IMG-4312-MN

Industrial IoT LTE LPWAN Gateway with IEEE 802.11 b/g/n and 2x10/100Base-T(X), 1xRS-232/422/485 ports

Features

- Compact size industrial gateway for remote access, data collection and end-devices control applications suitable for multiple IoT Cloud Platform interfaces
- Support **LTE-M (CAT-M1)/NB-IoT (CAT-NB1)** and single mini SIM card slot
- Support 2x 10/100Base-T(x) Ethernet ports
- Support 1x RS-232/422/485 Serial port in DB9 connector
- Support High Speed Wireless Connectivity: 802.11 b/g/n WLAN Wi-Fi interface with up to 150Mbps bandwidth
- Support **ORing Open Gateway** (protocol converter) software feature for user-friendly IIoT deployment
- Support **ORing Cloud Wizard** feature for easy and quick step-by-step device provisioning
- Support **Modbus TCP/RTU** industrial protocols
- Support **MQTT/MQTT Sparkplug B/CoAP/LWM2M** Cloud protocols
- Support **DHCP** server and forwarding through PPTP function
- Support **VPN** for secured network connection (OpenVPN, PPTP, IPSec)
- Support **NAT** (Network Address Translation)
- Support **Firewall** features
- Event warning by System logs, SNMP Trap, E-mail and SMS
- Redundant multiple host devices:
  5 host devices: Virtual COM, TCP Server, TCP Client mode, UDP mode (4 IP Ranges)
- Redundant 12~48VDC power input in terminal block
- Rugged IP-30 casing design and wide operating temperature range for harsh environment operation
- DIN Rail and Wall mounting types
- Support **OpenWRT SDK** for project customization

MQTT
Sparkplug MQTT Topic & Payload Definition
CoAP
Modbus

NB-IoT | Cat.-M1 4G LTE | b/g/n WiFi | RS-232/422/485 | OpenGateway | SSL | -10~60°C Temperature | Redundant PWR

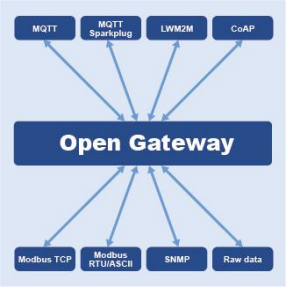
CE FC RoHS Lead Free

Introduction

IMG-4312-MN LPWAN (Low-Power Wide-Area Network) series Gateway is an innovative product for Cloud, Internet of Things and Industry 4.0 applications. It is a perfect choice for remote secured data collection from the factory floor (PLCs, machines, networking devices) and environmental sensors (temperature, humidity, noise, pollution, vibration etc.) as well as for serving control commands coming from Cloud Platforms for changing end-devices status.

Connectivity: IMG-4312-MN Gateway uses dual LPWA module which supports both **NB-IoT (Narrow Band IoT)** and **CAT-M1** technologies. Both of them have been designed to use existing cellular networks licensed spectrum for connecting a big number of IoT devices and provide **low cost, low energy consumption and better signal coverage** for hard to reach places. The device supports all global bands in one model what means it can be used freely not depending on the location. The user has a possibility to choose between three different communication interfaces to connect his end-device: **Fast Ethernet ports, Serial port and Wireless Wi-Fi connectivity**. With **Modbus RTU and TCP** protocols the Gateway can easily communicate with any compatible device to poll and write all kind of data types.

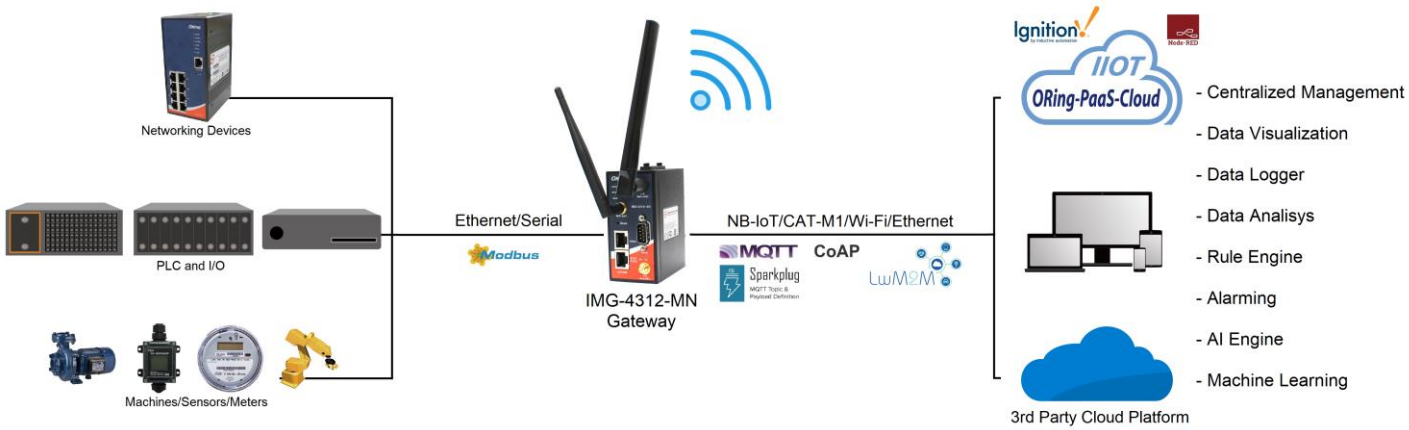
Cloud Platforms connection: IMG-4312-MN supports all common lightweight Cloud communication protocols: **MQTT** (Message Queuing Telemetry Transport) including **Sparkplug B** version for payload and topic definition, **CoAP** (Constrained Application Protocol) and **LWM2M** (Lightweight M2M). It is fully compatible with ORing PaaS Cloud but it also makes the Gateway a universal and flexible solution for any existing Cloud Platform integration.



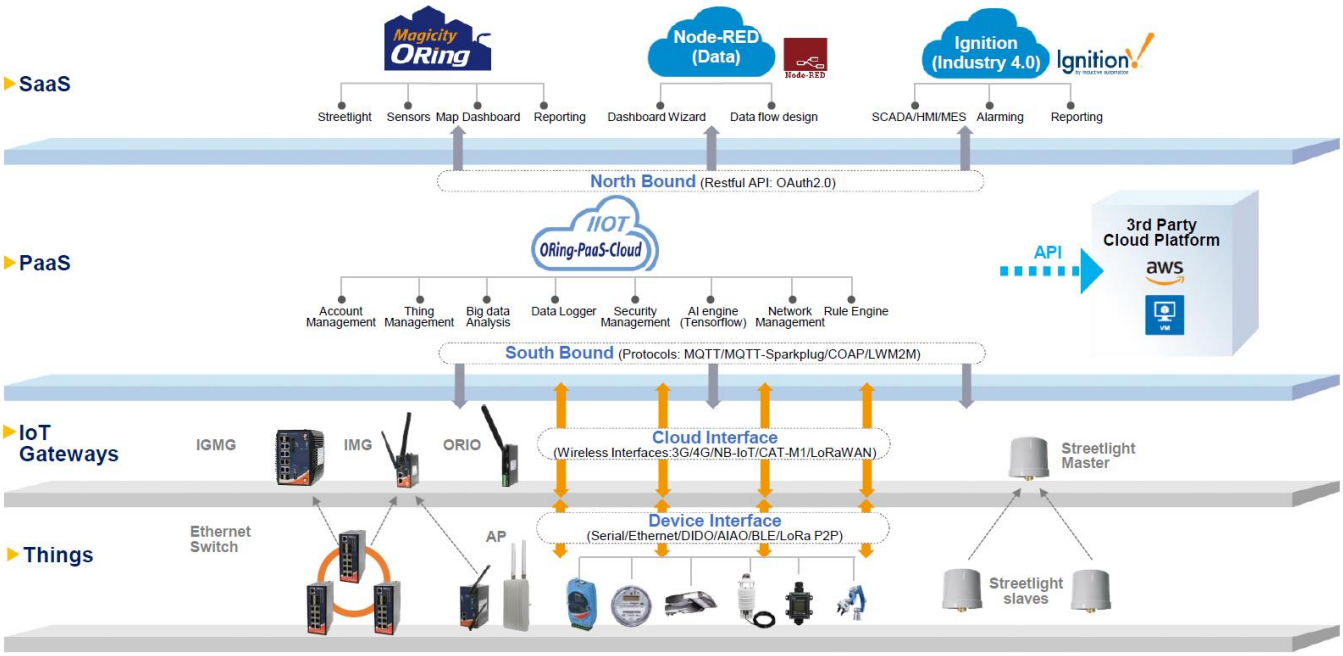
Thanks to ORing branded **Open Gateway** software feature it simplifies to maximum IoT solution deployment. Connecting big variety of end-devices, very often with different communication interfaces, to different Cloud Platforms has never been so easy. Open Gateway protocol converter from a very simple and user-friendly web-based configuration interface turns the gateway into a transparent man in the middle between Modbus field devices and MQTT/CoAP/LWM2M servers. The user has a possibility to define and shape the data format before it is sent to the Cloud for secured storing, analysis and Dashboard or HMI SCADA visualization.

Application

This is an example application of IMG-4312-MN connected with the cloud platform and edge devices.

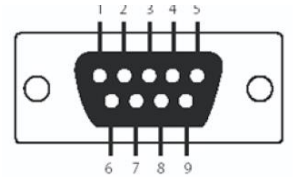


IoT Architecture



Above architecture picture shows typical application and use case scenario for ORing IoT system. IoT Gateways are responsible for providing transparent connectivity between end-devices and South Bound interface of the Cloud platform. Once the data reaches the Platform it can be stored securely and analyzed. Applications on the top of the system provide HMI and Dashboards for data visualization, reporting, alarming, historian and device location.

Pin Definition

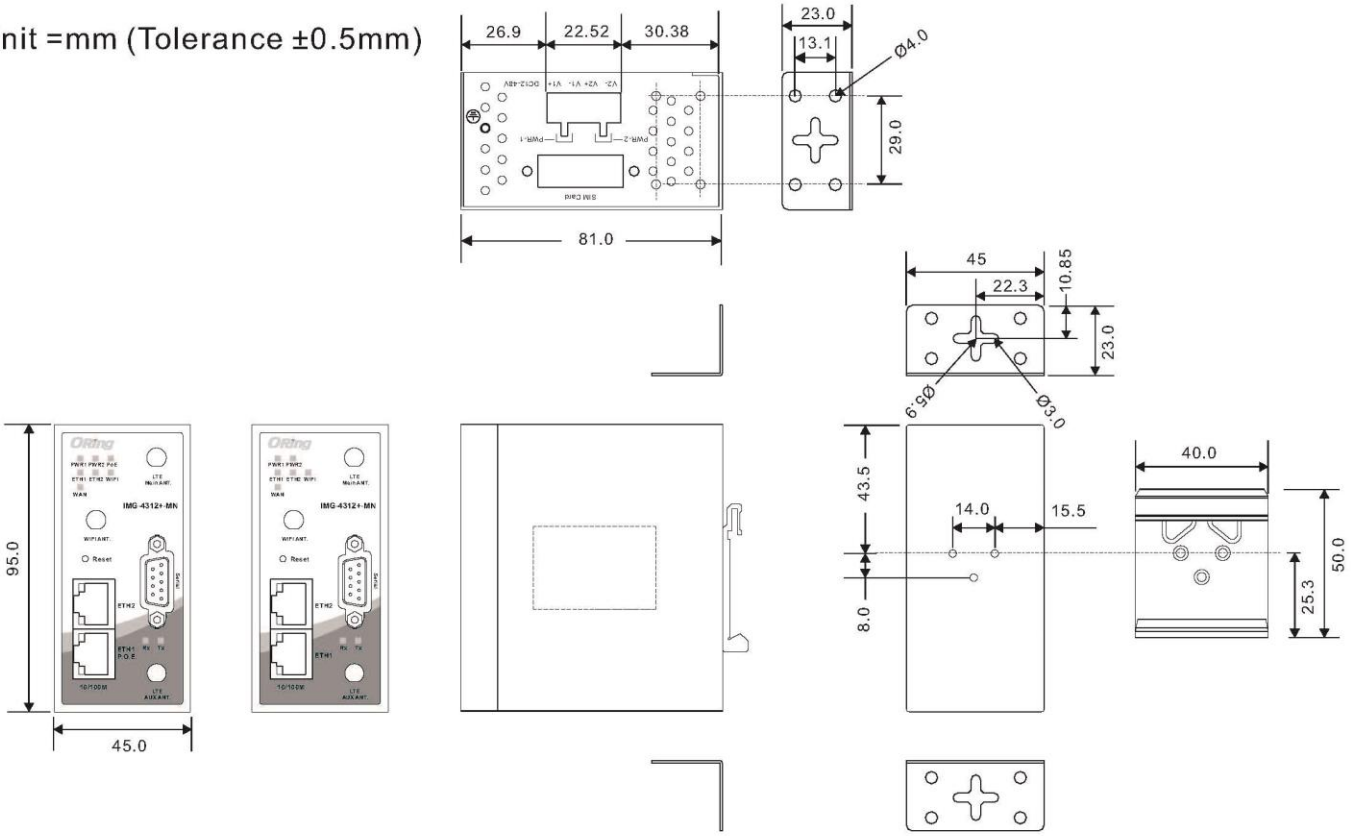


DB9 connector

Pin #	RS-232	RS-422	RS-485 (4 wire)	RS-485 (2 wire)
1	DCD	TX-	TX-	DATA -
2	RXD	TX+	TX+	DATA +
3	TXD	RX+	RX+	
4	DTR	RX-	RX-	
5	GND	GND	GND	
6	DSR			
7	RTS			
8	CTS			
9	RI			

Dimension

Unit =mm (Tolerance ±0.5mm)



Specifications

ORing M2M Gateway	IMG-4312-MN
Physical Ports	
10/100 Base-T(X) Ports in RJ45 Auto MDI/MDIX	**2**
PoE P.D Port (for IMG-4312+-MN model)	P.O.E.Present at ETH1 Power Device (IEEE 802.3af): IEEE 802.3af compliant input interface Over load & short circuit protection Isolation Voltage: 1000 VDC min. Isolation Resistance : 10^8 ohms min
Sim card slot	1
Cellular Interface	
Antenna Connector	2 x SMA Female
Cellular Standard	LTE Cat-M1/Cat-NB1
Download/Upload Rate	LTE Cat-M1:300 / 375 Kbps LTE Cat-NB1: 32 / 70 Kbps

Band options	**LTE Cat-M1/Cat-NB1 :** LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26/B28 **LTE Cat-M1 :** LTE TDD :B39
WiFi Interface	
Antenna Connector	1 x RP-SMA Female
Modulation	IEEE802.11b: CCK/DQPSK/DBPSK IEEE802.11g: OFDM IEEE802.11n: BPSK, QPSK, 16-QAM, 64-QAM
Frequency Band	America / FCC: 2.412~2.462 GHz (11 channels) Europe CE / ETSI: 2.412~2.472 GHz (13 channels)
Transmission Rate	802.11b: 1/2/5.5/11 Mbps 802.11g: 6/9/12/18/24/36/48/54 Mbps 802.11n(40MHz): UP to 150 Mbps
Transmit Power	802.11b: 19dBm ±1.5dBm 802.11g: 17dBm ±1.5dBm 802.11n(2.4G@20MHz): 16dBm ±1.5dBm 802.11n(2.4G@40MHz): 14dBm ±1.5dBm
Receiver Sensitivity	802.11b: -90dBm ±2dBm@1Mbps 802.11g: -72dBm ±2dBm@54Mbps 802.11n(2.4G@40MHz,MCS7): -68dBm ±2dBm
Encryption Security	WEP: (64-bit ,128-bit key supported) WPA/WPA2 :802.11i(WEP and AES encryption) WPA-PSK (256-bit key pre-shared key supported) 802.1X Authentication supported TKIP encryption
Serial Ports	
Connector	DB9 x 1
Operation Mode	RS-232/422/485
Serial Baud Rate	110 bps to 115.2 Kbps
Data Bits	7, 8
Parity	odd, even, none, mark, space
Stop Bits	1, 1.5, 2
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
Flow Control	XON/XOFF, RTS/CTS, DTR/DSR
Network Protocol	
Protocol	ICMP, IP, TCP, UDP, DHCP, BOOTP, SSH, DNS, SNMP V1/V2c, HTTPS, SMTP, DDNS, PPPoE
LED indicators	
Power indicator	3 x LEDs, PWR 1(2)(PoE) / Ready: Green On: Power is on
10/100TX RJ45 port indicator	2 x LEDs, Green for port Link/Act at 100Mbps.
Serial TX / RX LEDs:	Red: Serial port is receiving data Green: Serial port is transmitting data
WIFI LED	1 x LED, Green: WIFI Link /ACT
WAN LED	1 x LED, Green On : Power is on and functioning Normal
Power	
Redundant Input power	Dual DC inputs. 12-48VDC on 4-pin terminal block
Power consumption (Typ.)	3.5W
Overload current protection	Present
Reverse polarity protection	Present on terminal block
Physical Characteristic	
Enclosure	IP-30
Dimension (W x D x H)	45(W)x80.6(D)x95(H) mm
Weight (g)	372

Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-10 to 60°C (14 to 140°F)
Operating Humidity	5% to 95% Non-condensing
Regulatory approvals	
EMC	CE EMC (EN 55024, EN 55032), FCC Part 15B
EMI	EN 55032, CISPR32, EN 61000-3-2, EN 61000-3-3, FCC Part 15 class A
EMS	EN 55024 (IEC/EN61000-4-2 (ESD), IEC/EN 61000-4-3 (RS), IEC/EN 61000-4-4 (EFT), IEC/EN 61000-4-5 (Surge), IEC/EN 61000-4-6 (CS), IEC/EN 61000-4-8(PFMIF) IEC/EN 61000-4-11 (DIP))
Shock	IEC60068-2-27
Free Fall	IEC60068-2-31
Vibration	IEC60068-2-6
Safety	EN60950-1
MTBF	671546.9934 hrs
Warranty	3 years

Packing List

- **IMG-4312-MN x 1**
- **CD x 1**
- **Quick Installation Guide x 1**
- **Wall-Mount Kit x 1**
- **Din-Rail Kit x 1**
- **2.4G WiFi antenna x 1**
- **Cellular antenna x 2**

Optional Accessories

- **DR/SDR/DRP Series DIN-Rail power supply**

Mouser Electronics

Authorized Distributor

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ORing:
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