



Browan UG Pico Next Indoor Gateway User Guide

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BROWAN

Browan UG Pico Next Indoor Gateway



Revision History

Revision	Date	Description
.001	Aug. 19, 2021	Browan first release
.002	Feb. 15, 2022	Add Regulatory and change LED function

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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 20 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

IC WARNING

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device

Radiation Exposure Statement:

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Product Overview

Product Features

The Pico Next Gateway is a LoRa gateway with GPS, using numerous ways of connection: ethernet, LTE, and Wi-Fi. Depending upon the SKU, some functions might not be available. Pico Next is specifically designed for wide-area IoT applications. Applications include, but are not limited to, home security, automatic meter-reading, monitoring fault-indicators, and monitoring streetlights. This gateway is very suitable for small businesses or private area uses like at parking lots, exhibition centers, and campuses.

LED Functions

LED Functions	Constant	Flashing	Off
Power	Power On	Booting /OTA	OFF
Internet	Internet Available	Checking Internet	RFU
Service	LNS Connected	RFU	LNS Not Connected
LoRa	LoRa Working	Initializing	LoRa Not Working

Reset Button

Reboot:

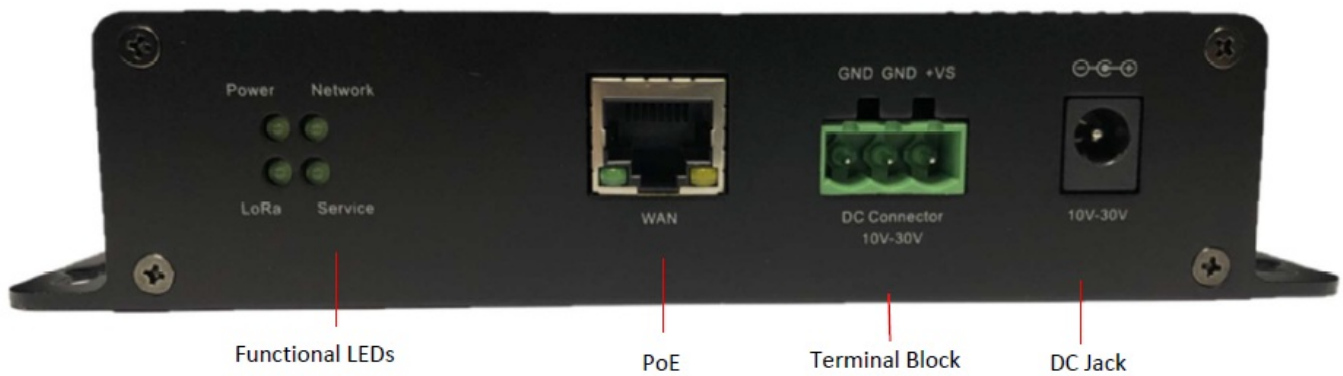
By pressing and holding the RESET Button, the Power LED will start flashing. The “reboot” procedure will be triggered when the RESET Button is released while the Power LED light is flashing.

Restore to Default:

By pressing and holding the RESET Button, the Power LED will start flashing. The “restore to default” procedure will be triggered when the RESET Button released after the Power LED light becomes constant.

I/O Ports

Front Panel



Back Panel -



Accessories

Different SKUs would provide accessories pertaining to that country or SKU, such as the adapter plug model and GPS antenna. LTE and Wireless antennas are interchangeable; they have the same specifications.

Adapter



LoRa Antenna



LTE and Wi-Fi Antenna



GPS Antenna



Installation

Power up

Power up Pico Next through the following ways.

DC Adapter

Connect the power adapter provided to the DC jack In. Pico Next will automatically turn on after powering up.

Terminal Block

Connect a power supply to Pico Next with a 3-pin pluggable male terminal block.

Ethernet

Connect a RJ45 Ethernet cable to Power-over-Ethernet In (WAN port). Connect the other end of the ethernet cable to a passive PoE that ensures a power of 12V / 1.5A DC. Provide power to the passive PoE.

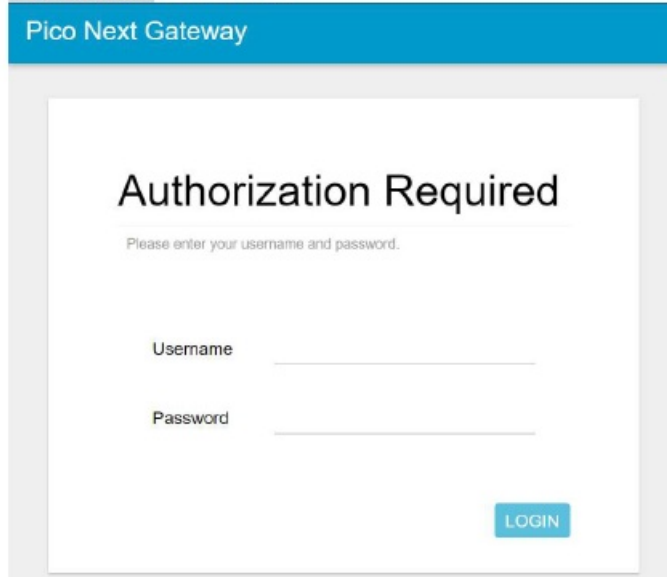
GUI Access

Open Admin GUI

Default mode of Pico Next Gateway is DHCP. Once Pico Next is turned on through plugging in the DC adapter, it will automatically link to available servers. Pico Next's IP address can be found from the DHCP server. Access Pico Next WebUI via the DHCP IP on Chrome. The default username is "admin" and the password can be found on the back label.

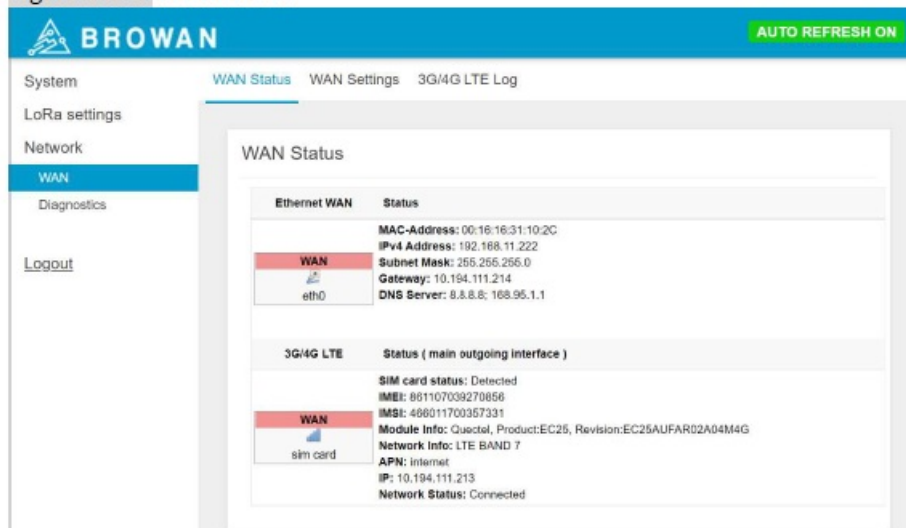
Figure 3.1-A Admin GUI

Figure 3.1-A Admin GUI



The image shows the login page of the Pico Next Gateway Admin GUI. At the top, there is a blue header with the text "Pico Next Gateway". Below the header, the main content area has a white background with the title "Authorization Required" in a large, bold, black font. Underneath the title, a smaller line of text says "Please enter your username and password." There are two input fields: "Username" and "Password", each followed by a horizontal line for text entry. At the bottom right of the form, there is a blue button with the text "LOGIN" in white capital letters.

Figure 3.1-B Admin GUI



The image shows the WAN Status page of the BROWAN Admin GUI. The top header is blue with the "BROWAN" logo on the left and an "AUTO REFRESH ON" button on the right. A navigation menu on the left includes "System", "LoRa settings", "Network", "WAN" (highlighted in blue), "Diagnostics", and "Logout". The main content area is titled "WAN Status" and contains two sections. The first section, "Ethernet WAN", has a "Status" column and lists details for the "eth0" interface: MAC-Address: 00:16:16:31:10:2C, IPv4 Address: 192.168.11.222, Subnet Mask: 255.255.255.0, Gateway: 10.194.111.214, and DNS Server: 8.8.8.8; 168.95.1.1. The second section, "3G/4G LTE", has a "Status (main outgoing interface)" column and lists details for the "sim card" interface: SIM card status: Detected, IMEI: 861107039270856, IMSI: 466011700357331, Module Info: Quectel, Product: EC25, Revision: EC25AUFAR02A04M4G, Network Info: LTE BAND 7, APN: Internet, IP: 10.194.111.213, and Network Status: Connected.

System

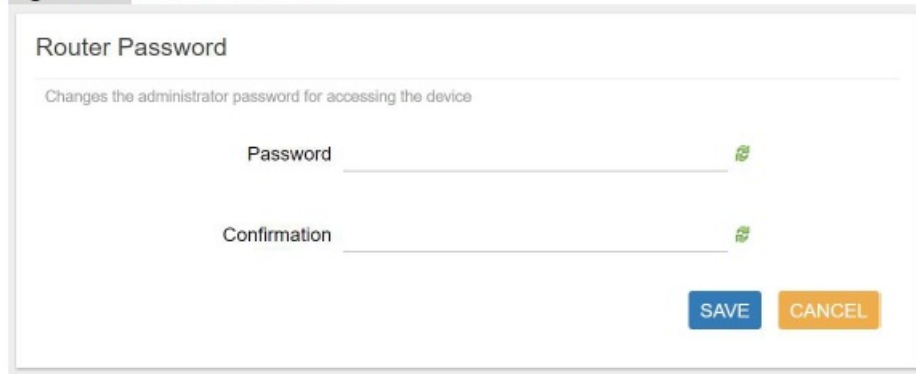
The System menu consists of the following categories: Administration, Restore and System Firmware. An introduction of each category will be distinctly stated in individual paragraphs.

Administration

Pico Next login password can be configured on this page.

Figure 4-A Router Password

Figure 4-A Router Password

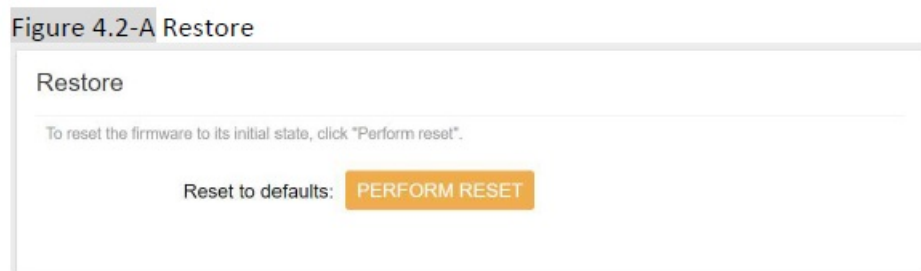


The 'Router Password' form is titled 'Router Password' and includes a subtitle 'Changes the administrator password for accessing the device'. It features two input fields: 'Password' and 'Confirmation', each with a green eye icon to the right for toggling visibility. At the bottom right, there are two buttons: a blue 'SAVE' button and an orange 'CANCEL' button.

Restore

Restore the Password Credential, LoRa Setting and Network Setting to the default configurations.

Figure 4.2-A Restore

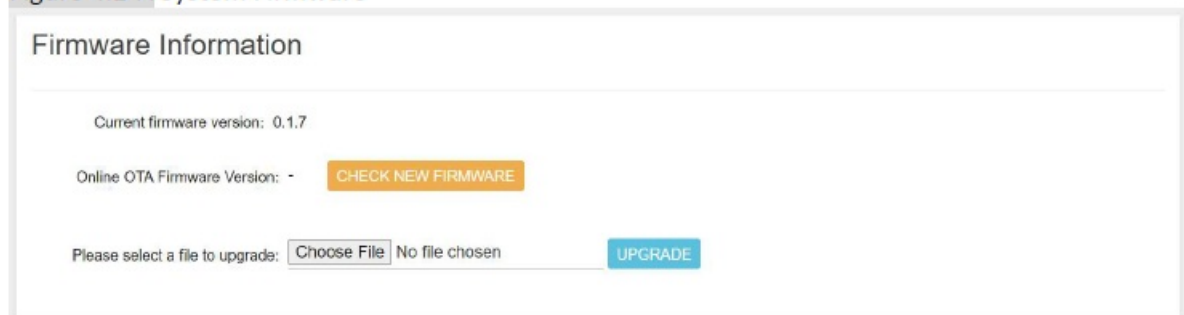


The 'Restore' form is titled 'Restore' and includes a subtitle 'To reset the firmware to its initial state, click "Perform reset"'. It features a single orange button labeled 'PERFORM RESET' next to the text 'Reset to defaults:'.

System Firmware

Here the current firmware version can be found. Click the "Choose File" button to upload the newest system firmware. Click the "UPGRADE" button to upgrade the system firmware.

Figure 4.2-A System Firmware



The 'System Firmware' form is titled 'Firmware Information'. It displays 'Current firmware version: 0.1.7'. Below this, it shows 'Online OTA Firmware Version: -' with an orange 'CHECK NEW FIRMWARE' button to its right. At the bottom, it says 'Please select a file to upgrade:' followed by a 'Choose File' button, the text 'No file chosen', and a blue 'UPGRADE' button.

LoRa Settings

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

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

Figure 5.1-A LoRa Mode Selection

LoRa Mode Selection

Mode: Disable ▾

- Disable
- Packet Forwarder
- Basic Station

APPLY

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-A LoRa Mode Selection - Packet Forwarder

Applying settings...

LoRa Mode Selection

Mode: Packet Forwarder ▾

APPLY

Figure 5.1.1-B LoRa Mode Selection - Packet Forwarder menu

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System Gateway Info Gain Radio and Channel Settings LBT Settings

LoRa settings

- Mode Selection
- Packet Forwarder**
- Channel Scan
- Log
- Network
- Logout

Gateway Info

Gateway ID: 1c497bfff5e56

Server Address: browan.eu1.cloud.thethings

Server Uplink Port: 1700 (1-65535)

Server Downlink Port: 1700 (1-65535)

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

Figure 5.1.1.1-A Gateway Info

Gateway Info

Gateway ID:	1c497bfffefb5e56	
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)

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

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: -200000	(-100000~+100000)
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: 250K

APPLY

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

LBT Settings

LBT Status: Disable

RSSI Target: -80 (dBm)

Channel settings:

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

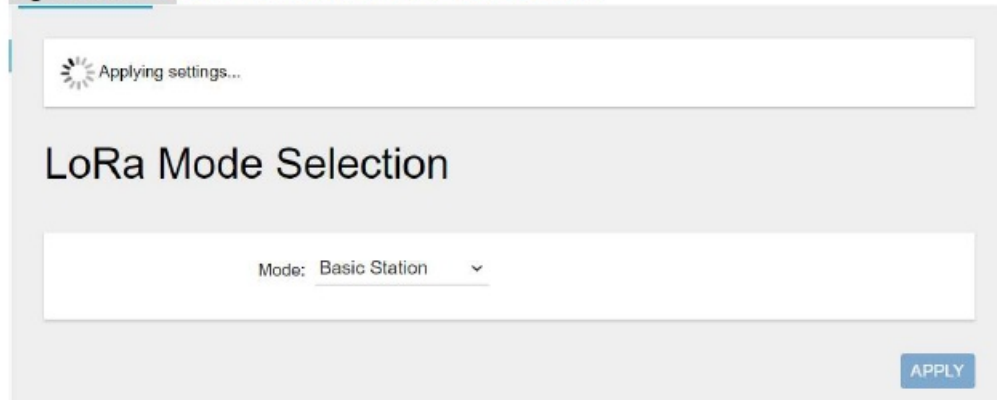
APPLY

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

Figure 5.1.2-A LoRa Mode Selection - Basic Station



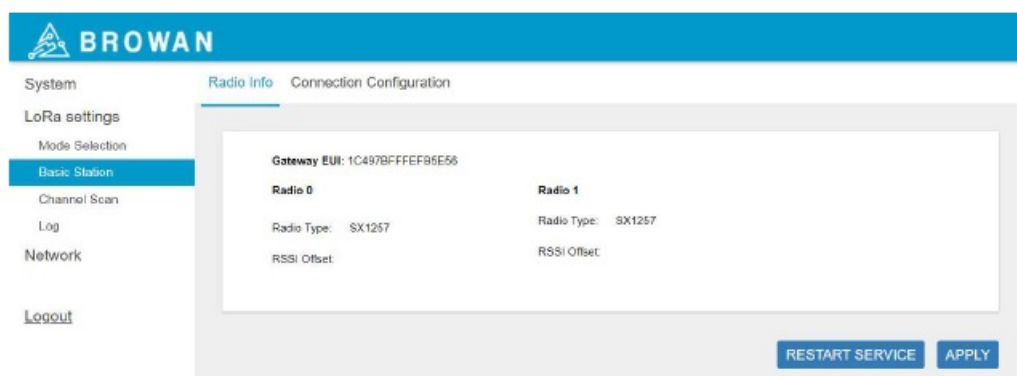
Applying settings...

LoRa Mode Selection

Mode: Basic Station ▼

APPLY

Figure 5.1.2-B LoRa Mode Selection – Basic Station menu



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System Radio Info Connection Configuration

LoRa settings

Mode Selection

Basic Station

Channel Scan

Log

Network

Logout

Gateway EUI: 1C497BFFFEFB5E56

Radio 0

Radio Type: SX1257

RSSI Offset:

Radio 1

Radio Type: SX1257

RSSI Offset:


RESTART SERVICE APPLY

Radio Info

This page is to show the Gateway EUI information.

Figure 5.1.2.1-A Radio Info

Figure 5.1.2.1-A Radio Info



Gateway EUI: 1C497BFFFEFB5E56

Radio 0

Radio Type: SX1257

RSSI Offset:

Radio 1

Radio Type: SX1257

RSSI Offset:

RESTART SERVICE APPLY

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

The screenshot shows the LNS Mode configuration interface. At the top, 'Basic Station Mode' is set to 'LNS Mode'. Below it, 'Protocol' is 'WebSocket Secure'. 'Server Address' is 'browan.eu1.cloud.thethings.' and 'Server Port' is '8887'. There are three sections for certificates: 'Trust' (status: Installed), 'CRT' (status: Not Installed), and 'Key' (status: Installed). Each section has a 'Choose File' button, a 'No file chosen' text, and an 'UPLOAD' button. The 'Trust' and 'Key' sections also have a 'DELETE' button. At the bottom right, there are 'RESTART SERVICE' and 'APPLY' buttons.

- CUPS Mode

Configure the CUPS Mode settings and click the “APPLY” button.

Figure 5.1.2.2-B CUPS Mode

Figure 5.1.2.2-B CUPS Mode

The screenshot shows the CUPS Mode configuration interface. At the top, 'Basic Station Mode' is set to 'CUPS Mode'. Below it, 'Protocol' is 'HTTPS'. 'Type' is 'Boot'. 'Server Address' is 'browan.eu1.cloud.thethings.' and 'Server Port' is '443'. There are three sections for certificates: 'Trust' (status: Installed), 'CRT' (status: Not Installed), and 'Key' (status: Installed). Each section has a 'Choose File' button, a 'No file chosen' text, and an 'UPLOAD' button. The 'Trust' and 'Key' sections also have a 'DELETE' button. At the bottom right, there are 'RESTART SERVICE' and 'APPLY' buttons.

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

Figure 5.2-A Channel RSSI Scan

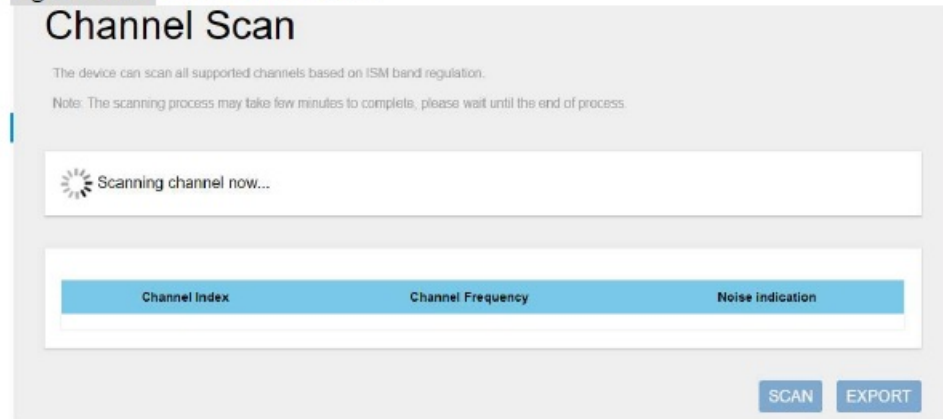


Figure 5.2-B Scan Result

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.

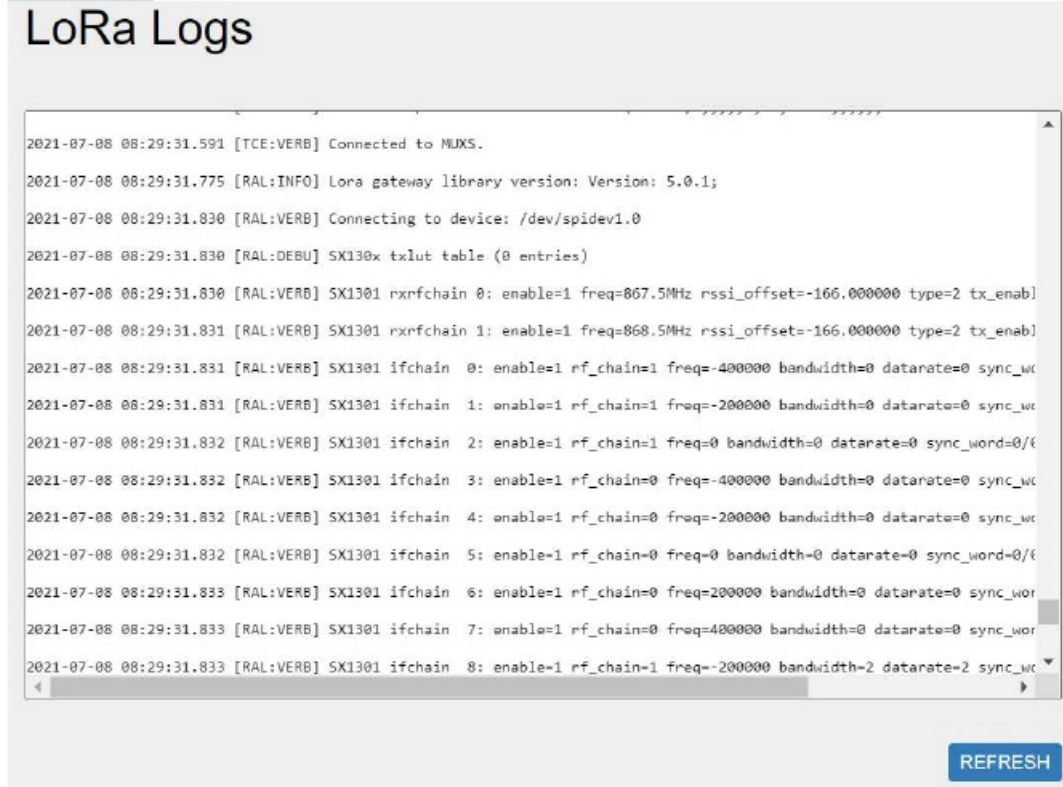
Channel Index	Channel Frequency	Noise Indication
Channel 1	863100000	-88.150
Channel 2	863300000	-90.470
Channel 3	863500000	-86.480
Channel 4	863700000	-84.810
Channel 5	863900000	-87.730
Channel 6	864100000	-86.210
Channel 7	864300000	-85.280
Channel 8	864500000	-87.720
Channel 9	864700000	-89.070
Channel 10	864900000	-86.380
Channel 11	865100000	-86.500
Channel 12	865300000	-86.720
Channel 13	865500000	-87.030
Channel 14	865700000	-88.420
Channel 15	865900000	-86.290
Channel 16	866100000	-90.470

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

Figure 5.3-A Logs



Network

The Network menu consists of the following categories: WAN and Diagnostics. Introduction and input procedures for each category are described in the following paragraphs.

WAN

The purpose of this category is to view current WAN settings. This category is further divided into three sectors: WAN Status, Wan Settings and 3G/4G LTE Log. These individual options are lodged and labeled above the main content.

WAN Status

The current network status will be shown on this page.

Figure 6.1.1 WAN Status

Figure 6.1.1 WAN Status

WAN Status	
Ethernet WAN	Status
	MAC-Address: 00:16:16:31:10:2C
	IPv4 Address: 192.168.11.222
WAN	Subnet Mask: 255.255.255.0
eth0	Gateway: 10.248.18.17
	DNS Server: 8.8.8.8; 168.95.1.1
3G/4G LTE	Status (main outgoing interface)
	SIM card status: Detected
	IMEI: 861107039270856
WAN	IMSI: 468011700357331
sim card	Module Info: Quectel, Product:EC25, Revision:EC25AUFAR02A04M4G
	Network Info: LTE BAND 3
	APN: internet
	IP: 10.248.18.16
	Network Status: Connected

LTE	
General Information	State: Connected Network Operator: Far EasTone Technology: NA Uptime: 0 day 0 hr 57 min 8 sec Signal Strength: 29 (dBm)
LTE Information	Downlink Bandwidth: 20 (MHz) Uplink Bandwidth: 20 (MHz) RSRP: -88 (dBm) RSRQ: -12 (dBm) SINR: 10 (dB) PCI: 503 Cell ID: 36C040C
Uplink Status	Tx Data Rate: 20 (MHz) Tx bytes: 635 (bytes) Tx Packets: 52074
Downlink Status	Rx Data Rate: 20 (MHz) Rx bytes: 630 (bytes) Rx Packets: 35936

WAN Settings

Pico Next supports 3 WAN Modes: Ethernet WAN, 3G/4G LTE and Dual WAN (Ethernet+3G/4G).

Figure 6.1.2-A WAN Mode

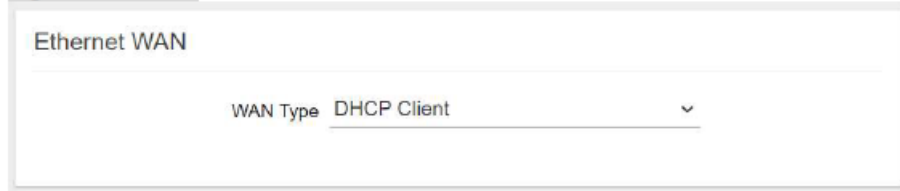
Figure 6.1.2-A WAN Mode

WAN Settings	
System will reboot if settings are applied successfully.	
WAN Mode	Ethernet WAN
	Ethernet WAN
	3G/4G LTE
	Dual WAN (Ethernet + 3G/4G)

Ethernet WAN

- DHCP Client

Figure 6.1.2.1-A DHCP Client



Ethernet WAN

WAN Type DHCP Client ▼

- Static IP

Figure 6.1.2.1-B Static IP



Ethernet WAN

WAN Type Static IP ▼

IP Address 192.168.11.222

Subnet Mask 255.255.255.0

Gateway 192.168.11.1

DNS Server 8.8.8.8
168.95.1.1 (optional)

3G/4G LTE

Configure “APN” information according to mobile service provider requirements.

Figure 6.1.2.2-A LTE Settings

Dual WAN (Ethernet+3G/4G)

Configure the Ethernet Setting and LTE Setting at the same time. If the Dual WAN mode is selected, the primary interface needs to be specified by default. Pico Next Gateway will automatically set the other workable interface to be the backhaul.

Figure 6.1.2.3-A Network Primary

Figure 6.1.2.2-A LTE Settings

3G/4G LTE

APN

Internet

Debug mode

Enable

▼

(After enabling this feature, you can export the debug log in "3G/4G LTE Log" section when you have connection issues)

PIN

(optional)

Dial number

▼

(optional)

Authentication

NONE

▼

(optional)

Username

(optional)

Password

(optional)

3G/4G LTE Log

If LTE Debug Mode is enabled, the LTE connection logs will be shown on this page. Click the “EXPORT” button to export the log.

Figure 6.1.3-A 3G/4G LTE Log

Diagnostics

Input a specific URL in the text field. Click the “PING” button to ping the URL specified

Figure 6.2-A Network Utilities

Figure 6.1.2.3-A Network Primary

WAN Settings

System will reboot if settings are applied successfully

WAN Mode

Dual WAN (Ethernet + 3G/4G)

▼

Network priority

3G/4G LTE

▼

(Specify which WAN is Primary, the other one will be backup)

Figure 6.1.2.3-B Ethernet and LTE Configuration

Figure 6.1.2.3-B Ethernet and LTE Configuration

Ethernet WAN

WAN Type DHCP Client

3G/4G LTE

APN internet

Debug mode Enable

(After enabling this feature, you can export the debug log in "3G/4G LTE Log" section when you have connection issues)

PIN (optional)

Dial number (optional)

Authentication NONE (optional)

Username (optional)

Password (optional)

3G/4G LTE Log

If LTE Debug Mode is enabled, the LTE connection logs will be shown on this page. Click the “EXPORT” button to export the log.

Figure 6.1.3-A 3G/4G LTE Log

Figure 6.1.3-A 3G/4G LTE Log

3G/4G LTE Log

[2021-07-09 17:48:33] 0 day 1 hr 2 min 3 sec

[2021-07-09 17:48:44] 0 day 1 hr 2 min 14 sec

[2021-07-09 17:49:58] ServingCell: +QENG: "servingcell", "NOCNN", "LTE", "FDD", 466, 01, 36C040C, 503, 1550, .

[2021-07-09 17:50:07] LTE AT port no response this moment! Please wait for next retry!

[2021-07-09 17:50:08] LTE continuesly connect for: 0 day 1 hr 3 min 38 sec

[2021-07-09 17:54:50] ServingCell: +QENG: "servingcell", "NOCNN", "LTE", "FDD", 466, 01, 36C040C, 503, 1550, .

[2021-07-09 17:54:57] LTE AT port no response this moment! Please wait for next retry!

[2021-07-09 17:54:58] LTE continuesly connect for: 0 day 1 hr 8 min 28 sec

[2021-07-09 17:58:50] 0 day 1 hr 12 min 20 sec

[2021-07-09 17:59:36] ServingCell: +QENG: "servingcell", "NOCNN", "LTE", "FDD", 466, 01, 36C040C, 503, 1550, .

[2021-07-09 17:59:43] RSSI: 29,99

[2021-07-09 17:59:44] LTE continuesly connect for: 0 day 1 hr 13 min 14 sec

[2021-07-09 18:04:27] ServingCell: +QENG: "servingcell", "NOCNN", "LTE", "FDD", 466, 01, 36C040C, 503, 1550, .

[2021-07-09 18:04:33] LTE AT port no response this moment! Please wait for next retry!

[2021-07-09 18:04:34] LTE continuesly connect for: 0 day 1 hr 18 min 4 sec

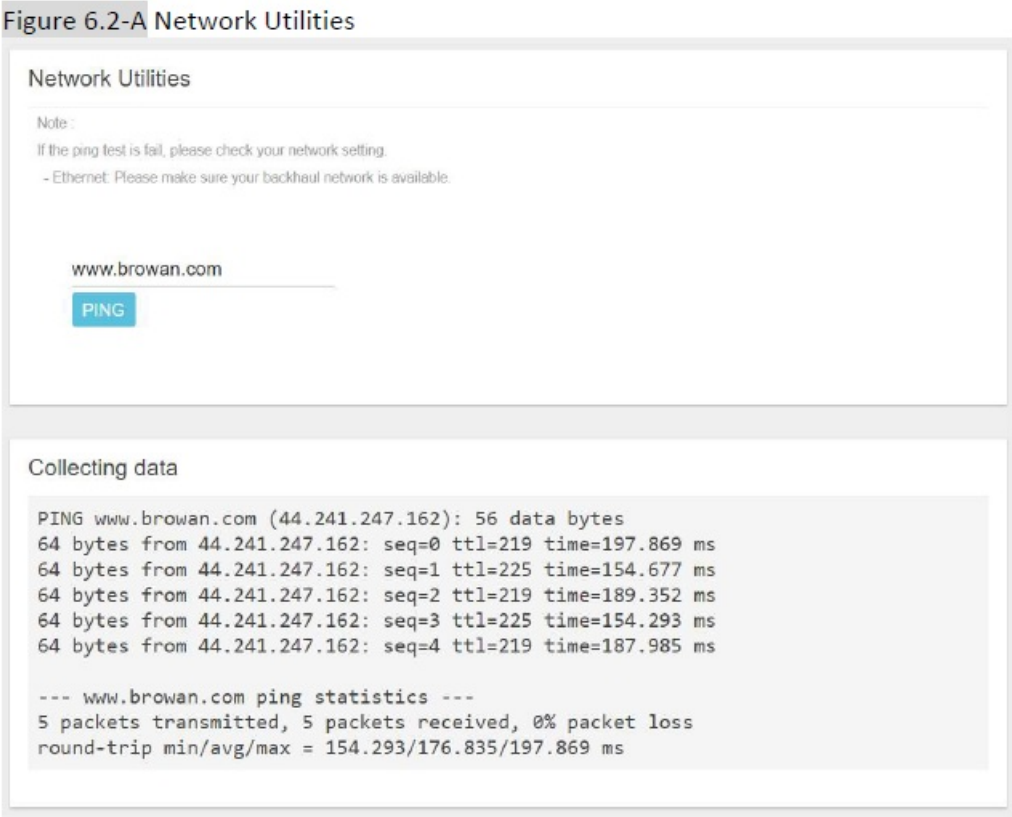
EXPORT

REFRESH



Diagnostics

Input a specific URL in the text field. Click the “PING” button to ping the URL specified

Figure 6.2-A Network Utilities



Documents / Resources

 <small>Browan Communication Inc. 10000 Boul. de l'Industrie B.P. 1000 Laval (Québec) H7V 1B7 Canada Tél: 514 350-0000 Fax: 514 350-0001 E-mail: info@browan.com</small> <small>Document number: 2015-02-001</small> Pico Next Gateway User Guide 	Browan UG Pico Next Indoor Gateway [pdf] User Guide UG Pico Next Indoor Gateway, Pico Next Indoor Gateway, Indoor Gateway
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