



Owner's Manual

Original Instructions

GMLink IoT Gateway

Applicable Models: GBM-NL100



Gree Dong Mingzhu Shop

To Users

Thank you for choosing Gree products. Before you install and operate the product, please read this manual carefully, so that you can understand and use this product properly. For the correct installation and operation of our product and for achieving the expected operating effect, please be aware of the following:

- (1) This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- (2) In order to ensure the reliability of the product, the product will consume some power in the standby state for maintaining the normal communication of the system.
- (3) Please select a reasonable model according to the actual engineering situation, otherwise the stability of the system will be affected.
- (4) This product cannot be installed in the corrosive, flammable and explosive environment and the places with special requirements. Otherwise it will cause the abnormal operation of the device or shorten its service life, and even cause fire or serious injury. For the above special occasions, special products with corrosion prevention or explosion prevention should be selected.
- (5) If you need to install, remove and repair the product, you should contact our designated customer service phone number (4008365315) to seek professional support. Otherwise, if there is related damage, our company may not be able to bear the relevant legal responsibility.
- (6) When using the platform supporting this product, your network device model, MAC address, device unique identification code, IMEI number, point information, error/alarm information will be collected for binding the device and data display on the platform. If you refuse to provide the corresponding information, you may not be able to use certain functions or services normally.

- (7) Data storage: the storage period of your information will be processed in accordance with the minimum period of local law in the People's Republic of China. According to the quantity, nature and sensitivity of the personal information, we will determine the storage period of data (retain for a longer period of time unless required by specific law), and we will delete or anonymize the data beyond the service period.
- (8) If you need to delete, change, access, obtain or cancel the authorized data collection of your data, please send an email to green_tech@cn.gree.com to inform us, and provide real and effective contact information. We have set up a dedicated personal information protection department. Under normal circumstances, we will reply the email within 15 days.
- (9) All illustrations and information in the manual are for reference only. In order to make the product better adapt to customers, our company will continue to make improvement and innovation. If the product is adjusted, please refer to the actual product.

Special Statement

Dear users:

Thank you for choosing GMLink edge controller product series (hereinafter referred to as “edge controller”). When you decide to use this series of controllers, it means that you have understood and accepted the following terms:

- (1) If the product is unable to work and/or losses are caused due to hacker attacks, government regulation, power failure, network failure, communication line failure or other reasons or force majeure, our company may not be able to bear the relevant legal responsibilities.
- (2) When using the edge controller, we must ensure that all controllers in the system are powered on. For all losses caused by the power failure of the edge controller, our company may not be able to bear the relevant legal responsibility.
- (3) The pictures listed in this manual are for illustration only, and the final effect is subject to the actual product.

Before installing and using this device, you should pay attention to the following contents and matters:

1) Device installation

- ① Please be sure to install the device indoors in a hard-to-reach and locked electric control cabinet.
- ② Please install the device in a place free from electromagnetic interference or dust.
- ③ The power cable and communication cable must be routed separately.
- ④ Do not lay the power cable and communication cable along the lightning conductor.
- ⑤ In a residential environment, the operation of this device may cause radio interference.
- ⑥ Normal working environment requirements for the edge controller:
 - a. Temperature: -10~+60℃.
 - b. Humidity is less than or equal to 85%.

c.Installed in the indoor electric control cabinet to avoid direct sunlight, rain and snow, etc.

2) Power supply

- ① The installation must be done by the professionals. Improper installation may lead to fire or electric shock.
- ② Make sure that the power plug is dry and clean before inserting it into the socket.
- ③ Before touching the electrical components, ensure that the device is powered off.
- ④ Do not touch the device with wet hands, which may lead to electric shock.
- ⑤ Be sure to use the power cable with specified specifications. Poor contact or improper installation may lead to fire.
- ⑥ If the power cable is incorrectly connected or the input power is out of the allowable range, fire hazard and damage to the device may be caused.
- ⑦ It cannot be directly connected to the port of the outdoor cable.

3) Communication

- ① Ensure that the communication cable (see Schedule 1) is connected to the correct interface, otherwise communication failure may happen.
- ② After connecting the wire, insulation tape should be used for protection to avoid oxidation and short circuit.

Contents

1 Safety Notices (Please be sure to abide)	1
2 Product Overview	1
2.1 Components	2
2.2 Network Topology	2
3 Detailed Instructions of Product	4
3.1 Interface Description	4
3.2 Wiring Instructions	5
3.2 LED Indicator, Button and Dip Switch	7
3.3 GMOS Development Software	9
4 Product Installation Guide	10
4.1 Controller Dimensions	12
4.2 Product Installation Methods	12
4.3 Selection of Communication Cable Material	16

1 Safety Notices (Please be sure to abide)



Warning: If not abide strictly, it may cause severe damage to the unit or the people.



Note: If not abide strictly, it may cause slight or medium damage to the unit or the people.



This sign indicates that the operation must be prohibited. Improper operation may cause severe damage or death to people.



This sign indicates that the items must be observed. Improper operation may cause damage to people or property.

2 Product Overview

GMLink edge controller is a kind of communication module used for electromechanical equipment integration and remote monitoring. The device complies with relevant national regulations and laws. It is a single antenna device which is applicable for the scene with low transmission rate. The following diagram shows the appearance of the edge controller:



Figure 2.1 Schematic Diagram of Edge Controller

Edge controller functions:

- (1) Support configuration programming, and quickly realize the secondary development in the site
- (2) Eight I/O interfaces onboard, supporting I/O device integration;
- (3) One RS485 interface, supporting access to Modbus RTU device;
- (4) Support access to I/O expansion module, which can be expanded to 64 control units;

(5) Remote monitoring can be achieved through wireless 4G network and wired Ethernet;

(6) Support SMS alarm, event control, timer and other functions. This system supports a maximum of 2000 points;

(7) Access to GMLink network controller to achieve wireless data transmission.

2.1 Components

The edge controller kit contains the following components.

Component name	Quantity	Configuration mode
GMLink edge controller	1	Equipped as standard
Owner's Manual	1	Equipped as standard
Qualification certificate	1	Equipped as standard
8-bit connection terminal	1	Equipped as standard
6-bit connection terminal	2	Equipped as standard
Antenna	1	Equipped as standard

Open the kit and check if the package is good. If the package is damaged, immediately notify the relevant personnel to replace.

2.2 Network Topology

The control system topology of GMLink edge controller is shown in the following figure:

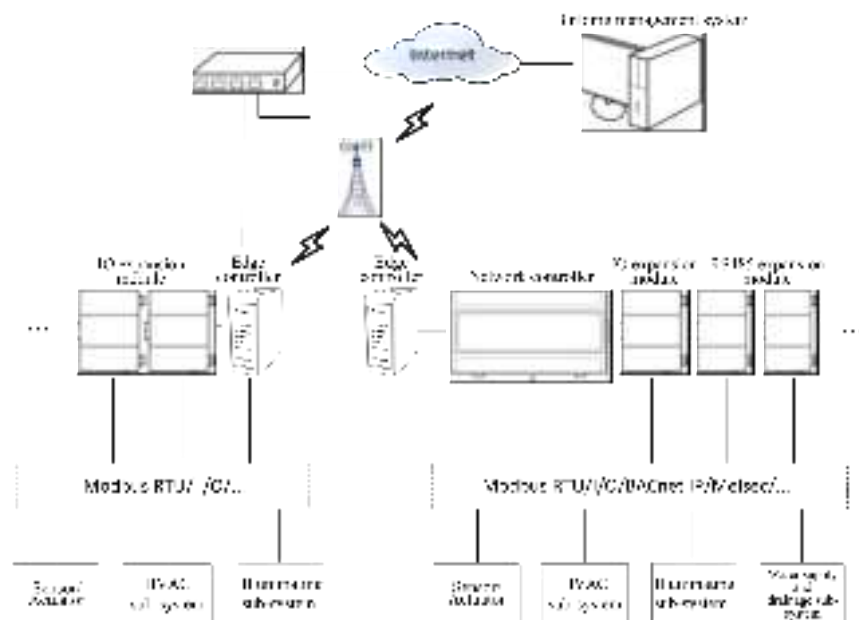


Figure 2.2 Control System Topology

3 Detailed Instructions of Product

3.1 Interface Description

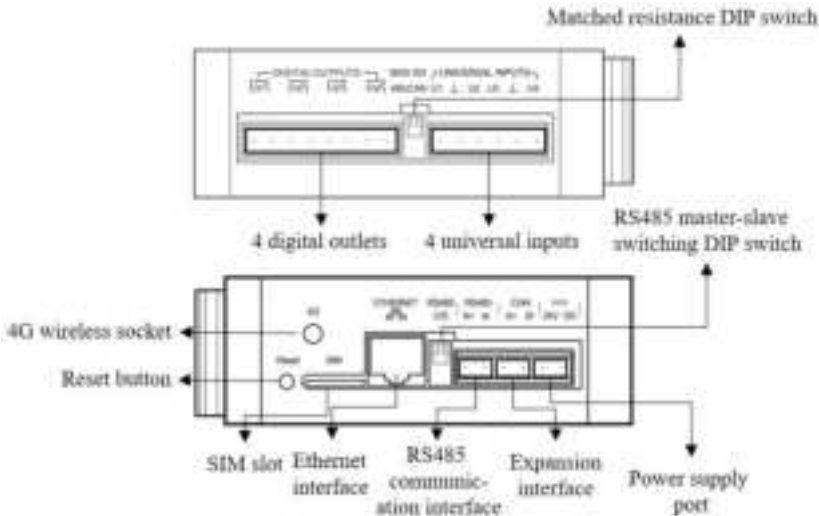



Figure 3.1 Edge Controller Interface Diagram

- (1) Power input
- 1) Working voltage: 24VDC or 24Vac 60Hz (Class 2 Power Supply, output short protected);
 - 2) Maximum current: 70mA

Open Type, Operating Control, Type 1.B, Class II Control. 



Caution!

When the quantity of expansion modules connected to expansion interfaces reaches a certain level (not more than 10 are recommended), the bus current may be insufficient. Therefore, you need to add additional power supplies to ensure the normal operation of expansion modules.

- (2) Hardware interface

Interface	Hardware features	Functions
-----------	-------------------	-----------

Ethernet interface	Default IP: 192.168.0.200 Interface type: RJ45, 10/100Mbit	<ul style="list-style-type: none"> ● Configuration programming software communication: access to the GMOS development software at the PC side through standard network cable; ● Device integration: access to the GMLink network controller for data transmission; ● Data sharing: access to the BMS building management system.
RS485 communication interface	Twisted pair: A+, B- Bus terminal resistance (set by DIP switch) : 120Ω Electrical characteristics: Electrical isolation	<ul style="list-style-type: none"> ● Device integration: can be configured as communication master station, integrated with Modbus RTU and other protocol devices;
Expansion interface	Twisted pair: A+, B- Bus terminal resistance (set by DIP switch) : 120Ω	<ul style="list-style-type: none"> ● Can be connected to the I/O expansion module through the communication cable.
SIM slot	Card inserting installation	<ul style="list-style-type: none"> ● The SIM card is inserted here and the SIM card of the three operators are supported. The SIM drawer is ejected by pressing inwards through the round hole in the SIM drawer
4G wireless socket	\	<ul style="list-style-type: none"> ● Plug in the 4G antenna

Table 3.1 Hardware Interface Description Table

**Caution!**

Do not pull out or insert the SIM card when the power is on.

(3) Onboard I/O interface

1) UI: universal input signal acquisition

Analog input		
Signal type	Range	Accuracy
Voltage signal	0-10V	0.02V
Current signal	0-20mA	0.02mA
Resistance signal	0-100kΩ	0.02kΩ

Table 3.2 Analog Input Description

Digital input		
Signal type	Range	Status
Voltage signal	0-10V	<=1V, disconnected, status value is 0 >1V, closed, status value is 1
Resistance signal	\	>=27kΩ, disconnected, status value is 0 <27kΩ, closed, status value is 1

Table 3.3 Digital Input Description

*Using wire type RV90, 18AWG, Use copper Conductors Only

2) DO: relay output, normally-opened contact

Signal type	AC	DC
Power-off voltage	0-240V (±10%)	0-28V (±10%)
Rated current	Max AC 2A (or 240Vac, 1.4A steady for valve load)	

Table 3.4 Relay Output Description

*Using wire type RV90, 18AWG, Use copper Conductors Only



Caution!

The relay output cannot be used for inductive loads, otherwise external protection is required for inductive loads.

3.2 Wiring Instructions

(1) Universal input (UI) wiring:

1) The resistance acquisition wiring way is as follows (U1, U2, U3, U4 are input interfaces, G is ground).

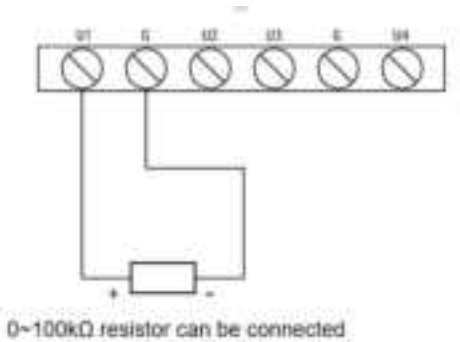


Figure 3.2 Resistance Acquisition Wiring Diagram

2) Voltage acquisition wiring way is as follows (U1, U2, U3, U4 are input interfaces, G is ground).

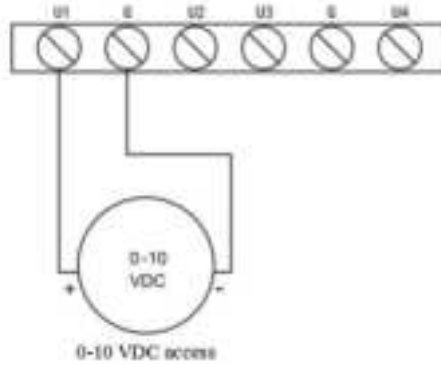


Figure 3.3 Voltage Acquisition Wiring Diagram

3) Current acquisition wiring way is as follows (U1, U2, U3, U4 are input interfaces, G is ground).

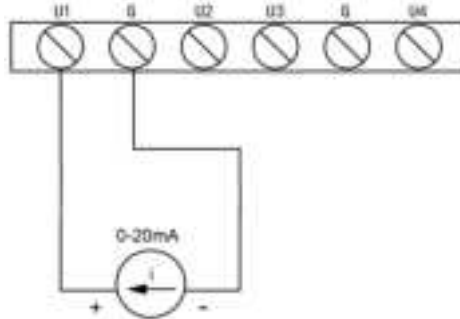


Figure 3.4 Current Acquisition Wiring Diagram

4) Digital quantity acquisition wiring is as follows (U1, U2, U3, U4 are input interfaces, G is ground).

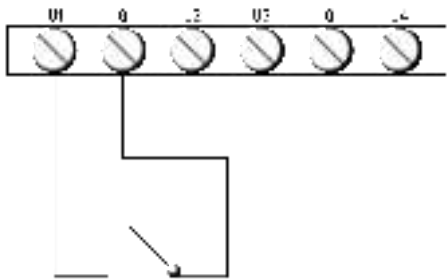


Figure 3.5 Digital Quantity Detection Wiring Diagram

(2) Relay output DO wiring:

The wiring way of relay output interface is shown as follows.

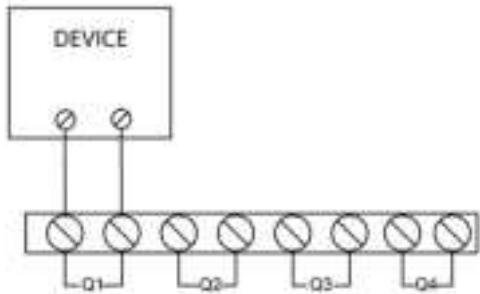


Figure 3.6 Relay Output Wiring Diagram

(3) Expansion wiring

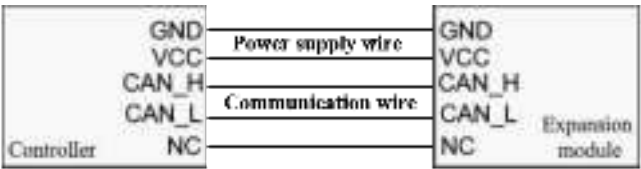


Figure 3.7 Wiring Diagram of Communication between Controller and Expansion Module

3.3 LED Indicator, Button and Dip Switch

(1) Indicator

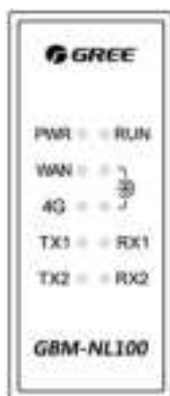



Figure 3.8 Indicator Diagram

Description of indicator status after power-on:

Indicator status	Description
All indicators are always on	Self-detect after power-on

Indicator description in normal operation:

Indicator	Color	Status	Description
PWR	Red	Always on	The power supply is normal
RUN	Green	Blinks 1s/time	The system is running normally
WAN	Green	Always on	The server connection fails
		Blinks 1s/time	Data is being transmitted
		Always off	The protocol opening function is not configured
4G	Green	Blinks 2s/time	The network is being connected
		Blinks 500ms/time	Data is being transmitted
	Green	Always on	The signal strength is indicated by two indicators arranged up and down. Indicator 1 is on the top and indicator 2 is on the bottom. For details, see Table 3.6

TX1	Green	Blinks	RS485 data is sent
RX1	Orange	Blinks	RS485 data is received
TX2	Green	Blinks	CAN data is sent
RX2	Orange	Blinks	CAN data is received

Table 3.5 Indicator Description

Status of indicator 1	Status of indicator 2	Signal strength
On	On	Strong
On	Off	Less strong
Off	On	Medium
Off	Off	Weak

Table 3.6 Description of Signal Strength Indicator

(2) Button

Button description (see Figure 3.1 for specific positions) :

Reset	Holding for 2s, the edge controller will restore the IP address of the Ethernet interface to the defaulted IP address (192.168.0.200) and then restart
-------	--

(3) Dip switch

1) BIAS SW

- ①CAN: When the edge controller is connected to the expansion module, a matching resistor shall be set.
- ②RS485: If the communication distance of the RS485 bus of the edge controller is long or the communication quality is poor, a matching resistor shall be set.

Matching resistance DIP setting diagram:

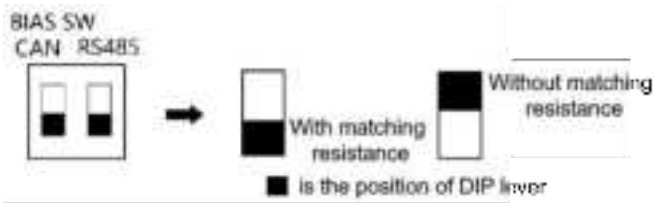


Figure 3.9 Matching Resistance DIP Setting Diagram

2) RS485 C/S

When the controller is the primary communication station, the DIP switch should be set as follows:



Figure 3.10 Primary Station Setting Diagram

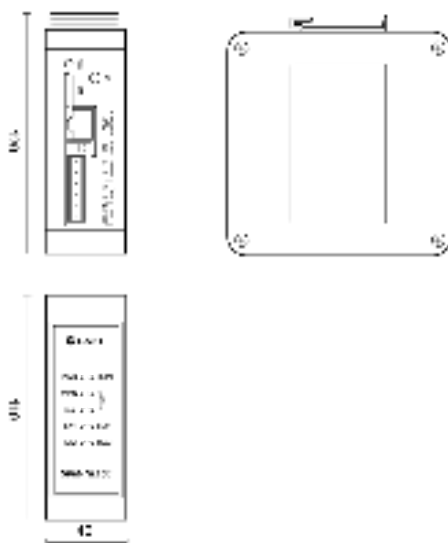
3.4 GMOS Development Software

The GMOS development software is compatible with GMLink controller products. It provides engineering management, point configuration, logic programming and other functions to meet the requirements such as onsite device access, device operation logic development, and protocol opening. For details, see the GMOS development software instructions.

4 Product Installation Guide

4.1 Controller Dimensions

Unit: mm



Length × width × height: 40×120×110

Figure 4.1 Three Dimensions View

4.2 Precautions

A. Purpose of control: BUILDING AUTOMATION CONTROLS AND SYSTEMS, Operating Control, Edge Control;

B. Using wire type RV90, 18AWG, Use Copper Conductors Only;

C. Indoor use only;

D. Pollution Degree 2;

E. Rated impulse voltage: 2500V;

F. The device must be installed professionally. The installation must be controlled and requires special training;

G. The intended use is generally not for the general public. It is generally intended for industrial/commercial use;

H. The connector is located the transmitter enclosure and can only be accessed by

disassembling the transmitter that is normally required. The does not have access to the connector.

4.3 Product Installation Methods

The guide rail installation procedures are as follows

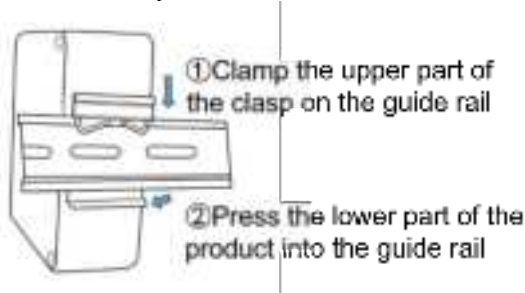
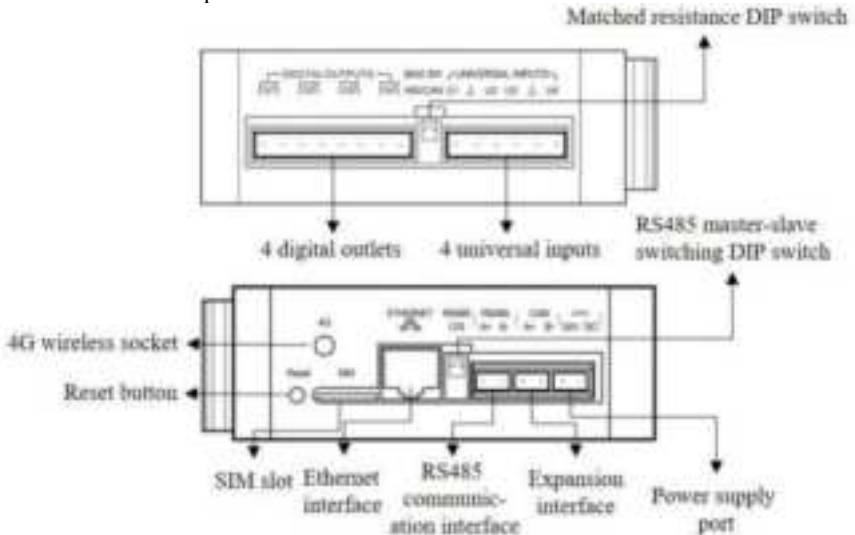


Figure 4.2 Installation Procedure Diagram

4.4 Identification of Terminals of Wiring Diagram

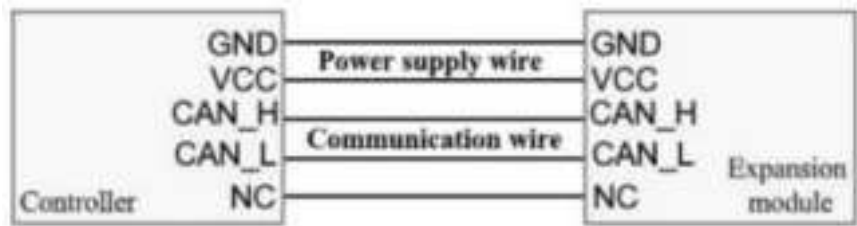
Interface Description:



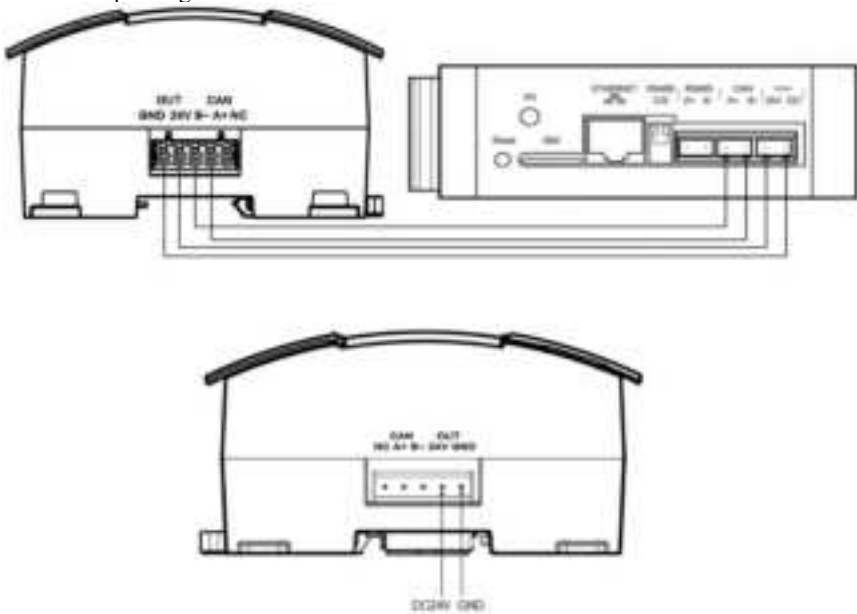
*The branch switch in the installation room shall not more than 10 A.

*If DIGITAL OUTPUTS is connected to 125V or 240Vac, the cables of which shall be separated from other cables by reinforced insulation or by enough reinforced distance.

System Wiring Diagram:

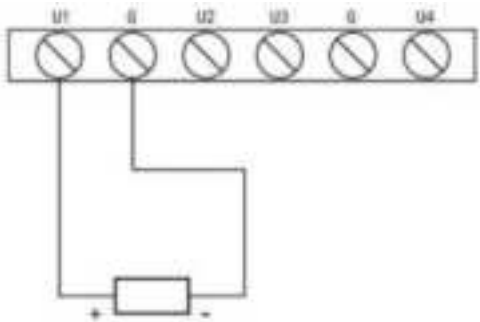


Example diagram:



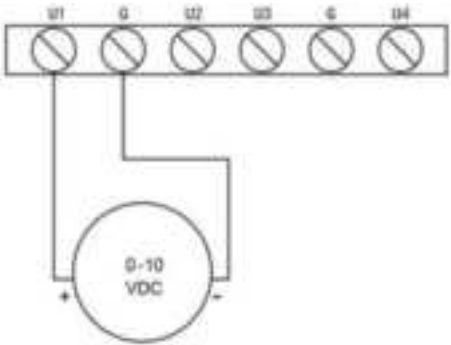
I/O Interface Wiring Instructions:

A. Resistance Acquisition Wiring Diagram

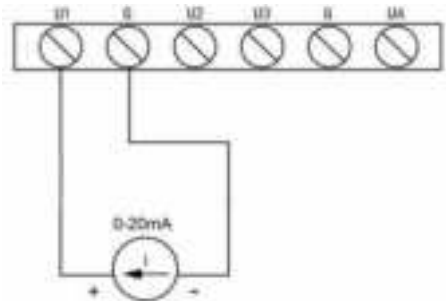


0~100kΩ resistor can be connected

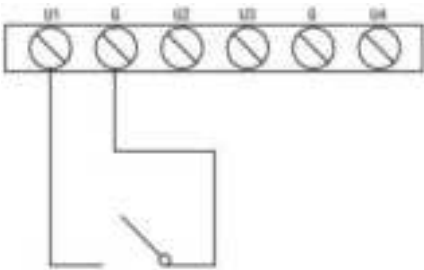
B. Voltage Acquisition Wiring Diagram



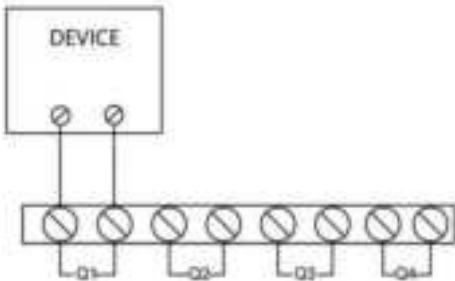
C. Current Acquisition Wiring Diagram



D. Digital Quantity Detection Wiring Diagram



E. Relay Output Wiring Diagram



4.5 Selection of Communication Cable Material

The system consists of various components, and each component must communicate effectively to work properly. Communication connections includes:

- (1) The communication between the edge controller and the PC uses the standard Ethernet communication cable;
- (2) The communication between the edge controller and the device on the RS485 bus needs to be connected with the communication cable, and the length of the communication cable is determined by the actual project;
- (3) When the edge controller and the expansion module are not in the same guide rail or the quantity of expansion modules is greater than 10, it is necessary to connect with the communication cable;
- (4) The selection of communication cables must use copper wires only. The specific requirements are shown in the table below.

Material of cable	Communication cable length L(m)	Cable diameter (mm ²)	Wire Type	Remark
Common sheath twisted-pair copper cable (RV)	L≤40	≥2×0.75 (AWG 18)	UL24 64	The maximum communication distance of the expansion bus is 40m
Common sheath twisted-pair copper cable (RVV)	L≤40	≥2×0.75 (AWG 18)	UL24 64	The maximum communication distance of the expansion bus is 40m

4.6 Warning

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

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.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.

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

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux

CNR d'Innovation, Sciences et Développement économique 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;
- 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

For FCC/IC RF exposure statement:

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.





GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

Add: Jinji West Rd., Qianshan, Zhuhai, Guangdong 519070, P. R. China

Tel: (+86-756) 86522218

Fax: (+86-756) 8669426

E-mail: global@cn.gree.com www.gree.com