# 4G Cellular IoT M2M RTU





## S270/S271 User Manual

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



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### [Warm Tips---Read Before Use]

With the rapid development of industrial Internet of things, it has been

widely used in various fields, but it involves a wide range of knowledge from sensor, intelligent instrument, gateway, 4G wireless communication, to cloud server, large screen display, app, etc

The professional knowledge of users has higher requirements, so please electronic engineers to install and set. We suggest you be careful reading this article will help you quickly and successfully complete the product setup and implementation of your application.

### 1. Working Principle

Taking a few minutes to understand the working principle of this product will help users quickly understand the working principle of the device and clarify their ideas, and realize the function of these applications.

1) Device Working Principle

This device collects front-end sensor and meter data, and after logical processing and calculation, it is sent to the



mobile phone number set by the user via SMS or sent to the designated cloud server via the data network. The cloud server identifies the device according to the unique number of the device The relationship between the device and the user, while pushing cloud data to the APP or WeChat official account bound to the user.



### S27X 4G RTU Working diagram

#### 2) Functional components of the overview

According to the type of transmitter and sensor supported by the equipment, select the appropriate model, .Please refer to 1.6 technical parameter description to confirm whether the selected sensor is suitable and wiring.

#### RTU device:

It is used to read the sensor data, and then perform the logical processing of the data. The processed data is transmitted to the cloud platform server via SMS or 4G wireless network. At the same time, the RTU device also accepts the instructions of the cloud platform server and performs logical processing, drive IO device.

#### Cloud server

To access the cloud platform, you need to set the server target address on the RTU device side, and then the RTU device takes the initiative to initiate a connection, the cloud platform must also set the RTU device parameters to receive the data sent by the RTU device.

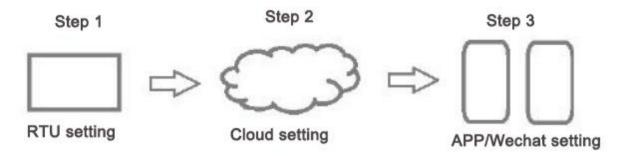
After receiving the data, the cloud platform server processes the data according to the rules, stores it in the database, and pushes it to the computer user or App users

#### Mobile phone/computer:

First, register an account in the cloud platform and bind the corresponding RTU device. After receiving the data uploaded from the RTU device, the cloud platform can push it to the corresponding mobile phone app and computer users after processing. Similarly, mobile app or the instructions sent by the computer will also be sent to the cloud platform first, and then the cloud platform will be pushed to the RTU device.

### 2. Device setting step

This product involves front-end sensors, logic processing of equipment itself, cloud platform data management, app and other parts, Therefore, understanding the setting sequence and steps of this product will help users quickly and orderly set device parameters and access to cloud platform to realize various application functions of users



### Step1: Hardware settings [set locally]

Set parameters according to the manual, IO input and output wiring specifications, logic judgment and control,



## /SMS/GPRS/3G/4G **Cellular IoT M2M**

RS485 serial port expansion and application, equipment and configuration software and cloud platform server communication parameter settings, etc.

#### Step2: **Cloud settings**

Only by setting the relevant parameters of the device on the cloud platform can the relationship between the device and the user be read, and the large screen display can be set content, cloud platform voice alarm, equipment and video monitoring Association, cloud platform SMS alarm, cloud platform mailbox alarm, and

User management rights and other functions.

Step3: APP download and wechat settings(if need)

Step4: Test and complete the setup.

If you have any questions or settings fail, please read "S27x 4G RTU FAQ" or find the corresponding model in the help center of https://www.bliiot.com/ to find solutions.

DATE	CONFIGURATOR VERSION	FIRMWARE VERSION	Author	DESCRIPTION
2018.12.21	V3.0	V3.0	KG	<ol> <li>Modbus address and function code revised;</li> <li>AIN/DIN alarm content setting revised;</li> <li>Interlock event added.</li> </ol>
2019.09.24	V3.01	V3.2	ΖҮН	<ol> <li>Cellular default settings</li> <li>Delete SDK function</li> </ol>
2020.7.24	V3.2	V3.3	C	<ol> <li>Add DIN1-3 low speed pulse counter</li> <li>Add MQTT</li> <li>Add "warm tips"</li> <li>Add notes to user FAQs</li> <li>Modify the configuration software picture and Di, AI description</li> <li>Fix some errors</li> </ol>
2020.8.03	V3.4	V3.4	ZLF	<ol> <li>Add IO internal schematic block diagram and wiring</li> <li>Modify mqtt parameter settings</li> </ol>
2020.8.18	V3.4.1	V3.4.1	С	1.Modify the preparation step error before configuration

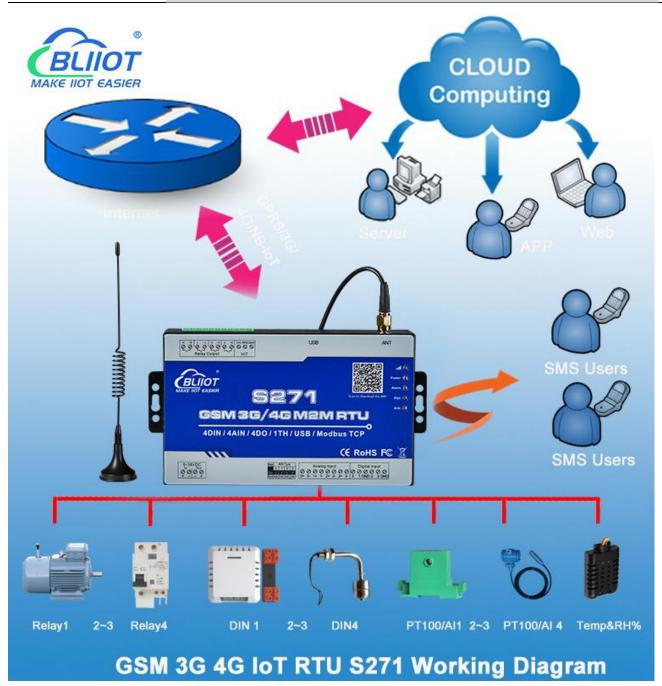
### 



### Model List

Model	DIN	AIN	Relay	тн	SD Card	Extend	I I/O tags/	Mapping I	registers	Port
Woder			Петау			Boolean	16-Bit	32-Bit	64-Bit	POIL
S270	2	2	2	1		×	×	×	×	USB
S271	4	4	4	1		×	×	×	×	USB
S272	8	6	4	1	8G	64	64	×	×	
S274	4	×	4	1	8G	64	128	64	64	USB/RS485
S275	8	6	4	1	8G	64	128	64	64	
Notice	<ol> <li>Default version is GSM/GPRS module inside.</li> <li>For 3G WCDMA, 4G LTE version, please tell our sales where would you like to use them.</li> </ol>									





### 1. Brief introduction

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. It provides 4/2 digital inputs, 4/2 analog or PT100 Resistance Temperature Detector (RTD) inputs, 4/2 relay outputs, 1 ambient sensor input for monitoring onsite temperature and humidity. It can monitoring and operates the I/O ports by SMS, APP, Web Server, internet, timers and programmed inter-lock events automatically.

The Cellular IoT M2M RTU inbuilt TCP/IP protocol stack make it suitable for internet of things (IoT) applications, it can be easily to operate by the provided cloud, app, and web server, or integrated to you IoT applications according to the TCP/UDP protocol, or integrated to SCADA systems by standard Modbus TCP protocol, too. This is very useful if you need remote control onsite devices with low cost solution.

The Cellular IoT M2M RTU is design for working in the harsh industrial application environment, widely used in a variety of industrial automation, security monitoring system, automatically measurement and control system, BTS



monitoring, remote data acquisition, telemetrically systems, automatically control system. It can be used as a remote switch, remote I/O, remote smart PLC, timer switches.

The Cellular IoT M2M RTU can be used as remote access control for BTS monitoring, the authorized users can open the gate or turn on the machine with a free charge call at specified time, this is useful for daily maintenance to save the time of traditional authorized.

#### 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.

### 2.Safety Directions



#### Safe Startup

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

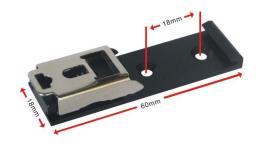
#### Interference

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

### 3. Standard Packing List

RTU X1; AC/DC Adaptor X1; GSM/3G/4G Antenna X1;User Manual X1; PC Configurator X1 . Note: The package does not include any SIM card.

Optional: 35mm Standard DIN rail fixed Bracket





35mm DIN Rail Fixed Bracket

### 4. Mainly Features and Specifications

### 4. 1Mainly 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;
- 2/4 digital inputs, compatibles dry and wet contact. Logic level: 0~0. 5V or short circuit treated as close,
   +3~30V or open circuits treated as open. DI0-3 can be used as counter, sampling frequency is 1Mhz, DI1 can be used as Arm/Disarm;
- 2/4 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;
- 1 temperature & humidity sensor input for monitoring onsite environment, the sensor model is AM2301,
   Measures temperatures from -40-80°C,0.5°C accuracy, Relative Humidity from 0-99RH%, accuracy is 3%;
- > 2/4 analog inputs, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output transducers;
- > Powerful SMS function: threshold high SMS alert, SMS set, SMS inquiry;
- Inbuilt 1 DC output for external transducers to save wiring cost;
- Automatically resend the data while communication interrupt or failure, and failure will alert by SMS text to users;
- Supports remotely restart the RTU, and configure& operate it by SMS commands remotely;
- 10 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 design, replace a module can 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, alert when external power failure, standby time is 5 hours;
- Support TCP/UDP,MQTT, Modbus TCP, Modbus RTU over TCP, King Pigeon IoT RTU protocol and data transparent transmission function;
- Using metal shell, protection class IP30. Metal shell and system security isolation, especially suitable for industrial applications in the field;
- L140 \* W88 \* H30mm, compatible wall installation and DIN35mm industrial rail installation.

### 4. 2 Specifications

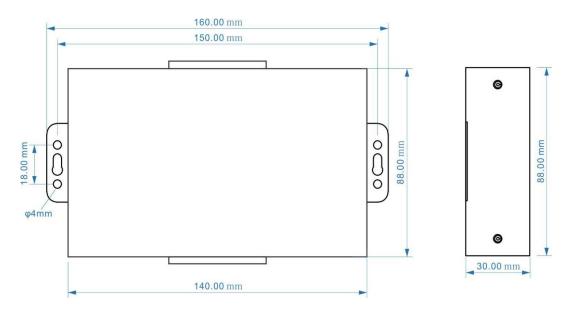
Item	Reference Scope
DC Power supply	Standard adapter: DC 12V/2A Range 9-36VDC
Power consumption	Standby:12V/50mA; Working Max.: 12V/150mA
GSM Frequency	850/900/1800/1900Mhz
3G/4G	Optional: WCDMA/TDD-LTE/FDD-LTE
TCP/IP stack	TCP,UDP
SIM interface	Supporting 3V and 1.8V SIM Card
External antenna	SMA Antenna interface, 50 Ohm, Gain: 3dB
Serial Interfaces	1 USB Port



Protocols	SMS, GPRS UDP, TCP, MQTT, Modbus RTU over TCP and King Pigeon RTU
	protocol.
	2/4 Digital input, NC/NO type, All can be used as Pulse Counters; DIO as
	a high-speed pulse counter, sampling frequency: 1MHz;
Digital Inputs	DI1~3 as a low-speed pulse counter, the anti-shake time can be set to
	1~2000ms, the default is 1ms;
	DI1 as arm and disarm function;
	Isolation protection:2KVrms
	2/4 Analog Inputs. 12 bit resolution, 0-5V or 0-20mA or 4-20mA;
Analog Inputs	Input resistance:>1M ohms
Temp.&Hum Inputs	Temperature range: -40 $^{\circ}$ C to +80 $^{\circ}$ C, Humidity Range: 0~100%RH;
Polov Outputs	2/4, Rated: 5A/30VDC,5A/250VAC
Relay Outputs	Isolation protection:2KVrms
Power Outputs	1 Port, for external device;
Backup Battery	3.7V 900mAH
Temperature range	-20-+70 °C
Humidity range	Relative humidity 95% (condensation free)
Exterior dimension	140mm*88mm*30mm
Net Weight	350g

### 5. Physical Layout and Installation Diagram&Wiring

### 5.1 Control Unit size







### 5.2 LED Indicator Definition

LED Indicator Definition				
	ail ● Power ● Run ● Arm ●			
Power	RTU status indicator, LED ON when switched RTU on			
all	Cellular network indicator. When 2G register network, off 2 seconds, on 0.5s and so on; When 3G 4G register network, on 2s, off 0.5sFlicks quickly means data transmission.			
Alarm	Alarm Indicator, alarm will ON and flick. Normally is OFF;			
Arm	Arm/Disarmed Indicator, Arm is ON, disarmed is OFF.			



Run

RTU running status indicator, ON or OFF stands for RTU halted, flicks slowly stands for RTU running.

### **5.3 Interface Definition**

	Backside Switch & Button Definition
	Open         SIM Card Slot         Work Load         ON         OFF
SIM Card Slot	For SIM Card Installation, only supports 1.8V/3V SIM Card
Power Switch	For switch ON or OFF the RTU
Upgrade Firmware Switch	For upgrade firmware purpose only. Only when upgrade new firmware version will use it, otherwise keep it at Work Side all the time.
	Power Connector Definition
	$ \begin{array}{c c} \bullet & - & \bullet & - \\ \bullet & \bullet & \bullet & \bullet \\ In & 0 \\ 9 - 36 \\ V \\ D \\ C \\ \end{array} $
DC IN+	External DC Power input port, Connect to 1.5A@9~36V DC power, positive electrode.
DC IN- DC Out+	External DC Power Input port, contact to negative electrode Power source output port, positive electrode. Provides power from RTU to external transducers or sensors or detectors. The output current should less than the power from DC IN inputs. If adapter current is 2A, then suggest external transducer current to be less than 1.5A
DC Out -	Power source output port, Negative electrode.
	DIP Switch Definition
	ModeAIN Type0123SetVVVRunmAmAmA
SET/RUN	For setting the RTU Mode is in Configuration Mode or Run mode. Switch it to upside is Set Mode, under this mode, the user can use PC Configurator via USB cable to configure the RTU Parameters or Read Parameter settings. Switch it to Downside is Run Mode, under this mode, the RTU is in Running mode. <b>Tips:</b> When device mode changed, need to switch off/on the device.
0/V/mA	The 1 <sup>st</sup> channel of analog input type switch. If not use this channel then no matter is upside or downside. Switch it to upside stands for the 1 <sup>st</sup> analog input should connect to 0~5V voltage output transducer. Switch it to Downside stands for the 1 <sup>st</sup> analog input should connect to 0~20mA or 4~20mA current output transducer.

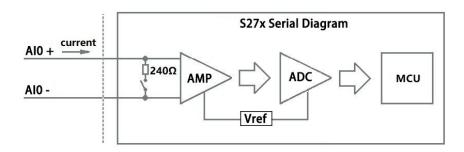


	Tips:         The wrong side will cause device can't read the analog value.				
	The 2 <sup>nd</sup> to 4 <sup>th</sup> channel of analog input type switch. If not use this channel then no matter				
	is upside or downside.				
1/V/mA~3/V/mA	Switch it to upside stands for the related analog input should connect to 0~5V voltage				
	output transducer.				
	Switch it to Downside stands for the related analog input should connect to 0~20mA or				
	4~20mA current output transducer.				
	Analog Input Definition				
	Analog Input				
	$ \bigcirc \bigcirc$				
Analoa inputs. Sam	pling frequency 200mS, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output				
transducers, please refer to above mentioned DIP Switch Definition to connect the correct transducers.					
The 1st Channel Analog input + stands for positive electrode - stands for pegative					
0+/0-	electrode.				
	The 2 <sup>nd</sup> ~4 <sup>th</sup> Channel Analog input. + stands for positive electrode, - stands for negative				
1+/1- ~3+/3-	electrode.				
	Digital Input Definition				
	Digital Input				
Dry contact or wet	contact, sampling frequency 200mS . Logic level: 0~0. 5V or short circuit treated as close,				
	cuits treated as open. One of the input can be used as counter, sampling frequency is				
	put can be used for Arm/Disarm.				
0	The 1st digital input, positive electrode.				
1~3	The $2^{nd}$ $4^{th}$ digital input, positive electrode.				
GND	GND for digital inputs, negative electrode.				
	ATN Port Connector Definition				
ATN	GSM/3G/4G Antenna connector, 500hm, SMA male.				
	USB Port Connector Definition				
USB	USB port, for configuration and upgrading firmware and exporting historical data;				
	Temperature Humidity Sensor Port Definitions				
	Acc Data GND				
	$\bigcirc \bigcirc \oslash$				
	T/H				
	Temperature & Humidity sensor AM230x input. Measurement Range: Temperature:				
т/н	-40°C to +80°C, Humidity: 0~100%RH.				
	Digital Solid Relay Output Connector Definition				
	$0^{-}$ $0^{+}$ $1^{-}$ $1^{+}$ $2^{-}$ $2^{+}$ $3^{-}$ $3^{+}$				
	0 0 0 0 0 0 0 0				
	LJ LJ LJ LJ				
	Relay Output				
Solid Relay inside fo	r outputs, Rated Capacity: 5A/30VDC,5A/250VAC.				
	The 1st Channel Solid Relay Output. + stands for positive electrode, - stands for negative				
0+/0- electrode.					
	The 2 <sup>nd</sup> ~ 4 <sup>th</sup> Channel Solid Relay Output. + stands for positive electrode, - stands for				
1+/1-~3+/3-	negative electrode.				

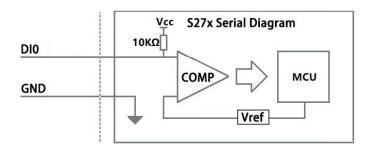


#### S27X wiring diagram

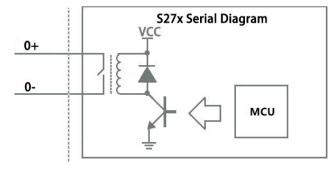
#### Al internal interface principle block diagram



DI internal interface Principle block diagram :



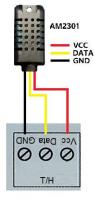
#### DO internal interface Principle block diagram :

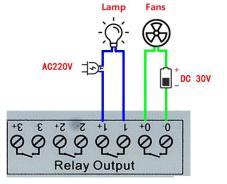






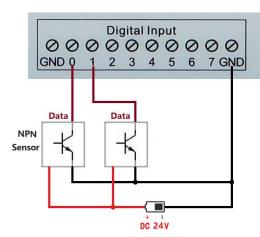
**Relay Output** 

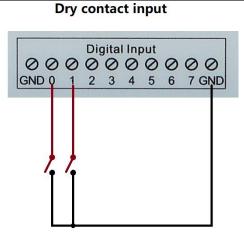




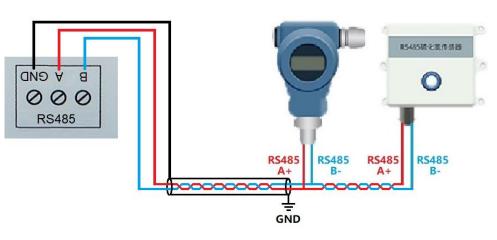


Wet contact input





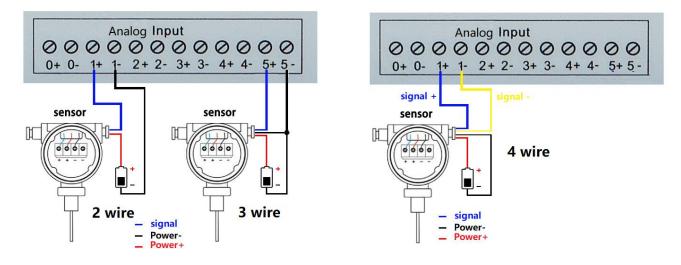




Analog Input

**Analog Input** 

RTU



### 6. Settings & Operation

The GSM SMS GPRS 3G 4G Cellular IoT M2M RTU is user-friendly design. The user can setup it or export historic data by the PC Configuration through USB cable, and upgrade firmware by USB port. The GSM SMS GPRS 3G 4G Cellular IoT M2M RTU also can be configured some basically parameters by SMS Commands, please refer to SMS



#### Command App or SMS Command List.

#### Tips!

When using an IoT card, it does not support sending and receiving SMS and voice dialing alarm functions, so there is no need to set the content related to SMS; at the same time, when the device need access to the cloud platform server, please disable the SMS alarm and dialing function, otherwise the device will frequent offline due to sending and receiving SMS and dialing

Below is the steps to setup the parameters by PC Configuration, please follow it step by step.

### 6.1 Start to Configure

#### Step1: Install the Configurator

Download from www.iot-solution.com or scan the QR code card in the package, then installs it on the computer.

#### Step2: Connection

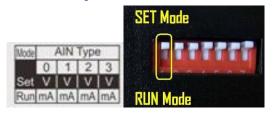
Please insert the SIM Card, and install the GSM/3G/4G Antenna.

#### Step3: Switch the DIP Switch to Setup Mode. (Before Power On the RTU)

Switch it to upside is Set Mode, under this mode, the user can use PC Configurator via USB cable to configure the RTU Parameters or Read Parameter settings.

#### Notice:

*Please switch it to Downside after you finished the configurations. Otherwise, the RTU cannot work properly. The Downside is Run Mode, under this mode; the RTU is in Running mode.* 



**Step4:** Connect the Gateway to the PC by USB Cable. And connect the external DC Power to DC Power Ports, Power on, and switch on the device, see below:

DC IN 9-36V	DC Out
+ -	+ GND

#### Step5: Install USB Drvier

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



🚔 Device Manager	
File Action View Help	
🔺 🛁 Sammy-PC	
Batteries	
D 📲 Computer	
Disk drives	
🕞 📲 Display adapters	
DVD/CD-ROM drives	
D IDE ATA/ATAPI controllers	
Imaging devices	
⊳ - Keyboards	
Mice and other pointing devices	
🔉 🖳 Monitors	
> I Network adapters	
Ports (COM & LPT)	
Silicon Labs CP210x USB to UART Bridge (COM3)	
Processors	

#### Step6: Run the Configurator (Compatible with Windows XP/7/8/10)

**Tips:** In some computer, it required download net framework 4.0 while installation, then please click "Yes" to go to Microsoft website to download this service pack.



Please click IoT M2M to run it. Enter the password, default is 1234. Then you can enter the configuration

#### page as below:

RTU configuration	n softwareV3.0	
	COM1	▼ Serial Port
	Password(Default passwor	d 1234 ) Select device(C)
	****	
	OK( <u>O</u> )	:

#### Notice:

If display the below windows, then means the RTU connect to the PC failure. The reasons are below:

Notice	
<u>^</u>	Please confirm the device connection status !
	确定

- *1)* USB Driver installation failure;
- 2) USB Cable connection is disconnected;
- *3)* The DIP Switch in RUN mode, not in SET mode;
- 4) The Upgrade Firmware Switch at Load side, not at Work side.



5) Power Switch switched off or DC Power Connection is disconnected.

## Step7: Choose the correct "COM port" in device manager above, enter the password(default is 1234),click the "OK" to connect and start to program

Details please check the picture as below:

RTU configuration	softwareV3.0	
	COM3	▼ Serial Port
K	Password(Default pas	sword 1234 ) Select device(C)
	OK( <u>O</u> )	S271-RTU

**Tips:** If not connect successfully, will not enter into next step. Pls check if USB connect well, or COM port and password correct or not.

Then select what SIM card do you use.

🖳 Ca	ardSelect
	Select SIM Card Category
	📝 Normal SIM Card(Call and SMS) 🛛 🕅 IOT M2M SIM Card(Data only )
	Enter Setting

### 6.2 Setting Self-checking

Phenomenon	Possible Reason						
	1. USB Driver installation failure;						
	2. COM Port not correct or USB driver installation failure;						
	3. Device not enter into setting mode:						
Can't enter software	1) Only power light on, that means the Upgrade Firmware Switch at Load side,						
	not at Work side. Solution: Switch the power switch to OFF>						
	Upgrade switch to Work side> Power switch to ON.						
	2) Signal light flicks, that means device in working mode. Maybe had not						
	rebooted the device after switch mode switch to Set.						
	(In setting mode, Power light normal ON, Run light flicks, other lights Off.)						
	1. The Upgrade Firmware Switch at Load side, not at Work side.						
After switching panel on,	Solution: Switch the power switch to OFF>Upgrade switch to Work side>						
only Power light on, panel	Power switch to ON;						
can't work	2. SD card fall out from the slot. Solution: Shake panel to listen if there is voice or						



	not;
	3. In upgrade mode, use upgrade tool erased the firmware.
	1. The Upgrade Firmware Switch at Load side, not at Work side.
Comit antor into working	Solution: Switch the power switch to OFF>Upgrade switch to Work side>
Can't enter into working mode	Power switch to ON;
moue	2. Device in setting mode. Solution: Switch device OFF>Mode switch to
	"Run">Switch the device on.
	1. Have not installed driver;
Can't find COM Dout	2. PC system problem cause driver installation failure, can't support Apple OS
Can't find COM Port	system.
	3. Check USB line, and try other common driver software such as "Drive TheLife".
In working mode, the	Have not set the device ID. Solution: In setting mode, set device ID>Switch the
device not response the	device to Run mode.
Modbus command	
After switching panel on,	After parameter setting, forget to click "Save" button in every page.
not running according to	Solution: Back to Set mode>Click "Save" Button after setting one
parameter setting	page>After all page set successfully, click "Save Setting" in the menu.

### Terms usually used by Cellular IoT M2M RTU

Cellular IoT RTU, Modbus RTU, Modbus Slave, Modbus RTU Over TCP, Modbus TCP, Arm, Disarm...

### 6.3 Configurator software interface and running

Basic Information	parameter setting 🕺			
Parameter setting     Alarm Numbers     Output Setting     Relay setting     Access control	Modify password Old password New password Confirm password:		Synchronous machine Time: Time zone: Read the RTU tin	2015-03-31 22:25:00
Access Control Settings				
Input Setting	Basic information Device ID 1 (	1~247) Model No.	\$271-RTU	Version 2EV30
DI Alarm setting	Device Description:			( 60 Characters )
AI setting	Add timestamp to alarm SMS	Arm Automatically whe	en power on.	
AI Alarm setting	☑ Auto Arm after disarm:	1 Minute(S)	( <mark>1~9999</mark> )	
Timer Setting	Timer Reporting SMS Content Settings			
( Hour Timer	Add the following additional information	tion in the report SMS		
Periodic Timer	AI0 Value	Arm Status	DIO Status	DO0 Status
ogic Trigger Setting	AI1 Value	GSM/3G Signal Value	🔲 DI1 Status	DO1 Status
1234	AI2 Value	External Power Status	DI2 Status	DO2 Status
O Logic Trigger	🗌 AI3 Value	Device ID	DI3 Status	DO3 Status
Cloud Platform Setting	Temperature Value	Device Description		
-	and the second			
Cellular network setting	Humidity Value			

**Save** : Click it to save all of the PC Configurator parameters to the RTU;

Load Configuration file: Click it to load additional configuration file to the Configurator;

Export Configuration file: Click it to save the present configuration parameters as a profile for next RTU



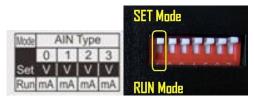
#### configurating or backup the parameter settings.

**Tips:** The load and export configuration file is very useful while you need to program bulks of RTU with similar parameters. After programmed the first unit then you can export profile to save it, for the second RTU then you can load profile directly to save you time.

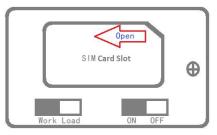
#### Factory Reset: Click it to recovery the parameters to factory defaults.

#### Notice:

- 1. After setting or revising parameter, need to click the "Save" button of this page, then click "Save Settings" in menu for saving parameters in device
- 2. Before S270/S271 export configuration, need to read Slaves configuration details first, to avoid Slaves information missing.
- 3. Easy way to revise parameter: Open parameter setting page---->Click "Read" button to get device current value
- ---->Revise and click "Save" button---->Click the "Save Settings" button in the menu.
- 4. Switch the device mode to "Run" as below, otherwise it will not work;



5. Reboot the device, switch the Power Switch to OFF, then switch it to ON, the device will enter into normal running mode after that



### Basic Settings

#### **Reminder:**

- **1**.Please click the "Read" for previous parameter before starting to set.
- 2.When accessing the cloud platform, the [Automatic report item] and [Alarm SMS setting] items may not be set.



호 GSM 3G M2M RTU ConfiguratorV3.0			100		
🐔 Load Profile 🐳 Export Profile 📲 Defa	ault Language About				
E Basic Information	parameter settings 🛛 🎊				
Parameter setting	Modify password	Sy	nchronous mac	hine time	- Â
Number setting	Old password:		Time :	2015-03-31 22:25:00	
	New password:			Read the RTU time	
Output Settings	၂၂ ပိ Confirm password:		ſ	Write the RTU time	
Relay setting		dify password	6	Read the computer time	
Incoming control		any password	L	Read the computer time	_
Access Control Settings	Basic information			V	-
Input Settings	Device ID 0 (0~9999)	Model No. S271-RTU		Version 2EV30	
DIN Trigger setting	Device Description:			( 60 Characters )	=
<b>米</b>		Arm Automatically when power	on.		
DIN Alarm setting	Auto Arm after disarm:	0 Minute(S) (1~999	9)		
AIN Trigger setting	Timer Reporting SMS Content Settings				
AIN Alarm setting	Add the following additional information				
	AIN0 Value	Arm Status GSM/3G Signal Value	DIN0 Sta		
Hour Timer	AIN1 Value	External Power Status	DINI Sta		
Periodic Timer	AIN3 Value	Device ID	DIN3 Sta	itus 🗌 DO3 Status	
	Temperature Value	Device Description			
Interlock Settings	Humidity Value				
Interlock Setting	Alarm SMS Content Settings				
Network settings	Add the following additional information	ation in the alarm SMS			
Cellular network setting	AIN0 Value	Arm Status	DIN0 Sta		
E-(0) History Record	AIN1 Value	GSM/3G Signal Value	🔲 DIN1 Sta	tus 🗌 DO1 Status	
History Record					
History Record					
COM3	Equ	ipment model:S271-RTU			

Modify Password: This is for modifying the RTU's Password, default is 1234.

**Synchronous device time:** This is to setup the RTU's time for daily report or other timers. After click Write the RTU Time, the RTU will be synchronous the same time as the PC. If connect to King Pigeon Cloud Server, no need this step.

Device ID: Non-necessary. This is mainly for monitoring center to identify the RTU;

If communicate via Modbus protocol, device ID only can be 1~247.

Device description: This is the description of the RTU, e.g.: installation address,

usage instructions and so on.

Add Timestamp to Alarm SMS: Tick it stands for while alarm occurrence, the Alarm SMS will include the RTU'S current time information at the SMS Content.

Arm automatically when Power On: Tick it stands for once the RTU powered up, the RTU will enter into Arm Mode automatically.

Auto Arm after Disarmed: Fill the timeout to enter into Armed Mode automatically after

disarmed operation. This is useful for security protection applications.

#### Tips:

**Arm:** Under this mode, any alarm occurrence will send SMS and dial the authorized numbers immediately. And execute the programmed I/O outputs.

**Disarmed**: Under this mode, alarm occurrence will not send SMS & dial the authorized numbers.

**Timer Reporting SMS Content Settings:** Tick the related items to add its value/status to the Timer report SMS contents.

Alarm SMS Content Settings: Ticks the related items to add its value/status to the Alarm SMS Contents.

### Number Settings(If access the cloud platform, no need to set)

This is to setup the Authorized User Telephone Numbers to receive the Alarm SMS or dial. Tick it stands for while the related event alarm occurrence will send SMS to this number.



#### Reminder:

When using an IoT card, it does not support sending and receiving SMS and voice dialing alarm functions, so there is no need to set the content related to SMS; at the same time, when the device wants to access the cloud platform server, please disable the SMS alarm and dialing function, otherwise the device will Sending and receiving SMS and dialing leads to frequent offline.

Information	parameter settings 🛛 🕺	Number	r setting 🔀							
Parameter setting	Authorized User Telephone	Number S	ettings							
Number setting	( Alarm No. ) User No.0	Power On	Timer Report	Arm/Disa SMS	rm Low Signal	Power Lost	Power Recovery	GPRS Failure	Relay Switch	
ut Settings	User No.1									
Relay setting	User No.2									
ning control	User No.3			(1 <sup>11</sup> )	[17]	100				
Access Control Settings	User No.4									
Settings	User No.5									
	User No.6			1071		1000 A				
DIN Trigger setting	User No.7									
DIN Alarm setting	User No.8									
AIN Trigger setting AIN Alarm setting	User No.9									
ng Settings Hour Timer	Notice:						Read		Save	
Periodic Timer lock Settings Interlock Setting ork settings Cellular network setting	<ol> <li>Alarm No. can include or 2. Low signal alert: Mobile</li> <li>Tick it stands for when the time of the stands for the stands</li></ol>	signal low	er than 14 (	full signal is i	31).				code,but can not be 44	
ory Record										

Power On: Tick it stands for while the RTU powered up, will automatically send SMS to this number,

include device model, version, description, IMEI, status, signal value etc....

Timer Report: Tick it stands for Timer report SMS will send to this number.

Arm/Disarm: Tick it stands for Arm or Disarm the RTU, will send SMS to this number.

**Low Signal:** Tick it stands for while GSM/3G/4G Network signal strength lower than 14 will send SMS to this number.

Power Lost: Tick it stands for while external DC Power loss will send SMS to this number.

**Power Recovery:** Tick it stands for while external DC Power recovery, will send SMS to this number.

**GPRS Failure:** Tick it stands for while GPRS connection re-try 3 times and still failure will send SMS to this number.

**Relay Switch:** Tick it stands for while the Digital Solid Relay Output action will send SMS to this number.

### Output Settings

This page is to setup the Output parameters and definite the output usages. The outputs will be used in the Interlock Page for programmable logic events.



ST GSM 3G M2M RTU ConfiguratorV	3.0	R. C. W. &-	* <b>B</b> 115				1. 1. 1.	1. 1.8.1			
諅 Load Profile 🛛 Export Profile	🚮 Default	t Language Abo	ut								
Basic Information	Relay set	tting <u>/</u>									
Output Settings		Output Type	Channel Name	Close Time (s)	Repeat Time	Interval Time(s)	ON/OFF SMS	Alarm Verify Time(s)	Open Description (MAX.30)	Close Desc (MAX.:	
AND AND A	Dout0	Switch on/off 👻		0	0	0		0			
Incoming control	Dout1	Switch on/off 👻		0	0	0		0			
Access Control S	Dout2	Open door 👻		0	0	0	1 6	0		1	
- O Input Settings	Doutz										
DIN Trigger sett	Dout3	Open door 🔹		0	0	0		0			
DIN Alarm settir									ŕ		
AIN Trigger sett	<u>.</u>									Read	Save
*	Notice: 1. If the	: e Close Time setup as	0, this channel will	output NC type	and the In	erval Time a	and Repeat	Times can not b	e edited.		
AIN Alarm settin		e Close Time setup as open,and repeat this							Time		
Timing Settings	3. Only	the first Channel (DO	0) can be setup as I	Door Open fun	ction, see A	cess Contro	l page.				
		e Output Type setup a e Output Type setup a						cording to the se	ettings		
Periodic Timer	in All	N/DIN Alarm and Inte	rlock page.								
Interlock Settings		e time, Interval time, R m Verify Time: If tick th						ess than the veri	fy time,		
Interlock Setting	the R	RTU will not send SMS	to alert the users.								
Network settings											
Cellular network											
History Record											
History Record											
202	•										
СОМЗ			Equip	oment model:S	271-RTU						

**Output Type:** Support 3 output types. The user can choose the Output Type for the relay outputs, includes Open Door, Switch ON/OFF, Siren. The relay 2 and 3 only used for Switch ON/OFF; Relay 0 can option as Open Door and Switch ON/OFF; Relay 1 can option as Siren and Switch ON/OFF.

 Open Door: Only the first Channel(DO0) can be setup as Open Door, use it for electric lock. If setup as Open Door, then the authorized number calls in RTU, can open the electric Lock directly or output a pulse signal and disarmed the RTU directly. See Access Control page about the authorized number.

#### Notice:

If relay 0 used for Open Door, then can't be action as normal Switch ON/OFF.

#### **Application:**

When RTU installed in generator room, many workers out and in, not convenience and safe for everyone taking keys. This function can authorize the person to remotely control the door and disarm the device within appointed time, avoid fault anti-thief alert. After worker maintenance the generator room, can touch the inside Arm/Disarm switch button to arm device, DIN2 can do this.

- 2) Switch ON/OFF: For switch on/off device.
- **3) Siren:** This is for output pulse signal for siren sounds, If setup as Siren, then while the RTU alarm and ticked the Siren function in AIN or DIN trigger pages, then this channel will execute the setting parameters.

**Channel Name:** to setup the Output Channel name, e.g.: Pump or Motor and so on, in order to identify it in SMS Contents.

**Close Time:** Stands for the relay close and last time, default 0 second, means always close.

Repeat Times: Stands for how many times does this relay should to repeat.

Interval Time: Stands for interval how many seconds then the relay repeat the action again.



Match with "Repeat Times" can work as pulse output, unit: second. **ON/OFF SMS:** Tick it stands for while the Recovery action, will also send SMS to the authorized numbers;

Alarm Verify Time(s): Stands for when the Relay Close or Open last time less than this value, will not send SMS to the authorized numbers, this is to avoid sending too many useless SMS.

**Open Description:** Stands for when the Relay Open, send what SMS to the authorized numbers; **Close Description:** Stands for when the Relay Close, send what SMS to the authorized numbers.

### Incoming Control Settings(If access the cloud platform, no need to set)

This page is for setting which authorized number at what time can dial to the RTU and let the first channel (DO0) output a pulse output.

Only when the output types of the first channel (DO0) setup as **Open Door** can dial to control it. It is very useful for serviceman dial to open the electric lock door and disarmed at specified time of the Room. Also this function can be used as authorized number dial in the RTU to output a pulse output or always close then call again open the relay at specified time. In this condition, please setup the output type of DO0 as **Open Door**, and setup other parameters correctly, and remember to setup the **Auto Arm after Disarmed** time as 0 to keep the RTU in Armed Mode if required.

Tick the box ahead the User No. stands for enable the first Authorized number can dial in to let the first channel (DO0) output a pulse output.

Basic Information	Access Control Set							
Output Settings	Access Control Tips:							
Incoming control	1.Only the first ch	annel (DO0) Output typ						
Access Control S	2.When the ticked		it will Disa,	rm and out	put pulse signal to open		lock automatically.	
Input Settings		Start time			End time			
	User No.0	2000-01-01 00:00		~	2000-01-01 00:00		Always	
DIN Trigger sett	📃 User No.1	2000-01-01 00:00	-	~	2000-01-01 00:00		Always	
- DIN Alarm settir	User No.2	2000-01-01 00:00		~	2000-01-01 00:00		Always	
- ( AIN Trigger sett	User No.3	2000-01-01 00:00		~	2000-01-01 00:00		Always	
AIN Alarm settin	User No.4	2000-01-01 00:00		~	2000-01-01 00:00		Always	
Timing Settings	🔲 User No.5	2000-01-01 00:00		~	2000-01-01 00:00		Always	
Hour Timer	User No.6	2000-01-01 00:00		~	2000-01-01 00:00		Always	
Periodic Timer	User No.7	2000-01-01 00:00		~	2000-01-01 00:00		Always	
Interlock Settings	🔲 User No.8	2000-01-01 00:00		~	2000-01-01 00:00		Always	
Interlock Settings	User No.9	2000-01-01 00:00		~	2000-01-01 00:00	•	Always	
Network settings					Rea	d	Save	
Cellular network	Notice:							
	1. Valid time set a				the door without limitatio			
History Record	2. Valid with Start	and End time means t	he User ca	n call to op	en the door on the durat	ion only.		
- History Record								
_								

**Start Time:** Stands for from what time this authorized number can dial in to control it. **End Time:** Stands for till what time this authorized number cannot dial in to control it. **Always:** Stands for this authorized number can dial in to control it all the time.

### DI Trigger Settings(If access the cloud platform, no need to set)

Note: When accessing the cloud platform, no need to set [Alarm SMS Content], [Restore SMS Content], Displacement SMS Content], [Interval Pulse Alarm Content] and [Total Pulse Count Alarm]



Basic Information	DIN trigger setting	200										
Parameter setting	Inp	ut Type	Alarm SMS	Recovery SMS	Change SMS	Current Status	Recovery Alarm	Alarm Verify Time(s)	Siren	24hr		
Output Setting	DIO	-						0	E			
Relay setting	DI1	•						0				
Access control	DI0Counter	InitialValue	IntervalAlarm	Value IntervalS	MSAlarmContent	TotalAlarmValue	(MAX.9999	TotalAlarmN	fessageCont	ent		
Input Setting												
DI setting		InitialValue	IntervalAlarm	Value IntervalS	MSAlarmContent	TotalAlarmValue		TotalAlarmN	lessageCont	ent	Anti-jitterTime	e
C236	DI1Counter	InitialValue	IntervalAlarm	Value IntervalS	MSAlarmContent	TotalAlarmValue	(MAX.99999		lessageCont	ent	Anti-jitterTime 10 (MAX.2000)	
O I setting     DI Alarm setting     AI setting     AI larm setting	Notice: 1. S270 Only DI S271 Only D 2. Only DI1 can	10~1 can be used 10~3 can be used 1 be used as Arm/1	as Pulse Counter, as Pulse Counter. Disarm Switch.	Value IntervalS	MSAlarmContent	TotalAlarmValue	(MAX.99999		fessageCont	ent	10	
O II setting     O I Alarm setting     Al setting     Al Alarm setting     Timer Setting     Hour Timer	Notice: 1. S270 Only DI S271 Only DI 2. Only DI1 can 3. Alarm Verify then cc	10~1 can be used 10~3 can be used 1 be used as Arm/I Time: active and Ia onsidered as alarr	as Pulse Counter, as Pulse Counter. Disarm Switch. ast this time m.	Value IntervalS	MSAlarmContent	TotalAlarmValue		99)	1essageCont	ent	10	
OI setting     OI Alarm setting     Al setting     Al Alarm setting     Al Alarm setting     Timer Setting	Notice: 1. S270 Only DI S271 Only D 2. Only DI1 can 3. Alarm Verify then cc 4. Siren: In arm Siren channel	10~1 can be used 10~3 can be used 1 be used as Arm/1 Time: active and 1	as Pulse Counter, as Pulse Counter. Disarm Switch. ast this time m. nen drive the tup one of the	Value IntervalS	MSAlarmContent	TotalAlarmValue		99)	1essageCont	ent	10	

**Input Type:** The user can choose the input type for related channel. Includes: Counter, Arm/Disarm, NC, NO, Change and Disabled.

- 1) Disabled: Not use this channel.
- 2) NC: For connecting Normal close type detector, open will alarm.
- 3) NO: For connecting normal open type detector, close will alarm.
- 4) **Change**: For connecting normal open or normal close type detector, once the status changed, will be treated as alarm.
- 5) Counter: DIO as a high-speed pulse counter, sampling frequency: 1MHz; DI1~3 as low-speed pulse counter, anti-shake time can be set 1~2000ms, default 1ms; Need to tick up the Pulse Counter box to setup initial value and interval alarm value and total alarm value. E.g.: contact a PIR sensor to count how many people pass through the ATM machine and so on.
- 6) Arm/Disarm: Only the Second Channel (DI1) can be used as Arm/Disarm Switch. For connecting a pulse output type switch to Arm or Disarmed the RTU.

Alarm SMS: Under Arm or 24h status, once triggered will send this SMS content to

#### authorized numbers.

**Recovery SMS:** Under Arm or 24h status, if tick the "Recovery Alarm", when triggered digital input recovery normal will send this SMS content to authorize number.

**Change SMS:** Under Arm or 24hr status, only when digital input choose "Change" type, once action will send this SMS to authorize number.

Current Status: Stands for input's current status.

Alarm Verify Time: Stands for when the digital input Close or Open last time more than this value, will be treated as a true alarm, if less than this value, then will not alarm.

Siren: Tick it stands for while this digital input triggering, the DO that output type was setup as Siren will execute its output parameters.

**24Hr:** Tick it stands for no matter the RTU is in Arm or Disarmed mode, this digital input triggered will alarm.

Initial Value: When DINO as counter, the value begin to count.

Interval Alarm Value: DINO as counter, under Arm or 24hr status, when counter value arrive "Interval Alarm Value" will send SMS to authorize number.

**Total Alarm Value:** When counter value arrive "Total Alarm Value", will automatically refresh it to "Initial Value". Under Arm or 24hr status, will call and SMS to authorize number.

Interval Alarm SMS: When interval alarm, will send this SMS to authorize number.

Total Alarm SMS: When arrive total max value, will send this SMS to authorize number.



### DI/AI Alarm Settings(If access the cloud platform, no need to set)

This page is for setup while DIN/AIN alarm, send SMS & Dial to which authorized numbers. Tick it stands for enable to send SMS or dial the related authorized number, see below page is for DIN settings, the AIN Alarm Settings is the same:

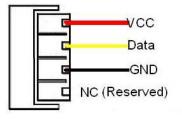
GSM 3G M2M RTU ConfiguratorV3.0							1		101	181.1	man .		×
🖝 Load Profile 🔺 Export Profile 📲 Defa	ault Language Abou	rt											
⊕	DIN alarm setting 🔊	<											
. Output Settings				larm Se	nd SMS )			larm Di	al Out )				
Incoming control													
Input Settings	DIN Channel User No.0	DIN0	DIN1	DIN2	DIN3	DIN0	DIN1	DIN2	DIN3				
DIN Trigger setting	User No.1	<b>V</b>	<b>v</b>	✓					V				
*	User No.2		V	<b>V</b>					V				
DIN Alarm setting	User No.3		V						V				
AIN Trigger setting	User No.4		<b>V</b>	<b>V</b>									
AIN Alarm setting	User No.5	<b>V</b>	V	<b>V</b>		<b>V</b>		V					
Timing Settings	User No.6		<b>V</b>										
Hour Timer	User No.7												
Periodic Timer	User No.8		V	V				V					
Interlock Settings	User No.9												
Interlock Setting	Notice: 1. Tick it stands fo 2. While dialing the dial the next use	e user te	lephone										
History Record						Re	ad	Sav	e				
History Record													
СОМЗ			Equ	ipment n	nodel:S271-R	ги							at

### AI Trigger Settings

This page is to setup the analog input alarm conditions and analog input parameter. AIN can be used for monitoring temperature, current, voltage, power factor, water level, pressure, environment, wind speed... And also one channel temperature and humidity transducer can be connected as below:



#### AM2301 PIN Difinition





GSM 3G M2M RTU ConfiguratorV3.	.0											0 2	۲
Load Profile  Export Profile	Pefault Langua	ge About											
	AIN trigger setting	g 🗶											
Output Settings	Input Type	High Alarm SMS	Low Alarm SMS	Recovery SMS	Maximum	Minimum	Current Value	Threshold High	Threshold Low	Recovery Alarm	Alarm Verify Time(s)	Siren 2	4hr
	AINO Disable 🔻				0	0	0	0	0		1		E
Input Settings	AIN1 Disable 👻				0	0	0	0	0		1		E
DIN Trigger setting	AIN2 Disable 👻				0	0	0	0	0		1		E
DIN Alarm setting	AIN3 Disable 👻		[]		0	0	0	0	0		1		E
AIN Trigger setting	Temp[Disable 💌				80	-40	0	0	0		1		E
AIN Alarm setting	Hum. Disable 👻				100	0	0	0	0		1		1
E Timing Settings	Notice:							Read	Save				
Hour Timer	1. Maximun/Minimu 2. Measurement Ra				00Mpa;		L.						
*	3. Alarm SMS Form	at: High/Low/Recov											
Periodic Timer	<ol> <li>Others are the sa</li> <li>Alarm Verify Time</li> </ol>		0 to 9999.										
Interlock Settings													
Interlock Setting													
Network settings													
Cellular network se													
History Record													
History Record													
362													
	•			III									F
сомз			Equipment me	odel:S271-RTU									

Input Type: The user can choose the input type for related channel. Includes: Disable, 0~5V, 0~20mA, 4~20mA.

- 1) Disabled: Not use this channel.
- 2) 0~5V: For connecting transducers that output voltage 0~5V. Please remember to switch the related channel DIP switch to V side, see DIP Switch Definitions.
- 3) **0~20mA:** For connecting transducers that output current 0~20mA, Please remember to switch the related channel DIP switch to A side, see **DIP Switch Definitions**.
- 4) 4~20mA: For connecting For connecting transducers that output current 0~20mA, Please remember to switch the related channel DIP switch to A side, see DIP Switch Definitions.
- 5) **Temperature and Humidity:** Enable/Disable support. Only accept AMS230x series sensor, the temperature maximum is 80, minimum is -40, and Humidity maximum is 100, minimum is 0, cannot change them.

**High Alarm SMS:** Under Arm or 24h status, once current value higher than threshold high value will send this SMS content to authorized numbers.

**Low Alarm SMS:** Under Arm or 24h status, once current value lower than threshold low value will send this SMS content to authorized numbers.

**Recovery SMS:** Under Arm or 24h status, if tick the "Recovery Alarm", when current value recovery normal will send this SMS content to authorize number.

**Maximum:** The transducer's maximum measure range. E.g.:100 Celsius degree. Usually it can be found out at the transducer's specification.

**Minimum:** The transducer's minimum measure range. E.g : -50 Celsius degree. Usually it can be found out at the transducer's specification.



**Current Value:** Stands for input's current value of the transducers.

Threshold High: The high value(reached) need to alarm; Example: set 50Celsius degree to alert.
 Threshold Low: The low value(reached) need to alarm; Example: set -30Celsius degree to alert.
 Recovery Alarm: Tick it stands for when the analog input recovery, will send SMS to the authorized numbers.

**Siren:** Tick it stands for while this input triggering, the DO that output type was setup as **Siren** will execute the its output parameters.

**24Hr:** Tick it stands for no matter the RTU is in Arm or Disarmed mode, this input triggered will alarm.

Reminder:1) According to the output type of the transmitter, set the correct mA and V type on the DIP switch of the device, please see 2.3 Mode Selection and 2.3 AI Wiring Diagram; 2) The same input type should be set in the configuration software; 3) The maximum and minimum range of the analog quantity, please refer to the transmitter technical specification to fill in, or consult the transmitter manufacturer

#### Timer Settings

This page is for setup hour timer and periodically timer, it is useful for scheduling when to execute what action automatically or it with repeat this action according to the interval time. Total can program 10 scheduling events. Tick it stands for enable this timer event:

GSM 3G M2M RTU ConfiguratorV3.0							
Export Profile			out				
Basic Information	Second tir						
	Periodic T						
Incoming control	Set au	tomatic upload G	PRS data cycle 5	mini	ute 📝 Enable/Dis	able	
Input Settings		Weekly	Hour	Minute	Interval(s)	Action	
E	1	Sunday 🔹	00 -	00	• 0	Reboot 🔹	
Hour Timer	2	Sunday 🔹	• 00	00 •	• 0	Reboot 👻	
*	3	Sunday 🔹	00 🔻	00 •	• 0	Reboot 🔻	
Periodic Timer	<b>4</b>	Sunday 🔹	00 👻	00	• 0	Reboot 🔹	
Interlock Settings	5	Sunday 🔻	• 00	00 •	• 0	Reboot 👻	
Interlock Setting	6	Sunday 🔻	00 🔻	00	• 0	Reboot 👻	
Network settings	7	Sunday 🔹	• 00	00 •	• 0	Reboot 👻	
Cellular network s	8 🗐	Sunday 🔹	• 00	00 •		Reboot 👻	
	9	Sunday 🔹	• 00	00	• 0	Reboot 🔹	
History Record	Notice						
History Record			every xxSeconds exc 0~9999 Seconds.	ute the choose a	iction.	Read Save	
		, ,					
-							
СОМЗ			Equ	ipment model:S2	271-RTU		

#### **Reminder:**

When GPRS/3G/4G data transmission protocol is King Pigeon IoT RTU Protocol, the periodically auto upload default enable and upload every 5 minutes.

#### Tick stands for enable this timer function, otherwise is disable.

Weekly+Hour+Minute: Stands for what day and at what time does the RTU should start to

execute the action and interval how many seconds then repeat to execute the action.

**Interval:** Stands for interval how many seconds does the RTU should repeat to execute the action. If setup it as 0, then this event will not be repeated.

Action: Stands for what action does the RTU should to execute at the specified time.



**Question:** Have set the timer SMS report, but finally not get the SMS. **Solution:** Have no ticked the "Timer Reporting SMS Content" in first Basic Parameter Settings page.

### Logic Trigger Settings

This page is for setup if what happen, then what action does the RTU should execute, it is a programmable logic events. Total can program up to 40 logic events for automatically control purposes.

Load Configuration Profile Import Configuration	onfiguration file 📲 Factory Reset Lang	juage About		
Basic Information	Association settings 熬			
Parameter setting	Event : All High alarm	-		
Alarm Numbers	Action : DO3 Close	▼ Add	Delete	
Output Setting				
Relay setting	Event	Action		
Access Control	DI0 trigger Al1 High alarm	DO0 Open DO3 Close		
Access Control Settings	ALL Fligh alarm	DOS CIOSE		
DI setting				
DI Alarm setting				
AI setting				
AI Alarm setting				
Timer Setting				
Hour Timer				
Periodic Timer				
Logic Trigger				
Cloud Platform Setting				
Cellular network setting				
History Record	Clear	Note: Max 40 Link Trigger events.		
History Record				
			Read Save	

#### Event: Stands for if this occurrence.

Action: Stands for then what action does the RTU should execute.

### Network Settings

This page used for setting device parameters connect to networks. The device can compatible with many third party upper computer system. And it can communication with monitoring software or clould via GPRS/3G/4G as below:

 Modbus RTU Protocol, means Modbus RTU over TCP, commucation with upper computer system. For example, connect to www.kpiiot.com cloud server. Domain: modbusrtu.kprtu.com, Port: 4000.
 Modbus TCP Protocol, commucation with upper computer system. For example, connect to www.my-m2m.com cloud server. Domain: modbus.dtuip.com, Port: 6655.

3) MQTT Protocol, connect to www.my-m2m.com cloud server. Domain: modbus.dtuip.com, Port: 6655.



asic Information	Association settings 🖄	GPRS	settir	ngs📉						
Parameter setting		Conne	ect Ki	TOIIOT	Connect my	-m2m Conn	nect oth	er IOT		
Alarm Numbers										
Jutput Setting	Communication Protocol		RTU	Protc -		Server 1 IP,			rtu.kprtu.com	(Max60)
Relay setting	Protocol	ТСР		•	S	Server Liste			(0-65535)	
ccess control	Access Point Name User Name				(Max60)	Server 2 Server Liste			(0.55555)	(Max60)
Access Control Settings	Passsword				(Max60)	Server Liste Server connection s		Drofor co	(0-65535)	
and the second se	10000010				(maxoo)	server connection :	strateg)	incici se		
DI setting	Pls fill in the login message(	device II	) of a	loud),and clic	k save		hi	int		
DI Alarm setting	Login Message	ASCII	•			(Max60)				
AI setting	Login ACK Message	ASCII	w			(Max60)			Click this button to King Pigeon sales I	fill in the login message, please contact the representative
AI Alarm setting	Logout Message	ASCII	-			(Max60)			Tel: +86 755-29451	1836 Request for login message
imer Setting	Heartbeat Message	ASCII	Ŧ	req		(Max60)			After filling in the lo device to access it	ogin message, click save and restart the
00.	Heartbeat ACK Message	ASCII	-	res		(Max60)				
Hour Timer	Heartbeat Interval	60		(1-9999s)						
Periodic Timer	No Response Resend Times	3	•	(1-9)						确定
ogic Trigger Setting	Login Message Strategy	Send O	nce \	When Login Se	erver 👻					
Logic Trigger										
loud Platform Setting										
Cellular network setting	FAQ for settin	igs pleas	se ref	ier to [Help] n	nenu			Read	Save	
istory Record										
istory kecord										

Note: If connect to KPIIOT or my-m2m cloud, only need ask King Pigeon sales for log in message, other part no need fill, keep as default.

**Communication Protocol:** "Disable", "Modbus RTU protocol", "IoT RTU protocol" or "Modbus TCP protocol" "MQTT" optional.

Protocol: TCP or UDP optional.

Access Point Name: APN, cellular operator provide.

User Name: User Name, operator provide.

**Password:** Network password, operator provide.

Sever 1/2 IP/DNS: Server IP address or DNS.

**Listen Port:** Stands for the server's listen port.

**Server Connection Strategy:** Only support "Prefer server 1" function, no "Both connection" now. When server 1 disconnect, will connect to server 2 automatically.

**Login Message:** Server register handshake protocol package. When transparent transmission or Modbus protocol, this item used for device ID, provided by cloud. Contact King Pigeon sales if need to connect www.kpiiot.com cloud server.

Login ACK Message: Once set, device need response within 10 seconds after device send login message, otherwise it will continue send login message according to "Reconnection Times", still not response will offline once time, then try to reconnect, according to "Server Offline 3 Times, Device Reconnection Time". Logout Message: Once server send to device, device will be offline.

Heartbeat Message: Heartbeat content to avoid network offline.

Heartbeat ACK Message: Once set, device need response within 6 seconds after device send heartbeat message, otherwise it will continue send login message according to "Reconnection Times", still not response will offline once time, then try to reconnect, according to "Server Offline 3 Times, Device Reconnection Time". Heartbeat Interval: Network keep online heartbeat interval time.

**No Response Resend Times:** After setting heartbeat and login message, if server no response, the times which server will send data.

Login Message Strategy: "Send Once When Login Server", "Plus It In Front Of Every Packet", "Both Of Them" optional. "Plus It In Front Of Every Packet" when data transmission.



GSM 3G M2M RTU ConfiguratorV3.2												3 <b>-</b> -3	a ×
🖷 Load Configuration File 🛛 🚽 Export Configurat	tion File 📲 Factory Reset 🛛 L	anguage About											
	Number settin	lelay setting 📩 Acces	s Control Setting 🛃	DI setting	📩 🛃 🛛 DI alarm se	tting 🖈 🛛 🗸	N setting 🖄	Al alarm setting 🖈	Clock timer 🖄	Second time	Logic trigger 🖄	Cellular network setting 1	<u>x</u> .
Parameter setting		Connect KPIIOT	Connect my-m	2m Cor	nnect other IOT								
	Communication Protoco Protoco Access Point Nau User Nau Passwor PIs fill in the login messas Login Acts Messas Login Messag Heartbeat Messa Heartbeat Messa Heartbeat Thiren No Response Resend Tir Login Message Strate	Connect KPIIOT           ol         Disable         ~           j         TCP         ~           me	Onnect my-m           (Max60)           (Max60)           Sitick save           16034020           Server	Zm         Cor           Server 11         Server 11           Server 12         Server 11           Server 13         Server 11           Server 14         Server 11           Server 15         Server 11           Server 16         Server 11           Server 16         Server 11	nnect other IOT	u kprtu.com (0-65535) er 1 is d cycle 10 inission [ Ena	(Max60) (Max60) (Max60) Sec	Al alarm setting D	Clock timer ℜ <sup>(</sup>	Second timed ×	Logic trigger 🗫	Cellular network setting 1	
COM5		Device Type S271-	RTU										

	MQTT Settings@ Network setting	
Item	Description	Default
Subscribe topics	Topic subscribed when the device receives control data	empty
Publish topic	Topic when the device publishes information	empty
Mqtt device ID	Serial number of the device, unique identification	empty
Mqtt user name	The account of the device to publish the theme on the proxy	empty
	server	
Mqtt password	The device publishes the password for the subject at the proxy	empty
	server	
Active upload data	The time interval for the device to upload data regularly, with a	10 seconds
cycle	maximum of 10 seconds	
Mqtt data	When enabled, the historical cache data during network	Disable
supplementary	disconnection will be retransmitted when the network is restored	
transmission		

### Historical Record

The device inbuilt 8G SD card, store alarm and historical records. For saving historical records, need to set the saving historical records interval time in "Periodically Timer" page.

For historical record, once it full, will automatically remove the earlier records for new records. And can save as CS format for other purpose usage.



GSM 3G M2M RTU ConfiguratorV3	.0		Incore Lana Grane-	S.S. mann an D.or.	
🛋 Load Profile 🛛 🚽 Export Profile	Nefault Language About				
Basic Information	history record 🔊				
Basic Information Goutput Settings Goutput Set		Read All      Read record from	~ 1 Clear	Read Export CSV Delet	e device record
	•		III		•
COM3		Equipment model:S271-RTU			.4

**Total:** Display device current historical records qty, "Read All" or "Read Record from xx to xx" optional. **Clear:** Clear the screen.

Read: Read historical records.

Export CSV: Historical records export as CSV file.

Delete device records: Click this button will erase all device historical records, be careful.

### 7. Example Of Applications

### 7.1 Device working self-checking

(1) Under setting mode, switch Dip to "Set"---->Switch device on---->Running configurator, choose port and password enter into software basic parameter settings---->Click "Read the computer time"---->Then click "Write the RTU time" for device time setting. At the same time, tick "√" for "Arm automatically when power on", then click "Save" button as below:



GSM 3G M2M RTU ConfiguratorV3.	Den 🐻	same. gomen	Anna States	ARRENT REAL	S management	
🛋 Load Profile 🛛 🚽 Export Profile	Pefault Language About					
Basic Information	history record 🖄 🛛 parameter setting	gs 🕺				
Parameter setting     Number setting     Output Settings     Incoming control     Input Settings	Modify password Old password: New password: Confirm password: Mor	Sy dify password	Rea	ne 01-03 15:03:31		
Timing Settings	Basic information	$\bigcirc$			<b>N</b>	
	Device ID 0 (0~9999)	(Model No.) S271-RTU		Version 2EV30	Read and write to	=
*	Device Description:	$\smile$		(60 Characters)	sync the time	
	Add timestamp to alarm SMS	Arm Automatically when power	on.			
History Record	Auto Arm after disarm:	0 Minute(S) (1~999	9)			
	Timer Reporting SMS Content Settings Add the following additional informa AltN0 Value AIN0 Value AIN1 Value	ation in the report SMS Arm Status GSM/3G Signal Value	DIN0 Status	DO0 Status		
	AIN2 Value	External Power Status	DIN2 Status	DO2 Status		
	AIN3 Value     Temperature Value     Humidity Value	Device ID	DIN3 Status	DO3 Status		
	Alarm SMS Content Settings	ation in the alarm SMS				-
	•		ш			•
COM3		Equipment model:S271-RTU				.::

(2) Under "Number Settings" page, write authorize number and tick the times needed. For example, if need power on, external power off/recovery SMS, then tick and write as below:

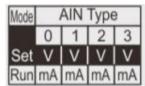
GSM 3G M2M RTU ConfiguratorV3.						-				a constant	
🛋 Load Profile 🔺 Export Profile	Pefault Language Abou	t									
Basic Information	Number setting										
Parameter setting	Authorized User Telephone N	umber Se	ettings								
Number setting	(Alarm No.) User No 0 00861359688369	Power On	Timer Report	Arm/Disarn SMS	n Low Signal	Power Lost	Power Recovery	GPRS Failure	Relay Switch		
Output Settings	User No.1										
Incoming control	User No.2										
	User No.3				<u>[</u> ]]]						
	User No.4										
Interlock Settings	User No.5										
*	User No.6			(f <sup>m</sup> )	[[ <sup>[1]</sup> ]	(T)					
<u>×</u>	User No.7										
History Record	User No.8										
	User No.9										
	Notice: 1. Alarm No. can include or 2. Low signal alert: Mobile s 3. Tick it stands for when the	ignal lowe	er than 14 (f	ull signal is 31	).			ut country	Save code,but can	not be 44	
СОМЗ			Equipm	ent model:S27	1-RTU						

(3) Click "Save"---->Switch device off---->Switch working mode to "Run"---->Put it SIM card and switch device on. 1~2 min after SIM card register network, power on SMS should be received---->The cut the external power, the power lost SMS should be received---->Connect the power support to device again, then power recovery SMS should be received. Thus, the device communication self-checking finished.



### 7.2 Device connect analog transducer

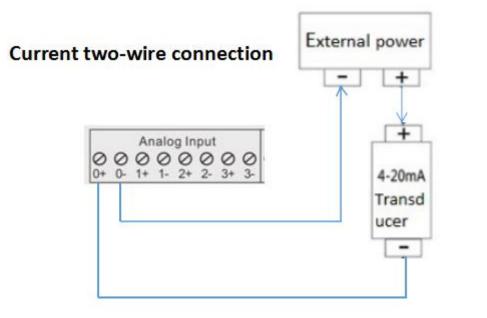
If AINO need to connect a temperature transducer, transducer output 4~20mA signal, measurement range: -40~100  $^{\circ}$ C, when temperature last 2 seconds higher than 35  $^{\circ}$ C need to alarm, last 2 seconds lower than 20  $^{\circ}$ C also need a alarm, then set as below:

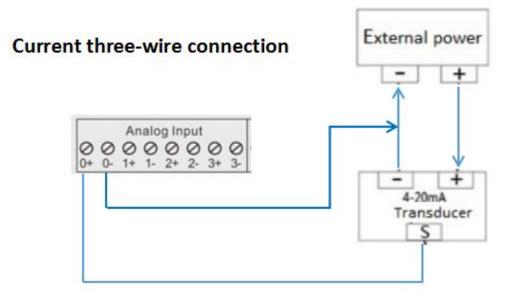


(1) Switch device off, then switch AINO input type

to "mA";

(2) Wire connect temperature transducer to AINO input as below:





(3) Basic setting according (1) and (2) in "Device working self-checking";

(4) Enter into "AIN Trigger" page---->Set input type to "4~20mA"---->Write "High/Low Alarm SMS"---->"Maximum": 100, "Minimum": -40, "Threshold High": 35, "Threshold Low": 20, "Verify Time": 2. If still need recovery alarm SMS, then need to tick "Recovery Alarm", and write content in "Recovery



SMS"---->After that, click "Save" as below:

🗟 GSM 3G M2M RTU Configura	itorV3.0		<u> </u>		-							x
諅 Load Profile 🛛 Export Pr	rofile 📲 Default Language About											
Basic Information	AIN trigger setting 🖄											
Parameter se	Input Type High Alarm SMS	Low Alarm SMS	Recovery SMS	Maximum	Minimum	Current Value	Threshold High	Threshold Low	Recovery Alarm	Alarm Verif Time(s)	y Siren 2	24hr
Number settin				100	-40	0	35	20		2		E
Output Settings	AIN1 Disable -			0	0	0	0	0		1		E
Incoming control	AIN2 Disable -			0	0	0	0	0		1		E
	AIN3 Disable -			0	0	0	0	0		1		E
DIN Trigger s	5 Temp Disable -			80	-40	0	0	0		1		Ε
DIN Alarm se	Hum. Disable -			100	0	0	0	0		1		E
<ul> <li>AIN Alarm set</li> <li>Timing Settings</li> <li>Interlock Settings</li> <li>Network settings</li> <li>History Record</li> </ul>	Maximur/Minimum: The measuremet     Measurement Range: -9999.99-9999     Alarm SMS Format: High/Low/Recov     Others are the same as DIN.     Alarm Verify Time values range from	9.99, supports minus a ery Contect Alarm,Cu 1 0 to 9999.	and decimal. rrent Value. m									•
COM3		Equipment m	odel:S271-RTU									:

(5) In "AIN alarm setting" page, tick the corresponding items for authorize number. For example, when AINO alarm, will can and send SMS to authorize number "0", remember to click "Save" as below:

B GSM 3G M2M RTU Configurator	V3.0	_		_	-		_	-						 				×
🛋 Load Profile 🛛 🖣 Export Profil	e 📲 Default Languag	ge .	Abou	t														
Basic Information	AIN alarm setting 🖄																	
Parameter set		1	(A)	IN Ala	rm :	Send	SMS )		(/		arm [	ial Ou	ıt)					
Number settir	AIN channel AI		AIN1	AIN2	AIN3	Temp	. Hum.	AINO	AIN1	AIN2	AIN3	Temp	. Hum.					
Output Settings	User No.0	7	<b>[</b> ]							<b>[</b> ]]		[!"]	<b>[</b> ]					
Incoming control	User No.1	٥																
E- () Input Settings	User No.2									<b></b>								
DIN Trigger s	User No.3																	
DIN Alarm set	User No.4										(C)							
罴	User No.5						6											
AIN Trigger s	User No.7												E					
AIN Alarm set	User No.8	m	m	(FT)	m		<u>_</u>		m	(FT)	m	m						
Timing Settings	User No.9			m			6	_					E					
Interlock Settings						_		_										
Network settings									Rea	d		Save						
B-OF History Record	Notice: 1. Tick it stands fo user telephone 2. While dialing th not answer will	e num ne use	ibers. er tele	phone	num	ber,ea												
СОМЗ						Equip	ment moo	del:S271-I	RTU					 				

(6) Switch device off;

(7) Switch DIP mode to "Run", working mode as below:





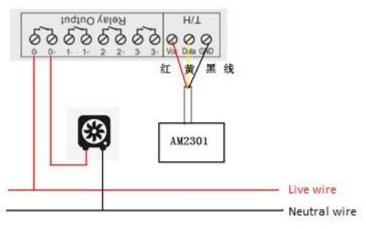
(8) Switch the device on, then device enter into working mode.

### Application:

When monitoring cabinet temperature, if higher than 38  $^{\circ}$ C, need to start the cabinet fan; If lower than 25  $^{\circ}$ C, need to close the fan.

Need: Temperature/Humidity transducer AM2301 and 1 channel relay output, if choose the first relay DO0, the set as below:

(1) Switch device off---->connect temperature/humidity transducer to T/H port---->connect the cabinet fan to DO0 output as below:



(2) Basic setting according (1) and (2) in "Device working self-checking";

(3) In "Output Settings" page, set first relay DOUTO, output type: Switch on/off, channel name: cabinet fan, close time: 0, 0 means always close. Click "Save" button as below:

GSM 3G M2M RTU Configurate			a garage			C. Married	-		Stort & scores		
Export Pro											
Basic Information	AIN aları	m setting 🖄	Relay setting 🖄		_						
Parameter set	Γ	Output Typ	e Channel Name	Close Time (s)	Repeat Time	Interval Time(s)	ON/OFF SMS	Alarm Verify Time(s)	Open Description (MAX.30)	Close Descriptic (MAX.30)	on
	Dout0	Switch on/off	<ul> <li>cabinet fan</li> </ul>	0	0	0		0			
Output Settings	Dout1	Switch on/off	-	0	0	0		0			
Relay setting	Dout2	Open door	•	0	0	0		0			
Incoming control	<b>D</b> 10			0	0			0			
	Dout3	Open door	•	U		0		0			
Timing Settings				Alw	ays cl	ose if	no oth	ner operat	e	Read	Save
Interlock Settings	Notice	:									Guite
Network settings			p as 0, this channel will p as not 0, this channel								
History Record	then	open,and repeat	this action according to	the Repeat Tir	nes after the	Interval Tir	me timeout		nine -		
	4 If th	e Output Type se	(DO0) can be setup as tup as Switch ON/OFF,	then this channe	l will be use	d as a switc	h.				
		e Output Type se N/DIN Alarm and	tup as Siren,then this ch Interlock page.	annel will be us	ed as siren,	and will be a	activated ad	cording to the s	ettings		
	6. Clos	e time, Interval ti	me, Repeat Times and					n na har na			
			tick the ON/OFF SMS al SMS to alert the users.	ert function, and	the relay cl	osing or op	ening time	less than the ver	ity time,		
	٠ [					m					•
COM3			E	quipment mode	I:S271-RTU						
				•••••							

(4) In "AIN Trigger Setting" page, set temperature type "Enable"---->Humidity and AIN0~7 choose "Disable" if not use---->Set corresponding alarm SMS content---->Threshold high: 38 and Threshold low: 25---->Recovery



and verify time according to need---->Click "Save" button as below:

🗟 GSM 3G M2M RTU Configurat	torV3.0	a second	anno - St.		- 9 mm	C Marrier	Sec. Sec. of		State of	and the second	-		
🐔 Load Profile 🛛 🖣 Export Pro	ofile 📲 🛙	Default Langu	iage About										
Basic Information	AIN t	rigger setting 🤰											
Parameter set		Input Type	High Alarm SMS	Low Alarm SMS	Recovery SMS	Maximum	Minimum	Current Value	Threshold High	Threshold Low	Recovery Alarm	Alarm Verify Time(s)	y Siren 24hr
Number settir	AIN0	Disable 🔻				0	0	0	0	0		1	
Output Settings	AIN1	Disable 🔻				0	0	0	0	0		1	E E
Relay setting	AIN2	Disable 🔻				0	0	0	0	0		1	
Incoming control	AIN3	Disable 🔻				0	0	0	0	0		1	
Input Settings	Temp	Enable 🔻	High Alarm	Low Alarm	Recovery	80	-40	0	29	25		1	E E
DIN Trigger s	Hum.	Disable 🔻				100	0	0	0	0		1	
DIN Alarm set     AIN Trigger s     AIN Alarm set     AIN Alarm set     AIN Alarm set     Interlock Settings     Network settings     History Record	1. M 2. M 3. Al 4. O	leasurement Rai larm SMS Forma ithers are the sa	nge: -9999.99~999 at: High/Low/Recov	9.99,supports minu rery Contect Alarm n 0 to 9999.	Current Value.	00Mpa;			Thr	eshold	high/1	ow valu	le ,
COM3				Equipment	t model:S271-RTU								

(5) In "Interlock Settings" page, Event choose "Temperature high alarm", Action: "DO0 close"---->Click "Add" button, stands for when temperature high than 38  $^{\circ}$ C, device will close DO0 to start the cabinet fan; Same operate for low alarm setting, then temperature lower than 25  $^{\circ}$ C, device will open DO0 to close the fan automatically---->Click "Save" button as below:

GSM 3G M2M RTU Configura	torV3.0	-		×
Load Profile     Export Pr     Basic Information	ofile 📲 Default Language About Association settings 🜌	Add to list		
Parameter setting	Event: Temperature Low alarm	Add Delete		*
Relay setting     Relay setting     Relay setting     Incoming control     Input Settings     Interlock Settings     Interlock Settings     Network settings     History Record	Event Temperature High alarm Temperature Low alarm	Action DO0 close DO0 open		ш
	Clear Custom interloc	k settings,Max.40	After adding, click "Save" button	
СОМЗ	Equ	ipment model:S271-RTU		

(6) Switch device off;



(7) Switch the DIP mode to "Run";

(8) Switch the device on, enter into working mode.

## 7.3 Cloud configuration, wechat notify application

Device can connect to cloud and SCADA via GPRS/3G/4G network, also can connect to clients own server and King Pigeon www.My-M2M.com clould server. King Pigeon my-m2m.com cloud as sample below:

King Pigeon my m2m cloud support Modbus TCP, cloud configuration, wechat alarm function, welcomed editable function.

(1) Basic setting according (1) and (2) in "Device working self-checking";

(2) In "Basic Parameter" setting page, set device ID, range 1~247 in Modbus RTU protocol as below:

GSM 3G M2M RTU Configurato	rV3.0		And in case of the local division of the loc			
🚽 Load Profile 🛛 🚽 Export Profi	ile 👫 Default Language About					
E Basic Information	parameter settings  🕺					
Parameter set	Modify password	S	ynchronous machine tin Time : 2015-	ne 03-31 22:25:00 ■▼		Â
Number settir	Old password:			d the RTU time		
Output Settings	New password:			te the RTU time		
Relay setting	Confirm password:	dify password		he computer time		
Incoming control		any password	Read t			
Input Settings	Basic information Device ID 1 0~9999)	Model No. S271-RTU	1	Version 2EV30		
Timing Settings	Device Description:			( 60 Characters )		II.
Interlock Settings	Add timestamp to alarm SMS	Arm Automatically when power	r on.			
Interlock Setti	🔲 Auto Arm after disarm:	0 Minute(*) (1~999		~		
• Network settings	Timer Reporting SMS Content Settings			range is 1~247 whe	en	
History Record	Add the following additional inform	ation in the report SMS <b>USed</b>	for Modbus p	rotocol		
Mark.	AINO Value	Arm Status	DIN0 Status	DO0 Status		
	AIN1 Value	GSM/3G Signal Value	DIN1 Status	DO1 Status		
	AIN2 Value	External Power Status	DIN2 Status	DO2 Status		
	AIN3 Value	Device ID	DIN3 Status	DO3 Status		
	Temperature Value	Device Description				
	Humidity Value					
	Alarm SMS Content Settings					
	Add the following additional inform	ation in the alarm SMS	m			
-						
СОМЗ		Equipment model:S271-RT	U			

(3) In "Cellular network setting"page, set parameter as below:

When Communication Data as "Modbus RTU Protocol", then server IP/DNS should be: modbus.dtuip.com, port is 6651, pls contact King Pigeon Sales for "Login Message Writing";

When Communication Data as "Modbus TCP Protocol", then server IP/DNS should be: modbus.dtuip.com,

port is 6655, pls contact King Pigeon Sales for "Login Message Writing";

When Communication Data as "King Pigeon RTU/Definition Protocol", then server IP/DNS should be: rtu-m2m.com, port is 8001, pls provide device IMEI to King Pigeon

Sales.



GSM 3G M2M RTU ConfiguratorV3.2											a x
Load Configuration File  Export Configuration	ition File 📲 Factory Reset 🛛 Language	About									
Basic Information	Number setting Relay sett	ting 📩 Access Control Se	tting 📩 DI settir	ng 🖄 🛛 DI alarm settin	g 🖈 🛛 Al setting 🖈	Al alarm setting 🖈	Clock timer 🖈	Second timer	Logic trigger 🖈	Cellular network setting 1	<u>ø</u> .
	Number setting Relay tett Communication Protocol Disable Protocol Tet Access Point Name User Name Passaword PIs fill in the login message(device Login Kessage Access Access Accessed) Login Kessage Accessed Heartbeat Message Heartbeat Message Accessed Heartbeat Message Accessed Heartbeat Message Accessed Heartbeat Message Accessed Heartbeat Message Accessed Heartbeat Message Strategy Send	Image: Second Control Second	t my-m2m C Server 1 Server 1 D) Server Server L O) Server connection	DI alarm settin connect other IOT I IP/DNS modburstukg USEN DATA 100 0 0 0 0 0 0 0 0 0 0 0 0	rtu.com (Max60) (0-65535) (Max60) 1 ✓ vde 10 Sec ion Enable / disable	A lalarm setting #	Clock timer 2	Second time	Logic trigger 🗫	Cellular network setting 3	<b>9</b>
COM5		Device Type S271-RTU									

- (4) Switch device off.
- (5) Switch the DIP mode to "Run".
- (6) Switch the device on, enter into working mode, then device I/O can connect to network.

## 8. Device SMS Command and SMS APP

The user can send SMS commands to setup or operate the device, also can use the APP to control it easier. The APP is under SMS communication, but their makes the program and operation easier than edit SMS every time.

The Android APP search "M2M RTU" or click to download link: http://nc-apk.wdjcdn.com/9/c8/1fd8e70a8634e9b4763a6a7114888c89.apk

The IOS APP search "M2M RTU" or click to download link (IOS 7.0 version or above support): https://itunes.apple.com/us/app/gsm-3g-m2m-rtu/id1095288504?l=zh&ls=1&mt=8

Or can scan QR code below:



SMS APP interface as below:



China M	Mobile	© 跶 क़ऀ⁴ऀऀ॑॑॑॑॑ऻ 🔲 3:41	M	ina Mobile	ااا: 🕈 چې چې	3:42 PM
<	GSM 3G	M2M RTU		<	GSM 3G M2M RTU	
		2				
	Access	Control			Sync RTU Time	
	0	1.1			Alarm Numbers	
					Access Control	
-	DOUT ON/OFF	Inquiry AIN value			DIN	
					AIN	
	Arm	Disarm			DOUT Settings	
		0			Daily Report Time GPRS/3G Data	
	Enable Online	Inquiry Status			Modify Password	
-					Would's Password	
	•	•			• •	
	-					
	$\triangleleft$ (			<		

## SMS Command List:

The SMS commands will be used for remote control the RTU are below:

## 1) Commands error return SMS

	Event	Return SMS Content		
Any incorrect C	ommand	SMS Format Error, Please check Caps Lock in Command!		
2) Externa	I DC Status			
	Event	Return SMS Content		
External DC goe	es off	External DC Power Goes OFF		
External DC Pov	wer Goes ON	External DC Power Goes ON		
3) Modify Password, 4digits, default is 1234				
	SMS Command	Return SMS Content		
Old Password+P+New Password		This is the New Password, please remember it carefully.		
4) Arm/Disarm SMS Command				
		Return SMS Content		
	SMS Command	Return SMS Content		
Arm	SMS Command password+AA	Return SMS Content           Armed		
Arm Disarm				
Disarm	password+AA password+BB	Armed		
Disarm	password+AA password+BB	Armed Disarmed		
Disarm 5) <b>Set RTU</b>	password+AA password+BB I <b>time,</b> format is 2015-05-22 15:20:30	Armed Disarmed W01, the W01 stands for Monday, W07 stands for Sunday.		
Disarm 5) Set RTU password+Dxxx	password+AA password+BB I time, format is 2015-05-22 15:20:30 SMS Command	Armed Disarmed Disarmed Disarmed Divo1, the W01 stands for Monday, W07 stands for Sunday. Return SMS Content		
Disarm 5) Set RTU password+Dxxx	password+AA password+BB <b>1 time,</b> format is 2015-05-22 15:20:30 SMS Command xx-xx-xxTxx: xx: xxWxx	Armed Disarmed Disarmed Disarmed Disarmed DW01, the W01 stands for Monday, W07 stands for Sunday. Return SMS Content		
Disarm 5) Set RTU password+Dxxx	password+AA password+BB <b>I time,</b> format is 2015-05-22 15:20:30 SMS Command xx-xx-xxTxx: xx: xxWxx Current Status SMS Command	Armed         Disarmed         DW01, the W01 stands for Monday, W07 stands for Sunday.         Return SMS Content         xxxx(Y)XX(M)XX(D)xx(H)X(M)xx(W)		

Version:



IMEI:

GSM Signal Value:

External DC Power Goes OFF/ON

# 7) **Setup 10 User number**(Alarm Number&Access Control Number), max 21digits. (Return 0~4 or 5~9 separately while setting.)

SMS Command		Return SMS Content	
Setup	password+A+series number+T+tel number	Tel1:	
		Tel2:	
	Notice:	Tel3: 13570810254	
	Series number = 0~9	Tel4:	
		Tel5:	
Inquiry	password+A	Return all numbers	
Delete	password+A+series number	Return 0~4 or 5~9 numbers.	

### 8) **Authority User Number to access control**: authorized number can dial to disarm and open the door.

	SMS Command	Return SMS Content
Setup	Specified access control time:	Tel1:
	password+B+series number+S+start time+E+endtime	Tel2:
	Always can access control:	Tel3: 13570810254
	password+B+series number+P	Tel4:
	Notice:	Tel5:
	Time format is 201505231230, stands for year, month, date, hour, minute.	
Inquiry	password+B	Return all authorized user numbers
Delete	password+B+series number	Return all authorized user numbers

### 9) Setup Daily Report time

	SMS Command	Return SMS Content
Setup	password+DR+series number+T+time	Daily SMS Report at: xx:xx
	Notice:	
	Series number =0~9, e.g.: 1234DR1T12:30	
Inquiry	password+DR	
Delete	password+DRDEL	

### 10)Inquiry DIN Status

	SMS Command	Return SMS Content
Inquiry Status	password+DINE	DIN1:Open/Close
		DIN2: Open/Close

#### 11) Setup AIN Name

	SMS Command		
Set Threshold	password+AINR+channel number+Lxxx+Hxxx	AINx: Low:xxx,High:xxx.	
Inquiry Threshold	password+AINR+ channel number <nnnnnnn></nnnnnnn>	AINx: Low:xxx, High:xxx.	
		AINy: Low:xxx, High:xxx.	
Delete Threshold	password+AINR+ channel number+DEL		
Set AIN measurement	password+AINM+ channel number+Lxxx+Hxxx	AINx: Min:xxx,Max:xxx	
range			
Inquiry measurement	password+AINM+ channel number <nnnnnnnn></nnnnnnnn>	AINx: Min:xxx, Max:xxx.	
range		AlNy: Min:xxx, Max:xxx.	



Delete measurement	password+AINM+channel number+DEL	
range		
Inquiry AIN Current	password+AINE+channel number <nnnnnnn></nnnnnnn>	AINx: xxxx ,+【Normal/Higher/Lower】
Value		
Inquiry All AIN Current	password+AINE	AIN0: xxxx ,+【Normal/Higher/Lower】
Value		AIN1: xxxx ,+【Normal/Higher/Lower】

## 12)SMS Control Digital Output

	SMS Command	Return SMS Content
Set DO Name	password+DO+channel number+T	DOx:xxxx
Inquiry DO Name	password+DO+ channel number <nnnn></nnnn>	
Delete DO Name	password+DO+ channel number+DEL	
Switch ON(Close)	password+DOC+ channel number <nnnn> , can close multi</nnnn>	DOx: ON
	channel, till next event trigger or SMS command.	DOy:ON
Switch OFF(Open)	password+DOO+ channel number <nnnn></nnnn>	DOx: OFF
		DOy:OFF
Inquiry DO Current	password+DOE+ channel number <nnnn></nnnn>	DOx: ON/OFF
Status		DOy:ON/OFF
Inquiry all DO Current	password+DOE	DO1: ON/OFF
Status		DO2:ON/OFF
Time Switch ON	password+DOLC+ channel number <nnnn> , can close multi</nnnn>	
(Close)	channel, till time setting in configurator software finished.	
Set Pulse Output time	password+DOT+xxx (3 digital, unit is seconds)	Pulse Output Time:xxxS
Inquiry pulse output	password+DOT	Pulse Output Time:xxxS
time		
Pulse Ouput	password+DOP+channel number <nnnn></nnnn>	No SMS Return

## 13)Set Server Parameter(Can not setup DNS by SMS)

SMS Command		Return SMS Content		
Set Server IP	Set Server IP password+IP+ IPaddress+P+Com port S			
		Port:		
Inquiry	password+IP			
Delete	password+IPDEL			

### 14)Set GPRS APN/USER NAME/PASSWORD

	Return SMS Content	
Set	APN:	
Inquiry	password+AP	User Name:
Delete password+APDEL		Password:

### 15) GPRS Online

password+HISDEL

SMS Command	Return SMS Content			
password+GPRSonline	GPRS always online			
16) Delete Historical Data				
SMS Command	Return SMS Content			

Delete all historical records

### 17)Clear/Inquiry Pulse Counter Value

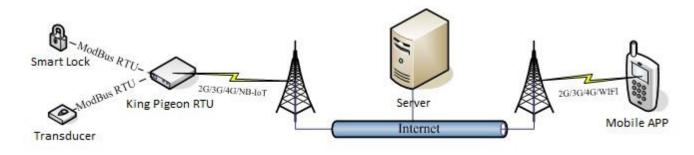


	Return SMS Content	
Clear Pulse Counter Value password+DIN0CLR		Clear Successfully
Inquiry Pulse Counter Value	password+PR	Counter Current Value: XX

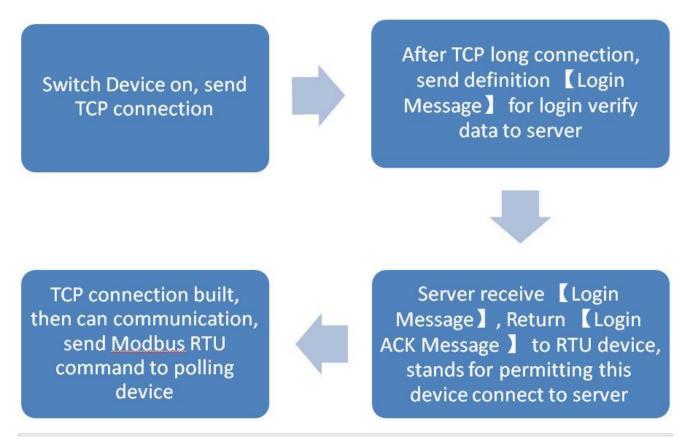
## 9. Device GPRS/3G/4G Communication Protocol

Device can connect to Cloud and SCADA via GPRS/3G/4G network, support Transparent Transmission, Modbus RTU over TCP, Modbus TCP and King Pigeon RTU protocol. User also can connect device to third party cloud or server.

## 9.1 Device Networks Topology



## 9.2 Communication Networks





## S270/S271 RTU I/O Register List and Function Code

Read Input Coil (Function Code 02: Read Coil)				
Register Address     Definition     Description       (Decimal)     Definition     Description				
0	RTU DINO	DIN0 value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0		
1	RTU DIN1 DIN1 DIN1 DIN1 Alue, when dry contact, NC=1, NO=0; When contract, 0~0.5V=1, 3~24V=0			
2	RTU DIN2	DIN2 value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0		
3	RTU DIN3	DIN3 value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0		

Read Input Register (Function Code 4: Read Input Register.)					
Register Address (Decimal)	Definition	Data Type	Description		
0	RTU AINO	32 Bit Signed ABCD 2 Byte in Modbus protocol	value/100       AIN1 value, real value       32 Bit Signed ABCD       value/100       2 Byte in Modbus protocol       AIN2 value, real value		AINO value, real value= AINO value/100
2	RTU AIN1			AIN1 value, real value= AIN1 value/100	
4	RTU AIN2			AIN2 value, real value= AIN2 value/100	
6	RTU AIN3		AIN3 value, real value= AIN3 value/100		
813	(reserved, not work)				
14	RTU Power	16 Bit Unsigned AB 1 Byte in Modbus protocol	External power voltage, real value= Power value/100		
1523	(reserved, not work)				
24	RTU Temperature	16 Bit Signed AB 1 Byte in Modbus protocol	AM2301 Temperature value (*100), real value= Temperature value/100		
25	RTU Humidity	16 Bit Signed AB 1 Byte in Modbus protocol	AM2301 Humidity value (*100), real value= Humidity value/100.		
26	RTU DINO Count Value	32 Bit Unsigned	This value Enable when DINO as counter mode		
28	TU DIN1 Count Value	32 Bit Unsigned	This value Enable when DINO as counter mode		



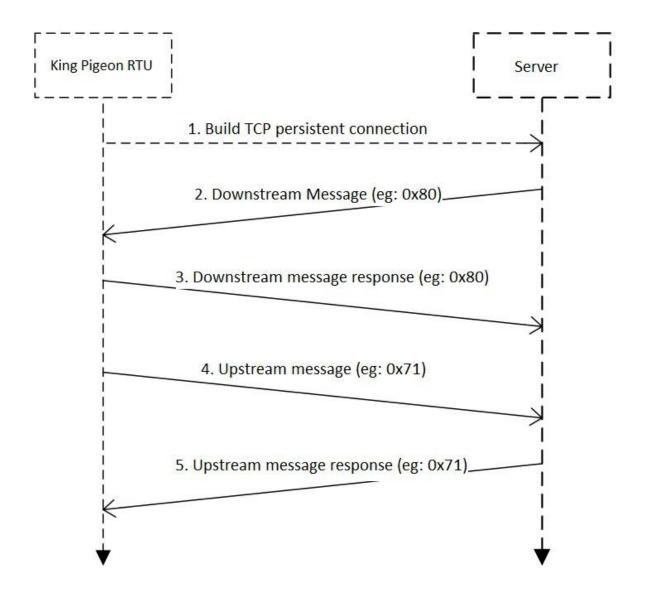
30	TU DIN2 Count	32 Bit Unsigned	This value Enable when DIN0 as
	Value		counter mode
32	TU DIN3 Count	32 Bit Unsigned	This value Enable when DINO as
	Value	52 bit Unsigned	counter mode

Read and Write Holding Coil (Function Code 1, Function Code 5, Function Code 15.)					
Register Address (Decimal)	Description				
0	RTU DO0	Bool	DO0 Value, Read/Write, 1=Close, 0=Open		
1	RTU DO1	Bool	DO1 Value, Read/Write, 1=Close, 0=Open		
2	RTU DO2	Bool	DO2 Value, Read/Write, 1=Close, 0=Open		
3	RTU DO3	Bool	DO3 Value, Read/Write, 1=Close, 0=Open		

Read and Write Holding Coil (Function Code 03, Function Code 06, Function Code 16.)					
Register Address     Definition     Data Type     Description					
260(bit0)	DIO Count clear bit	Bool	Write 1 to clear DI0 count		
260(bit1)	DI1 Count clear bit	Bool	Write 1 to clear DI1 count		
260(bit2)	DI2 Count clear bit	Bool	Write 1 to clear DI2 count		
260(bit3)	DI3 Count clear bit	Bool	Write 1 to clear DI3 count		



## 9.3 Message communication sequence



## 9.4 King Pigeon IoT RTU Protocol/ Definition Protocol

If users need device send alarm data, or timely send data to server, can choose this communication protocol. Set "Communication Data" in "Cellular network setting" page, need to choose "King Pigeon RTU/Definition protocol", "Protocol" choose TCP, set the Domain/IP/Port of connecting server, other parameter setting according to server.

#### Notice:

1) When Modbus TCP or Modbus RTU over TCP communication protocol adopted, device used as Internet remote server or slave device of cloud. So device ID is necessary for server polling device address data, and Internet remote server and cloud used for Modbus Master function.

2) When Modbus TCP or Modbus RTU over TCP communication protocol adopted, cloud server can remotely read and write device register address, according to "S270/S271 RTU I/O Register List and Function Code".



## 9.5 Modbus TCP Protocol

Device can connect to server or cloud to build TCP connection automatically via GPRS/3G/4G networks. After building TCP connection, server or SCADA or cloud can send Modbus TCP command to device for Modbus TCP communication.

## 9.6 Modbus RTU Over TCP

After device switched on, automatically connect to server or cloud to build TCP connection via GPRS/3G/4G networks. Users can set handshake protocol, login message, heartbeat or other parameter according to cloud server. After TCP connection, server or SCADA or cloud can send Modbus RTU command to device, to build Modbus RTU networks which based on TCP connection.

For Modbus RTU over TCP protocol, setting as below:

(1) In "Basic Parameter" setting, set device ID, range 1~247 in Modbus RTU protocol, click "Save" as below:

Basic Information Parameter set Number settir Output Settings Relay setting Incoming control	parameter settings 🔊 Modify password Old password: New password: Confirm password:	S odify password	Rea	ne 03-31 22:25:00 ••• d the RTU time he computer time		
A matching center A matching center Input Settings A matching settings Interlock Settings Interlock Settings Network settings History Record	Auto Arm after disarm: Timer Reporting SMS Content Settings Add the following additional inform AINO Value AIN1 Value AIN1 Value AIN2 Value Temperature Value		ron. 19) Us device ID,	Version 2EV30 (60 Characters) range is 1 <sup>~</sup> 247 when rotocol DO0 Status D01 Status D02 Status D03 Status	n	Ε
СОМЗ	Alarm SMS Content Settings Add the following additional inform	nation in the alarm SMS	m			

(2) In "Cellular network setting" page, "Communication Data" choose "Modbus RTU Protocol", means communication with Modbus RTU over TCP. After setting server IP/DNS and other parameter, click "Save" button as below:



(4) Switch device off.

(5) Switch the DIP mode to "Run".

(6) Switch the device on, enter into working mode, then device I/O can connect to network via Modbus RTU protocol.

## 9.7 Modbus RTU over TCP Communication Application

Modbus RTU over TCP communication protocol application, server as Modbus (RTU) Master, device as Modbus (RTU) slave. If device ID is 1, and already connected to remote clould server via GPRS/3G/4G networks.

#### Read device relay DO status:

Device's relay DO register address as holding coil, address 0~3, refer to "<u>S270/S271 RTU I/O Register List and</u> <u>Function Code</u>".

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 Origin	2	00.0011	Range: 0000-0003, address refer to "S270/S271 RTU I/O				
Register Address	2	00 00H	Register List and function code"				
Read DO Register	2	00.0411	Denses 000111 000411 Dead DO sty				
Qty	2	00 04H	Range: 0001H-0004H, Read DO qty				
16CRC Verify	2	3D C9	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, a	ccording to the	data Master se	end			
Function Code	1	01H	Read holding	coil					
Return Byte Length	1	01H	Return Data Length						
Returning Data	1	02Н	02H means 4 DO status, high 4 byte invalid, low 4 Byte converter Binary as below         DO3(bit3)       DO2 (bit2)       DO1 (bit1)       DO1 (converter Binary as below)         0       0       1       0       0       0       0         0       0       1       0						
16CRC Verify	2	D0 49H	CRC0 CRC1 low byte in front, high 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 Origin Register Address " and " Read DO Register Qty ", calculate the CRC again, returning data according to description data.

### Control device DO output:

1) Control 1 channel device DO output

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 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						
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= Already actived close relay, 00 00H= Already actived open relay						
16CRC Verify	2	8C 3AH	CRC0 CRC1 low byte in front, high 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 00 H DO0= Address; 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

Content	Bytes	Data (H: HEX)	Description							
Device Address	1	01H	01H Device, accord	ling to setting	address					
Function Code	1	0FH	Write multi holding	g coil						
DO Starting Register Address	2	00 00H	Range: 0000-0003, stands for DO0-DO3							
Control Relay Qty	2	00 04H	Qty: 0-4							
Write Byte Qty	1	01H	Write 1 byte, since	device only 4	DO, use 4 bina	ry can do it				
Writing Data	1	OFH	OFH stands for 4 DO status, high converter to binary as belowDO3(bit3)DO2 (bit2)11Active closeActive close		A byte invalid, low 4 byte FDO1 (bit1)DO1 (bit0)11Active closeActive close					
			1= Active close, 0= Active open							
16CRC Verify	2	7E 92H	CRC0 CRC1 low byte in front, high behind							

### 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 holding coil					
DO Register Address	2	00 00H	Range: 0000-0003, 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 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.

If need to control multi relays at same time, only need to change "Relay Starting Address", "Control Relay Qty", "Write Data" and calculate "CRC Verify" again.

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 Address	2	00 00H	Range: 0000-0003, stands for DIN0-DIN3					
Read DIN Register Qty	2	00 04H	Read qty of DIN status					
16CRC Verify	2	79 C9H	CRC0 CRC1 low byte in front, high behind					

## Read device DIN status:

## Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description					
Device	1	01H	01H Device, Range: 1-247, according to setting address					
Address	T	UIN	orn Device, Range. 1-247, according to setting address					
Function	1	02H	02 read input coil DIN status					
Code	T	0211						
Return	1	011	Banger 0000 0002 stands for DINO DIN2					
Bytes Qty	L	01H	Range: 0000-0003, stands for DIN0-DIN3					



Returning 1			FFH converter to binary 1111 1111 from high to low byte, stands for DIN7-DIN0 status								
	1	00H	(bit7)	(bit6)	(bit5)	(bit4)	DIN3 (bit3)	DIN2 (bit2)	DIN1 (bit1)	DIN0 (bit0)	
Data			0	0	0	0	0	0	0	0	
			Invalid	Invalid	Invalid	d Invalid Open Open Open Oper					
			1= Close, 0= Open								
16CRC	2	A1 88H									
Verify	2	AT 991	CRC0 CRC1 low byte in front, high behind								

Example: Inquiry device48 DIN data at same time, then:

Server send: 01 02 00 00 00 04 79 C9

01H= Device address; 02H= Inquiry DIN status; 00 00HDIN= Starting address; 00 04H= Serial reading 4 DIN status; 79 C9 H CRC verify.

### Device answer: 01 02 01 00 A1 88

01H= Device address; 02H= Inquiry DIN status; 01H= Returning data bytes qty; 00H DIN status, every byte stands for one DIN status, FFH converter to binary 1111 1111 from high to low byte, stands for DIN3-DIN0 status, 0= Open, 1= Close, A1 88H 16 byte CRC verify.

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

## *Read device AIN DIN pulse count value, temperature and humidity value, external power voltage value:* 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	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 count			
Address			value address: 001A, 001B			
			External power voltage address: $000E_{\circ}$			
Read Register	2	00.104	Read qty of input register, read AIN0 to DIN0 count value address,			
Qty	Qty 2 00 1CH		total 28 register, 0000H to 0001BH.			
16CRC Verify	2	F1 C3H	CRC0 CRC1 low byte in front, high behind			

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function	1	04H	04 read input register



Code											
			One address can read 2 bytes.								
Data Bytes	Data Butos		AIN address range: 0000-000BH, One AIN data take two address,								
Range	1	38H	temperature	e address: 0	018H, ł	hum	nidity addr	ress: 0019	H, DII	N0 co	unt value
Nange			address: 001	1A,001B							
			External pov	wer voltage	addres	s: 0	00E。				
		00 00 00		N= Retu	rning b	yte	s, sample	data 56 po	oints:		
		E7 00 00	AIN	AINO	AIN	1	AIN2	AIN3	Inv	alid	Invalid
		00 DD 00	Receivin	00 00	00 00	0	00 00	00 00	00	00	00 00
		00 00 DD 00	g Data	00 E7H	00		00	00 DCH	00 [	DEH	00 DFH
		00 00 00			DDF	1	DDH				
		DC 00 00	Decimal	194	207		0	0		0 0	
	00 DE 00	Value									
		00 00 DF 00 00 00 00 04 C6	Real	1.94	2.07	7	0	0	0		0
			Value								
Returning	N		 								
Data		01 9A 00	Other	External Power		Temperature		e Humi	dity		I0 Count
		00 00 01	Value	Voltag						Value	
		00 01 00	Receivin	04 C6	H	0B 36H		1B E4H		00 00 00 0B	
		01 00 01	g Data								
		00 01 00	Decimal	1222		2870		7140		11	
		01 00 01	Value								
		OB 36 1B	Real	12.22	V		28.7℃	71.4%	SRH	1	1 times
		E4 00 00	Value								
		00 OBH	AIN, Externa	al Power Vol	tage, T	emp	perature, l	Humidity r	eal va	alue=	Register
			value/100 $_{\circ}$								
16CRC	2	A9 3CH	CRC0 CRC1 I	ow byte in f	front, h	igh	behind				
Verify											

Example: Inquiry device 28 input type register at same time, start from address 0. Include 6 AIN, one device temperature, humidity, external power voltage, DINO 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 00 DD 00 00 DD 00 00 DD 00 00 DC 00 00 DE 00 00 DF 00 00 00

 00 04 C6 01 9A 00 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 AINO value, 00 00 00 DDD AIN1 value, 00 00 0D DDH AIN2 value, 00 00 00 DCH AIN3 value, 00 00 00 DEH invalid value, 00 00 00 DFH invalid 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 H invalid value, 0B 36H temperature value, 1B 36H humidity value, 00 00 00 DBH DINO count value, A9 3C CRC verify.



## 10. MQTT Protocol

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### Introduction to MQTT

MQTT is a client-server based message publish/subscribe transfer protocol. The MQTT protocol is lightweight, simple, open, and easy to implement. These characteristics make it applicable to a wide range. In many cases, including restricted environments, such as: machine-to-machine (M2M) communication and Internet of Things (IoT). It has been widely used in communication sensors via satellite links, occasionally dialed medical devices, smart homes, and some miniaturized devices. The MQTT protocol runs on TCP/IP or other network protocols and provides orderly, lossless, bidirectional connections.

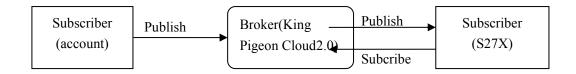
#### **MQTT** implementation principle

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

#### When the device publish I/O point data:



#### When the customer control the device:



### **Configuration:**

Domain: (King Pigeon Cloud 2.0 default:mqtt.dtuip.com)
Server Port : Broker Server Port number (King Pigeon Cloud 2.0 default:1883)
Subscribe topic: Client subscribe topic (King Pigeon Cloud 2.0 default:login message/+)
Publish topic: Device publish data topic (King Pigeon Cloud 2.0 default:login message)
MQTT Client ID: The unique identity of the device, which can be a serial number, device ID, or IMEI(King Pigeon Cloud 2.0 default is serial number)
MQTT user name: Device's account on the broker server (King Pigeon Cloud 2.0 default is MQTT)
MQTT password: Password of device's account on the broker server(King Pigeon Cloud 2.0 default is MQTTPW)

After the configuration is complete, the client will initiate a connection to the server:



CONNECT: The client sends a" CONNECT "connection message request to the server; CONNACK: The server responds with a "CONNACK" confirmation connection message, indicating that the

connection is successful;

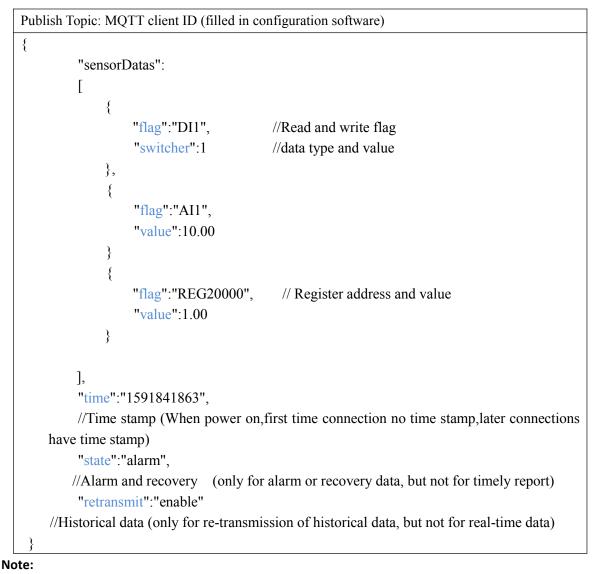
After the client establishes a connection, it is a long connection, and the client can publish or subscribe to the message on the server;

Take the device and the client's mobile phone as the client:

After the device publishes the topic on the broker proxy server, the customer can view the data through subscription. That is, the device is the publisher and the customer's mobile phone is the subscriber.

Users can also publish topics through the MQTT server to control the device. That is, the user is the publisher and the device is the subscriber.

## Payload data format of device publish message



//Read and write flag: the character is "flag", followed by "read and write identification of IO 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)

Subscribe Topic	
Publish Topic	
MQTT Client ID	
MQTT User Name	
MQTT Password	
Automatic data upload cycle	Sec
MQTT Date retransmission 🔲 Ena	able / disable

### Payload data format in device subscription message

(The topic of the King Pigeon 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)

{	{			
		"sensorI	Datas":	
		[		
		{		
			"sensorsId": 211267,	//platform sensor ID
			"switcher":1,	//data type :value
			"flag":"DO1"	// Read and write flag
		}		
		],		
	"down":"down"		"down"	//Platform downstream packet identification
}	ł			



//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 "read and write identification of IO 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 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	ТЕМР	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;
- "Alx" : Al0, Al1, Al2, Al3, Al4, Al5.

## 11. Upgrade Firmware

The device supports upgrade firmware via USB port directly. If you required upgrade, please contact us to discuss and modify the firmware according to you requirements, we can provide the upgraded firmware to you to upgrade them.

## 12. Cellular Module Upgrade

The device adopt modular structure design, when user local Gsm operator upgrade network, no need to replace the whole hardware, only need to replace inbuilt communication module, easily upgrade Gsm to 3G, or 3G to 4G network.

# Cellular Module Upgrade

Users can easily upgrade GSM (or 3G) to 3G/4G, NB-IoT or 5G network.

No need to replace whole device again when local network upgrade, only pick Gsm module out, put a 3G/4G module in, then device can support 3G/4G.



## 13. Warranty

1) This system is warranted to be free of defects in material and workmanship for one year.



2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions. In no event shall the manufacturer be liable for any alarm system altered by purchasers

The End! Any questions please help to contact us feel free. https://www.bliiot.com/