

# Semi-Industrial LoRaWAN® Gateway

## UG65

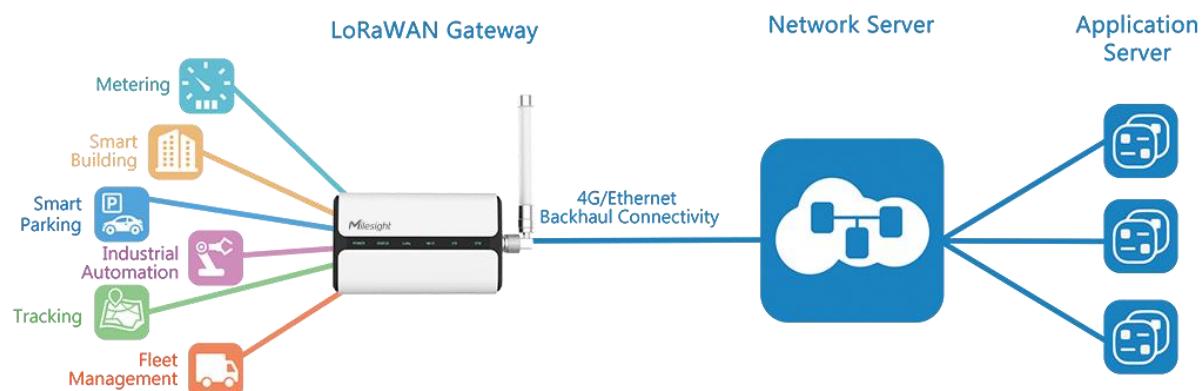
**Milesight**



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/DMV PN/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        | 2 × Internal Antennas + 1 × 50 Ω N-Female External Connector    |
| Channel        | 8 (Half/Full-duplex)  |
| Frequency Band | CN470/IN865/EU868/RU864/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  |
| <b>Wi-Fi Interface</b>               |   |
| 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)  |
| <b>Cellular Interface (Optional)</b> |   |
| Network                              | 4G LTE  |
| Tx Power                             | Class 3 (23 dBm ±2 dB)  |
| Antenna                              | Internal Antenna  |
| SIM Slot                             | 1 (mini SIM-2FF)  |
| <b>Others</b>                        |   |
| 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  |
| <b>Power Supply and Consumption</b>  |   |
| Power Input                          | <ol style="list-style-type: none"> <li>1. DC 9-24 V by Power Connector</li> <li>2. 802.3 af PoE</li> <li>3. 5V/1A by USB Type-C Port</li> </ol> |
| Power Consumption                    | Typical 2.9 W, Max 4.2 W  |
| <b>Physical Characteristics</b>      |   |
| 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 |

## Approvals

|               |                                |
|---------------|--------------------------------|
| Regulatory    | CE, CE (RED), Telec, JATE, RCM |
| 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 |

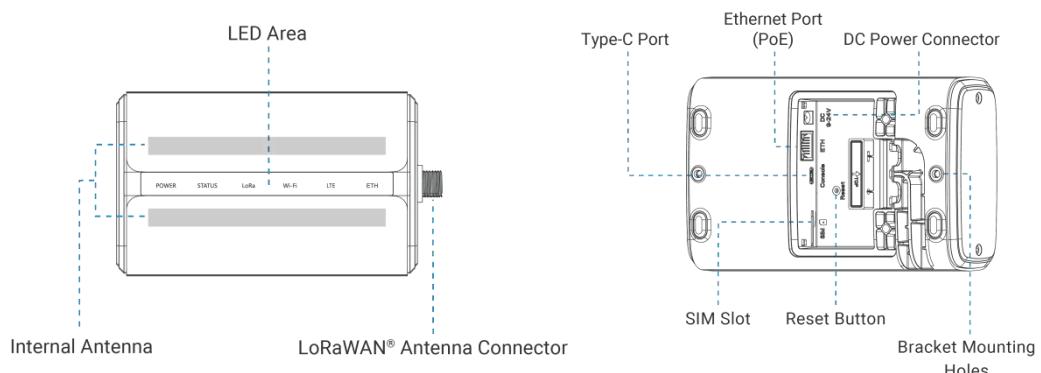
### Network

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

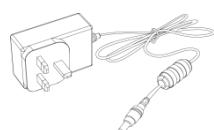
<sup>1</sup> Only parts of packet forwarders support this feature.

|                        |  |
|------------------------|--|
| 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  |
|                        | AP: WPA-PSK/WPA2-PSK authentication, WEP/TKIP/AES encryption   |
| Security               | Client: WPA-PSK/WPA2-PSK/WPA-Enterprise/WPA2-Enterprise authentication, WEP/TKIP/AES encryption                    |
| <b>Management</b>      |  |
| Configuration          | Web, CLI (SSH/Telnet), SMS, 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   |

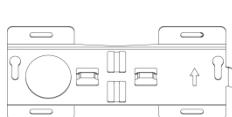
## ◆ Hardware Overview



## ◆ Accessories



1 × DC Jack Power Adapter



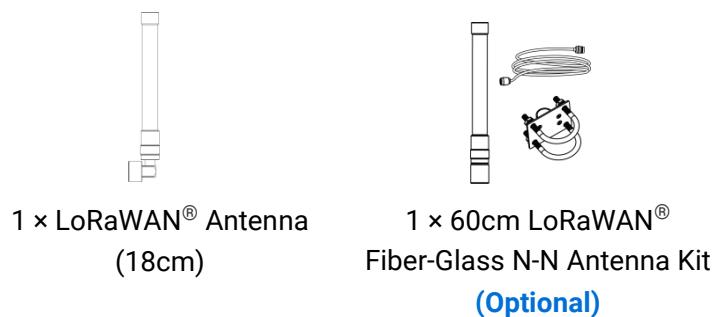
1 × Mounting Bracket



2 × Bracket Fixing Screws



4 × Wall Mounting Kits



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

## ◆ Dimensions(mm)

