify the saved changes

eneral	Board Det	tails Utilit	ies Configuration	Firewall	Wireless M	odem	HM Alarm	Log					
BIST R	esults Pe	erformance	SW Management	Backup and F	Restore	Misc							
Short	List 🔻 Re	ad Versions							Bsp Status	Read Upgradable	Read Installable	Upgrade All	Upgrade Select
			Compo	nent							Version		
		_											
Upgr	ade Servers												
Us	er Name:		P	Password:				Use au	hentication			_	
	Туре	N	ame					Pa	th			Re	ad Server Config
													Add Entry
												R	emove Selected
													ite Server Config

Figure-4 Upgrade Servers

The following entries are used when upgrading gateways to:

- Kona Micro BSP older than or equal to 3.3.6, Kona Enterprise BSP older than or equal to 1.1.4
 - Kona Macro BSP older than or equal to 4.3.5, Kona Mega BSP older than or equal to 4.3.7

Туре	Name	Path
src/gz	bsp	file:///lib/firmware/bsp/bsp
src/gz	gpio-fpga	file:///lib/firmware/bsp/gpio-fpga

Table-3 Upgrade Servers Entries for Kona Micro and

Kona Enterprise Gateways upgrading to BSPs *older than or equal to* 3.3.6 / 1.1.4

Туре	Name	Path
src/gz	bsp	file:///lib/firmware/bsp/bsp
src/gz	fe-fpga	file:///lib/firmware/bsp/fe-fpga
src/gz	gpio-fpga	file:///lib/firmware/bsp/gpio-fpga

Table-4 Upgrade Servers Entries for Kona Macro and

Kona Mega Gateways upgrading to BSPs *older than or equal to 4.3.5 / 4.3.7*

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The following entries are used when upgrading gateways to:

• Kona Micro BSP newer than or equal to 3.3.7, Kona Enterprise BSP newer than or equal to 2.0.1

Туре	Name	Path
src/gz	bsp	file:///lib/firmware/bsp/bsp
src/gz	gpio-fpga	file:///lib/firmware/bsp/gpio-fpga
src/gz	networking-extra	file:///lib/firmware/bsp/networking-extra
src/gz	python-extra	file:///lib/firmware/bsp/python-extra
src/gz	utils	file:///lib/firmware/bsp/utils
src/gz	webserver	file:///lib/firmware/bsp/webserver

Table-5 Upgrade Servers Entries for Kona Micro and

Kona Enterprise Gateways upgrading to BSPs <u>newer than or equal to 3.3.7 / 2.0.1</u>

The following entries are used when upgrading gateways to:

• Kona Macro BSP newer than or equal to 4.3.6, Kona Mega BSP newer than or equal to 4.3.8

Туре	Name	Path
src/gz	bsp	file:///lib/firmware/bsp/bsp
src/gz	gpio-fpga	file:///lib/firmware/bsp/gpio-fpga
src/gz	fe-fpga	file:///lib/firmware/bsp/fe-fpga
src/gz	networking-extra	file:///lib/firmware/bsp/networking-extra
src/gz	python-extra	file:///lib/firmware/bsp/python-extra
src/gz	utils	file:///lib/firmware/bsp/utils
src/gz	webserver	file:///lib/firmware/bsp/webserver

Table-6 Upgrade Servers Entries for Kona Macro and

Kona Mega Gateways upgradingto BSPs <u>newer than or equal to</u> 4.3.6 / 4.3.8

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Initiating BSP Upgrade - Legacy

This slide is intended for upgrading gateways v2.x.x to v3.y.y (on Kona Macro and Mega) and v1.x.x to v2.y.y (on Kona Macro and Mega) and v1.x.x to v2.y.y (on Kona Macro and Mega).

- Kona Micro). For upgrading gateways in <u>any other case</u>, proceed to the next slide for the standard method.
- 1. Go to the **SW Management** tab.
- 2. Click on **Read Upgradable** option. It will list down all the packages which needs to be upgraded shown in Figure-5.
- 3. A prompt showing for BSP Upgrade Detected will appear. Click NO.
- 4. Find opkg-arch-config and tektelic-upgrade packages and click on Upgrade Selected option.
- 5. Upgrade status message will be displayed on the same screen. Upon successful upgrade of the package, a message Software upgrade succeeded will be displayed.
- 6. Click on **Read Upgradable** option again. Prompt showing for **BSP Upgrade Detected** will appear. Click **YES** to initiate the BSP upgrade process.
- 7. While BSP is upgrading, Upgrade status message will display the status of the process shown in Figure-6.
- 8. If you need to upgrade the gateway further, proceed to the next slide.

<u>Note</u>: BSP Upgrade may take up to 15-30 minutes.

Initiating BSP Upgrade - Standard

This slide will detail the standard method for upgrading gateways.

- 1. Go to the **SW Management** tab.
- 2. Click on **Read Upgradable** option. It will list down all the packages which needs to be upgraded shown in Figure-5.
 - If no packages appear, ensure the <u>files have been uploaded</u> to the location <u>corresponding to the paths</u> <u>specified.</u>
 - By default, KonaFT will upload the files to **/lib/firmware/bsp/**
 - To verify the location of files, you will need to SSH into the GW.
- 3. A prompt showing the title **BSP Upgrade Detected** will appear. Click on **YES** to initiate the upgrade process of BSP on the GW.
- 4. While BSP is upgrading, Upgrade status message will display the status of the process as shown in Figure-6.

<u>Note</u>: BSP Upgrade may take up to 15-30 minutes.

Initiating BSP Upgrade (Continued)

		Ilk upgrade/install operations disabled Bsp Status Rea	ad Upgradable Read Installable Upgrade All Upgrade Selecte
	Component	Current Version	New Version
50	ntp	4.2.8p13-r0-tektelic2	4.2.8p13-r0-tektelic6
51	tektelic-add-users	1.3-r3	1.5-r24
52	syslog-ng	3.19.1-r0.arago0-tektelic0	3.19.1-r0.arago0-tektelic7
53	kona-network-monitor	0.19-r6	0.33-r19
54	curl	7.64.1-r0	7.64.1-r0.tektelic0
55	strongswan-plugin-nonce	5.7.1-r0.arago4	5.9.8-r0.arago4-tektelic1
56	libopkg1	1:0.4 BSP Upgrade Detected X	1:0.4.0-r0-tektelic2
57	tektelic-hw-reset-tool	1.0.0	2.1.1-r0
58	packagegroup-core-boot	1.0-r BSP Upgrade has been detected Would you like to upgrade now?	1.0-r17-tektelic2
59	kernel-devicetree	1:3.1. Yes No	1:5.10.82-r16
60	tektelic-system-monitor	0.14-rs	2:0.25.0-r1

Figure-5 BSP Upgrade Prompt

Initiating BSP Upgrade (Continued)

Shor	ort List 🔻 Read Versions Special packages de	ed, bulk upgrade/install operations disabled Bsp Status Read Upgradable Read Insta	allable Upgrade All Upgrade Selected		
	Component	Current Version	New Version		
50	ntp	4.2.8p13-r0-tektelic2 4.2.8p13-r0-tektelic6			
51	tektelic-add-users	1.3-r3 1.5-r24			
52	syslog-ng	3.19.1-r0.arago0-tektelic0 3.19.1-r0.arago0-tektelic	:7		
53	kona-network-monitor	0.19-r6 0.33-r19			
54	curl	7.64.1-r0 7.64.1-r0.tektelic0			
55	strongswan-plugin-nonce	5.7.1-r0.arago4 5.9.8-r0.arago4-tektelic1			
56	libopkg1	■ BSP Upgrading in Progress × 1:0.4.0-r0-tektelic2	1:0.4.0-r0-tektelic2		
57	tektelic-hw-reset-tool	Upgrading BSP from 3.0.4-r5 to 5.1.1-r8 2.1.1-r0			
58	packagegroup-core-boot	Do not turn off your board The board may reboot several times 1.0-r17-tektelic2			
59	kernel-devicetree	8% II:5.10.82-r16			
60	tektelic-system-monitor	0K 2:0.25.0-r1			
~	parade Servers	10.30 110	v		
	User Name: Passwo	Use authentication			
	Type Name	Path	Read Server Config		
			Add Entry		
			Remove Selected		
			Write Server Config		
ddre	ress 10.7.7.225 SNMP V2c 🔻				
	161 Stop Connected		TEKTELIC		
t IP		Poll Now Do Not Poll	communications		

Initiating BSP Upgrade (Continued)

Upon the successful completion of the BSP upgrade, BSP Upgrade Succeeded message will be shown.

	Results Perform	hance 5	SW Managemen		and Rest												
Shor	t List 🔻 Read Ve	ersions	Special pac	kages dete	cted, bul	<mark>k upgrade/i</mark>	nstall oper	ations disabled	Bsp Status	Rea	d Upgradable	Read Installable	Upgrade All	Upgrade Selec			
		Co	omponent					urrent Version				New V	ersion				
50	ntp						4.2.8p13-r0-tektelic2					4.2.8p13-r0-tektelic6					
51	tektelic-add-users					1.3-r3					1.5-r24						
52	syslog-ng					3.19.1-r0.ara	go0-tektelic	0			3.19.1-r0.arag	o0-tektelic7					
53	kona-network-n	nonitor				0.19-r6					0.33-r19						
54	curl					7.64.1-r0					7.64.1-r0.tektelic0						
55	strongswan-plugin-nonce				5.7.1-r0.arago4					5.9.8-r0.arago4-tektelic1							
56	libopkg1	bopkg1				1:0.4.0-r					1:0.4.0-r0-tektelic2						
57	tektelic-hw-rese	t-tool				1.0.0-r2 BSP Upgrade succeeded				2.1.1-r0							
58	packagegroup-core-boot kernel-devicetree					1.0-r17-t					1.0-r17-tektelic2 1:5.10.82-r16						
59																	
60	tektelic-system-monitor					0.14-r5					2:0.25.0-r1						
	rade Servers	· c				40.00 110					C10 140						
	Iser Name:			Password	:			Use authe	ntication								
	Туре	Nam						Path					Re	ad Server Confid			
	966							1001						Add Entry			
														emove Selected			
													VVI	ite Server Confi			
ddre	ess 10.7.7.225	SNMP V2	c 🔻		Polling Int	terval: 5 s	\$				$\overline{}$	a T					
	161	Stop		ected	r oling in		•	Rebo	ot			ງ"	нкі	H I I I			

Figure-7 BSP Upgrade Success Status

Installation of Geo-location features

NOTE for Kona Gateways with Geo-location features:

- Starting from BSP 4.3.X, all BSP upgrade packages will include the files required for the Geo-location feature. If you require files from a lower BSP version, please raise a ticket on <u>https://supporthub.tektelic.com/</u>
- After the upgrade files are uploaded to the gateway, below is the high-level procedure to install geolocation features.
- 1. Use this guide and follow all the steps to upgrade BSP.
- 2. Click the **Read Installable** button located near the **Read Upgradable** button in the top right.
- 3. Select the row with "gl" as the package name, then click Install Selected to install the package.
- 4. Install Success message will appear on bottom left corner upon successful installation.

Installation of Geo-location features

General Board Details Utilities Configuration Firewall Wireless Modem HM Alarm Log

Preferences Tools

	List 🔻 Read Ve	Ersions		Bsp Status Read Upgradable Read Installable Install All Install Selecte
			Component	Version
1	acme.sh			2.8.9-tek0.0.1
2	aws-iot-securet	unneling-localprox	у	1.1.0-tektelic2
3	gl			2.0.0-r5
4	kona-pkt-forwa	rder-misc		6.0.3-r142
5	kona-pkt-forwa	rder-update-mac		6.0.3-r142
6	libbsd0			0.8.3-r0
7	libcom-err2			1.44.5-r0
8	libestr0			0.1.11-r0
9	libevent			2.1.8-r0
10	libfastjson4			0.99.8-r0
11	libgdbm-compa	at4		1.18.1-r0
	n n c			1101.0
	rade Servers ser Name:		Password:	Use authentication
_				
	Туре	Name	en 1700 en 18	Path Read Server Config
	src/gz	bsp	file:///lib/firmware/bsp/bsp	Add Entry
	src/gz	gpio-fpga	file:///lib/firmware/bsp/gpio-fpga	Remove Selected
3	src/gz	fe-fpga	file:///lib/firmware/bsp/fe-fpga	V Write Server Config

Figure-8 Geolocation package

Conserving Gateway Space

When a gateway requires multiple BSP upgrades, you will need to remove the upgrade files and backup created. This will ensure that the gateway will have enough space to create a backup and perform the upgrade. If the gateway does not have enough space to perform an upgrade, the upgrade will throw an error and will not proceed.

Because each new BSP release may contain new versions of the packages, they will not overwrite existing upgrade files. Hence, we will always recommend removing upgrade package and associated files.

This section will cover how to remove the following:

- Gateway upgrade files
- Gateway backups

Conserving Gateway Space (Files)

The files and upgrade package can <u>only</u> be removed through SSH.

When a package is uploaded through KonaFT, the package is uploaded to the directory **/dev/shm**

- If the Decompress option is ticked, the gateway will automatically remove the upgrade package.
- To remove the upgrade package, run the following command: sudo rm /dev/shm/<upgradepackage-name>.zip

All BSP upgrade files can be found in the following folder: **/lib/firmware/bsp**

• To remove the upgrade files, run the following command: **sudo rm -rf /lib/firmware/bsp**

Conserving Gateway Space (Backups)

Backups are always created as part of the BSP upgrade process. When doing multiple intermediate upgrades, backups should also be removed to conserve space. Backups can be removed through 2 methods: SSH or KonaFT.

SSH:

- 1. Log into the gateway via SSH.
- 2. See the list of available backups: **Is /backup**
- 3. Remove backups as desired: sudo rm -rf /backup/<Three digit backup index>

KonaFT:

- 1. Connect to the gateway.
- 2. In the top row of tabs, select **Board Details.**
- 3. In the row of tabs slightly below, select **Backup and Restore.**
- 4. Under Restore, select **Update Table.**
- 5. A list of backups will now appear. Click one and then select **Delete Selected** to delete the backup.

Conserving Gateway Space (Backups)

KonaFT											_		
erences Too	2												
eneral Board	d Details	ties Cor	nfiguration F	irew 3 Wireless Mo	odem HM Alar	rm Log							
BIST Results	Performance	SW Mana			Misc								
DIST RESULTS			<u> </u>		VIISC								
	Backup and	d Restore St	tatus						Backup Erro	Reason			
Restore												_	
	Update Tab			7 5 Se	elected		Delete Selected	_	Con	pare Selected		_	
	Da	ite					Description	n					
0 2023-05	5-19T20:49:35		d	dist-upgrade: before (updating from B	3SP 3.0.4-r5 to 4.0.2	r7						
								_					
Backup													
Description											Start Bag	ckup	
Address 10.7.	7 7 220 CNIME	V2c 🔻											
Address 10.7.	.7.230 SINMP	vzc •		Polling Interval:	5 s 🗘			LoRa					
rt 161		Stop	Connected			Reboot		InPa	TM	KIF	-		
				Poll Now	Do Not Poll			LUNA					
st IP Auto	Upda	te Host IP			DO NOLPOI				com	munic	ati	ons	
) Vpda	ite Host IP						۲	com	munic	ati	ons	
) 🗸 Upda	te Host IP						GUI S/W v0.47 GP	com	munic	atı	ons	

Figure-9 Deleting Backups

Best-In-Class, Carrier Grade & Most Cost Effective Portfolio of Gateways, Network Server, Sensors & Applications