

User Manual



Enterprise Gateway

GEE810U-915U

1. Introduction

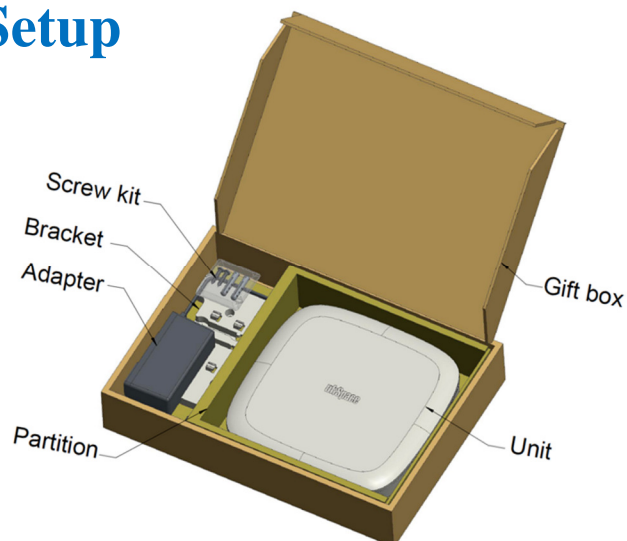
Enterprise LoRa indoor gateway is designed to meet the needs of IoT services. This Enterprise indoor gateway allow the users to setup this in indoor environment as an aggregator of LoRa sensors to the internet for the related services.

2. Hardware Specifications

Item	Technical Information
Processor	Cortex A8
Storage/Memory	8GB eMMC/ 4Gb DDR3
LoRa	863-869.65 MHz
WiFi	IEEE 802.11 b/g/n 2.4 GHz
Ethernet	10/100/1000 Mbps/ RJ45
Interface	USB 2.0 for 2G/3G/4G
DC PWR	DC 12V / 2.065A & PoE 48V/0.5208A (802.3 AT compliant)
Power Consumption	25W
Antenna (Internal)	WiFi: 3.51 dBi Peak Gain LoRa: 1.4 dBi Peak Gain.
Operation Temperature & Humidity	-10~50 °C , 10%~90%
Storage Temperature & Humidity	-40~70°C , 5%~90%
Dimension	200 x 200 x 49.5 mm
Weight	280g
Regulatory	CE/TELEC/JATE

3. Accessory and Setup

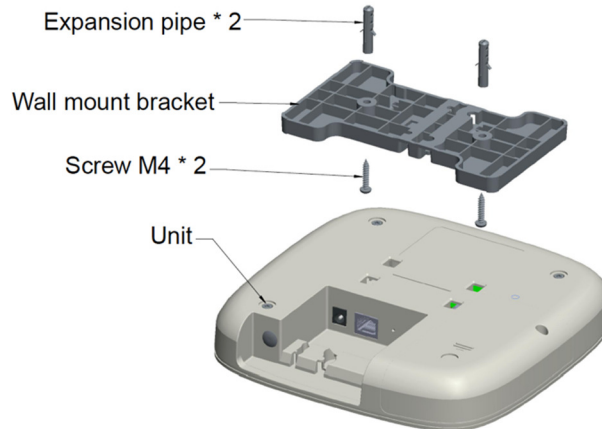
3.1 Accessory



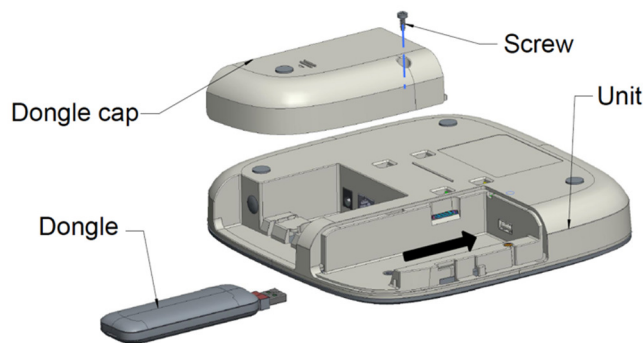
3.2 Setup Quick Guide

3.2.1 Wall Mount & Ceiling Mount Installation Support

This product provides the wall mounting support. For this function, 2 sets of tapping screws & expansion pipes in accessories should be used. I/O Port cables can be at upward or downward direction.



3.2.2 USB Dongle (not included)



3.3 LEDs Specification

Type	Status	Comment
WAN	Constant Off	All WAN interfaces do not enable.
WAN	Constant Light Red	The connection relationship with Lrr server by Actility is not available.
WAN	Constant Light Blue	The connection relationship with Lrr server by Actility is available.
LAN	Constant Off	Ethernet link down. (connect to eth phy, SW can NOT control)
LAN	Constant Light Blue	Ethernet link up. (connect to eth phy, SW can NOT control)
LAN	Blinking Blue	There is the traffic in the ethernet connection relationship. (connect to eth phy, SW can NOT control)
WLAN	Constant Off	Wifi AP does not enable.

WLAN	Constant Light Blue	Wifi AP is enabled.
LPWAN	Constant off	LoRa radio is off. (ret= -1 in the radioparams.txt)
LPWAN	Constant Light Blue	LoRa radio is on. (ret= 0 in the radioparams.txt)

4. Software Setup

4.1 Use web interface to setup LoRa Indoor GW under Ethernet DHCP client mode (Defult Primary WAN type)

- 4.1.1 Plug in Ethernet cable in GW and the other end of cable should plug into where is DHCP server existing.
- 4.1.2 Power up Indoor GW.
- 4.1.3 Make sure Indoor GW gets a valid IP Address from DHCP server.
- 4.1.4 Based on iptables rules, please use PC/NB/smart-phone to connect to the same network (91.134.250.x/32), and assign PC ip as 91.134.250.101 to access GW with ssh connection. For GW BS ID, username and password information, please ask Foxconn contact window directly.

Web UI is not allowed to access by default. If user tries to acces Web UI, please enetr the command as below.

```
am335x-evm:~# /usr/bin/firewall-reset.sh
```

After applying the command as above, then user can access to Web UI by the following steps. Open a browser with the assigned GW IP address to access its web interface. For example, GW gets 91.134.250.102 from DHCP server, then access web page by “http://91.134.250.102/”

The login information is like:

Username: bsconfig

Password: aup6g/t;3

- 4.1.5 Required a web browser
Chrome version “55.0.2883.87 m” web browser to access Indoor LoRa GW web page.
- 4.1.6 MP FW version:
am335x-evm:~# cat /etc/mlb-version
PCG020C-20200131-FULLSDK1003-GenericFW

- 4.1.7 Connection to Indoor LoRa GW web UI

STATUS	STATUS
WAN	Firmware Version: PCG020C-20171226-FULLSDK1003
WiFi AP	HW Revision: PCG020C-V5
NTP	Wan Status: ETH, 91.134.250.104
Management	Forwarding: Disable
LRR Log	- Ping GW: PASS
Logout	- Check DNS Server: PASS (DNS#1)
	Gateway ID: 46584258C00010B9

- FW Version – Display current FW version
- HW Revision – Display current HW reversion (should not change)
- Wan Status – Display current backhaul connection state in the following format:
 <WAN Type>,<Current IP address> or NO (if WAN connection is not ready)
- Forwarding – “bs_pkt_fwd” process is running.
 “bs_pkt_fwd” forwards RF packets receive by the concentrator to a server through a IP/UDP link, and emits RF packets that are sent by the server.

The default value: pkt_fwd_start=false (Disable).

This Status is used for “U-Thing” server .

- Ping GW – Display the ping test result to default gateway
 PASS (default GW is okay)
 FAIL (default GW is unreachable or ICMP-blocked)
- Ping DNS Server – Display the result to ping “8.8.8.8” or “168.95.1.1”
 PASS (ping test to ping “8.8.8.8” or “168.95.1.1” is okay)
 FAIL (ping test to ping “8.8.8.8” or “168.95.1.1” is failed)

4.2 Set WAN Interface

Select [WAN] page for setting WAN configuration

The LoRa service on Indoor GW will start automatically when backhaul connection is ready. Hence, user needs to take the backhaul (WAN) connection per network environment that Indoor GW is installed.

STATUS	WAN Settings
WAN	Ethernet Settings
WiFi AP	Ethernet IP Type ☐ Static ☒ DHCP
NTP	Apply
Management	
LRR Log	
Logout	

4.2.1 Select “Ethernet” as WAN

4.2.1.1 Use DHCP Mode to get IP address automatically

- Set Primary WAN type as “Ethernet”
- Set Ethernet IP Type under Ethernet Settings as “DHCP”
- Press Apply button

4.2.1.2 Use static IP Mode

- Set Primary WAN type as “Ethernet”
- Set Ethernet IP Type under Ethernet Settings as “Static”
- Configure proper settings in IP address / Netmask / Gateway / Primary DNS / Secondary DNS under Static IP Settings
- Press Apply button

STATUS	WAN Settings
WAN	Ethernet Settings Ethernet IP Type ☒ Static ☐ DHCP IP Address 192.168.128.250 Netmask 255.255.255.0 Gateway IP address 192.168.128.1 Primary DNS IP address 168.95.1.1 Secondary DNS IP address 8.8.8.8 Apply
WiFi AP	
NTP	
Management	
LRR Log	
Logout	

4.3 Set Time Server

Select [NTP] page for setting NTP configuration. You will need to change this setting if LoRa Indoor GW will be used in a private network with its own time server and Internet is not available. GW will query NTP server from the first one until GW get the response from NTP server.

STATUS	NTP Settings
WAN	NTP Server 1 IP/Domain lrc1-poc.thingpark.com NTP Server 2 IP/Domain pool.ntp.org NTP Server 3 IP/Domain 0.de.pool.ntp.org NTP Server 4 IP/Domain 1.de.pool.ntp.org NTP Server 5 IP/Domain 2.pool.ntp.org Apply
WiFi AP	
NTP	
Management	
LRR Log	

4.4 Management Page



The screenshot shows a web interface with a sidebar on the left containing links: STATUS, WAN, WiFi AP, NTP, Management (highlighted), LRR Log, and Logout. The main content area is divided into two sections. The top section, titled 'Firmware Upgrade', contains a 'Choose File' button followed by the text 'No file chosen', and an 'Upgrade' button below it. The bottom section, titled 'Factory Reset', contains a 'Reset' button.

Firmware Upgrade

Before performing FW upgrade, please check the Status page for current firmware version. You need to be aware that only firmware for the same production could be used. Using invalid firmware or firmware from other products will get a “FW Upgrade Fail” message.

The firmware file usually has a name in following format:

PCG020C_[Date Code]_TI1003TP

Where [Date Code] is the release date of this firmware. You may refer the release note for version information.

For firmware upgrade, first use [Choose File] button to select firmware file, then press [Upgrade] to start the upgrade process. After a success upgrade, the device will reboot automatically.

Factory Reset

If the device is not function as expected, or the release note of new firmware request to do factory reset due to configuration adjustment, you may use [Reset] to reset all configurations to default value of firmware. After completion of reset operation, a message “Factory reset is done!! Waiting for rebooting..” will be shown and the device reboots automatically.

4.5 LRR Log Page

With integrated ThingPark Wireless client application - LRR, both LoRa traffic and control can be observed via the application log. This page provides an easy way to do filtering, selection and saving on the log. On page loading, the current date information of device is shown before the radio selection, and week day of today is selected as default. Since LRR log on device is preserved as the last 7 week days, please do selection before further operation if you want to view log of the other past day.

STATUS WAN WiFi AP NTP Management LRR Log	LRR Trace Log	
	UTC 2017/05/19 10:45:59 ● Mon ● Tue ● Wed ● Thu ● Fri ● Sat ● Sun	
	Filter command	PKT RECV
	Apply	
	Download	
	<pre> 06:35:08.498 (4072) [./lgw_xl.c:1067] PKT RECV tms=000105780 tus=104937747 if=4 status=CRCErr sz=201 freq=867900000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/7 rssi=-129.000000 snr=-11.000000 channel=8 nam='LC8' G0 txstatus=2 06:37:20.630 (4072) [./lgw_xl.c:1067] PKT RECV tms=000237912 tus=237067099 if=1 status=CRCErr sz=17 freq=867300000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/7 rssi=-129.000000 snr=-11.500000 channel=5 nam='LC5' G0 txstatus=2 06:41:20.544 (4072) [./lgw_xl.c:1067] PKT RECV tms=000477792 tus=476958812 if=5 status=CRCErr sz=101 freq=868100000 mod=0x10 bdw=BW125 spf=SF8 ecc=CC4/6 rssi=-129.000000 snr=-13.750000 channel=1 nam='LC1' G0 txstatus=2 06:43:11.360 (4072) [./lgw_xl.c:1067] PKT RECV tms=000588617 tus=587784963 if=2 status=CRCErr sz=21 freq=867500000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/5 rssi=-127.000000 snr=-11.000000 channel=6 nam='LC6' G0 txstatus=2 06:44:55.908 (4072) [./lgw_xl.c:1067] PKT RECV tms=000693156 tus=692328755 if=1 status=CRCErr sz=255 freq=867300000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/7 rssi=-127.000000 snr=-10.250000 channel=5 nam='LC5' G0 txstatus=2 06:48:53.770 (4072) [./lgw_xl.c:1067] PKT RECV tms=000930998 tus=930172091 if=1 status=CRCErr sz=193 freq=867300000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/7 rssi=-129.000000 snr=-11.500000 channel=5 nam='LC5' G0 txstatus=2 06:54:54.849 (4072) [./lgw_xl.c:1067] PKT RECV tms=001292057 tus=1291242523 if=3 status=CRCErr sz=53 freq=867700000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC? (0x0) rssi=-127.000000 snr=-11.500000 channel=7 nam='LC7' G0 txstatus=2 06:59:18.492 (4072) [./lgw_xl.c:1067] PKT RECV tms=001555693 tus=1554882835 if=1 status=CRCErr sz=128 freq=867300000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC? (0x0) rssi=-129.000000 snr=-11.500000 channel=5 nam='LC5' G0 txstatus=2 07:00:34.261 (4072) [./lgw_xl.c:1067] PKT RECV tms=001631465 tus=1630651419 if=4 status=CRCErr sz=5 freq=867900000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/8 rssi=-129.000000 snr=-9.750000 channel=8 nam='LC8' G0 txstatus=2 07:01:11.778 (4072) [./lgw_xl.c:1067] PKT RECV tms=001668983 tus=1668173443 if=4 status=CRCErr sz=149 freq=867900000 mod=0x10 bdw=BW125 spf=SF7 ecc=CC4/5 rssi=-129.000000 snr=-12.000000 channel=8 nam='LC8' G0 txstatus=2 07:03:01.011 (4072) [./lgw_xl.c:1067] PKT RECV tms=001778219 tus=1777414819 if=0 status=CRCErr sz=203 freq=867100000 mod=0x10 bdw=BW125 spf=SF7 </pre>	

View log in web browser

The Filter command controls a simple content filter in log, you may enter keyword (case sensitive) to it, and only a line contained such keyword will be displayed. If keyword contained white space, double quota (") must be used around the whole keyword. You will still need to enter (") in Filter command to display full log without filtering. Then, press [Apply] button and the log content will be displayed below. Log output maybe truncated if it is too big for browser to show.

Download log as a file

After selecting week day, you can use [Download] button to download log of selected day as a file in your local space. The Filter command is not used because full log is retrieved.

Warning:

- 1) This product is only to be connected to PoE networks without routing to outside plants.
- 2) To reduce potential safety issues, only the AC adapter provided with the product, a replacement AC adapter provided by Hon Lin Technology Co Ltd., or an AC adapter purchased as an accessory from Hon Lin Technology Co Ltd. should be used with the product.

Federal Communication Commission Interference Statement

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 a particular 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.

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.

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.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with FCC 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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/CANADA