MiniHub Pro
GUI Configuration Guide
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## Release History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Author</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020/09/08</td>
<td>1.1</td>
<td>Joey, Jason</td>
<td>● Draft release.</td>
</tr>
</tbody>
</table>
| 2020/12/08 | 1.2     | Joey, Jason, Crux, Demy | ● Update some screenshots.  
● Add chapter "2. Enable Browan's OTA Server Daily Checking".  
● Add the LED behavior table.  
● Browan 1st release, DOC # BQW_02_0026.001 |
About this Document

MiniHub Pro supports either Semtech UDP packet forwarder and LoRa Basics™ Station. This starting guide will show you how to configure the MiniHub Pro.

1. WiFi Connect to MiniHub Pro

1.1  Power on the MiniHub Pro and connect to WiFi SSID. The SSID format should be MiniHubPro-XXXXXX. You can find the WiFi information from the device label.
1.2 When connected to MiniHubPro-XXXXXX AP, it will open the setup page automatically. If the web page doesn't open automatically, please use Firefox or Chrome to open "192.168.4.1" manually.
2. Enable Browan's OTA Server Daily Checking

2.1 Click the "Configure OTA Mode" to open the setting page.

2.2 The default setting is disabled. Please switch to "Enable" and click the "Save" button.

When everything is OK, the web will show the "Success!" message.
3. LoRa Configuration

3.1 Packet Forwarder Mode Configuration

3.1.1 Click the "Configure LoRa Setting" to open the setting page.

3.1.2 On the "Configure LoRa Setting" page, please select "LoRa Packet Forwarder".

3.1.3 LoRa Packet Forwarder Mode

Here you can set up the "Gateway Info" / "Frequency" / "LBT Settings". We use the “The Things Network” public server in this guide.

REF: 
https://www.thethingsnetwork.org/docs/gateways/packet-forwarder/semtech-udp.html#router-configuration
3.1.4 Gateway Info

You could set up the LNS address and the uplink/downlink port here.

![Gateway Info]

Please use the "Gateway ID" info to register the gateway on the TheThingNetwork server.

REF: https://www.thethingsnetwork.org/docs/gateways/registration.html
3.1.5 Frequency

The RX frequency is calculated with the radio central frequency and the offset value. Each channel could be enabled/disabled individually. And please do not make the offset value to be over the range.

**Radio 0 Settings**

<table>
<thead>
<tr>
<th>Central Frequency (Hz):</th>
</tr>
</thead>
<tbody>
<tr>
<td>9043000000</td>
</tr>
</tbody>
</table>

**Radio 1 Settings**

<table>
<thead>
<tr>
<th>Central Frequency (Hz):</th>
</tr>
</thead>
<tbody>
<tr>
<td>9050000000</td>
</tr>
</tbody>
</table>

**Channel Assignment**

- **Enable Channel 0**
  - Radio Interface: radio 0
  - Center Frequency Offset (Hz): -400000

- **Enable Channel 1**
  - Radio Interface: radio 1
  - Center Frequency Offset (Hz): -200000

- **Enable Channel 2**
  - Radio Interface: radio 1
  - Center Frequency Offset (Hz): 0

- **Enable Channel 3**
  - Radio Interface: radio 0
  - Center Frequency Offset (Hz): 200000
You could find the TTN Frequency Plan here:

REF:
https://www.thethingsnetwork.org/docs/lorawan/frequency-plans.html#us902-928
3.1.6 LBT Setting

For some regions (e.g. JP), the gateway must enable the LBT function. And the LBT channels were calculated from the RX frequency.

☐ Enable LBT
RSSI Target (dBm):
-80
Frequency (Hz): 903900000
Scan Time:  128 us  5000 us
Frequency (Hz): 904100000
Scan Time:  128 us  5000 us
Frequency (Hz): 904300000
Scan Time:  128 us  5000 us
Frequency (Hz): 904500000
Scan Time:  128 us  5000 us
Frequency (Hz): 904700000
Scan Time:  128 us  5000 us
Frequency (Hz): 904900000
Scan Time:  128 us  5000 us
Frequency (Hz): 905100000
Scan Time:  128 us  5000 us
Frequency (Hz): 905300000
Scan Time:  128 us  5000 us

3.1.7 Please click the "Save" button to save these configurations.

When everything is OK, the web will show the "Success!" message.

Click the "OK" button to redirect to the WiFi configuration page.
3.2 LoRa Basics™ Station Mode Configuration

LoRa Basics™ Station supports CUPS mode and LNS mode.

3.2.1 Click the "Configure LoRa Setting" to open the setting page.

![MiniHubPro Setting](image)

3.2.2 On the "Configure LoRa Setting" page, please select "LoRa Basics™ Station".

![MODE](image)
3.2.3 Please use the "Gateway EUI" info to register the gateway on the network server.
3.2.4 CUPS Mode

Under the CUPS mode, you could choose the "Boot" or "Regular" type. Here you can input the CUPS URI and upload the credentials. Gateway uses the uri and credentials(if needed) to communicate with CUPS.

- Enable CUPS

**CUPS**

- Type: • Boot  ○ Regular
- CUPS URI: https://s2.sm.tc:7007
- [ ] Install CUPS Trust [installed]
- [ ] Choose File
- [ ] Install CUPS CRT [installed]
- [ ] Choose File
- [ ] Install CUPS Key [installed]
- [ ] Choose File

3.2.5 LNS Mode

Under the LNS mode, the basic station could communicate with LNS directly. Here you can input the LNS URI and upload the credentials. Gateway uses the uri and credentials(if needed) to communicate with LNS.

Please make sure the CUPS URI field is emptied and all of the CUPS credential checkboxes are unchecked before saving the configurations.

**LNS**

- LNS URI: wss://browan.eu1.cloud.thethings.industries:8887
- [ ] Install LNS Trust [non-install]
- [ ] Choose File
- [ ] Install LNS CRT [non-install]
- [ ] Choose File
- [ ] Install LNS Key [non-install]
- [ ] Choose File
3.2.6 Please click the "Save" button to save these configurations.

When everything is OK, the web will show the "Success!" message.

Click the "OK" button to redirect to the WiFi configuration page.
4. MiniHub Pro WiFi Configuration

4.1 Choose one of the WiFi APs which you prefer to connect to the internet. You also can add SSID manually by yourself on this page.

Choose one of the WiFi APs.

<table>
<thead>
<tr>
<th>CHOOSE A NETWORK:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>crux</td>
<td>WiFi</td>
</tr>
<tr>
<td>AP-F3CE17</td>
<td>WiFi</td>
</tr>
<tr>
<td>AP-F3CE32</td>
<td>WiFi</td>
</tr>
<tr>
<td>BROWAN_MIS_2.4G</td>
<td>WiFi</td>
</tr>
<tr>
<td>Alex-2.4G</td>
<td>WiFi</td>
</tr>
<tr>
<td>BROWAN_MIS</td>
<td>WiFi</td>
</tr>
<tr>
<td>-andrlin</td>
<td>WiFi</td>
</tr>
</tbody>
</table>

Input the SSID password if needed. And click the "Join" button.
AP mode will be disabled after connection successful, so please check the status from LED behavior as below.

<table>
<thead>
<tr>
<th>Colors</th>
<th>Blink Pattern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>Blinking 1 sec</td>
<td>Waiting for configuration.</td>
</tr>
<tr>
<td>Orange</td>
<td>Blinking 1/4 sec</td>
<td>WiFi station is connecting to the root AP.</td>
</tr>
<tr>
<td>Green</td>
<td>Blinking 1/4 sec</td>
<td>WiFi station connected, establishing the connection to CUPS &amp; LNS.</td>
</tr>
<tr>
<td>Green</td>
<td>Solid</td>
<td>WiFi station connected, ready to receive LoRa.</td>
</tr>
</tbody>
</table>
Troubleshooting

1. Data Loss while sending the configuration to the MiniHub Pro.

![Web Service: Connected]

Please wait...

Failed!

Data loss while sending.

Solution:
Please reconfigure again.

2. GUI always shows “Please wait” and the Web Service status is Disconnected.

![Web Service: Disconnected]

Please wait...

Reading configuration from the device...

Solution:
Please check the WiFi connection first.
If the WiFi is connected but still could not get the response, suggest to power off/on and reconfigure the MiniHub Pro again.
3. GUI always shows “Please wait” and the Web Service status is Connected.

Solution:
If the WiFi is connected but still could not get the response, suggest to power off/on and reconfigure the MiniHub Pro again.
4. WiFi connection failed.

Solution:
Please check if the AP Password is correct or not. And reconfigure again.

5. MiniHub Pro is WiFi Station mode and you want to reconfigure it.

Solution:
Hold the "RESET" button for over 5 seconds. MiniHub Pro will restore to default. You could reconfigure it again.
Appendix

A. Register Gateway (**Packet Forwarder**) on TheThingNetwork Public Network.

A-1 Gateway Console

<table>
<thead>
<tr>
<th>Gateway EUI</th>
<th>Packet Forwarder Gateway ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 00 80 02 9C 59 CA 58</td>
<td>![Gateway Console Image]</td>
</tr>
</tbody>
</table>

- **I'm using the legacy packet forwarder**
  - Select this if you are using the legacy Semtech packet forwarder.

- **Description**
  - A human-readable description of the gateway
  - `000080029c59ca58`  

- **Frequency Plan**
  - The frequency this gateway will use
  - **United States 915 MHz**

- **Router**
  - The router this gateway will connect to. To reduce latency, pick a router that is in a region which is close to the location of the gateway.
  - `Taipei-315.900`  

- **Location**
  - The exact location of your gateway. This will be used if your gateway cannot determine its location by itself. Set a location by clicking on the map.

- **Antenna Placement**
  - The placement of the gateway antenna
  - `indoor`  

![Map Image]
MiniHub Pro connected to the TTN server.
B. Register Gateway (Basic Station) on The Things Industries Network.

B-1 Gateway Console

Add gateway

General settings

Owner •

Gateway ID •

80029c59ca5b

Gateway EUI

80 62 9C FF FE 59 CA 58

Gateway Name

80029c59CA5b

Gateway description

80029c59CA5b

Optional gateway description; can also be used to save notes about the gateway

Gateway Server address

browan.eu1.cloud.thethings.industries

The address of the Gateway Server to connect to

Gateway status

Public

The status of this gateway may be publicly displayed

Attributes

Add attributes

Attributes can be used to set arbitrary information about the entity, to be used by scripts, or simply for your own organization

LoRaWAN options

Frequency plan

United States 902-928 MHz, FSB 1

The frequency plan used by the end device
B-2  MiniHub Pro connected to the TTI server.