V1.2 March 2020

IMG-4312D+-D4G

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

Features

- Compact size industrial M2M gateway for remote access, data collection and end-devices control applications suitable for multiple IoT Cloud Platform interfaces
- Support **LTE Cat. 4** with up to 150Mbps downlink and 50Mbps uplink data rates
- Support dual mini SIM card slot
- Support 2x 10/100Base-T(x) Ethernet ports
- Support 1x RS-232/422/485 Serial port in DB9 connector
- Support 1x DI and 1x DO
- 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
- **PoE power input** available with 1kV isolation
- 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



PTCRB

Certified Solutions at&t

CoAP Sparkplug MQTT Topic & Payload Definition RoHS Lead Free MQTT Modbus ATEX

Magi Collect Magi Connect 4G LTE b/g/n WiFi RS-232/422/485 OpenGateway SSL -25~70°C Temperature PoE/PD Redundant PWR CE FC cULus

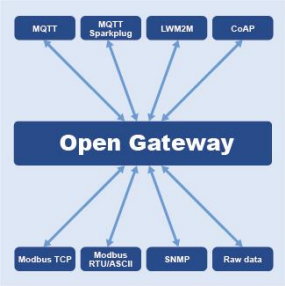
* All specifications are subject to change without notice.

Introduction

IMG-4312D+-D4G LTE cellular M2M 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-4312D+-D4G Gateway uses LTE module which supports **2G/3.5G/4G** technologies. 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 150Mbps link speed. With **Modbus RTU and TCP** protocols the Gateway can easily communicate with any compatible device to poll and write all kind of data types. IMG-4312D-D4Gcan also transfer data to 5 host PCs simultaneously for backup purposes. In addition the gateway supports all common **VPN** protocols (OpenVPN, PPTP, IPSec) and can establish secured tunneling connection between clients and servers.

Cloud Platforms connection: IMG-4312D+-D4Gsupports 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-4312D+-D4Gconnected with the server and edge devices.



M2M Gateway Connection

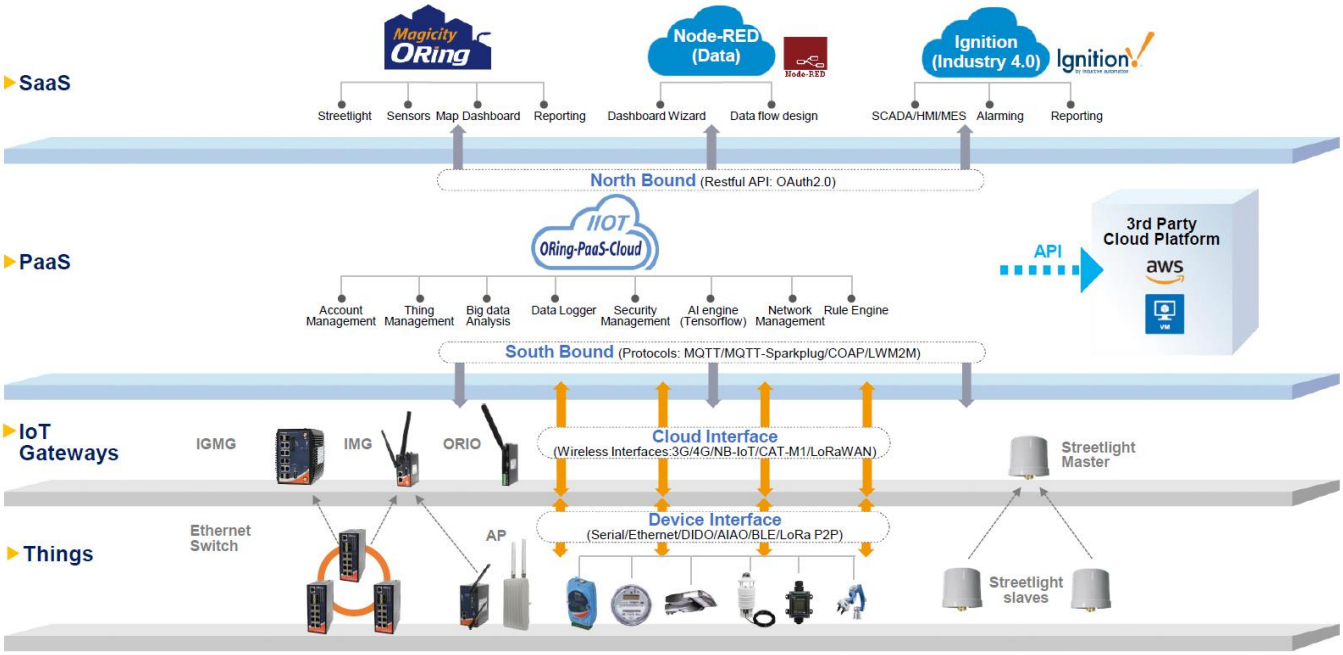
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IMG provide a variety of VPN security connections and supports server and client mode in VPN connection.



VPN Connection

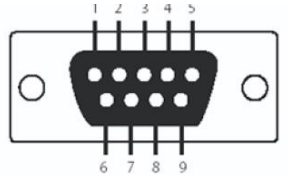
IoT Architecture



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.

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Pin Definition

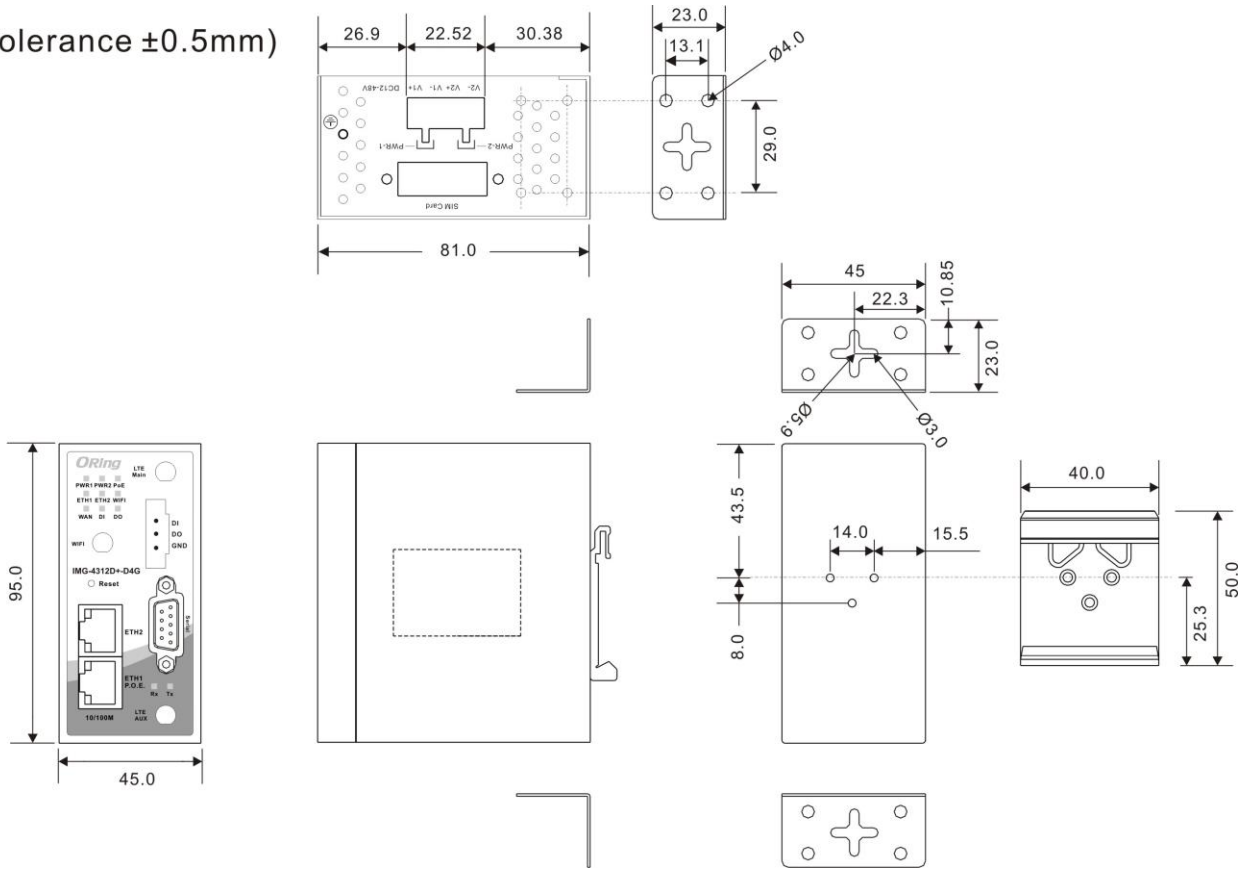


DB9 connector

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)



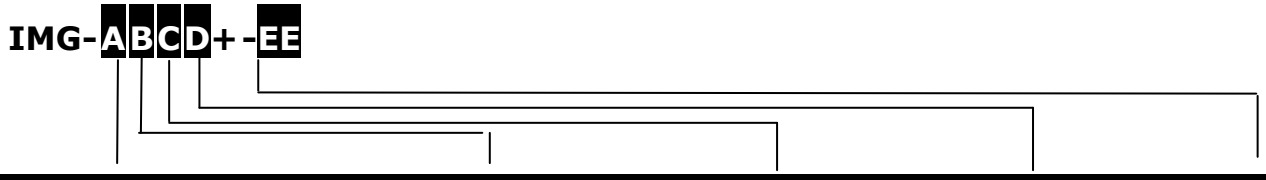
Specifications

ORing Device Server Model	IMG-4312D+-D4G
Physical Ports	
10/100 Base-T(X) Ports in RJ45 Auto MDI/MDIX	**2**
PoE P.D Port	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	2
DI/DO(Dry Contact)	DI x 1, DO x 1 (DI :Logic level 1: 5V~30V, Logic level 0: 0V~2V DO :Maximum Voltage is 30V, Maximum Current is 20mA)
Cellular Interface	
Antenna Connector	2 x SMA Female
Cellular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA /LTE
Band Option	**America (US grade)** LTE: FDD:1900(B2)/1700(B4)/850(B5)/700(B12)/700(B13)/700(B14)/1700(B66)/600(B71) MHz UMTS/HSDPA/HSUPA/HSPA+: 1900/1700/850 MHz **Europe (EU grade)** LTE: FDD:2100(B1)/1800(B3)/2600(B7)/900(B8)/800(B20) MHz TDD:TDD:2600(B38)/2300(B40)/2500(B41) MHz UMTS/HSDPA/HSUPA/HSPA+: 2100(B1)/900(B8) MHz GSM/GPRS/EDGE: 900/850 MHz **Taiwan (TW grade)** LTE: FDD:2100(B1)/1900(B2)/1800(B3)/1700(B4)/850(B5)/2600(B7)/900(B8)/700(B28) MHz TDD:2300(B40) UMTS/HSDPA/HSUPA/HSPA+/DC-HSPA+: 2100(B1)/1900(B2)/850(B5)/900(B8) MHz GSM/GPRS/EDGE: B2/B3/B5/B8 **China (CN grade)** LTE: FDD:2100(B1)/1800(B3)/900(B8) MHz TDD:2600(B38)/1900(B39)/2300(B40)/2500(B41) MHz TDSCDMA: B34/B39 WCDMA: 900/2100 MHz CDMA 1x/EVDO: 800(BC0) MHz GSM: 900/1800 MHz
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	Red: Serial port is receiving data Green: Serial port is transmitting data
WIFI	1 x LED, Green: WIFI Link /ACT
WAN	1 x LED, Green On : Power is on and functioning Normal
Digital I/O	2 x LEDs, Green On: active
Power	
Redundant Input power	Dual DC inputs. 12-48VDC on 4-pin terminal block
Power consumption (Typ.)	5.5W
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 (1.77 x 3.17 x 3.74 inch)
Weight (g)	395
Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-25 to 70°C (-13 to 158°F)
Operating Humidity	5% to 95% Non-condensing
Regulatory approvals	
EMC	CE EMC (EN 55024, EN 55032), FCC Part 15 B
EMI	EN 55032, CISPR32, EN 61000-3-2, EN 61000-3-3, FCC Part 15 B Class A
EMS	EN 55024, (IEC/EN 61000-4-2 (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(PFMF), IEC/EN 61000-4-11(DIP))
Radio Frequency	EN 301 489-1/-17(2.4G), EN 300 328(2.4G), EN 301 511(2G), EN 301 908-1(3G/4G), FCC Par 15C(2.4G)

Safety	UL61010-1/-2-201, *ATEX, *C1D2
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-31
Vibration	IEC 60068-2-6
MTBF	353,679 hrs
* Under Development	
Warranty	5 years

Ordering Information



Code Definition	Wireless Mode	Serial Port Type	Serial Port Number	Ethernet Port Number	Cellular Interface
Option	1: 802.11 b/g 2: 802.11 a 3: 802.11 a/b/g **4:** 802.11 b/g/n 5: 802.11 a/n 6: 802.11 a/b/g/n	- 1: RS-232 only - 2: RS-422/485 only **- 3:** RS-232/422/485	**- 2:** 2 port	**- 2:** 2 port	**-** 3G: HSUPA **- 4G:** LTE

Available Model	Model Name	Description
	IMG-4312D+-D4G_xx	Industrial IEEE 802.11 b/g/n 4G LTE Cellular Router with 2x10/100Base-T(X) 1x RS-232/422/485 Gateway, 1-port PoE P.D, **EU/US/TW/CN** band

Packing List

- **IMG-4312D+-D4G x 1**
- **Wall-Mount Kit x 1**
- **2.4G wifi antenna x 1**
- **Din-Rail Kit x 1**
- **LTE antenna x 2**
- **Quick Installation Guide x 1**

Optional Accessories

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

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