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WMDS-183G2

User Guide



Revision History

Revision	Date	Description
.001	Jun. 15, 2022	Browan first release
.002	Aug. 17, 2022	Add 50cm distance usage limit



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Regulatory

Federal Communication Commission Statement (FCC, U.S.)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in an installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radiation Exposure Statement

This device complies with RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This device must operate with a minimum distance of 50 cm between the radiator and user body.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment



Industry Canada statement

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- 1) l'appareil ne doit pas produire de brouillage;
- 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Radiation Hazard Warning

To ensure compliance with FCC and Industry Canada RF exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 50 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

Installez l'appareil en veillant à conserver une distance d'au moins 50 cm entre les éléments rayonnants et les personnes. Cet avertissement de sécurité est conforme aux limites d'exposition définies par la norme CNR-102 relative aux fréquences radio.

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1 Product Overview

1.1 Product Features

The WMDS-183G2 LoRa module is a module using the latest Semtech LoRa chip, SX1302/SX1303 along with SX1250. Depending upon the SKU, SX1262 allows for channel scan and LBT.

1.2 Setup

Plugging the WMDS-183G2 LoRa module in a device's Semtech miniPCIE port allows the device to link to the module and utilize LoRa properties with their firmware.

Due to radiation safety regulations, WMDS-183G2 must remain a distance of 50cm away from the human body during usage.

1.3 Certified Accompanying Antennas

Following antennas has been tested and confirmed to comply with regulations, falling within the 50cm distance category.

Brand	Model	Gain
GSC	OMA-G01	8 dbi
GSC	OMA-G03A	5 dbi
GSC	OMA-G04A	3 dbi
ASUS	A8-A003-00108	1.2 dbi
Tengxiang	AB0915-4602RS-1P5M	0.61 dbi

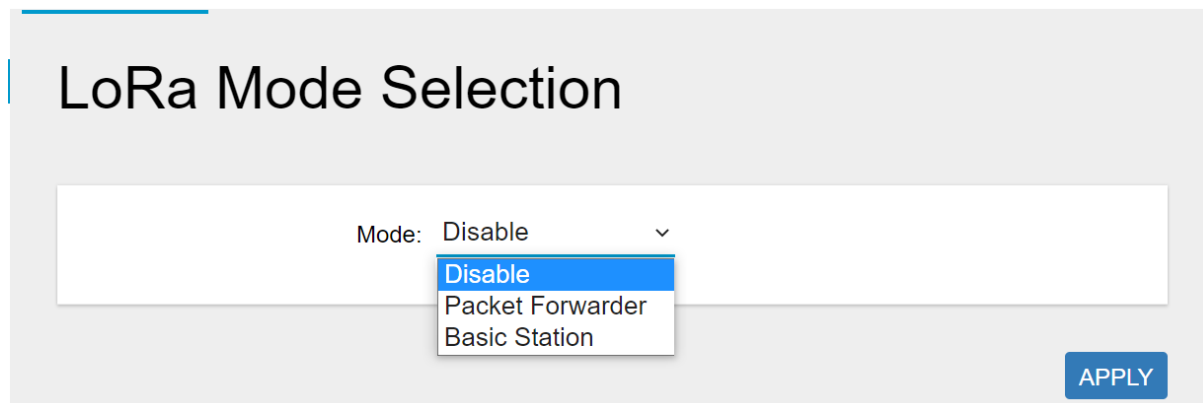
2 LoRa Settings

The LoRa menu on GUI consists of the following categories: **Mode Selection**, **Channel Scan** and **Log**. An introduction of each category will be distinctly stated in individual paragraphs.

2.1 Mode Selection

By default, the LoRa Mode is disabled. Configure the "**Packet Forwarder**" or "**Basic Station**" by using the dropdown list.

Figure 5.1-A LoRa Mode Selection



2.1.1 Packet Forwarder

Choose the "***Packet Forwarder***" option and click the "***APPLY***" button to Enable the Packet Forwarder mode. After applying the setting, the "Packet Forwarder" field can be found on the left menu.

Figure 5.1.1-A LoRa Mode Selection - Packet Forwarder

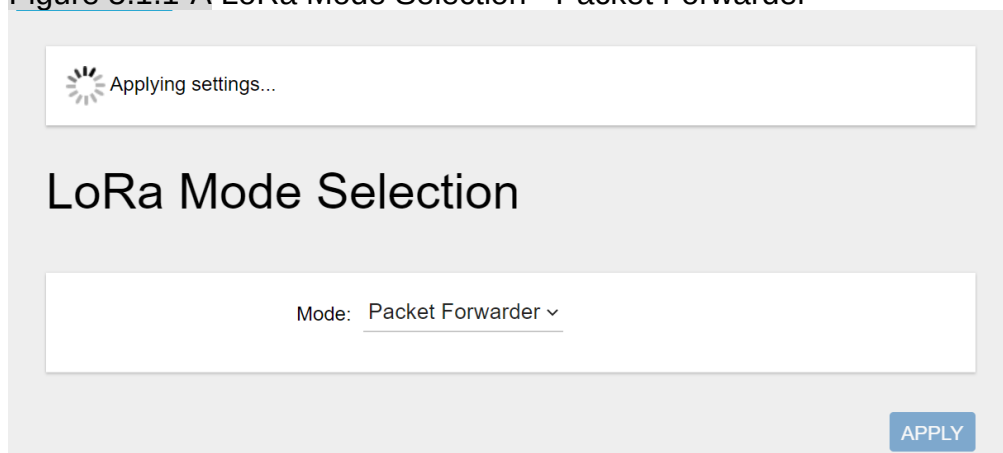


Figure 5.1.1-B LoRa Mode Selection - Packet Forwarder menu



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System

LoRa settings

Mode Selection

Packet Forwarder

Channel Scan

Log

Network

Logout

Gateway Info

Gain

Radio and Channel Settings

LBT Settings

Gateway Info

Gateway ID: 1c497bffffb5e56

Server Address: browan.eu1.cloud.thethings

Server Uplink Port: 1700 (1-65535)

Server Downlink Port: 1700 (1-65535)

2.1.1.1 Gateway Info

This page is to set up the LoRa configuration including **Gateway ID**, **Server Address**, **Server Uplink Port**, **Server Downlink Port**, **Keep-Alive Interval**, **Statistics Display Interval**, and **Push Timeout**.

Figure 5.1.1.1-A Gateway Info

Gateway Info

Gateway ID:	1c497bfff5e56	
Server Address:	browan.eu1.cloud.thethings	
Server Uplink Port:	1700	(1~65535)
Server Downlink Port:	1700	(1~65535)
Keep Alive Interval:	10	(seconds)
Statistics display Interval:	30	(seconds)
Push Timeout:	100	(milliseconds)

2.1.1.2 Antenna Gain

This page is to set up the **antenna gain** of Lora.

Figure 5.1.1.2-A Antenna Gain

Antenna Gain:	0	(0 ~ 15)
---------------	---	----------

APPLY

2.1.1.3 Radio and Channel Settings

This page is to configure the radio 0 and radio 1 configurations of Lora, including **Central Frequency**, **Channel Status**, and **Center frequency offset**.

Figure 5.1.1.3-A Radio and Channel Settings

Radio Settings

Here you can modify Central frequency of Radio 0 or Radio 1 to change channel frequencies.

Radio 0	Radio 1
Central Frequency: 867400000 (Hz)	Central Frequency: 868200000 (Hz)
RSSI Offset: -167 (dBm)	RSSI Offset: -167 (dBm)

Channel Assignment

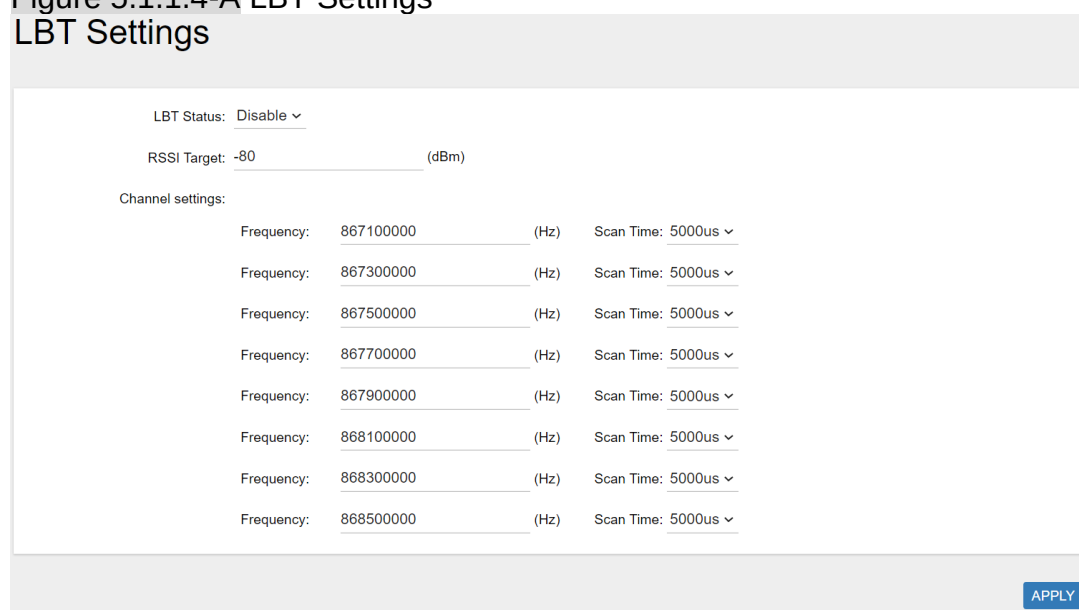
CH 0 Status: Enable	Radio Interface: 0	CenterFreqOffset: -300000 (-400000~+400000)
CH 1 Status: Enable	Radio Interface: 0	CenterFreqOffset: -100000 (-400000~+400000)
CH 2 Status: Enable	Radio Interface: 0	CenterFreqOffset: 100000 (-400000~+400000)
CH 3 Status: Enable	Radio Interface: 0	CenterFreqOffset: 300000 (-400000~+400000)
CH 4 Status: Enable	Radio Interface: 1	CenterFreqOffset: -300000 (-400000~+400000)
CH 5 Status: Enable	Radio Interface: 1	CenterFreqOffset: -100000 (-400000~+400000)
CH 6 Status: Enable	Radio Interface: 1	CenterFreqOffset: 100000 (-400000~+400000)
CH 7 Status: Enable	Radio Interface: 1	CenterFreqOffset: 300000 (-400000~+400000)
CH 8 Status: Enable	Radio Interface: 1	CenterFreqOffset: 100000 (-375000~+375000)

Channel Bandwidth:

2.1.1.4 LBT Settings

For some regions (i.e. Japan), the Listen Before Talk (LBT) function is a must. This page is to set up the LBT configuration of Lora, including **LBT Status**, **RSSI Target**, **Channel settings**.

Figure 5.1.1.4-A LBT Settings



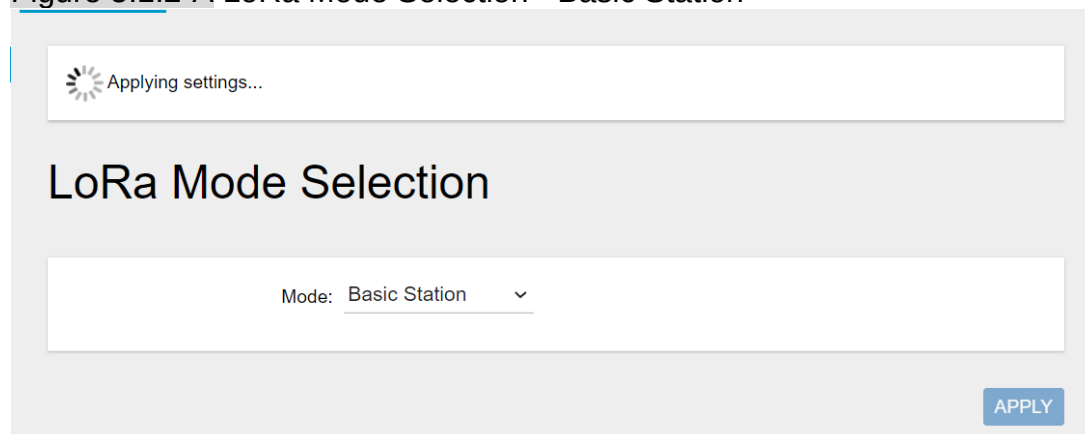
The screenshot shows the LBT Settings configuration page. At the top, there is a dropdown menu for "LBT Status" set to "Disable". Below it is a text input for "RSSI Target" set to "-80" with "(dBm)" as a unit. Under the heading "Channel settings:", there is a table with 8 rows. Each row contains a "Frequency" field (ranging from 867100000 to 868500000 Hz), a unit "(Hz)", and a "Scan Time" dropdown menu set to "5000us". An "APPLY" button is located at the bottom right of the form.

Frequency	Unit	Scan Time
867100000	(Hz)	5000us
867300000	(Hz)	5000us
867500000	(Hz)	5000us
867700000	(Hz)	5000us
867900000	(Hz)	5000us
868100000	(Hz)	5000us
868300000	(Hz)	5000us
868500000	(Hz)	5000us

2.1.2 Basic Station

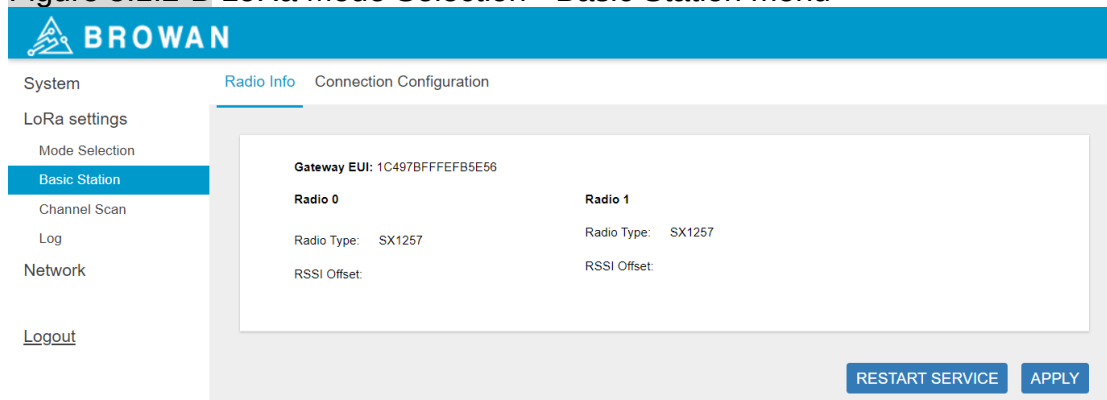
Choose the "**Basic Station**" option and click the "**APPLY**" button to Enable the Basic Station mode. After applying the setting, the "Basic Station" field can be found on the left menu.

Figure 5.1.2-A LoRa Mode Selection - Basic Station



The screenshot shows the LoRa Mode Selection interface. At the top, there is a loading spinner and the text "Applying settings...". Below this is the title "LoRa Mode Selection". Underneath the title is a dropdown menu for "Mode" set to "Basic Station". An "APPLY" button is located at the bottom right of the form.

Figure 5.1.2-B LoRa Mode Selection - Basic Station menu

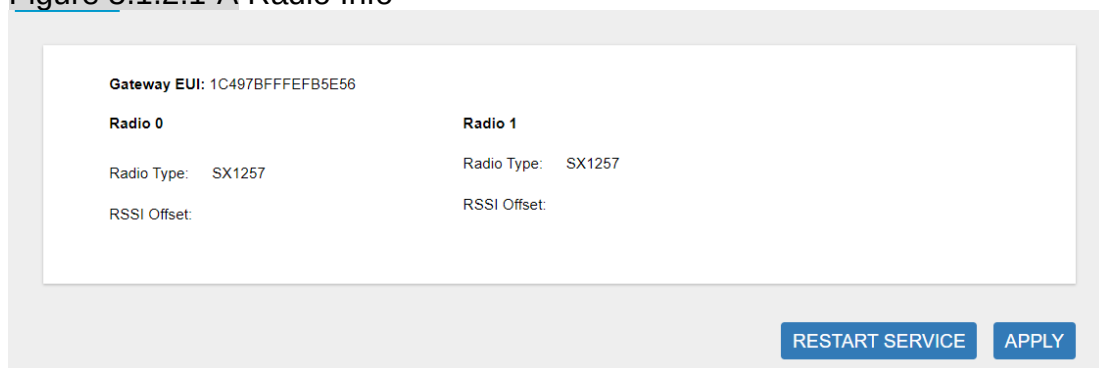


The screenshot shows the Browan web interface. The top navigation bar includes 'System', 'Radio Info', and 'Connection Configuration'. The left sidebar lists 'LoRa settings' with sub-items: 'Mode Selection', 'Basic Station' (highlighted), 'Channel Scan', 'Log', and 'Network'. Below these is a 'Logout' link. The main content area displays the 'Basic Station' configuration. It shows the 'Gateway EUI' as 1C497BFFFEFB5E56. Under 'Radio 0' and 'Radio 1', the 'Radio Type' is set to 'SX1257' and 'RSSI Offset' is empty. At the bottom right, there are 'RESTART SERVICE' and 'APPLY' buttons.

2.1.2.1 Radio Info

This page is to show the **Gateway EUI** information.

Figure 5.1.2.1-A Radio Info



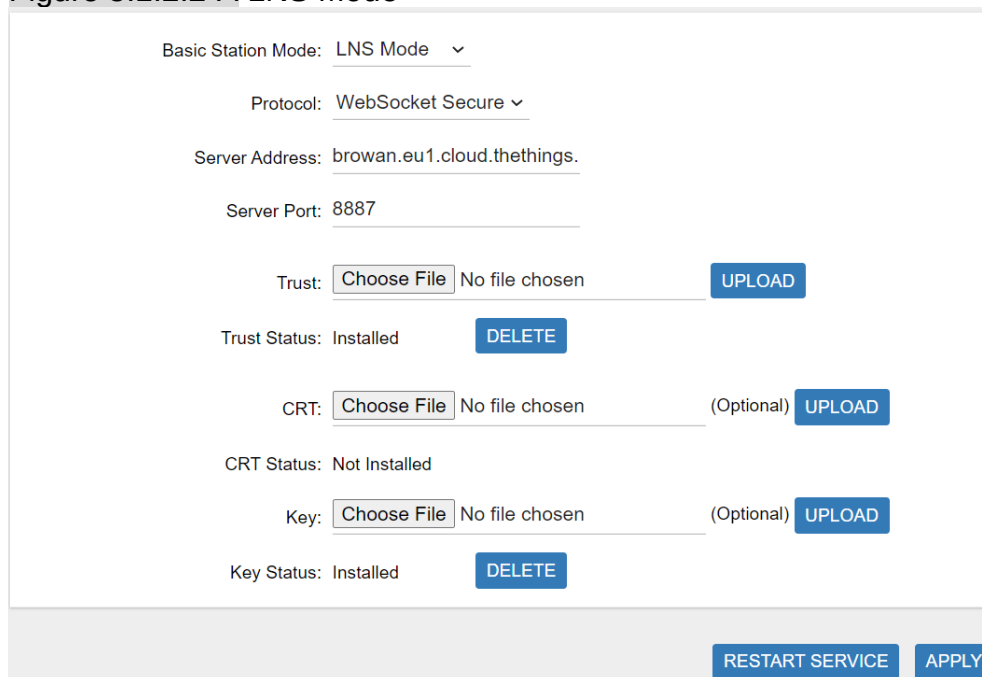
The screenshot shows the 'Radio Info' page. It displays the 'Gateway EUI' as 1C497BFFFEFB5E56. Below this, it shows 'Radio 0' and 'Radio 1' settings. For both radios, the 'Radio Type' is 'SX1257' and the 'RSSI Offset' is empty. At the bottom right, there are 'RESTART SERVICE' and 'APPLY' buttons.

2.1.2.2 Connection Configuration

This page is to set up the basic station configuration, including **Basic Station Mode**, **Protocol**, **Server Address**, **Server Port** and **Credentials**.

- LNS Mode

Configure the LNS Mode settings and click the "APPLY" button.

Figure 5.1.2.2-A LNS Mode

Basic Station Mode: LNS Mode ▾

Protocol: WebSocket Secure ▾

Server Address: browan.eu1.cloud.thethings.

Server Port: 8887

Trust: Choose File No file chosen **UPLOAD**

Trust Status: Installed **DELETE**

CRT: Choose File No file chosen (Optional) **UPLOAD**

CRT Status: Not Installed

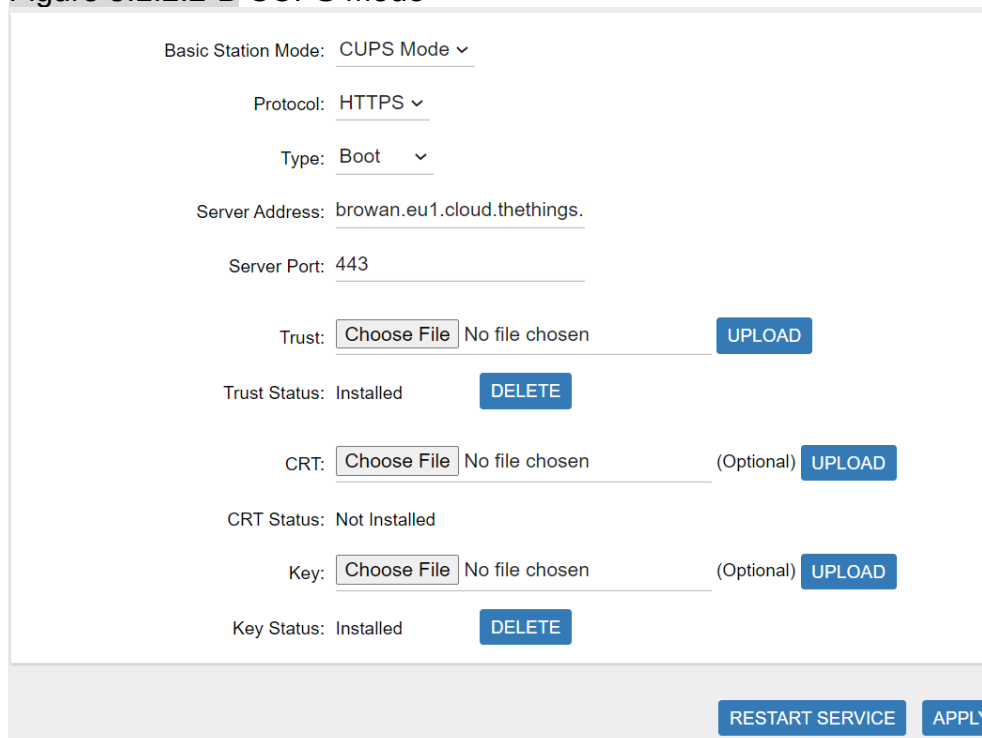
Key: Choose File No file chosen (Optional) **UPLOAD**

Key Status: Installed **DELETE**

RESTART SERVICE **APPLY**

- CUPS Mode

Configure the CUPS Mode settings and click the "APPLY" button.

Figure 5.1.2.2-B CUPS Mode

Basic Station Mode: CUPS Mode ▾

Protocol: HTTPS ▾

Type: Boot ▾

Server Address: browan.eu1.cloud.thethings.

Server Port: 443

Trust: Choose File No file chosen **UPLOAD**

Trust Status: Installed **DELETE**

CRT: Choose File No file chosen (Optional) **UPLOAD**

CRT Status: Not Installed

Key: Choose File No file chosen (Optional) **UPLOAD**

Key Status: Installed **DELETE**

RESTART SERVICE **APPLY**

2.2 Channel Scan

Click the "SCAN" button to scan the RF signal. Then click the "EXPORT" button to export the scan result.

Figure 5.2-A Channel RSSI Scan

Channel Scan

The device can scan all supported channels based on ISM band regulation.
Note: The scanning process may take few minutes to complete, please wait until the end of process.

 Scanning channel now...

Channel Index	Channel Frequency	Noise Indication
---------------	-------------------	------------------

SCAN
EXPORT

Figure 5.2-B Scan Result

Channel Scan

The device can scan all supported channels based on ISM band regulation.
Note: The scanning process may take few minutes to complete, please wait until the end of process.

Channel Index	Channel Frequency	Noise indication
Channel 1	863100000	-88.150
Channel 2	863300000	-90.470
Channel 3	863500000	-86.480
Channel 4	863700000	-84.810
Channel 5	863900000	-87.730
Channel 6	864100000	-86.210
Channel 7	864300000	-85.260
Channel 8	864500000	-87.720
Channel 9	864700000	-89.070
Channel 10	864900000	-88.380
Channel 11	865100000	-88.500
Channel 12	865300000	-88.720
Channel 13	865500000	-87.030
Channel 14	865700000	-88.420
Channel 15	865900000	-88.290
Channel 16	866100000	-90.470

2.3 Log

The LoRa logs will be shown on this page. Packet forwarder mode will show recent logs with a maximum limit of 5MB. Basic Station mode will show recent logs within 5,000,000 lines.

Figure 5.3-A Logs

LoRa Logs

```
2021-07-08 08:29:31.591 [TCE:VERB] Connected to MUXS.
2021-07-08 08:29:31.775 [RAL:INFO] Lora gateway library version: Version: 5.0.1;
2021-07-08 08:29:31.830 [RAL:VERB] Connecting to device: /dev/spidev1.0
2021-07-08 08:29:31.830 [RAL:DEBU] SX130x txlut table (0 entries)
2021-07-08 08:29:31.830 [RAL:VERB] SX1301 rxrfchain 0: enable=1 freq=867.5MHz rssi_offset=-166.000000 type=2 tx_enabl
2021-07-08 08:29:31.831 [RAL:VERB] SX1301 rxrfchain 1: enable=1 freq=868.5MHz rssi_offset=-166.000000 type=2 tx_enabl
2021-07-08 08:29:31.831 [RAL:VERB] SX1301 ifchain 0: enable=1 rf_chain=1 freq=-400000 bandwidth=0 datarate=0 sync_wc
2021-07-08 08:29:31.831 [RAL:VERB] SX1301 ifchain 1: enable=1 rf_chain=1 freq=-200000 bandwidth=0 datarate=0 sync_wc
2021-07-08 08:29:31.832 [RAL:VERB] SX1301 ifchain 2: enable=1 rf_chain=1 freq=0 bandwidth=0 datarate=0 sync_word=0/6
2021-07-08 08:29:31.832 [RAL:VERB] SX1301 ifchain 3: enable=1 rf_chain=0 freq=-400000 bandwidth=0 datarate=0 sync_wc
2021-07-08 08:29:31.832 [RAL:VERB] SX1301 ifchain 4: enable=1 rf_chain=0 freq=-200000 bandwidth=0 datarate=0 sync_wc
2021-07-08 08:29:31.832 [RAL:VERB] SX1301 ifchain 5: enable=1 rf_chain=0 freq=0 bandwidth=0 datarate=0 sync_word=0/6
2021-07-08 08:29:31.833 [RAL:VERB] SX1301 ifchain 6: enable=1 rf_chain=0 freq=200000 bandwidth=0 datarate=0 sync_wor
2021-07-08 08:29:31.833 [RAL:VERB] SX1301 ifchain 7: enable=1 rf_chain=0 freq=400000 bandwidth=0 datarate=0 sync_wor
2021-07-08 08:29:31.833 [RAL:VERB] SX1301 ifchain 8: enable=1 rf_chain=1 freq=-200000 bandwidth=2 datarate=2 sync_wc
```

REFRESH