

# Semi-Industrial LoRaWAN® Gateway UG65

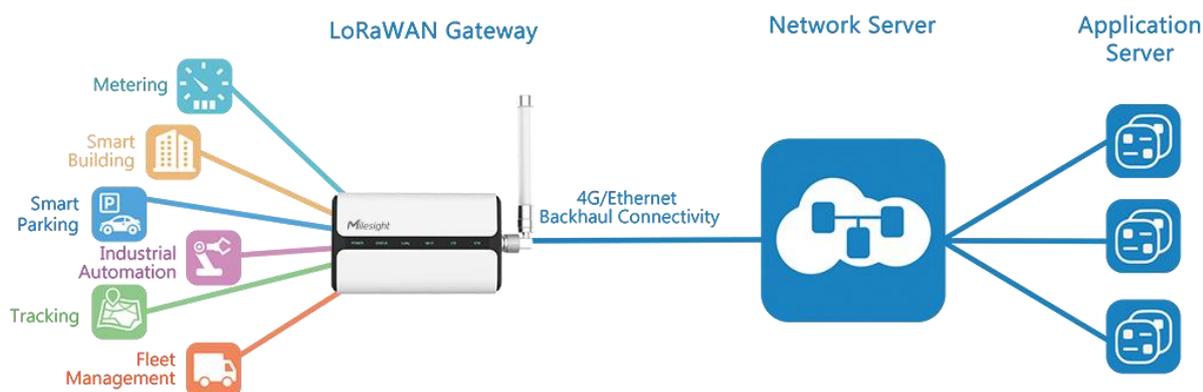
*Milesight*



UG65 is a robust 8-channel indoor LoRaWAN® gateway. Adopting SX1302 LoRa chip and high-performance quad-core CPU, UG65 supports connection with more than 2000 nodes. UG65 has line of sight up to 15 km and can cover about 2 km in urbanized environment, which is ideally suited to smart office, smart building and many other indoor applications.

UG65 supports not only multiple back-haul backups with Ethernet, Wi-Fi and cellular, but also has integrated mainstream network servers (such as The Things Stack, ChirpStack, etc.) and built-in network server for easy deployment.

## ◆ Application Example



## ◆ Features

- Quad-core industrial processor with big memory
- Equip with SX1302 chip, handling a higher amount of traffic with lower consumption
- 8 half/full-duplex channels
- IP65 enclosure and industrial design for parts of outdoor environment applications like eaves
- Desktop, wall or pole mounting
- Multi backhaul backups with Ethernet, cellular (4G) and Wi-Fi
- DeviceHub and Milesight Development Platform provide easy and centralized management of remote devices
- Enable security communication with multiple VPNs like IPsec/OpenVPN/L2TP/PPTP/DMVPN/WireGuard
- Compatible with mainstream network servers like The Things Stack, ChirpStack, Actility, AWS, etc.
- Detect and analyze the noise level and provide intuitive diagram for deployment
- Built-in network server and MQTT(s)/HTTP(s) API for easily integration
- Support BACnet/IP and Modbus to integrate LoRaWAN® data to BMS/PLC system easily
- Embedded Python SDK for users secondary development
- Fast and user-friendly programming by Node-RED development tool

## ◆ Hardware Specifications

### Hardware System

CPU	Quad-core 1.5 GHz, 64-bit ARM Cortex-A53
Memory	512 MB DDR4 RAM
Flash	8 GB eMMC

### LoRaWAN®

Antenna	1 × 50 Ω N-Female External Connector
Channel	8 (Half/Full-duplex)
Frequency Band	US915/AU915/KR920/AS923-1&2&3&4
Sensitivity	-140dBm Sensitivity @292bps
Tx Power	27dBm Max
Protocol	V1.0 Class A/Class B/Class C and V1.0.2 Class A/Class B/Class C

### Ethernet Interface

Port	1 × RJ45 WAN Port (PoE PD supported)
Physical Layer	10/100/1000 Base-T (IEEE 802.3)
Data Rate	10/100/1000 Mbps (Auto-Sensing)

Interface	Auto MDI/MDIX
Mode	Full or Half Duplex (Auto-Sensing)
Ethernet Isolation	1.5 kV RMS

### Wi-Fi Interface

Antenna	Internal Antenna
Standards	IEEE 802.11 b/g/n, 2.4GHz
	802.11b: 18 dBm +/-2.0 dBm (11 Mbps)
	802.11g: 15 dBm +/-2.0 dBm (6 Mbps)
	802.11g: 15 dBm +/-2.0 dBm (54 Mbps)
Tx Power	802.11n@2.4 GHz: 14 dBm +/-2.0 dBm (MCS0_HT20)
	802.11n@2.4 GHz: 14 dBm +/-2.0 dBm (MCS7_HT20)
	802.11n@2.4 GHz: 13 dBm +/-2.0 dBm (MCS0_HT40)
	802.11n@2.4 GHz: 13 dBm +/-2.0 dBm (MCS7_HT40)

### Cellular Interface

Network	4G LTE (CAT 1)
Frequency Bands	B2/4/5/12/13/66
Tx Power	Class 3 (23 dBm ±2 dB)
Antenna	Internal Antenna or External Antenna (Hardware Optional) External Antenna Version: 1 × 50 Ω SMB Male Connector
SIM Slot	1 (mini SIM-2FF)

### Others

Reset Button	1 × RST
USB	1 × USB Type-C for Power Supply and Console
LED Indicators	1 × POWER, 1 × STATUS, 1 × LoRa, 1 × Wi-Fi, 1 × LTE, 1 × ETH
Power Connector	1 × DC Male Jack Connector (2.1 x 5.5 mm)
Built-in	Watchdog, RTC, Timer

### Power Supply and Consumption

	1. DC 9-24 V by Power Connector
Power Input	2. 802.3 af PoE
	3. 5V/1A by USB Type-C Port
Power Consumption	Typical 2.9 W, Max 4.2 W

### Physical Characteristics

Ingress Protection	IP65
Material & Color	PC+ABS (UL94 V0), White & Black
Weight	548g

Dimensions	180 x 110 x 55.5 mm (7.09 x 4.33 x 2.19 in)
Installation	Desktop, Wall or Pole Mounting
<b>Environmental</b>	
Operating Temperature	-40°C to +70°C (-40°F to +158°F)
Temperature	Reduced Cellular Performance Above 60°C
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Relative Humidity	0% to 95% (non-condensing) at 25°C/77°F
<b>Approvals</b>	
Regulatory	FCC, IC, PTCRB
Carrier	AT&T, Verizon, T-Mobile
Environmental	RoHS

## ◆ Software Specifications

### LoRaWAN®

Supported Devices	Around 2000 Class A/B/C Devices (10 min uplink interval)
Protocol	V1.0 Class A/Class B/Class C and V1.0.2 Class A/Class B/Class C
Compatibility	DeviceHub LNS, Milesight Development Platform LNS, Milesight IoT Cloud, etc. For more see <a href="#">ecosystem program</a> .

### Packet Forwarder

Noise Analyzer	Scan the noise of the frequencies for channel selection
Packet Filter	Add whitelist or blacklist to filter the packets
Data Retransmission <sup>1</sup>	Re-transmit the data packets after network recovery

### Embedded Network Server

Decode and Encode	Inbuilt Milesight devices codec library, support custom codec setup
Gateway Fleet	Work as the network server of other Milesight blind-filling gateways
Multicast	Support multicast downlink control
FUOTA	Upgrade FUOTA supported end devices
Integration	MQTT(s), HTTP(s), BACnet/IP, BACnet/SC, Modbus TCP, Modbus RTU over TCP

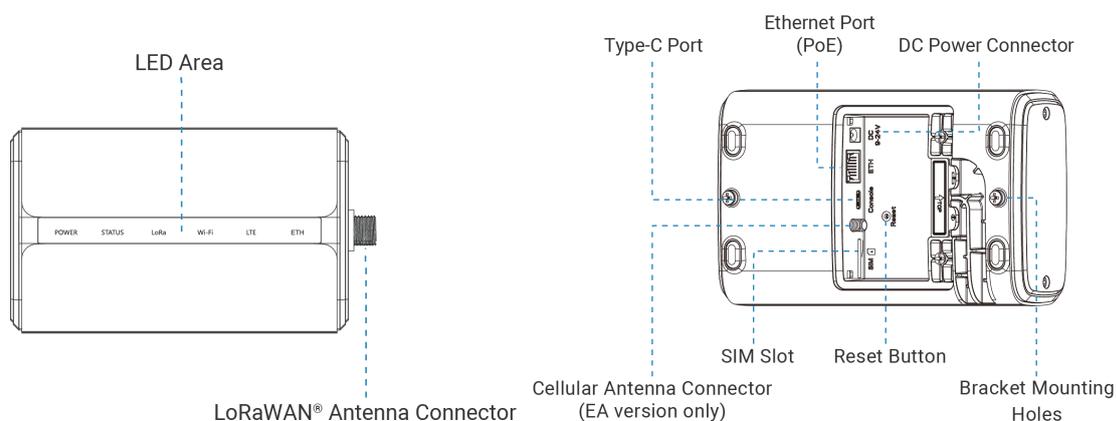
### Network

Network Protocols	PPPoE, SNMP v1/v2c/v3, TCP, UDP, DHCP, DDNS, HTTP, HTTPS, DNS, ARP, SNTP, Telnet, SSH, etc.
-------------------	---

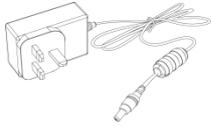
<sup>1</sup> Only Parts of packet forwarders support this feature.

VPN Tunnel	OpenVPN/IPsec/PPTP/L2TP/GRE/DMVPN/WireGuard
Firewalls	Access Control, DMZ, Port Mapping (DNAT), MAC Binding, Filtering (IP&Domain)
DDNS	Supported >16 service providers, others can be configured manually
Multilevel Authority	Multiple Levels of User Authority
Reliability	WAN Failover
Diagnostics Tools	Ping, Traceroute, Tcpdump, QXDM, Log Server
<b>Wi-Fi Interface</b>	
Standards	IEEE 802.11 b/g/n, 2.4GHz
Mode	AP or Client mode
Security	AP: WPA-PSK/WPA2-PSK authentication, WEP/TKIP/AES encryption Client: WPA-PSK/WPA2-PSK/WPA-Enterprise/WPA2-Enterprise authentication, WEP/TKIP/AES encryption
<b>Management</b>	
Configuration	Web, CLI (SSH/Telnet), On-demand dial up, SNMP, HTTP API, MQTT API, Milesight Development Platform, DeviceHub
Update	Web, Milesight Development Platform, DeviceHub
Remote Management	Milesight Development Platform, DeviceHub
Event Alarm	Power On, Network Up/Down, VPN Up/Down, etc.
<b>Others</b>	
App	Python SDK, Node-RED

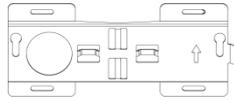
## ◆ Hardware Overview



## ◆ Accessories



1 × DC Jack Power Adapter



1 × Mounting Bracket



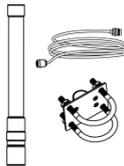
2 × Bracket Fixing Screws



4 × Wall Mounting Kits



1 × LoRaWAN<sup>®</sup> Antenna (18cm)



1 × 60cm LoRaWAN<sup>®</sup> Fiber-Glass N-N Antenna Kit  
**(Optional)**



1 × Magnetic Cellular Antenna  
**(Cellular EA Version Only)**

**\*Note:** Contact us if you need any other special accessories or customized accessories.

## ◆ Dimensions(mm)

