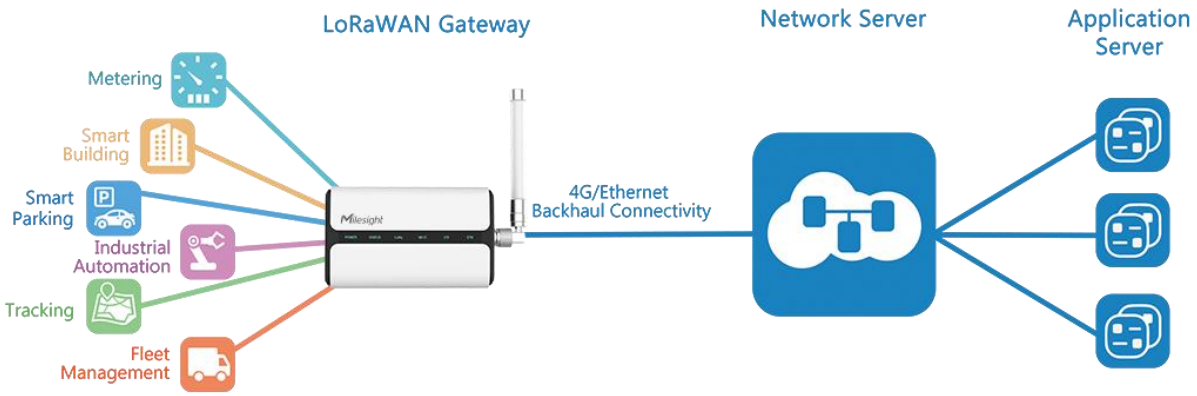
Semi-Industrial LoRaWAN® Gateway

UG65

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
Tx Power	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) 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	
Power Input	1. DC 9-24 V by Power Connector 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
Environmental	
Operating Temperature	-40°C to +70°C (-40°F to +158°F) 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	FCC, IC, PTCRB
Carrier	AT&T, Verizon, T-Mobile
Environmental	RoHS

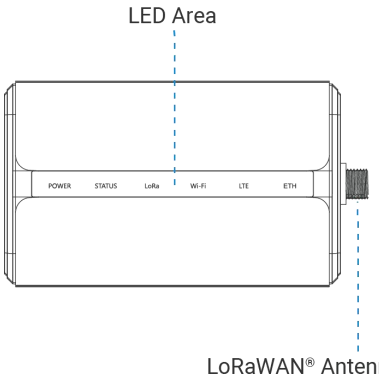
◆ Software Specifications

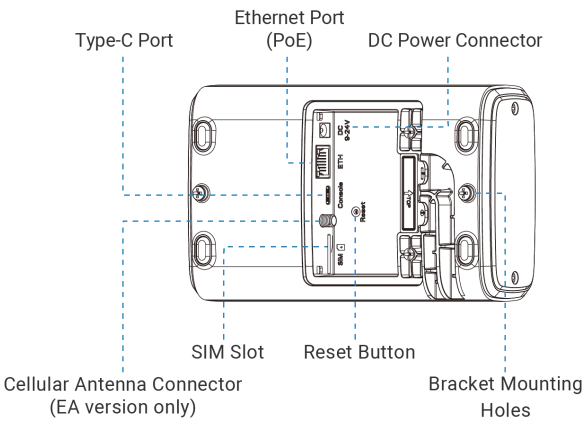
LoRaWAN®	
Supported Devices	Around 2000 Class A/B/C Devices (10 min uplink interval)
Protocol	V1.0 Class A/Class B/Class C and V1.0.2 Class A/Class B/Class C
Compatibility	DeviceHub LNS, Milesight Development Platform LNS, Milesight IoT Cloud, etc. For more see ecosystem program.
Packet Forwarder	
Noise Analyzer	Scan the noise of the frequencies for channel selection
Packet Filter	Add whitelist or blacklist to filter the packets
Data Retransmission[1]	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, HTTP(s), BACnet/IP, 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, MQTT, MQTTS, BACnet/IP, Modbus RTU over TCP, Modbus TCP, etc.

[1] Only Parts of packet forwarders support this feature.

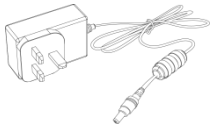
VPN Tunnel	OpenVPN/IPsec/PPTP/L2TP/GRE/DMVPN/WireGuard
Firewalls	Access Control, DMZ, Port Mapping (DNAT), MAC Binding, Filtering (IP&Domain)
DDNS	Supported >16 service providers, others can be configured manually
Multilevel Authority	Multiple Levels of User Authority
Reliability	WAN Failover
Diagnostics Tools	Ping, Traceroute, Tcpdump, QXDM, Log Server
Wi-Fi Interface	
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
Management	
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.
Others	
App	Python SDK, Node-RED

◆ Hardware Overview

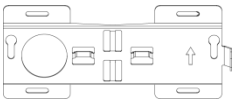




◆ Accessories



1 × DC Jack Power Adapter

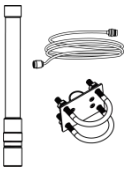


1 × Mounting Bracket

2 × Bracket Fixing Screws

4 × Wall Mounting Kits

1 × LoRaWAN® Antenna (18cm)

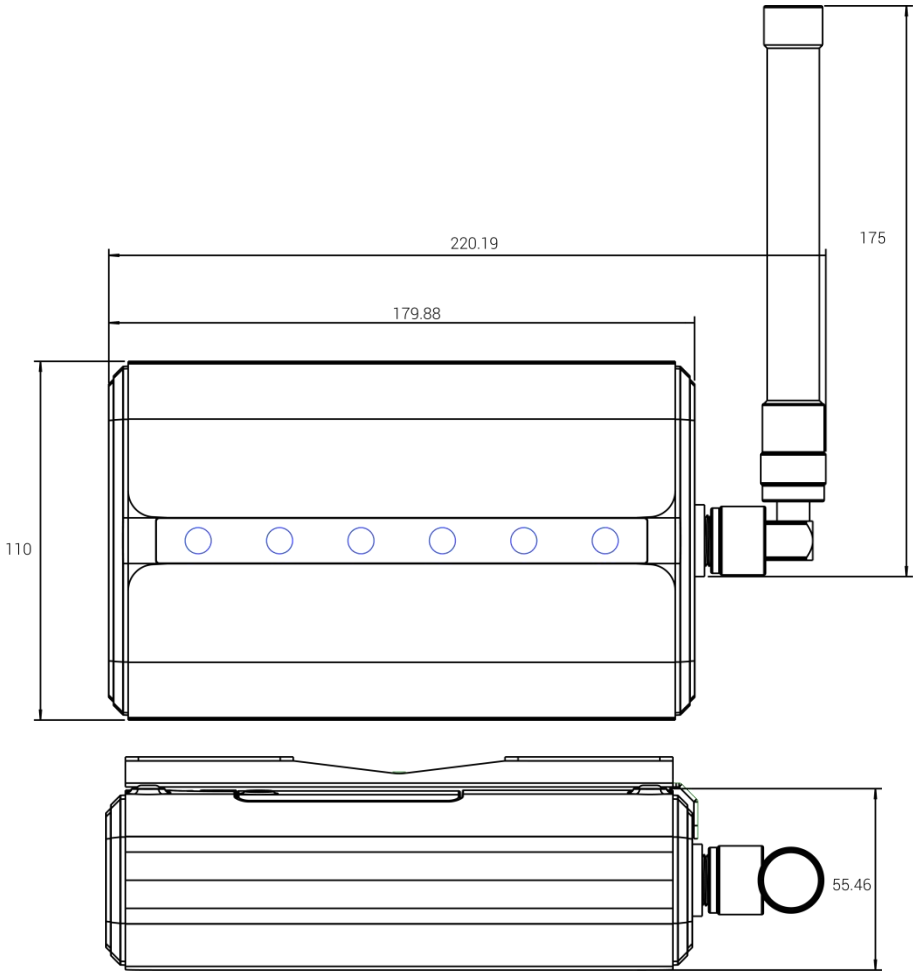


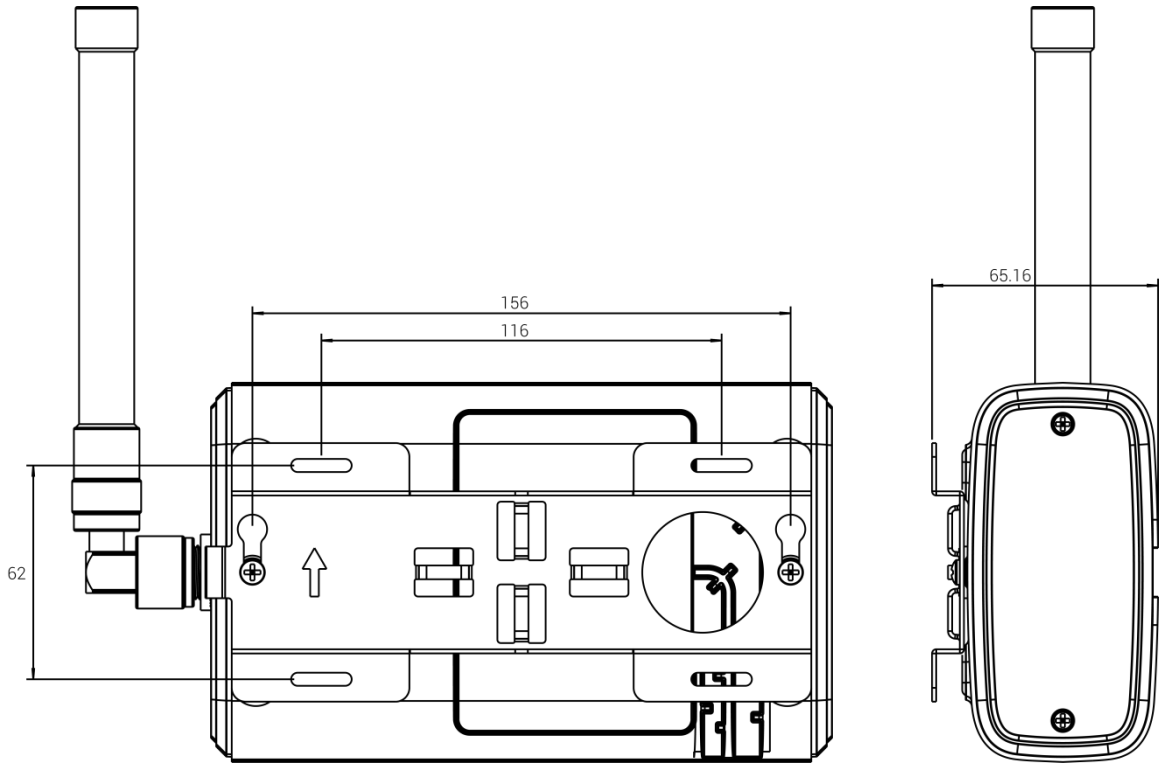
1 × 60cm LoRaWAN® Fiber-Glass N-N Antenna Kit **(Optional)**

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

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

◆ Dimensions(mm)

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