# Cellular IoT M2M RTU





S275 User Manual

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Shenzhen Beilai Technology Co., Ltd

Website: https://www.bliiot.com



#### Preface

Thanks for choosing BLIIoT Cellular IoT M2M RTU. These operating instructions contain all the information you need for operation of a device in the RTU S27 family.

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#### Disclaimer

This document is designed for assisting user to better understand the device. As the described device is under continuous improvement, this manual may be updated or revised from time to time without prior notice. Please follow the instructions in the manual. Any damages caused by wrong operation will be beyond warranty.

#### **Revision History**

Revision Date	Version	Description	Owner
November 30th, 2021	V1.0	Initial Release	XJH
October 21st, 2022	V1.1		LKY



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### **1** Introduction

#### 1.1 Overview

The Cellular IoT M2M RTU is an industrial class, high reliability, high stability, and programmable Remote Terminal Unit (RTU). It embedded 32-Bit High Performance Microprocessor MCU, inbuilt industrial Cellular module. The RTU features 8 digital inputs, 6 analog inputs, 4 relay outputs, 1 ambient sensor input for monitoring onsite temperature and humidity, and 1 RS485 serial port. And as Modbus master, the RTU can connect to expansion I/O module or read data from instruments, PLC and other devices.

Users can set high and low limit according to different application scenarios, when alarm occurs, the RTU will notify users by SMS, dialing, and also uploading data to cloud platform, monitoring center. The RTU also can be used as a remote switch, remote I/O, remote smart PLC, timer switches, which is able to open the gate or turn on the machine with a free charge call at specified time to save time for daily maintenance.

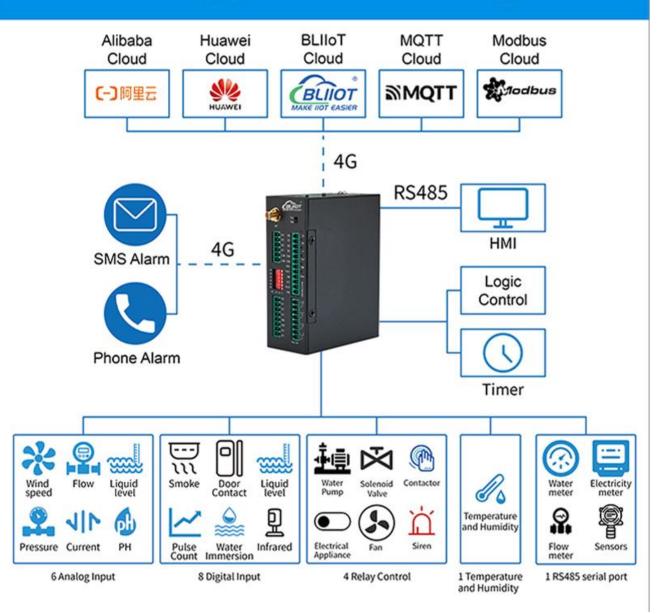
The RTU supports BLIIoT IoT RTU protocol, Modbus RTU over TCP protocol, Modbus TCP protocol, MQTT protocol, which can communicate directly with the server, cloud platform or SCADA. It is a cost effective IoT solution for industrial automation, security monitoring system, automatically measurement and control system, BTS monitoring, remote data acquisition, telemetry systems, automatically control system.

## **1.2 Typically Applications**

BTS Monitoring, Security Alarm System applications, Supervision and monitoring alarm systems, Automatic monitoring system, Vending Machines security protection, Pumping Stations, Tanks, Oil or Water levels, Buildings and Real Estate, Weather Stations, River Monitoring and Flood Control, Oil and gas pipelines, Corrosion protection, Temperatures, Water leakage applications, Wellheads, boat, vehicle, Energy saving, street lights control system, Valve controls, Transformer stations, Unmanned machine rooms, Control room application, Automation System, M2M, Access Control System, etc.



# S275 Application Diagram



# **1.3 Safety Directions**



#### Safe Startup

Do not use the unit when using GSM/3G/4G equipment is prohibited or might bring disturbance or danger.



#### Interference

All wireless equipment might interfere network signals of the unit and influence its performance.



## 1.4 Packing List

Please make sure below items are included in the package:

(Pictures are for reference only)

 1xRTU, Wiring terminal, 1xMini USB, 1xSMA cellular antenna, 1xPower adaptor, Wall-mounting clip kit, DIN-Rail mounting clip kit, Product qualification certificate, Warranty card



#### 1.5 Features

- GSM/GPRS/3G/4G network communication, can be operated from anywhere, no distance limitation;
- ➢ Wide range power supply 9~36VDC with over voltage and phase-reversal protection;
- Embedded ARM Cortex-M4 32 Bit RISC Core, 168 MHz inside, RTOS system, reliable performance with in-built watchdog;
- > 8 digital inputs, supports both dry contact and wet contact. Logic level: 10~30V or short circuit



treated as close, 0~3V or open circuits treated as open. DIN0 as a high-speed pulse counter, sampling frequency: 1MHz; DIN1~3 as low-speed pulse counter, anti-shake time can be set 1~2000ms, default 1ms; DIN1 with arm and disarm function;

- 4 relay output (5A@30VDC, 5A@250VAC), can auto control by timer, alarm-link and remote control by SMS, cloud. The first DO can set time to control by authorize number;
- I temperature & humidity sensor input for monitoring onsite environment, the sensor model is AM2301, temperatures range from -40°C to 80°C, with a 0.5°C accuracy, humidity range from 0 to 100RH%, with a 3% accuracy;
- > 6 analog inputs, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output transducers;
- > Inbuilt 32G SD card to save up to tens of thousands historical data and events;
- 1 RS485 port, support Modbus slave protocol, can link up to SCADA, HMI, DSC, PLC. Support Modbus Master protocol, can connect to 16 Modbus Salve, e.g.: Data Acquisition Module, meters, generator, PLC, VFD, etc., and 320 tags can set alarm value and content, also support data transparent transmission;
- Powerful SMS function: Threshold high SMS alert, SMS set, SMS inquiry, SMS command for Modbus PLC, and SMS monitoring communication with Slaves;
- > Inbuilt 2 DC output for external transducers to save wiring cost;
- Automatically resend the data while communication interrupt or failure, and failure will alert by SMS;
- > Supports remotely restart. configure and operate by SMS commands;
- I0 SMS Alert and auto dial numbers for receiving alarm message, can program to receive specified alarm message. The authorized numbers also can dial to open the door or turn on/off machine with a free charge call at the specified time;
- > Inbuilt inter-lock logic programmer and powerful timer program function;
- Modular structure, replace a module to upgrade the network from 2G to 3G/4G or 3G to 4G;
- Support SMS, dial, GPRS, 3G, 4G network for alert, USB port for configuration and upgrade firmware;
- Inbuilt large capacity rechargeable backup battery, which is able to alert when external power failure;
- Support TCP/UDP, MQTT, Modbus TCP, Modbus RTU over TCP, BLIIoT IoT RTU protocol and data transparent transmission;



- Metal case with IP30 protection grade, safely isolated from inner system, especially suitable for industrial control application.
- Small size: 108mmx82mmx40mm, support wall-mounting and DIN Rail mounting.

# **1.6 Technical Specifications**

Category	Parameter	Description			
	Input Voltage	DC 9~36V			
	Power Consumption	Normal: 50mA@12V, Max: 150mA@12V			
	Output	2 Channel; Voltage: 9~36V DC; Current:			
Power	Output	1500mA@12V(Max)			
	Protection	Reverse wiring prevention;			
	Protection	ESD Air: 15KV; Surge: 4KV			
	Backup Battery	3.7V/900mA			
USB	USB	1xMini USB			
	QTY	1xRS485			
	Baud Rate	1200bps-115200bps			
	Data Bit	8			
Serial Port	Parity Bit	None, Even, Odd			
	Stop Bit	1, 2			
	Protocol	Modbus RTU(slave), Modbus RTU(master)			
	Protection	ESD Contact: 8KV; Surge: 4KV(8/20us)			
	QTY	8 Channel			
	Туре	Support both Wet contact and Dry contact			
	Dry Contact	Close: Short circuit; Open: Open circuits			
	Wet Contact	Close: 10~30V; Open: 0~3V			
Digital Input		DIN0 as a high-speed pulse counter, sampling			
	Others	frequency: 1MHz; DIN1~3 as low-speed pulse counter,			
	Others	anti-shake time can be set 1~2000ms, default 1ms;			
		DIN1 with arm and disarm function;			
	Protection	2KVrms			
	QTY	4 Channel			
	Туре	Relay output (5A@30VDC, 5A@250VAC)			
Digital Output	Others	The first DO can set time to control by authorize			
		number; Custom setting close and open times			
	Protection	2KVrms			
Analog Input	QTY	6 Channel			
	Туре	Differential input, 4-20mA/0-20mA/0-5V			



	Resolution	12Bit				
		±0.1% FSR @ 25°C				
	Accuracy	±0.3% FSR @ -10 and 60°C				
	-	±0.1% FSR @ 25°C				
	Sampling Rate	200ms				
	Input Impedance	>1M ohms				
	Resolution	16bit(0.1%RH, 0.1°C)				
	Sampling Rate	200ms				
Temperature&	Temperature Range	-40 to +80°C				
Humidity	Accuracy	0.5°C				
(AM2301)	Humidity Range	0 to 99RH%				
	Accuracy	3%RH				
		Drawer type, Support 1.8V/3V SIM/UIM card, Built-in				
	SIM	15KV ESD protection				
	SIM Slot	1				
		GSM/EDGE:900,1800MHz				
		WCDMA:B1,B5,B8				
	L-E Version	FDD-LTE:B1,B3,B5,B7,B8,B20				
		GSM/EDGE:900,1800MHz				
		WCDMA:B1,B8				
	L-CE Version	TD-SCDMA:B34,B39				
		FDD-LTE:B1,B3,B8				
4G		TDD-LTE:B38,B39,B40,B41				
		WCDMA:B2,B4,B5				
	L-A Version	FDD-LTE:B2,B4,B12				
		GSM/EDGE:850,900,1800MHz				
		WCDMA:B1,B2,B5,B8				
	L-AU Version	FDD-LTE:B1,B3,B4,B5,B7,B8,B28				
		TDD-LTE:B40				
		WCDMA:B2,B4,B5				
	L-AF Version	FDD-LTE:B2,B4,B5,B12,B13,B14,B66,B71				
		GSM:900,1800				
	CAT-1 Version					
		IPV4, TCP/UDP, Modbus RTU, Modbus TCP, MQTT,				
	Internet Protocol					
Software		4G signal, running, arming and disarming, 485				
	Indicator					
·						



		WIN 8 and WIN 10			
		16 devices, Max 320 I/O data points(Bool, 16bit, 32bit,			
	Slave Connection	64bit)			
	Transparent	Summert			
	Transmission	Support			
	SMS Command	Support			
	Login Package	Support custom login package			
	Heartbeat Package	Support custom heartbeat package			
	Storago	Built in 32G SD card, capable of storing up to 100,000			
	Storage	historical records			
	MTBF	≥100,000 hours			
		EN 55022: 2006/A1: 2007 (CE &RE) Class B			
		IEC 61000-4-2 (ESD) Level 4			
		IEC 61000-4-3 (RS) Level 4			
Safety	EMC	IEC 61000-4-4 (EFT) Level 4			
		IEC 61000-4-5 (Surge)Level 3			
		IEC 61000-4-6 (CS)Level 4			
		IEC 61000-4-8 (M/S) Level 4			
	Others	CE, FCC, RoHS			
Fastingangent	Working	-45~85°C, 5~95% RH			
Environment	Storage	-45~105°C, 5~95% RH			
	Shell	Metal			
Others	Size	108x82x40mm			
Outers	Protection	IP30			
	Installation	Wall-mounting or DIN Rail mounting.			

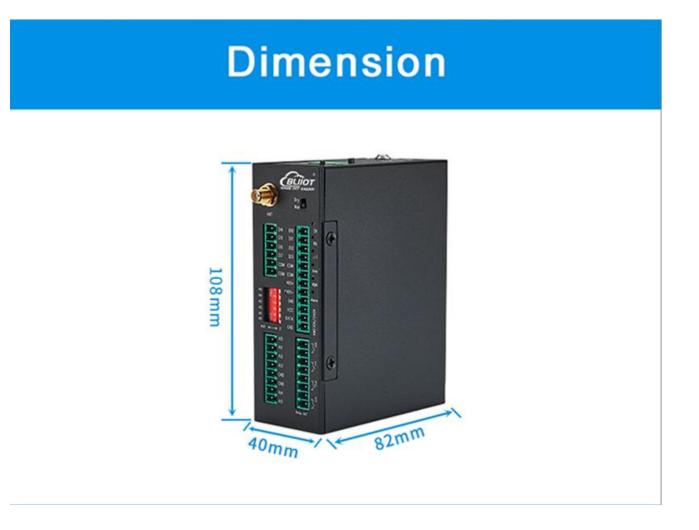
# 1.7 Model Selection

Model	DI	AI	DO	Tem& Storege LISE	Storage USB RS485	I/O data points					
meder		AI		Hum	Storage	036	K3400	bool	16Bit	32Bit	64Bit
S270	2	2	2	1	2M	1	x	х	x	x	x
S271	4	4	4	1	2M	1	x	х	x	x	x
S272	8	6	4	1	32G	1	1	64	64	x	x
S274	4	x	4	1	32G	1	1	64	128	64	64
S275	8	6	4	1	32G	1	1	64	128	64	64



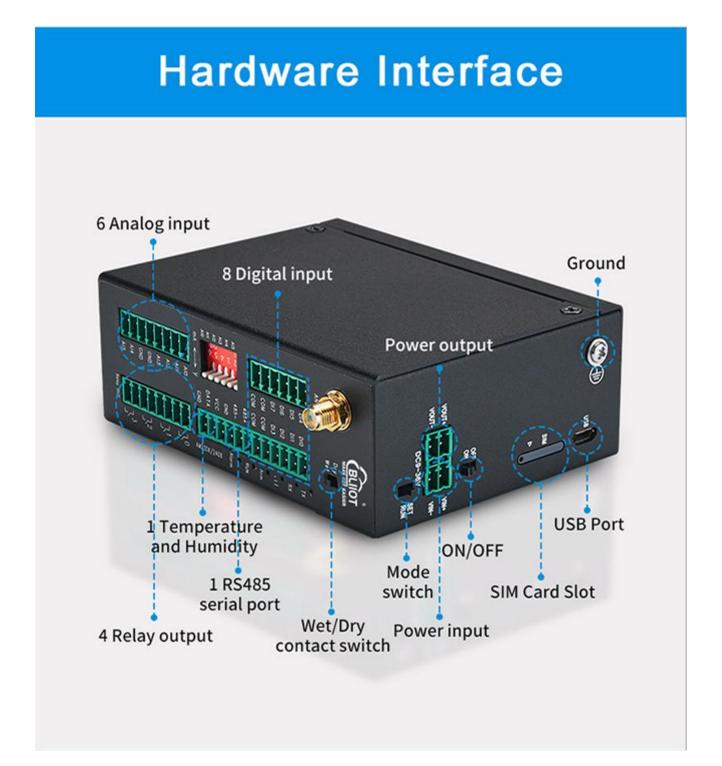
# 2 Hardware Specifications

#### 2.1 Size





## 2.2 Interface



# 2.2.1 Digital Input

Digital Input				
Function	Description			
DIO	First channel of Digital input, support high speed pulse counting, sampling			

#### Cellular IoT M2M RTU --- S272/S274/S275

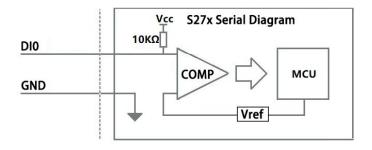


	frequency: 1MHz
DI1	Second channel of Digital input, support low speed pulse counting, support used
	as arming and disarming input
DI2	Third channel of Digital input, support low speed pulse counting
DI3	Fourth channel of Digital input, support low speed pulse counting
СОМ	Common grounding
СОМ	Common grounding
DI4	Fifth channel of Digital input
DI5	Sixth channel of Digital input
DI6	Seventh channel of Digital input
DI7	Eighth channel of Digital input
СОМ	Common grounding
СОМ	Common grounding
Dry	DI switch to Dry contact
Wet	DI switch to Wet contact

Note: DIN0 as a high-speed pulse counter, sampling frequency: 1MHz; DIN1~3 as low-speed pulse counter, anti-shake time can be set 1~2000ms, default 1ms;

When using the counter function, please swtich the DIP switch on device to Wet.

#### Diagram of DI internal interface:



#### 2.2.2 LED Indicators

LED Indicators						
Symbol	Name	Color	State	Description		
	4C signal	signal RED	Always ON	Normal		
0000	4G Signal		OFF	4G module abnormal		
Alarm			Always ON	Triggered alarm		
Alam	Alarm	RED	OFF	No alarm		
Dun	Dun		Flickering	System is running		
Run	Run Run RED		OFF	System stop running		
Arm	Arm	RED	Always ON	Armed		

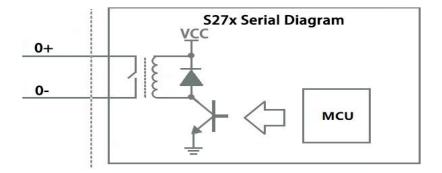


			OFF	Disarmed
TX Transmit via serial port	RED	Flickering	Data communication via RS485 serial port	
		OFF	No data	
RX Receive via	RED	Flickering	Data communication via RS485 serial port	
	serial port		OFF	No data

# 2.2.3 Digital Output

Digital Output			
Functions	Description		
DO0+	First channel of Digital output		
DO0-	First channel of Digital output		
DO1+	Second channel of Digital output		
DO1-	Second channel of Digital output		
DO2+	Third channel of Digital output		
DO2-	Third channel of Digital output		
DO3+	Fourth channel of Digital output		
DO3-	Fourth channel of Digital output		

#### Diagram of DO internal interface:



# 2.2.4 Analog Input

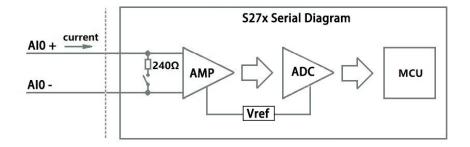
Mode selection(DIP Switch)			
Functions	Description		
V	Switch to "V" indicate that the analog input type is "0-5V"		
mA	Switch to "mA" indicate that the analog input type is "0-20mA" or "4-20mA"		
A0-A5	Corresponding to the analog input of each channel		



Note: According to the output type of the transmitter(mA or V), switch the DIP switch of the corresponding channel to the corresponding position on the device.

Analog Input			
Functions	Description		
AI0	First channel of Analog input positive interface		
Al1	Second channel of Analog input positive interface		
Al2	Third channel of Analog input positive interface		
AI3	Fourth channel of Analog input positive interface		
GND	Common grounding		
GND	Common grounding		
Al4	Fifth channel of Analog input positive interface		
AI5	Sixth channel of Analog input positive interface		

#### Diagram of AI internal interface:



## 2.2.5 RS485 and Temperature&Humidity

RS485 and Temperature&Humidity			
Functions	Description		
485+	RS485 A +		
485-	RS485 B -		
GND	485 Grounding		
VCC	Power supply interface of Tem &Hum sensor(AM230x/AM240x)		
DATA	Data interface of Tem &Hum sensor(AM230x/AM240x)		
GND	Grounding of Tem &Hum sensor(AM230x/AM240x)		

#### 2.2.6 Power&Switch&Mode Settings

#### Power&Switch&Mode Settings



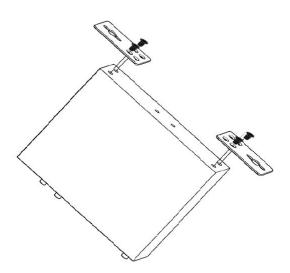
Functions	Description
VIN+	9-36V Power input positive
VIN-	9-36V Power input negative
VOUT+	9-36V Output positive
VOUT-	9-36V Output negative
OFF	Device shutdown
ON	Device startup
SET	Switch to SET to enter configuration mode when configuring
RUN	When configuring is complete, switch to RUN to enter the running
KON	mode.
USB	Used to connect configuration software, set parameters, and
	upgrade

### 2.2.7 SIM Card Slot

When inserting/removing the SIM card, please turn off the device. Note: Please place the device flat when inserting/removing the SIM card.

### **3** Installation

#### 3.1 Wall mounted





#### 3.2 DIN Rail mounting



# 4 Configuration

## 4.1 Preparation before configuration

Please follow the steps

- 1) Insert the SIM Card;
- 2) The device must be configured in [SET] mode, switch to [SET] before configuration;



Connect the device to an external power and power on, switch the power switch to ON.
 Please switch to SET mode first, then power on the device.

#### Cellular IoT M2M RTU --- S272/S274/S275





- 4) Connect the RTU to PC by USB cable, and install the USB Driver to the computer;
- 5) Open configuration software, choose the correct COM port and fill in the password(Default: 1234), select Normal SIM card mode to enter configuration software;
- Open parameter setting page---->Click "Read" button to get device current value--->After modifying or setting the parameters---->Click the "Save" button to saving parameters in device;
- If you need to program bulks of RTU with similar parameters, you can [Export Configuration File], and then [Import Configuration File] to the next device to complete the settings quickly;
- 8) Power off the device when configuration is complete, switch the power switch to OFF;
- 9) Switch to [RUN] mode after power off the device;
- 10) Reboot the device, then the device will enter into normal running mode.

#### Notice:

- 1, The device must be configured in [SET] mode, switch to [SET] before power ON the device;
- 2, Click the "Save" button to saving parameters in device;
- 3, When configuration is complete, power OFF the device, then switch to [RUN] mode;

#### 4.1.1 Install USB Driver

Install the USB Driver to the computer firstly. When successful, it can be found out at the device manager of the XP or Windows 7 or Win8/Win10. Also, the driver for different OS can be downloaded from Silicon Laboratories, Inc. http://www.silabs.com , the model is CP210x.



# 4.1.2 Check COM Port

🗇 🏟 🔲 🗐 🛐 🖬 🔯			
A 🚔 Sammy-PC			
Batteries			
D 🖳 Computer			
<ul> <li>Disk drives</li> <li>Siplay adapters</li> </ul>			
Display adapters DVD/CD-ROM drives			
DE ATA/ATAPI controllers			
Imaging devices			
> - Keyboards			
Mice and other pointing devices	s		
Monitors			
Network adapters			
Ports (COM & LPT)			
Silicon Labs CP210x USB to U	JART Bridge (COM3)		
Processors			
Gitzi		-	$\Box$ $\times$
	Choose Port		
	Choose Port	~	Refresh
		~	Refresh
	COM3	~	Refresh

Choose the correct "COM port" when entering configuration software.

# 4.1.3 Login Configuration Software

Choose the correct port, then fill in the password to login configuration software

The login password is 1234

Click "Read" button to get device current parameters first



🙇 Cellular IoT RTU Configurator V2.7					
🖷 Import Configuration file 🛛 🐳 Expo	ort Configuration File 📑 Fac	tory Reset 🛛 🗿 Help			
Basic Setting	Parameter 🔀				
Parameter Alarm Numbers Output Setting OO DO	New	password: password: password: (4 digits) Modify password	Time zone: ((	015-03-31 22:25:00	Read
Access     Access     Input Setting     DI Setting	Device Description:	247, fill it when used as Modbus Slave o		2-RTU Version 2EB55 (60 Characters)	Note: Pls find "Set Run" switch on device, then switch to "Set" mode.then set.after saving
DI Alarm     Al Setting	<ul> <li>Add timestamp to ala</li> <li>Auto Arm after disarr</li> <li>Timer Reporting SMS Cor</li> </ul>	n: 1 Minute(s) (0~9999, W	en power on. hen set as 0, the RTU will in a	armed mode immediately.)	settings, Pls switch to "Run" mode.Upside switch is "Set", downside switch is "Run".In
Al Alarm	Add the following add	ditional information in the report SMS			"Run" mode,settings can't be saved and effective.
Timer Setting	DIO Status	GSM/3G Signal Value	Al0 Value	DO0 Status DO1 Status	
Hour Timer	DI2 Status	<ul> <li>External Power Status</li> <li>Device ID</li> </ul>	AI2 Value	DO2 Status	
Periodic Timer	DI4 Status	Temperature Value	AI4 Value		
Link Trigger Setting	DIS Status DI6 Status DI7 Status	<ul> <li>Humidity Value</li> <li>Device Description</li> </ul>			
RS485 Setting	Alarm SMS Content Settin	gs ditional information in the alarm SMS			
Serial Port	DIO Status	Arm Status GSM/3G Signal Value	Al0 Value	DO0 Status	
Slave Setting	DI2 Status	External Power Status     Device ID	Al2 Value	DO2 Status	
1 1 100	L DIS Status				

# 4.2 Basic Settings

Cellular IoT RTU Configurator V2.7					
Import Configuration file 🛛 🖣 Expo	ort Configuration File 🛛 📲 Fa	ctory Reset 🛛 📓 Help			
Basic Setting	Parameter 🔀				
Parameter	Modify password		Synchronous machine tir	me	
2	Old	password:	Time: 2015	-03-31 22:25:00	
Alarm Numbers	New New	password:		+08:00)	Read
Output Setting		·	Time zone: (UTC	+00:00)	Save
T DO	Confirm	password: (4 digits)	Write	the RTU time	Save
00		Modify password	Read the RTU time	Read the computer time	
			ricad the tire time	ricus die computer and	
Access	Basic information				Note:
	Device ID 1 (1~	247,fill it when used as Modbus Slave o	ver RS485) Model No. S272-R	TU Version 2EB55	Pls find "Set Run" switch on
Input Setting	Device Description:			(60 Characters)	device, then switch to "Set"
DI Setting					mode, then set, after saving
*	Add timestamp to al		•		settings, Pls switch to "Run"
DI Alarm	Auto Arm after disar	m: 1 Minute(s) (0~9999, W	hen set as 0, the RTU will in arm	ed mode immediately.)	mode.Upside switch is "Set",
Al Setting	Timer Reporting SMS Co	ntent Settings			downside switch is "Run".In
Al Alarm	Add the following ad	Iditional information in the report SMS			"Run" mode,settings can't be
and the second s	DI0 Status	Arm Status	Al0 Value	DO0 Status	saved and effective.
- Timer Setting	DI1 Status	GSM/3G Signal Value	Al1 Value	DO1 Status	
Hour Timer	DI2 Status	External Power Status	Al2 Value	DO2 Status	
*	DI3 Status	Device ID	AI3 Value	DO3 Status	
	DI4 Status	Temperature Value	Al4 Value		
Link Trigger Setting	DI5 Status	Humidity Value	AI5 Value		
Start com	DI6 Status	Device Description			
Link Trigger	DI7 Status				
RS485 Setting	Alarm SMS Content Settin	The second			
Serial Port	-	lditional information in the alarm SMS			
	DI0 Status	Arm Status	Al0 Value	DO0 Status	
Scharron					
Slave Setting	DI1 Status	GSM/3G Signal Value	Al1 Value	DO1 Status	
	DI1 Status DI2 Status DI3 Status	GSM/3G Signal Value External Power Status Device ID	Al1 Value Al2 Value Al2 Value Al3 Value	DO1 Status DO2 Status DO3 Status	

Modify password			
Item	Description	Default	
Old password	Enter the old password	Empty	
New password	Enter the new password	Empty	



### Cellular IoT M2M RTU --- S272/S274/S275

Confirm password	Confirm the password	Empty	
Modify password	Password modification takes effect		
Synchronous machine time			
Item	Description	Default	
Time	Current time on device		
Time zone	Current time zone on computer		
Write the RTU time	Time on computer is synchronized with RTU		
Read the computer	Dood the current time on computer		
time	Read the current time on computer		

Basic information			
Item	Description	Default	
	As device ID address only when device is Modbus		
Device ID	slave via RS485, range: 1-247 It is invalid in other	1	
	situations.		
Model No.	Device model number		
Version	Device version		
IMEI	Device serial number		
Device description	The alarm message will include device description	Empty	
Device description	information.	Empty	
Add timestamp to	Alarm message will include the time	Check	
alarm SMS		CHECK	
Arm automatically	RTU will enter into Arm mode automatically once	Check	
when power on	the RTU powered on	CHECK	
Auto arm after	RTU will change to arm mode automatically after	Uncheck	
disarm	a certain period after disarm	UNCHECK	

No need to set the "Timer reporting SMS content" and "Alarm SMS Content"

if the RTU connect to cloud platform

Timer reporting SMS content settings				
Item	Description	Default		
Add the following additional	Check the related item to add its			
information in the report	value/status to the Timer report text	Uncheck		
SMS	message.			

Alarm SMS content settings						
Item	Description	Default				
Add the following additional	Check the related item to add its	Uncheck				



information in the alarm	value/status to the alarm text message.	
SMS		

## 4.3 Alarm Numbers Settings

When device connect to cloud platform, it may be frequently offline due to sending text message, receiving text message and dialing. We don't suggest you use SMS alarm if RTU need to be connected to cloud platform.

Alarm Numbers		(Alarm No.)	Power	Timer Report	Arm/Disarm SMS	Low Signal	Power Lost	Power Recovery	GPRS Failure	Relay Switch	Slave Alarm	Slave Failure
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	User No.0				5.05							
tput Setting	User No.1											
DO	User No.2											
ess Control	User No.3											
Access	User No.4											
5	User No.5											
out Setting	User No.6											
DI Setting	User No.7											
DI Alarm	User No.8											
Al Setting	User No.9											
Al Alarm												
ner Setting								Read		Save		
Hour Timer	Notice:					00				h	L	
Periodic Timer		can include or no alert: Mobile sig				n setup ou	44 or +44	or without co	ountry code,	but can not	De 44.	
nk Trigger Setting		ds for when the e				e related t	elephone r	numbers.				

Authorized user telephone number settings							
Item	Description	Default					
Alarm No.	Authorized mobile numbers to receive the alarm	Empty					
Alarm No.	text message or dial	Empty					
	Text message will be sent when RTU powered						
Power on	on, the message includes device model, version,	Check					
	description, IMEI, status, signal value etc						
Timer report	Timer report text message will be sent	Check					
Arm/Disarm	Text message will be sent when the state(Arm or	Check					
SMS	Disarm) of RTU changed.						
	Text message will be sent when 4G signal	Uncheck					
Low signal	strength lower than 14						
Power lost	Text message will be sent when external DC	Check					
Fower lost	power loss						
	Text message will be sent when external DC	Check					
Power recovery	power restored						
GPRS failure	Text message will be sent when re-connection	Uncheck					



	failed three times.	
Polov owitch	Text message will be sent when relay state	Uncheck
Relay switch	changes	Uncheck
Slave alarm	Text message will be sent when Modbus slave	Uncheck
Slave alaliti	alarm occurs	Uncheck
Slave failure	Text message will be sent when Modbus slave	Uncheck
Slave failure	communication timeout	

## 4.4 Digital Output Settings

No need to set Channel name, ON/OFF SMS, Open description, Close description when device connect to cloud platform.

This device features 4 relay outputs, rated range: 5A/30VDC, 5A/250VAC. It can be set as an authorized number to call in for control, or it can be controlled remotely by SMS, or timer, event correlation automatic control, or remote control via the monitoring center and cloud platform.

Basic Setting	DO 🔀										
Parameter		Output Type	Channel Name (MAX. 20)	Close Time(s)	Repeat Times	Interval Time(s)	ON/OFF SMS	Alarm Verify Time(s)	Open Description (MAX.30)		escription (MAX. 30)
Alarm Numbers	DO_0	Switch on/off $~~$		2	0	0		2			
Output Setting	DO_1	Switch on/off v		2	0	0		2			
DO DO	DO_2	Switch on/off		2	0	0		2			
Access Control	DO_3	Switch on/off ~		2	0	0		2			
Input Setting											Save
E and a second se											
DI Setting	Notice:		al.'s also and 20 see		1.1	17	D		- 21- 2	Read	Save
DI Setting	1. If the 0 2. If the 0	Close Time setup as 0, Close Time setup as no	ot 0, this channel will	output NC typ	be and the re	lay will close	accordin			Kead	Save
*	1. If the 0 2. If the 0 then op 3. Only th	Close Time setup as no pen,and repeat this ac he first Channel (DOO)	ot 0, this channel will tion according to the can be setup as Doo	output NC type Repeat Time or Open functi	be and the re s after the Ir on, see Acce	elay will close iterval Time ti ss Control pa	accordin			Kead	Save
DI Alarm	1. If the 0 2. If the 0 then op 3. Only th 4. If the 0	Close Time setup as no pen, and repeat this ac he first Channel (DO0) Output Type setup as	ot 0, this channel will tion according to the can be setup as Doo Switch ON/OFF, then	output NC type Repeat Time or Open function this channel w	e and the re s after the Ir on, see Acce vill be used a	elay will close iterval Time ti ss Control pa is a switch.	accordin imeout. ige.	g to the Close Tir	me	Kead	Save
DI Alarm	1. If the C 2. If the C 3. Only th 4. If the C 5. If the C in Al/D	Close Time setup as no pen,and repeat this ac he first Channel (DOO)	ot 0, this channel will tion according to the can be setup as Doo Switch ON/OFF, then Siren,then this chann page.	output NC type e Repeat Time or Open functi this channel v el will be used	be and the re s after the Ir on, see Acce vill be used a as siren,and	elay will close iterval Time ti ss Control pa is a switch. I will be active	accordin imeout. age. ated acco	g to the Close Tir	me	Kead	Save

Relay Output settings							
Item	Description	Default					
	Support 3 output types						
	• <b>Open door</b> : Only the first Channel(DO0) can						
	be set as Open Door, DO0 will close and the						
	device will be automatically set to disarm						
	status when the authorization number calls in.	Switch					
Output type	When DO0 used as Open door, then it cannot	on/off					
	be used as regular ON/OFF switch						
	• Siren: Only DO1 can be set as Siren, DO1 will						
	close when the siren function(DI setting) is						
	executed						



	• Switch ON/OFF: The relay is used as a	
	switch, it can be used as a normal timing	
	event, linkage event, and SMS control.	
Channel name	Custom setting channel name, in order to identify it	Empty
Channel name	in text message.	
Close time	Relay close and last time, 0 second means always	0
Close time	close.	
Denset times	Times to repeat closure when the relay action is	0
Repeat times	performed.	
	The interval time of relay repeating the close and	0
Interval time of	open action.	
Interval times	Use it with "repeat times", you can consider it as	
	pulse output. The unit is second.	
	Text message will be sent when relay state	Uncheck
ON/OFF SMS	changes	
Alarm verify	Alorm ofter a period when the relevant to changed	0
times	Alarm after a period when the relay state changed	
Open description	Description of "OPEN" state in the text message	Empty
Close description	Description of "CLOSE" state in the text message.	Empty

# 4.5 Access Control Settings

No need to set this when device connect to cloud platform

This function is valid only when the DO0 is set as open door.

Users can quickly set the number and time period for call-in control. It is really convenient for remote control of electric locks in unattended computer rooms. It is possible to remotely authorize a certain maintenance personnel to open the door by calling in with his mobile phone within a limited period of time, which solves the traditional cumbersome approval process that takes a lot of time to pick up and deliver keys. And you can also set various parameters on this page through SMS, cloud platform, and monitoring center..



Parameter	Access Control					
*	Tips:					
Alarm Numbers		hannel (DO0) Output type d User No.x call to RTU,it		Door Open. output pulse signal to open	the electric	lock automatic
Output Setting		Start time		End time	1	
DO O	🗌 User No.O	2000-01-01 00:00	-	2000-01-01 00:00		🗌 Always
Access Control	🗌 User No.1	2000-01-01 00:00	-	2000-01-01 00:00		🗌 Always
Access	🗌 User No.2	2000-01-01 00:00	-	2000-01-01 00:00		🗌 Always
Input Setting	🗌 User No.3	2000-01-01 00:00		2000-01-01 00:00		Always
DI Setting	🗌 User No.4	2000-01-01 00:00		2000-01-01 00:00		🗌 Always
DI Alarm	🗌 User No.5	2000-01-01 00:00		2000-01-01 00:00		🗌 Always
<b>X</b>	🗌 User No.6	2000-01-01 00:00	-	2000-01-01 00:00		Always
Al Setting	🗌 User No.7	2000-01-01 00:00	-	2000-01-01 00:00		🗌 Always
AI Alarm	🗌 User No.8	2000-01-01 00:00	-	2000-01-01 00:00	-	🗌 Always
Timer Setting	🗌 User No.9	2000-01-01 00:00	-	2000-01-01 00:00		🗌 Always
Hour Timer						
Periodic Timer	Notice:			Read		Save
Link Trigger Setting				en the door without limitation open the door on the dura		

Access Control						
Item	Description	Default				
User No.0-No.9	Authorized mobile number	Uncheck				
Start time	Mobile number call-in permission start time					
End time	Mobile number call-in permission end time					
Always	You can call in to open the door at any time	Uncheck				

#### 4.6 Input Settings

This device features 8 digital input, 6 analog input, and 1 temperature and humidity input, of which DI0 supports counter function. For their addresses in the registers and the supported Modbus function code, please refer to 8.1 Device Register Address

#### 4.6.1 DI Setting

When device connect to cloud platform, it may be frequently offline due to sending text message, receiving text message and dialing.

No need to set [Alarm SMS], [Recovery SMS], [Change SMS], [Interval alarm SMS] and [Total value alarm] when device connect to cloud platform.



# Cellular IoT M2M RTU --- S272/S274/S275

Parameter		Inpu	at Type	Alarm SMS	Recovery	SMS Chan	current ge SMS Status	Recovery Alarm	Alarm Veri Time(s)	fy Siren	24hr
Alarm Numbers	DIO	NO	~				Open		2		
Output Setting	DI1	NO	~				Open		2		
OD OD	DI2	NO	~				Open		2		
Access Control	DI3	NO	~				Open		2		
Access	DI4	NO	~				Open		2		
Input Setting	DI5	NO	~	-			Open		2		
DI Setting	DIG	NO	~	[			Open		2		
OI Alarm		NO	~				Open		2		
Al Setting	DI7	NO						_			
Al Alarm	DIG	Counter	Initial V	alue Interval	Alarm Value	Interval Alarm	SMS Total Alarm Va	lue Total	Alarm SMS		
Timer Setting	DIOC	ounter					(MAX.99999	9)			
Hour Timer			Initial V	alue Interva	Alarm Value	Interval Alarm	SMS Total Alarm Va	ue Total	Alarm SMS	Anti-sha	ke-tim
Periodic Timer	DI1 C	Counter	0	0			0			1	
Link Trigger Setting							(MAX.99999	9)		(MAX)	(.2000)
C Link Trigger			Initial V		I Alarm Value	Interval Alarm		lue Total	Alarm SMS	Anti-sha	ke-tim
RS485 Setting	DI2 C	Counter	0	0			0 (MAX.99999			1 (MAX	
Serial Port				a							
Slave Setting	DIA	Counter	Initial V	alue Interva	I Alarm Value	Interval Alarn	SMS Total Alarm Va	lue   lotal /	Alarm SMS	Anti-sha	ke-tim
	015 0	oounter .					(MAX.99999	9)		(MAX)	.2000)
C Slave Mapping L											

Select the corresponding input type according to the detector.

DI setting						
Item	Description	Default				
Input type	<ul> <li>Disable: Digital input of this channel unable to use</li> <li>NO: The normal state of the digital input is normally open, and the normally closed state is an abnormal event.</li> <li>NC: The normal state of the digital input is normally closed, and the normally open state is an abnormal event.</li> <li>Change: Each time the state of the digital input changes, it will be treated as an abnormal event</li> <li>Counter: DIN0 as a high-speed pulse counter, sampling frequency: 1MHz; DIN1~3 as low-speed pulse counter, anti-shake time can be set 1~2000ms, default 1ms;</li> <li>Arm/Disarm: Only DIN1 can be set as Arm/Disarm. The arm and disarm state will switch when DI changes from NO to NC</li> </ul>					
Alarm SMS	The text message sent to authorized numbers when alarm occurs	Empty				
Recovery SMS	The text message sent to authorized numbers when	Empty				





	alarm restored	
	When DI input type set as "Change", the text	Empty
Change SMS	message you entered here will be sent once the	
	alarm occurs	
Current status	Current state of digital input	
	Under the arm or 24-hour state, when alarm	Uncheck
Recovery alarm	restored, the text message will be sent to authorized	
	numbers	
Alorm vorify time	When the abnormal event last more than this period,	1
Alarm verify time	it will be treated as a true alarm. The unit is second	
Siren	Enable the Siren function, when DO1 set as Siren,	Uncheck
Silen	DO1 will close when the alarm occurs	
24br	Alarm will be triggered no matter RTU is in Arm or	Uncheck
24hr	Disarm mode	

	Counter	
Item	Description	Default
Counter	Pulse counter	Uncheck
Initial value	Initial value to start counting	Empty
Interval alarm value	Alarm occurs when counting to the interval value	Empty
Interval alarm	The text message sent to authorized numbers	Empty
SMS	when interval alarm happens	
Total alarm	When counts to the total value, it will automatically	Empty
value	clear the count value to the initial value	
Total alarm SMS	The text message sent to authorized numbers	Empty
	when counts to the total value	
	Unit: ms, default 1, indicates that the maximum	1
	pulse sampling frequency is 1KHz; when the pulse	
	frequency is low, appropriately increasing the	
Anti-shake time	anti-shake time can improve the accuracy.	
Anu-shake ume	(Pulse sampling frequency = 1000/anti-shake time,	
	for example, 1ms corresponds to 1000Hz, 10ms	
	corresponds to 100Hz, 100ms corresponds to	
	10Hz, 1000ms corresponds to 1Hz)	
When using cou	nter function, please switch the DIP switch on device	to Wet.



## 4.6.2 DI Alarm Settings

When device connect to cloud platform, it may be frequently offline due to sending text message, receiving text message and dialing.

Users can authorize a certain person to receive alarm

Parameter			a		rm S	end s	SMS)					(DI A	Jarm I	Dial O	ut)		
Alarm Numbers	DI Channel	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
ut Setting	User No.0	$\square$		$\square$	$\square$	$\square$	$\square$	$\square$					$\square$	$\square$	$\square$	$\square$	
Setting	User No.1																Ŀ
	User No.2																E
trol	User No.3					$\square$											P
ess	User No.4					$\square$	$\square$	$\square$									P
	User No.5																
	User No.6																
	User No.7																E
	User No.8																Ŀ
ting	User No.9																
arm													Read		;	Save	
	Notice:											-					
imer	1. Tick it stands 2. While dialing																

# 4.6.3 AI Setting

Analog input can be used for temperature monitoring, current monitoring, voltage monitoring, power factor monitoring, water level monitoring, pressure monitoring, environmental monitoring, wind speed monitoring, etc. Users can set high and low limit alarm thresholds and restore alarms according to needs. When the limit is exceeded or recovered, personalized notifications can be set to specific users.

This device features 6 analog input, 12-bit resolution, 200ms sampling frequency, and supports 0-5V, 0-20mA, 4-20mA output sensors. It can be flexibly combined for measurement and monitoring of various different applications. Such as three-phase current and voltage monitoring and so on. Note: Analog input type

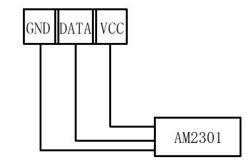
There is DIP switch on the device, switch to mA or V type according to the output type of the transmitter.





- 2) The input type you choose in the configuration software should be the same as the DIP switch
- 3) For information on measuring ranges, please refer to transmitter specification

The device features 1 temperature & humidity sensor input for monitoring onsite environment, the sensor model is AM230x/AM240x, temperatures range from -40°C to 80°C, with a 0.5°C accuracy, humidity range from 0 to 100RH%, with a 3% accuracy;



Basic Setting		ting 🗙			Low Alarm SMS	D		Minimum	Current	Threshold	Threshold	Recovery	Alarm Verif	V ci	241-
Parameter		input ly	pe	High Alarm 5M5	LOW Alarm 5M5	Recovery 5M5	Maximum	Minimum	Value	High	Low	Alarm	Time(s)	- Siren	24nr
Alarm Numbers	A10	0~20mA	~				20	0	0.02	0	0		2		
Output Setting	AI1	0~20mA	~				20	0	0.02	0	0		2		
O DO	AI2	0~20mA	~				20	0	0.02	0	0		2		
100 <sup>-1</sup>	AI3	0~20mA	~				20	0	0.03	0	0		2		
Access Control	AI4	0~20mA	~				20	0	0.02	0	0		2		
Access	AI5	0~20mA	~				20	0	0.03	0	0		2		
Input Setting	Temp.	Enable	~				80	-40	0	0	0		2		
O DI Setting	Hum.	Enable	~				100	0	0	0	0		2		
O DI Alarm	Notic														
Sec.	1.		ne V/	/mA switch on de	vice ,and switch to	V or mA accodi	ng to your se	nsor output,sw	itch to V or n	nA.eg.	Read	Save			
Al Setting					h to mA,if sensor										
Al Alarm	2.				urement range of t			a;							
	3.			Range: -99999.99 same as DI.	~9999.99, support	s minus and deci	mal.								
Timer Setting	4.	Others ar	e the	same as DI.											

No need to set [High alarm SMS], [Low alarm SMS], [Recovery SMS], when device connect to cloud platform.

	AI setting	
Item	Description	Default
	Disable: Do not use this channel	
Input type	Enable: Use this channel	
	0~5V: Connect sensors with 0-5V output	Disable
	0~20mA: Connect sensors with 0~20mA output	
	4~20mA: Connect sensors with 4~20mA output	
High clorm SMS	The text message sent to authorized numbers	Empty
High alarm SMS	when current value higher than upper limit	
Low alarm SMS	The text message sent to authorized numbers	Empty
LOW AIATTI SIVIS	when current value lower than lower limit	
Decovery SMS	The text message sent to authorized numbers	Empty
Recovery SMS	when current value return to normal	
Maximum	The maximum measuring range of the sensor	Empty



Minimum	The minimum measuring range of the sensor	Empty	
	Refer to the current real value, such as the		
Current value	pressure is xxxPa, or the temperature is xxx°C and		
	other specific values.		
Threshold high	When the current value exceeds the upper limit of	Empty	
Theshold high	the alarm, an alarm will be triggered;	Empty	
Threshold low	When the current value is lower than the alarm	Empty	
THESHOLDIO	lower limit value, an alarm will be triggered;	Епріу	
Pocovory alarm	When the value returns to the normal range, a text	Uncheck	
Recovery alarm	message will be sent to authorized numbers	Ulicheck	
Alarm verify time	When the abnormal event last more than this	1	
	period, it will be treated as a true alarm.		
Siren	When DO1 set as Siren, DO1 will be closed when	Uncheck	
Silen	the alarm occurs	Ulicheck	
24hr	Alarm will be triggered no matter RTU is in Arm or	Uncheck	
24111	Disarm mode	Uncheck	

## 4.6.4 AI Alarm Settings

Users can authorize a certain person to receive alarm

When device connect to cloud platform, it may be frequently offline due to sending text message, receiving text message and dialing.

Basic Setting	Al Alarm 🗙																
Parameter			(4	Al Ala	rm S	end	SMS	3)				(AI)	Alarm	Dial	Out	)	
Alarm Numbers	Al Channel	0	1	2	3	4	5	Temp.	Hum.	0	1	2	3	4	5	Temp.	Hum.
Dutput Setting	User No.0	$\checkmark$	$\checkmark$	$\square$	$\square$	$\square$	$\square$	$\square$	$\checkmark$	$\checkmark$	$\square$	$\checkmark$	$\square$	$\square$	$\checkmark$	$\square$	
DO DO	User No.1	$\checkmark$	$\checkmark$	$\square$	$\square$		$\square$	$\square$	$\checkmark$	$\square$	$\square$	$\checkmark$	$\square$	$\square$	$\checkmark$	$\square$	
	User No.2	$\checkmark$	$\square$	$\square$	$\square$		$\square$	$\square$	$\square$	$\square$	$\checkmark$	$\checkmark$		$\square$	$\checkmark$		$\checkmark$
Access Control	User No.3	$\checkmark$	$\square$	$\square$	$\square$	$\square$	$\square$	$\square$	$\square$	$\square$	$\square$	$\checkmark$		$\square$	$\square$	$\square$	$\square$
Access	User No.4	$\checkmark$	$\square$	$\checkmark$	$\square$		$\square$	$\square$	$\square$	$\square$	$\square$	$\checkmark$		$\square$	$\checkmark$		$\square$
- Input Setting	User No.5	$\checkmark$	$\checkmark$	$\square$	$\checkmark$	$\square$	$\square$	$\square$	$\square$	$\square$	$\square$	$\checkmark$	$\checkmark$	$\square$	$\checkmark$	$\square$	
DI Setting	User No.6	$\checkmark$	$\checkmark$	$\square$	$\square$	$\square$	$\square$	$\square$	$\checkmark$	$\checkmark$	$\square$	$\checkmark$	$\square$	$\square$	$\checkmark$	$\square$	
DI Alarm	User No.7	$\checkmark$	$\checkmark$	$\square$	$\checkmark$	$\square$	$\square$	$\square$	$\checkmark$	$\square$	$\square$	$\checkmark$	$\checkmark$	$\square$	$\square$	$\checkmark$	$\square$
	User No.8	$\checkmark$		$\square$			$\square$			$\square$		$\checkmark$		$\square$	$\square$		
Al Setting	User No.9	$\checkmark$	$\checkmark$				$\square$		$\checkmark$	$\square$					$\square$		
Al Alarm												Rea	d		Ş	ave	
Hour Timer Periodic Timer	Notice: 1. Tick it stands user telepho 2. While dialing not answer	one nu g the u	mber ser te	s. elepho	one n	umbe	r,ead										

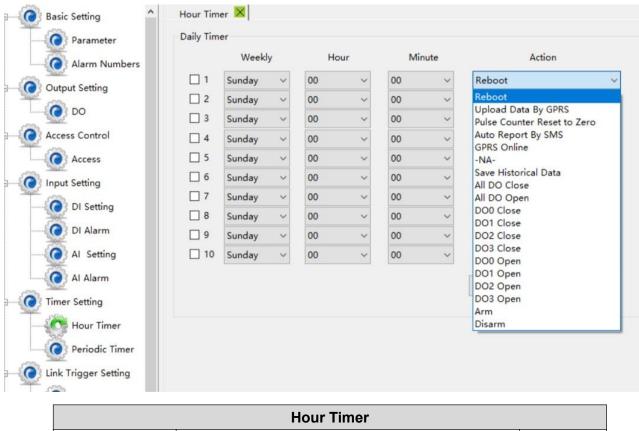


## 4.7 Timer Setting

The device is able to perform certain actions automatically at a preset time, which can effectively reduce human participation and greatly improve efficiency. For example, turn on the water pump regularly, discharge sewage regularly, start the exhaust fan regularly, switch equipment on and off at regular intervals, and so on.

In addition, this device supports a variety of timing functions, which can meet the application requirements of most places. For example, it can perform certain actions according to a certain time every day and every week, and start from a certain preset time point. Interval a certain preset time, and then execute a certain action periodically, a total of 10 timing events can be set.

#### 1) Hour Timer



Hour Timer								
Item	Description	Default						
1-10	Represents timers 1-10	Uncheck						
Weekly	Monday to Sunday or Everyday							
Hour	Specific hour							
Minute	Specific minute							
Action	The action to be executed at preset time							

#### 2) Periodic Timer



Parameter	pe	eriodically a	uto up	load GPR	S data	50	seco	ond 🗹 Enable,	/Disable	
Alarm Numbers		Week	y	Ho	our	Mir	nute	Interval(s)	Act	ion
Output Setting	1	Sunday	~	00	~	00	~	0	Reboot	
DO	2	Sunday	~	00	~	00	~	0	Reboot	6000G
Access Control	3	Sunday	~	00	~	00	~	0	Upload Data By Pulse Counter Re	
Access	4	Sunday	~	00	~	00	~	0	Auto Report By GPRS Online	SMS
<u> 107</u>	5	Sunday	~	00	~	00	~	0	-NA-	
Input Setting	6	Sunday	~	00	~	00	~	0	Save Historical E	)ata
DI Setting	7	Sunday	~	00	~	00	~	0	Reboot	
DI Alarm	8	Sunday	~	00	~	00	~	0	Reboot	
Al Setting	9	Sunday	~	00	~	00	~	0	Reboot	
Al Alarm	Notice	:							Read	Save
Timer Setting	1. From	n the Start				ute the cho	oose acti	on.		
Hour Timer	2. Inte	rval time ra	nge is	0~9999 Se	econds.					

	Periodic Timer									
Item	Description	Default								
Periodically auto	When GPRS/3G/4G data transmission protocol is									
upload GPRS	BLIIoT IoT RTU Protocol, enable periodically auto	5								
data	upload is the default. Unit: Minute									
1-10	Represents timers 1-10	Uncheck								
Weekly	Monday to Sunday or Everyday									
Hour	Specific hour									
Minute	Specific minute									
Action	The action to be executed at preset time									

## 4.8 Logic Trigger Setting

Users can quickly set up to 40 automatic logic control functions, which can meet the automation control needs of most applications. It is automatically triggered according to preset conditions without human intervention, and the device automatically performs predetermined actions and notifies the user with text messages or network data. On the one hand, it saves time and reduces losses, on the other hand, it improves work efficiency.

For example: it can be set to automatically start the exhaust cooling equipment when the temperature is too high, and automatically shut down the exhaust cooling equipment when the temperature recovers, or start the diesel generator when the current and voltage are low, and stop the diesel generator when the current and voltage are high, or turn off the water pump when the water pressure is high, start the water pump when the water pressure is low, and so on.



## Cellular IoT M2M RTU --- S272/S274/S275

Basic Setting	Link Trigger 🛛 🔀		
Parameter	Event: Arm ~		
Alarm Numbers	Action: All DO close $\checkmark$ A	dd	Delete
Output Setting			
DO O	Event Action		
Access Control			
Access			
Input Setting			
DI Setting			
DI Alarm			
Al Setting			
Al Alarm			
Timer Setting			
Hour Timer			
Periodic Timer			
Link Trigger Setting	Clear Note: Max 40 Link Trigger events.		
RS485 Setting			1
Serial Port		Read	Save
	Logic trigger		
Item	Description		Default
	Including "Arm", "DIx trigger", "DIx recovery",	"Dlx	Dolaan
	alarm of pulse interval", "DIx alarm of total num		
	·		
Event	pulse", "Alx high alarm", "Alx low alarm", "Alx		
Event	pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Tempera	ature	
Event	pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Tempera low alarm", "Temperature recovery", "Humidity	ature high	
Event	pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Tempera low alarm", "Temperature recovery", "Humidity alarm", "Humidity low alarm", "Humidity recove	ature high ery"	
Event	pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Tempera low alarm", "Temperature recovery", "Humidity alarm", "Humidity low alarm", "Humidity recove Including "Reboot", "All DO close", "All DO ope	ature high ery" en",	
Event	<ul> <li>pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Temperature low alarm", "Temperature recovery", "Humidity alarm", "Humidity low alarm", "Humidity recover", "Humidity low alarm", "Humidity recover", "All DO close", "All DO oper", "DO0 close", "DO1 close", "D</li></ul>	ature high ery" en", open",	
	<ul> <li>pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Temperature low alarm", "Temperature recovery", "Humidity alarm", "Humidity low alarm", "Humidity recover", "Humidity recover", "Humidity low alarm", "Humidity recover", "All DO close", "All DO open", "DO1 close", "DO1 close", "DO1 close", "DO3 close close", "DO3 close", "D</li></ul>	ature high ery" en", open", open",	
Action	<ul> <li>pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Temperature low alarm", "Temperature recovery", "Humidity alarm", "Humidity low alarm", "Humidity recover", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity recover", "Humidity low alarm", "Humidity recover", "Humidity recover", "DO0 close", "All DO close", "All DO close", "DO1 close", "DO1 close", "DO1 close", "DO3 close", "DO3 close", "DO3 close", "DO3 close", "DO3 close", "Open door", "Siren", "Arm", "Disarm", "GPRS</li> </ul>	ature high ery" en", open", open",	
	<ul> <li>pulse", "Alx high alarm", "Alx low alarm", "Alx recovery", "Temperature high alarm", "Temperature low alarm", "Temperature recovery", "Humidity alarm", "Humidity low alarm", "Humidity recover", "Humidity recover", "Humidity low alarm", "Humidity recover", "All DO close", "All DO open", "DO1 close", "DO1 close", "DO1 close", "DO3 close close", "DO3 close", "D</li></ul>	ature high ery" en", open", open",	

Note: "x" in "DIx" means serial number of DI channel, range: 0-7; "x" in "AIx" means serial number of AI channel, range: 0-5

## 4.9 Serial Port Settings

This chapter introduces the purpose and parameters of the RS485 serial port, including Modbus master, Modbus slave, and transparent transmission.



As Modbus master, S275 can be used to connect to expansion I/O module or read data from instruments, PLC and other devices;

As Modbus slave, S275 can be connected to HMI, PLC, and DSC for local data communication;

When serial port set as transparent transmission, the data of built-in I/O cannot be

transmitted to the cloud platform via network. If you need this function, please choose other model like S475.

	ort comigura		tory neser an neip			
O DO ^^	Serial Po	rt 🔀				
Access Control	Rs485 Baud rate	Transparent tra Close		Scan Rate		(200~65535ms)
Input Setting		ModBus RTU Mast ModBus RTU Slav Transparent tra	e	Time Out	200	(200~65535ms)
DI Setting	Parity bit	none	~	Master/slave	communicatio	n fail verify time
DI Alarm	Stop bit	1	~	(	60	(0~65535s)
Al Setting		Read	Save			
Al Alarm	Notice:					
Timer Setting		ate can't less than out can't less than				
Hour Timer						
Periodic Timer						
Link Trigger Setting						
Link Trigger						
RS485 Setting						
Serial Port						

Serial port		
Item	Description	Default
RS485	Including "Close", "ModBus RTU master", "ModBus	Close
	RTU Slave" and "Transparent transmission"	
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600,	9600
	115200	
Data bit	8	8
Parity bit	none, even, odd	none
Stop bit	1, 2	1
Scan rate	Interval time between two polling command(unit:ms)	200
Time out	The longest time waited for slave to return data when	
	master sent a command to slave(unit: ms).	200
	If the waiting time longer than this time, the slave will	
	be considered as no response.	
Master/slave	When master and slave communication fails many	60
communication	times, the period of communication fail more than	



fail verify time	this value, the slave will be regarded as lost, and a	
	slave failure message will be sent.(unit:s)	

Note: "Scan rate", "Time out" and "Master/slave communication fail verify time" are only valid when the RS485 set as "ModBus RTU Master".

# 4.10 Modbus RTU Slave Settings

When RS485 serial port set as "Modbus RTU master", the device will actively poll the slave continuously according to the Modbus RTU protocol, and read the value of the register in the slave into the mapping area of the device for storage, so that the registers in the slave are mapped to the device, and the reading and writing of the mapped registers of the device will be directly transmitted to the slave via RS485 serial port.

There is a one-to-one correspondence between the address of the slave register and the address of the mapping register in this device, which is the list of mapping registers.

S275 can connect various slaves via serial port, and it supports up to 16 slave, expansion I/O module can be connected to the device.

For example, S275 connect to M series Ethernet I/O module to expanding the number of DI, DO, AI, AO, and PT100 input, or connect to the power monitoring module to read the current, voltage, and power of the three-phase power, or connect to the UPS power supply for data monitoring, etc.

## 4.10.1 Slave Mapping List

Users can add, modify, and delete slave. After entering the slave mapping list, please read the mapped slave information first to prevent new slaves from overwriting the previous slave. To edit a slave, just select a line and click the right mouse button to complete operations such as deletion, addition, and parameter modification.

### 1) Add slave

<ul> <li>Slave Address</li> </ul>	Data Type	Function	Register Star	t Address	Registers	Quantity	Mapping	Address-Start	Mapping Address-En
	Add Slave								
	Editor Slave								
	Write Value	1							
	Delete Slave								
	Clear Display								

#### Right-click to Add Slave



lo	1	
Slave Address (Range 1~254)		
Data Type	Boolean	~
Function Code	01	~
Register start address		
Registers Quantity		
Mapping start address	64	~

	Add slave				
Item	Description	Default			
Slave address	Slave address range: 0-247	Empty			
Data type	ata type Boolean, 16 bit, 32bit, 64bit				
Function code	01, 02, 03, 04, 15, 16	Empty			
Register start	Register start address for reading and writing slave	Empty			
address	data				
Register	The number of slave data	Empty			
quantity		Empty			
Mapping start	The start address of slave register start address	Empty			
address	which mapped to the device register map area.	Linbty			
Mapping end	Calculate the end mapping address according to start	Empty			
address	address and reading data quantity	спру			

### 2) Edit slave

No	Slave Address	Data Type	Function	Starting	Address Hi-Lo	Registers Quantity	Mapping Address-Start	Mapping Address-End
1	1	Boolean			1	64	64	127
2	1	₩ord	Add Slav	/e	1	1	20000	20000
3	1	Integer	Editor S	ave	1	1	20128	20129
4	1	Double			1	1	20256	20259
5			Write Va	lue				
6			Delete S	lave				
7								
8			Clear Di	splay				

🙀 Slave Editor												-
Address Mapping	Channel Name	Data Type	Input Type	Alarm Verify Time	Alarm SMS Content	Recovery SMS Content	Enable Recovery SMS	Relay0	Relay1	Relay2	Relay3	Enable
64	Tag64	DATA_BOOL ~	NO V	2								



💀 Slave Edit	or									1775-		×
Address Mapping	Channel Name	Data Type	Ratio	Alarm Verify Time	Threshold high	Threshold low	High Alarm SMS Content	Low Alarm SMS Content	Recovery SMS Content	Enable Recovery SMS	Relay0	Relay
20000	Int20000	DATA_SIGNED_AB ~	1	2	0	0						

	Edit slave	
Item	Description	Default
Address	The device mapping address corresponding to the	
mapping	slave register	
	"Channel name + Alarm content" include in the text	
Channel name	message sent to authorized number when	
	alarm/recovery	
	• Boolean	
	It has been selected as a Boolean type when adding	Boolean
	a slave	Doolean
Data type	• 16bit/32bit/64bit	ABCDEF
	According to the type of data point selected from the	GH
	slave, the letter ABCDEFGH indicates the sorting of	
	the data in the slave register	
Input type	<ul> <li>NO: The normal state is normally open (0)</li> </ul>	NO
	• NC: The normal state is normally closed (1)	
	The data in the mapping address will be multiplied	
	by this ratio, and the multiplied value will be	
	compared with the upper limit value and the lower	
	limit value. If the threshold value is exceeded, an	
Ratio	alarm will be triggered, and the alarm content and	1
	the current value will be sent to the authorized	
	number. The data of the mapped address will not be	
	multiplied by this ratio when it is collected by	
	GPRS/3G/4G	
	When the abnormal event last more than this	
Alarm verify time	period, alarm will be triggered, and text message	2
	sent to authorized number	
	If value of the mapped address data multiplied by	
Threshold high	the ratio higher than this value, when alarm occurs,	Empty
The shold high	the "channel name" + "high limit alarm SMS	стрту
	content" will be sent to the authorized number	
	If value of the mapped address data multiplied by	
Threshold low	the ratio lower than this value, when alarm occurs,	Empty
	the "channel name" + "low limit alarm SMS content"	



	will be sent to the authorized number		
High clorm SMS	When the high limit alarm occurs, "channel name" +		
High alarm SMS content	this SMS content will be sent to the authorized	Empty	
content	number.		
Low alarm SMS	When the low limit alarm occurs, "channel name" +		
content	this SMS content will be sent to the authorized	Empty	
content	number.		
Alarm SMS	When alarm occurs, "channel name" + this SMS	Empty	
content	content will be sent to the authorized number.	Empty	
Recovery SMS	When alarm restored, "channel name" + this SMS	Empty	
content	content will be sent to the authorized number.	Empty	
Enable recovery	Text message will be sent when alarm restored	Uncheck	
SMS	Text message will be sent when alarm restored	Uncheck	
Relay0	First relay will close when alarm occurs	Uncheck	
Relay1	Second relay will close when alarm occurs	Uncheck	
Relay2	Third relay will close when alarm occurs	Uncheck	
Relay3	Fourth relay will close when alarm occurs	Uncheck	
Enable	Enable alarm function	Uncheck	

Note: Check "slave alarm" in "alarm numbers settings" page to enable the slave alarm function

# 4.10.2 Mapping Register

DO ^	Boolean	16Bit	32Bit	64Bit	
cess Control	Register No. Current Value				
Access	64	20000	20128	20256	
Access	65	20001	20130	20260	
out Setting	66	20002	20132	20264	
our setung	67	20003	20134	20268	
DI Setting	68	20004	20136	20272 2	2 Regular inquiry
2 Dr Solding	69	20005	20138	20276 S	econds. minimum 2 seconds
DI Alarm	70	20006	20140	20280	
DI Ridini	71	20007	20142	20284	Read
AI Setting	72	20008	20144	20288	
Ar Setting	73	20009	20146	20292 N	otice:
Al Alarm	74	20010	20148	20296 1	Before reading data, pls read slave list
	75	20011	20150		pls read slave list
ner Setting	76	20012	20152	20304	first then it can display
er setung	77	20013	20154	20308	from "Slave Mapping List" first, then it can display correct value
Hour Timer	78	20014	20156	20312	
2 Hour Hiller	79	20015	20158	20316	
Periodic Timer	80	20016	20160	20320	
2 Penodic Timer	81	20017	20162	20324	
k Trigger Setting	82	20018	20164	20328	
t mgger setting	83	20019	20166	20332	
Link Trigger	84	20020	20168	20336	
Link ingger	85	20021	20170	20340	
85 Setting	86	20022	20172	20344	
ob setting	87	20023	20174	20348	
Serial Port	88	20024	20176	20352	
2 Senarron	89	20025	20178	20356	
we Setting	90	20026	20180	20360	
resetting	91	20027	20182	20364	
Slave Mapping L	92	20028	20184	20368	
2 slave mapping c	93	20029	20186	20372	
Mapping Registe	94	20030	20188	20376	
Mapping Registe	95	20031	20190	20380	
oud Platform Setting	96	20032	20192	20384	
Sud Platform Setting	97	20033	20194	20388	
Cellular Network	98	20034	20196	20392	
	99	20035	20198	20396	
storical Record	100	20036	20200	20400	
storied Record	101	20037	20202	20404	
Historical Data	102	20038	20204	20408	
3 mstorical Data	103	20039	20206	20412	

Click "Mapping Register" to view the value of the current slave

Note: If you want to view the current value of the slave, you need to click the [Read] button in the



[Slave Mapping list], first read the slave configuration information to the configuration software, and then go to the [Mapping Register] page to view The current value of the slave.

## 4.11 Network Settings

If you want to use BLIIoT platform, please contact BLIIoT sales person to get Login message/Client ID.

Note:

- 1, The device must be configured in [SET] mode, switch to [SET] before power ON the device;
- 2, Click the "Save" button to saving parameters in device;
- 3, When configuration is complete, power OFF the device, then switch to [RUN] mode;
- 4, At last, reboot the device, then the device will enter into normal running mode.

#### \*Refer to chapter 4.1 Preparation before configuration

Connect KPIIOT	C	onne	ct my-m2m	Connect	other	IOT server				
unication Protocol M	dbus RTU	Prot	000 ~		Ser	ver 1 IP/DNS	modbus. dtuij	p.com		(Max60)
Protocol T	2P		~		Ser	rver Listen Port	6651		(0-65535)	
Access Point Name				(Max60)	5	Server 2 IP/DNS				(Max60)
User Name				(Max60)	Ser	ver Listen Port			(0-65535)	
Passsword				(Max60) Serve	er con	nection strategy	Prefer ser	rver 1	~	]
Login ACK Messay Logout Messay	e ASCII	~				(Max60) (Max60)				
Heartbeat Messa	e ASCII	~	Q			(Max60)				
Heartbeat ACK Messa		~	A			(Max60)				
Heartbeat Interva			(1-9999s)							
Response Resend Tim	es 3	~	(1-9)							
Login Message Strate;	y Send O	nce 1	Ahen Login S	Server						

	BLIIoT Cloud via Modbus										
Item	tem Description										
Communication	ommunication When choosing BLIIoT cloud, the parameter										
protocol	is default										
Protocol	TCP	ТСР									
Access point	Access point name provided by mobile	Empty									
name	operator	Empty									
APN user name	User name provided by mobile operator	Empty									
APN password	Password provided by mobile operator	Empty									



Login message	Device serial number issued by BLIIoT (Contact sales to get the serial number)	Pay for cloud services
Login ACK message	System default	
Logout message	System default	
Heartbeat message	System default	
Heartbeat ACK message	System default	
Login message strategy	System default	Send once when login server
Server 1 IP/DNS	modbusrtu.kpiiot.com(BLIIoT V3.0 modbus) modbus.dtuip.com(BLIIoT V2.0 modbus)	Default
Server listen	Target server 1 port number(BLIIoT V3.0 modbus)	4000
port	Target server 1 port number(BLIIoT V2.0 modbus)	6651
Server 2 IP/DNS	Target server 2 DNS or IP	Empty
Server listen port	Target server 2 port number(0-65535)	Empty
Heartbeat interval	If the connection to the server fails 3 times in a row, the time interval for the next connection to the server.(1-9999) seconds	60
No response resend time	After setting heartbeat and login message, if server no response, the times of data resend(1-9)	3

BLIIoT Cloud via MQTT		
Item	Description	Default
Access point name	Access point name provided by mobile operator	Empty
APN user name	User name provided by mobile operator	Empty
APN password	Password provided by mobile operator	Empty
Server 1 IP/DNS	mqtt.dtuip.com	Default
Server listen port	Target server 1 port number	1883
Server 2 IP/DNS	Target server 2 DNS or IP	Empty
Server listen port	Target server 2 port number(0-65535)	Empty



Subscribe topic	The topic when the device subscribes to the information /+	Automatically generate
Publish topic	The topic when the device publishes information	Automatically generate
MQTT Client ID	Device serial number issued by BLIIoT(Contact sales to get the serial number)	Pay for cloud services
MQTT user name	The account that publishes the topic on the proxy server	MQTT
MQTT password	The password to publish the topic on the proxy server	MQTTPW
Publish period	The time interval for the device to upload data regularly (10-65535)	10
MQTT data re-transmission	Whether to enable data re-transmission	Enable/Disable

# 4.12 Historical Record

The device has a built-in 32G SD card, which is used to store the alarm records and historical records of the device. If you need the device to record historical records, then you need to set the interval for saving historical records in the [Periodic Timer] page, and alarm records do not need to be set separately, and the device will automatically save them.

The device will automatically manage the historical records. When there is no space in the memory, it will automatically delete the previous data and keep the latest half of the historical data. It is convenient for users to inquire. In addition, users can also export data to computers for permanent storage. Details as follows:



vent Record: Total:0	Read All	○ Read record from 1	to 1	Clear	Read	Save as CSV	Erase RTU Record
otice:							
Total can save 100000 events	in the internal memory						

Historical Record		
Item	Description	Default
Total	All records	
Read all	Read all records in the device	Check
Read record from	Customize filtering of records	Uncheck
Clear	Clear the screen	Empty
Read	Read historical records	Empty
Save as CSV	Export to a CSV format file	
Erase RTU records	Clear all the historical data	

## 4.13 System

The same parameters can be quickly configured for multiple devices through the export and import function, and the factory reset function will restore the device to the factory settings.



# 4.13.1 Export Configuration File

It is convenient for the user to save the configuration parameters of the device and configure multiple devices in batches.



## 4.13.2 Import Configuration File

Click Import Configuration File button at the top left of the page and select the file to load

### 4.14.3 Factory Reset

Reset device through the factory reset button in configuration software. All parameters of the device will be restored to the factory default initial value. If you forget the password you set, please contact the after-sales service of Beilai Technology.

## **5 SMS Functions**

This device supports remote setting, query, control and other operations through SMS commands. Notes:

1. The default password is 1234, you can use SMS command to modify the password;

2. The "password" in the SMS command refers to the device password, such as 1234, just enter the password directly;

3. The "+" sign in the SMS command is not the content of SMS, please do not add any spaces or other characters in SMS;

4. SMS commands must distinguish between uppercase English letters, such as "PWD" instead of "pwd";

5. If the password is entered correctly and the command is entered incorrectly, the host will return a text message: "The command format is wrong, please confirm!" At this time, please check whether the Chinese and English input methods or uppercase and lowercase letters are correct;

6. If the password is entered incorrectly, no information will be returned;

7. The host will return a confirmation message after receiving the message command, if no message is returned, please check whether the password is correct and the signal is normal.

# 5.1 SMS Command List

#### 1) Modify password

Event	SMS Command	Return SMS Content
		This is the New
Setting	Old Password+P+New Password	Password, please
		remember it carefully.

Default password: 1234, new password must be 4 digits



### 2) Arm/Disarm

Event	SMS Command	Return SMS Content
Arm	Password+AA	Armed
Disarm	Password+BB	Disarmed

### 3) Set RTU Time

Event	SMS Command	Return SMS Content
Setting	Password+Dxxxx-xx-xxTxx: xx: xxWxx For example: 1234D2015-05-22T15:20:30W01	xxxx(Y)XX(M)XX(D)xx(
	W01 stands for Monday, W07 stands for Sunday	H)X(M)xx(W)

### 4) Query Device Current State

Event	SMS Command	Return SMS Content
Query	Password+EE	Status:
		Armed/Disarmed:
		Model:
		Version:
		IMEI:
		GSM Signal Value:

#### 5) Set User Numbers

Event	SMS Command	Return SMS Content
	Password+A+series number+T+tel	
Setting	number	Telx:
	Series number = 0~9	
Query	Password+A	Return all numbers
Delete		Return 0~4 or 5~9
Delete	Password+A+series number	numbers.

### 6) Call-in to open the door

Authorized number can dial to open the door

Event	SMS Command	Return SMS Content
	• Open door within the	
	authorized time	Tel1:
	Password+B+series	Tel2:
Setting	number+S+start time+E+end time	Tel3: 13570810254
	Always have permission to	Tel4:
	open door	Tel5:
	Password+B+series number+P	



Query	Password+B	Return all authorized
		user numbers
Delete	Password+B+series number	Return all authorized
		user numbers

Example: "1234B0S201505231230E201605231230", where "201505231230" represents the year, month, day, hour and minute respectively.

### 7) Set Daily Report Time

Event	SMS Command	Return SMS Content
Setting	Password+DR+series number+T+time	Daily SMS Report at:
Query	Password+DR	XX:XX
Delete	Password+DRDEL	

Serial number: 0~9, example: "1234DR1T12:30"

### 8) Digital Input

Event	SMS Command	SMS Command
		DI1: Open/Close
Query state	Password+DINE	DI2: Open/Close

### 9) Analog Input

Event		SMS Command	SMS Command
	Sotting	Password+AINR+channel	Alx: Low:xxx,
	Setting	number+Lxxx+Hxxx	High:xxx.
Threshold	Query	Password+AINR+channel	Alx: Low:xxx, High:xxx.
Threshold	Query	number	Aly: Low:xxx, High:xxx.
	Delete	Password+AINR+channel	
	Delete	number+DEL	
	Sotting	Password+AINM+channel	Alx: Min:xxx, Max:xxx
AI	Setting	number+Lxxx+Hxxx	
measure	Query	Password+AINM+channel	Alx: Min:xxx, Max:xxx.
ment	Query	number	Aly: Min:xxx, Max:xxx.
range	Delete	Password+AINM+channel	
	Delete	number+DEL	
Query		Password+AINE+channel	AINx: xxxx ,
current			【Normal/Higher/Lower】
value			
Query all			AIN1: xxxx,
current		Password+AINE	【Normal/Higher/Lower】
value			AIN2: xxxx ,



\_\_\_\_

[Normal/Higher/Lower]

You can query the value of multiple channels by enter several channel number

### 10) Control Relay

Event		SMS Command	Return SMS Content			
	Setting	Password+DO+channel number+T	DOx:xxxx			
DO Name	Query	Password+DO+channel number	DOx:xxxx			
Name	Delete	Password+DO+ channel number+DEL				
	Polov	Password+DOC+ channel number	DOx: Close			
Close F	kelay	Password+DOC+ channel humber	DOy: Close			
Onon B	Polov	Password+DOO+ channel number	DOx: Open			
Open R	leidy		DOx:xxxx DOx:xxxx DOx:Close DOy: Close			
Query o	ery current Password+DOE+ channel number		DOx: Close/Open			
value			DOy: Close/Open			
Quory	all current		DO1: Close/Open			
value		Password+DOE	DO2: Close/Open			
value						
Close r	elay					
accordi	ng to	Password+DOLC+ channel number	DOx:			
configu	red		DOy:			
closing	time					
	Set	Password+DOT+Time	Pulse Output Time:			
Pulse	time		xxxS			
output	Query	Password+DOT	Pulse Output Time:			
Juiput	Query		xxxS			
	Delete	Password+DOP+channel number				

#### 11) Set Server (cellular network)

Event	SMS Command	Return SMS Content
Sotting	Password+IP+ IP address+P+Com	
Setting	port	Sever:
Query	Password+IP	Port:
Delete	Password+IPDEL	

### 12) Set cellular network parameters

Event	SMS Command	Return SMS Content
Sotting	Password+AP+apn+#+user	APN:
Setting	name+#+user password	User name:
Query	Password+AP	Password



Delete	Password+APDEL		
--------	----------------	--	--

#### 13) GPRS Online

Event	SMS Command	Return SMS Content
Online	Password+GPRSonline	GPRS always online

#### 14) Historical Data

Event	SMS Command	Return SMS Content
	Delete all historical	
Delete		records

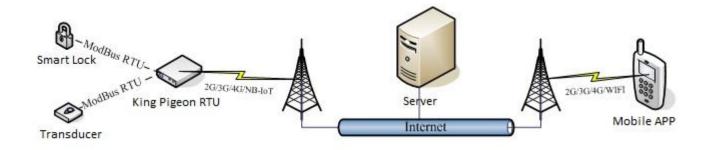
#### 15) Set pulse counter

Event	SMS Command	Return SMS Content
Clear	Password+DIN+Channel	Clear Successfully
	number+CLR	
Query	Password+PR	Counter Current Value:
		xxx

Channel number is 0~3, corresponding to DI0~3 pulse counter

### **6** Communication Protocols

S275 can be connected to servers, SCADA or cloud platform via GPRS/3G/4G.



#### Make sure mobile phone communication is normal

1, The device must be configured in [SET] mode, switch DIP switch on device to [SET] first, then power ON the device. Open configuration software to login in.

#### \*Refer to chapter 4.1 Preparation before configuration

2, On parameter page, click "Read the computer time", "Write the RTU time" to set up time synchronization.



- 3, Check arm automatically when power on
- 4, Click the "Save" button to saving parameters in device

Basic Setting	Parameter 🗙				
Parameter	Modify password		Synchronous machine ti	ime	
9525	Old	password:	-	5-03-31 22:25:00	
Alarm Numbers	New	password:			Read
Output Setting	TIC		Time zone: (UTC	.+08:00)	Save
DO DO	Confirm	password: (4 digits)	Write	the RTU time	Save
		Modify password	Read the RTU time	Read the computer time	
Access Control					
Access	Basic information				Note:
	Device ID 1 (1~2	247, fill it when used as Modbus Slave or	er RS485) Model No. S272-F	TU Version 2EB55	Pls find "Set Run" switch on
Input Setting	Device Description:			(60 Characters)	device, then switch to "Set"
	Add timestamp to ala	rm SMS 🛛 Arm automatically whe	n nower on		mode, then set, after saving
DI Alarm	_				settings, Pls switch to "Run"
*	Auto Arm after disarn	n: 1 Minute(s) (0~9999, Wh	en set as 0, the RTU will in arn	ned mode immediately.)	mode.Upside switch is "Set",
	Timer Reporting SMS Con	itent Settings			downside switch is "Run".In
*		itent Settings ditional information in the report SMS			"Run" mode, settings can't be
Al Alarm			Al0 Value	DO0 Status	
*	Add the following add	ditional information in the report SMS	Al0 Value	DO0 Status DO1 Status	"Run" mode,settings can't be
Al Alarm	Add the following add	ditional information in the report SMS Arm Status			"Run" mode, settings can't be
Al Alarm     Timer Setting     Hour Timer	Add the following add DIO Status DI1 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value	Al1 Value	DO1 Status	"Run" mode, settings can't be
Al Alarm	Add the following add DIO Status DI1 Status DI2 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status	Al1 Value	DO1 Status DO2 Status	"Run" mode,settings can't be
Al Alarm	Add the following add DI0 Status DI1 Status DI2 Status DI3 Status DI3 Status DI4 Status DI5 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value	Al1 Value Al2 Value Al3 Value	DO1 Status DO2 Status	"Run" mode,settings can't be
Al Alarm     Timer Setting     Hour Timer     Periodic Timer     Link Trigger Setting	<ul> <li>Add the following add</li> <li>DIO Status</li> <li>DI1 Status</li> <li>DI2 Status</li> <li>DI3 Status</li> <li>DI4 Status</li> </ul>	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value	Al1 Value Al2 Value Al3 Value Al4 Value	DO1 Status DO2 Status	"Run" mode, settings can't be
Al Alarm Timer Setting Hour Timer Periodic Timer	Add the following add DI0 Status DI1 Status DI2 Status DI3 Status DI4 Status DI5 Status DI5 Status DI6 Status DI6 Status DI7 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description	Al1 Value Al2 Value Al3 Value Al4 Value	DO1 Status DO2 Status	"Run" mode, settings can't be
Al Alarm     Timer Setting     Hour Timer     Periodic Timer     Link Trigger Setting	Add the following add     DIO Status     DI1 Status     DI2 Status     DI3 Status     DI4 Status     DI4 Status     DI6 Status     DI6 Status     Alarm SMS Content Setting	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description	Al1 Value Al2 Value Al3 Value Al4 Value	DO1 Status DO2 Status	"Run" mode,settings can't be
Al Alarm     Timer Setting     Hour Timer     Periodic Timer     Link Trigger     Link Trigger     RS485 Setting	Add the following add     DIO Status     DII Status     DI3 Status     DI3 Status     DI4 Status     DI5 Status     DI6 Status     DI7 Status     Alarm SMS Content Settin     Add the following add	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description gs ditional information in the alarm SMS	<ul> <li>Al1 Value</li> <li>Al2 Value</li> <li>Al3 Value</li> <li>Al4 Value</li> <li>Al5 Value</li> </ul>	DO1 Status DO2 Status DO3 Status	"Run" mode,settings can't be
Al Alarm     Timer Setting     Hour Timer     Periodic Timer     Link Trigger Setting     Link Trigger     RS485 Setting     Serial Port	Add the following add     DI0 Status     DI1 Status     DI2 Status     DI3 Status     DI3 Status     DI4 Status     DI5 Status     DI6 Status     DI7 Status     Alarm SMS Content Settin;     Add the following add     DI0 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description gs ditional information in the alarm SMS Arm Status	<ul> <li>Al1 Value</li> <li>Al2 Value</li> <li>Al3 Value</li> <li>Al4 Value</li> <li>Al5 Value</li> <li>Al0 Value</li> </ul>	<ul> <li>DO1 Status</li> <li>DO2 Status</li> <li>DO3 Status</li> </ul>	"Run" mode,settings can't be
Al Alarm     Timer Setting     Hour Timer     Periodic Timer     Link Trigger     Link Trigger     RS485 Setting	Add the following add DIO Status DII Status DI2 Status DI3 Status DI3 Status DI4 Status DI5 Status DI5 Status DI7 Status Alarm SMS Content Settin Add the following add DI0 Status DI1 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description gs ditional information in the alarm SMS Arm Status GSM/3G Signal Value	<ul> <li>A11 Value</li> <li>A12 Value</li> <li>A13 Value</li> <li>A14 Value</li> <li>A15 Value</li> <li>A15 Value</li> <li>A10 Value</li> <li>A11 Value</li> </ul>	<ul> <li>DO1 Status</li> <li>DO2 Status</li> <li>DO3 Status</li> <li>DO0 Status</li> <li>DO0 Status</li> <li>DO1 Status</li> </ul>	"Run" mode,settings can't be
Al Alarm     Timer Setting     Hour Timer     Periodic Timer     Link Trigger Setting     Link Trigger     RS485 Setting     Serial Port	Add the following add     DI0 Status     DI1 Status     DI2 Status     DI3 Status     DI3 Status     DI4 Status     DI5 Status     DI6 Status     DI7 Status     Alarm SMS Content Settin;     Add the following add     DI0 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description gs ditional information in the alarm SMS Arm Status	<ul> <li>Al1 Value</li> <li>Al2 Value</li> <li>Al3 Value</li> <li>Al4 Value</li> <li>Al5 Value</li> <li>Al0 Value</li> </ul>	<ul> <li>DO1 Status</li> <li>DO2 Status</li> <li>DO3 Status</li> </ul>	"Run" mode,settings can't be

5, On alarm numbers page, enter the mobile phone number used to receive the alarm, and then check the corresponding options, if you want to receive text messages from device power on, power lost, and power recovery, check the power on, power lost, power recovery, then click the [Save] button.

Basic Setting Alarm Number	ers×										
Parameter Authorized	User Telephone	Number Se	ttings								
Alarm Numbers	(Alarm No.)	Power On	Timer Report	Arm/Disarm SMS	Low Signal	Power Lost	Power Recovery	GPRS Failure	Relay Switch	Slave Alarm	Slave Failure
Output Setting											
User No.1											
DO User No. 2											
Access Control User No. 3											
Access User No. 4											
User No. 5			$\square$								
User No.6											
DI Setting User No. 7											
DI Alarm User No. 8											
Al Setting User No.9			$\square$								
Al Alarm											
Timer Setting							Read		Save		
Hour Timer Notice:											
	can include or no alert: Mobile sigr				n setup 00	44 or +44	or without co	untry code,	but can not	be 44.	
	ds for when the e				e related t	elephone n	umbers.				

6, Power OFF the device first, switch DIP switch on device to [RUN] mode, then reboot the device to enter into normal running mode.

7, Install the SIM card, and then turn on the device, wait for about 1-2 minutes, the number used to



receive the alarm should receive message notify the device is turned on. Unplug the external power supply of the device, the number used to receive the alarm should receive message notify the external power lost. Then re-connect the external power supply to the device, then the mobile phone number used to receive the alarm should receive message notify the external power recovery. So far, it has been verified that the device can communicate normally.

8, Power off the device, switch DIP switch on device to [SET], reboot device, and enter the configuration page again. Click [Read] button on the page, read the previously set parameters first, otherwise it will be overwritten by the new parameters.

# 6.1 Modbus RTU Slave Application

# 6.1.1 Read DO State

Relay DO register address as holding coil, address 0~3, refer to chapter 8.1 Device Register Address

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting
	-	•=	address
Function Code	1	01H	Read holding coil type, function code 01
DO Register	2	00 00H	
start address	Z	00000	Range: 0000H-0003H
Read DO	2	00.0411	Bangar 000111 000411
Register QTY	2	00 04H	Range: 0001H-0004H
16CRC Verify	2	3D C9H	CRC0 CRC1 low byte in front, high byte in behind

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description	
Device Address	1	01H	01H Device, according to the data Master send	
Function Code	1	01H	Read holding coil	
Return Byte	1	0111	Detum Dete Longth	
Length		01H	Return Data Length	



Returning Data		02Н	02H means 4 DO status, high 4 byte invalid, low 4 Byte converter Binary as below			
			DO3(bit3)	DO2(bit2)	DO1(bit1)	DO0(bit0)
	1		0	0	1	0
			Open	Open	Close	Open
			Device curre	nt relay status:	D00,D02,D03	3 = Open,
			DO1= Close			
16CRC Verify	2	D0 49H	CRC0 CRC1 low byte in front, high byte in behind			behind

Example: Read 4 relays DO0~DO3 status, device address as 1 :

Server send: 01 01 00 00 00 04 3D C9

01H= Device address; 01H= Read relay function code; 00 00H= Read starting relay DO0 address; 00 04H= Read serial 4 DO status; 3D C9H CRC= Verify.

Device answer: 01 01 01 02 D0 49

01H= Device address; 01H= Read relay function code; 01H= Return data byte qty; 02H= Returning data, stands for Binary 0000 0010 high 4 byte invalid, low 4 byte 0010, sort as DO3 DO2 DO1 DO0 status, D0 49HCRC verify.

If read DO or multi DO status, only need to revise " DO Register start address" and " Read DO Register QTY ", calculate the CRC again, returning data according to description data.

# 6.1.2 Control DO

1) Control 1 channel device DO output

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	05H	Write single holding coil type, function code 05
DO Register Address	2	00 00H	Range: 0000-0003, stands for DO0-DO3
Active	2	FF 00H	This value: FF 00H or 00 00H, FF 00H= Close relay, 00 00H= Open relay
16CRC Verify	2	8C 3AH	CRC0 CRC1 low byte in front, high byte in behind

ContentBytesDataDescription
-----------------------------



		(H: HEX)	
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	05H	Write single holding coil type, function code 05
DO Register	2	00.00H	Danger 000011 000211 stands for DO0 DO2
Address	2		Range: 0000H-0003H, stands for DO0-DO3
Active	2 5	FF 00H	This value: FF 00H or 00 00H, FF 00H= Already actived
Active 2	FF UUH	close relay, 00 00H= Already actived open relay	
16CRC Verify	2	8C 3AH	CRC0 CRC1 low byte in front, high byte in behind

Example: Control relay DO0 close, then:

Server send: 01 05 00 00 FF 00 8C 3A

01H= Device address; 05H= Control single relay command; 00 00H = Address of DO0; FF 00H= DO0 close;

8C 3A H16 byte CRC verify.

Device answer: 01 05 00 00 FF 00 8C 3A

01H= Device address; 05H= Control single relay command; 00 00 H = DO0 Address; FF 00H= Active DO0 close; 8C 3AH 16 byte CRC verify.

If single control other relay outputs, only need to change "DO Register Address" and "Active", calculate CRC verify again.

#### 2) Multi control DO outputs

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description			
Device Address	1	01H	01H Device, according to setting address			
Function Code	1	OFH	Write multi holo	ling coil		
DO Register start address	2	00 00H	Range: 0000H-0	Range: 0000H-0003H, stands for DO0-DO3		
Control Relay Qty	2	00 04H	Range: 00001H-0004H			
Write Byte QTY	1	01H	Write 1 byte, since device only 4DO, use 4 binary can do it			
			0FH stands for 4 converter to bin		h 4 byte invalio	d, low 4 byte
Writing Data	1	OFH	DO3(bit3)	DO2(bit2)	DO1(bit1)	DO0(bit0)
Writing Data	L	UFH	1	1	1	1
			Active close	Active close	Active close	Active close
			1= Active close,	0= Active ope	en	
16CRC Verify	2	7E 92H	CRC0 CRC1 low byte in front, high byte in behind			

Content	Bytes	Data	Description



		(H: HEX)	
Device Address	1	01H	01H Device, according to setting address
Function Code	1	OFH	Write multi holding coil
DO Register start address	2	00 00H	Range: 0000H-0003H, stands for DO0-DO3
Active Relay Qty	2	00 04H	Qty: 0-4, stands for how many relays already actived
16CRC Verify	2	54 08H	CRC0 CRC1 low byte in front, high byte in behind

Example: Close device 4 DO at same time, then:

Server send: 01 0F 00 00 00 04 01 0F 7E 92

01H= Device address; 0FH= Control multi relay; 00 00H= Relay DO0 starting address; 00 04H= Control 4 relays; 01H= Send data qty; 0FH= Data sent converter to binary 0000 1111 high 4 byte invalid, low 4 byte 1111 sort to match DO3 DO2 DO1 DO0, 1 stands for close relay, 7E 92H CRC verify.

Device answer: 01 0F 00 00 00 04 54 08

01H= Device address; 0FH= Control multi relay; 00 00H= Relay DO0 starting address; 00 04H= Actived 4 relays; 54 08H CRC verify.

# 6.1.3 Read DI State

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	02H	02 read input coil DIN status
DIN Register Start Address	2	00 00H	Range: 0000H-0007H, stands for DIN0-DIN7
Read DIN Register Qty	2	00 08H	Range: 0001H-0008H, Read qty of DIN status
16CRC Verify	2	79 CCH	CRC0 CRC1 low byte in front, high byte in behind

Content	Bytes	Data (H: HEX)	Description			
Device	1	01	014 Davisa, Banga: 1,247, according to softing address			
Address	T	01H	01H Device, Range: 1-247, according to setting address			
Function	1	1 02H	02 road input coil DIN status			
Code	T		02 read input coil DIN status			
Return Bytes	·   1   01H	Poturn Data Longth				
Qty		Return Data Length				



			0FH converter to binary 1111 1111 from high to low byte, stands for DIN7-DIN0 status								
Returning Data	1	OFH	DIN 7 (bit7 )	DIN6 (bit6)	DIN5 (bit5)	DIN4 (bit4)	DIN3 (bit3)	DIN2 (bit2)	DIN1 (bit1)	DINO (bit0)	
			1	1	1	1	1	1	1	1	
			Close	Close	Close	Close	Close	Close	Close	Close	
			1= Close, 0= Open								
16CRC Verify	2	E1 8CH	CRC0 CRC1 low byte in front, high byte in behind								

Example: Inquiry device 8 DIN data at same time, then:

Server send: 01 02 00 00 00 08 79 CC

01H= Device address; 02H= Inquiry DIN status; 00 00H= DI Starting address; 00 08H= Serial reading 8 DIN status; 79 CC H CRC verify.

Device answer: 01 02 01 0F E1 8C

01H= Device address; 02H= Inquiry DIN status; 01H= Returning data bytes qty; 0FH DIN status, every byte stands for one DIN status, 0FH converter to binary 1111 1111 from high to low byte, stands for DIN7-DIN0 status, 0= Open, 1= Close, E1 8CH 16 byte CRC verify.

If need to inquiry multi DIN status, only need to change "DIN Register Start Address", "Read DIN Register Qty", calculate CRC verify again.

# 6.1.4 Read AI, Tem&Hum, DI0, Power value

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	04H	04 read input register
			One address can read 2 bytes.
Register			AIN address range: 0000-000BH, One AIN data take two address,
Starting	2	00 00H	temperature address: 0018H, humidity address: 0019H, DIN1
Address			count value address: 001A, 001B
			External power voltage address: 000E

Master Send Data Format:



Read Register	2	00 1CH	Read qty of input register, read AIN0 to DIN0 count value address,			
Qty	2	001011	total 28 register, 0000H to 0001BH.			
16CRC Verify	2	F1 C3H	CRC0 CRC1 low byte in front, high byte in behind			

#### Receiver Return Data Format:

Content	Bytes	Data (H: HEX)				De	scription				
Device Address	1	01H	01H Device, Range: 1-247, according to setting address								
Function Code	1	04H	04 read input register								
Data Bytes Range	1	38H	One address can read 2 bytes. AIN address range: 0000-000BH, One AIN data take two address, temperature address: 0018H, humidity address: 0019H, DINO count value address: 001A,001B External power voltage address: 000E								
		00 00 00		N= Retur	ning b	yte	s, sample	data 56 p	oints	5:	
		E7 00 00	AIN	AINO	AIN	1	AIN2	AIN3	AI	N4	AIN5
		00 DD 00	Receivin	00 00	00 0	0	00 00	00 00	00	00	00 00
		00 00 DD	g Data	00 E7H	00		00	00	0	0	00
	00 00 DC 00	00 00 00			DDł	H	DDH	DCH	D	EH	DFH
		DC 00 00	Decimal Value	194	207	7	0	0		)	0
		00 DE 00 00 00 DF	Real Value	1.94	2.0	7	0	0	(	כ	0
Returning	N	00 00 00		I			1 1		1		
Data	Ν	00 04 C6	Other	Extern	al	Temperatur		Humidity		DIN0 Count	
		01 9A 00 00 00 01	Value	Power Vo	ltage	e				Value	
		00 00 01	Receivin	04 C6	Н		0B 36H	1B E4	1H	00 (	00 00 OB
		01 00 01	g Data								
		00 01 00	Decimal	1222			2870	714	0		11
		01 00 01	Value								
			Real	12.22	V	28.7°C		71.4%RH		1	1 times
		0B 36 1B E4 00 00	Value								
		00 OBH	AIN, Externative value=Regis		-	Tei	mperature	, Humidit	y rea	ıl	
16CRC Verify	2	A9 3CH	CRC0 CRC1			hig	gh byte in l	pehind			

Example: Inquiry device 28 input type register at same time, start from address 0. Include 6 AIN, one

device temperature, humidity, external power voltage, DIN0 count value, then:

Server send: 01 04 00 00 00 1C F1 C3

01H= Device address; 04H= Read input register value; 00 00H AIN0= Starting address; 00 1CH= Serial reading 28 input register value; F1 C3H CRC verify.

Device answer: 01 04 38 00 00 00 E7 00 00 0D DD 00 00 DD 00 00 0D DC 00 00 0D DE 00 00 00 DF 00 00 00 DF 00 00 00 04 C6 01 9A 00 00 01 00 01 00 01 00 01 00 01 00 01 00 01 0B 36 1B E4 00 00 00 0B A9 3C

01H= Device address; 04H= Read input register value; 56 bytes data after 38H, 00 00 00 E7H AIN0 value, 00 00 00 DDD AIN1 value, 00 00 00 DDH AIN2 value, 00 00 00 DCH AIN3 value, 00 00 00 DEH AIN4 value, 00 00 00 DFH AIN5 value, 00 00 00 00 H invalid value, 04 C6H external power voltage value, 01 9A 00 00 00 01 00 01 00 01 00 01 00 01 00 01 00 01 H invalid value, 0B 36H temperature value, 1B 36H humidity value, 00 00 00 0BH DIN0 count value, A9 3C CRC verify.

# 6.2 Modbus RTU Master Application

As Modbus master, RTU can be used to connect to expansion I/O module via RS485 serial port.

This section takes this RTU as a Modbus RTU master connect to Modbus RTU slave as an example, the details are as follows:

#### 1) Serial port settings

In the [Serial Port] page, select "ModBus RTU Master", the baud rate, data bit, parity bit, and stop bit are consistent with the parameters of device connected to RS485 serial port, and the scan rate, timeout time and The master/slave communication fail verify time can be set as default.

O DO ^	Serial Port 🔀			
Access Control	Baud rate ModBus RTV ModBus RTV		Scan Rate 200 Time Out 200	(200~65535ms) (200~65535ms)
DI Setting	Parity bit none Stop bit 1	~	Master/slave communicati	on fail verify time (0~65535s)
Al Setting	Read	Save		
Timer Setting	Notice: 1. Scan Rate can't les 2. Time Out can't les			
Hour Timer				
Link Trigger Setting				
RS485 Setting				
Serial Port				

Slave settings

Refer to chapter 4.10.1 Slave Mapping List

3) Shut down and restart the device

The device will running according to the configuration parameters.

Note: After adding slave information, the device must be shut down and restart.

# 6.2.1 Read Bool Mapping Address Data

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	01H	Read Holding Coil type, Function Code 01
Boolean Register Starting Address	2	00 40H	Range: 0040H-007FH, Address refer to chapter 8.2 Mapping Register
Read Register Qty	2	00 0AH	Range: 0001H-0040H, Boolean mapping address, total 64 address
16CRC Verify	2	BD D9H	CRC0 CRC1 low byte in front, high byte in behind

Content	Bytes	Data (H: HEX)				Descr	iptior	1						
Device Address	1	01H	01H Device	01H Device, according to the data Master send										
Function Code	1	01H	Read Holdi	ng Coil										
Return Bytes Length	1	02H	Return data length											
	N		High byte means low address data, low byte means high data, According to Modbus protocol, fix 73 01H real value to 01 73H converter binary as below:											
Deturciae Dete	N=	N=	N=	N=		BIT Position	Bit15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Returning Data	Return ing bytes	73 01H	Boolean Address	Invali d	Inv alid	Inv alid	Inv alid	Inv alid	Inva lid	73	72			
	length		Value	0	0	0	0	0	0	0	1			
	lengen		BIT	Bit7	Bit	Bit	Bit	Bit	Bit2	Bit	Bit			
			Position		6	5	4	3	DILZ	1	0			
			Boolean	71	70	69	68	67	66	65	64			



			Address								
			Value	0	1	1	1	0	0	1	1
			Eg: Read 10	) value,	high 1(	) byte	addres	s value	e looke	d as in	valid
16CRC Verify	2	5D 0CH	CRC0 CRC1	low byt	e in fro	ont, hig	gh byte	e in bel	nind		

Example: Read 10 mapping Boolean value starting from address 64, then:

Server send: 01 01 00 40 00 0A BD D9

01H= Device address; 01H= Read holding coil; 00 40H= Read Boolean value starting from address 64; 00 0AH= Serial reading 10 Boolean status; BD D9H CRC verify.

Device answer: 01 01 02 73 01 5D 0C

01H= Device address; 01H= Read holding coil; 02H= Returning data bytes; 73 01H= 10 Boolean status read, refer to table above; 5D 0CH CRC verify.

## 6.2.2 Revise Bool Mapping Address Data

If need to revise slaves connected, need to add slave and use function code 15 for mapping command in configuration software. After mapping address value changed, will revise to write RS485 matched slave address data.

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	05H	Write single Holding Coil type, Function Code 05
Boolean Mapping Register Address	2	00 40H	Range: 0040H-007FH, address refer to chapter 8.2 Mapping Register
Writing Value	2	FF 00H	This value: FF 00H or 00 00H, FF 00H= Write 1, 00 00H= Write 0
16CRC Verify	2	8D EEH	CRC0 CRC1 low byte in front, high byte in behind

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	05H	Write single Holding Coil type, Function Code 05



Boolean	2	00 40H	Range: 0040H-007FH		
Register Address			5		
Writing Value	2	FF 00H	This value: FF 00H or 00 00H, FF 00H= Write 1, 00 00H= Write 0		
16CRC Verify	2	8D EEH	CRC0 CRC1 low byte in front, high byte in behind		

Example: Revise Boolean mapping address 64 status value, revise to 1, then:

Server send: 01 05 00 40 FF 00 8D EE

01H= Device address; 05H= Revise Boolean value; 00 40 H= Revise mapping address; FF 00H= Write 1, 8D EEH16 byte CRC verify.

Device answer: 01 05 00 40 FF 00 8D EE

01H= Device address; 05H= Revise Boolean value; 00 40 H= Revise mapping address; FF 00H= Write 1, 8D EEH16 byte CRC verify.

If need revise multi, please refer to Modbus protocol, Function code 15.

## 6.2.3 Read Data Type Mapping Address

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	03H	03 function code, read holding register
Mapping Register Starting Address	2	4E 20H	One address can read 2 bytes. Address range: 4E20H-501CH, mapping data type address range, address refer to chapter 8.2 Mapping Register
Read Mapping Register Qty	2	00 0AH	Read qty of input register
16CRC Verify	2	3D 2FH	CRC0 CRC1 low byte in front, high byte in behind

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	03H	Read holding register



Data Bytes Range	1	14H	One address	can read :	2 bytes.			
			N= Returning Mapping Address	bytes, sa 20000	mple data 20001	20002	s: 20003	20004
		00 14 00 1E 00	Receive Data	00 14H	00 1EH	00 28H	00 32H	00 4BH
Returning Data	N= Returnin	28 00 32 00 4B 00 41 00 0A 00	Mapping Address	20005	20006	20007	20008	20009
	g Bytes	25 00 14 00 2AH	Receive Data	00 41H	00 0AH	00 25	00 14	00 2A
			Mapping add mapping data to " Mapping	a type acc	ording de	vice RS48	5 connect	
16CRC Verify	2	FB 34H	CRC0 CRC1 lo	w byte in	front, hig	h byte in	behind	

Example: Read 10 mapping address data, start from 20000, then:

Server send: 01 03 4E 20 00 0A D3 2F

01H= Device address; 03H= Read holding register; 4E 20H= Read starting address, decimal 20000 00 0AH read 10 register value, D3 2FH 16 byte CRC verify.

Device answer: 01 03 14 00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A FB 34

01H= Device address; 03H= Read holding register; 14H return 20 bytes, 00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A return data, refer to table above, FB 34H 16 byte CRC verify.

## 6.2.4 Revise Data Type Mapping Address

If need to revise slave data which RS485 connected, need to add slave and use function code 16 for mapping command in configuration software. After mapping address value changed, will revise to write RS485 matched slave address data.

If the data type of address 20000 mapping salves is signed-int AB:

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address



Function Code	1	06H	Write single holding register
Mapping	n	4E 20H	Address range: 4E20H-501CH, mapping data type address
Register Address	Z	4E 20H	range, address refer to chapter 8.2 Mapping Register
Writing Data	2	00 64H	Sample data writing value is decimal 100
16CRC Verify	2	9E C3H	CRC0 CRC1 low byte in front, high byte in behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	06H	Write single holding register
Mapping Register Address	2	4E 20H	Address range: 4E20H-501CH, mapping data type address range
Writing Data	2	00 64H	Writing 100 successfully
16CRC Verify	2	9E C3H	CRC0 CRC1 low byte in front, high behind

Example: If the data type of address 20000 mapping salves is signed-int AB, revise mapping address 20000 register to 100, then:

Server send: 01 06 4E 20 00 64 9E C3

01H= Device address; 06H= Revise single holding register value, 4E 20H= Revise address 20000 register value, 00 64H= Write to decimal value 100, 9E C3 H16 byte CRC verify.

Device answer: 01 06 4E 20 00 64 9E C3

01H= Device address; 06H= Revise single holding register value, 4E 20H= Revise address 20000 register value, 00 64H= Revise to decimal value 100, 9E C3 H16 byte CRC verify.

If need to revise multi data type mapping address, refer to Modbus protocol, Function code 16.

# 7 Connect to Cloud Platform

# 7.1 BLIIoT Modbus Cloud

1) Enter "Login message" then click "Save"

Please contact sales person to get Login message



	Conne	ect my-m2m	Connect other	r IOT server		
unication Protocol Mo	lbus RTU Prot	toco 🗸	Ser	rver 1 IP/DNS	modbus. dtuip. com	(Ma
Protocol TC	P	~	Se	rver Listen Port	6651	(0-65535)
Access Point Name			(Max60)	Server 2 IP/DNS		(Ma
User Name			(Max60) Ser	ver Listen Port		(0-65535)
Passsword			(Max60) Server con	mection strategy	Prefer server	1 ~
Logout Message	ASCII ~			(Mar60)		
Heartbeat Message Heartbeat ACK Messag		Q A		(Mar60) (Mar60)		
	e ASCII V	11.				
Heartbeat ACK Messag	e ASCII ~	A				
Heartbeat ACK Messag Heartbeat Interval	e ASCII ~	A (1-9999s) (1-9)	erver 🗸			

2) Add data points BLIIoT cloud(Data point identification REGXXX refer to chapter 8.1 Device Register Address)

M	2 Monite	ring Center			
0	← Device List				
<b>■</b>	Device	mo		÷	Ø
	Equipment	Equipment translation serial	number		
∿ ⊙	Device	Please enter the device name	ne		5
٠	Link	MB RTU		v	0
	time zone	UTC+08:00		×	3
	Dropping	Recommended Value 👻	60 (seconds)	×	3
	Sensor	Append	Batch Addition		
		Sensor Name	Numerical Type	*	0(Decimal Place) Vnit Sort



Read write instruction settings

– 🛛 🗙

Serial Number	Sensor	Slave Address	Function Code	Bias	Data Format	Data Bits	Byte Order	Acquisitio Cycle
1	DO0	1	01Read and write 🔍	1	bit			60
2	DO1	1	01Read and write 🔍	2	bit			60
3	DIN0	1	02Read-only -	1	bit			60
4	DIN1	1	02Read-only -	2	bit			60
5	AIN0	1	04Read-only	t	32Position Signed N 💌		AB CD 👻	60
6	AIN1	1	04Read-only	3	32Position Signed N 💌		AB CD 🛛 👻	60
7	温度	1	04Read-only	25	16Position Signed N 💌			60
8	湿度	1	04Read-only	26	16Position Signed N 💌			60
9	DIN0计数	1	04Read-only	27	32Position Unsigned		AB CD 👻	60
10	电压电源	1	04Read-only	15	16Position Unsigned 👻			60



#### Slave address: S27X ID

- Function code: Select the corresponding function code according to the slave type(Refer to chapter 8.2 Mapping Register)
- > Bias: The register address of S27X needs to plus 1, such as address 0 bias item enter 1
- Data format: The Boolean type does not need to be set, and the numerical type is selected according to the actual situation.
- Byte order:Sorting of numerical data points
- > Acquisition cycle: Interval time of data acquisition



Device name /ID	Q	•⊃ Return	冷轧净环	Serial Number: 8611900523344520		8
All Equipment Alarm 0 Off	line 25		DO0 ID:2922812			AlmQ RT Curve@ Hist
✓ mo S272	2/9		DO1 ID:2922813	Connected     Updated:2023/04/21 11:03:21	OFF	Alm⊕ RT Curve⊙ Hist
◆ 智慧工厂物联网数据采集与控制			DIN0 ID:2922814	Connected     Updated:2023/04/21 11:03:21	OFF	AlmQ RT Curve⊙ Hist
RTU5028E (Modbus RTU)_021 电影励A230T			DIN1 ID:2922815	☐ Connected Updated:2023/04/21 11:03:21	OFF	AlmQ RT Curve© Hist
BL102			AIN0 ID:2922816	Connected     Updated:2023/04/21 11:03:22	0.18 * 🛩	AlmQ RT Curve⊙ Hist
💼 RTU5028E (Modbus RTU)			AIN1 ID:2922817	☐ Connected Updated:2023/04/21 11:03:22	0.00 * 🛩	Alm⊕ RT Curve⊖ Hist
砖线四合— BL110(MQTT)			温度 ID:2922818	Connected Updated:2023/04/21 11:03:22	0.00 % 🛩	AlmQ. RT Curve⊖ Hist
<ul><li>&gt; 控制器组</li></ul>	0/8		<b>湿度</b> ID:2922819		0.00 % 🛩	AlmΩ RT Curve⊖ Hist
> KTCS	0/3		DIN0计数 ID:2922820	☐ Connected Updated:2023/04/21 11:03:22	0 % 🛩	AlmQ RT Curve⊙ Hist
<ul> <li>&gt; 甘肃兰州区域</li> <li>&gt; CX_BL102</li> </ul>	0/2		电压电源 ID:2922821	Connected     Updated:2023/04/21 11:03:22	12.59 v 🛩	AlmΩ RT Curve⊖ Hist

# 7.2 BLIIOT MQTT Cloud

There are three kinds of identities in the MQTT protocol: Publisher (Publish), Broker (Broker) (server), and Subscriber (Subscribe). Among them, the publisher and subscriber are both clients, the broker is server, and the message publisher can also be a subscriber. Take S27X connected to BLIIoT cloud 2.0 platform as an example:

When device publish I/O point data:



When customer control the device:



Enter MQTT Client ID



. dtuip. com     (Max60)       (0-65535)     (Max60)       (0-65535)     (Max60)       (0-65535)     (Max60)       Frotocol Settings
(Max60) (0-65535) fer server 1 ~
(0-65535) Fer server 1 ~
fer server 1 v
1 <u>6</u>
Jser Name MQTT Password MQTTFW data upload cycle 60 Se
a retransmission Enable / disable
ly use MQTT Protocol require to setup

### Add data points on BLIIoT cloud

M	20 Monito	ring Center		
0	← Device List			
	Device	mo	×	
•	Equipment	Equipment translation serial	number	
<b>∿</b> ⊙	Device	Please enter the device name	ie	5
+	Link	MQTT	T.	3
	time zone	UTC+08:00	*	3
	Dropping	Recommended Value 🔻	60 (seconds)	0
	Sensor	Append	Batch Addition	
		Sensor Name	Numerical Type 🔹	0(Decimal Place) VInit Sort Delete



Read and write identification setting, slave identification unified as REG plus mapping register address, refer to chapter 8.2 Mapping Register

Link Protocol	← Device List				
TCP Protocol	All Sensors				
HTTP Protocol					
MB RTU		215	215	215	
MB TCP		(')	(')	(')	(')
MQTT Protocol				$\sim$	<b>U</b>
UDP Protocol		DO0	D01	DINO	DIN1
TCP JSON Protocol		Sensor ID: 2922812	Sensor ID: 2922813	Sensor ID: 2922814	Sensor ID: 2922815
CTCoAP Protocol		Read write	Read write	Read write	Read write
NB-IoT Protocol	Setting Parameters	Write	Write	Write	Write
CoAP Protocol	Jetung Farameters	1110	11100		
	( A A	V A	្ព		
			4		
	AINO	AIN1	温度	200	DIN0计数
	Sensor ID: 2922816	Sensor ID: 2922817	Sensor ID: 2922818	Sensor ID: 2922819	Sensor ID: 2922820
	Read write				
	Write	Write	Write	Write	Write

Payload data format of device publish message

```
Publish Topic: MQTT client ID
{
         "sensorDatas": [
              ł
                  "flag":"DI1",
                                          //Read and write flag
                  "switcher":1
                                          //data type and value
              },
              {
                  "flag":"AI1",
                  "value":10.00
              }
              {
                  "flag":"REG20000",
                                            // Register address and value
                   "value":1.00
              }
         ],
         "time":"1591841863",
                                           //Time stamp (When power on, first time
    connection no time stamp, later connections have time stamp)
         "state":"alarm",
                                          //Alarm(Only appears when alarm occurs)
         "state":"recovery",
                                         //Alarm(Only appears when alarm recover)
         "retransmit":"enable"
                                         //Historical data (only for re-transmission of
    historical data, but not for real-time data)
      }
```



Note:

//Read and write flag: the character is "flag", followed by "MQTT identification of data points"

//Data type and value:

1. Switch-type data: the character is "switcher", followed by "0" or "1" (0 open, 1 closed)

2. Numerical data: the character is "value", followed by "specific value"

//Timestamp: the character is "time", followed by "specific timestamp "

//Alarm and recovery identification: the characters are "state", followed by "alarm" or "recovery" (alarm is alarm data, recovery is recovery data)

//Historical data identification: the character is "retransmit", followed by "enable"

The data collected during the network disconnection will be temporarily stored in the device, and will be republished when the network is recovered. It is identified by the "retransmit" character, indicating historical data. (Need to enable MQTT data retransmission function in the configuration software)

Payload data format in device subscription message

(The topic of the BLIIoT 2.0 platform downstream publish message is called "device serial number/sensor ID", so the device subscribe topic needs to add the wildcard "/+" in order to receive the data sent by the platform to achieve control)Subscribe topic: device serial number /+ (corresponding to the data filled in the subscribe topic item on the configuration software)

#### Note:

//Platform sensor ID: The character is "sensorsID", followed by the ID number (ID is automatically generated by the platform)

//Data type and value:

- 1. Switch-type data: The character is "switcher", followed by "0" or "1" (0 open, 1 closed)
- 2. Numerical data: The character is "value", followed by "specific value"



//Read and write flag: The character is "flag", followed by "MQTT identification of data points"

//Downstream packet identification of the platform: The character is "down", followed by "down", which means that this is the downlink data of the platform.

Device I/O	data p	oint read	and	write flag	J
------------	--------	-----------	-----	------------	---

Data Point	Flag	Туре	Description
DO	DOx	Switcher	0 is open, 1 is closed
DI	DIx	Switcher	0 is open, 1 is closed
AI	Alx	Value	True value = original value
Temperature	ТЕМР	Value	True value = original value
Humidity	нимі	Value	True value = original value
External power voltage	EXTPWR	Value	True value = original value
DIN0 counter	COUNT	Value	True value = original value
DIN1counter	COUNT1	Value	True value = original value
DIN2 counter	COUNT2	Value	True value = original value
DIN3 counter	COUNT3	Value	True value = original value

Note:

"DOx": DO0, DO1, DO2, DO3

"DIx": DI0, DI1, DI2, DI3, DI4, DI5, DI6, DI7

"Alx": AI0, AI1, AI2, AI3, AI4, AI5

### 7.3 Other IoT Server

S27X supports custom cloud platform configuration, which supports MODBUS RTU, MOBUDS TCP, and MQTT protocols.

The data format of the custom MQTT protocol is the same as the data format of the MQTT of the BLIIoT Cloud V2.0 platform.

The Modbus RTU and Modbus TCP protocols are standard Modbus protocols.



Connect KPIIOT	Connec	t my-m2m	Connect other	r IOT server			
mmunication Protocol Mod	ous RTU Proto	ico ~	Sez	ver 1 IP/DNS			(Max60)
Protocol TCP		~	Set	rver Listen Por	rt [	(0-65535)	
Access Point Name			(Max60)	Server 2 IP/DNS	5		(Max60)
User Name			(Max60) Ser	ver Listen Port	t	(0-65535)	
Passsword			(Max60) Server cor	nection strate;	sy Prefer server	1 ~	
Login Message Login ACK Message		690909697922	2FC54CA4650FD9916	(Max60)	<b>IQTT Protocol</b> Subscribe Topic [ Publish Topic [		
	ASCII ~ ASCII ~	690909697922	2FC54CA4650FD9916	(Max60)	Subscribe Topic [		
Login ACK Message Logout Message	ASCII ~ ASCII ~ ASCII ~	690909697922	PC54CA4650FD9916	(Max60) (Max60) (Max60)	Subscribe Topic   Publish Topic   MQTT Client ID		
Login ACK Message Logout Message Neartbeat Message	ASCII ~ ASCII ~ ASCII ~ ASCII ~	690909697922	2FC54CA4650FD9916	(Max60) (Max60) (Max60) (Max60) (Max60)	Subsoribe Topic Publish Topic MQTT Client ID MQTT User Name		Sec
Login ACK Message Logout Message Heartbeat Message Heartbeat ACK Message	ASCII ~ ASCII ~ ASCII ~ ASCII ~ 60		2FC54CA4650FD9916	(Max60) (Max60) (Max60) (Max60) (Max60) (Max60)	Subsoribe Topic Publish Topic MQTT Client ID MQTT User Name MQTT Password utomatic data upload	ayale 60	
Login ACK Message Logout Message Heartbeat Message Heartbeat ACK Message Heartbeat Interval	ASCII ~ ASCII ~ ASCII ~ ASCII ~ 60 3 ~	(1-9)		(Max60) (Max60) (Max60) (Max60) (Max60) (Max60) Ax	Subsoribe Topic Publish Topic MQTT Client ID MQTT User Name MQTT Password	oyole 60 ssion □ Enable	e / disable

# 8 Register

# 8.1 Device Register Address

1) Read and Write, Holding Coil (Function Code 01, Function Code 05, Function Code 15)

Register Address		Definition	Data Type	Description
Hexadecimal	Decimal	Demition	Data Type	Description
0	0	DO0	Bool	
1	1	DO1	Bool	• 1: Relay close
2	2	DO2	Bool	• 0: Relay open
3	3	DO4	Bool	

2) Read, Input Coil (Function Code 02: Read Coil)

<b>Register Addres</b>	S	Definition	Data Turna	Description	
Hexadecimal	Decimal	Demition	Data Type	Description	
0	0	D10	Bool	<ul> <li>Dry contact</li> </ul>	



1	1	DI1	Bool	Short circuit: Logic 1
2	2	DI2	Bool	Open circuit: Logic 0
3	3	DI3	Bool	
4	4	DI4	Bool	<ul> <li>Wet contact</li> </ul>
5	5	DI5	Bool	0-0.5V: Logic 1
6	6	DI6	Bool	3-30V: Logic 0
7	7	DI7	Bool	

3) Read, Input Register (Function Code 04: Read Input Register)

Register Addre	SS	Definition	Dete Tree	Description
Hexadecimal	Decimal	Definition	Data Type	Description
0	0	AI0	32bit int	Y=X/100
2	2	AI1	32bit int	Y=X/100
4	4	AI2	32bit int	Y=X/100
6	6	AI3	32bit int	Y=X/100
8	8	Al4	32bit int	Y=X/100
Α	10	AI5	32bit int	Y=X/100
C-D	12-13	Unavailable		
E	14	Voltage	16bit unint	Y=X/100
F-17	15-23	Unavailable		
18	24	Temperature	16bit int	Y=X/100
19	25	Humidity	16bit int	Y=X/100
1388	5000	DI0 count value	32bit uint	Enable when DIN0 as
1300			SZDIL UITI	counter mode
138A	5002	DI1 count value	32bit uint	Enable when DIN1 as
130A			SZDIL UITL	counter mode
138C	5004	DI2 count value	32bit uint	Enable when DIN2 as
				counter mode
138E	5006	DI3 count value	32bit uint	Enable when DIN3 as
130E				counter mode

In the description, each variable is defined as follows:

Y: True value

X: The value stored in the register

"Y=X/100" means: "real value = the value stored in the current register/100"

4) Read and Write, Holding Register (Function Code 03, Function Code 06, Function Code 16)

Register Addre	ess	Definition	Data Type	Description
Hexadecimal	Decimal	Demition	Data Type	Description



5A(bit0)	90(bit0)	DI0 count clear	Bool	Write 1 to clear DI0 count
5A(bit1)	90(bit1)	DI1 count clear	Bool	Write 1 to clear DI1 count
5A(bit2)	90(bit2)	DI2 count clear	Bool	Write 1 to clear DI2 count
5A(bit3)	90(bit3)	DI3 count clear	Bool	Write 1 to clear DI3 count

Device I/O data point read and write flag

Data Point	Flag	Туре	Description
DO	DOx	Switcher	0 is open, 1 is closed
DI	DIx	Switcher	0 is open, 1 is closed
AI	Alx	Value	True value = original value
Temperature	TEMP	Value	True value = original value
Humidity	HUMI	Value	True value = original value
External power voltage	EXTPWR	Value	True value = original value
DIN0 counter	COUNT	Value	True value = original value
DIN1counter	COUNT1	Value	True value = original value
DIN2 counter	COUNT2	Value	True value = original value
DIN3counter	COUNT3	Value	True value = original value

Note:

"DOx": DO0, DO1, DO2, DO3

"DIx": DI0, DI1, DI2, DI3, DI4, DI5, DI6, DI7

"AIx": AI0, AI1, AI2, AI3, AI4, AI5

# 8.2 Mapping Register

1) Holding Coil (Function Code 01, Function Code 05, Function Code 15)

Register Address		Definition	Data Type	Description
Hexadecimal	Decimal	Demition	Data Type	Description
40	64	Bool 64	Bool	
41	65	Bool 65	Bool	Boolean type, slave
42	66	Bool 66	Bool	mapping address, can mapping slave input coil
			Bool	and holding coil status.
			Bool	Total 64
7F	127	Bool 127	Bool	

2) 16 Bit Slave Register: Read and Write, Holding Register, Function Code 03, 06, 16

Register Address	Definition	Data Type	Description
------------------	------------	-----------	-------------



Hexadecimal	Decimal			
4E 20	20000	16bit data 20000	Sort AB, its data type according to slave mapping data type	According to mapping
4E 21	20001	16bit data 20001		rules set via configuration
4E 22	20002	16bit data 20002		software, this address will
				sort slave mapping data
				to AB, stock in this
4E 9F	20127	16bit data 20127		address, for cloud reading together, can mapping slave input and holding register. Total 128

3) 32 Bit Slave Register: Read and Write, Holding Register, Function Code 03, 06, 16

Register Address		Definition	Dete Turne	Description
Hexadecimal	Decimal	Definition	Data Type	Description
4E A0	20128	32bit data 20128	Sort ABCD, its data type according to slave mapping data type	According to mapping rules set via configuration software, this address will sort slave mapping data to ABCD, stock in this address, for cloud reading together, can mapping slave input and
4E A2	20130	32bit data 20130		
4E A4	20132	32bit data 20132		
 4F 1E	20254	 32bit data 20254		
41 TE	20234			holding register. Total 64

4) 64 Bit Slave Register: Read and Write, Holding Register, Function Code 03, 06, 16

Register Address		Definition	Dete Turne	Description
Hexadecimal	Decimal	Definition	Data Type	Description
4F 20	20256	64bit data 20256	Sort	According to mapping
4F 24	20260	64bit data 20260	ABCDEFGH	rules set via
4F 28	20264	64bit data 20264	, its data	configuration software,
			type according to	this address will sort slave mapping data to
			slave	ABCDEFGH, stock in
50 1C	20508	64bit data 20508	mapping data type	this address, for cloud reading together, can



		mapping slave input
		and holding register.
		Total 64

MQTT identifier of the mapping register is unified as "REG" + the corresponding value For example: Slave Boolean 64, MQTT ID is REG64, 16-bit 20000 ID is REG20000.

## 9 Upgrade

1) User is able to replacing the communication module inside the device to upgrade the device from GSM network to 3G network, or from 3G network to 4G network.

2) Firmware of this device can be upgraded through USB, please contact BLIIoT sales person if you need to upgrade the firmware.

## **10 Warranty Term**

1) This equipment will be repaired free of charge for any material or quality problems within one year from the date of purchase.

2) This one-year warranty does not cover any product failure caused by man-made damage, improper operation, etc.

# 11 Technical Support

Shenzhen Beilai Technology Co., Ltd. Website: https://www.bliiot.com