4G Cellular IoT Modbus MQTT RTU



S275 User Manual

Ver 2.7

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KING PIGEON

www.iot-solution.com



GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

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This handbook has been designed as a guide to the installation and operation of S273/S274/275 GSM/SMS/GPRS/3G/4G Cellular IoT Modbus RTU

Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.

We recommend that the advice of a registered electrician be sought before any Installation work commences.

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King Pigeon Hi-Tech.Co., Ltd, its employees and distributors, accept no liability for GSM Network upgrading or SIMCard upgrading due to the technology specifications contained in this handbook.

UPGRADE HISTORY

DATE	CONFIGURATO R VERSION	FIRMWARE VERSION	HARDWARE VERSION	DESCRIPTION
2018.12. 13	V2.5	V2.5	V2.4	 1.DIN status revised to reverse from V2.4 version, only support V2.5 configurator software. 2.The total value range function of DIN1 pulse count upgraded.
2020.7.2 3	V2.7	V2.7	V2.7	 Add DIN1-3 pulse counter Add MQTT

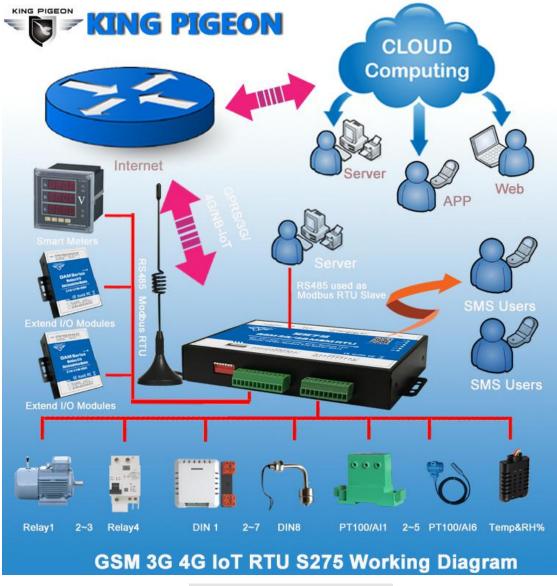




IS/GPRS/3G/4G GS M/S **Cellular IoT Modbus RTU**

Model List

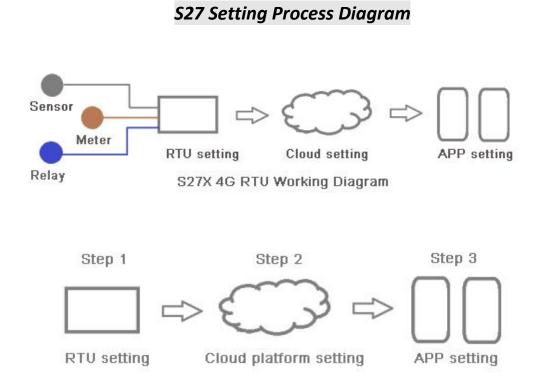
Model	DIN	AIN	00	Temp&	CD courd	USB	RS485	M	apping R	egisters	
woder	DIN	AIN	DO	Humi	SD card	USB	K3485	Boolean	16Bit	32Bit	64Bit
S272	8	6	4	1	8G	1	1	64	64	×	×
S275	8	6	4	1	8G	1	1	64	128	64	64
Neties	1.Defa	ult versio	on is GS	M/GPRS m	odule insid	e.					
Notice	2.For 3	G WCDN	/IA, 4G	LTE version	i, please tel	l our sale	es where w	vould you like	e to use t	hem.	



S27 Application Example



SM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu



1. Brief introduction

The Cellular IoT Modbus 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 8 digital inputs, 6 analog or PT100 Resistance Temperature Detector (RTD) inputs, 4 relay outputs, 1 ambient sensor input for monitoring onsite temperature and humidity, and RS485 serial port, supports 80/224/320 mapping registers via Modbus RTU protocol. 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 Modbus 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 Modbus 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 Modbus 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.

The Cellular IoT Modbus RTU supports transparent data transmission and performs as Modbus Slave over GPRS/3G/4G network and RS485 serial port. Moreover, the Cellular IoT Modbus RTU can be used as Modbus RTU Master to reading smart meters, I/O modules, PLC, and converts to SMS alert once triggered the threshold value, or transmit data to remote server over GPRS/3G/4G network.



IS/GPRS/3G/4G **Cellular IoT Modbus RTU**

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.

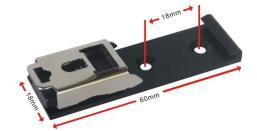
Interference

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

3. Standard Packing List

Gateway 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. 1Mainly Features

- GSM/GPRS/3G/4G network communication, can be operated from anywhere, no distance limitation; \geq
- Wide range power supply 9~36VDC with over voltage and phase-reversal protection; ۶
- Embedded ARM Cortex -M4 32 Bit RISC Core, 168 MHz inside, RTOS system, reliable performance \triangleright with in-built watchdog;
- 8 digital inputs, compatibles dry and wet contact. Logic level: 0~0. 5V or short circuit treated as close, +3~30V \geq or open circuits treated as open.DINO as a high-speed pulse counter, sampling frequency: 1MHz;DIN1~3 as low-speed pulse counter, anti-shake time can be set 1~2000ms, default 1ms;
- \geq DIN1 as arm and disarm function;

GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

- 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%;
- > 6 analog inputs, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output transducers;
- > Inbuilt 8G SD card to save up to tens of thousands historical data and events;
- 1 RS485 port, support Modbus slave protocol, can link up to SCADA、HMI、DSC. Support Modbus Master protocol, can extend up to 16 Modbus Salve device, e.g.: Data Acquisition Module, meters, generator, PLC, VFD, etc., and 320 tags can set alarm value and content, also support data transparent transmission;
- Powerful SMS function: Threshold high SMS alert, SMS set, SMS inquiry, SMS command for Modbus PLC..., and SMS monitoring communication with Slaves;
- Inbuilt 2 DC output for external transducers to save wiring cost;
- Automatically resend the data while communication interrupt or failure, and failure will alert by SMS 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 automatically rechargeable backup battery, alert when external power failure;
- 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;
- > L195 * W88 * H30mm, compatible wall installation and DIN35mm industrial rail installation.

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
Protocois	protocol.
RS485	1 RS485, Support Transparent transmission and Modbus RTU Slave,

4. 2 Specifications

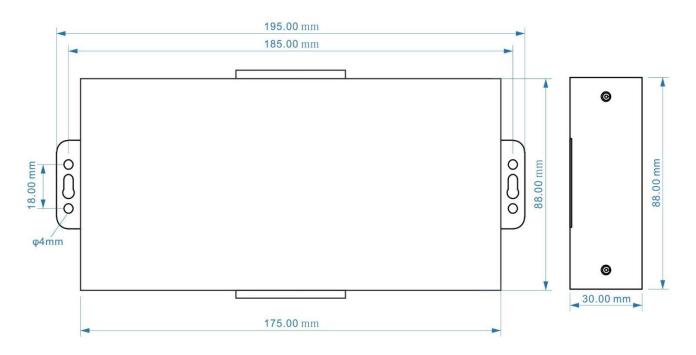


GSM/SMS/GPRS/3G/4G Cellular Iot Modbus RTU

	Modbus RTU Master.
Digital Inputs	8 Digital input, NC/NO type, one of it can be used as Pulse Counters;
Analog Inputs	6 Analog Inputs. 12 bit resolution, 0-5V or 0-20mA or 4-20mA;
Temp.&Hum Inputs	Temperature range: -40°C to +80°C, Humidity Range: 0~100%RH;
Relay Outputs	4, Rated: 5A/30VDC,5A/250VAC
Power Outputs	2 Port, for external device;
Extend I/O Tags	Max.320
Memory Capacity	Internal 8G SD card inside, can save the data for 100000events.
Backup Battery	3.7V 900mAH
Temperature range	-20-+70 °C
Humidity range	Relative humidity 95% (condensation free)
Exterior dimension	195mm*88mm*30mm
Net Weight	350g

5. Physical Layout and Installation Diagram

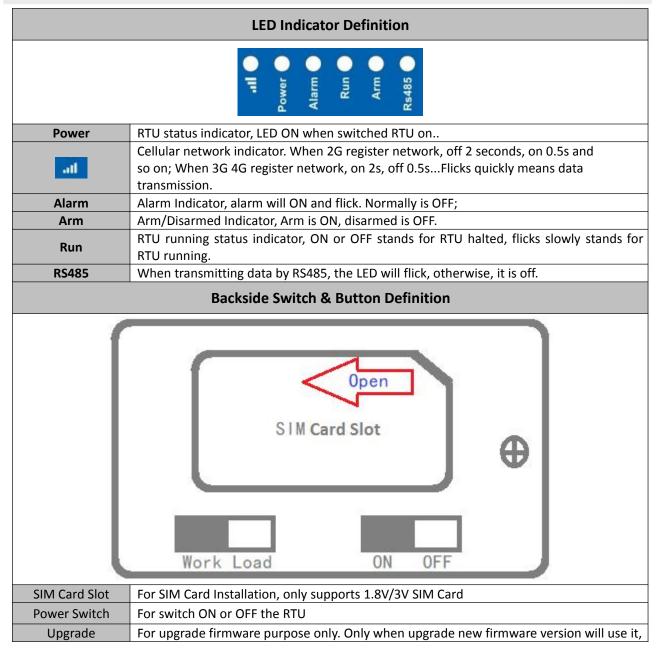
5.1 Control Unit size and physical layout





GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

JSB QN0 ¥ 8 Ø Ø Ø R\$485	0HE #0 Th -5 5 +5 2 +1 1 -0 0 Ø <t< th=""><th>A</th><th>ιT</th></t<>	A	ιT
52 [°]	75		atl C Power C Alarm C
	Iot Rtu	-•	Run 🤇 Arm 🔇 Rs485 🔇
RS485 / Modbus R	SB / DTU / Modbus TCP TU Master-Slave		
		CE RoHS FC	X



GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

Firmware Switch	otherwise keep it at Work Side all the time.
	Power Connector Definition
	$ \begin{array}{ c c c c c } \hline \bullet & \bar{\bullet} &$
DC IN+	External DC Power input port, Connect to 1.5A@9~36V DC power, positive electrode.
DC IN-	External DC Power Input port, contact to negative electrode
DC Out+	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
	Mode Analog Input Type 0 1 2 3 4 5 Set V V V V V Run mA mA mA mA mA For setting the RTU Mode is in Configuration Mode or Run mode. Set No. Set No. Set No.
SET/RUN	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. Tips: <i>When device mode changed, need to switch off/on the device.</i>
0/V/mA	The 1 st 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 st analog input should connect to 0~5V voltage output transducer. Switch it to Downside stands for the 1 st 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.
1/V/mA~5/V/mA	The 2 nd to 6 th 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 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 \oslash \bigotimes \bigotimes \bigotimes \bigotimes \bigotimes \bigotimes \bigotimes \bigotimes $O+$ $O-$ 1+1-2+2-3+3-4+4-5+5-
	pling frequency 200mS, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output
	refer to abovementioned DIP Switch Definition to connect the correct transducers. The 1st Channel Analog input. + stands for positive electrode, - stands for negative
0+/0-	electrode.
1+/1- ~5+/5-	The 2 nd ~6 th Channel Analog input. + stands for positive electrode, - stands for negative electrode.
	Digital Input Definition
	Digital Input OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

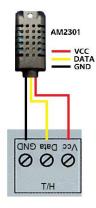
GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

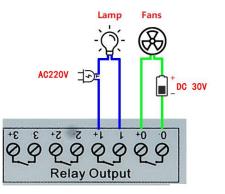
Dry contact or wet contact, sampling frequency 200mS. Logic level: 0~0. 5V or short circuit treated as close, +3~30V or open circuits treated as open. One of the input can be used as counter, sampling frequency is 1Mhz, the second input can be used for Arm/Disarm. The 1st digital input, positive electrode. 0 1~7 The 2nd~8th digital input, positive electrode. GND GND for digital inputs, negative electrode. **ATN Port Connector Definition** GSM/3G/4G Antenna connector, 500hm, SMA male. ATN **USB Port Connector Definition** USB USB port, for configuration and upgrading firmware and exporting historical data; **Temperature Humidity Sensor Port Definitions** Data GND Ncc 0 0 0 T/H Temperature & Humidity sensor AM230x input. Measurement Range: Temperature: T/H -40°C to +80°C, Humidity: 0~100%RH. **Digital Solid Relay Output Connector Definition** 5+ -2 +L +8 -8 -L +0 -0 0 Relay Output Solid Relay inside for outputs, Rated Capacity: 5A/30VDC,5A/250VAC. The 1st Channel Solid Relay Output. + stands for positive electrode, - stands for negative 0+/0electrode. The $2^{nd} \sim 4^{th}$ Channel Solid Relay Output. + stands for positive electrode, - stands for 1+/1-~3+/3negative electrode. RS232/RS485 Ports Definition GND A В 0 0 0 **RS485** GND Ground A/B RS485 A /B

5.2 Wiring

T&H

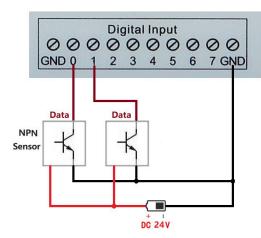
Relay Output

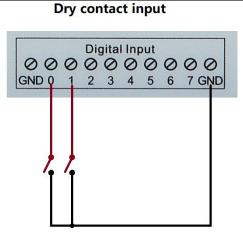




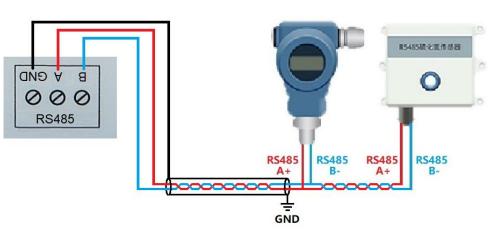
GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

Wet contact input



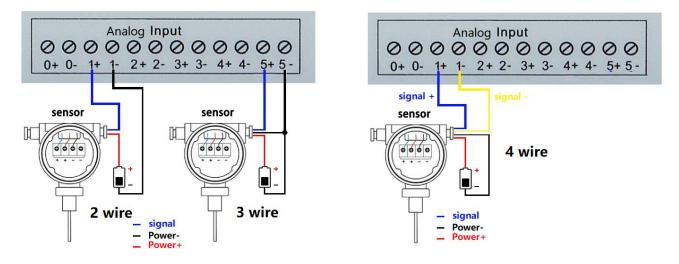






Analog Input

Analog Input



6. Settings&Operation

The GSM SMS GPRS 3G 4G Cellular IoT Modbus 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



GSM/SMS/GPRS/3G/4G Cellular lot Modbus R1

Cellular IoT Modbus RTU also can be configured some basically parameters by SMS Commands, please refer to SMS Command App or **Command List.**

Tips!

- 1) Please insert the SIM Card firstly, and install the GSM/3G/4G Antenna, please power on to check the LEDs status according to above mentioned LED Definitions, keep switch on it during the programming.
- 2) The PC Configuration in the CD, please click it to run it. Also can download from www.GPRS-M2M.com under S273/4/5 page directly.

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

Start to Configure:

Step1: Install the Configurator

Download from <u>www.GPRS-M2M.com</u>, then installs it on the computer.

Step2: Connection

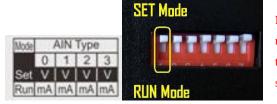
Please insert the SIM Card, and install the GSM/3G/4G Antenna.

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.



Notice:when setting,pls switch to set mode,after save settings,pls switch to Run mode.(in Run mode,can't save settings)

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:



Step5: Install USB Drvier

Install the USB Driver to the computer from the CD firstly. 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.



SM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

🖆 Device Manager	
File Action View Help	
⊿ - 🚔 Sammy-PC	
Batteries	
⊳ - 🖳 Computer	
🔈 🧫 Disk drives	
👂 📲 Display adapters	
DVD/CD-ROM drives	
IDE ATA/ATAPI controllers	
> 🐻 Imaging devices	
Keyboards	
Mice and other pointing devices	
👂 🜉 Monitors	
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.



to run it. Enter the password, default is 1234. Then you can enter the

configuration page as below:

Chose Port		
COM1	•	Refresh
Device connection failed!.		
Password (Default:1234)		

OK(O)		Cancel(<u>C</u>)

Notice:

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



- *l)* 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

GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

1234), click the "OK" to connect and start to program

Details please check the picture as below:

	Chose Port		
	СОМЗ	•	Refresh
K	Password (Default:1234)		

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.

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:
	1) Only power light on, that means the Upgrade Firmware Switch at Load side,
Can't enter software	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 evitabing panel on	Solution: Switch the power switch to OFF>Upgrade switch to Work side>
After switching panel on,	Power switch to ON;
only Power light on, panel can't work	2. SD card fall out from the slot. Solution: Shake panel to listen if there is voice or
can't work	not;
	3. In upgrade mode, use upgrade tool erased the firmware.
	1. The Upgrade Firmware Switch at Load side, not at Work side.
Can't enter into working	Solution: Switch the power switch to OFF>Upgrade switch to Work side>
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 Port	2. PC system problem cause driver installation failure, can't support Apple OS
	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, although clicked "Save" in every page, but missed the

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not running according to parameter setting final "Save Setting" in the menu. Solution: Back to Set mode---->Click "Save" Button after setting one page---->After all page set successfully, click "Save Setting" in the menu.

🐓 Terms usually used by Cellular IoT Modbus RTU

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

Configurator software interface and running

Select card and enter setting

– Select SIM Card Catego	Select SIM Card Category				
🥅 Normal SIM Card(Call	. and SMS)	📄 IOT M2M S.	IM Card@ata	only	
	Enter Sett				

Setting	Parameter 🔀				
Parameter	Modify password		Synchronous machine tin	ne	
	blo	password:	Time: 2015-	03-31 22:25:00	Read
Alarm Numbers	New New	password:	Time zone: (UTC-	+08.00)	Read
ut Setting	Confirm	password: (4 digits)			Save
DO	Commi	password. (4 uigits)	Write t	the RTU time	
ss Control		Modify password	Read the RTU time	Read the computer time	
	Basic information				
Access	Device ID (1~:	247,fill it when used as Modbus Slave ov	er RS485) Model No.	Version	Note:
t Setting	Device Description:			(60 Characters)	Pls find "Set Run" switch on device, then switch to "Set"
DI Setting		_		(ou characters)	mode, then set, after saving
-	🔄 Add timestamp to ala				settings, Pls switch to "Run"
DI Alarm	🔲 Auto Arm after disari	m: Minute(s) (0~9999, Wh	en set as 0, the RTU will in arme	ed mode immediately.)	mode.Upside switch is "Set",
AI Setting	Timer Reporting SMS Cor	ntent Settings			downside switch is "Run".In
AI Alarm	Add the following ad	ditional information in the report SMS			"Run" mode, settings can't be
	DIO Status	Arm Status	🔲 AIO Value	DO0 Status	saved and effective.
r Setting	DI1 Status	GSM/3G Signal Value	🔲 AI1 Value	DO1 Status	
Hour Timer	DI2 Status	External Power Status	AI2 Value	DO2 Status	
	DI3 Status	Device ID	🔲 AI3 Value	DO3 Status	
Periodic Timer	DI4 Status	Temperature Value	🗌 AI4 Value		
Trigger Setting	DI5 Status	🔲 Humidity Value	🛄 AI5 Value		
	DI6 Status	Device Description			
Link Trigger	DI7 Status				
5 Setting	Alarm SMS Content Settin	gs			
5	Add the following ad	ditional information in the alarm SMS			
Serial Port	DIO Status	Arm Status	AI0 Value	DO0 Status	
Setting	DI1 Status	GSM/3G Signal Value	All Value	DO1 Status	
	DI2 Status	External Power Status	AI2 Value	DO2 Status	
lave Mapping L 🖕	DI3 Status	Device ID	AI3 Value	DO3 Status	

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

Import 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 Import 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.



ASM/SMS/GPRS/3G/4G Cellular lot Modbus Rtu

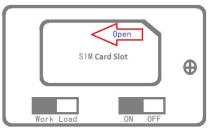
Notice:

- 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 S275 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;



Upside is Set mode, switch to downside is Run mode.Pls set the device in Set mode, and save settings, then switch to Run mode.In Run mode, settings can not be saved and effective!!!

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: Please click the "Read" for previous parameter before starting to set.

ifiguration file 🚽 Exp	Parameter 🗙	tory Reset 🛛 🙀 Help			
Alarm Numbers tput Setting DO ess Control Access	Modify password Old New	password: password: password: (4 digits) Modify password	Time zone: (U1	15-03-31 22:25:00 □ ▼ TC+08:00) te the RTU time	Read
2	Device ID (1~2	247,fill it when used as Modbus Slave o	over RS485) Model No.	Version	Note: Pls find "Set Run" switch on
ut Setting	Device Description:			(60 Characters)	device, then switch to "Set"
DI Setting	Add timestamp to ala	rm SMS 🛛 🕅 Arm automatically wh	en power on.		mode, then set, after saving
DI Alarm	Auto Arm after disarr		hen set as 0, the RTU will in ar	med mode immediately.)	settings, Pls switch to "Run"
AI Setting			nen set us o, the title will in u	inco mode ininediately.)	mode.Upside switch is "Set", downside switch is "Run".In
AI Setting	Timer Reporting SMS Cor	-			"Run" mode, settings can't be
AI Alarm		ditional information in the report SMS			saved and effective.
2	DI0 Status	Arm Status	AI0 Value	DO0 Status	
er Setting	DIO Status	☐ Arm Status ☐ GSM/3G Signal Value	AI1 Value	DO1 Status	
er Setting	DIO Status DI1 Status DI2 Status	 Arm Status GSM/3G Signal Value External Power Status 	☐ AI1 Value ☐ AI2 Value	DO1 Status	
er Setting Hour Timer	DIO Status DI1 Status DI2 Status DI2 Status	Arm Status GSM/3G Signal Value Kternal Power Status Device ID	AI1 Value AI2 Value AI3 Value	DO1 Status	
er Setting Hour Timer Periodic Timer	DIO Status DI1 Status DI2 Status DI3 Status DI4 Status	Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value	AI1 Value AI2 Value AI2 Value AI3 Value AI4 Value	DO1 Status	
er Setting Hour Timer Periodic Timer	 DIO Status DI1 Status DI2 Status DI3 Status DI4 Status DI5 Status 	Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value	AI1 Value AI2 Value AI3 Value	DO1 Status	
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er Setting Hour Timer Periodic Timer Trigger Setting Link Trigger 85 Setting	 DIO Status DI1 Status DI2 Status DI3 Status DI4 Status DI5 Status DI5 Status DI6 Status DI7 Status 	Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description	AI1 Value AI2 Value AI2 Value AI3 Value AI4 Value	DO1 Status	
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Al Alarm er Setting Hour Timer Periodic Timer Trigger Setting Link Trigger 185 Setting Serial Port e Settina	DIO Status DI1 Status DI2 Status DI3 Status DI3 Status DI4 Status DI5 Status DI6 Status DI7 Status Alarm SMS Content Settin Add the following ad	Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description gs ditional information in the alarm SMS	Al1 Value Al2 Value Al3 Value Al4 Value Al5 Value	DO1 Status DO2 Status DO3 Status	
er Setting Hour Timer Periodic Timer Trigger Setting Link Trigger 85 Setting	DIO Status DI1 Status DI2 Status DI3 Status DI5 Status DI5 Status DI6 Status DI7 Status Alarm SMS Content Settin Ad the following ad DI0 Status	Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description gs ditional information in the alarm SMS Arm Status	 A11 Value A12 Value A13 Value A14 Value A15 Value A15 Value 	 DO1 Status DO2 Status DO3 Status 	

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



GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

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.

🍳 Alarm Number Settings

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:

Please remember that click "Save" -" Save Settings" button to save it after parameter be written, below pages are the same.

and a second sec		Reset [Help								
ting Alarm Nu	mbers <mark>×</mark>										
ameter Authori:	ed User Telephone	, Number S	ettings								
rm Numbers	(Alarm No.)	Power On	Timer Report	Arm/Disarm SMS	Low Signal	Power Lost	Power Recovery	GPRS Failure	Relay Switch	Slave Alarm	Slave Failure
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User No	.1 0										
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ontrol User No	.3 0										
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ur Timer Notice: iodic Timer 1. Alarm 2. Low si ger Setting 3. Tick it ktring ial Port	gnal alert: Mobile sig	nal lower th	han 14 (full	signal is 31).				ountry code,	but can not	be 44.	



GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

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.

Slave Alarm: Tick it stands for the salve tag triggered will send SMS to this number.

Slave Failure: Tick it stands for when slave communication failure alarm verify time arrive, will send SMS to this number.

Digital Output Relay Output Setting

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.

asic Setting Alarm Nur		eset [Help								
asic Setting Alarm Nur	Output Type	Channel Name	Close	Repeat			Alarm Verify	Open Description	Close	Description
Alarm Numbers DO 0	·	(MAX. 20)	Time(s)	Times	Time(s)	SMS	Time(s)	(MAX. 30)		(MAX. 30)
Dutput Setting			U				U			
DO_1	• ·		0	0	0		0			
DO_2	•		0	0	0		0			
Ccess Control			0	0	0		0			
Access	•			0	0					
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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.

1) **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



GSM/SMS/GPRS/3G/4G **Cellular IoT Modbus RTU**

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.

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. **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;

Access Control Setting

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.

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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 Settings		ss 🔀				
Output Settings Access Control Control Access Input Settings	2.When the ticked	Start time 2018-06-14 19:45	arm and ou	In the signal to open the electr End time 2018-06-14 19:45	Always	
Timer Settings	🔲 User No.1	2018-06-14 19:45	~	2018-06-14 19:45	Always	
Interlock Settings	🔲 User No.2	2018-06-14 19:45	~	2018-06-14 19:45	Always	
RS485 Settings	📃 User No.3	2018-06-14 19:45	~	2018-06-14 19:45	Always	
Slave Settings	🔲 User No.4	2018-06-14 19:45	~	2018-06-14 19:45	Always	
Network Settings	🔲 User No.5	2018-06-14 19:45	~	2018-06-14 19:45	Always	
Historical Record	🔲 User No.6	2018-06-14 19:45	~	2018-06-14 19:45	Always	
nistorical nectora	🔲 User No.7	2018-06-14 19:45	~	2018-06-14 19:45	Always	
	🔲 User No.8	2018-06-14 19:45	~	2018-06-14 19:45	Always	
	🔲 User No.9	2018-06-14 19:45	~	2018-06-14 19:45	Always	
		as "Always" means the User can o and End time means the User ca		Read	Save	

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.



This page is for setting the digital input alarm conditions and usages.



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t Configuration file 🛛 🚽 Expo	ort Configuration File	Restory Res	set 🚺 Help								
Basic Setting	Alarm Numbers ×	do x	Access ×	DI Setting							
Parameter	Inj	out Type /	llarn SMS	Recovery	- SMS Change SMS	Current Status	Recovery Alarm	Alarn Ver: Time(s)	ify Siren	24hr	
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DO DO	DT2 NC							0			
Access Control	DI3 Chang							0		8	
Access	DI4						•	0			
Input Setting								0		n	
DI Setting	DI5										
DI Alarm	DI6	•						0			
AI Setting	DI7	-						0			
AI Alarm		Initial Valu	e Interval A	larm Value	Interval Alarm SMS	Total Alarm Value	Total /	Alarm SMS			
Timer Setting	DI0 Counter										
Hour Timer						(MAX.999999)					
300		Initial Valu	e Interval	Alarm Value	Interval Alarm SMS	Total Alarm Value	Total /	Alarm SMS	Anti-sha		
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Link Trigger Setting		Initial Valu	a Internal	Alarea Value	Interval Alarm SMS		Tetal	Alarm SMS	Anti-sha		
Link Trigger	DI2 Counter	Initial valu	ie interval	Alarm value	Interval Alarmi Sivis	Total Alarm Value	Total A	Alarm Sivis	10	ms	
RS485 Setting						(MAX.999999)			(MAX	.2000)	
Serial Port		Initial Valu	ie Interval	Alarm Value	Interval Alarm SMS	Total Alarm Value	Total /	Alarm SMS	Anti-sha	ke-time	
Slave Setting	DI3 Counter								10	ms	
Slave Mapping L						(MAX.999999)			(MAX	.2000)	
III +	Notice:							Read	Sa	ive	

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



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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.
Step Alarm SMS: When step 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

This page is for setup while DI/AI 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 DI settings, the AI Alarm Settings is the same:

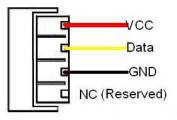
ation file 🛛 🚽 Export Configuration Fil	e 🔛 Fa	actory	Reset	🗐 He	lp													
tting 🔺 Alarm Numbers	× D	0 ×	Acce	ss ×	D	I Sett	ing X	DI	Alarm	×								
rameter		(1	DI Alarn	n Send	SMS)				(DI A	larm I	Dial C	Dut)					
arm Numbers DI Channe	1 0	1	2 3	4	5	6	7	0	1	2	3	4	5	6	7			
User No.0	[^[27]			1 0		F												
User No.1	[]			1 6														
User No.2				3 0														
User No.3				9 6														
User No.4																		
User No.5	[[""						F											
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tting User No.9				1 0				(m)			F							
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9 Notice: Timer 1. Tick it star 2. While dial dic Timer dial the ne	ng the u	ser tel	ephone											I				
iger																		
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Al 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/SMS/GPRS/3G/4G Cellular lot Modbus RTU

💁 Cellular IoT RUT Configurator V2.3														- D X
🔁 Save Settings 🛛 Load Profile 🍝	Export Pro	ofile 🛛 👫 Default	: 🚺 Help											
Basic Settings	AIN Trig	ger 🔀												
Output Settings		Input Type Hi	gh Alarm SMS	Low Alarm SMS	Recovery SMS	Maximum	Minimum	Current Value	Threshold High	Threshold Low	Recovery . Alarm	Alarm Verify Time(s)	'Siren	24hr
Access Control	AINO	•				0	0		0	0		0		
Input Settings	AIN1	•				0	0		0	0		0		
DIN Trigger	AIN2	-				0	0		0	0	—	0		
	AIN3	•				0	0		0	0		0		
DIN Alarm	AIN4	•				0	0		0	0		0		F
AIN Trigger	AIN5	•				0	0		0	0		0	(
AIN Alarm	Temp.	•		i i i i i i i i i i i i i i i i i i i		80	-40		0	0		0		
Timer Settings	Hum.	•		i i i i i i i i i i i i i i i i i i i		100	0		0	0		0		E
Interlock Settings R5485 Settings Slave Settings Network Settings Historical Record		1. 2. 3.	Measurement Others are the	imum: The measu Range: 9999,99 same as DIN. ime values range	9999.99,support			Mpa;		Read	Save			
СОМЗ				Device type:S27	5-RTU									,d

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

GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

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.

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:

Cellular IoT RUT Configurator V2.3	1.00					
🗐 Save Settings 🛛 🖷 Load Profile	🛃 Export Profile 🛛 📲 Default	🗿 Help				
P	Hour Timer × Periodi	: Timer 🔀				
Parameter	Periodic Timer					
Numbers	periodically auto u	pload GPRS data 0	minu	ite 📃 Enable,	'Disable	
-000 <u>"Nat"</u>	Weekly	Hour	Minute	Interval(s)	Action	
Output Settings	🕅 1 🛛 Sunday 👻	00 -	00 -	0	Reboot 👻	
Access Control	✓ 2 Wednesday ▼	16 👻	03 🕶	0	Reboot 👻	
Input Settings	🖾 3 Monday 👻	00 -	01 •	0	Reboot 🔻	
Timer Settings	🖾 4 🛛 Everyday 🔻	00 🔻	• 00	0	Reboot 👻	
Hour Timer	🖾 5 Monday 👻	• 00	• 00	0	Reboot 👻	
040	🗖 6 Monday 👻	00 🔻	00 👻	0	Reboot 👻	
Periodic Timer	🗖 7 Monday 👻	• 00	• 00	0	Reboot 👻	
Interlock Settings	🗌 8 Monday 🔻	00 🔻	• 00	0	Reboot 👻	
RS485 Settings	🖾 9 Monday 👻	00 👻	• 00	0	Reboot 👻	
Slave Settings	Notice:				Read Save	
Network Settings	1. From the Start Time,		ite the choose actio	on.	Save	
Historical Record	2. Interval time range is	: 0~9999 Seconds.				
СОМЗ		Device	type:			
		Sevice		-		

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 Setting

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.



GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

প্র Cellular IoT RTU Configurator V2.7		The sea was been	
Timport Configuration file	rt Configuration File 🛛 📲 Factory Reset 🏼 🛐 I	Help	
Basic Setting	Alarm Numbers X DO X Access	× DI Setting × DI Alarm × AI Setting × Link Trigger ⊠	
Parameter	Event: Temperature Low Alarm		
Alarm Numbers	Action : DO3 close	Add Delete	
Output Setting			
T O DO	Event	Action	
	DI0 trigger	DO0 open	
-14/2 -000	AI1 High Alarm	Siren	
Access	Temperature Low Alarm	DO3 close	
Input Setting			
DI Setting			
DI Alarm			
AI Setting			
AI Alarm			
Timer Setting			
Hour Timer			
Periodic Timer			
Environment Link Trigger Setting	Clear		
Link Trigger	Note: N	1ax 40 Link Trigger events.	
RS485 Setting		Read Save	
Serial Port		Neau Save	
Slave Setting			
Slave Mapping L +			
1	Device	type:	

Event: Stands for if this occurrence.

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

RS485 Serial Port Setting

This page is for setup the serial port parameters. Over the RS485, the S275 RTU can be used as Modbus RTU Slave, Modbus RTU Master and transparent transmission.

Cellular IoT RUT Configurator V2	12.3	_ - X
🛅 Save Settings 🛛 🖷 Load Profile	ile 📲 Export Profile 📲 Default 🧃 Help	
Basic Settings	Serial Port 🔀	
Output Settings	Rs485 ModBus KTV Master ▼ Scan Rate 200 (200~65535ms)	
Access Control		
Input Settings	Baud rate Store Time Out 200 (200~65535ms) Data bit 8 •	
1000	Parity bit Inone Slave fault verify time 60 (0~65535s)	
Timer Settings	Stop bit 1	
Interlock Settings		
RS485 Settings	Read Save	
Serial Port	Notice:	
Slave Settings	1. Scan Rate can't less than 200ms	
Network Settings	2. Time Out can't less than 200ms	
Historical Record		
<u> </u>		
COM3	Device type:	

Modbus RTU Master: Stands for the RS485 used for Modbus RTU Master. Modbus RTU Slave: Stands for the RS485 used for Modbus RTU Slave, and the "Scan rate", "Time out" and "Slave failure verify time " of Master function will be disable. Baud Rate: 1200/2400/4800/9600/19200/38400/57600/115200 optional.



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Data Bit: 8 bit.

Parity Bit: None, Even and Odd optional.

Stop Bit: 1 or 2 stop bit optional.

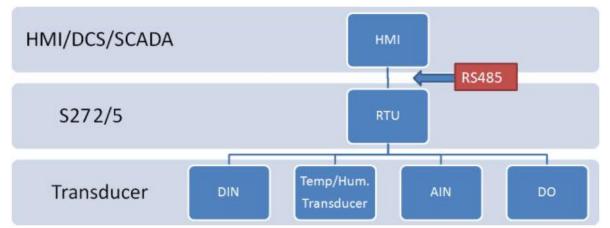
Scan rate: When RS485 used as Master, the interval time between two polling command.

Time out: When RS485 used as Master, after sending command to slave, the longest time waiting for slave data back. If longer than this setting value, will ensure slave no response.

Slave failure verity time: When RS485 used as Master, if no response time between Master and Slave longer than this value, will send SMS to authorize number.

State function: 🕺 Modbus RTU Slave function:

When RS485 as Modbus RTU Slave, can be connected to HMI, SCADA, DCS, PLC... as below:



RTU I/O Register List and function code:

	Read Input Coil (F	unction Code 02: Read Coil)
Register Address (Decimal)	Definition	Description
0	RTU DINO	DINO value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0
1	RTU DIN1	DIN1 value, when dry contact, NC=1, NO=0; When wet 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
4	RTU DIN4	DIN4 value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0
5	RTU DIN5	DIN5 value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0
6	RTU DIN6	DIN6 value, when dry contact, NC=1, NO=0; When wet contract, 0~0.5V=1, 3~24V=0
7	RTU DIN7	DIN7 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.)



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Register Address (Decimal)	Definition	Data Type	Description
0	RTU AINO		AINO value, real value= AINO value/100
2	RTU AIN1		AIN1 value, real value= AIN0 value/100
4	RTU AIN2	32 Bit Signed ABCD	AIN2 value, real value= AIN0 value/100
6	RTU AIN3	1 Byte in Modbus protocol	AIN3 value, real value= AIN0 value/100
8	RTU AIN4		AIN4 value, real value= AIN0 value/100
10	RTU AIN5		AIN5 value, real value= AIN0 value/100
1213	(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

Read and Write Holding Coil (Function Code 1, Function Code 5, Function Code 15.)					
Register Address	Definition	Description			
(Decimal)					
0	RTU DO0	DO0 Value, Read/Write, 1=Close, 0=Open			
1	RTU DO1	DO1 Value, Read/Write, 1=Close, 0=Open			
2	RTU DO2	DO2 Value, Read/Write, 1=Close, 0=Open			
3	RTU DO3	DO3 Value, Read/Write, 1=Close, 0=Open			
463	(reserved, not work)				

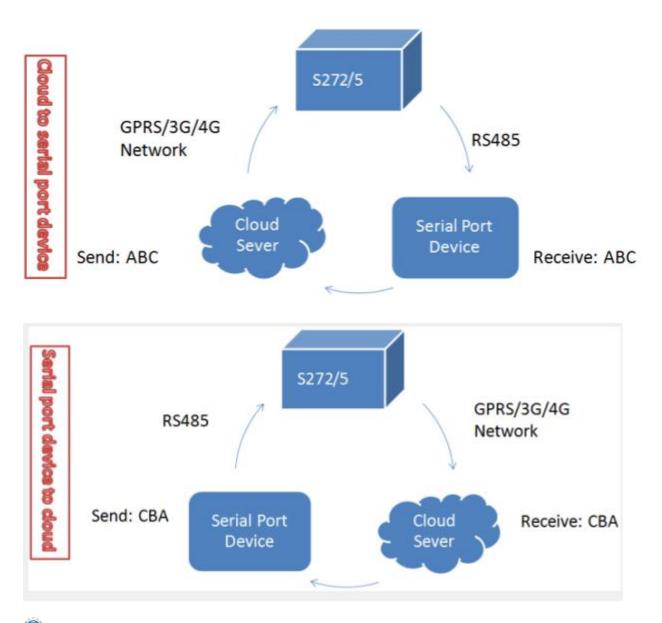
Stransparent Transmission:

The RS485 can be used as transparent transmission, transmit the device data on this serial port to GPRS/3G/4G, the device not deal with or store any data, only do as a data transmit channel, converter serial port to TCP/IP.

This function can be used for connecting PLC, Remote I/O data acquisition module, Smart meter, Power



monitoring moduel, Smart transducer, Diesel generator, Accumulator battery monitoring system...



States and the second s

When RS485 as Modbus RTU Master with mapping registers, support max 16 slaves for connecting PLC, Remote I/O data acquisition module, Smart meter, Power monitoring module, Smart transducer, Diesel generator, UPS, Accumulator battery monitoring system...; Can mapping register value from Slave to Master, these registers' can be setup high or low threshold value, and NC/NO type, moreover, can enable to send SMS to users once alarm occurrence by the registers if required. Also can remote control Slaves by writing coil.





GSM/SMS/GPRS/3G/4G **Cellular IoT Modbus RTU**

Mapping Register Table and function code:

Reminder:

1. Use this function code when connect to Modbus RTU/Modbus TCP upper computer via GPRS/3G/4G (Device as Modbus RTU Slave). Stands for when Cloud communication with \$275, the \$275 is Modbus RTU Slave of Cloud Server.

2. When device connect to Modbus RTU/Modbus TCP upper computer via GPRS/3G/4G (Device as Modbus

RTU Slave). The I/O of S275 itself refer to "Modbus RTU Slave function" above.

Boolean Slave Register Assignment Table(S272 & S275)

Holdir	Holding Coil (Function Code 1, Function Code 5, Function Code 15.)					
Boolean Register Address (Decimal)	Definition	Description				
64	Boolean 64	Boolean type, slave mapping address, can mapping slave input coil and holding coil status.				
65	Boolean 65	Same as above				
	125 data similar as above	Same as above				
127	Boolean 127	Same as above				

16 Bit Slave Register Assignment Table(S272 &S275)

Support 03/06/16 function code, 1 data take one address in Modbus protocol, total can mapping 128 slave data.

Read and Write	Read and Write Holding Register (Function Code 03, Function Code 06, Function Code 16)						
16 Bit Register Address (Decimal)	Definition	Data Type	Description				
20000	16 Bit data 20000	Sort AB, its data type according to slave mapping data type	According to configurator set mapping rules, this address will sort slave mapping data to AB, stock in this address, for cloud easy reading together, can mapping slave inputting and holding register.				
20001	16 Bit data 20001	Same as above	Same as above				
20002	16 Bit data 20002	Same as above	Same as above				
	124 data similar as above	Same as above	Same as above				
20127	16 Bit data 20127	Same as above	Same as above				

32 Bit Slave Register Assignment Table

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Support 03/06/16 function code, 1 data take two address in Modbus protocol, total can mapping 64 slave data.

	Holding Register						
32 Bit Register Address (Decimal)	Definition	Data Type	Description				
20128	32 Bit data 20128	Sort ABCD, its data type according to slave mapping data type	According to configurator set mapping rules, this address will sort slave mapping data to ABCD, stock in this address, for cloud easy reading together, can mapping slave inputting and holding register.				
20130	32 Bit data 20130	Same as above	Same as above				
20132	32 Bit data 20132	Same as above	Same as above				
	60 data similar as above	Same as above	Same as above				
20254	32 Bit data 20254	Same as above	Same as above				

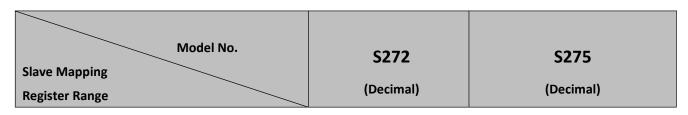
64 Bit Slave Register Assignment Table

Support 03/06/16 function code, 1 data take four address in Modbus protocol, total can mapping 64 slave data.

	н	olding Register	
64 Bit Register Address (Decimal)	Definition	Data Type	Description
20256	64 Bit data 20256	Sort ABCDEFGH, its data type according to slave mapping data type	According to configurator set mapping rules, this address will sort slave mapping data to ABCDEFGH, stock in this address, for cloud easy reading together, can mapping slave inputting and holding register.
20260	64 Bit data 20260	Same as above	Same as above
20264	64 Bit data 20264	Same as above	Same as above
	60 data similar as above	Same as above	Same as above
20508	64 Bit data 20508	Same as above	Same as above

Notice:

The difference of S273/S274/S275 is that they have different mapping register qty, but their device I/O register qty are same. The above is for S275 register address, the S274 and S273 mapping register address range as below. Pls remember to set the the device ID first before reading register data.



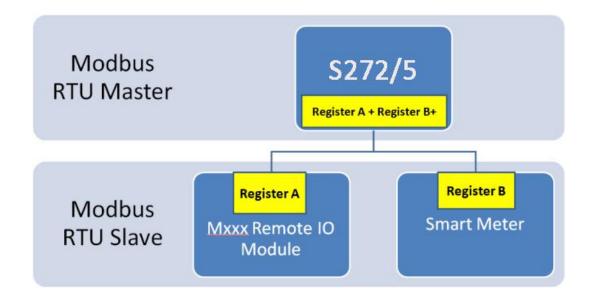
GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

Boolean mapping address	64-127	64-127
16 Bit data mapping address	20000-20127	20000-20063
32 Bit data mapping address	None	200128-20190
64 Bit data mapping address	None	20256-20508

Adding Slave (Extend I/O tags or Modbus RTU converter to SMS alarm gate way)

When RS485 as Modbus RTU Master, can extend I/O tags, support max 16 slaves for connecting PLC, Remote I/O data acquisition module, Smart meter, UPS, Power monitoring...

When RS485 as Modbus RTU Master, the device will polling the slaves , read the salve register value to device mapping address and stock them as below. The yellow part is mapping register area.



Slave Mapping list:

This page is for adding, revising and deleting the slaves. Pls read the salves mapping list first before right click editing start.

	Add Slave			
	Editor Slave			
	Write Value			
¢	Delete Slave			
	Clear Display			
	cical biopidy	1		
15				
0				
1				
2				
3				
4				
5				
6				



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No	1
Slave Address (Range 1~25	54)
Data Type	Boolean 🔹
Function Code	Boolean Word
Register start address	Integer Double
Registers Quantity	
Mapping start address	64 🔹

Slave Address: Stands for the Modbus RTU Slave ID.

Data Type: Stand for "Boolean", "16 Bit", "32 Bit", "64 Bit".

Function Code: Stand for Modbus RTU protocol function code, command for slave reading and writing.
 Slave Register Starting Address: The starting register address for slave data reading and writing.
 Reading Register Quantity: How many data quantity need to read, used for mapping to device register address.

Mapping Address-Start: Stand for mapping the slave start register data to the device start mapping address. Mapping Address-End: Calculate the end mapping address according to start address and reading data quantity.

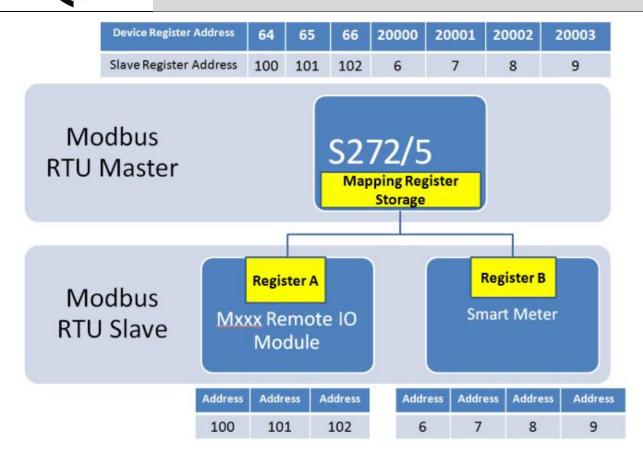
The example of Mapping Register as below:

Mxxx remote I/O module, slave register start address is 100, reading data qty is 3, the device(S273/4/5) mapping register start address is 1; Smart meter slave register start address is 6, readding data qty is 4, the device mapping register start address is 4.

----If so, when reading/writing device register 1~3, actually is reading/writing 100, 101, 102 register of Mxxx remote I/O module; When reading/writing device register 4~7, actually is reading/writing 6~9 register of smart meter.



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Slave Settings:

Step1: Connect the slave to device(S272/5) RS485 port.

Step2: Find the salve port communication parameter and register address from user manual.

Step3: Write device RS485 parameter according to slave port communication parameter, pls ensure both parameter are same, others communication failure, refer to "port setting" part.

Step4: Set RS485 port as **Modbus RTU Master,** then set polling and time out parameter, refer to "port setting" part.

Step5: Back to Slave Mapping page as below, right click the line to add.



GSM/SMS/GPRS/3G/4G Cellular Iot Modbus RTU

No Slave Address	Data Type	Function	Starting Address Hi-Lo	Registers Quantity	Manning Address-Start	Manning Address-Fr
1 STAVE HULLESS	Data Type	Function	Starting Audress in Lo	Registers qualitity	mapping nucless start	mapping address er
2		Add Slave				
3		Editor Slave				
4		100 10 10 1				
5		Write Value				
7		Delete Slave				
8		Clear Display	8			
9						
10						
11						
12						
13						
15						
16						
Notice: 1. Before adding 2. Salect a blank 3. Max adding 15 d	levice, pls click ' line, right click levices	'Read" button, to add mapping	to read mapping device list firs device	at a		

Click Add Slave as below:

Cellular IoT RUT Configurator V2.3	-					-	
400	Export Profile 🛛 📲 Defi	ault [Help					
Basic Settings Output Settings Access Control Access Control Ontput Settings Slave Settings Slave Register Ontput Settings On	Slave No Slave Address 1 No Slave Address 1 2 3 3 4 5 6 6 7 8 9 9 10 11 12 13 14 15 16 16 16 16 1 1 1 1 1 1 1 1 1 1 1 1	levice, pls .	Setting Slave No Slave Addrd Data Type Function Strating Address Registers (=ss (Range 1~254) iddress Hi-Lo	1 Boole 01 64	Mapping Address-Start	Napping Address-End
COM3			Device type:			 	
			Device type:				

If one slave have multi register, then need to add seperately according to register type; For exmaple, Mxxx remote I/O module, with digital and analog inputs, need to add the digital(Boolean) first, then add the analog(16 Bit).

Step6: Right click the line to edit the slave.



SM/SMS/GPRS/3G/4G Cellular Iot Modbus RTU

No Slave Address	Data Type	Function	Starting Address Hi-Le	Registers Quantity	Mapping Address-Start	Mapping Address-End
1 1	Boolean	1	Add Slave	10	64	73
2			Editor Slave			
4			Write Value			
5						
6			Delete Slave			
8			Clear Display			
9						
10						
11 12						
13						
14						
15						
10						
			Delete Device Read			
Notice: 1. Before adding d 2. Select a blank 3. Max adding 16 d	evice, pls click "F line, right click t evices	Read" button, co add mapping	to read mapping device lixt fi ; device	st		

Click the "Edit Slave" to list the register according to chosen type (Boolean, 16 Bit, 32 Bit, 64 Bit). Boolean list edit as below:

Basic Settings	No Sla	ve Addre	ss Data	Type	Function	n Starting	Address Hi-	Lo Register	s Quan	tity M	apping	Addre	ss-Sta	rt Mapping	Address-Er	nd
Output Settings	1	1	Bool		1		0		10			64			73	
Access Control															D	
Input Settings	🖳 Slave Editor		_	_									e		1	
	Address Mapping	Channel Name	Data Type	Input Type	Alarm Verify Time	Alarm SMS Content	Recovery SMS Content	Enable Recovery SMS	Rel ay0	Rel ay1	Relay2	Relay3	Enable			
limer Settings	64	Tag64	DATA_BOOL						1							
nterlock Settings	65	Tag65	DATA_BOOL	NO 🔻	2											
RS485 Settings	66	Tag66	DATA_BOOL	NO 🔻	2											
-	67	Tag67	DATA_BOOL	NO 🔻	2											
Slave Settings	68	Tag68	DATA_BOOL	NO 🔻	2					(1 ²¹)						
Slave	69	Tag69	DATA_BOOL	NO 🔻	2				1							
Ser	70	Tag70	DATA_BOOL	NO 🔻	2											
Register	71	Tag71	DATA_BOOL	NO 🔻	2			100	(2 ¹)							
Network Settings	72	Tag72	DATA_BOOL	NO 🔻	2				1							
Historical Record	73	Tag73	DATA_BOOL	NO 🔻	2											
													OK	Cancel		
															2	

Address Mapping: Used for device to mapping slave register address.

Channel Name: Setup channel name, alarm/recovery send "channel name + alarm content" to authorize number, need to tick Slave Alarm function in number setting page.

Data Type: Fixed, already chosen when add slave.

Input Type: NO NC optional, default NO. Choose NO: Normal is NO, not alarm when read 0, alarm when read 1; Choose NC: Normal status is NC, not alarm when read 1, alarm when read 0.

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Alarm Verify Time: Stands for unnormal value last time more than this value, will send alarm SMS to authorize number.

Alarm SMS Content: When alarm happen, send SMS "channel name + content" to authorize number.

Recovery SMS Content: When alarm recovery, send SMS "channel name + content" to authorize number.

Enable Recovery SMS: Tick it, then can send SMS to authorize number when recovery.

Relay X: X=0~3, unnormal value will alarm-link relative relay.

Enable: Tick it stand for enable alarm function.

Reminder:

If need SMS Alarm function, pls tick Slave Alarm function for authorize number in Number Settings page.

16 Bit, 32 Bit, 64 Bit list edit as below:

Basic Settings		Slave Ad	Slave 🔀 dress Data T	лое	Function	Starting	Address Hi	-Lo Registe	rs Quantity	Mapping A	ddress-Start	Mappi	ing Address-End
Output Settings	1	1	Word	A	3		0		10	Internation and the second second	20000		20009
Access Control	Slave Editor										×		
Input Settings	Address	Channel	Data Type	Ratio	Alarm Verify Time	Threshold	Threshold	High Alarm	Low Alarm	Recovery	Enable	RelayO	
Timer Settings	Mapping 20000	Name	DATA_SIGNED_AB	1	Verify Time	high 0	low	SMS Content	SMS Content	SMS Content	Recovery SMS	Relayo	Teray
Interlock Settings	the second second		DATA_SIGNED_AB	1	2	0	0						
	20002		DATA_SIGNED_AB	1	2	0	0						
RS485 Settings	20003	2	DATA SIGNED AB	1	2	0	0						
Slave Settings	20004	1200262207.00	DATA SIGNED AB 🔻	1	2	0	0		-				
Slave	20005	Int20005	DATA_SIGNED_AB -	1	2	0	0						
67.05	20006	Int20006	DATA_SIGNED_AB -	1	2	0	0					m	
Register	20007	Int20007	DATA_SIGNED_AB -	1	2	0	0						
Network Settings	20008	Int20008	DATA_SIGNED_AB 🔻	1	2	0	0						
Historical Record	20009	Int20009	DATA_SIGNED_AB	1	2	0	0						
	<					m							- b
											OK	Cance	1

Address Mapping: Used for device to mapping slave register address.

Channel Name: Setup channel name, alarm/recovery send "channel name + alarm content" to authorize number, need to tick Slave Alarm function in number setting page.

Data Type: Optional according to slave data type, ABCDEFG stands for sorting data in the slave register. Ratio: Real value=read register value*ratio.alarm threshold high low value is read register value *ratio.But when GPRS/3G/4G acquisition data will not multiple the ratio.

Threshold High: When new value above higher than this value, will send SMS alarm to authorize number. Threshold Low: When new value above lower than this value, will send SMS alarm to authorize number.

Alarm Verify Time: Stands for unnormal value last time more than this value, will send alarm SMS to authorize number.

High Alarm SMS Content: When threshold high alarm happen, will send "channel name + this content" to authorize number.

Low Alarm SMS Content: When threshold low alarm happen, will send "channel name + this content" to authorize number.

Recovery SMS Content: When alarm recovery, send SMS "channel name + this content" to authorize number. **Enable Recovery SMS:** Tick it, then can send SMS to authorize number when recovery. KING PIGEON

GSM/SMS/GPRS/3G/4G Cellular Iot Modbus RTU

Relay X: X=0~3, unnormal value will alarm-link relative relay. **Enable:** Tick it stand for enable alarm function.

Reminder:

1. If need SMS Alarm function, pls tick Slave Alarm function for authorize number in Number Settings page.

2. When 16 Bit used for extend AIN inputs, can't convert acquisition ADC value to actual one according to range. For example: When Mxxx remote I/O module extend AIN, since Mxxx AIN register value is ADC, then device(S273/4/5) read value is also ADC value. But DAM122 AIN value is calculated to actual value according to range, then stored in register, so the value device read, is also calculated value.

When add slave, function code choose 16, then write value page as below:

Vitie:	No Slave Address	Data Type Fu	unction Starting A	ddress Hi-Lo Registers	Quantity Mag	pping Address-Star	t Mapping Address-E
4 0 0 0 5 0 0 0 10 0 0 0 11 0 0 0 12 0 0 0 13 0 0 0 14 0 0 0 15 0 10 20000 20009	1 1	Word	Add Slave	10	0	20000	20009
Signal Witter Suew Clear Display Difference Black Berice Bl	3		Editor Slave				
V24 V24 No Device type:	4		Write Value				
7 Gene Display 9 0 10 11 12 13 13 10 14 10 15 10 16 10 Multice: Notice: Notice: Device type: Opence type:				_			
Base Depay 11 12 13 14 15 15 16 17 18 19 10 11 12 13 14 15 15 16 17 18 18 19 10 10 11 11 11 11 12 13 14 15 15 16 17 18 19 10 10 11 12 13 14 15 15 16 17 18 19 11 10 11 10 10	7			-			
10 Image: Second Seco	8		Clear Display				
12 13 14 15 16 16 16 17 18 19 19 10 10 11 11 11 11 11 11 11 11 12 13 14 15 16 17 18 19 10 10 10 11 11 12 13 14 15 16 17 18 19 11 10 11 11 12 13 14 15 16 17 18 19 114 105 105 106 107 108 108 109 100 100 100							
12 Image: Section of the section of							
14 15 15 16 16	12						
15 16 16 Nalet Borie Nalet Borie Device type: Device							
16 Image: Second S							
Notice: Partice: A start device, pit a cloc "Bead" butten, to read anyping device list first Partice: A first device: Device type:							
Nuise: 1: Store sking brice, pix club test batton, to read suppling device list first 1: Store sking to device, pix club to sed suppling device 1: Store sking to device Device type: Device type: Iso Slave Address Data Type Function Starting Address Hi-Lo Registers Quantity Mapping Address-Start Mapping Address-I and the start of the							
Notice: 1 1 Skine derives, pla click "Bad" button, to read mapping derice list first 2 Me sading 10 derives Device type: Device type: Slave Bise I I Device type: Device type: Device type: I I Device type: Device type: Device type: Device type: I I Device type: Device type: I I Device type: I I Device type: I I I I I I I I I I I I I I I <							
Notice: · Defice:			Delete Devi	ce Read Save	0		
No Slave Address Data Type Function Starting Address Hi-Lo Registers Quantity Mapping Address-Start Mapping Mapping Address-Start Mapping Mapping </th <th></th> <th>Dev</th> <th></th> <th>_</th> <th></th> <th></th> <th></th>		Dev		_			
1 1 Vord 16 0 10 20000 20009 2	Texport Profile			-			1.1
3 4 4	➡ Export Profile 📲 D Slave 🔀	efault 📓 Help	-		Quantity Ma		t Mapping Address-E
4	Export Profile Do Slave X No Slave Address	efault 🕼 Help s Data Type Fu	nction Starting A	ddress Hi-Lo Registers		pping Address-Star	
5 6 IDD_WRITEVALUE 7 8 9 10 11 20000 0 12 20001 0 13 20003 14 20005 15 20006 20008 0 20009	Export Profile D Slave Slave Address 1 1 2	efault 🕼 Help s Data Type Fu	nction Starting A	ddress Hi-Lo Registers		pping Address-Star	
7 8 9 9 Address Wapping Value 10 20000 0 11 20001 0 12 20002 0 13 20003 0 14 20004 0 15 20005 0 16 20006 0 20009 0 0	Export Profile D Slave No Slave Address 1 1 2 3	efault 🕼 Help s Data Type Fu	nction Starting A	ddress Hi-Lo Registers		pping Address-Star	
Address Mapping Value 9 0 10 0 11 20001 0 12 20002 0 13 20003 0 14 20004 0 15 20005 0 16 20006 0 20008 0 0 20009 0 0	Export Profile D Slave Slave Address 1 1 2 3 4 5	efauk 🕼 Help s Data Type Fu Word	nction Starting A	ddress Hi-Lo Registers 0 10	0	pping Address-Star	
9 0 0 10 20001 0 11 20002 0 12 20003 0 13 20003 0 14 20004 0 15 20005 0 16 20006 0 20008 0 0 20009 0 0	Export Profile PD Slave Mddress 1 1 2 3 4 5 6	efauk 🕼 Help s Data Type Fu Word	nction Starting A	ddress Hi-Lo Registers 0 10	0	pping Address-Star	
11 20001 0 12 20002 0 13 20003 0 14 2004 0 15 20005 0 16 20006 0 20008 0 20009 0	Export Profile	efault 🔃 Help s Data Type Fu Vord	nction Starting A 16 RITEVALUE	ddress Hi-Lo Registers 0 10	0	pping Address-Star	
12 20002 0 13 20003 0 14 20004 0 15 20005 0 16 20006 0 20007 0 20008 0 20009 0	Export Profile ∎ D	efault 🔃 Help s Data Type Fu Vord	mction Starting A 16 RITEVALUE Mapping	ddress Hi-Lo Registers 0 10	0	pping Address-Star	
14 20004 0 15 20005 0 20006 0 20007 20007 0 20009 20009 0 0	Export Profile Slave Slave No Slave Address 1 1 2 3 4 5 6 7 8 9 10	efault 🔃 Help s Data Type Fu Vord	notion Starting A 16 RITEVALUE Mapping 2000	ddress Hi-Lo Registers 0 10 Lo Lo L	0	pping Address-Star	
15 20005 0 16 20005 0 20007 0 20006 20008 0 0 20009 0 0	Export Profile 10 Slave 20 Sla	efault 🔃 Help s Data Type Fu Vord	Inction Starting # 16 IRITEVALUE Mapping 20000 20001	ddress Hi-Lo Registers 0 10 Value 0 0	0	pping Address-Star	
16 2006 0 2006 0 2007 0 2007 0 2008 0 2009 0 2009 0	Export Profile	efault 🔃 Help s Data Type Fu Vord	Inction Starting A 16 IRTEVALUE Mepping 20001 20002 20003	ddress Hi-Lo Registers 0 10 Velue 0 0 0 0 0 0	0	pping Address-Star	
20007 0 20008 0 20009 0	Export Profile Do Slave No 1 1 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 -	efault 🔃 Help s Data Type Fu Vord	Inction Starting A 16 RITEVALUE Mopping 20001 20002 20003 20003 20004	ddress Hi-Lo Registers 0 10 0 Value 0 0 0 0 0 0 0 0 0 0 0 0 0	0	pping Address-Star	
20008 0 20009 0	Export Profile D Slave I 1 1 2 - 3 - 4 - 5 - 6 - 7 8 9 - 10 11 12 13 14 15	efault 🔃 Help s Data Type Fu Vord	Inction Starting # 16 RITEVALUE Mepping 20001 20002 20003 20004 20005	ddress Hi-Lo Registers 0 10 Value 0 0 0 0 0 0 0 0 0 0 0 0 0	0	pping Address-Star	
Notice'	Export Profile ■ D Slave ■ No Slave Address 1 1 2 2 4 5 6 7 8 9 10 11 12 13 14 15 14 15	efault 🔃 Help s Data Type Fu Vord	Inction Starting # 16 RITEVALUE Mapping 20001 20002 20003 20004 20005 20008	ddress Hi-Lo Registers 0 10 Value Value 0 0 0 0 0 0 0 0 0 0 0 0 0	0	pping Address-Star	
Notice: 1. Before adding device, plr 2. Select a blank line, righ 3. Max adding 16 devices OK Cancel	Export Profile Distance Profile Distance Profile Distance Profile Distance Address Distance Address Distance Di	efault 🔃 Help s Data Type Fu Vord	Inction Starting A 16 RITEVALUE Mapping 20001 20002 20003 20004 20005 20005 20005 20006 20007	ddress Hi-Lo Registers 0 10 10 10 10 10 10 10 10 10 10 10 10 10 1	0	pping Address-Star	
Botre: 1. Before adding device, plr 2. Salect a blank line, righ 3. Max adding 16 devices	Export Profile ■ D Slave ■ No Slave Address 1 1 2 2 4 5 6 7 8 9 10 11 12 13 14 15 14 15	efault 🔃 Help s Data Type Fu Vord	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0	0	pping Address-Star	
3. Max adding 16 devices	Export Profile 10 Slave Solution Address 1 1 2 3 4 5 5 6 6 7 7 8 9 10 11 12 13 14 15 15 15 16 6 14 15 15 16 15 15 15 15 15 15 15 15 15 15 15 15 15	efault 🔃 Help s Data Type Fu Vord	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0	0	pping Address-Star	
	Export Profile 10 12 13 14 15 16 14 15 16 14 15 16 14 15 16 14 15 16 16 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	efault 🕼 Help 5 Data Type Fu Word	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		pping Address-Star	
	Export Profile 10 12 13 14 15 16 14 15 16 14 15 16 14 15 16 14 15 16 16 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	efault 🕼 Help 5 Data Type Fu Word	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		pping Address-Star	
	Export Profile 10 12 13 14 15 16 11 14 15 16 16 14 15 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	efault 🕼 Help 5 Data Type Fu Word	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		pping Address-Star	
	Export Profile 10 12 13 14 15 16 11 14 15 16 16 14 15 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	efault 🕼 Help 5 Data Type Fu Word	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		pping Address-Star	
	Export Profile 10 12 13 14 15 16 11 14 15 16 16 14 15 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	efault 🕼 Help 5 Data Type Fu Word	Inction Starting A 16 IRTEVALUE Mepping 20000 20000 20002 20003 20004 20005 20006 20006 20007 20008	ddress Hi-Lo Registers 0 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		pping Address-Star	





Revise value, click OK, will write the value to slave corresponding register

And can mapping the register to device, read its function code for slave data current status, to check if set successfully or not.

Step7: Click "Save" when operate finished, then click "Save Setting" in the menu, to save parameter to device. **Delete Slave:**

Right click the slave which need to delete---->click the "Delete Slave"----> click "Save"---->click the "Save

No Slave Address	Data Type	Function	Starting Addr	ess Hi-Lo	Registers Quantity	Mapping Address-Start	Mapping Address-End
1 1	Vord	10	0		10	20000	20009
2		Add Slave					
3		Editor Slave					
4		Write Value					
5							
6		Delete Slave					
7 8		Clear Displa	y				
9							
10							
11							
12							
13							
14							
15							
16							
		_					
Notice: 1. Before adding 4 2. Slatet a blank 3. Mac adding 18 de	evice, plz click line, right click evices	"Read" button, : to add mappin	to read mapping d g device	evice list fi	st		

Inquiry Slave Current Value:

Click "Register" page to real time check slave current value.

Reminder:

Before reading data, pls read slave list from "Slave Mapping List" first, then can check slave current value in "Register" page:



Basic Settings	Register 🔀 Boolean	16Bit	32Bit	64Bit	
Output Settings	Register No. Current Value	Register No. Current Value *	Register No. Current Value	Register No. Current Value	
*	64	20000	20128	20256	
Access Control	65	20001	20130	20260	
	66	20002	20132	20264	
Input Settings	67	20003	20134	20268	
Timer Settings	68	20004 =	20136		Regular inquir
Ilmer Settings	69	20005	20138	000773	uinum 2 seconds
Interlock Settings	70	20006	20140	20280	Tildi 2 Seconds
Interlock Settings	71	20007	20142	20284 Read	
RS485 Settings	72	20008	20144	20288	
KS485 Settings	73	20009	20146	20292	
Slave Settings	74	20010	20148	20296 E Notice: 1. Before re	ading data
Slave Settings	75	20011	20150	20300 pls read	slave list
Slave	76	20012	20152	20304 from "Sla	we Mapping List ten it can displ
Slave	77	20013	20154	20308 first, th	en it can dispi
	78	20014	20156	20312	
Register	79	20015	20158	20316	
Network Settings	80	20016	20160	20320	
Network Settings	81	20017	20162	20324	
Historical Record	82	20018	20164	20328	
Historical Record	83	20019	20166	20332	
	84	20020	20168	20336	
	85	20021	20170	20340	
	86	20022	20172	20344	
	87	20023	20174	20348	
	88	20024	20176	20352	
	89	20025	20178	20356	
	90	20026	20180	20360	
	91	20027	20182	20364	
	92	20028	20184	20368	
	93	20029	20186	20372	
	94	20030	20188	20376	
	95	20031	20190	20380	
	96	20032	20192	20384	
	97	20033	20194	20388	
	98	20034	20196	20392	
	99	20035	20198	20396	
	100	20036	20200	20400	
	····	· · · · · · · · · · · · · · · · · · ·	< III +	4 m +	

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 Protoco	l,connect to www.my-m2	2m.com cloud server	. Domain: modbus.dtuip.o	:om, Port: 6655.

Cellular IoT RTU Configurator V2.7	-	-			and the state				
Import Configuration file 🚽 Expo		1.001.020101-001-	🚺 Help letwork 🔀						
Access	Slave mapping List ×	Cellular N	letwork 🔼						
Input Setting	Connect KPIIOT	Con	nect my-m2m	(Connect other IOT server				
DI Setting									
	Communication Protocol Mo	dbus RTU P:	rotoco 👻		Server 1 IP/DMS	modbusrtu. k	xprtu.com	(Max60)	
AI Setting	Protocol TC	Р	•		Server Listen Port	4000	(0-65535)		
AI Alarm	Access Point Name			(Max60)	Server 2 IP/DMS			(Max60)	
Timer Setting	User Name			(Max60)	Server Listen Port		(0-65535)		
Hour Timer	Passsword			(Max60)	Server connection strategy	Prefer se	rver 1 🗣		
Periodic Timer	Pls fill in the login		lorrigo TD of	aloud) a	and chint			×)
Link Trigger Setting				cioddy, c					
Mart ma			•				the login message,	please contact the	
Link Trigger	Login ACK Message		•		King Pigeon Tel: +86 755		sentative , Request for login m	essage	
RS485 Setting					After filling i	n the login n	nessage, click write		
Serial Port			• req		device to ac	cess it			
O Slave Setting	Heartbeat ACK Message		res						
Slave mapping Li	Heartbeat Interval No Response Resend Times		(1-9999s)					确定	
Mapping Registe	No Kesponse Kesend limes Login Message Strategy			Cannar					J
Cloud Platform Setting	Todin message orracefy	Send once	AUGU LOGIU	201.001					
Cellular Network									
Historical Record									
Historical Data	FAQ for set	tings please	a refer to [He	lp] menu		Rea	ad Sa	ve	
-									

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

KING PIGEON

GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

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.

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.

🖄 Cellular IoT RUT Configurator V2.4	THE MEN PROFILE PER	10-0 M/2010/00-0.17	131-0100-010-0111-0	
📄 Save Settings 🛛 🖷 Load Profile	🜒 Export Profile 🛛 📲 Default 🛛 🗐 Help			
Basic Settings	Historical Data 🔀			
Output Settings	Event Record: Total:0	Read All Read record from 1	to 1 Clear I	Read Save as CSV Erase RTU Records
Access Control				
Input Settings				
Interlock Settings				
RS485 Settings				
Network Settings				
Historical Record				
Historical Data				
"bud"				
	Notice:			
	 Total can save 100000 events in the interest. If the memory full, will remove the earling 			





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.

Save as CSV: Historical records export as CSV file.

Erase RTU Records: Click this button will erase all device historical records, be careful.

7. Example Of Applications

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 "V" for "Arm automatically when power on", then click "Save" button as below:

	t 🚺 Help				
Basic Settings Parameter 🔀					
Parameter Modify password		Synchronous machine	e time		
blo	password:	Time: 20	018-06-25 10:25:09	Read	
Numbers New	password:	B	ead the RTU time	Read	
Output Settings	· · · · · · · · · · · · · · · · · · ·			Save	
Access Control	password: (4 digits)	W	/rite the RTU time	3400	
Access Control	Modify password	Read	d the computer time		
Input Settings					
Timer Settings Basic information	\bigcirc				
Device ID 0	(0~65535) (Model No.)		Version		
Interlock Settings Device Description:	\bigcirc		(60 Characters)	Read and write to sync	
DC495 Catilana			(oo characters)	the time	
Add timestamp to al	arm SMS 🛛 🗹 Arm automatically whe	n power on.			
Slave Settings 📃 Auto Arm after disar	m: 0 Minute(s) (0~9999, Wi	en set as 0, the RTU will in a	armed mode immediately.)		
			initia initia initia and and a second		
Network Settings Timer Reporting SMS Co	ntent Settings		annea mode inimediately.		
Network Settings Timer Reporting SMS Co	and the second		annoa moda minicalato ji j		
	ntent Settings Tick Iditional information in the report SMS	AIN0 Value	DO0 Status		
Historical Record	dditional information in the report SMS	☐ AIN0 Value □ AIN1 Value			
Historical Record	dditional information in the report SMS		DO0 Status		
Historical Record Add the following ac DINO Status DIN1 Status	dditional information in the report SMS Arm Status GSM/3G Signal Value	AIN1 Value	DO0 Status		
Historical Record DINO Status DINO Status DIN1 Status DIN2 Status	ditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID	AIN1 Value	DO0 Status DO1 Status DO2 Status		
Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN3 Status	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value	AIN1 Value	DO0 Status DO1 Status DO2 Status		
Historical Record Add the following ac DINO Status DINI Status DIN2 Status DIN3 Status DIN3 Status DIN4 Status	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value	AIN1 Value AIN2 Value AIN3 Value AIN3 Value AIN4 Value	DO0 Status DO1 Status DO2 Status		
Historical Record DINO Status DINO Status DIN1 Status DIN2 Status DIN3 Status DIN3 Status DIN5 Status DIN5 Status DIN5 Status	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value	AIN1 Value AIN2 Value AIN3 Value AIN3 Value AIN4 Value	DO0 Status DO1 Status DO2 Status		
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Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN3 Status DIN5 Status DIN5 Status DIN6 Status DIN6 Status Alarm SMS Content Setti	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description	AIN1 Value AIN2 Value AIN3 Value AIN3 Value AIN4 Value	DO0 Status DO1 Status DO2 Status		
Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN3 Status DIN5 Status DIN5 Status DIN6 Status DIN6 Status Alarm SMS Content Setti	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description hgs	AIN1 Value AIN2 Value AIN3 Value AIN3 Value AIN4 Value	DO0 Status DO1 Status DO2 Status		
Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN2 Status DIN3 Status DIN4 Status DIN5 Status DIN5 Status Alarm SMC Scontent Settin Add the following ac	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description	AIN1 Value AIN2 Value AIN2 Value AIN3 Value AIN4 Value AIN5 Value	DO0 Status DO1 Status DO2 Status DO3 Status		
Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN2 Status DIN3 Status DIN3 Status DIN5 Status DIN5 Status Alarm SMS Content Settin Add the following ac DIN0 Status	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description ngs dditional information in the alarm SMS Arm Status	AIN1 Value AIN2 Value AIN2 Value AIN3 Value AIN4 Value AIN5 Value AIN5 Value	DO0 Status DO1 Status DO2 Status DO3 Status		
Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN3 Status DIN3 Status DIN4 Status DIN5 Status DIN5 Status DIN5 Status DIN5 Status DIN5 Status DIN5 Status DIN7 Status	dditional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID Temperature Value Humidity Value Device Description	AIN1 Value AIN2 Value AIN2 Value AIN3 Value AIN4 Value AIN5 Value AIN5 Value	DOO Status DOI Status DO2 Status DO3 Status		

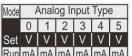
(2) Under "Number Settings" page, write authorize number and tick the times needed. For example, if need power on, external power off/recovery SMS, then tick and write as below:



(3) Click "Save Settings"---->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.

Device connect analog transducer:

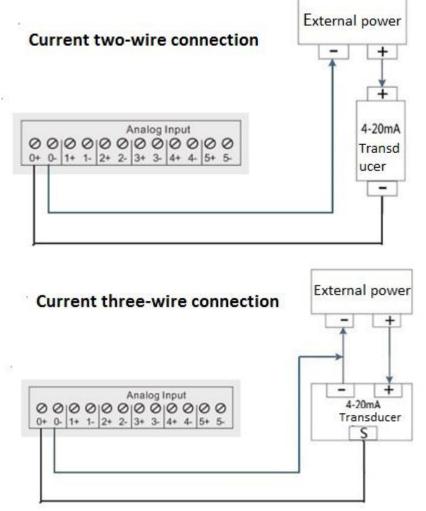
If AINO need to connect a temperature transducer, transducer output 4~20mA signal, measurement range: -40~100 $^{\circ}$ C, when temperature last 2 seconds higher than 35 $^{\circ}$ C need to alarm, last 2 seconds lower than 20 $^{\circ}$ C also need a alarm, then set as below:



(1) Switch device off, then switch AINO input type RunmA mA mA mA mA mA mA mA '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, "Miximum": -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:



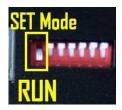
Cellular IoT RUT Configurator V2.4		x
🔁 Save Settings 🛛 🖷 Load Profile	🕢 Export Profile 📲 Default 🔞 Help	
Basic Settings	AIN Trigger 🐱	
Output Settings	Input Type Wigh Alara SMS Low Alara SMS Recovery SMS Maxinum Minimum Current Inreshold Threshold Recovery Marm Verify Siren 24hr	
Access Control	Value night LOW Marm (lime(s)	
38	AIN0 4 200A - 100 - 40 0 35 20 2 0 AIN1 - 0	
Input Settings		
DIN Trigger		
DIN Alarm		
AIN Trigger		
AIN Alarm	Temp. V 80 -40 26.9	
-000 State	Hum.	
Timer Settings		
Interlock Settings	Notice: 1. Maximun/Minimum: The measurement range of the transducers.e.g.: 0~100Mpa; Read Save	
RS485 Settings	2. Measurement Range: -9999.99~9999.99,supports minus and decimal.	
B Slave Settings	 Others are the same as DIN. Alarm Verify Time values range from 0 to 9999. 	
Network Settings	(1) The state of the second se Second second secon second second sec	
Historical Record		
Instance Record		
COM3	Device type:	

(5) In "AIN Alarm" 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:

	Export Profile		Tuun		icib														
Basic Settings	AIN Alarm 🔀	1																	
Output Settings			TA		arm S	end S	MS				AIN	Alar	m Dia	I Out					
Access Control	AIN Channel	0	_	2	10.535.000		Телр	. Hum.	0	1	2	3	1000	5		Hun.			
Input Settings	User No.0									0			1 77						
OIN Trigger	User No.1												P ²						
	User No.2				0			[]		<u>[</u>]			[]	F					
DIN Alarm	User No.3									(***)			m		m				
AIN Trigger	User No.4																		
AIN Alarm	User No.5					8													
Timer Settings	User No.6									[¹¹]			m		m				
	User No.7					8 6													
Interlock Settings	User No.8												1						
RS485 Settings	User No.9			m		8 E							[]						
Slave Settings											9.0	2	- 🗸	-	-	5			
Network Settings											Rea	d		Si	ave				
Historical Record	Notice: 1. Tick it stands	s for w	vhen tł	ne AIN	N alarn	n occur	rence,	will send	SMS or dia	the	related	1							
	user telepho 2. While dialing																		
	not answer v						ich nur	nder will	wait max 20	seco	nas,ii								

(6) Click "Save Settings" in the menu, then switch device off;

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





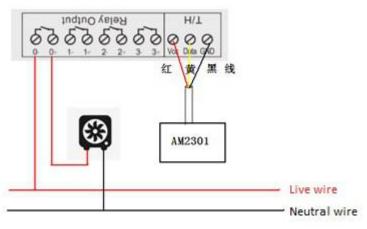
(8) Switch the device on, then device enter into working mode.

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:

Cellular IoT RUT Configurator V2.4						I - Intel West Sum over		×
🔤 Save Settings 🛛 Load Profile 🚽	Export Profile 📲 Default 🛛 🕅	Help						
Basic Settings	AIN Alarm \times Access \times	DOUT 🔀						
Output Settings	Output Type	Channel Name Close (MAX.20) Time(s)		ON/OFF SMS	Alarm Verify Time(s)	Open Description (MAX.30)	Close Description (MAX.30)	
DOUT	Dout0 Switch on/off		0]	0			
Access Control	Dout1	0	0 0]	0			
Input Settings	Dout2 Switch on/off 👻	0	0]	0			
Timer Settings	Dout3 Switch on/off 👻	0	0]	0			
RS485 Settings						_		
B	Notice:		Always clos	se if n	o other operat	e	Read Save	
Network Settings	1. If the Close Time setup as	0, this channel will output NC type. not 0, this channel will output NC ty						
Historical Record	then open, and repeat this	action according to the Repeat Tim)) can be setup as Door Open func	es after the Interval Time	timeout.	ig to the close fim	e		
There.	4 If the Output Type setup a	s Switch ON/OFF, then this channel s Siren,then this channel will be use	will be used as a switch.		ording to the settin	05		
	in AIN/DIN Alarm and Inter				ording to the settin	93		
		e ON/OFF SMS alert function, and t			ss than the verify ti	me,		
	the first will not send sins							
СОМЗ		Device type:						ai

(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:



Cellular IoT RUT Configurator V2.4											C	
📋 Save Settings 🛛 Load Profile	🚽 Export Profile 🛛 📲	Default [Help										
Basic Settings	AIN Alarm ×	Access × DOL	T × AIN Tri	gger 🔀								
Output Settings	Input Ty	pe High Alarm SM	5 Low Alarm S	MS Recovery SMS	Maximum	Minimum	Current Value	Threshold High	Threshold Low	Recovery Alarm Verif Alarm Time(s)	7 Siren	24hr
€ Access Control	AINO	•					-50					
Input Settings	AIN1	•					0				(m)	
DIN Trigger	AIN2	•					0					
DIN Alarm	AIN3	•					0					
China	AIN4	•					0					
AIN Trigger	AIN5	•					0				(f ^{**})	
AIN Alarm	Temp. Enable	✓ High Alarm	Low Alarm	Recovery	80	-40	29	38	25			[10]
Timer Settings	Hum.	•			100	0	62.1					
COM3		 Measuremer Others are the 	nimum: The mea It Range: -9999.9 Ie same as DIN.	IS content surement range of 19-9399.99,support ge from 0 to 9999.	the transduc is minus and	ers.e.g.: 0~10C decimal.	JMpa;		'Ihresh Read	old high/low val	ue	

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

🖄 Cellular IoT RUT Configurator V2.4	COLUMN TO A STATE		
📋 Save Settings 🛛 Load Profile 🚽	Export Profile 📲 Default 📓 Help		
Basic Settings	Interlock 🔀		
Dutput Settings	Event : Temperature Low Alarm	- Add to list	
T O DOUT	Action : D00 open	Add Delete	
Access Control			
Access	Event	Action	
100 Mar	Temperature High Alarm	DO0 close	
Input Settings	Temperature Low Alarm	DO0 open	
DIN Trigger			
DIN Alarm			
AIN Trigger			
AIN Alarm			
B Timer Settings			
Interlock Settings			
Interlock			
RS485 Settings			
Slave Settings			
Network Settings	Clear		
Historical Record	Custom i	nterlock settings,Max.40	After adding, click "Save" button, then
		Read Save	click the "Save Settings" in menu.
COM3	De	vice type:	ii.

- (6) Click "Save Settings" button, then switch device off;
- (7) Switch the DIP mode to "Run";
- (8) Switch the device on, enter into working mode.



I/SMS/GPRS/3G/4G **Cellular IoT Modbus RTU**

RS485 extend I/O tags and Modbus converter SMS alarm:

When RS485 as Modbus RTU Master, can extend I/O tags, support max 16 slaves for connecting PLC, Remote I/O data acquisition module, Smart meter, UPS , Power monitoring...

When RS485 as Modbus RTU Master, the device will polling the slaves , read the salve register value to device mapping address and stock them. Could server can read and control via GPRS/3G/4G networks according to King Pigeon RTU protocol, Modbus RTU over TCP or Modbus TCP protocol. Now remote I/O module M100 (2DI, 2DO,2AI) as example:

Reminder:

The AIN data acquisition of Mxxx is ADC current or ADC voltage, device never calculated according to AIN max or min range. If need extend AIN to read calculated real value, pls choose the acquisition module with inside converter function, such as DAM:

	Model List								
DAM114	2AIN	12 Bit resolution, default input 4~20mA							
DAM116	4AIN	12 Bit resolution, default input 4~20mA							
DAM118	2PT RTD	12 Bit resolution, default PT-100, 2/3 wire connection							
DAM120	4PT RTD	12 Bit resolution, default PT-100, 2/3 wire connection							
DAM122	2AI+2PT	Same as above							
DAM124	4AI+4PT	Same as above							

(1) When order M100, if need relay output, need to mark DO as relay when place order;

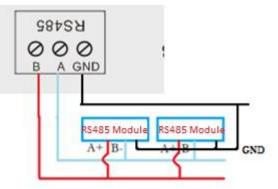
(2) According to M100 user manual, set port Baud Rate and device ID as below:

M100 port parameter: Baud Rate (9600), Byte Size (8), Stop Bit (1), Parity (Even), M100 device ID: 1.

🖾 Mxxx Configuration Software V1.0	_ ×
Model 🔹 Serial COM3 🔹 Open Com	Port Broadcast
BaudRat 9600 StopBit_1 ByteSiz_8 Modify Parameter	
Address 1 🔹 Modify Address	
Languag <mark>English 💌</mark>	-

(3) Connect M100 to device, GND not necessary;





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

- (5) In "Serial Port" setting page, set device parameter as below:
- A) RS485 choose as "Modbus RTU Master";

B) Baud Rate, Data Bit, Parity Bit, Stop Bit port parameter setting need to be corresponding with M100, otherwise not working; If one more slaves, all slave port parameter need to be corresponding with Master.

C) Scan Rate, Time out, Slave fault verity time can be according to default, if the slaves qty a little more, can set bigger value;

D) Click the "Save" button.

Cellular IoT RUT Configurator V2.4	100 V
🔄 Save Settings 🛛 🖷 Load Profile	📲 Export Profile 📲 Default 📓 Help
Basic Settings Output Settings Output Settings Access Control Input Settings Timer Settings Interlock Settings Serial Port Slave Settings Network Settings Historical Record	Serial Port Rs485 Baud rate Parity bi Read Save Notice: 1. Scan Rate can't less than 200ms 2. Time Out can't less than 200ms

(6) In "Slave Mapping List", right click a line---->Click "Add Slave". If have added slave information before, need to click "Read" first, to avoid other slave device information been covered.



Basic Settings	Slave 🔀						1
Output Settings	No Slave Address	Data Type	Function Star	ting Address Hi-Lo	Registers Quantity	Mapping Address-Start	Mapping Address-End
	1		Add Slave				
Access Control	2						
Input Settings	3 4		Editor Slave				
	5		Write Value				
Timer Settings	6		Delete Slave				
Interlock Settings	7						
Interlock Settings	8		Clear Display				
RS485 Settings	9						
	10						
Slave Settings	11						
Slave	12						
515	13						
Register	14						
Network Settings	15						
Network Settings	16						
Historical Record							
				10/132 20			
	Notice: 1. Before adding 2. Salect a Llank 3. Max adding 16 d	levice, plz click line, right clic levices	"Read" button, to rea	d mapping device list fi	rst		

(7) Set slave M100 basic parameter, if one slave have multi input type and function code, need to set data type, function code and mapping register relationship seperately as below:

- A) Slave address: Refer to step (2), it is 1;
- B) Set register mapping and function code:
- According to M100 user manual, the DI data type and function code as below:

8.1Read Input Coil (Function Code 2: Read Coil)↔

	Read Input Coil (Function Code 2: Read Coil)↔									
Channel	Register Address↔	Data Type	Description ²							
DIN 10	0↔	1Bit.	DIN1 Value, Read Only,0=Open,1=Close.↔							
DIN 2	10	1Bit ₂	DIN2 Value, Read Only,0=Open,1=Close.↔							

So the parameter set as below, the DI set to Boolean type, Function code 02, Register starting address 0, Register quantity 2.

Basic Settings	Slave 🔀		
 Basic Settings Output Settings Access Control Input Settings Timer Settings Interlock Settings RS485 Settings Slave Settings 	No Slave Address 1 2 3 4 5 6 7 8 9 10 11 12	Data Type Function Starting Ad	dress Hi-Lo Registers Quant
Register Redister Network Settings Historical Record	13 14 15 16	Registers Quantity Mapping Address Start Hi-Lo	2 64 • • K Cancel
		Dalete Device rice, pls click "Read" button, to read mapping ne, right click to add mapping device rices	



Click "Ok"---->Right click this line in "Slave" list---->Click "Edit Slave" as below:

	No Slave Address	Data Type	Function	Starting Address Hi-Lo	Registers Quantity	Mapping Address-Start	Mapping Address-
out Settings	1 1	BAdd	cl	0	2	64	65
ontrol	2	Add	Slave				
	3	Edito	r Slave				
gs	4	Write	Value				
	5						
	6	Delet	e Slave				
s	7	Clear	Display				
	8	-	, ,				
	9						
	10						
	11						
	12						
	13						
	15						
5	16						
	10						
ord							
	-						
				Delete Device Read	Save		

Cellular IoT Modbus RTU

Then M100 DIN1 mapping address is 64, DIN2 mapping address is 65, DIN1 and DIN2 parameter can be editable. "V" Enable stands for enable this channel, "V" Relay 0 stands for when DIN1 trigger, DO0 will close. And "Alarm SMS Content", "Recovery SMS content" can be editable. After that, click "OK" as below:

Basic Settings	Parame	$_{ m ter} imes$	Slave 😕														
Output Settings	No Sla	ve Addre	ss Da	ta Type	Funct	ion	Starti	ng Address	Hi-Lo	Regis	ters Quantity	Mapp	ing A	ddress	-Start	Mappir	ig Address-Er
24	1	1	E	oolean	2			0			2			64			65
Access Control	2 Slave I	Editor	-									-					
 Input Settings Timer Settings 	Address		Channel Name	Data Type	Input Type	Aları Verit	h Ev Time	Alarm SMS Content	Recov SMS C	very Content	Enable Recovery SMS	RelayO	Relayi	Relay2	Relay3	Enable	
MAC.		64	Tag64	DATA_BOOL	- NO -	1	2					V					
Interlock Settings		65	Tag65	DATA_BOOL	• NO •		2		0			1					
 RS485 Settings Slave Settings Slave Register 																	
 Network Settings Historical Record 																	

In "Slave Mapping List" page, right click blank line---->Choose "Add Slave"---->DO Data type and Function code as below according to M100 user manual.

8.2 Read and Write Holding Coil (Function Code 1: Read Coil, Function Code 5: Write Single Coil, Function + Code 15: Write multi Coils.)+

Read and Write Holding Coil (Function Code 1, Function Code, Function Code 15.)									
Register Address@	Data Type	Description							
0+7	1Bit₄ ^j	DO1 Value, Read/Write, 0=Open,1=Close.							
10	1Bit ²	DO2 Value, Read/Write, 0=Open,1=Close.							
	Register Address	Register Address Data Type 0+3 1Bit+3							

So set DO parameter as below, set DO Data type to Boolean, Function code 1, Register start address 0, Register quantity 2.

ellular IoT RUT Configurator V ave Settings		Profile 📢 Defa	ult 🗿 Help	max	27.				
Basic Settings		eter X Slav							
*	No Sla	ve Address	Data Typ	e Function	Starting	Address Hi-	Lo Registers	s Quantity	Mapping Addr
Output Settings	1	1	Boolear	ı 2	/	0		2	64
Access Control	2		🖳 🖳 Sett	ng Slave				3	
Input Settings	3								
input settings	4		N	.		2			
Timer Settings	6								
Interlock Settings	7		S	ave Address	(Range 1~25	54) 1			
anterioek settings	8		D	ata Type		Boolear			
RS485 Settings	9		D.	па турс		Боотеа			
Slave Settings	10		F	unction		01	•		
Slave Settings	11		S	arting Addres	s Hi-Lo	0			
Network Settings	12		_						
Historical Record	13		R	egisters Quant	ity	2			
	15		M	apping Address	: Start Hi-	-Lo 66	•		
	16			ipping naaroo.	, Deare mi				
					_		i		
						OK	Cancel		

Click "Ok"---->Right click this line in "Slave" list---->Click "Edit Slave" to edit the channel.

So set DO parameter as below, set DO Data type to Boolean, Function code 15, Register start address 1, Register quantity 2. Click "Add Slave" as below:

Basic Settings	Para	meter × Sl	ave 🔀					
Output Settings	No SI	ave Address	Data Type	Function	Starting Add	ress Hi-Lo	Registers Quantit	y Mapping Address-Star
Output settings	1	1	Boolean	2	0		2	64
Access Control	2	1	Roolean	1	0		2	66
	3		🖳 Setting Slave					
Input Settings	4							
Timer Settings	5		No		3			
	6		10		0			
Interlock Settings	7		Slave Addr	ess (Range	1~254) 1			
	8							
RS485 Settings	9		Data Type		Boole	in 🔻		
Slave Settings	10		Function		15),		
	11		ranction		13			
Network Settings	12		Starting A	ddress Hi-L	.0 1			
	13			2				
Historical Record	14		Registers	Quantity	2			
	15		Manning Ad	dress Start	Hi-Lo 68			
	16		mapping ha	uress beare	111 120 [08			
						(
					OK	Cancel		
		[-		
					Delete Device	Read	Save	
		lotice:	g device, pls click	«n »« » · · ·				

Click "Ok"----> Right click this line in "Slave" list---->Click "Edit Slave" to edit the channel.

In "Slave Mapping List" page, right click blank line---->Choose "Add Slave". According to M100 user manual,
 AIN data is high byte in front, low byte behind, data type and function code as below:

8.3 Read Input Register (Function Code 4: Read Input Register.)&

Read Input Register (Function Code 4: Read Input Register.)								
Channel₽	Register Address	Data Type	Description					
AIN1/RTD 1.0	0⇔0	1 Word₽	AIN1/RTD1 Value, Read Only.+					
AIN2/RTD 20	1.0	1 Word₽	AIN2/RTD2 Value, Read Only.+?					

So set AIN parameter as below, set AIN Data Type to 16 Bit, Function code 4, Register start address 0, Register quantity 2.

Basic Settings	10000	ave 🔀	Address	Data Tama	Francisk de ser	Generations	A	L. T. a. David and			
Output Settings		Stave .	auuress	Data Type Boolean	2	Starting	Autress n.	l-Lo Regist	2		
5	1 2		1	Boolean	1		0		2		
Access Control	3		1	Boolean	15		1		2		
Input Settings	4		- Settin		10			×	4		
£	5		e Settin	g slave							
Timer Settings	6		E								
Interlock Settings	7		No			4					
A Interiock Settings	8										
RS485 Settings	9		Sla	ive Address (R	ange 1~254.) 1					
2	10		Det	a Type		Word					
Slave Settings	11		Dai	а турс	(uoru					
Slave	12		Fur	nction		04	/-				
Surge State	13										
	14		578	nrting Address	H1-Lo	0					
There.	15		Res	isters Quanti	tv	2					
Network Settings	16			,	• 5						
Historical Record	_		Map	ping Address	Start Hi-L	0 20000	•				
	-					OK	Cancel				
					100			Save			

Click "Ok"----> Right click this line in "Slave" list---->Click "Edit Slave" to edit the channel.

The M100 AIN data acquisition is ADC current or ADC voltage value, device have not calculated according to AIN max and min range. So the "Ratio" no need to write, both "Threshold High" and "Threshold Low" are ADC value.

Save Settings 💿 Load Profile	e 🚽 Export Profile 📲 Def Slave 🔀	ault [Help											
Output Settings	No Slave Address	Data Type	Function	Starting	Address Hi	-Lo Registe	rs Quantit	y Mapping A	ddress-	Start	Mappir	ng Addr	ress
*	🖳 Slave Editor	Berlinst	1		1		3		-				x
Access Control	1 Data Type Ra	tio Alarm Verify Time	Threshold high	Threshold low	High Alarm SMS Content	Low Alarm SMS Content	Recovery SMS Content	Enable Recovery SMS	Relay0	Relayi	Relay2	Relay3	Enabl
Input Settings	0 DATA_SIGNED_AB	1 2	20	0						V			Ø
Timer Settings	11 DATA_SIGNED_AB	1 2	0	0							1000	1777	
Interlock Settings													
RS485 Settings													
Slave Settings													
Slave													
Register													

(8) Paramter setting finished, since slave address is from same one device, the Slaves address are same, Data type and Function code are not same. Click save button to write parameter into device.



Cellular IoT RUT Configurator V2.4	Call Torday	HA WAY	TLACKE	ROLE H	又图: 771%4.5	AT LACKE DA	
📄 Save Settings 🛛 Load Profile	🐳 Export Profile 🛛 🜉 Def	ault [Help					
Basic Settings	Slave 🔀	\sim	\cap				
Dutput Settings	No Slave Address	Data Type		Starting Address Hi-Lo	Registers Quantity		
300	1 1	Boolean	2	0	2	64	65
	2 1	Boolean	1	0	2	66	67
Input Settings	3 1 4 1	Boolean Word	15	0	2	68 20000	69 20001
Timer Settings	5 6	\bigcirc	\bigcirc				
B-(Interlock Settings	7						
B-CO RS485 Settings	9						
Slave Settings	10 11						
Slave	12						
39.25	13						
Register	14						
	15						
300	16						
Historical Record							
				Delete Device Read	Save		
	Refree: 1. Before adding 2. Select a blank 3. Max adding 16	device, pls click ' line, right click devices	'Read" button, to add mapping	to yead mapping device list fi s device	rst		

- (9) Click "Save Settings" in the menu, then switch device off.
- (10) Switch the DIP mode to "Run".
- (11) Switch the device on, enter into working mode, device running according parameter setting.

RS485 connected as Modbus RTU Slave:

Device support Modbus RTU slave function, can connect to HMI, SCADA, DCS, MES system. It can be used for field data acquisition, remote SMS alarm, remote dial alarm and GPRS/3G/4G to cloud...

For example, when device as Modbus RTU slave, connect to HMI as below:

- (1) Connect device to HMI via RS485 port, set HMI RS485 port parameter;
- (2) Basic setting according (1) and (2) in "Device working self-checking";
- (3) In "Basic Parameter Settings" page, set "Device ID", range is 1~247 in Modbus protocol as below:

Save Settings 💿 Load Profile	Export Profile 📲 Default	🔄 Help			
Output Settings	Modify password Old p	assword: assword: assword: Modify password	R	e time D15-03-31 22:25:00 ead the RTU time /rite the RTU time d the computer time	Read
Timer Settings Interlock Settings RS485 Settings	Device Description:	~65535) Model No.		Version (60 Characters)	
Slave Settings	Add timestamp to alar Auto Arm after disarm Timer Reporting SMS Cont	0 Minute(s) (0~9999, W	en poweron. hen set as 0, the RTU will in a evice ID, range is		
Historical Record		tional information in the report SMS Arm Status GSM/3G Signal Value External Power Status Device ID	for Modbus protoco	DOO Status DOI Status DO2 Status DO2 Status	

- (3) In "Serial Port" setting page, set device parameter as below:
- A) RS485 used as "Modbus RTU Slave";
- B) Baud Rate, Data Bit, Parity Bit, Stop Bit setting should be corresponding with HMI, otherwise commucation

GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

will be failure. If multi Masters, all Masters paramter should corresponding with device;

C) No need set: "Scan Rate", "Time Out", "Slave Fault Verify Time";

D) Click "Save" button.

Save Settings 🔶 Load Profile	e – Export Profile 📲 Default 📓 Help	
Basic Settings	Serial Port 🛛 _Choose as	s Slave
Output Settings	Rs485 ModBus RTU Slave	scan Rate 200 (200~65535ms)
E Access Control	Baud rate 9600	Time Out 200 (200~65535ms)
Input Settings	Data bit 8	Slave fault verify time 60 (0~65535s)
Timer Settings	Parity bit none	
Interlock Settings	Stop bit Baud Rate parame	ter same
RS485 Settings		ith Master
Serial Port		
	Notice: 1. Scan Rate can't less than 200ms	Ignor this part since only use
Slave Settings	2. Time Out can't less than 200ms	it when device as Master
Network Settings		
X		
Historical Record		

(5) Click "Save Settings" in the menu, switch the device off;

(6) Switch DIP mode to "Run";

(7) In HMI configurator software, set the Modbus RTU Register address of device. Refer to [*RS485 Serial Port Setting---->Modbus RTU Slave Function---->Device I/O Register Address and Function code*];
 (8) Switch the device on, enter into working mode, device running according parameter setting.

Transparent Transmission As DTU:

Device can support data transparent transmission: DTU function. Could server transmit data to device via GPRS/3G/4G, device will transfer the data to RS485 port directly wihtout deal with. Once device receive data from RS485, also transmit to cloud server directly via GPRS/3G/4G, refere to "Serial Port Transparent Transmission". When device RS485 port no need mapping slave, or connect to others which is not standard Modbus RTU protocol, then can choose transparent transmission as below:

(1) Items connect to device via RS485, set RS485 port parameter;

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

(3) In "Serial Port" setting page, device parameter as below:

A) Choose RS485 as "Transparent Transmission";

B) Baud Rate, Data Bit, Parity Bit, Stop Bit setting should be corresponding with items, otherwise commucation will be failure. If multi items, all items paramter should corresponding with device;

C) No need set: "Scan Rate", "Time Out", "Slave Fault Verify Time";

D) Click "Save" button.



Save Settings 🛛 🛥 Load Profile	🗕 🕘 Export Profile 📲 Default 📓	Help		
Basic Settings	Serial Port 🔀			
Output Settings	Rs485 Transparent transmiss	sion 🗸 Scan Rate	e 200	(200~65535ms
Access Control	Baud rate 9600	Time Out	200	(200~65535ms
Input Settings	Data bit 8	Slave fault verify time	60	(0~65535s)
Timer Settings	Parity bit none	· · · · · · · · · · · · · · · · · · ·	ou	(0-055555)
Interlock Settings	Stop bit 1			
RS485 Settings	Read	Save		
Serial Port	Notice:	Set the same valu	e as	
Slave Settings	1. Scan Rate can't less than 200r	ms connection items		
Network Settings	2. Time Out can't less than 200r	ms		
Historical Record				

(4) In "GPRS Setting" page, set "Communication Data" as "Modbus RTU Protocol", then set "Server IP/DNS" and "Port", also can set handshake protocol like "Login Message" below:

Basic Settings	GPRS 🔀						
Output Settings	Communication Date Mod	ibus RTU Pro	toco +	Se	erver 1 IP/DNS	modbus. dtuip. com	(Max60)
Access Control	Protocol TCF	,	-		Server Port	6651 ((-65535)
Input Settings	Access Point Name			(Max60) Se	erver 2 IP/DNS		(Max60)
Timer Settings	GPRS User Name			(Max60)	Server Port		-65535)
245	GPRS Passsword			(Max60) Se	erver choose w <mark>a</mark> y:	Prefer server 1	<u>/ -</u>
Interlock Settings	server offl	ine or unrespo	ne 3 times, d	vice reconne	ection time ways	30	(1-999s)
RS485 Settings					Set IP and	port which co	nnect to ser
Slave Settings	Login Message	ASCII 🗸	6SFIM07N3L1	WES6	(Max60)		
Network Settings	Login ACK Message	ASCII 👻	l		(Max60)		
Network Settings		ASCII -			(Max60)	×	
GPRS	Logout Message	ASCII .					
CR94	Logout Message Heartbeat Message				(Max60)	\sim	
GPRS		ASCII 🗸			(Max60) (Max60)	Fnahle whe	n transparen
GPRS	Heartbeat Message	ASCII -					n transparen on , parameto
GPRS	Heartbeat Message Heartbeat ACK Message	ASCII - ASCII - 3]				on , paramet

(5) Click "Save Settings" in the menu, then switch device off.

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

(7) Switch the device on, enter into working mode, device running as transparent transmission when data communication between cloud server and items.

Device connect to www.My-M2M.com cloud configuration,

wechat notify application

GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

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:

we Settings 🛛 🕘 Load Profile		I Help			
Basic Settings	Parameter 🔀				
Parameter	Modify password		Synchronous mach	ine time	
342	Old pas	ssword:	Time:	2015-03-31 22:25:00	
Numbers	New pas	ssword:		Read the RTU time	Rea
Output Settings	- TICN				Save
Access Control	U Confirm pas	ssword: (4 digits)		Write the RTU time	
Access Control	N	Modify password	R	ad the computer time	
Input Settings					
Timer Settings	Basic information				
994 - C	Device ID 1 (0~6	65535) Model No.		Version	
Interlock Settings	Device Description:			(60 Characters)	
RS485 Settings	Add timestamp to alarm	SMS 🔲 Arm automatically wh			
Slave Settings			and the second se	Contractory and the second	
Slave Settings	🔲 Auto Arm after disarm: (0 Millute(s) (0~9999, Wi	hen set as 0, the RTU will i	n armed mode immediately.)	
	Timer Reporting SMS Conten	nt Settings Modbus de	evice ID, range	is 1~247 when used	
O Network Settings					
94.		onal information in the report SMS	for Modbus proto	col	
Sec.		onal information in the report SMS : Arm Status	for Modbus proto	col 🗌 DO0 Status	
M.	Add the following addition				
345	Add the following addition	Arm Status	AIN0 Value	DO0 Status	

(3) In "GPRS" 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 (Only used for S272).

Save Settings • Load Profile	Export Profile Parameter × GPRS			Sever do Sever 2		and the second second second second	onnecting Port	*
Output Settings	Communication Date Mod	5				Server 1 IP/DNS	modbus. dtuip. com	(Max60)
Access Control	Protocol TCP			•	A1 a a b	Server Port	6651	(0-65535)
Input Settings	Access Point Name GPRS User Name				(Max60) (Max60)	Server 2 IP/DNS Server Port		(Max60) (0-65535)
Timer Settings	GPRS Passsword				(Max60)	Server choose ways	Prefer server 1	•
- Interlock Settings	server offli	ne or unre	spone	e 3 times, dev	ice rec	onnection time ways	30	(1-999s)
RS485 Settings								
Slave Settings	Login Message	ASCII	•	6SFIMO7N3L1VW	'ES6	(Max60	Only support 1"now, When	rt "Prefer Ser
Network Settings	Login ACK Message	ASCII	•	1		(Max60		failure, ther
GPRS	Logout Message	ASCII	•			(Max60	connect to	backup server
Historical Record	Heartbeat Message	ASCII	•			(Max60		
The fit	Heartbeat ACK Message	ASCII				(Max60 >	D	1.
	Heartbeat Interval	3		(1-9999s)			server	ter according
	No Response Resend Times	2	•	(1-9)			501 101	need
				nen Login Se		2		

(4) Click "Save Settings" in the menu, then switch device off.



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

(6) Switch the device on, enter into working mode, then Slave and Master 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.

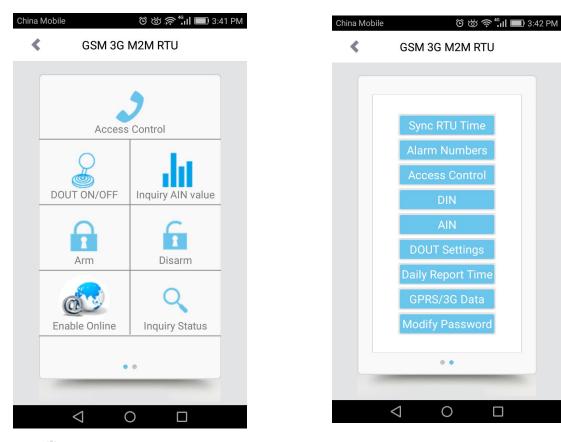
The Android APP search "M2M RTU" or click to download link: http://nc-apk.wdjcdn.com/9/c8/1fd8e70a8634e9b4763a6a7114888c89.apk

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:



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 Command	SMS Format Error, Please check Caps Lock in Command!
2) External DC Status	
Event	Return SMS Content
External DC goes off	External DC Power Goes OFF
External DC Power Goes ON	External DC Power Goes ON
3) Modify Password, 4digits, default is 1	234
SMS Command	Return SMS Content
Old Password+P+New Password	This is the New Password, please remember it carefully.
4) Arm/Disarm SMS Command	
SMS Command	Return SMS Content

	SMS Command	Return SMS Content
Arm	password+AA	Armed
Disarm	password+BB	Disarmed

5) Set RTU time, format is 2015-05-22 15:20:30W01, the W01 stands for Monday, W07 stands for Sunday.

SMS Command	Return SMS Content
password+Dxxxx-xx-xxTxx: xx: xxWxx	xxxx(Y)XX(M)XX(D)xx(H)X(M)xx(W)

6) Inquiry Current Status SMS Command

SMS Command	Return SMS Content
password+EE	Armed/Disarmed
	Model:
	Version:
	IMEI:
	GSM Signal Value:
	External DC Power Goes OFF/ON

7) **Setup 10 User number** (Alarm Number&Access Control Number), max 21 digits. (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		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

Return all authorized user numbers

Delete password+B+series number

9) Setup	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	Return SMS Content
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 <nnnnnnn></nnnnnnn>	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 <nnnnnnnn></nnnnnnnn>	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>	

GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

(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	password+IP+ IPaddress+P+Com port	Server:
		Port:
Inquiry	password+IP	
Delete	password+IPDEL	

14)Set GPRS APN/USER NAME/PASSWORD

	SMS Command	Return SMS Content
Set	password+AP+apn+#+username+#+userpassword	APN:
Inquiry	password+AP	User Name:
Delete	password+APDEL	Password:

15) GPRS Online

SMS Command	Return SMS Content
password+GPRSonline	GPRS always online

16) Delete Historical Data

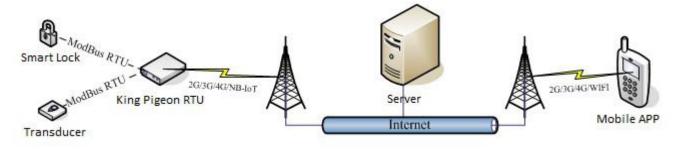
SMS Command	Return SMS Content					
password+HISDEL	Delete all historical records					
17)Clear/Inauiry Pulse Counter Value						

SMS Command Return SMS Content Clear Pulse Counter Value password+DINOCLR 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.

Device Networks Topology:







Switch Device on, send TCP connection

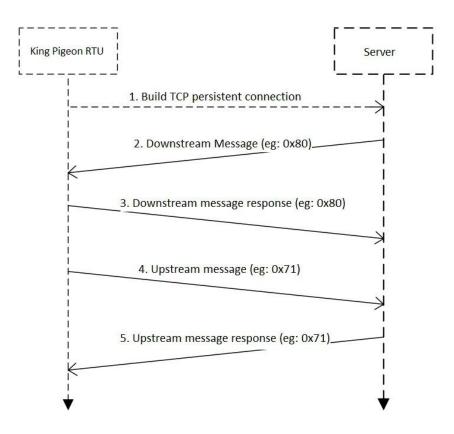


After TCP long connection, send definition 【Login Message】 for login verify data to server



TCP connection built, then can communication, send Modbus RTU command to polling device Server receive 【Login Message】, Return 【Login ACK Message】 to RTU device, stands for permitting this device connect to server

Message communication sequence:



👰 Transparent Transmission

KING PIGEON

GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

Pls refer to "Transparent Transmission" content above.

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 "GPRS" 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 and slave mapping register address, according to Modbus TCP or Modbus RTU protocol. Device register address and function code refer to "RS485 Serial Port Setting---->Modbus RTU Slave Function---->Device I/O Register Address and Function Code"; Mapping register address and function code refer to "RS485 Serial Port Setting---->Modbus RTU Setting---->Modbus RTU Master Function---->Mapping Register List and Function Code".

父 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.

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:

Save Settings 🛛 Load Profile	Export Profile 📲 Default	🚺 Help			
Basic Settings	Parameter 🔀				
Parameter Numbers Output Settings Access Control	New	password: password: (4 digits) Modify password	Re	time 15-03-31 22:25:00 • • • • • • • • • • • • • • • • • •	Read Save
Input Settings Timer Settings Interlock Settings	Basic information Device ID 1 (Device Description:	0~65535) Model No.		Version (60 Characters)	
RS485 Settings Slave Settings Network Settings	Add timestamp to ala Auto Arm after disarn Timer Reporting SMS Con	n: 0 Minute(s) (0~9999, V	hen poweron. /hen set as 0, the RTU will in ar evice ID, range is		
Historical Record		ditional information in the report SMS	and the second		
Mar.	DIN0 Status	Arm Status GSM/3G Signal Value	AIN0 Value	DO0 Status	
	DIN2 Status	External Power Status	AIN2 Value	DO2 Status	
	DIN3 Status	Device ID	AIN3 Value	DO3 Status	

(1) In "GPRS" 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:



Basic Settings	Export Profile 📲 Default				erver d		igeon		merrage	
75	Communication Date Mode	ous RTU	Proto	-	nicac c	Server 1		modbus. dtuip.	com	(Max60)
*	Protocol TCP			<u> </u>			er Port	6651	(0-65535)	
Access Control	Access Point Name				(Max60)	Server 2	IP/DNS		-	(Max60)
Input Settings	GPRS User Name				(Max60)		er Port		(0-65535)	
Timer Settings	GPRS Passsword				(Max60)			Prefer serv	And a second sec	
Interlock Settings	server offli:								ci i 🔹	(1-999s)
*	Server UIIII.	ne or un	espon	e J (Imes,	device fec	onneccion	cime ways	50		(1 3332)
RS485 Settings										
Slave Settings	Login Message	ASCII	•	6SFIMO7N3L	.1 VWES6		(Max60)			
30.0								T		and the second second second
Network Settings	Login ACK Message	ASCII	•				(Max60)		message acc	
Network Settings	Login ACK Message Logout Message		•				(Max60) (Max60)	server,	usually w	rite ASCI
GPRS	Logout Message	ASCII					(Max60)	server, means	, usually w ASCII code;	rite ASCI
- 080	Logout Message Heartbeat Message	ASCII ASCII	•				(Max60) (Max60)	server, means	usually w	rite ASCI
GPRS	Logout Message Heartbeat Message Heartbeat ACK Message	ASCII ASCII ASCII	•	(1-9999s)			(Max60)	server, means	, usually w ASCII code;	rite ASCI
GPRS	Logout Message Heartbeat Message Heartbeat ACK Message Heartbeat Interval	ASCII ASCII ASCII 30	•	(1-9999s)			(Max60) (Max60)	server, means	, usually w ASCII code;	rite ASCI
GPRS	Logout Message Heartbeat Message Heartbeat ACK Message	ASCII ASCII ASCII 30 3	• • •	(1-9)			(Max60) (Max60) (Max60)	server, means	, usually w ASCII code;	rite ASCI

(4) Click "Save Settings" in the menu, then switch device off.

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

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

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 "Device I/O Register Address and Function Code".

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 "Device I/O Register				
Register Address	2	00 00H	Address 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	01H Device, according to the data Master send					
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 2 converter Binary as below DO3(bit3) DO2 (bit2) DO1 (bit1) DO1 (bit0) 0 0 1 0 Open Open Close Open, DO1 Device current relay status: DO0,DO2,DO3 = Open, DO1= Close						
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, according to setting address						
Function Code	1	0FH	Write multi holding 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 4DO, use 4 binary can do it						
Writing Data	1	OFH	OFH stands for 4 DO status, high 4 byte invalid, low 4 byte Fconverter to binary as belowDO3(bit3)DO2 (bit2)DO1 (bit1)DO1 (bit0)1111Active closeActive closeActive close1= 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: 0000-0007, stands for DIN0-DIN7						
Read DIN Register Qty	2	00 08H	Read qty of DIN status						
16CRC Verify	2	79 CCH	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 0		01H Device, Range: 1-247, according to setting address				
Address	T	UIH	off Device, Range. 1-247, according to setting address				
Function	1	021	02 read input coil DIN status				
Code	Code 1 02H 0						
Return Bytes	1	01H	Range: 0000-0007, stands for DIN0-DIN7				
Qty	I						



			FFH converter to binary 1111 1111 from high to low byte, stands for DIN7-DIN0 status							
Returning			DIN7	DIN6	DIN5	DIN4	DIN3	DIN2	DIN1	DIN0
Ŭ	1	FFH	(bit7)	(bit6)	(bit5)	(bit4)	(bit3)	(bit2)	(bit1)	(bit0)
Data			1	1	1	1	1	1	1	1
			Close	Close	Close	Close	Close	Close	Close	Close
			1= Close, 0= Open							
16CRC Verify	2	E1 C8H	CRC0 CRC1 low byte in front, high behind							

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

Server send: 01 02 00 00 00 08 79 CC

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

Device answer: 01 02 01 FF E1 C8

01H= Device address; 02H= Inquiry DIN status; 01H= Returning data bytes qty; FFH DIN status, every byte stands for one DIN status, FFH converter to binary 1111 1111 from high to low byte, stands for DIN7-DIN0 status, 0= Open, 1= Close, E1 C8H 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	00.1.01	Read qty of input register, read AIN0 to DIN0 count value address,
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 Code	1	04H	04 read input register	

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			One address	s can read 2	bytes.						
Data Bytes			AIN address range: 0000-000BH, One AIN data take two address,								
Range	1	38H	temperature	e address: 0	018H, ł	num	nidity addr	ess: 0019	H, DIN	10 co	unt value
Nalige			address: 002	1A,001B							
			External pov	wer voltage	addres	s: 0	00E。				
				N= Retu	rning b	yte	s, sample	data 56 po	oints:		
		00 00 00	AIN	AINO	AIN1	L	AIN2	AIN3	AIN	14	AIN5
		E7 00 00	Receivin	00 00	00 00	0	00 00	00 00	00	00	00 00
		00 DD 00	g Data	00 E7H	00		00	00 DCH	00 D	ЕН	00 DFH
		00 00 DD			DDF	ł	DDH				
		00 00 00 DC 00 00 00 DE 00 00 00 DF	Decimal	194	207		0	0	0	1	0
			Value								
			Real	1.94	2.07	,	0	0	0	0 0	
			Value								
Returning	N	00 00 00							-		
Data	IN	00 04 C6 01 9A 00	Other	External P	ower	Te	emperatur	Humic	lity	DIN	l0 Count
			Value	Voltage		е				Value	
		00 00 01 00 01 00 01 00 01	Receivin	04 C6	н	0B 36H		1B E4H		00 00 00 0B	
			g Data								
		00 01 00	Decimal	1222		2870		7140		11	
		01 00 01	Value								
		01 00 01 0B 36 1B	Real	12.22	V		28.7°C	71.4%	RH	1	1 times
		E4 00 00	Value								
		00 0BH	AIN, Externa	al Power Vol	tage, To	emp	perature, H	lumidity r	eal va	lue=	Register
			value/100 $_{\circ}$								
16CRC Verify	2	A9 3CH	CRC0 CRC1	ow byte in f	front, h	igh	behind				

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 00 DD 00 00 00 DC 00 00 00 DE 00 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 00 36 1B E4 00 00 00 0B A9 3C

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

Read Boolean mapping address data, belong to holding coil type:

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Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	01H	Read Holding Coil type, Function Code 01
Boolean Register	2	00.4011	Range: 0040H-007FH, Address refer to "Mapping
Starting Address	2	00 40H	Register Address and Function Code"
Read Register	2		Range: 0001H-0040H, Boolean mapping address, total 64
Qty	2	00 0AH	address
16CRC Verify	2	BD D9H	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)				Desci	riptior	ו			
Device Address	1	01H	01H Device,	accordi	ng to tl	ne data	a Maste	er send			
Function Code	1	01H	Read Holdir	ng Coil							
Return Bytes Length	1	02H	Return data	length							
			High byte m According to converter b	o Modbu	is prote	ocol, fi		-		-	
	N	73 01H	BIT Position	Bit15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit8
Returning Data	N= Returni		Boolean Address	Invali d	Inv alid	Inv alid	Inv alid	Inv alid	Inva lid	73	72
	ng		Value	0	0	0	0	0	0	0	1
	bytes length		BIT Position	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	BitO
			Boolean Address	71	70	69	68	67	66	65	64
			Value	0	1	1	1	0	0	1	1
			Eg: Read 10	value, h	igh 10	byte a	ddress	value l	ooked	as inva	lid
16CRC Verify	2	5D 0CH	CRC0 CRC1	low byte	in fror	nt, high	n behin	d			

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

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

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

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

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

Revise Boolean mapping address data, belong to holding coil type:

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

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	05H	Write single Holding Coil type, Function Code 05
Boolean Mapping	2	00.4011	Range: 0040H-007FH, address refer to "Mapping Register
Register Address	2	00 40H	Address and Function code"
Writing Value	2	FF 00H	This value: FF 00H or 00 00H, FF 00H= Write 1, 00 00H= Write 0
16CRC Verify	2	8D EEH	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

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

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

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

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

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

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

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

Read data type mapping address, belong to holding register:

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	03H	03 command read holding register
Mapping Register	2	45 2011	One address can read 2 bytes.
Starting Address	2	4E 20H	Address range: 4E20H-501CH, mapping data type address

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			range, address refer to "Mapping Register Address and Function
			code"
Read Mapping	2	00 0AH	Read gty of input register
Register Qty	2	00 040	Read dry of input register
16CRC Verify	2	3D 2FH	CRC0 CRC1 low byte in front, high behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description						
Device Address	1	01H	01H Device, R	ange: 1-24	47, accord	ing to sett	ing addres	S	
Function Code	1	03H	04 command	read inpu	t register				
Data Bytes Range	1	14H	One address can read 2 bytes.						
			N= Returning	bytes, san	nple data s	56 points:			
			Mapping Address	20000	20001	20002	20003	20004	
			Receive						
		00 14 00 1E 00	Data	00 14H	00 1EH	00 28H	00 32H	00 4BH	
Returning	N= Returnin	28 00 32 00 4B 00 41 00 0A 00	Mapping Address	20005	20006	20007	20008	20009	
Data	g Bytes	25 00 14 00	Receive						
		2AH	Data	00 41H	00 0AH	00 25	00 14	00 2A	
			Mapping add mapping data Mapping Regi	type acco	ording devi	ce RS485	connected		
16CRC Verify	2	FB 34H	CRC0 CRC1 lo	w byte in t	front, high	behind			

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

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

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

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

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

Revise data type mapping address, belong to holding register:

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

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

Master Send Data Format:

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

Receiver Return Data Format:

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

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

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

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

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

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

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

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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

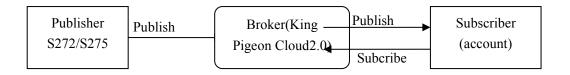
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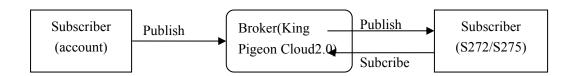
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subscriber (Subscribe). Among them, the publisher and subscriber of the message are both clients, the message broker is the server, and the message publisher can also be a subscriber. Take S27X connected to King Pigeon cloud 2.0 platform as an example:

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

Publish topic: Device publish data topic

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

Publish Topic: MQTT client ID (filled in configuration software)

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```
ł
         "sensorDatas":
         ſ
              {
                   "flag":"DI1",
                                          //Read and write flag
                   "switcher":1
                                          //data type and value
              },
              {
                   "flag":"AI1",
                   "value":10.00
              }
              {
                   "flag":"REG20000",
                                            // Register address and value
                   "value":1.00
              }
         ],
         "time":"1591841863",
         //Time stamp (When power on, first time connection no time stamp, later connections
    have time stamp)
         "state":"alarm",
        //Alarm and recovery (only for alarm or recovery data, but not for timely report)
         "retransmit":"enable"
    //Historical data (only for re-transmission of historical data, but not for real-time data)
```

Note:

//Read and write flag: the character is "flag", followed by "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 uploa	d cycle	Sec
MQTT Date retransi	nission 🔲 Ena	able / disable

Payload data format in device subscription message

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

Note:

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

//Data type and value:

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

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

//Read and write flag: the character is "flag", followed by "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	TEMP	Value	True value = original value
Humidity	HUMI	Value	True value = original value
External power voltage	EXTPWR	Value	True value = original value
DIN0 counter	COUNT	Value	True value = original value
DIN1counter	COUNT1	Value	True value = original value
DIN2 counter	COUNT2	Value	True value = original value
DIN3counter	COUNT3	Value	True value = original value

Note:

"DOx" : DO0, DO1, DO2, DO3 ;

"DIx" : DI0、DI1、DI2、DI3、DI4、DI5、DI6、DI7;

"Alx" : Alo, Al1, Al2, Al3, Al4, Al5.

Mapping register read-write flag

Data	Read&write Flag	Data type	Description
Boolean data	REG64~REG127	Switcher	According to the definition of
			slave register data
16-bit data type	REG20000~REG20127	Value	According to the definition of



			slave register data
32-bit data type	REG20128~REG20254	Value	According to the definition of
			slave register data
64-bit data type	REG20256~REG20508	Value	According to the definition of
			slave register data

Note:

Mapping register read and write identification is unified as "REGx" (x is the address of the mapping register)

10. 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.

11. 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.







12. 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. Http://www.iot-solution.com