LGW Gateway Product Specification

Version	Issue date	Changes	Remark
1.0	2022/09/16	Initial Version	

IMPORTANT

This document contains important information and
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1 Introduction

LGW is a gateway integrating Lora, WIFI, 4G/LTE, LAN/WAN interfaces. The WIFI module adopt MT7688AN as module core chipset. The operating system of WIFI module could be ether Linux or OpenWRT. The LoRa module adopt SX1262 as core chipset. There is a mPCIe slot for adopting 4G/LTE mPCIe card. The mPCIe slot connect to the USB port of WIFI module and act as a 4G/LTE network card under associated Linux driver. There are RS485, DI and DO interface connect to WIFI module that could be used to connect peripheral devices.

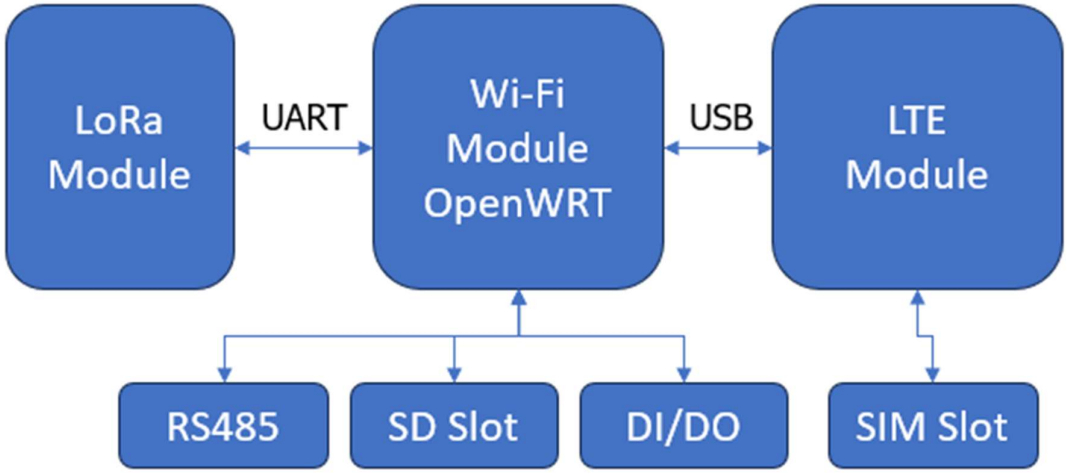
2 Features

- WIFI module core chipset is the major controller
- Operating system : Linux or OpenWRT
- RS485 interface : with isolation and TX/RX auto switch
- DI/DO : with isolation
- DO: could be normal open or normal close output
- LoRa module : receiving sensitivity -140dBm and 4000 communication range typ.
- LoRa maximum output power : 22dBm
- LoRa frequency ： 920~925MHz
- DC Supply voltage : 5~12 Vdc

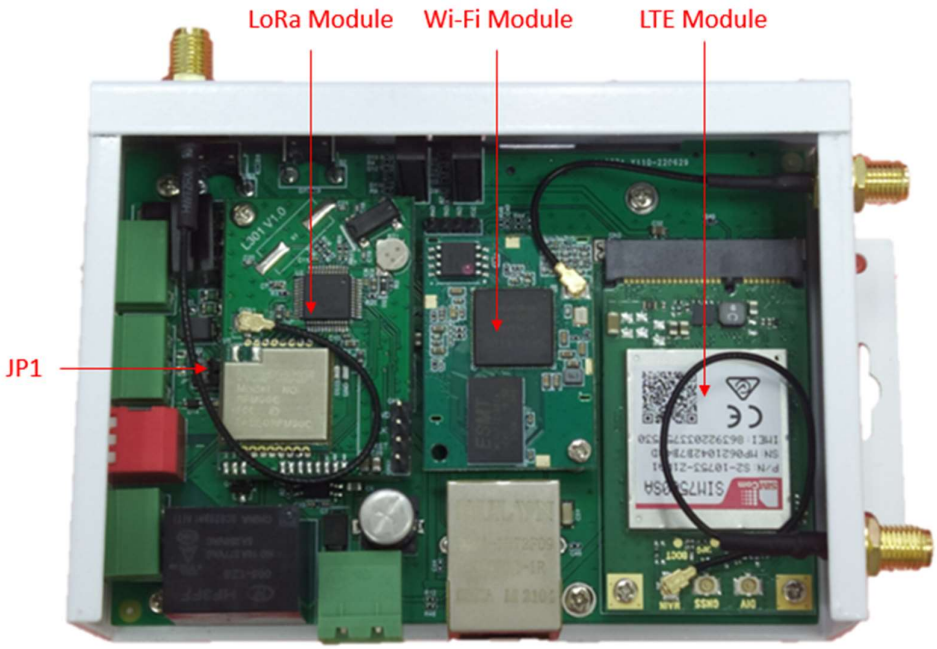
3 Product Outlook

4 Specifications

4.1 Block diagram

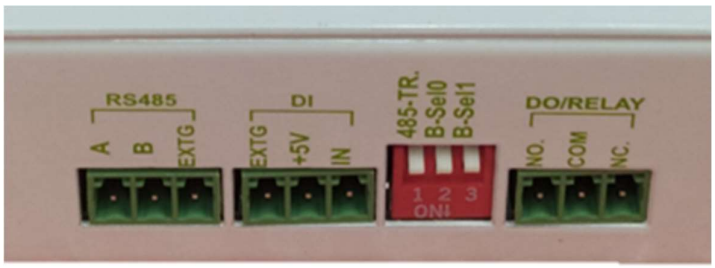


LGW block diagram



LGW internal picture

4.2 IO interfaces



Right side view

Front side View

Back side View

Name	Description	
RS-485 port	A	485 A/+ signal
	B	485 B/- signal
	EXTG	Isolated ground of RS485/DI)
DI port	EXTG	Isolated ground of RS485/DI)
	+5V	Isolated +5V output (100mA)
	IN	DI Input
DIP switch	485.TR	Terminal resister switch for RS-485, ON: effective, OFF : not effective
	B-Sel0	LoRa frequency setting, refer to Table 4
	B-Sel0	
DO/RELAY	Normal On/ NO.	Normal On dry contact output
	COM	Common contact output
	Normal Close/ NC.	Normal Close dry contact output

Table 1 IO interfaces

4.3 Buttons and Slots

Name	Function
RESET Button	Defined by WIFI module firmware, refer to Table 6
WPS Button	Defined by WIFI module firmware, refer to Table 6
Micro SD slot	Micro SD connected to WIFI module
SIM slot	SIM slot connected to 4G/LTE module

Table 2 Buttons and slots

4.4 LED indicators

Name	Function
POWER LED	Power On/Off indication
Cloud LED	Defined by WIFI module firmware, refer to Table 6
System LED	Defined by WIFI module firmware, refer to Table 6
DO LED	DO output status indication
Dev. LED	Defined by WIFI module firmware, refer to Table 6
4G LED	Connected to 4G/LTE module
WIFI LED	Defined by WIFI module firmware, refer to Table 6
LoRa LED	Defined by WIFI module firmware, refer to Table 6

Table 3 Description of LED indicators

4.5 Antennas interface

There are three antenna interface ：

- LoRa：SMA female normal connector
- Wi-Fi：SMA female reverse connector
- LTE：SMA female normal connector

4.6 Jumper Setting

B-Sel0/ B-Sel1	Frequency	Description
OFF/OFF	set by Firmware	920~925 MHz, default = 925 MHz
OFF/ON	920 MHz	
ON/OFF	922 MHz	
ON/ON	924 MHz	

Table 4 LoRa frequency setting

Note: This DIP SW (**B-Sel0/ B-Sel1**) PIN is connected to Wi-Fi module. Please refer to Table 6 Wi-Fi module MT7688AN Pin Definition

JP1	Upper short	RS485 A(+) 470 Ohm pull high to +5V
	Lower short	RS485 B(-) 470 Ohm pull low to GND

Table 5 RS485 pull up/low setting

4.7 Wi-Fi module pin definition

This is a reference for customized firmware development.

Function	Name or Type	Signals	GPIO Mapping	Pins
Console	UART0	TXD0	GPIO#12	30
		RXD0	GPIO#13	31
RS485 (Master)	UART1	TXD1	GPIO#45	147
		RXD1	GPIO#46	148
L301 LoRa module	UART2	TXD2/MDI_TP_P2	GPIO#20	47
		RXD2/MDI_TN_P2	GPIO#21	48
	#RESET L301	I2S_WS	GPIO#2	18
USB/PCI-E	USB_DP	USB Port0 Data+	-	61
	USB_DM	USB Port0 Data-	-	62
	PERST_N	PCIe device reset	GPIO#36	135

RJ45 connector	MDI_RP_P0	RX+	-	33
	MDI_RN_P0	RX-	-	34
	MDI_TP_P0	TX+	-	35
	MDI_TN_P0	TX-	-	36
	DATA LED	LINK0	GPIO#43	143
	I2S_DO	I2S_SDO	GPIO#1	17
LED BAR L TOP		Power	-	
LED BAR L2	RXI1_P	Cloud	GPIO#16	43
LED BAR L 3	RXI1_N	System	GPIO#17	44
LED BAR L BOT	WLAN_LED	DO Status	GPIO#44	144
LED BAR R TOP	LINK4	Device	GPIO#39	139
LED BAR R 2	4G_LED_PWR	4G	-	-
LED BAR R 3	LINK3	WIFI	GPIO#40	140
LED BAR R BOT	I2S_CLK	LoRa	GPIO#3	19
DI	GPIO	TXO1_N	GPIO#15	42
DO	GPIO	WLAN_LED	GPIO#44	144
BTN_WPS	I2S_DI	I2S_SDI	GPO#0	16
BTN_RESET	GPIO0	RESET	GPIO#11	29
LoRa Band Select	SEL0	TXO1_P	GPO#14	40
	SEL1	I2C_SCLK	GPO#4	20
H/W WDT	WPS-RST_PBC	WDT_RST_N	GPIO#38	137
MicroSD				

Table 6 Wi-Fi module MT7688AN Pin Definition