

User Manual

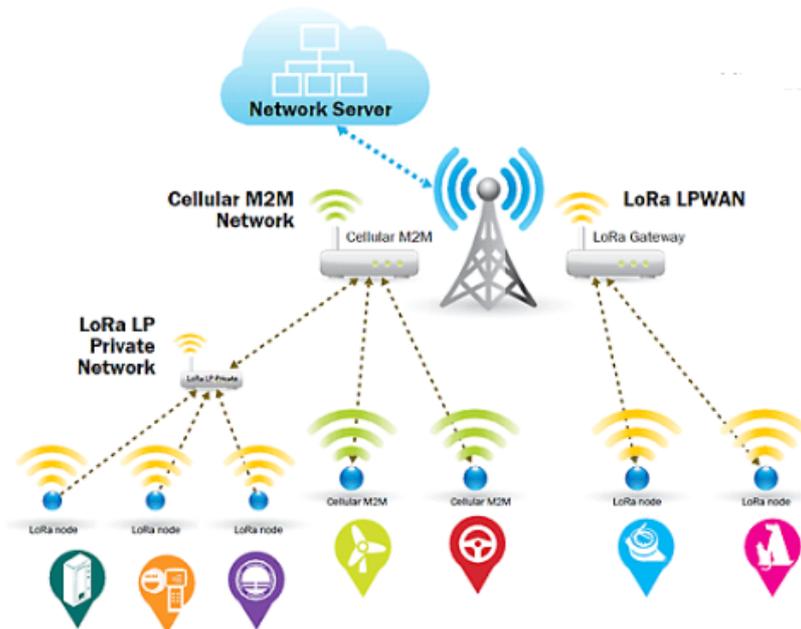


Enterprise Gateway

GEE810E-868U

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. Tomorrow's connected devices will control everything from indoor temperatures to air conditioner, from the flow of energy through our cities to the flow of critical healthcare data, unlocking hidden value in unconnected machines. So the connectivity is critical to generate intelligence, except the WiFi, LoRa is also an alternatively solution for indoor applications.



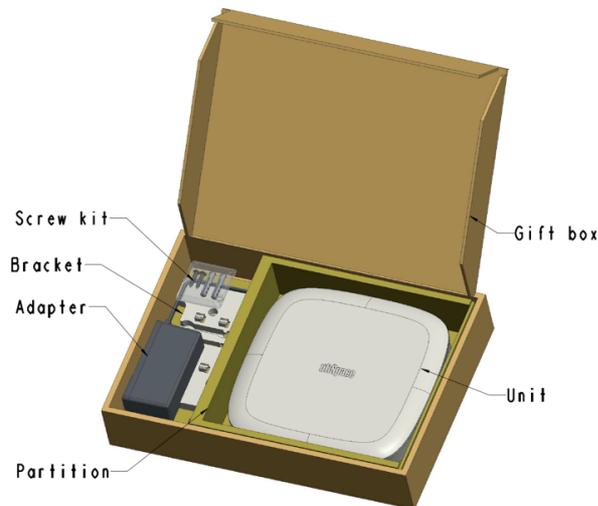
2. Hardware Specifications

Item	Technical Information
Processor	Cortex A8
Storage/Memory	8GB eMMC/ 4Gb DDR3
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

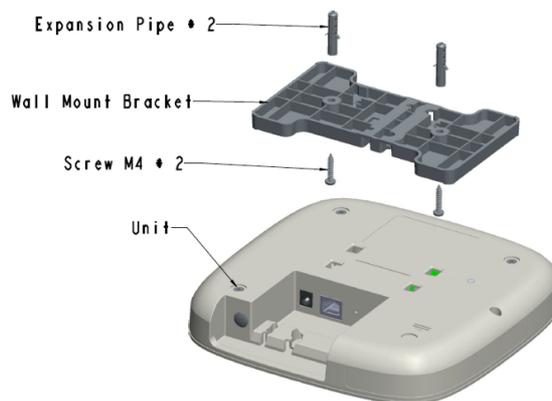
3.1 Accessory



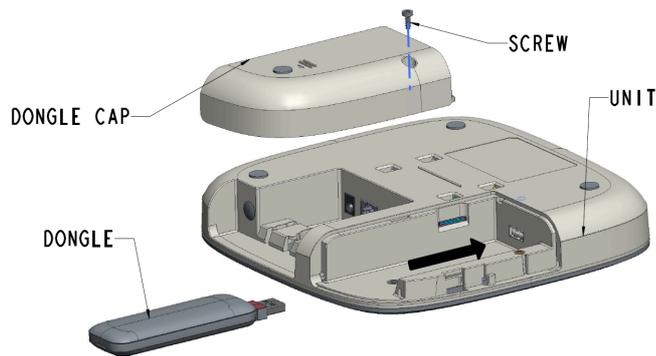
3.2 Setup Quick Guide

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 Activity is not available.
WAN	Constant Light Blue	The connection relationship with Lrr server by Activity 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 (Default 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 access Web UI, please enter 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:

LoRa module: HAL 5.0.1

LRR version: fcpico_2.4.20

T77I914.02: UBoot (Oct 18 2018 - 17:14:32), Linux (#5 Sat Jun 3 17:17:29 CST 2017),

PCG020C_20181009_TI1003TP

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).

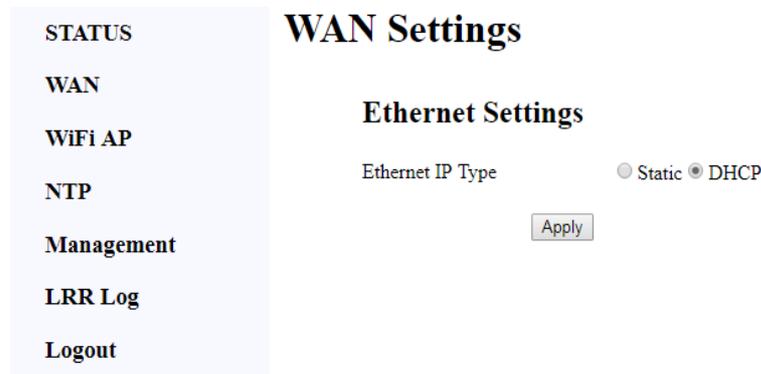
This Status is used for “U-Thing” server .

- 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.



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	
WiFi AP	
NTP	
Management	
LRR Log	
Logout	

Ethernet Settings	
Ethernet IP Type	<input checked="" type="radio"/> Static <input type="radio"/> DHCP
IP Address	<input type="text" value="192.168.128.250"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway IP address	<input type="text" value="192.168.128.1"/>
Primary DNS IP address	<input type="text" value="168.95.1.1"/>
Secondary DNS IP address	<input type="text" value="8.8.8.8"/>
<input type="button" value="Apply"/>	

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	
WiFi AP	
NTP	
Management	
LRR Log	

NTP Server 1 IP/Domain	<input type="text" value="lrc1-poc.thingpark.com"/>
NTP Server 2 IP/Domain	<input type="text" value="pool.ntp.org"/>
NTP Server 3 IP/Domain	<input type="text" value="0.de.pool.ntp.org"/>
NTP Server 4 IP/Domain	<input type="text" value="1.de.pool.ntp.org"/>
NTP Server 5 IP/Domain	<input type="text" value="2.pool.ntp.org"/>
<input type="button" value="Apply"/>	

4.4 Management Page

STATUS	Firmware Upgrade
WAN	
WiFi AP	
NTP	
Management	
LRR Log	
Logout	

<input type="button" value="Choose File"/> No file chosen	
<input type="button" value="Upgrade"/>	

Factory Reset	
<input type="button" value="Reset"/>	

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]_T11003TP

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	LRR Trace Log
WAN	UTC 2017/05/19 10:45:59 <input type="radio"/> Mon <input checked="" type="radio"/> Tue <input type="radio"/> Wed <input type="radio"/> Thu <input type="radio"/> Fri <input type="radio"/> Sat <input type="radio"/> Sun
WiFi AP	Filter command <input type="text" value="PKT RECV"/>
NTP	<input type="button" value="Apply"/>
Management	<input type="button" value="Download"/>
LRR Log	<pre> 06:35:08.498 (4072) [./lgw_x1.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_x1.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_x1.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_x1.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_x1.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_x1.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_x1.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_x1.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_x1.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_x1.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_x1.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.