# GLR200-R Rugged LoRaWAN Gateway



# **User Manual**

Version:1.2

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# **Revision History**

No.	Description	Date
V1.0	First release	Jun. 2, 2024
V1.1	Updated the graphics for pole mounting	Jul. 24, 2024
V1.2	Added chapter 3 to demonstrate how to transmit data from an end node to the network server	Dec. 3, 2024

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## Foreword

Thank you for purchasing GLR200-R rugged LoRaWAN gateway ("the gateway" or "the product"). This manual intends to provide guidance and assistance necessary on setting up, operating and maintaining the product. Please read this manual and make sure you understand the structure and functionality of the product before putting it into use.

### **Intended Users**

This manual is intended for:

- Network administrators
- Technical support engineers
- Other users

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### Disclaimer

While all information contained herein has been carefully checked to assure its accuracy in technical details and typography, Vantron does not assume any responsibility resulting from any error or features of this manual, nor from improper uses of this manual or the software.

It is our practice to change part numbers when published ratings or features are changed, or when significant structure changes are made. However, some specifications of the product may be changed without notice.

## **Technical Support and Assistance**

Should you have any question about the product that is not covered in this manual, contact your sales representative for solution. Please include the following information in your question:

- Product name and PO number;
- Complete description of the problem;
- Error message you received, if any.

### Vantron Technology, Inc.

Address: 48434 Milmont Drive, Fremont, CA 94538 Tel: (650) 422-3128 Email: <u>sales@vantrontech.com</u>

## **Regulatory Information**

The product is designed to comply with:

- FCC
- ISED

Please refer to the Appendix for Regulatory Compliance Statement.

### Symbology

This manual uses the following signs to prompt users to pay special attention to relevant information.

Â	Caution for latent damage to system or human injury
ì	Attention to important information or regulations

### **General Safety Instructions**

The product is supposed be installed by knowledgeable, skilled persons familiar with local and/or international electrical codes and regulations. For your safety and prevention of damage to the product and other equipment connected to it, please read and observe carefully the following safety instructions prior to installation and operation. Keep this manual well for future reference.

- Do not disassemble or otherwise modify the product. Such action may cause heat generation, ignition, electronic shock, or other damages including human injury, and may void your warranty.
- Keep the product away from heat source, such as heater, heat dissipater, or engine casing.
- Do not insert foreign materials into any opening of the product as it may cause the product to malfunction or burn out.
- To ensure proper functioning and prevent overheating of the product, do not cover or block the ventilation holes of the product.
- Follow the installation instructions with the installation tools provided or recommended.
- The use or placement of the operation tools shall comply with the code of practice of such tools to avoid short circuit of the product.
- Cut off the power before inspection of the product to avoid human injury or product damage.

### **Precautions for Power Cables and Accessories**

- Use proper power source only. The product supports 12V DC power supply. Make sure the supply voltage falls within the specified range.
- A Place the cables properly at places without extrusion hazards.
- Use only approved antenna(s). Non-approved antenna(s) may produce spurious or excessive RF transmitting power which may violate FCC limits.
- Cleaning instructions:
  - Power off the product before cleaning
  - Do not use spray detergent
  - Clean with a damp cloth
  - Do not try to clean exposed electronic components unless with a dust collector

Power off and contact Vantron technical support engineer in case of the following faults:

- The product is damaged
- The temperature is excessively high
- Fault is still not solved after troubleshooting according to this manual

Do not use in combustible and explosive environment:

- Keep away from combustible and explosive environment
- Keep away from all energized circuits
- Unauthorized removal of the enclosure from the product is not allowed
- Do not change components unless the power cable is unplugged
- In some cases, the product may still have residual voltage even if the power cable is unplugged. Therefore, it is a must to remove and fully discharge the product before replacement of the components.

# **CHAPTER 1 INTRODUCTION**

## 1.1 Overview

Vantron GLR200-R is a fully rugged, IP65-rated LoRaWAN gateway designed to withstand harsh environments. The gateway supports the LoRa physical layer technology and complies with the LoRaWAN 1.0.3 specification to ensure reliable data transmission. Operating with high receiver sensitivity, it facilitates long-range wireless connectivity while consuming less than 5W of power under load.

GLR200-R features 8 frequency channels and 8 spreading factors from SF5 to SF12 for efficient detection and demodulation of data packets from LoRaWAN Class A and C end devices. It then forwards these packets to a LoRaWAN network server, which manages the entire LoRaWAN network. It offers two fast Ethernet ports for connection to an Ethernet switch/router and provides essential IP networking features. It also supports 4G LTE and optional Wi-Fi connectivity, while the multi-mode GNSS module provides precise timestamping and high-accuracy geolocation.

GLR200-R offers a comprehensive solution for deploying LoRaWAN networks, combining robust network management capabilities and advanced geolocation functionalities. It allows connection of thousands of end devices scattered in very long distances and is wellsuited for smart grid, agriculture, digital medical, oil & gas, public security, and more.

#### LoRaWAN LoRaWAN Network Serve End Points Gateway .... 0 Non-LoRa DTU-LoRa GI R200 End Node LoRa RF Ethernet/ RS232/RS485 LoRaWAN Wi-Fi/Cellular

# **1.2** Typical Application

**Option 1: A LoRa-enabled DTU involved for nodes without LoRa capability** 



### **Option 2: Direct connection with LoRa-enabled nodes**

## 1.3 Unpacking

The product has been carefully packed with special attention to quality. However, should you find anything damaged or missing, please contact your sales representative in due time.

- 1 x GLR200-R rugged LoRaWAN gateway
- 1 x LoRa antenna
- 2 x 4G LTE antenna / 1 x 4G LTE antenna + 1 x Wi-Fi antenna
- 1 x GNSS antenna
- 2 x M12 cable tube
- 1 x Mounting bracket
- 2 x M6 x 12mm hex-head bolt
- 1 x Mounting strap
- 1 x 12V 1A DC power adapter

Actual accessories might vary slightly from the list above as the customer order might differ from the standard configuration options.

# 1.4 Specifications

		GLR200-R				
	CPU	MIPS24KEc, 580MHz				
System	Memory	256MB				
	SPI flash	64MB				
	Ethernet	1 x LAN, 100Mbps; 1 x WAN, 100Mbps				
	Wi-Fi	Wi-Fi 802.11 b/g/n (Optional)				
Communication	4G LTE	CAT 1				
	RF	LoRa				
	GNSS	BDS, GPS, GLONASS, GALILEO				
	Frequency	915MHz				
	Transmit power	~ 22dBm				
	Bandwidth	125 kHz / 250 kHz / 500kHz				
	Packet detector	8 Channels x 8 Spreading factors (SF5~SF12)				
LoRa Features	Receiver sensitivity	-121 dBm (at 125kHz bandwidth, SF5)				
Lona reactires	(Typical)	-127 dBm (at 125kHz bandwidth, SF7)				
		-141 dBm (at 125kHz bandwidth, SF12)				
	Antenna impedance	50Ω				
	LoRaWAN	LoRaWAN V1.1 (backward compatible with V1.0)				
	LONGWAN	Support for Class A and C end devices				
4G LTE Features	Frequency band	North America: WCDMA: B1/B2/B4/B5/B6/B8				
	M12 connector	2 x M12 connector (WAN + DC in, LAN + RS232 debugging)				
	Internal SIM slot	1 x Internal Micro SIM slot				
I/O		1 x LoRa antenna, N-type (omni-directional, gain: 4.3dBi)				
170	Astores	1 x GNSS antenna, N-type (directional, total gain: 30dBi)				
	Antenna	2 x 4G LTE / 1 x 4G LTE + 1 x Wi-Fi antenna, N-type (omni- directional, gain: 3.8dBi)				
		1 x Power indicator				
	Internel LED indicator	1 x LoRa communication indicator				
Sustan Control	Internal LED indicator	1 x Network status indicator				
System Control		1 x System status indicator				
	Internal button	1 x Restore button				
	milemal bullon	(1~5s: Restart the device; > 5s: Factory reset)				
	Enclosure	Aluminum				
Mechanical	Dimensions	184mm x 133mm x 72mm (enclosure only)				
meenanica	Installation	Pole mounting				
	IP rating	IP65				
	Input	12V/1A DC				
Power	mput	3-pin DC input included in an M12 connector for power supply				
	Consumption	< 5W (load)				

# 1.3 Specifications (Cont'd)

GLR200-R						
	Operating system	VantronOS				
Software	Device management platform	Vantron BlueSphere GWM (Optional)				
	Log	Supported				
	Upgrade	Local, OTA update				
		DHCP client (IPv4), Static IP (IPv4), PPPoE				
	IP features	Network Address Translation (NAT)				
Network	IP leatures	Domain Name System (DNS)				
		Network Time Protocol (NTP)				
	Network diagnostics	Ping, Traceroute, Nslookup				
	Firewall	Supported				
	VPN	OpenVPN, L2TP, PPTP, IPSec				
Security &	Multi-level permission	Supported				
Reliability	Link detection	Heartbeat detection, automatic re-connection				
	Network reliability	Failover supported, link backup between Ethernet and 4G LTE				
	Software integrity	Secure boot, SHA256 for firmware signature, and u-boot				
	Temperature	Operating: -20°C~+60°C				
Environment	remperature	Storage: -40°C ~ +85°C				
Condition	Humidity	Operating: 5%-95% RH (Non-condensing)				
condition	EMC level	EMC Level 3				
	Certification	FCC, ISED				

# 1.5 Product View

### 1.5.1 Bottom view



### I/O description:

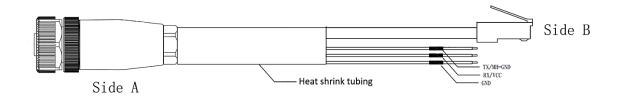
No.	Name	Description		
1	GNSS antenna connector	For connecting the GNSS antenna, N-type, fiber reinforced plastic		
2	WAN + DC in	M12 connector, offering pins for WAN + DC in		
3	LoRa antenna connector	For connecting the LoRa antenna, N-type, fiber reinforced plastic (gain: 4.0dBi, impedance: $50\Omega$ )		
4	Primary 4G antenna connector For connecting a 4G antenna, N-type, fiber reinforced			
5	LAN + debugging	M12 connector, offering pins for LAN + RS232 debugging		
6	Diversity 4G antenna / Wi-Fi antenna connector	For connecting a 4G antenna or Wi-Fi antenna (WLAN version), N-type, fiber reinforced plastic		

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### 1.5.2 M12 cable tube

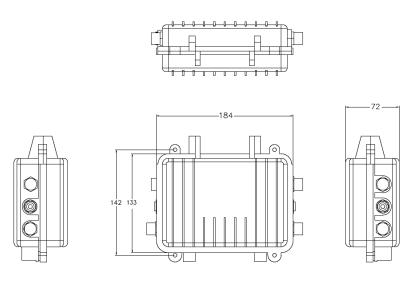
There are two M12 connectors on the gateway, one offering WAN and 3-pin DC input for power, the other offering LAN and 3-pin RS232 for debugging.

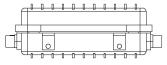
The pinout of the matching cable is shown below.



## **1.6 Mechanical Dimensions**

• 184mm x 133mm x 72mm (enclosure only)



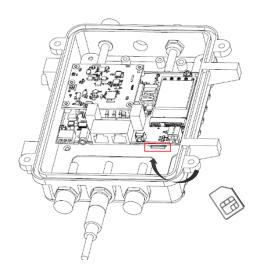


# **CHAPTER 2 QUICK START**

# 2.1 Setting up the Device

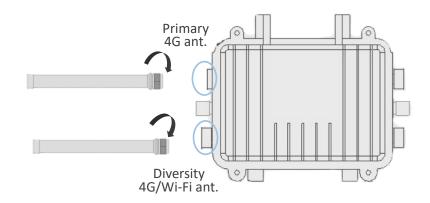
### 2.1.1 Hardware connection

- 1. Unscrew the top cover of GLR200-R and open it;
- 2. Insert an activated SIM card into the Micro SIM slot at the back of the 4G LTE module, with the golden contact facing up;

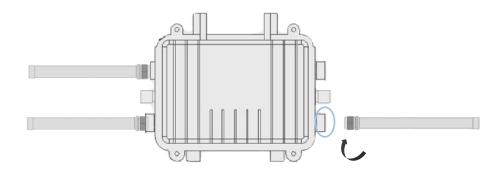


Gently push the SIM card in again, and it will eject from the slot automatically.

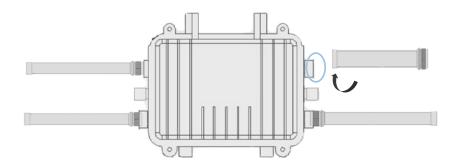
- 3. Close the top cover and fasten the screws;
- 4. Install the 4G LET antennas / 4G LTE + Wi-Fi antennas as indicated by the label on the antenna;



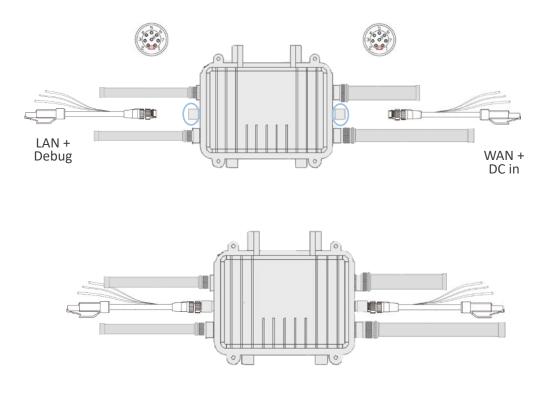
5. Install the LoRa antenna as indicated by the label on the antenna;



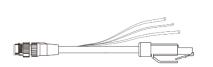
6. Install the GNSS antenna as indicated by the label on the antenna;



7. Align the mark on the connectors and install the two M12 cable tubes to the M12 connectors;



8. Connect the Ethernet cable of the WAN + DC in cable tube to the LAN port of a router/switch to connect the device to the internet;





An Ethernet extender might be needed.

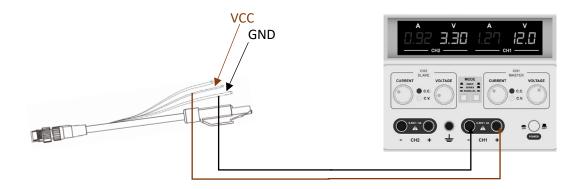
9. Connect the Ethernet cable in the LAN + Debugging cable tube to a host computer;





An Ethernet to USB extension cable might be needed.

10. Connect the VCC and GND wires of the WAN + DC in cable tube to the positive and negative poles of a DC power supply, respectively;

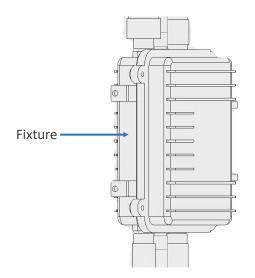


11. Turn on the power supply to power up GLR200-R.

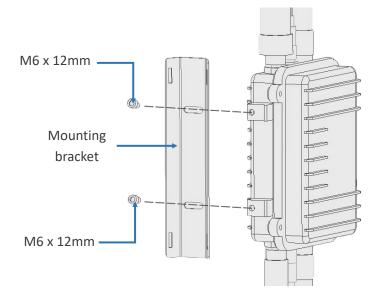
Before mounting GLR200-R to a pole, please make sure the pole is secured in place.

### 2.1.2 Pole mounting

1. Vertically hold the gateway with the fixture side facing the outside;

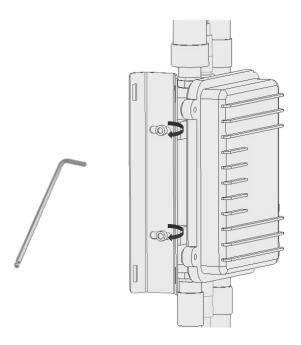


2. Align the slots of the mounting bracket to the screw holes on the fixture and attach the bracket to the gateway using the two M6 x 12mm screws provided in the package;

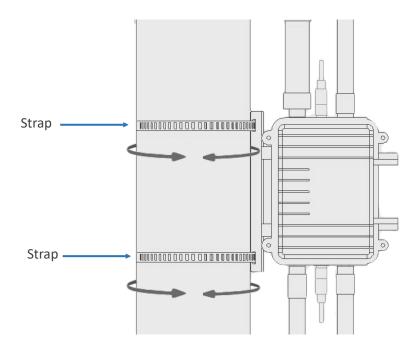


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3. Use an inner hexagonal spanner to tighten the screws so that the mounting bracket is secured on the gateway;

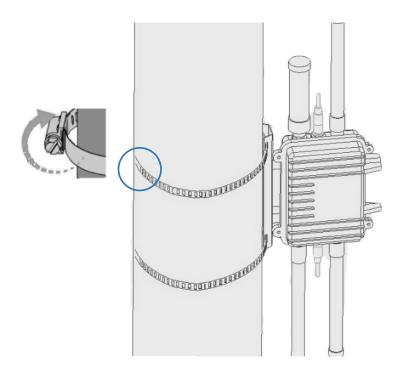


4. Select an appropriate height on the pole, position the mounting bracket against the pole, and then route the mounting straps through the slots on the bracket;



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5. Wrap the straps around the pole and lock the straps to prevent the mounting bracket from sliding down the pole.



## 2.2 GPS Module

The GPS module is automatically turned on after device bootup.

• To query the GPS information of the device, use the following command:

# vt\_data\_query --pretty gps

## 2.3 Connecting the Device to the Internet

GLR200-R is designed to connect to the internet via **Ethernet, cellular, or Wi-Fi** for data transmission. To connect it via Ethernet or cellular, refer to the steps outlined in 2.1.1 to set up the device. The device offers a Wi-Fi module as an optional feature, depending on the customer's specific use case.

To connect GLR200-R to a Wi-Fi access point, use the device's web management portal for configuration. The portal can also be used for managing the device settings.

- 1. Install the accessories and connect the Ethernet cable in the LAN + debugging cable tube to a host computer;
- 2. Log in to the web portal of the device using the default<u>LAN port IP: 172.18.1.1</u> with the following account:
  - Username: root
  - Password: rootpassword
- Navigate to Network > Wireless WIFI, change the default Wi-Fi mode from AP to client, and save the change;

	Wireless(WIFI)	
	WIFI Settings	
· series	General Setting Advanced Setting	
	Status	Mode: Master (SID: Vantron-188892 BSSID: OC CF 49-28-88-39 ( Encryption: mixed WPA WPA2 PSK (CCMP) Channel: 12-121 (2Hcj) T-P-Port: 20 GEm Signal: 37 GBm ( Note: - 45 GBm Bitrate: 300 Albeis ( Conserve; US
A Network	VIFI mode	AP Client (1) Switch Mode (2)

4. Under the **Wifi Client Setting** section, select the SSID of the target access point from the list, and input the password to join the network;

Wireless(WIFI)					
WIFI Settings					
General Setting Advanced Setting					
Status		SSID: ?   Mode: und es, Whelen: it shabled e	ictions) or not accordated		
WIFI mode		Clert	~	Switch Mode	
Protocol *		DHCP	~		
		Default DEICP; if the 1	WIFI access point needs	to specify IP; please select Static	
Vifi Client Setting					
ieleet SSED *		Mac Bouid *			Key *
62% ; vantron_test8_5G	~	Auto			•

5. When GLR200-R is successfully connected as a client, there will be the network information next to **Scan WIFI** button.

## 2.4 Data Transmission Over LoRaWAN

The LoRa module is automatically turned on after device bootup.

• To query the working frequency of the LoRa module, use the following command:

#### # gpio get lora freq

To ensure successful transmission of data packets from an end node to GLR200-R and ultimately to a network server, make sure the following prerequisites are met:

- 1. The end node is LoRa-enabled or connected to an intermediate LoRa-enabled device, such as a LoRa-enabled DTU, if it does not have LoRa capability.
- 2. The end node and GLR200-R are configured to operate on the same regional frequencies. GLR200-R typically operates at 915MHz in the US.
- 3. The end node, GLR200-R, and the network server are all compatible with the LoRaWAN protocol (GLR200-R supports V1.1 with backward compatibility).
- 4. The end node is a class A or class C device.

By registering GLR200-R and the end node with the same network server, GLR200-R will be able to transmit the data packets from the end node to the network server for further analysis and management.

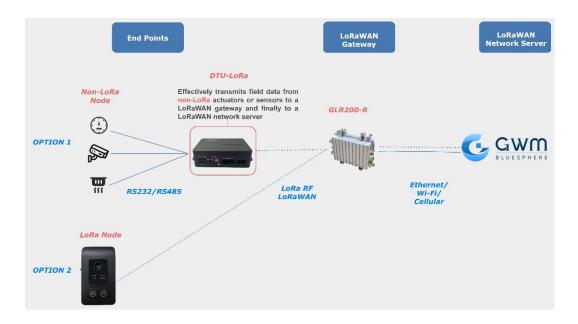
Please refer to chapter 3 for the typical use of GLR200-R in transmitting data packets from an end node to Vantron BalueSphere GWM, a self-developed cloud-based remote manager for IoT communication devices, which functions as the network server.

# **CHAPTER 3 USE CASE**

GLR200-R is typically used to transmit data from LoRa-enabled end nodes to a network server. For end nodes without LoRa capability, it is recommended to use an intermediate LoRa-enabled device, such as a LoRa-enabled DTU, to interface with both the end node and GLR200-R.

To ensure smooth data transmission over a LoRaWAN network, you need to register both the end nodes (or the LoRa-enabled intermediate device, such as a LoRa-enabled DTU for non-LoRa devices) and GLR200-R with the same network server. This allows you to monitor and manage the transmitted data without issues.

In the following topology, data packets from the end nodes are transmitted by GLR200-R to BlueSphere GWM, a self-developed remote management platform for IoT communication devices that acts as the LoRaWAN network server, where they are then managed.



The difference between option 1 and option 2 is that in option 1, a LoRa-enabled DTU (e.g., VT-M2M-DTU-LoRa from Vantron) is used to connect the non-LoRa-enabled end node and transmit data to GLR200-R, while in option 2, the end node is LoRa-enabled and can transmit data directly to GLR200-R once connected over LoRa.

Before you proceed, ensure that all prerequisites set out in 2.4 are met. Then, follow the steps below to register GLR200-R and the LoRa-enabled device with BlueSphere GWM, respectively to enable smooth data transmission.

- 1. Install the accessories and refer to the steps outlined in 2.3 to connect GLR200-R to the internet via Ethernet, cellular, or Wi-Fi (if the WLAN variant is chosen);
- 2. Ensure the LAN port of GLR200-R is connected to a host computer via the Ethernet cable in the LAN + debugging cable tube;
- 3. Log in to BlueSphere GWM at <a href="https://gatewaymanager.bluesphere.cloud/#/login">https://gatewaymanager.bluesphere.cloud/#/login</a> with the authorized account and corresponding password;

*Generally, the account information will be provided upon delivery of the device.* 

4. Click the user account in the top right corner and select the **User Profile** option after the login;

Gwm	Device Management						O 11	000 (UTC +8)	vantrongataway	Evantron.com *	. 0 0
Monitoring V	👔 🗰 🔍 Search					Operation + Saud	0.5++125	* Add D		er Pyofia	ay PLC
Provisioning	Device Groups	All Devices									
Device Management	Ungrouped (21)	Device Name	Hodel +	Device Status +	SN	Lora Gateway ID	Lota	Lora State	Group Name	License -	Operation
Configuration	🗆 🖿 VI-M2M-G202 (L)	V202101003-001	VT-M2M-GLR	Officer	V202101003-001	asas42363cb960w1	2		Unprosped	VT5Y5-20	
fige Computing	🗖 🐂 VT-M2M-0304 (0)	5102-20241150-000	W107-07-24/100	Didina	5102-20245118-00002		×		Unprosped	V75Y3-20	
Software Monagement	🔲 📁 VT-M2M-GLR (2)	5307-24100030-000	VT-DGL-AH-101-GE	Offices	5307-24100010-00012		×		Unproceed	VT5Y5-20	
iyatem 🔿	🖸 🖿 VT-M2M-R205 (0)	5302-2310000e-223	VT-M2M-OLR	Office	5302-23100006-12346	asaa40363cb96037	×	OTINE	Ungrouped	VT5Y5-20	
ogViewer	🔲 🔤 VT-M2M-R362 (0)	GLR-NA-R-1	VT-M2M-GLR	-	5302-23100006-12345	asaa40363c6960ad	2	Name Same	Unproupled	VT5Y5-20	

5. Locate the **Customer ID** and copy it for use in subsequent steps;

	User Profile			
Monitoring	Basic Information			
Dashboard	E-mail	vantrongateway@vantron	1.com	
Alarm Overview	Name	vantron		
Alarm Routing	Surname	gateway		
Device Report	SMS	+1 00000000		
Topology Viewer	Description			
MQTT Tracing	Language	English	Ø	
Data Widgets <	Last Login	Nov/29/2024 14:47:46		
Provisioning ^	-			
Device Management	Customer ID	D ay		
Configuration	Account Security			
Edge Computing	Password		Change Password	
Software Management				

> Log in to the web management portal (VantronOS) for GLR200-R using the <u>default LAN</u> port IP: 172.18.1.1;

Account: root

#### Password: rootpassword

C ▲ Not secure 172.18	5.1.1/cgi/gateway		61
tronOS			
	and the second	States of the local division in the local di	A DESCRIPTION OF THE OWNER OF THE
		al-0-2	
			Username
		VantronOS	root
		Welcome	Password
		Melouie	
			Login
	and a company	and the second	

7. Navigate to **BlueSphere**, paste the previously identified Customer ID and select **Enabled** from the **Enable Configurations** tab;

	Status	,	BlueShpere Cor	nfigration							
-	otatus	1	Connecting to the Vantron management, diversified r	's next-generation Internet of T eport generation, and strict and	hings gateway managem flexible security manage	ent system (BlueShpere). ement functions.	It provides flexible and pract	ical topology management	, comprehensive network	states menitoring, powerful alar	m
0	Quick Start	,	Enable Configration	2 Disabled	v						
11	Virtual Tunnel	>	Customer ID	0							
			Download Log								
ф	Network	>	disabled								
C	Users Manage	>									
o	Customization	~									
-	- Custom Program										
-	- IPK installer										
1	Manufactorer Info Mo	widy									
	BlueSphere										
-	LoraWan										

8. Wait a few seconds to allow the settings to take effect and the connection information will be automatically printed below the configurations;

Connecting to the Ventron's	- next-generation Internet of Things gateway management system (BlueShpere). It provides flexible and practical topology management, comprehensive network status monitoring, powerful alar
	rear-generation internet of rinning gateway management system (Dieconpres), it provides neurone and practical topology management, comprehensive network status monitoring, powertor and ort generation, and strict and flexible security management functions.
Enable Configration	Enabled
Customer ID	DC
Download Log	
24-11-29 06:31:33 [I	NFO] : dowload file success: /tmp/update/udmp_agent-vantronos_mipsel_24kc_musl-2.0.8-20240829.ipk
	NF0] : uninstall udmp_agent success
	NFO] : start install /tmp/update/udmp_agent-vantronos_mipsel_24kc_musl-2.0.8-20240829.ipk
24-11-29 06:31:55 [I	NFO] 6207 share_info.c:481:     / / / /
24-11-29 06:31:55 [T	NPO 6207 share info.c.483:  ////////////////////////////////////
24-11-29 06:31:55 [I	NF0] 6207 share info.c:484: //,//////////////////////////////////
	NFO] 6207 share_info.c:485:
	NFO] 6207 share_info.c:486: udmp agent version : 2.0.8
	NF0] 6207 share_info.c:487: app build time : 2024-08-29 14:03:23 NF0] 6207 share_info.c:488: current branch : gwm2.0
	NPOJ 6207 share_info.c:489: current branch : gwm2.0 NPOJ 6207 share info.c:489: system depend lb : musl
	NFO 6207 share info.c.490: system ceptral to : mast
	NF0] 6207 share info.c:491: log path : /tmp/log
	NFO] 6207 share_info.c:492: log level : 0
	NFO] 6207 share_info.c:493: compress flag : open
	NF0] 6207 share_info.c:494: compress level : 7 NF0] 6207 share_info.c:497: current run path : /
	NFO] 6207 share_info.c:497: current run path : / NFO] 6207 share_info.c:502: o ta upgrade type : vantronos
24-11-29 06:31:55 [1	NO 600 share_info.c:512:
	NF0] 6207 broker.c:251: broker listen on: mqtt://127.0.0.1:1884
	NF0] 6207 ota_business.c:221: download file save path: /tmp/update
	NFO] 6207 ota_business.c:222: system image upgrade env path: /etc/config
	NFO] 6207 ota business.c:223: breakpoint download file: close NFO] 6238 ota client.c:143: ota client time timeout reconnection: 0x779a5df0
	nroj 626 dra_intent.c:43: dra fitent timed reconnection: 6x//9add/0 EBUG] 6238 dra client.c:86: dra matt client connect
	NFO] 6236 broker.clist: broker client connect success
	NF0] 6238 ota_client.c:94: ota mqtt client connect is successful
	NF0] 6238 ota_client.c:103: ota sub success: /udmp/agent/ota/rpc/+
	NFO] 6236 broker.c:129: broker sub topic: /udmp/agent/ota/rpc/#
	ARN) 6207 business.ci1172: unknown device serial number ARN) 6227 business.ci1186: udmp disconnect, proxy device clear
	JANY jozof vusiness.c:ilisb: udmp disconnect, proxy device clear NFO1 : install udmp agent success, udmp agent runing
	mroj : domijađenje uni: https://apo.cha.prod-1301612748.cos.ap-
	/gwm/public/smPackage/application/gwm_adapter/1.0.1/2024/9/2/3/21/52/gwm_adapter-vantronos_mipsel_24kc_musl-1.0.1-20240828.ipk?q-sign-
	AKIDSnvpVxCCyWueCZwy6BPVVMPPPIQWizTo&q-sign-time=1732861889%3B1733466689&q-key-time=1732861889%3B1733466689&q-header-list=host&q-url-param-
list=&q-signature=1a	70c71d4d1cbccee83752b17eedf98ee1b74d1f

- 9. Navigate to the LoraWan page;
- 10. Select **Enabled** from the **Enable Configurations** tab and enter the **server address** that matches the login domain of BlueSphere GWM, then click the **Save & Apply** button;

ssl://udmp.bluesphere.cloud for AWS;

<u>ssl://udmp-cn.bluesphere.cloud</u> for Tencent cloud.

Status	,	Lorawan Protocol Configu Configure Lorawan devices under Vantros	iration 's next-generation IoT gateway management system	to achieve DTU net	work access, data uplink, data	downlink, and other operat	iona.	
Quick Start	>	Enable Configration	Enabled	~				
11 Virtual Tunnel	,	Region	U\$915					
in the local desired	- 33	Path	/dev/spidev0.1					
di Network	>	Gateway ID	AAAA40D63CB6DD7E					
🕑 Users Manage	>	Lorawan Data Forwarder Co	onfiguration					
O Customization	~	Log Level	Trace	~				
Custom Program		SynLog	Disabled	*				
IPK installer		Server Address	sst//udmp.bluesphere.cloud					
···· Manufacturer Info Me	odify				Save & Apply			
BlueSphere		Successfully configured						

You can confirm the domain information with the aftersales team.

11. Return to the BlueSphere GWM platform and navigate to **Provisioning > Device Management** to check if the gateway is online with LoRa module functioning properly;

You can use the **LoRa gateway ID** to determine which is the target device.

VantronOS > LoraWan page:

Status	>	Lorawan Protocol Config Configure Locawan devices under Vanto	ration 1 new-presention IoT gateway management system to achieve DTU network access, data opliak, data downlink, and other operations.
Quick Start	>	Enable Configration	Enabled
1 Virtual Tunnel		Region	U\$915
IP Virtual Tunnel	,	Path	/dev/spidev0.1
d Network	>	Gateway ID	AAAA40D63CB80D7E

#### BlueSphere > Provisioning > Device Management page:

Devices									
Device Name	Model -	Device Status *	SN	Lora Gateway ID	Lora	Lora State	Group Name	License *	Operation
V202101003-001	VT-M2M-GLR	Offline	V202101003-001	aaaa42d63cb960e1	~		Ungrouped	VTSYS-20	
5102-20241118-000	WIOT-GT-2AI100	Online	5102-20241118-00002		×		Ungrouped	VTSYS-20	
5307-24100010-000	VT-DGL-AH-101-GE	Offline	5307-24100010-00012	÷.	×		Ungrouped	VTSYS-20	
5302-23100006-123	VT-M2M-GLR	Offline	5302-23100006-12346	aaaa40d63cb960df	~	Offline	Ungrouped	VTSYS-20	
GLR-NA-R-1	VT-M2M-GLR	Offline	5302-23100006-12345	aaaa40d63cb960ad	~	Never Seen	Ungrouped	VTSYS-20	
5302-23100006-123	VT-M2M-GLR	Online	5302-23100006-12347	aaaa40d63cb8dd7e	~	Online	Ungrouped	VTSYS-20	(
5102-20241118-000	WIOT-GT-2AI100	Offline	5102-20241118-00003		×	1.00	Ungrouped	VTSYS-20	
5103-20241129-000	VT-DGL-AH-103-GE	Online	5103-20241129-00001	÷	×	3	Ungrouped	VTSYS-20	••••
5102-20241118-000	WIOT-GT-2AI100	Online	5102-20241118-00001	<del>.</del>	×	. •	Ungrouped	VTSYS-20	
GLR-NA-R	R102	Offline	5302-23100006-01234	2	×		Ungrouped	VTSYS-20	
5302-23100025-000	VT-M2M-R105	Offline	5302-23100025- <b>0</b> 0001	۵.	×	1.51	Ungrouped	VTSYS-20	
GLR-NA-4	VT-M2M-GLR	Offline	5302-24030031-00004	aaaa189ba5178894	~	Offline	Ungrouped	VTSYS-20	

After adding GLR200-R to BlueSphere GWM, you need to register the LoRa-enabled end node or the LoRa-enabled intermediate device with the platform. This will establish a connection between the end node and GLR200-R for data transmission.

Before registering the LoRa-enabled intermediate device (e.g., VT-M2M-DTU-LoRa from Vantron), you need to connect it with the end node, typically via a serial port, depending on the available interfaces on both devices.

- 1. Log in to BlueSphere GWM at <a href="https://gatewaymanager.bluesphere.cloud/#/login">https://gatewaymanager.bluesphere.cloud/#/login</a> with the authorized account and corresponding password;
- Navigate to Provisioning > Device Management and click the Add Device button under the Lora tab;

lentoring ^	Q farm							Add Device	Cateri	WY PLC
an ann ann ann	Device Groups	All Devices					L		]	
shboard arm Overview	<ul> <li>Ungrouped (20)</li> </ul>	Device Name	Last Seen +	DevEut	Profile	Class Brobled	Device Addr	Bettery Level	Gat	Operation
en Routing	<ul> <li>VT-M2H-0282 (1)</li> <li>VT-M2H-0LR (2)</li> </ul>	560307-63-3	Nov(19/2024, 17:28:06	0080+11505305+59	07AA_USVLS_PROFILE_VT_SENSOR	CLASS_C	00+90299		832	
nine Report	* 🖿 VT-DGL-AH (2)	M224040006-00000	Dec/03/2024, 20:20:51	0300#11905303#56	07AA_DH470_PROFILE_VT_SENS_	CLASS_C	01507355	<b>100%</b>	850	***
TT Thecing	VT-R2N-RE6100-AP (1)	M224040006-00002	Dec/02/2024, 20:20:50	0000e1150530e0e7	OTAA_CN470_PROFILE_V7_SONS	CLASS,C	00854568	HN 100%	850	***
a Widgers a		M224040006-00000	Dec/03/2024, 20:20:49	0000#1150530#043	OTAK_DN4T0_PROFILE_VT_SENS	CLASS_C	019:52:65		457	***
wisioning ^		M224040006-00010	Dec/02/2024, 20:20:48	0000e0150530d5f5	OTAA_DN4TO_PROFILE_VT_SENS	CLASS_C	01000633	100N		

3. Refer to the device label and fill in the information of the end node accordingly;

Gwm	Device menafernent			Torran 1972 Income	Ψ Ψ U
- ILUISIDHERE	Q Search			Add Device	Gateway PLC Lora
🖾 Monitating 🔷	Device Groups	All Devices			
Dashboard					_
Alarm Overview	<ul> <li>Ungrouped (7)</li> </ul>	Device Name Last Seen	DevEUI Profile Class Enabled Device Ac	dr Battery Level	Gateway Id Operation
Alarm Routing	<ul> <li>Im Loop (2)</li> </ul>				
Device Report	• 🖿 DEMO (5) Add	Device	×		
Topology Viewer		vice Name	DevEU1) check device label		0
MQTT Tracing		SLR-NA+R	0080e1150530db7d		
Data Widgets	(	AA key) check device label	Profile		
C Provisioning		287E151628AED2A6ABF7158809CF4F	OTAA_US915_PROFILE_VT_SENSOR +		
	De	scription	OTAA_CN470_PROFILE		
Device Management			OTAA_CN470_PROFILE_VT_SENSOR		
Configuration			OTAA_US915_PROFILE for LoRa sensor		
Edge Computing			OTAA_US915_PROFILE_VT_SENSOR		

*If the information is not provided on the device label, you may need to figure it out via the debugging interface of the device. Please confirm with the relevant personnel.* 

4. Wait a few seconds, and the device will be online, indicating successful registration with BlueSphere GWM. The date and time under the **Last Seen** tab indicate the last time data upload to the platform;

Gwm	Device Management					0	15:03 (1/70+3)	vertringsteiney	Qvertuision Y	₿ Ø
BEACLAHERE	Q. Seen							Aato	wice Gate	way PLC Los
tonitoring A	Device Groups	All Devices								
ashboard	oution droups	THEOLITICS								
larm Ovorview	+ Ungrouped (21)	Device Name	Last Seen 3 +	DevEUI	Profile	Class Erabled	Device Addr	Battery Level	Gateway Iz	Operation
arm Routing	<ul> <li>VT-M2N-G202 (1)</li> </ul>	GLR-NA-R	Nov/29/2024, 14:58:21	0000e1150530db7d	OTAA_US915_PROFILE_VT_SENSCR	CUASS_C	8e68cH00	100%	3000-7006	***
Nice Report	* 📴 5T-M2M-GLR (2)	serece-us-3	Nov/19/2024, 17:28:36	0080w11505306w59	OTAA_LIS915_PROFILE_VT_SENSOR	CLASS_C	00#50299	100%	aaaaddde!	***
pology Viewer	<ul> <li>VT-DGUAH (2)</li> </ul>									
DIT Incine	<ul> <li>&gt; VT-M2M-MM6106-AP (1)</li> </ul>	sensor us 6	Nov/19/2024.15:28:29	0000e1150530d3a8	OTAA_US915_PROFELE_VT_SENSOR	CLASS_C	00f5c7e3		aaaa40d6:	(***

5. Click the device name to access the details of data transmission.

C Gwm	Device Management > Device Ow	erview	0	15:04 (JTC+6) vantergetewey@vantros.com V 🏚 🙆 🔒
	Uplink Downlink			0
Dashboard	< GLR-NA-R			
Atarm Overview	I Information			
Alarm Routing	Device Name GLR-NA-R	Devilut OC	Profile OTAA_U3925_PROFILE_VT_SENSOR	Data Destinal CLASS_C
Device Report	Device Actor Office Actor	Setter/Lavel	Getrany 10 aana631657cbRets7a	Created Time
Topology Viewer	CONCREME	100%	33582.055105007#	
NOTT Tracing	1 Oata			
Data Widgets c	Time •	Data		Row Event
G Provincenng A	Nov(29/2024, 14:58:21	("num"133.9%,"g_sensor"1("s"1512,"y"1266,"2": 18872),"battery_lev	witter, payload_len131, battery_voltage14.089, light129361, temp123.	206) ('VecuplicationEd'''Scic425cb-4s0e-4a8de-9af9-1
Device Management	Nov/25/2024, 14:50:01	"battery_level":95;"peploed_ler="31;"temp":23.19;"turn":33.708;"	g_eensor" ("x":256,"y":0,"z": -15072),"bettery_voltage":4.009,"ight":2746	1] ['decupication1d':'c94cc664-b13-62ca-90c6-6 ,
Configuration	Nov/29/2024, 14:57:41	["battery_level":96/"temp":23.176/%gnt":27193/"num":33.856/ba	ttery_voltage1t4.000;"paylood_len1t31;"g_sencor15[1x1t256;"y1t0;"x1t-1567	['decupicatenId'Tet15640c-4172-4819-340e-' ;
Edge Computing	Nov/29/2024, 14:57:21	("g_samor")["1256;"2"-15616;"y"10;"battery_level"196;"temp":2	3.176,"payload_lan":31,"bartary_voltaga":4.09,"n.un":33.637,"iight":2722	7) ("decuplicationId";"296d3ea6-a935-4500-8cm2- ,
Software Management	Nov/29/2024, 14:57:01	(1g_sensor1)(101256/21-15872/910)(1gnt127437/hum133.84)	/battery_voltage1:4.089."payload_len":31/temp1:23.19/battery_lave11:96	['decuplicationId':'dc3b?069 ee26-470F-97/e-( ,

- Gateway ID indicates the LoRaWAN gateway that the end node is connected to;
- Clicking on the triangle after an entry will expand the details of the data that was uploaded to the platform at that time.

Data		
Time •	Data	Raw Event
"object": (		
"hum": 33.95,		
"g_sensor": { "x": 512,		
"y": 256, "z": -15872		
h		
"battery_level": 9 "payload_len": 31		
"battery_voltage"		
"light": 27361, "temp": 23.206		
<u>}.</u>		
"rxInfo": [ {		
1		

# **CHAPTER 4 DISPOSAL AND WARRANTY**

# 4.1 Disposal

When the device comes to end of life, you are suggested to properly dispose of the device for the sake of the environment and safety.

Before you dispose of the device, please back up your data and erase it from the device.

It is recommended that the device is disassembled prior to disposal in conformity with local regulations. Please ensure that the abandoned batteries are disposed of according to local regulations on waste disposal. Do not throw batteries into fire or put in common waste canister as they are explosive. Products or product packages labeled with the sign of "explosive" should not be disposed of like household waste but delivered to specialized electrical & electronic waste recycling/disposal center.

Proper disposal of this sort of waste helps avoid harm and adverse effect upon surroundings and people's health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

# 4.2 Warranty

### **Product warranty**

VANTRON warrants to its CUSTOMER that the Product manufactured by VANTRON, or its subcontractors will conform strictly to the mutually agreed specifications and be free from defects in workmanship and materials (except that which is furnished by the CUSTOMER) upon shipment from VANTRON. VANTRON's obligation under this warranty is limited to replacing or repairing, at its option, of the Product which shall, within <u>24 months</u> after shipment, effective from invoice date, be returned to VANTRON's factory with transportation fee paid by the CUSTOMER and which shall, after examination, be disclosed to VANTRON's reasonable satisfaction to be thus defective. VANTRON shall bear the transportation fee for the shipment of the Product to the CUSTOMER.

### **Out-of-Warranty Repair**

VANTRON will furnish the repair services for the Product which are out-of-warranty at VANTRON's then-prevailing rates for such services. At customer's request, VANTRON will provide components to the CUSTOMER for non-warranty repair. VANTRON will provide this service as long as the components are available in the market; and the CUSTOMER is requested to place a purchase order up front. Parts repaired will have an extended warranty of 3 months.

### **Returned Products**

Any Product found to be defective and covered under warranty pursuant to Clause above, shall be returned to VANTRON only upon the CUSTOMER's receipt of and with reference to a VANTRON supplied Returned Materials Authorization (RMA) number. VANTRON shall supply an RMA, when required within three (3) working days of request by the CUSTOMER. VANTRON shall submit a new invoice to the CUSTOMER upon shipping of the returned products to the CUSTOMER. Prior to the return of any products by the CUSTOMER due to rejection or warranty defect, the CUSTOMER shall afford VANTRON the opportunity to inspect such products at the CUSTOMER's location and no Product so inspected shall be returned to VANTRON unless the cause for the rejection or defect is determined to be the responsibility of VANTRON. VANTRON shall in turn provide the CUSTOMER turnaround shipment on defective Product within fourteen (14) working days upon its receipt at VANTRON. If such turnaround cannot be provided by VANTRON due to causes beyond the control of VANTRON, VANTRON shall document such instances and notify the CUSTOMER immediately.

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# Appendix Regulatory Compliance Statement

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

### **FCC Compliance Statement**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### Exposure to radio frequency energy:

The radiated output power of this device meets the limits of FCC radio frequency exposure limits. This device should be operated with a minimum separation distance of 20cm (8 inches) between the equipment and a person's body.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **ISED Canada Compliance Statement**

This device complies with ISED Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

#### Exposure to radio frequency energy:

The radiated output power of this device meets the limits of ISED Canada radio frequency exposure limits. This device should be operated with a minimum separation distance of 20cm (8 inches) between the equipment and a person's body.

Le présent appareil est conforme aux CNR d'ISDE Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

La bande 5150–5250 MHz est réservée uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

### L'exposition à l'énergie radiofréquence:

La puissance de sortie rayonné de cet appareil est conforme aux limites de la ISDE Canada limites d'exposition aux fréquences radio. Cet appareil doit être utilisé avec une distance minimale de séparation de 20cm entre (8 pouces) l'appareil et le corps d'une personne.

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