

Industrial LoRaWAN[®] Gateway UG56

Quick Guide



Safety Precautions

Milesight will not shoulder responsibility for any loss or damage resulting from not following the instructions of this operating guide.

- The device must not be modeled in any way.
- Do not place the device close to objects with naked flames.
- Do not place the device where the temperature is below/above the operating range.
- Do not power on the device or connect it to another electrical device when installing.
- Check lightning and water protection when used outdoors.
- Do not connect or power the equipment using cables that have been damaged.

Related Documents

This Quick Start Guide only explains the installation of Milesight UG56 LoRaWAN[®] Gateway. For more functionality and advanced settings, please refer to the relevant documents as below.

Document	Description
UG56 Datasheet	Datasheet for UG56 LoRaWAN® Gateway.
UG56 User Guide	Users can refer to the guide for instruction on how to log in the web GUI, and how to configure all the settings.

The related documents are available on Milesight website: https://www.milesight-iot.com

Declaration of Conformity

UG56 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.





For assistance, please contact Milesight technical support: Email: iot.support@milesight.com Tel: 86-592-5085280 Fax: 86-592-5023065

Revision History

Date	Doc Version	Description
Aug.8, 2022	V1.0	Initial version

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1. Packing List

Before you begin to install the UG56 LoRaWAN[®] Gateway, please check the package contents to verify that you have received the items below.





1 × LoRaWAN[®] Fiber-Glass Antenna Kit(Optional)

If any of the above items is missing or damaged, please contact your sales representative.

2. Hardware Introduction

2.1 Overview



- 1 LoRaWAN[®] Antenna Connector
- 2 SIM Slot
- ③ Micro SD Slot
- ④ Reset Button



- $\ensuremath{\textcircled{5}}$ Type-C Power & Console Port
- 6 LED Indicators
- ⑦ Ethernet Port (PoE)

2.2 Dimensions (mm)





2.3 LED Indicators

LED	Indication	Status	Description			
		Off	The system is starting up			
SYS	System Status	Red Light	The system goes wrong			
		Green Light	The system is running properly			
LoRa	LoRa Status	Off	Packet Forwarder mode is running off			
Lond		On	Packet Forwarder mode is running well			
Ethernet	Link Indicator	Off	Disconnected or connect failure			
	(Yellow)	On		Connected		
Port	(renow)	Blinking	Transmitting data			
FUIL	Rate Indicator	Off	Other modes			
	(Green)	On	100 Mbps mode			

2.4 Reset Button

Function	Description				
Function	SYS LED	Action			
	Static Green	Press and hold the reset button for more than 5 seconds.			
Reset	Static Green → Rapidly Blinking	Release the button and wait.			
	Off → Static Green	The gateway resets to factory default.			

3. Hardware Installation

3.1 SIM & Micro SD Installation

Remove the front panel of the device, insert the SIM card or micro SD card into the corresponding slot. Note: UG56 does not support hot plugging (also called hot swapping). please turn off the power before you insert or take off cards.



3.2 Antenna Installation

Rotate the LoRa antenna into the antenna connector. The antenna should be installed vertically and kept away from batteries.



If you need to fix the LoRa fiber-glass antenna to a pole, please pass the LoRa antenna through the antenna clamp and fix it with 4 screws, then wrap the U-bolt around a pole and fix the clamp with nuts and other accessories.



3.3 Power Supply

UG56 can be powered by 802.3af standard PoE or Type-C port (5 VDC). If both are connected, the device will be powered by the former method (PoE).

• Power by a PoE Switch



Note: When connecting, Ethernet cable of UG56 device side should be installed first, otherwise, PoE devices or gateway may be damaged.

3.4 Gateway Installation

Before you get started, make sure all fittings are installed and the power supply is disconnected. A. Fix the wall mounting bracket to the device with 2 x M3 bracket fixing screws.



B. Drill 4 holes on the wall according to the wall mounting bracket, then fix the wall plugs into the wall.

C. Fix the device to the wall plugs with M3 wall mounting screws. When installation, it's suggested to fix the upper two screws first.



4. Web GUI Access

UG56 provides web-based configuration interface for management. If this is the first time you configure the gateway, please use the default settings below:

ETH IP Address: **192.168.23.150** Wi-Fi IP Address: **192.168.1.1** Wi-Fi SSID: **Gateway_******* Username: **admin** Password: **password** Browser: **Chrome(recommended)**

4.1 Wireless Access

A. Enable wireless network connection on your computer and search for access point "**Gateway_*******" to connect it.

B. Open a web browser on your PC (Chrome is recommended) and type in the IP address **192.168.1.1** to access the web GUI, enter the username and password, click "Login".



If you enter the username or password incorrectly more than 5 times, the login page will be locked for 10 minutes.

D. After logging the web GUI, follow the guide to complete the basic configurations. It's suggested that you change the password for the sake of security.

For your device security,	please change the default password in tim
Old Password	
New Password	
Confirm New Password	

E. You can view system information and perform configuration of the gateway.

Milesigh	nt								💄 admin 🔁
For your device security, please change the default password									
Status		Overview	Cellular	Network	WLAN	VPN	Routing	Host List	Help —
Packet Forwarder		System Infor	mation						Model Show the model name of gateway.
Network Server		Model Region		UG56-L008 US915	E-915M				Region Show the Region of gateway.
Network	Þ	Serial Number Firmware Vers		6041C2232 56.0.0.1-a2					Serial Number Show the serial number of gateway.
System	•	Hardware Vers	sion	V1.0) 16:31:28 Wednes	Firmware Version Show the current firmware version of gateway.			
Maintenance	۲	Uptime		03:10:23	10.01.20 11001100	acy			Hardware Version Show the current
APP	Þ	CPU Load		6%					hardware version of gateway.
			RAM (Available/Capacity) 194MB/512MB (37.89%)						
		eMMC (Availa	ble/Capacity)	6.2GB/7.00	GB (88.46%)				Show the current local time of system.
						Manual F	Refresh 🗸 Ref	resh	Uptime Show the information on how long the gateway has been running.

4.2 Wired Access

Connect PC to UG56 ETH port directly or through PoE injector to access the web GUI of gateway. The following steps are based on Windows 10 system for your reference.

A. Go to "Control Panel" \rightarrow "Network and Internet" \rightarrow "Network and Sharing Center", then click "Ethernet" (It may have different names).

→ 、 小 整 > Control F	Panel → Network and Internet → Network and Sharir	ng Center
Control Panel Home	View your basic network information	and set up connections
	View your active networks	
Change adapter settings		
Change advanced sharing	Milesight 5G	Access type: Internet
settings	Public network	Connections: 4 Ethernet
Media streaming options		
5.	Change your networking settings	Ethernet
	Set up a new connection or network	
		onnection; or set up a router or access point.
	Troubleshoot problems	
	Diagnose and repair network problem	s or act troubleshapting information

B. Go to "Properties" \rightarrow "Internet Protocol Version 4 (TCP/IPv4) "and select "Use the following IP address", then assign a static IP manually within the same subnet of UG56.

Internet 协议版本 4 (TCP/IPv4) P	roperties ×	
General		
	automatically if your network supports seed to ask your network administrator	
Ogbtain an IP address autom		192 . 168 . 23 . 200
IP address:	192 . 168 . 23 . 200	
Subnet mask:	255 . 255 . 255 . 0	255.255.255.0
Default gateway:	192 . 168 . 23 . 150	
Obtain DNS server address	automatically	192 . 168 . 23 . 150
Use the following DNS serve	r addresses:	
Preferred DNS server:	8.8.8.8	
Alternate DNS server:		
Validate settings upon exit	Advanced	
	OK Cancel	

C. Open a Web browser on your PC (Chrome is recommended) and type in the IP address 192.168.23.1 50 to access the web GUI.

D. Enter the username and password, click "Login".

	Language English
Milesight – Lotanum Galewy – &	a de la
2 Logn	
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If you enter the username or password incorrectly more than 5 times, the login page will be locked for 10 minutes.

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E. After logging the web GUI, follow the guide to complete the basic configurations. It's suggested that you change the password for the sake of security.

Old Password		
New Password	Old Password	
	New Password	
Confirm New Password	Confirm New Password	

F. You can view system information and perform configuration of the gateway.

Milesight	t								💄 admin 🔁
For your device security, please change the default password									
Status		Overview	Cellular	Network	WLAN	VPN	Routing	Host List	Help —
Packet Forwarder		System Informa	tion						Model Show the model name of gateway.
Network Server		Model Region		UG56-L001 US915	E-915M				Region Show the Region of gateway.
Network	×	Serial Number Firmware Version		6041C223					Serial Number Show the serial number of gateway.
System	×	Hardware Version		V1.0 2022-08-10) 16:31:28 Wednesd	lav			Firmware Version Show the current firmware version of gateway.
Maintenance	×	Uptime		03:10:23					Hardware Version
APP	×	CPU Load		6%					Show the current hardware version of gateway.
		RAM (Available/C			2MB (37.89%) GB (88.46%)				Local Time Show the current local time of system.
						Manual F	Refresh 🗸 Ref	resh	Uptime Show the information on how long the gateway has been running.

5. Network Connection

This section explains how to connect the gateway to network via WAN connection, Wi-Fi or cellular.

5.1 Configure the Ethernet Connection

A. Go to "Network" \rightarrow "Interface" \rightarrow "Port" page to select the connection type and configure Ethernet port information.

B. Click "Save & Apply" for changes to take effect.

Port	WLAN	Cellular	Loopback	
- Port_	1			
Port			eth 0	
Conn	ection Type		Static IP	*
IP Ad	dress		192.168.22.112	
Netm	ask		255.255.255.0	
Gate	way		192.168.22.1	
MTU			1500	
Prima	ry DNS Server		8.8.8.8	
Seco	ndary DNS Server		114.114.114.114	
Enab	le <mark>NA</mark> T			

C. Connect Ethernet port of gateway to the devices like router or modem.

D. Log in the web GUI via the newly assigned IP address and go to "Status" \rightarrow "Network" to check Ethernet port status.

Overview	Packet	Forward	Cellular	Network	WLAN	VPN	Host List		
WAN									
Port	Status	Туре	IP Address	Net	tmask	Gateway	,	DNS	Duration
eth 0	ир	Static	192.168.22.112	255.2	55.255.0	192.168.22	2.1	8.8.8.8	1days,02h 34m 22s

5.2 Configure the Wi-Fi Connection

A. Go to "Network" \rightarrow "Interface" \rightarrow "WLAN" and select "Client" mode.

B. Click "Scan" to search for Wi-Fi access points. Select the available one and click "Join Network".

Port	WLAN		Cellular	Loo	pback			
< GoBack								
SSID		Channel	Signal	Cipher	BSSID	Security	Frequency	
AAA		Auto	-61dBm	AES	24:e1:24:f0:c4:13	WPA-PSK/WPA2-PSK	2412MHz	Join Network

C. Type the key of Wi-Fi.

Port	WLAN	Cellular Loopback		
VLAN				
Enable				
Work Mode		Client	~	Scan
SSID		AAA		
BSSID		24:e1:24:f0:c4:13		
Encryption M	lode	WPA-PSK/WPA2-PSK	~	
C <mark>ipher</mark>		AES	~	
Key		••••••		
P Setting				
Protocol		DHCP Client	~	

D. Go to "Status" \rightarrow "WLAN" to check Wi-Fi status. If it shows "Connected", it means gateway connects to Wi-Fi successfully.

Overview	Packet Forward	Cellular	Network	WLAN
WLAN Status				
Wireless Status		Enabled		
MAC Address		24:e1:24:f0:de:14		
Interface Type		Client		
SSID		AAA		
Channel		Auto		
Encryption Type		WPA-PSK/WPA2-PSk	K	
Cipher		AES		
Status		Connected		
IP Address		192.168.1.145		
Netmask		255.255.255.0		
Connection Duratio	n	0 days, 02:44:45		

5.3 Configure the Cellular Connection

A. Go to "Network" \rightarrow "Interface" \rightarrow "Cellular" \rightarrow "Cellular Setting" page to enable cellular settings.

- B. Choose relevant network type and fill in SIM card information like APN or PIN code.
- C. Click "Save" and "Apply" for changes to take effect.

Port	WLAN	Cellular	Loopback
Cellular S	etting		
Enable			
Network Ty	/pe	Auto	~
APN			
Username			
Password		75	
Access Nu	mber		
PIN Code			
Authentica	tion Type	Auto	~
Roaming			
SMS Cente	er		
Connectio	on Setting		
Enable NA	т		

D. Go to "Status" \rightarrow "Cellular" page to view the status of the cellular connection. If it shows "Connected", it means the SIM has dialed up successfully. On the other hand, you can check the status of LTE indicator. If it keeps on light statically, it means SIM has dialed up successfully.

Overview	Packet Forward	Cellular	Network	WLAN
Modem				
Status		Ready		
Model		EC25		
Version		EC25ECGAR06A07M1	G	
Signal Level		23asu (-67dBm)		
Register Status		Registered (Home netv	v <mark>or</mark> k)	
IMEI		860425047368939		
IMSI		460019425301842		
ICCID		8986011783800993412	20	
ISP		CHN-UNICOM		
Network Type		LTE		
PLMN ID				
LAC		5922		
Cell ID		340db83		
Network				
Status		Connected		
IP Address		10.132.132.59		
Netmask		255.255.255.240		
Gateway		10.132.132.60		

6. Packet Forwarder Configuration

UG has installed multiple packet forwarders including Semtech, Chirpstack-Generic MQTT broker, etc. This section explains how to connect the gateway to network servers.

Make sure the gateway connects to the network as shown in <u>Section 5</u>.

A. Go to "Packet Forwarder" \rightarrow "General" page and click \pm to add a network server.

Status		General	Radios	Advanced	Custom	Traffic		
Packet Forwarder		General Setting						
Network Server		Gateway EUI Gateway ID		24E124FFF				
Network	×	Frequency-Sync		Disabled	~			
System	۲	Multi-Destination		Connected				
Maintenance	•		ID	Enable	•	Туре	Server Address	Operation
АРР	۲		0	Enable	d	Embedded NS	localhost	
								+

B. Fill in the server information and enable this server.

Туре	Semtech ~
Server Address	eu1.cloud.thethings.network
Port Up	1700
Port Down	1700

C. Go to "Packet Forwarder" \rightarrow "Radio" page, center frequency and channels. The channels of the gateway and network server need to be the same.

Region		US915		~
	Name			Center Frequency/MHz
	Radio 0		90	04.3
	Radio 1		90	05.0
/lulti Channels Settin	g			
Enable	Index	Radio		Frequency/MHz
	0	Radio 0	~	903.9
	1	Radio 0	~	904.1
	2	Radio 0	~	904.3
	3	Radio 0	~	904.5
	4	Radio 1	~	904.7
	5	Radio 1	~	904.9
	6	Radio 1	~	905.1
	7	Radio 1	~	905.3

D. Add the gateway on network server page. For more details about the network server connection please refer to <u>Milesight IoT Support portal</u>.

E. Go to "Traffic" page to view the data communication of UG56.

General	Radios	Ad	lvanced	Custom	Traffic			
Traffic Setti								
Stop	Clear		Tisks		Deterrite	Colorate	Deel	CND
Rfch	Direction	Time		Frequency	Datarate	Coderate	RSSI	SNR
1	up	11:52:38	317882157 1	865.985	SF7BW125	4/5	-91	5.0
1	up	11:52:22	316226269 2	866.585	SF7BW125	4/7	-1 <mark>0</mark> 8	-11.8
0	down	100	3 <mark>1</mark> 1888813 1	865.0625	SF7BW125	4/5		ia.
0	up	11:51:37	3117888 <mark>1</mark> 3 1	865.0625	SF7BW125	4/5	-95	-0.8

7. Network Server Configuration

UG56 can work as network server and transmit data to Milesight IoT Cloud or another platform via MQTT/HTTP/HTTPS.



M Make sure the gateway connects to the network as shown in <u>Section 5</u>.

7.1 Connect UG56 to Milesight IoT Cloud

A. Go to "Packet Forwarder" \rightarrow "General" page to enable the embedded network server.

Status		General	Radios	Advanced	Custom	Traffic		
Packet Forwarder		General Setting						
Network Server		Gateway EUI Gateway ID		24FFF				
Network	۲	Frequency-Sync	Di	sabled	~			
System	۲	Multi-Destination Connect Status	Con	nected				
Maintenance			10					
АРР	•		1D 0	Enable		Type Embedded NS	Server Address	Operation
								±

B. Go to "Packet Forwarder" \rightarrow "Radio" page to select the antenna type, center frequency and channels. The channels of the gateway and nodes need to be the same.

Region		US915		~
	Name			Center Frequency/MHz
	Radio 0			904.3
	Radio 1		[905.0
Multi Channels Settin	g			
Enable	Index	Radio		Frequency/MHz
	0	Radio 0	~	903.9
	1	Radio 0	~	904.1
	2	Radio 0	~	904.3
	3	Radio 0	~	904.5
	4	Radio 1	~	904.7
	5	Radio 1	~	904.9
	6	Radio 1	~	905.1
	7	Radio 1	~	905.3

C. Go to "Network Server" → "General" page to enable the network server and "Milesight IoT Cloud" mode.

Status		General	Applications	Profiles	Device	Gateways
Packet Forwarder		General Setting	9			
Network Server		Enable Milesight IoT Clo	vud 🔽			
Network	•	NetID	010203			
		Join Delay	5		sec	
System	•	RX1 Delay	1		sec	
Maintenance		Lease Time	8760-0-0		hh-mm-ss	
Maintenance		Log Level	info	~		

D. Log in the Milesight IoT Cloud. Then go to "My Devices" page and click "+New Devices" to add gateway to Milesight IoT Cloud via SN. Gateway will be added under "Gateways" menu.

Dashboard	Devices	Gate	ways H	istory	+			
My Devices	Search	٩		Normal 1	m 1	⊗ Inactive 3		+ New Devices
Map Triggers		<u>真实设备-EN</u> 6136A39023	Add Device			×	e.	@ h 0
Reports	\odot	UC3X52-虚 61151109	* SN :			sociated with your	-	<u>ن</u> يا (۵
Event Center 30	□ } \$(UC3X5 6123A124	• Name.				15 minutes ago	@ M @
Me	o ä	AM102- 6128A2175>>	CO2	Сапс	el Confirm Barometric Pressure	ux ination	a few seconds ago	© <u>v</u> ©
		4	27°C Temperature	51% Humidity	O Activity Level (PIR)	2lux Illumination		
≡•								

E. The gateway is online on Milesight IoT Cloud.

② Dashboard	Devices	Gateways	+		
My Devices	Search	Q	⊘ Normal 1 🔐 Offline 0 ⊗ Inad	ctive 0	+ New Devices
Map		Status Name	Associated Devices (Joined /Not Joined /Failed)	Last Updated	
Reports		UG Gateway 621793129987	, <u>0 / 1 / 0 Detail</u>	2 minutes ago	<u>ک اس</u> (۵)
Event Center 94					· · · · · · · · · · · · · · · · · · ·

7.2 Connect UG56 to MQTT/HTTP Server

A. Go to "Packet Forwarder" \rightarrow "General" page to enable the embedded network server.

Status		General	Radios	Advanced	Custom	Traffic		
Packet Forwarder		General Setting						
Network Server		Gateway EUI Gateway ID		24FFF				
Network	Þ	Frequency-Sync	Dis	abled	~			
System	•	Multi-Destination Connect Status	Conn	ected				
Maintenance	•		ID	Enable		Туре	Server Address	Operation
АРР	•		0	Enabled		Embedded NS	localhost	

B. Go to "Packet Forwarder" \rightarrow "Radio" page to select the antenna type, center frequency and channels. The channels of the gateway and nodes need to be the same.

Region		US915		~
	Name			Center Frequency/MHz
	Radio 0		90	4.3
	Radio 1		90	5.0
Multi Channels Settin	g			
Enable	Index	Radio		Frequency/MHz
	0	Radio 0	~	903.9
	1	Radio 0	~	904.1
	2	Radio 0	~	904.3
	3	Radio 0	~	904.5
	4	Radio 1	~	904.7
	5	Radio 1	~	904.9
	6	Radio 1	~	905.1
	7	Radio 1	~	905.3

C. Go to "Network Server" \rightarrow "General" page to enable the network server mode.

Status	General	Applications	Profiles	Device	Gateways
Packet Forwarder	General Setting				
Network Server	Enable Milesight IoT Clou	Id D			
Network 🕨	NetID	010203			
	Join Delay	5		sec	
System 🕨	RX1 Delay	1		sec	
Maintenance	Lease Time	876000-0-	0	hh-mm-ss	
Maintenance	Log Level	info		~	

D. Go to "Network Server" \rightarrow "Application" to add a new application.

General	Applications	Profiles	Device
Applications			
Name		cloud	
Description	[cloud	
Payload Codec	[None	~

After saving the application, you can select HTTP, HTTPS or MQTT protocol and fill in corresponding server information to send data to another server.

Data Transmission		
Туре	MQTT	•
Status	HTTP	
Status	MQTT HTTPS	
General		4
Broker Address		
Broker Port		
Client ID		
Connection Timeout/s	30	
Keep Alive Interval/s	60	

E. Go to "Profiles" page to add a new profile for the device.



F. Go to "Device" page and click "Add" to add LoRaWAN® node devices.

		Profiles	Device	Gateways	Packets	
vice						
Add	Bulk Import	Delete All			Search	h
Device Name	Device EUI	Device-Profile	Application	Last Seen	Activated	Operation
		No m	atching records found			
	Devic	ce Name	uc11		×	
	Desc	ription	a short description of you	ur node		
	Devic	e EUI	00000000000000000			
	Devic	ce-Profile	ClassA-OTAA	•		
	Appli	cation	cloud	¥		
	Fram	e-counter Validation				
	Appli	cation Key				
	Devic	ce Address				
	Netw	ork Session Key				
	Appli	cation Session Key				
	Uplin	k Frame-counter	0			
	Dowr	link Frame-counter	0			
			Save & Apply			
	8		oure wrippy			

You ca

				×
Import File	Browse	mpore	Template Download	

Click "Template Download" to download template file and add device information to this file. Application

and device profile should be the same as you created on web page.

- 24	A	В	C	D	E	F	G	Н	1
1	name	description	deveui	application	deviceprofile	appkey	devaddr	appskey	nwkskey
2	24e1242191323266		24e1242191323266	cloud	ClassC-OTAA	112233445566778899aa112233445566			
3									
4									
5									

Import this file to add bulks of devices.

F. Go to "Packets" page to check the packets from LoRaWAN® node devices. The type starts from "Up" means uplinks and "Dn" means downlinks.

etwork Server									
Clear								Search	Q
Device EUI	Frequency	Datarate	SNR	RSSI	Size	Fcnt	Туре	Time	Details
24e124126a146579	868300000	SF7BW125	8.5	-85	4	14	UpUnc	2020-04-28T15:09:25+08:00	0
24e124126a146579	868300000	SF7BW125	10.2	-75	4	13	UpUnc	2020-04-28T15:04:25+08:00	0

Click "Details" to check the properties and payload contents of packets.

Packets Details		×
Fcnt	14	*
Port	85	
Modulation	LORA	
Bandwidth	125	
SpreadFactor	7	
Bitrate	0	
CodeRate	4/5	
SNR	8.5	
RSSI	-85	
Power	5	
Payload(b64)	A3cYAA==	
Payload(hex)	03771800	
MIC	f5acdeb2	

[END]