

TEKTELIC COMMUNICATIONS INC.

TEKTELIC OAM SERVER USER GUIDE

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Document Revision

Revision	Issue Date	Author	Comments
0.1	March 27, 2020	OS	Based on 2.2.0 production OAM Server release
0.2	April 02, 2020	KC	Added Bulk Upgrade, Updated Contents for few topics

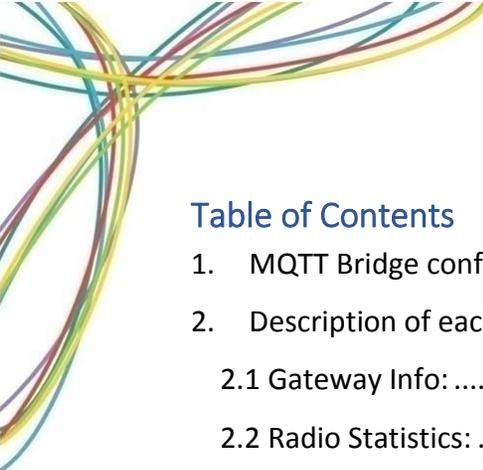
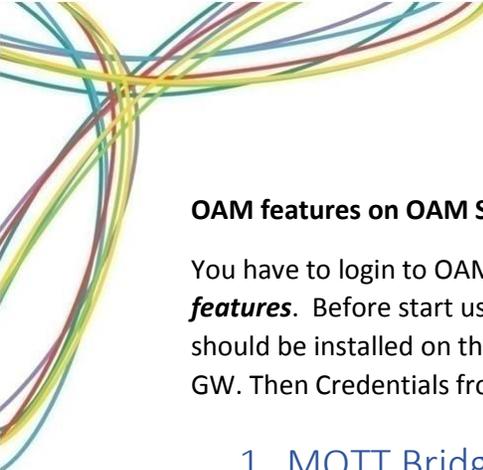


Table of Contents

1. MQTT Bridge configuration	4
2. Description of each OA&M Feature	7
2.1 Gateway Info:	7
2.2 Radio Statistics:	8
2.3 Spectrum Analyzer:	10
2.4 Spectral Scan:	13
2.5 Location:	18
2.6 Events:	19
2.7 Configuration:.....	21
2.8 Commands:	27
2.8 Backup and Restore:.....	37
2.9 Firewall:	44
2.10 SW Management:.....	46
2.11 Wireless Modem:	50
2.12 WAN	58
2.13 File Transfer.....	60
2.14 Log Retrieval.....	61
2.15 Bulk Upgrade	65



OAM features on OAM Server:

You have to login to OAM Server (<https://gateway-oam.tektelic.com/>) as a **customer administrator or provider administrator to use OAM features**. Before start using OAM features on the OAM server, the user has to register their Gateways in OAM server. The Tektelic MQTT Bridge should be installed on their Gateways. Then fields for the OAM should be enabled (uncommented) on the `/etc/default/mqtt-bridge.conf` on the GW. Then Credentials from `/etc/default/mqtt-bridge.conf` file should be used in OAM Server->Gateway Groups->Gateway->Manage Credentials.

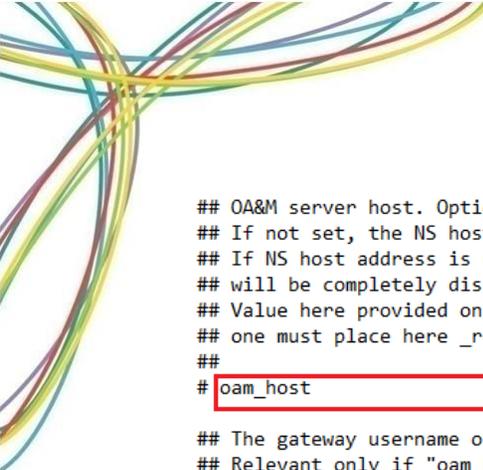
1. MQTT Bridge configuration

OAM Server:

To ensure the connection to the OAM server will be established successfully, you should specify the right credentials. You can find them in the `mqtt-bridge.conf` file on your gateway in the `/etc/default/` directory. There are specified oam host, oam user and password.

IMPORTANT: Remember to uncomment it. Only one server can be used in the same time: or NS, or OAM.

NOTE: oam stream host should be also uncommented if you want to use Log Retrieval. It should be configured as “gateway-oam.tektelic.com:8082”



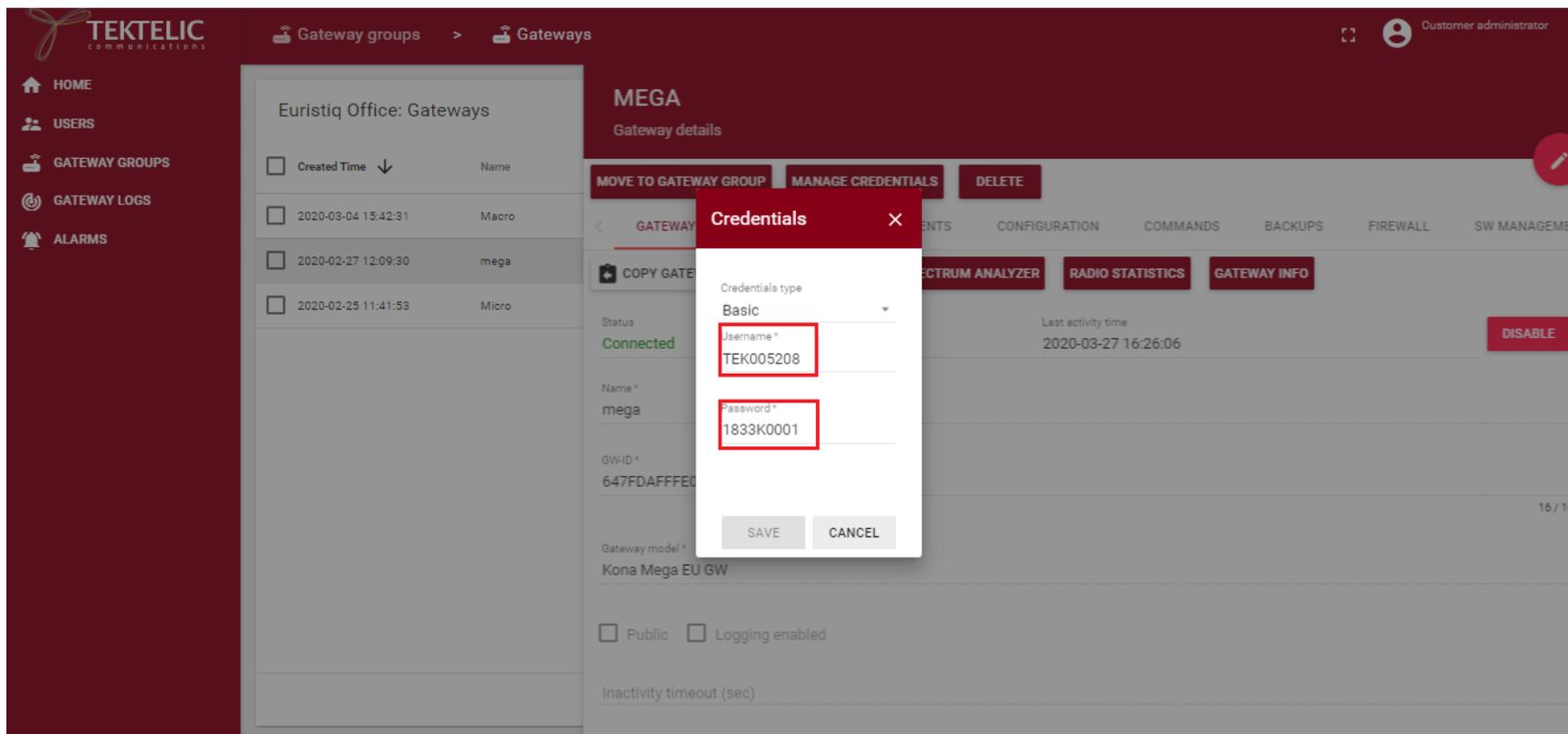
```
## OA&M server host. Optional.
## If not set, the NS host address will be used for establishing OA&M connection.
## If NS host address is not defined, SNMP (control plane) <-> MQTT bridging
## will be completely disabled.
## Value here provided only for a reference! When running in real environment,
## one must place here _real_ OA&M host.
##
# oam_host gateway-oam.tektelic.com

## The gateway username obtained from the OA&M Server. Optional.
## Relevant only if "oam_host" is set.
## Value here provided only for a reference. When running in real environment,
## one must place here _real_ OA&M username.
##
# gw_oam_user oam_username

## The gateway password obtained from the OA&M Server. Optional.
## Relevant only if "oam_host" is set.
## Value here provided only for a reference! When running in real environment,
## one must place here _real_ OA&M password.
##
# gw_oam_password oam_password

## OA&M file stream host. Optional.
## The file stream host defines HTTP/HTTPS endpoint to receive file data
## requested by OA&M.
## If not set, the file transfer features will that rely on HTTP file streaming
## will not be supported.
## Value here provided only for a reference! When running in real environment,
## one must place here _real_ OA&M host.
##
# oam_stream_host stream-oam.tektelic.com
```

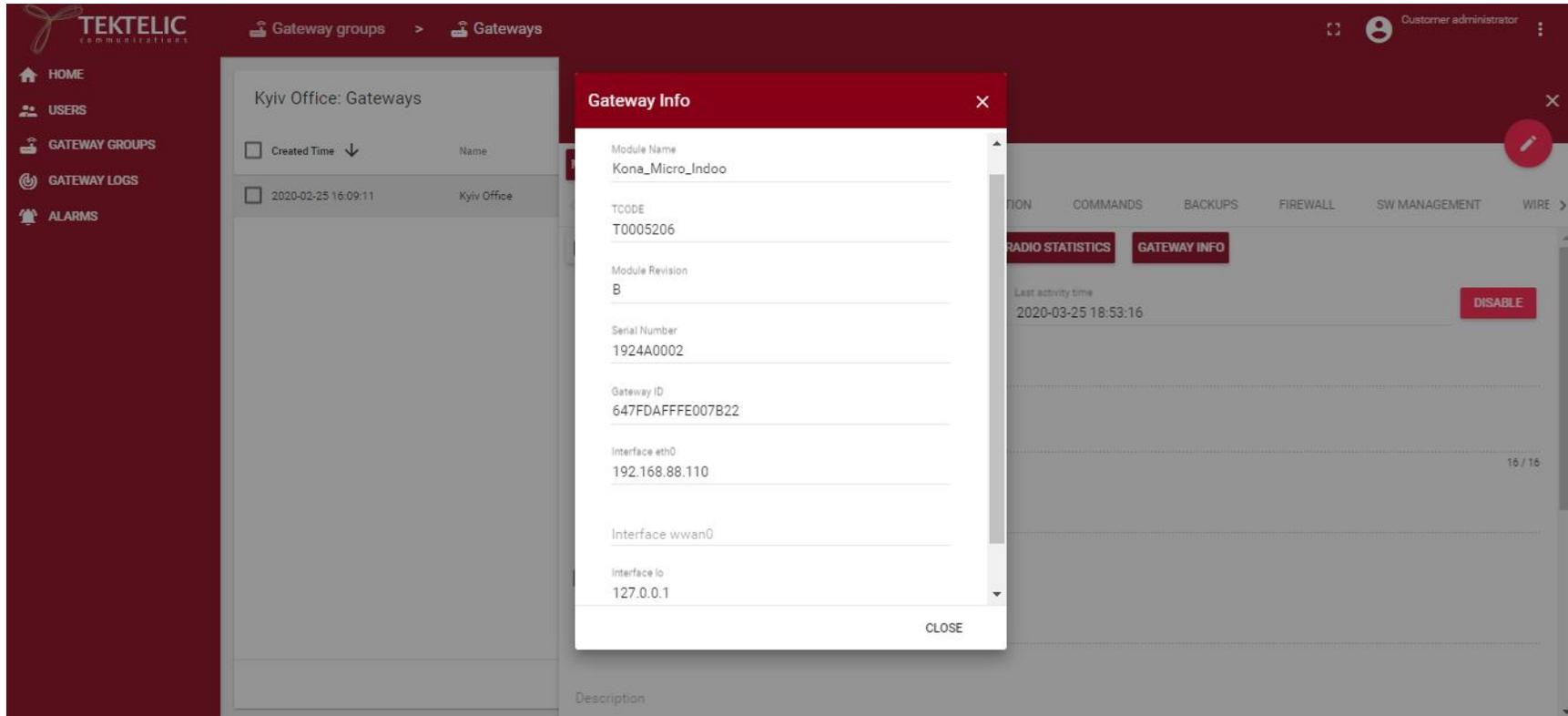
Gateway oam user and password from the mqtt-bridge.conf should be specified as credentials to your GW on the OAM server. Check the screenshot below.



2. Description of each OA&M Feature

2.1 Gateway Info:

This tab provides Module Name, T-code, Module Revision, Serial number, Gateway ID, IP addresses of Eth0, wwan0 and Loopback.



2.2 Radio Statistics:

This tab provides number of transmitted and received packets, number of packets with and with out timestamps, number of packets with CRC passed and failed and number of packets with RX packet error rate and no match. By default, the poll Interval is 5 sec.

The screenshot displays the Tektelic OAM Server Gateway Management interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and includes a table of gateways under 'Euristiq Office: Gateways'. The 'mega' gateway is selected, and its details are shown on the right. The 'RADIO STATISTICS' tab is highlighted with a red box. The gateway status is 'Connected' with a 'DISABLE' button. The gateway ID is '647FDAFFFE005208' and the model is 'Kona Mega EU GW'. There are also checkboxes for 'Public' and 'Logging enabled', and an 'Inactivity timeout (sec)' field.

Created Time	Name
2020-03-04 15:42:31	Macro
2020-02-27 12:09:30	mega
2020-02-25 11:41:53	Micro

MEGA
Gateway details

MOVE TO GATEWAY GROUP | MANAGE CREDENTIALS | DELETE

GATEWAY DETAILS | LOCATION | EVENTS | CONFIGURATION | COMMANDS | BACKUPS | FIREWALL | SW MANAGEMENT | WIRE

COPY GATEWAY ID | SPECTRAL SCAN | SPECTRUM ANALYZER | **RADIO STATISTICS** | GATEWAY INFO

Status: **Connected** | Last activity time: 2020-03-26 13:30:53 | **DISABLE**

Name*: mega

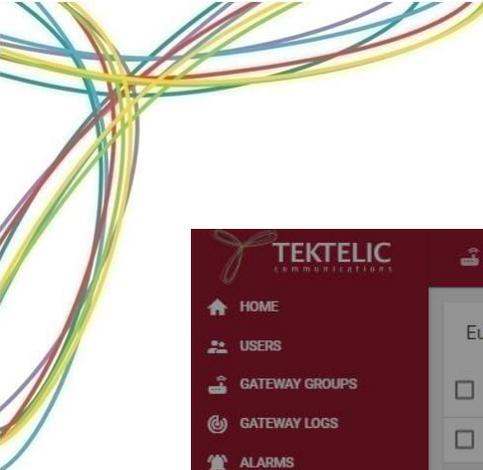
GW-ID*: 647FDAFFFE005208 | 16 / 16

Gateway model*: Kona Mega EU GW

Public | Logging enabled

Inactivity timeout (sec)

Description



TEKTELIC COMMUNICATIONS

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office: Gateways

MEGA

Created Time ↓
2020-03-04 15:42:31
2020-02-27 12:09:30
2020-02-25 11:41:53

BACKUPS FIREWALL SW MANAGEMENT WIRE

GATEWAY INFO

DISABLE

16 / 16

Inactivity timeout (sec)

Description

Radio Statistics

# of transmitted packets	# of received packets	
0	444	
With fine timestamp	Without fine timestamp	No match
0	0	0
CRC passed	CRC fail	Rx packet error rate
8	436	0.981982

RESET COUNTERS

Polling Interval, s
5

POLL NOW Do Not Poll

CLOSE

2.3 Spectrum Analyzer:

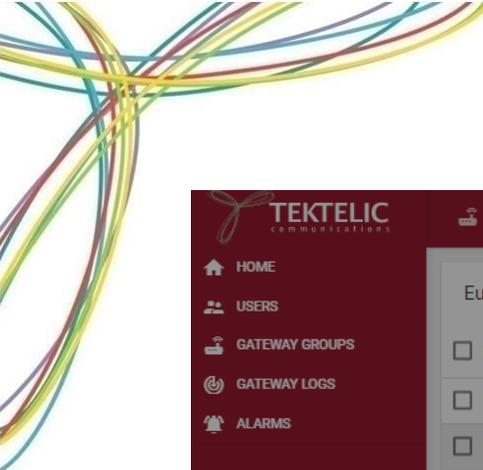
This feature is not yet supported on Micro platform.

This tab plot the graph between frequency and power with live data. The user should set the start and stop frequency, bin spacing, sample period and Antenna before start the Spectrum Analyzer.

The screenshot displays the Tektelic OAM Server user interface. On the left is a dark red sidebar with navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and contains a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

The 'mega' gateway is selected. The main panel shows 'MEGA Gateway details' with a navigation bar containing: MOVE TO GATEWAY GROUP, MANAGE CREDENTIALS, DELETE, GATEWAY DETAILS (selected), LOCATION, EVENTS, CONFIGURATION, COMMANDS, BACKUPS, FIREWALL, SW MANAGEMENT, and WIRE. Below the navigation bar are buttons for COPY GATEWAY ID, SPECTRAL SCAN, SPECTRUM ANALYZER (highlighted with a red box), RADIO STATISTICS, and GATEWAY INFO. The gateway status is 'Connected' with a 'DISABLE' button. Other fields include Name (mega), GW-ID (647FDAFFFE005208), Gateway model (Kona Mega EU GW), and checkboxes for Public and Logging enabled.



TEKTELIC communications

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office: Gateways

MEGA
Gateway details

Created Time Name

2020-03-04 15:42
2020-02-27 12:09
2020-02-25 11:41

Antenna Selection
Antenna 0

Sample Period, μ s	Start Frequency, kHz	Stop Frequency, kHz	Bin Spacing, kHz
0.5	902300	914100	200

Average count
1

START SPECTRUM ANALYZER

Minimum	Maximum
Auto	Auto

DISABLE

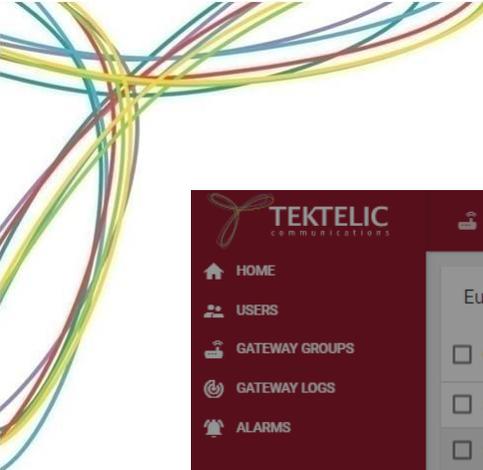
16 / 16

Public Logging enabled

Inactivity timeout (sec)

Description

CLOSE



TEKTELIC communications

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office

Created Time

2020-03-04 15:42
2020-02-27 12:09
2020-02-25 11:41

PS FIREWALL SW MANAGEMENT WIRE

DISABLE

16 / 16

Spectrum Analyzer

Sample Period, μ s: 0.5 Antenna Selection: Antenna 0

Average count: 1 Start Frequency, kHz: 902300 Stop Frequency, kHz: 914100 Bin Spacing, kHz: 200

STOP SPECTRUM ANALYZER

Minimum: -137 Maximum: -90

Power (dBm)

Frequency (MHz)

CLOSE

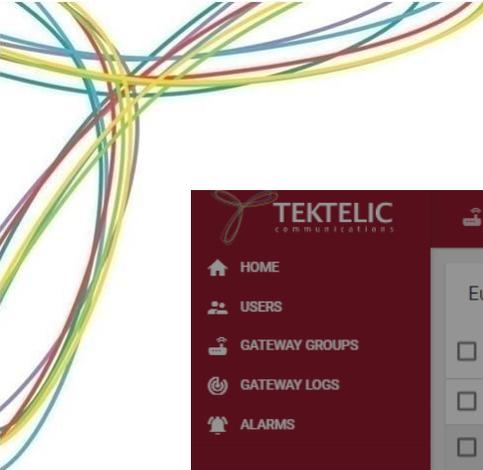
2.4 Spectral Scan:

Spectral scan will scan the channels on the Gateway and plot and display the graph between frequency and power, and Count and Power bins. It will take a minute to provide results. The channels, antenna, step size and sample period have to be configured properly before start the Spectral Scan.

The screenshot displays the Tektelic OAM Server user interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:33	Micro

The 'mega' gateway is selected. The right-hand panel shows the 'MEGA Gateway details' page. At the top, there are buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'GATEWAY DETAILS', 'LOCATION', 'EVENTS', 'CONFIGURATION', 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', and 'WIRE'. Under the 'GATEWAY DETAILS' tab, there are buttons for 'COPY GATEWAY ID', 'SPECTRAL SCAN', 'SPECTRUM ANALYZER', 'RADIO STATISTICS', and 'GATEWAY INFO'. The 'SPECTRAL SCAN' button is highlighted with a red box. Below the buttons, the gateway status is shown as 'Connected' with a 'DISABLE' button. Other details include the Name 'mega', GW-ID '647FDAFFFE005208', Gateway model 'Kona Mega EU GW', and checkboxes for 'Public' and 'Logging enabled'. The inactivity timeout is set to 16 / 16 seconds.



TEKTELIC COMMUNICATIONS

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office: Gateways

MEGA
Gateway details

Created Time
2020-03-04 15:42
2020-02-27 12:09
2020-02-25 11:41

PS FIREWALL SW MANAGEMENT WIRE

DISABLE

16 / 16

Inactivity timeout (sec)

Spectral Scan

Sample Period, μ s	Antenna Selection
0.5	Antenna 0

Num 125kHz Chan	125kHz Start Freq, kHz	125kHz Step Size, kHz
34	863100	200

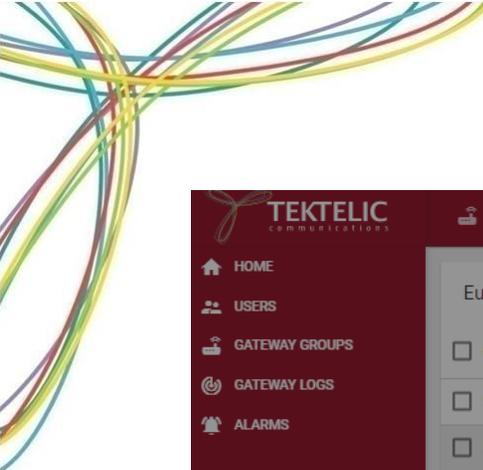
Num 500kHz Chan	500kHz Start Freq, kHz	500kHz Step Size, kHz
0	863100	1600

START SPECTRAL SCAN

Minimum: Auto Maximum: Auto

IMPORT FROM FILE EXPORT TO FILE Channels

CLOSE



TEKTELIC communications

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office: Gateways

MEGA
Gateway details

Created Time

2020-03-04 15:42
2020-02-27 12:09
2020-02-25 11:41

PS FIREWALL SW MANAGEMENT WIRE

DISABLE

16 / 16

Inactivity timeout (sec)

Description

Spectral Scan [X]

[Redacted]

Sample Period, μ s: 0.5
Antenna Selection: Antenna 0

Num 125kHz Chan	125kHz Start Freq, kHz	125kHz Step Size, kHz
34	863100	200

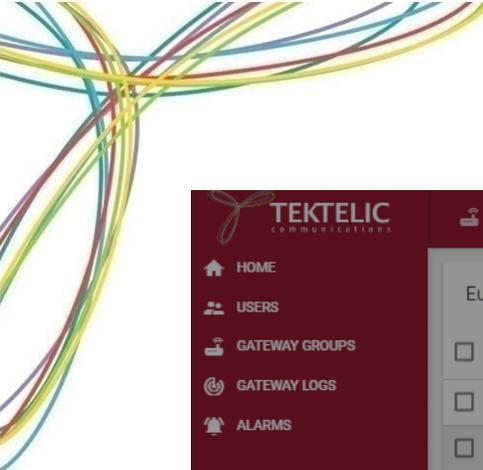
Num 500kHz Chan	500kHz Start Freq, kHz	500kHz Step Size, kHz
0	863100	1600

STOP SPECTRAL SCAN

Minimum: Auto Maximum: Auto

IMPORT FROM FILE EXPORT TO FILE Channels

CLOSE



TEKTELIC communications

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office

Created Time

2020-03-04 15:42
2020-02-27 12:09
2020-02-25 11:41

Spectral Scan

Sample Period, μ s: 0.5
Antenna Selection: Antenna 0

Num 125kHz Chan	125kHz Start Freq, kHz	125kHz Step Size, kHz
34	863100	200

Num 500kHz Chan	500kHz Start Freq, kHz	500kHz Step Size, kHz
0	863100	1600

START SPECTRAL SCAN

Minimum: -137 Maximum: -85

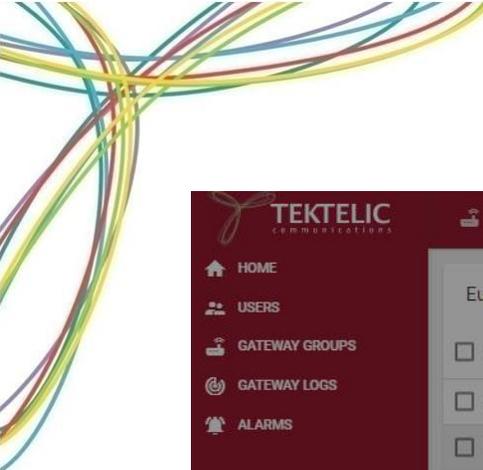
IMPORT FROM FILE **EXPORT TO FILE** Channels: 50% power over frequency

16 / 16

DISABLE

PS FIREWALL SW MANAGEMENT WIRE

Description



TEKTELIC COMMUNICATIONS

Gateway groups > Gateways

Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

Euristiq Office

Created Time

2020-03-04 15:42
2020-02-27 12:09
2020-02-25 11:41

Spectral Scan

Sample Period, μ s: 0.5
Antenna Selection: Antenna 0

Num 125kHz Chan	125kHz Start Freq, kHz	125kHz Step Size, kHz
34	863100	200

Num 500kHz Chan	500kHz Start Freq, kHz	500kHz Step Size, kHz
0	863100	1600

START SPECTRAL SCAN

Minimum: Auto Maximum: Auto

IMPORT FROM FILE **EXPORT TO FILE**

Channels: 125k channel 0 - 863100

CLOSE

PS FIREWALL SW MANAGEMENT WIRE

DISABLE

16 / 16

2.5 Location:

The Micro GW does not send the coordinates, because it doesn't have GPS antenna. For Micro GW, User can manually enter the Location information by clicking "toggle edit mode" (pencil icon).

The location tab will show the coordinates of the gateway taken from /tmp/position file. Also, the coordinates will be shown on a map. Location tab gets updated every 2 minutes. They can be changed manually if the GW do not send that data.

The screenshot displays the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled "Euristiq Office: Gateways" and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

The "mega" gateway is selected. The right panel shows "MEGA Gateway details" with a "toggle edit mode" pencil icon. Below the title are three buttons: "MOVE TO GATEWAY GROUP", "MANAGE CREDENTIALS", and "DELETE". A horizontal menu includes: GATEWAY DETAILS, LOCATION (selected), EVENTS, CONFIGURATION, COMMANDS, BACKUPS, FIREWALL, SW MANAGEMENT, and WIRE. The location details are as follows:

- Location: Lviv
- Latitude: 49.80555
- Longitude: 24.00577
- Altitude: 338.7

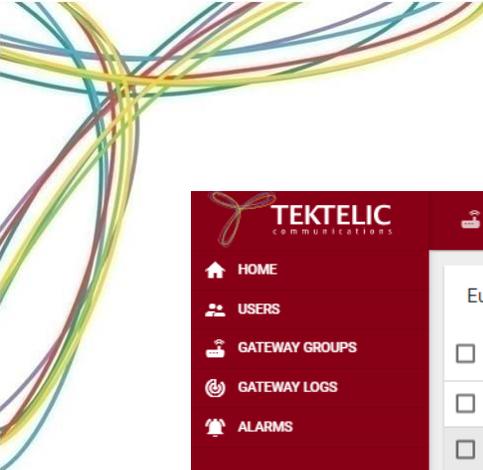
A map below the details shows the location of Lviv, Ukraine, with a blue pin marker. The map includes labels for "Рудне", "М-11", "М-06", "М-09", "Ванники", "Глин", and "Новоармицький Лс".

2.6 Events:

This tab displays different event types. Alarms and Faults which are generated by the gateway. Online and offline status are provided by the OAM Server. With the current implementation events from the event types won't provide anything.

The screenshot displays the Tektelic OAM Server interface for gateway management. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area shows the 'MEGA' gateway details, including a list of gateway groups and a table of events. A dropdown menu is open over the 'Alarms' tab, showing options: Alarms, Faults, Events, Connected, and Not connected. The event table includes columns for Severity, Description, and State.

Created Time	Name	Severity	Description	State
2020-03-04 15:42:31	Macro			
2020-02-27 12:09:30	mega			
2020-02-25 11:41:53	Micro			
2020-03-02 12:06:22	2020-03-26 15:34:55	Major	Status Update	Clear
2020-03-02 12:06:22	2020-03-26 15:34:55	Major	Battery on discharge	Clear
2020-02-27 12:09:44	2020-03-26 15:34:55	Major	Gateway high temperature shutdown	Clear
2020-02-27 12:09:44	2020-03-26 15:34:55	Major	Gateway performance degradation	Clear
2020-02-27 12:09:44	2020-03-04 16:21:56	Major	Gateway interface alarm	Clear



TEKTELIC communications

Gateway groups > Gateways

Customer administrator

Euristiq Office: Gateways

<input type="checkbox"/> Created Time ↓	Name
<input type="checkbox"/> 2020-03-04 15:42:31	Macro
<input type="checkbox"/> 2020-02-27 12:09:30	mega
<input type="checkbox"/> 2020-02-25 11:41:53	Micro

MEGA

Gateway details

MOVE TO GATEWAY GROUP **MANAGE CREDENTIALS** **DELETE**

< GATEWAY DETAILS LOCATION **EVENTS** CONFIGURATION COMMANDS BACKUPS FIREWALL SW MANAGEMENT WIRE

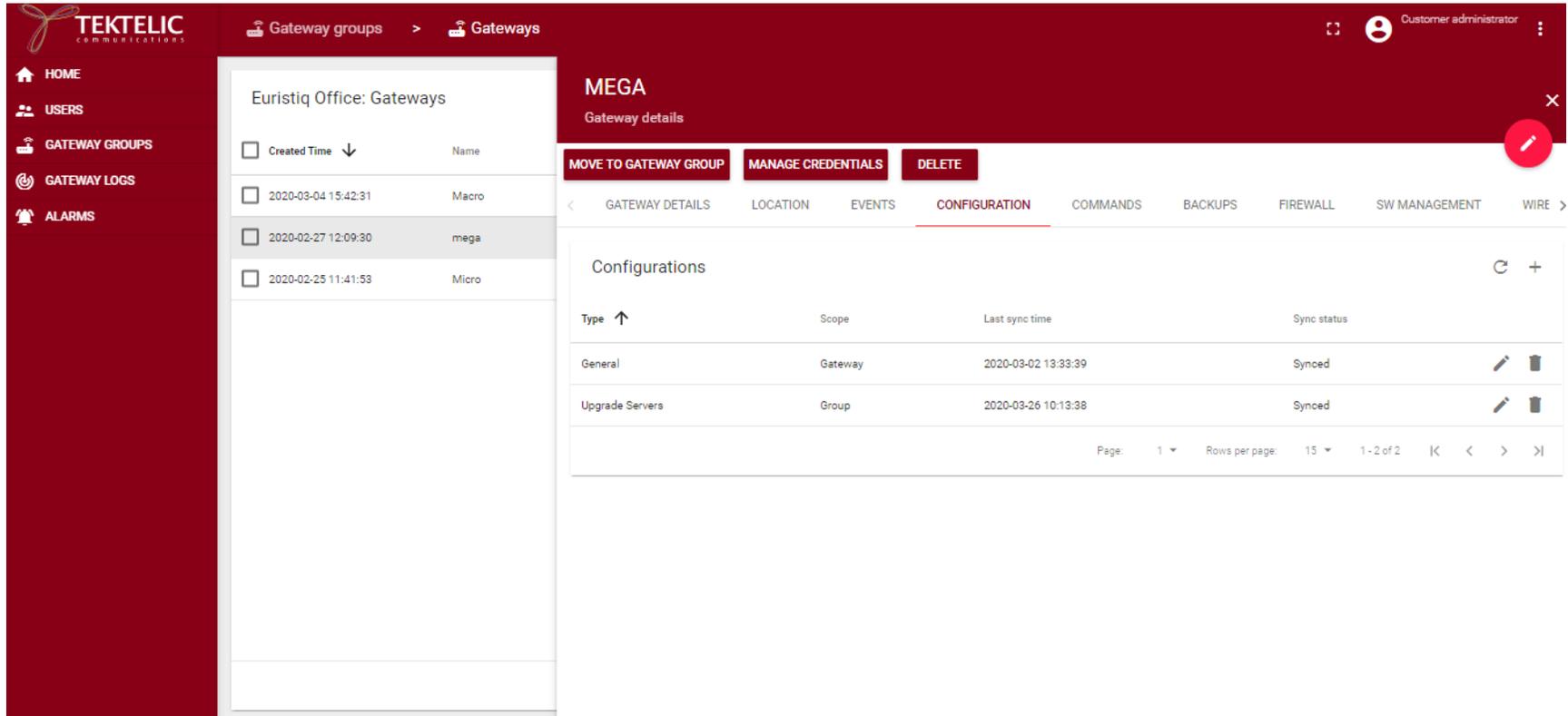
Event type: **Alarms** **LAST 30 DAYS**

Alarms

Start time ↓	End time	Severity	Description	State
2020-03-04 16:22:27	2020-03-26 15:34:55	Major	Gateway interface alarm	Raised
2020-03-02 12:06:22	2020-03-26 15:34:55	Major	Low battery warning	Clear
2020-03-02 12:06:22	2020-03-26 15:34:55	Major	Status Update	Clear
2020-03-02 12:06:22	2020-03-26 15:34:55	Major	Battery on discharge	Clear
2020-02-27 12:09:44	2020-03-26 15:34:55	Major	Gateway high temperature shutdown	Clear
2020-02-27 12:09:44	2020-03-26 15:34:55	Major	Gateway performance degradation	Clear
2020-02-27 12:09:44	2020-03-04 16:21:56	Major	Gateway interface alarm	Clear

2.7 Configuration:

This tab provides last sync time with config.json file from the gateway.



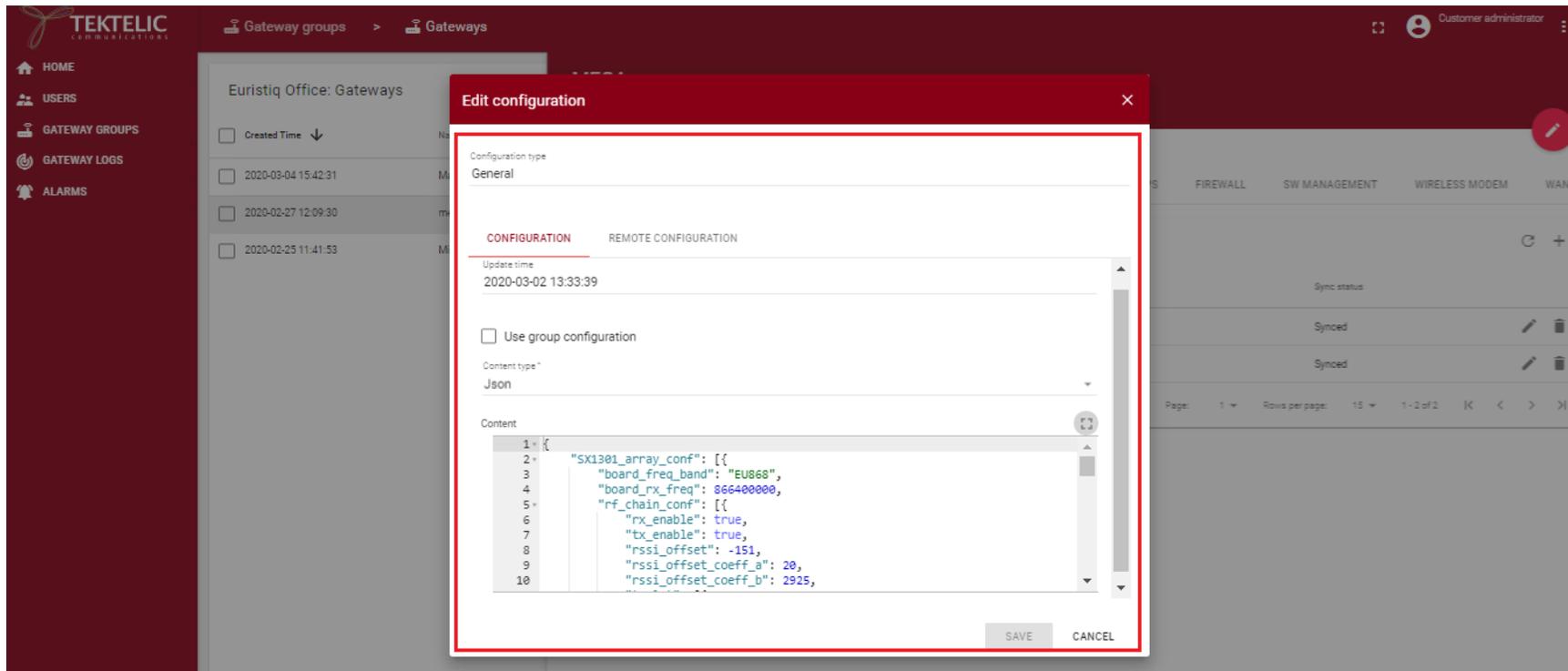
The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is divided into three sections:

- Euristiq Office: Gateways:** A table listing gateway groups with columns for Created Time and Name.

Created Time	Name
2020-03-04 15:42:31	Macro
2020-02-27 12:09:30	mega
2020-02-25 11:41:53	Micro
- MEGA Gateway details:** A header section with tabs for GATEWAY DETAILS, LOCATION, EVENTS, CONFIGURATION (selected), COMMANDS, BACKUPS, FIREWALL, SW MANAGEMENT, and WIRE. Action buttons include MOVE TO GATEWAY GROUP, MANAGE CREDENTIALS, and DELETE.
- Configurations:** A table showing configuration details for the selected gateway.

Type	Scope	Last sync time	Sync status
General	Gateway	2020-03-02 13:33:39	Synced
Upgrade Servers	Group	2020-03-26 10:13:38	Synced

To view a configuration file on the gateway, click on the pencil for the type (General/Upgrade Servers) of configuration. Then click on “Remote Configuration” For example, the config.json file on the gateway can be accessed by clicking on the pencil of the “General” configuration, then selecting “Remote Configuration”.



To make a change to the file, select the whole file from remote configuration and copy it. On the “Configuration” tab, deselect “Use group configuration” and paste the file into the content section. For this .json file example, choose “Json” under the “Content type” pull-down menu. Note: C-style comments (`/* */`) are not allowed in .json files. The default config.json file has comments (`/* */`) indicating the fields that can be adjusted – adjust the settings as desired then remove the comment lines. The “Save” option won’t be available until the comment lines are removed. Once the file is saved, the “Remote Configuration” on the gateway will be synced to the updated “Configuration” file. This can be seen by looking at the Sync Status column on the “Configurations” screen as shown below.

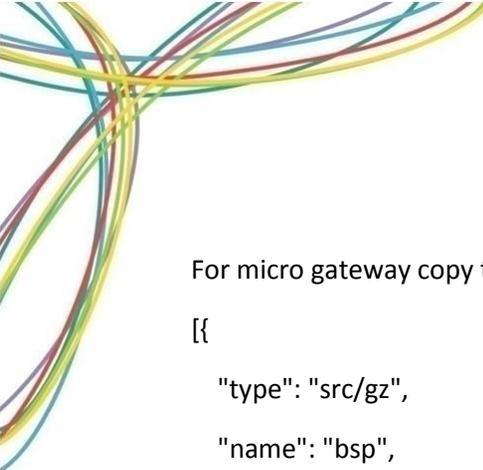
The screenshot shows the Tektelic OAM Server User Guide interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'GATEWAY DETAILS', 'LOCATION', 'EVENTS', 'CONFIGURATION', 'COMMANDS', 'BACKUPS', and 'FIREWALL'. The 'CONFIGURATION' tab is active, showing a table of configurations. The table has columns for 'Type', 'Scope', 'Last sync time', and 'Sync status'. The 'Upgrade Servers' row is highlighted, and its 'Sync status' is 'Synced'. A red box highlights the 'Sync status' column.

Type	Scope	Last sync time	Sync status
General	Gateway	2020-03-02 13:33:39	Synced
Upgrade Servers	Group	2020-03-26 10:13:38	Synced

Important: Before performing a BSP software upgrade for the first time on a particular gateway, the “Upgrade Servers” configuration needs to be updated.

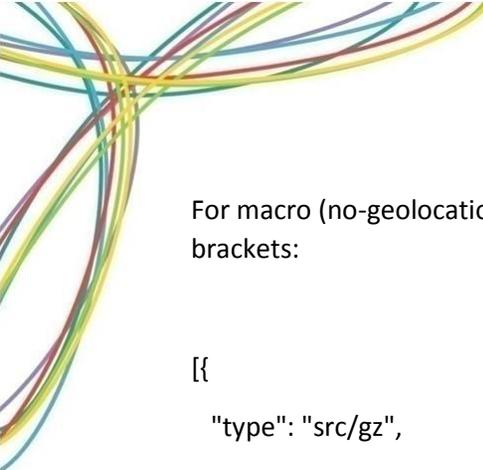
From the “Configuration” tab, select the pencil icon on the “Upgrade Servers” row. If a software upgrade has never been performed on a gateway, the “Remote Configuration” will be blank. In this case, in the “Edit Configuration” window, de-select the “Use group configuration” box, and select “Json” as Content type.

Choose from the following text options depending on the type of gateway being upgraded, copy the text and paste into the content section of the “Edit configuration” window:



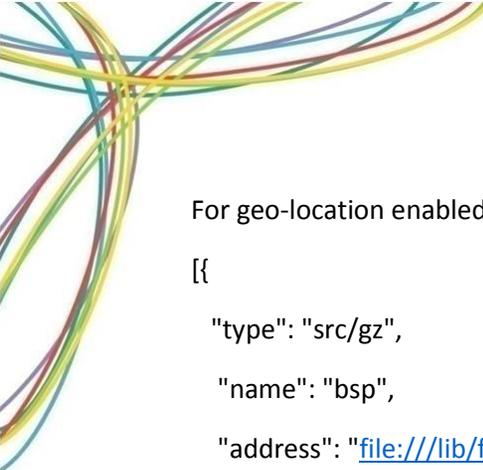
For micro gateway copy the following info into the Content section (everything within and including the square brackets:

```
{  
  "type": "src/gz",  
  "name": "bsp",  
  "address": "file:///lib/firmware/bsp/"  
}, {  
  "type": "src/gz",  
  "name": "gpio-fpga",  
  "address": "file:///lib/firmware/gpio-fpga/"  
}]
```



For macro (no-geolocation) and mega gateways, copy the following info into the Content section (everything within and including the square brackets):

```
[{  
  "type": "src/gz",  
  "name": "bsp",  
  "address": "file:///lib/firmware/bsp/"  
}, {  
  "type": "src/gz",  
  "name": "fe-fpga",  
  "address": "file:///lib/firmware/fe-fpga/"  
}, {  
  "type": "src/gz",  
  "name": "gpio-fpga",  
  "address": "file:///lib/firmware/gpio-fpga/"  
}]
```



For geo-location enabled macro gateways copy the following info into the Content section (everything within and including the square brackets:

```
[[  
  "type": "src/gz",  
  "name": "bsp",  
  "address": "file:///lib/firmware/bsp/"  
}, {  
  "type": "src/gz",  
  "name": "fe-fpga-geo",  
  "address": "file:///lib/firmware/fe-fpga-geo/"  
  
}, {  
  "type": "src/gz",  
  "name": "gpio-fpga",  
  "address": "file:///lib/firmware/gpio-fpga/"  
}]
```

2.8 Commands:

By using this tab, user can:

- reboot the gateway
- check the ping from the gateway
- get public key
- establish and terminate ssh sessions
- execute script
- get antennas count
- get GPS coordinates.

The screenshot displays the Tektelic OAM Server interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The user is logged in as 'Customer administrator'. The main content area is titled 'MEGA Gateway details' and features a 'COMMANDS' tab. A red box highlights the following commands:

- Reboot
- Ping
- Get public key
- Establish reverse SSH session
- Terminate all reverse SSH sessions

The interface also shows a table of gateway details under 'Euristiq Office: Gateways' with columns for 'Created Time' and 'Name'.

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

To execute Reboot command, select reboot from the list of available commands and select execute button. This will reboot the gateway. After execute this command, NS will display a confirmation message.

The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main header shows 'Gateway groups > Gateways' and the user 'Customer administrator'. A green notification banner at the top states 'The gateway 'mega' is rebooting' with a 'CLOSE' button. Below this is a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

To the right of the table is the 'Gateway details' panel for the 'mega' gateway. It includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'COMMANDS' tab is active, showing a 'Command' dropdown menu with 'Reboot' selected and an 'EXECUTE' button.



TEKTELIC
COMMUNICATIONS

Gateway groups > Gateways Customer administrator

HOME
USERS
GATEWAY GROUPS
GATEWAY LOGS
ALARMS

The gateway 'mega' has been successfully rebooted CLOSE

<input type="checkbox"/> Created Time ↓	Name
<input type="checkbox"/> 2020-03-04 15:42:31	Macro
<input type="checkbox"/> 2020-02-27 12:09:30	mega
<input type="checkbox"/> 2020-02-25 11:41:53	Micro

Gateway details

MOVE TO GATEWAY GROUP **MANAGE CREDENTIALS** **DELETE**

COMMANDS BACKUPS FIREWALL SW MANAGEMENT WIRELESS MODEM WAN FILE TRANSFER

Command
Reboot

EXECUTE

To execute ping command, select ping command from the list, then set the number of packets to sent from the gateway and the destination IP address or host name.

The screenshot displays the Tektelic OAM Server interface. On the left is a dark red sidebar with navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries. The 'MEGA' gateway is selected, and its details are shown in a white panel. This panel includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'COMMANDS' tab is active, showing a 'Command' dropdown set to 'Ping'. Below this, there are input fields for 'Number of packets*' (set to 6) and 'Destination*' (set to google.com). An 'EXECUTE' button is present, and a JSON output is shown:

```
{ "packets_sent": 6 }
```

Created Time	Name
2020-03-04 15:42:31	Macro
2020-02-27 12:09:30	mega
2020-02-25 11:41:53	Micro

MEGA
Gateway details

MOVE TO GATEWAY GROUP MANAGE CREDENTIALS DELETE

COMMANDS BACKUPS FIREWALL SW MANAGEMENT WIRELESS MODEM WAN FILE TRANSFER

Command: Ping

Number of packets*: 6 Destination*: google.com

EXECUTE

```
{ "packets_sent": 6 }
```

To execute get public key command, select this command from the list and press on the “Execute” button. An example of the result is shown on the screenshot below.

The screenshot displays the Tektelic OAM Server interface. On the left is a dark red sidebar with navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main header is dark red with the Tektelic logo and navigation for Gateway groups > Gateways. The user is identified as 'Customer administrator'. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

Below the table, the 'MEGA Gateway details' section is visible. It includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A tabbed interface shows 'COMMANDS' selected, with other tabs for GATEWAY DETAILS, LOCATION, EVENTS, CONFIGURATION, BACKUPS, and FIREWALL. A 'Command' dropdown is set to 'Get public key', and an 'EXECUTE' button is present. The output of the command is displayed in a text area:

```
"ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQACzwkyo1sRWTtMzwYUTISkw71Ftz4YWxaLEK0x83U6lWmRtEXo9uIO!
```

To execute establish reverse SSH session command, select this command from the list, fill the fields as shown below and press on the “Execute” button. An example of the result is shown on the screenshot below.

The screenshot displays the Tektelic OAM Server interface. The main content area shows the 'MEGA Gateway details' page, specifically the 'COMMANDS' tab. A form for executing a command is visible, with the following fields and values:

- Command: Establish reverse SSH session
- SSH host: 10.7.7.156
- SSH port: 8001
- Reverse SSH port (default is 9000): 9000
- Username: pv
- Password: [masked]

An 'EXECUTE' button is located below the form. The result of the command execution is shown as a JSON object:

```
{  
  "status": "ok"  
}
```

To execute terminate all reverse SSH sessions command, select this command from the list and press on the “Execute” button. An example of the result is shown on the screenshot below.

The screenshot displays the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled "Euristiq Office: Gateways" and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

The "MEGA" gateway details are shown on the right, with tabs for GATEWAY DETAILS, LOCATION, EVENTS, CONFIGURATION, COMMANDS, BACKUPS, and FIREWALL. The "COMMANDS" tab is active, displaying a list of commands. One command, "Terminate all reverse SSH sessions", is highlighted with a red box. Below the command is an "EXECUTE" button. The execution result is shown as a JSON object: {"status": "ok"}.

To execute script, select this command from the list, write a script and press on the “Execute” button. *(This is for future use)*

The screenshot displays the TEKTELIC OAM Server interface. The top navigation bar includes the TEKTELIC logo, breadcrumb navigation for 'Gateway groups' > 'Gateways', and a user profile for 'Customer administrator'. A left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

Below the table, the 'MEGA Gateway details' page is shown, with the 'COMMANDS' tab selected. A dropdown menu for 'Command' is open, showing 'Execute script' selected. Below this, a 'Script' input area is visible with a single line containing the number '1'. An 'EXECUTE' button is located at the bottom of the script input area.

To execute get antennas count, select this command from the list and press on the “Execute” button. An example of the result is shown on the screenshot below.

The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled "Euristiq Office: Gateways" and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

The "mega" gateway is selected. The right-hand pane shows "MEGA Gateway details" with tabs for GATEWAY DETAILS, LOCATION, EVENTS, CONFIGURATION, COMMANDS, BACKUPS, and FIREWALL. The "COMMANDS" tab is active, showing a list of commands with "Get antennas count" selected. Below the command list is an "EXECUTE" button. The execution result is displayed in a code block:

```
{  
  "antennasCount": 2,  
  "status": "ok"  
}
```

To execute get GPS coordinates, select this command from the list and press on the “Execute” button. An example of the result is shown on the screenshot below.

The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

The 'mega' gateway is selected. The right-hand pane shows 'MEGA Gateway details' with tabs for GATEWAY DETAILS, LOCATION, EVENTS, CONFIGURATION, COMMANDS, BACKUPS, and FIREWALL. The 'COMMANDS' tab is active, showing a dropdown menu with 'Get GPS coordinates' selected. Below the dropdown is an 'EXECUTE' button. The execution result is displayed in a code block:

```
{  
  "lat": "49.80562",  
  "long": "24.00607",  
  "alti": "360.1",  
  "status": "ok"  
}
```

2.8 Backup and Restore:

Backup:

When you select update table under the backup tab, this will list the available backups. If there are no available backups then status says n/a.

The screenshot displays the Tektelic OAM Server user interface. On the left is a dark red navigation sidebar with the Tektelic logo and menu items: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

Below the table is a 'Backups' section with a table header:

Date ↓	Description
NO BACKUPS FOUND	

At the top of the main content area, there is a 'MEGA Gateway details' panel with buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these buttons are tabs for 'GATEWAY DETAILS', 'LOCATION', 'EVENTS', 'CONFIGURATION', 'COMMANDS', 'BACKUPS', and 'FIREWALL'. The 'BACKUPS' tab is active, and an 'UPDATE TABLE' button is highlighted with a red box. The user is logged in as 'Customer administrator'.

Create Backup:

Select create backup icon. Then enter the description for backup. Then select Create button.

The screenshot displays the Tektelic OAM Server interface. The main window shows the 'MEGA Gateway details' page with the 'BACKUPS' tab selected. A 'Create backup' dialog box is open in the foreground, featuring a text input field for the description, which contains 'mega 4.0.1'. Below the input field are 'CREATE' and 'CANCEL' buttons. In the background, a cloud icon in the bottom right corner of the main window is highlighted with a red box, indicating the 'Create backup' action.

Then status will display backup-in-progress message. And also, you can see the backup that is in-progress in the table. Wait at least for a minute then select update table, the status will display ok message if the backup is completed.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a list of gateways. The selected gateway is 'MEGA', with details for 'MEGA Gateway details'. Below the details are buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A navigation bar includes 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'BACKUPS' section is active, showing a status of 'backup:ok' and an 'UPDATE TABLE' button. Below this is a table of backups with columns for Date and Description.

Date	Description
<no timestamp>	<no description>
2020-03-02T14:54:08	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.1-r5
2020-03-02T12:04:59	mega 4.0.1
2020-01-20T09:34:55	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.0-r5

Restore:

Go to Backups tab in NS. Then select Update Table to view the available Backups.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a list of gateway entries. The 'MEGA' gateway details are displayed, including buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. The 'BACKUPS' tab is selected, and the 'UPDATE TABLE' button is highlighted. The Backups table lists the following entries:

Date	Description	
<no timestamp>	<no description>	
2020-03-02T14:54:08	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.1-r5	
2020-03-02T12:04:59	mega 4.0.1	
2020-01-20T09:34:55	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.0-r5	

Then decide the backup that you want to restore then select the restore icon from the backup list to restore. In this example, I want to restore to mega 4.0.1 from the list.

The screenshot displays the Tektelic OAM Server interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and features a 'Backups' tab. Below the tab, there is a table of backups with columns for 'Date' and 'Description'. The backup entry for '2020-03-02T12:04:59' with the description 'mega 4.0.1' is highlighted with a red box, and its corresponding restore icon is also highlighted with a red box. Other backup entries include '<no timestamp>' with '<no description>', '2020-03-02T14:54:08' with 'dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.1-r5', and '2020-01-20T09:34:55' with 'dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.0-r5'.

Date	Description	Restore Icon
<no timestamp>	<no description>	🔄
2020-03-02T14:54:08	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.1-r5	🔄
2020-03-02T12:04:59	mega 4.0.1	🔄
2020-01-20T09:34:55	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.0-r5	🔄

Once you select restore backup icon, you will see restore:in-progress message.

The screenshot shows the Tektelic OAM Server interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The user is logged in as 'Customer administrator'. The main content area is titled 'MEGA Gateway details'. It features a table of gateway groups and a 'BACKUPS' tab. A red box highlights the 'UPDATE TABLE' button and the 'restore:in-progress' status in the backup table.

Created Time	Name
<input type="checkbox"/>	2020-03-04 15:42:31 Macro
<input type="checkbox"/>	2020-02-27 12:09:30 mega
<input type="checkbox"/>	2020-02-25 11:41:53 Micro

Date	Description
<no timestamp>	<no description>
2020-03-02T14:54:08	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.1-r5
2020-03-02T12:04:59	mega 4.0.1
2020-01-20T09:34:55	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.0-r5

Wait for at least a minute, then select Update Table button, the status message will display ok message. This means restore is successful. Then the gateway will reboot automatically to restore to take effect.

Note: reboot is mandatory after the restore.

The screenshot displays the Tektelic OAM Server web interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries. The 'MEGA' gateway is selected, and its details are shown on the right. The 'UPDATE TABLE' button is highlighted, and the status message 'restore:ok' is displayed. Below the status message, there is a 'Backups' section with a table of backup entries.

Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31 Macro
<input type="checkbox"/>	2020-02-27 12:09:30 mega
<input type="checkbox"/>	2020-02-25 11:41:53 Micro

MEGA
Gateway details

UPDATE TABLE Status: restore:ok

Date ↓	Description
<no timestamp>	<no description>
2020-03-02T14:54:08	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.1-r5
2020-03-02T12:04:59	mega 4.0.1
2020-01-20T09:34:55	dist-upgrade: before updating from BSP 3.2.6-r3 to 4.0.0-r5

2.9 Firewall:

This tab will help user to read and write firewall configuration on the gateway. Select Read Firewall Configuration button to view the firewall settings from your gateway.

The screenshot displays the Tektelic OAM Server interface for gateway management. The left sidebar contains navigation links: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main header shows 'Gateway groups' and 'Gateways', with the current gateway named 'MEGA' and 'Gateway details' displayed. A list of gateways is shown on the left, with 'mega' selected. The main content area features buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'FIREWALL' tab is active, showing 'READ FIREWALL CONFIGURATION' and 'SET FIREWALL CONFIGURATION' buttons. The firewall configuration is displayed as follows:

- Firewall Enabled
- Filters**

Name	Description	Chain	Target	Enabled	Delete
1 Filter 1	Error	INPUT	DROP	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- ICMP Enabled
- Enabled

To set/change firewall configuration check/uncheck a tick that you need, add/delete filters and then press “Set firewall configuration” button. After that, you can press “Read firewall configuration” and check that changes were made.

The screenshot displays the Tektelic OAM Server web interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a list of gateways. The selected gateway is 'MEGA', and its details are shown on the right. The 'MEGA Gateway details' page has a top navigation bar with options: MOVE TO GATEWAY GROUP, MANAGE CREDENTIALS, and DELETE. Below this is a sub-navigation bar with options: ITS, CONFIGURATION, COMMANDS, BACKUPS, FIREWALL (selected), SW MANAGEMENT, WIRELESS MODEM, WAN, and FILE TRANSFER. The 'FIREWALL' section contains a 'READ FIREWALL CONFIGURATION' button and a 'SET FIREWALL CONFIGURATION' button. The 'Firewall Enabled' checkbox is checked. Below this is a 'Filters' table with columns: Name, Description, Chain, Target, Enabled, and Delete. The table is currently empty, showing 'NO FILTERS CONFIGURED'. Below the filters are sections for 'ICMP' and 'SSH', both of which are 'Enabled'. The 'Enabled' checkboxes for both are checked.

Created Time	Name
<input type="checkbox"/>	2020-03-04 15:42:31 Macro
<input type="checkbox"/>	2020-02-27 12:09:30 mega
<input type="checkbox"/>	2020-02-25 11:41:53 Micro

Name	Description	Chain	Target	Enabled	Delete
NO FILTERS CONFIGURED					

ICMP	Enabled
<input checked="" type="checkbox"/> Enabled	
Rate Limit	Disabled

SSH	Enabled
<input checked="" type="checkbox"/> Enabled	

2.10 SW Management:

This tab allows users to read the installed software versions from the gateway, upgrade to new software version and install new software packages.

Important: Before performing a software upgrade for the first time on a particular gateway, the “Upgrade Servers” configuration file needs to be updated. Please refer to section 2.7.

You can also check the BSP status: BSP Upgrade Never Performed, BSP Upgrade Succeeded, BSP Upgrade Failed.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and includes a 'Created Time' filter and a list of gateways. The 'MEGA' gateway is selected, showing its details and a 'BSP STATUS' button. Below this, there is a 'Software versions' table with columns for '#', 'Component', and 'Version'. A notification at the bottom of the page states 'BSP Upgrade Succeeded' with a 'CLOSE' button.

#	Component	Version
1	amx3-cm3	1:1.9.2-r0-tektelec0
2	amx3-cm3	1.0-r3-tektelec0
		1.2.0-r1

Read Version:

Short List: It will display major version of packages installed from the gateway.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and includes a 'Gateway groups' breadcrumb. A table lists gateways under 'Euristiq Office: Gateways' with columns for 'Created Time' and 'Name'. The 'mega' gateway is selected. Below this, a 'SW versions type' dropdown is set to 'Short List', and a 'READ VERSIONS' button is highlighted. Other buttons include 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', 'DELETE', 'BSP STATUS', 'READ UPGRADABLE', 'READ INSTALLABLE', 'INSTALL ALL', and 'INSTALL SELECTED'. The 'Software versions' section contains a table with the following data:

#	Component	Version
1	Distributor ID	Tektelic
2	Description	Tektelic Kona Mega GNU/Linux 4.0.1
3	Release	4.0.1
4	Product	Kona Mega
5	u-boot	2013.07-rc2-Kona64-v0.11-gb19332eca5
6	Linux kernel	3.12.17-tektelic-1.9.12-kona64-g86122f9bb1
7	System monitor	tektelic-system-monitor-0.20+10

At the bottom right, the pagination shows 'Page: 1', 'Rows per page: 15', and '1 - 15 of 22'.

Full List: It will display all the versions of packages and tools installed from the gateway.

The screenshot shows the Tektelic OAM Server interface. The top navigation bar includes 'HOME', 'USERS', 'GATEWAY GROUPS', 'GATEWAY LOGS', and 'ALARMS'. The main content area is titled 'Euristiq Office: Gateways' and displays a list of gateways. The selected gateway is 'MEGA', and its details are shown in a sub-panel. The 'SW MANAGEMENT' tab is active, displaying a 'Full List' of software versions. A table lists the installed components and their versions.

#	Component	Version
1	amx3-cm3	1.1.9.2-r0-tekcelic0
2	arago-gpl-notice	1.0-r3-tekcelic0
3	automount-backup-partition	1.2.0-r1
4	automount-logs-partition	1.2.0-r1
5	base-files	3.0.14-r89-arago4-tekcelic16
6	base-passwd	3.5.29-r0
7	bash	4.4.18-r0-arago0

Software Upgrade:

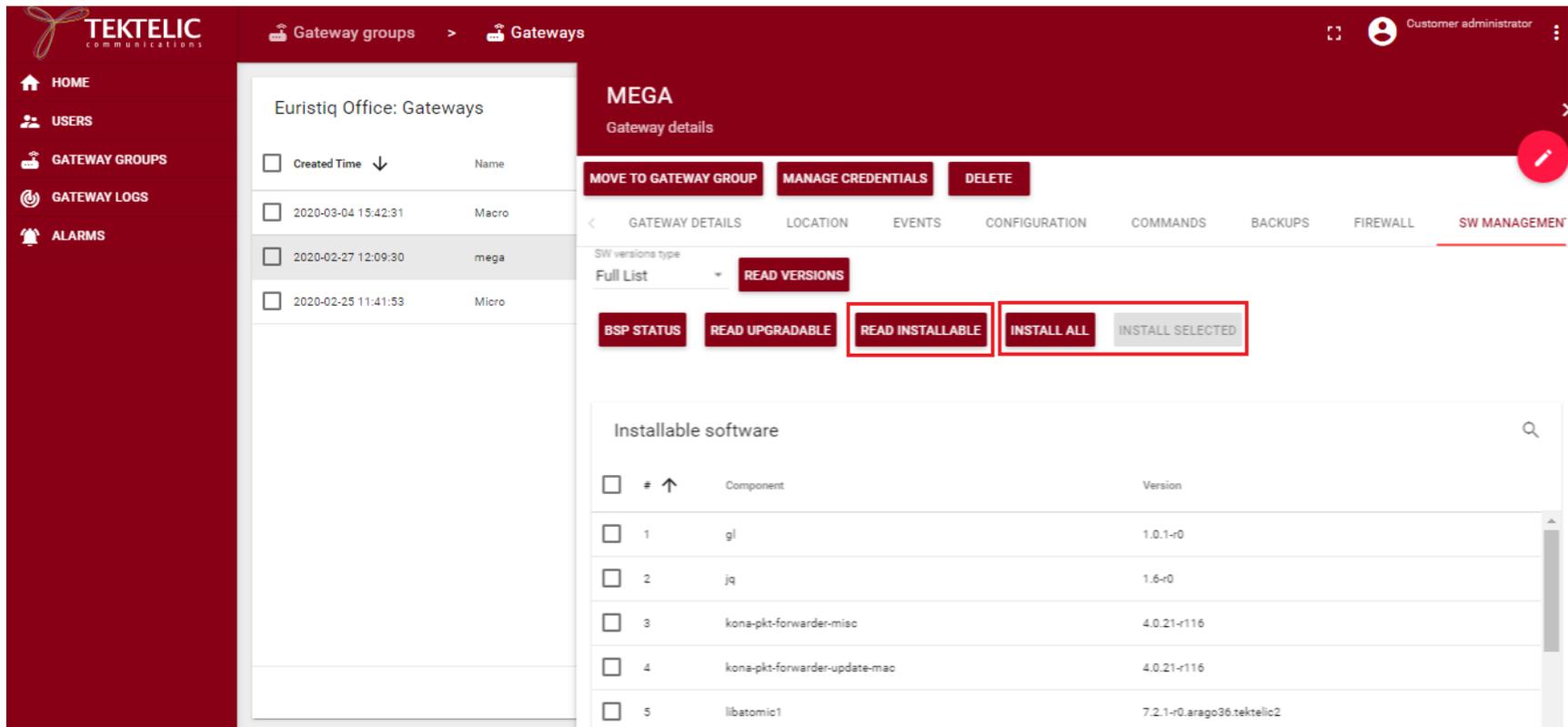
To upgrade the BSP, please, press on the “Read Upgradable” button. You will see the list with the BSP components, available for upgrading. Then you can press “Upgrade BSP”. The upgrading process will start. The progress bar and a warning message will inform you that the process was started. The next message will tell you when upgrading will be completed. Usually, it takes a 10-15 minutes.

The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and includes a 'SW MANAGEMENT' tab. A table lists gateway components with columns for 'Created Time' and 'Name'. The 'mega' component is selected. Below the table are buttons for 'BSP STATUS', 'READ UPGRADABLE' (highlighted with a red box), 'READ INSTALLABLE', 'UPGRADE ALL', and 'UPGRADE SELECTED'. A section titled 'Upgradable software' contains a table with columns for '#', 'Component', 'Current Version', and 'New Version'. A red box highlights the message 'NO PACKAGES AVAILABLE FOR UPGRADING' in the table. The interface also shows a breadcrumb trail 'Gateway groups > Gateways' and a user profile 'Customer administrator'.

Packages Installation:

To install new packages, please, press on the “Read Installable” button. You will see the list with the packages, available for installation. Then you can press “Install all” or choose a few packages and press “Install Selected”. The installation process will start. The progress bar and a warning message will inform you that the process was started. The next message will tell you when installation will be completed. Usually, it takes a few minutes.

If there are no packages, you will see the message that “NO PACKAGES AVAILABLE FOR INSTALLATION”.



The screenshot shows the Tektelic OAM Server User Guide interface. The top navigation bar includes "HOME", "USERS", "GATEWAY GROUPS", "GATEWAY LOGS", and "ALARMS". The main content area is titled "MEGA Gateway details" and includes a "SW MANAGEMENT" tab. The "SW MANAGEMENT" tab is active, showing a list of installable software components. The list has columns for "#", "Component", and "Version".

#	Component	Version
1	gl	1.0.1-r0
2	jq	1.6-r0
3	kona-pkt-forwarder-misc	4.0.21-r116
4	kona-pkt-forwarder-update-mac	4.0.21-r116
5	libatomic1	7.2.1-r0.arago36.tektelic2

2.11 Wireless Modem:

This tab provides information of Modem, SIM, APN and Modem Firmware update.

The device information tab provides information about Modem.

Note: Wireless modem firmware button will allow user to upgrade modem firmware on the GW, but this feature is still under development.

The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

At the top right, the user is identified as 'Customer administrator'. Below the gateway list, there are three buttons: 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A secondary navigation bar includes tabs for: COMMANDS, BACKUPS, FIREWALL, SW MANAGEMENT, WIRELESS MODEM (highlighted), WAN, and FILE TRANSFER. A red box highlights the 'WIRELESS MODEM FIRMWARE' section, which contains a list of expandable menu items:

- WIRELESS MODEM FIRMWARE
- Device Information
- Home Network
- RF Information
- Active Profile Parameters
- Call Statistics
- APN

Device Information:

The screenshot displays the Tektelic OAM Server interface. On the left is a dark red sidebar with navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main header is dark red and contains the Tektelic logo, navigation for 'Gateway groups' and 'Gateways', and a user profile for 'Customer administrator'. Below the header, a modal window titled 'MEGA Gateway details' is open. It features a table of gateway entries under the heading 'Euristiq Office: Gateways'. The table has columns for 'Created Time' and 'Name'. The entry '2020-02-27 12:09:30 mega' is selected. Below the table are three buttons: 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A navigation bar below the buttons includes 'CONFIGURATION', 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', and 'WIRELESS MODEM'. The 'WIRELESS MODEM' section is active, showing a 'Device Information' tab. This tab contains a table with the following data:

Interface	IP Address
Public IP	10.70.189.208
Phone Number	My telephone
Interface wwan0	10.70.189.208
Interface lo	127.0.0.1
Interface eth0	192.168.31.125

Below the table is a 'Home Network' section with a dropdown arrow.

Home Network:

This tab provides information about SIM, Roaming Status, Data Capabilities, Session state etc.

The screenshot displays the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a list of gateway entries with columns for 'Created Time' and 'Name'. The 'MEGA' gateway is selected, and its details are shown in a modal window. The 'WIRELESS MODEM' tab is active, displaying a table of network-related information. A red box highlights the 'Home Network' section of the table.

Created Time	Name
<input type="checkbox"/>	2020-03-04 15:42:31 Macro
<input type="checkbox"/>	2020-02-27 12:09:30 mega
<input type="checkbox"/>	2020-02-25 11:41:53 Micro

Home Network	
Home Network	UA-KS
Roaming Status	UNKNOWN
Data Capabilities	EDGE
Session State	CONNECTED
Data Bearer	EDGE

RF Information:

This tab provides information about Signal Strength, Active Band, Active Channel etc.

The screenshot shows the Tektelic OAM Server interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The user is logged in as 'Customer administrator'. The main content area is titled 'Euristiq Office: Gateways' and 'MEGA Gateway details'. A table lists gateway entries with columns for 'Created Time' and 'Name'. The 'MEGA' gateway is selected. Below the table, there are buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A navigation menu includes 'CONFIGURATION', 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', and 'WIRELESS MODEM'. The 'WIRELESS MODEM' tab is active, showing the 'RF Information' section. This section contains a table with the following data:

Parameter	Value
Radio Interface	GSM
Active Band Class	429
Active Channel	0
Signal Strength	-89
ECIO	5

Below the RF Information table is a section for 'Active Profile Parameters'.

Active profile parameters:

This tab provide information about active APN profile name, APN Name, Username etc.

The screenshot displays the Tektelic OAM Server interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and lists three gateway entries with columns for 'Created Time' and 'Name'. The selected gateway is 'MEGA', with details for 'PDP Type', 'Authentication', 'Profile Name', 'APN Name', and 'User Name'. The 'Active Profile Parameters' section is highlighted with a red box, showing the following values:

Parameter	Value
PDP Type	0
Authentication	0
Profile Name	profile8
APN Name	dsfsdf
User Name	

Call Statistics:

This tab provides information about Call Status, Byte Transferred and Received and current Rx and Tx rate.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'MEGA Gateway details' and includes a list of gateways under 'Euristiq Office: Gateways'. The 'Call Statistics' tab is active, displaying a table with the following data:

Call Status	CONNECTED
Bytes Transferred	0
Bytes Received	0
Current TX Rate	-1
Current RX Rate	-1

Below the table, there is an 'APN' field with a dropdown arrow.

User will see the list of added APNs here, he can add, modify, delete and set (as active) APNs:

Note: Maximum number of allowed APNs - 16. Current Active APN will be highlighted in Green.

The screenshot shows the Tektelic OAM Server interface. The top navigation bar includes 'Gateway groups' and 'Gateways'. The user is logged in as 'Customer administrator'. The main content area is titled 'MEGA Gateway details'. On the left, there is a sidebar with navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area has a sub-header 'Euristiq Office: Gateways' and a table of APNs. The table has columns for 'Created Time' and 'Name'. The APNs listed are: 2020-03-04 15:42:31 Macro, 2020-02-27 12:09:30 mega, and 2020-02-25 11:41:53 Micro. Below the table, there are buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. The 'WIRELESS MODEM' tab is selected, showing a list of APNs. The 'APN' header is highlighted in red. The table lists APNs 1 through 4. The second APN, 'apn2', is highlighted in green. The '+' icon for adding a new APN is also highlighted in red.

Created Time	Name
2020-03-04 15:42:31	Macro
2020-02-27 12:09:30	mega
2020-02-25 11:41:53	Micro

APN	Actions
New APN	+
1 apn1	edit
2 apn2	edit delete
3 apn3	edit delete
4 apn4	edit delete

2.12 WAN

This tab would allow users to change ping address for preferred interface (by default 8.8.8.8) and change the preferred and fallback Interface (By default preferred interface is Eth0). “Update WAN Info” button will get current settings from the gateway.

To change the Preferred Ping Address, enter the IP address/Domain Name and select “Set Preferred Ping Address” button.

To change the Preferred, fall back Interface, use the Preferred and Fallback pull down menus, then select “Set Preferred and Fallback” button to set this.

The screenshot displays the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a list of gateway entries with columns for 'Created Time' and 'Name'. The 'mega' gateway is selected. The right-hand pane shows the 'MEGA Gateway details' page, which includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'WAN' tab is active, showing an 'UPDATE WAN INFO' button (highlighted with a red box), a 'SET PREFERRED PING ADDRESS' button with a text input field containing '0.0.0.0', and a 'SET PREFERRED AND FALLBACK' button with dropdown menus for 'Preferred' and 'Fallback'. At the bottom, a 'Connectivity Types' table is visible.

Type	Speed, Mbit/s	Bandwidth usage, %	Preferred	Fallback
Ethernet			<input type="checkbox"/>	<input type="checkbox"/>
Cellular			<input type="checkbox"/>	<input type="checkbox"/>



TEKTELIC COMMUNICATIONS

Gateway groups > Gateways

Customer administrator

Euristiq Office: Gateways

<input type="checkbox"/> Created Time ↓	Name
<input type="checkbox"/> 2020-03-04 15:42:31	Macro
<input type="checkbox"/> 2020-02-27 12:09:30	mega
<input type="checkbox"/> 2020-02-25 11:41:53	Micro

MEGA

Gateway details

MOVE TO GATEWAY GROUP **MANAGE CREDENTIALS** **DELETE**

COMMANDS BACKUPS FIREWALL SW MANAGEMENT WIRELESS MODEM **WAN** FILE TRANSFER

UPDATE WAN INFO

SET PREFERRED PING ADDRESS Preferred ping address: 8.8.8.8

SET PREFERRED AND FALLBACK Preferred: Preferred Fallback: Fallback

Connectivity Types

Type	Speed, Mbit/s	Bandwidth usage, %	Preferred	Fallback
Ethernet			<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cellular			<input type="checkbox"/>	<input checked="" type="checkbox"/>

2.13 File Transfer

The functionality on the File Transfer page is identical to that of the File Transfer function within Kona FT. Select the “Decompress” check box when uploading BSP software releases in .zip format. Click “Browse” to select a file to upload from the computer you are accessing the OAM server webpage from. Click “Upload File” once you have selected the file to upload. Zip files are uploaded to /dev/shm/ then extracted to /lib/firmware/. Non-zipped files are uploaded to /dev/shm/.

The screenshot displays the Tektelic OAM Server interface. On the left is a navigation menu with options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and contains a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

Below the table is a 'MEGA Gateway details' panel. It includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A navigation bar at the bottom of the panel shows tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'FILE TRANSFER' tab is selected, showing a 'File upload' section. This section contains a 'BROWSE' button, a 'Selected file' field with the value 'tek-tcs.pub.pem', an 'UPLOAD FILE' button, and a 'Decompress' checkbox.

2.14 Log Retrieval

This functionality allows user to download the logs from the GW to his Computer. Log retrieval you can find on the file transfer tab. Just choose Log retrieval from drop down list.

NOTE: oam stream host should be also uncommented if you want to use Log Retrieval. It should be configured as “gateway-oam.tektelic.com:8082”. Check section 1.1 of this document.

This feature is not fully implemented yet. Still under development.

The screenshot displays the Tektelic OAM Server web interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and shows a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

Below the table, the 'MEGA' gateway details are shown. The 'FILE TRANSFER' tab is active, and the 'Log retrieval' option is selected in the dropdown menu. Other options include 'File upload' and 'UPLOAD FILE' (with a 'Decompress' checkbox).

Press the "Retrieve log files list" and all log files will be shown in the table below.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and 'MEGA Gateway details'. It includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'FILE TRANSFER' tab is active, showing a 'Log retrieval' section with a 'RETRIEVE LOG FILES LIST' button (highlighted with a red box) and a 'DOWNLOAD SELECTED FILES' button. Below the buttons is a table of log files, also highlighted with a red box.

<input type="checkbox"/>	File name ↑	Access	Type	File size
<input type="checkbox"/>	auth.log	r	file	199
<input type="checkbox"/>	cron.log	r	file	714
<input type="checkbox"/>	daemon.log	r	file	1013448
<input type="checkbox"/>	daemon.log.1.gz	r	file	55654
<input type="checkbox"/>	daemon.log.10.gz	r	file	49748

Choose some files and press on the “Download selected files”. The dialog window will ask where you want to download you files.

The screenshot shows the Tektelic OAM Server interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and 'MEGA Gateway details'. Below the title are buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. A navigation bar includes 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'FILE TRANSFER' tab is active, showing a 'Log retrieval' section with a 'RETRIEVE LOG FILES LIST' button and a 'DOWNLOAD SELECTED FILES' button. A table of log files is displayed with columns for File name, Access, Type, and File size. Three files are selected with red checkmarks: auth.log (199 bytes), cron.log (714 bytes), and daemon.log (1013448 bytes). The 'DOWNLOAD SELECTED FILES' button is highlighted with a red box.

<input type="checkbox"/>	File name ↑	Access	Type	File size
<input checked="" type="checkbox"/>	auth.log	r	file	199
<input checked="" type="checkbox"/>	cron.log	r	file	714
<input checked="" type="checkbox"/>	daemon.log	r	file	1013448
<input type="checkbox"/>	daemon.log.1.gz	r	file	55654
<input type="checkbox"/>	daemon.log.10.gz	r	file	49748

After you choose the directory, the process will start. The progress bar and a warning message will inform you that the process was started. The next message will tell you when files uploading will be stopped. Usually, it takes a few minutes.

The screenshot shows the Tektelic OAM Server web interface. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Euristiq Office: Gateways' and displays a table of gateway entries:

<input type="checkbox"/>	Created Time ↓	Name
<input type="checkbox"/>	2020-03-04 15:42:31	Macro
<input type="checkbox"/>	2020-02-27 12:09:30	mega
<input type="checkbox"/>	2020-02-25 11:41:53	Micro

The 'mega' gateway is selected, and its details are shown in a modal window titled 'MEGA Gateway details'. The modal includes buttons for 'MOVE TO GATEWAY GROUP', 'MANAGE CREDENTIALS', and 'DELETE'. Below these are tabs for 'COMMANDS', 'BACKUPS', 'FIREWALL', 'SW MANAGEMENT', 'WIRELESS MODEM', 'WAN', and 'FILE TRANSFER'. The 'FILE TRANSFER' tab is active, showing a 'Log retrieval' section with buttons for 'RETRIEVE LOG FILES LIST' and 'DOWNLOAD SELECTED FILES'. A red-bordered box highlights a warning message: 'Log retrieval is in progress. Please do not refresh the page, close the tab or turn off your board. The board may reboot several times'. Below the warning is a table of log files:

<input type="checkbox"/>	File name ↑	Access	Type	File size
<input checked="" type="checkbox"/>	auth.log	r	file	199
<input checked="" type="checkbox"/>	cron.log	r	file	714
<input checked="" type="checkbox"/>	daemon.log	r	file	1013448

2.15 Bulk Upgrade

This feature would allow users to do Bulk BSP Upgrade for their GWs. To do that, Go to Gateway Groups where users have their GWs registered.

Created Time	Name	# of gateways
2019-03-11 15:28:49	PV	6

Created Time	Name	GW-ID	Gateway model	Public	Logging enabled	Status
2019-11-12 11:07:21	Kama's Micro US 58C3	647FDAFFFE0058C3	Kona Micro US GW	<input type="checkbox"/>	<input type="checkbox"/>	Not connected
2019-11-05 12:12:30	Micro EU	647FDAFFFE0054E	Kona Micro EU GW	<input type="checkbox"/>	<input type="checkbox"/>	Connected
2019-10-23 16:50:18	Micro US 7355	647FDAFFFE00529	Kona Micro US GW	<input type="checkbox"/>	<input type="checkbox"/>	Not connected
2019-06-19 17:38:07	Micro US	647FDAFFFE005412	Kona Micro US GW	<input type="checkbox"/>	<input type="checkbox"/>	Not connected
2019-05-30 11:47:56	Kona_Micro_US	647FDAFFFE00417A	Kona Macro US GW	<input type="checkbox"/>	<input type="checkbox"/>	Connected
2019-03-11 15:29:14	Kona_Mega_US	647FDAFFFE0000D9	Kona Mega US GW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Connected

Then Select Gateway Groups. Then go to Software Management tab. This tab would list all the GWs registered under this Gateway Groups. And also, it would give information about whether BSP is Up to Date or New BSP is available. In order to see the new BSP is available status, User should copy the BSP image into GW (/lib/firmware directory) and update the Server information (Please see section 2.7) before hand.

The screenshot shows the 'PV Gateway group details' page. The left sidebar contains navigation options: HOME, USERS, GATEWAY GROUPS, GATEWAY LOGS, and ALARMS. The main content area is titled 'Gateway groups' and shows a list of gateway groups with a 'Created Time' column. The 'SW MANAGEMENT' tab is selected, displaying a table of 'Gateways BSP versions'. The table has columns for 'GW ID', 'BSP version', 'BSP new version', and 'BSP upgrading status'. An 'UPGRADE BSP' button is visible in the top right corner of the table area.

GW ID	BSP version	BSP new version	BSP upgrading status
647FDAFFFE0000D9	4.0.1+5		BSP is up to date
647FDAFFFE00417A	4.0.2+5		BSP is up to date
647FDAFFFE005412			Gateway is not connected!
647FDAFFFE00554E	3.0.2+5	3.0.4+5	BSP upgrade is available
647FDAFFFE0058C3			Gateway is not connected!
647FDAFFFE006529			Gateway is not connected!

This screenshot is identical to the one above, showing the 'PV Gateway group details' page with the 'UPGRADE BSP' button visible in the top right corner of the table area.

GW ID	BSP version	BSP new version	BSP upgrading status
647FDAFFFE0000D9	4.0.1+5	4.0.2+5	BSP upgrade is available
647FDAFFFE00417A	4.0.2+5	4.0.3+5	BSP upgrade is available
647FDAFFFE005412			Gateway is not connected!
647FDAFFFE00554E	3.0.2+5	3.0.4+5	BSP upgrade is available
647FDAFFFE0058C3			Gateway is not connected!
647FDAFFFE006529			Gateway is not connected!

Then select the Upgrade BSP button. Once the BSP upgrade is started then it would display the following message. "Upgrade Status: BSP Upgrade in progress. Do not turn off your board. The board may reboot several times."

The screenshot shows the 'PV Gateway group details' page. The 'Gateways BSP versions' table is in the 'Upgrade in progress' state. The table has the following data:

GW-ID ↑	BSP version	BSP new version	BSP upgrading status
647FDAFFFE0000D9	4.0.1+5	4.0.2+5	Upgrade in progress
647FDAFFFE00417A	4.0.2+5	4.0.3+5	Upgrade in progress
647FDAFFFE005412			Gateway is not connected!
647FDAFFFE00554E	3.0.2+5	3.0.4+5	Upgrade in progress
647FDAFFFE0058C3			Gateway is not connected!
647FDAFFFE006529			Gateway is not connected!

Below the table, the page indicates 'Page: 1', 'Rows per page: 15', and '1 - 6 of 6'.

Once the BSP upgrade is successful, it would display “Upgrade Status: BSP Upgrade Succeeded” message.

The screenshot shows the 'PV Gateway group details' page after a successful BSP upgrade. The 'Upgrade status' is now 'BSP Upgrade Succeeded'. The table data is as follows:

GW-ID ↑	BSP version	BSP new version	BSP upgrading status
647FDAFFFE0000D9	4.0.2+5		BSP is up to date
647FDAFFFE00417A	4.0.3+5		BSP is up to date
647FDAFFFE005412			Gateway is not connected!
647FDAFFFE00554E	3.0.4+5		BSP is up to date
647FDAFFFE0058C3			Gateway is not connected!
647FDAFFFE006529			Gateway is not connected!

Below the table, the page indicates 'Page: 1', 'Rows per page: 15', and '1 - 6 of 6'.