4G Cellular IoT Modbus MQTT RTU



S275 User Manual

Ver 2.7

Date Issued: 2020-08-05 King Pigeon Hi-Tech. Co., Ltd.

KING PIGEON

www.iot-solution.com



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

Table of contents

| 1. | Brief Introduction | 3 |
|-----|--|-----|
| 2. | Safety Directions | 4 |
| 3. | Standard Packing List | 4 |
| 4. | Mainly Features | 5 |
| 5. | Physical Layout and Installation Diagram | 6 |
| 6. | Settings & Operations | 11 |
| 7. | Example Of Applications | 36 |
| 8. | Device SMS Command and SMS APP | 52 |
| 9. | Device GPRS/3G/4G Communication Protocol | 55 |
| 10. | Upgrade Firmware | 73 |
| 11. | Cellular Module Upgrade | 73 |
| 12. | Warranty | .74 |

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.

King Pigeon Hi-Tech.Co., Ltd, its employees and distributors, accept no liability for any loss or damage including consequential damage due to reliance on any material contained in this handbook.

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 |

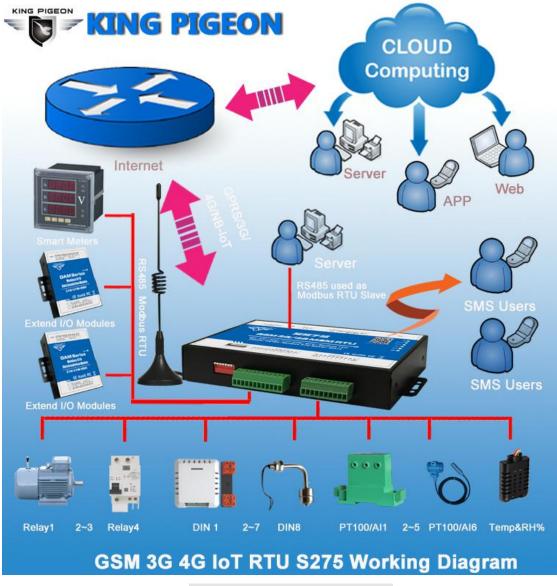




IS/GPRS/3G/4G GS M/S **Cellular IoT Modbus RTU**

Model List

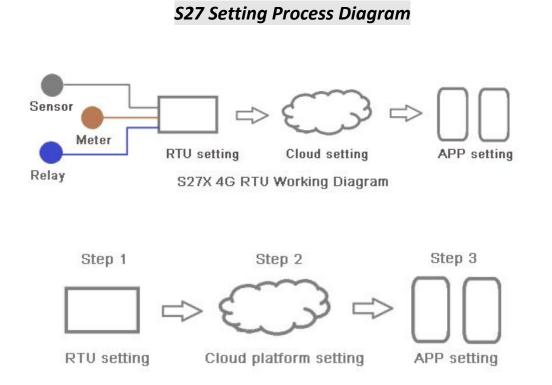
| Model | DIN | AIN | 00 | Temp& | CD courd | USB | RS485 | M | apping R | egisters | |
|--------|---------|------------|----------|-------------|---------------|------------|------------|----------------|------------|----------|-------|
| woder | DIN | AIN | DO | Humi | SD card | USB | K3485 | Boolean | 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.

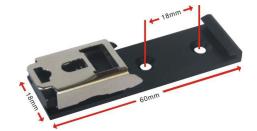
Interference

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

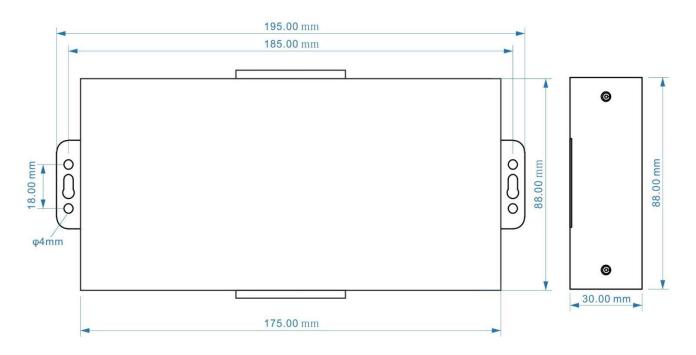


GSM/SMS/GPRS/3G/4G Cellular Iot Modbus RTU

| | 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

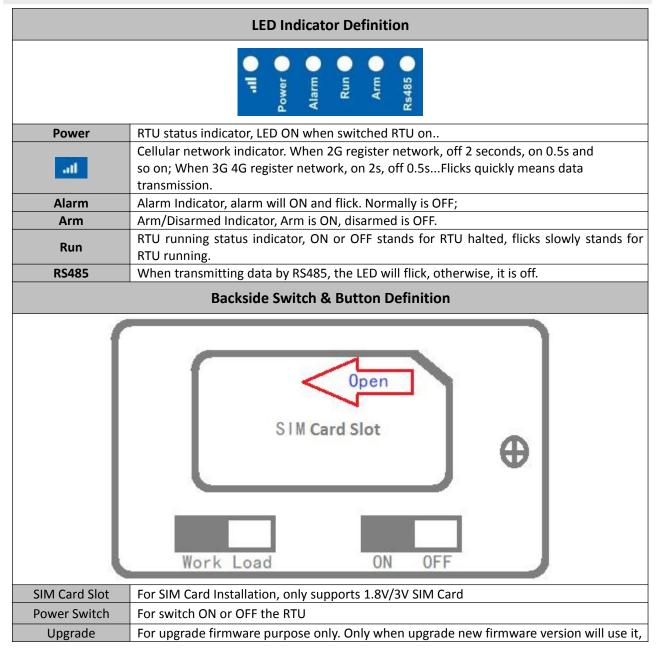
5.1 Control Unit size and physical layout





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 |

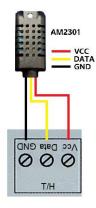
GSM/SMS/GPRS/3G/4G Cellular lot Modbus RTU

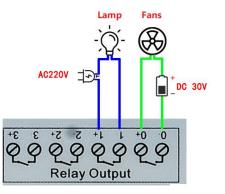
Dry contact or wet contact, sampling frequency 200mS. Logic level: 0~0. 5V or short circuit treated as close, +3~30V or open circuits treated as open. One of the input can be used as counter, sampling frequency is 1Mhz, the second input can be used for Arm/Disarm. The 1st digital input, positive electrode. 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

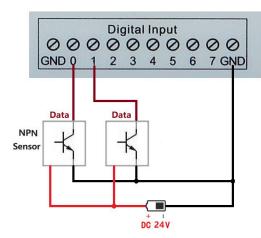
Relay Output

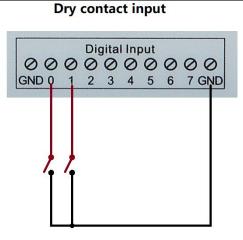




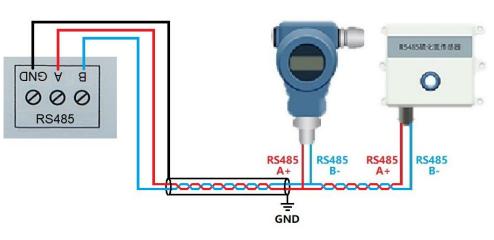
GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

Wet contact input



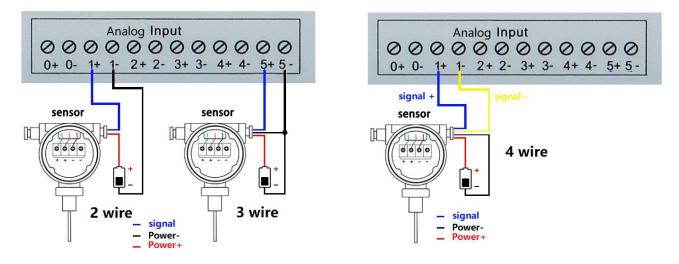






Analog Input

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

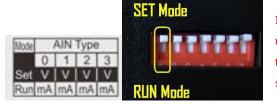
Please insert the SIM Card, and install the GSM/3G/4G Antenna.

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 |

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

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

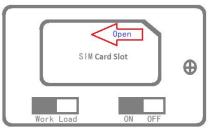
Notice:

- 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 | |
| er Setting Hour Timer Periodic Timer Trigger Setting | DIO Status DI1 Status DI2 Status DI3 Status DI4 Status DI5 Status DI6 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 Trigger Setting Link Trigger | 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 Device Description | AI1 Value AI2 Value AI2 Value AI3 Value AI4 Value | DO1 Status | |
| 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 | |
| er Setting Hour Timer Periodic Timer Trigger Setting Link Trigger 185 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 gs | AI1 Value AI2 Value AI2 Value AI3 Value AI4 Value | DO1 Status | |
| 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 |
| User No | .0 🔳 | | | | | | | | | | |
| User No | .1 0 | | | | | | | | | | |
| User No | .2 0 | | | | (T) | E | | | | | |
| ontrol User No | .3 0 | | | | | | | | | | |
| ess User No | .4 0 | | | | | [77] | | | | | |
| User No | .5 0 | | | 1 23 | | | | | | m | |
| - User No | .6 0 | [[77] | | | <u>[]]</u> | | | | | | |
| Setting User No | .7 0 | | | | | | | | | | |
| Alarm User No | .8 0 | | | | | | | | | | |
| Setting User No | .9 0 | | | | | | | | | | |
| Alarm | | | | | | | | | | | |
| · · · · · · · · · · · · · · · · · · · | | | | | | | | | | | |
| ting | | | | | | | Read | | Save |) | |
| | | | | | | | | | | | |
| ur Timer Notice: | | | | | | | | | | | |
| ur Timer Notice: | No. can include or n | | | | in setup 00 |)44 or +44 | or without co | ountry code, | but can not | be 44. | |
| ur Timer Notice: iodic Timer 2. Low sig | No. can include or n gnal alert: Mobile sig stands for when the | nal lower th | han 14 (full | signal is 31). | | | | ountry code, | but can not | be 44. | |
| ur Timer Notice: iodic Timer 2. Low si ger Setting 3. Tick it | gnal alert: Mobile sig | nal lower th | han 14 (full | signal is 31). | | | | ountry code, | but can not | be 44. | |
| ur Timer Notice: iodic Timer 1. Alarm 2. Low si ger Setting 3. Tick it K Trigger | gnal alert: Mobile sig | nal lower th | han 14 (full | signal is 31). | | | | ountry code, | but can not | be 44. | |
| ur Timer iodic Timer ger Setting k Trigger tting | gnal alert: Mobile sig | nal lower th | han 14 (full | signal is 31). | | | | ountry code, | but can not | be 44. | |
| ur Timer Notice: iodic Timer 1. Alarm 2. Low si ger Setting 3. Tick it K Trigger | gnal alert: Mobile sig | nal lower th | han 14 (full | signal is 31). | | | | ountry code, | but can not | be 44. | |
| ur Timer iodic Timer ger Setting k Trigger tting | gnal alert: Mobile sig | nal lower th | han 14 (full | signal is 31). | | | | ountry code, | but can not | be 44. | |
| 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 | | | | | |
| nput Setting | | | | | | | | | Read | Save |
| DI Setting | | | | | | | | | Reau | Jave |
| | | | | | | | | | | |
| 1. If the | Close Time setup as 0, | | | | | | | | | |
| DI Alarm 1. If the 2. If the then c | Close Time setup as no pen,and repeat this ac | ot 0, this channel will tion according to the | output NC ty Repeat Time | pe and the r is after the I | elay will close nterval Time ti | accordin | | | | |
| DI Alarm I. If the I. If the I. If the It the AI Setting Solution | Close Time setup as no pen,and repeat this ac he first Channel (DO0) | ot 0, this channel will tion according to the can be setup as Doc | output NC ty Repeat Time or Open functi | pe and the r is after the I ion, see Acce | elay will close nterval Time ti ess Control pa | accordin | | | | |
| DI Alarm 1. If the AI Setting 3. Only to AI Alarm 4. If the 5. If the 5. If the | Close Time setup as no pen,and repeat this ac he first Channel (DO0) Output Type setup as Output Type setup as | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren,then this channe | output NC ty Repeat Time or Open functi this channel v | pe and the r s after the In ion, see Acce will be used | elay will close nterval Time ti ess Control pa as a switch. | accordin imeout. ige. | g to the Close Tim | e | | |
| DI Alarm 1. If the Al Setting 3. Only Al Alarm 4. If the inter Setting in Al / If the S. If the S. If the S. If the S. If the | Close Time setup as no pen, and repeat this ac he first Channel (DO0) Output Type setup as Output Type setup as 10 Alarm and Interlock time, Interval time, Rep | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren,then this chann page. peat Times and Alarr | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm 1. If the Al Setting 3. Only Al Alarm 5. If the imer Setting 6. Close Hour Timer 7. Alarm | Close Time setup as no pen, and repeat this ac he first Channel (DOO) Output Type setup as Output Type setup as I Alarm and Interlock time, Interval time, Re Verify Time: If tick the | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm 1. If the Al Setting 3. Only Al Alarm 5. If the imer Setting 6. Close Hour Timer 7. Alarm | Close Time setup as no pen, and repeat this ac he first Channel (DO0) Output Type setup as Output Type setup as 10 Alarm and Interlock time, Interval time, Rep | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm 1. If the 2. If the 3. Only AI Setting 3. Only AI Alarm 4. If the inter Setting 6. Close Hour Timer 7. Alarm | Close Time setup as no pen, and repeat this ac he first Channel (DOO) Output Type setup as Output Type setup as I Alarm and Interlock time, Interval time, Re Verify Time: If tick the | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm I. If the A I Setting AI Setting Al Alarm Al Alarm Al Alarm S. If the imer Setting Hour Timer Periodic Timer | Close Time setup as no pen, and repeat this ac he first Channel (DOO) Output Type setup as Output Type setup as I Alarm and Interlock time, Interval time, Re Verify Time: If tick the | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm 1. If the 2. If the 2. If the 3. Only AI Setting AI Alarm AI Alarm AI Alarm Hour Timer Periodic Timer ink Trigger Setting | Close Time setup as no pen, and repeat this ac he first Channel (DOO) Output Type setup as I Alarm and Interlock time, Interval time, Re Verify Time: If tick the | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm 1. If the 2. If the 2. If the 2. If the 3. Only 4.1 Setting AI Alarm AI Alarm AI Alarm Hour Timer Periodic Timer Ink Trigger Setting Link Trigger | Close Time setup as no pen, and repeat this ac he first Channel (DOO) Output Type setup as I Alarm and Interlock time, Interval time, Re Verify Time: If tick the | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |
| DI Alarm 1. If the 2. If the 2. If the 2. If the 3. Only 4. A Setting AI Alarm AI Alarm AI Alarm Hour Timer Periodic Timer Ink Trigger Setting Link Trigger S485 Setting | Close Time setup as no pen, and repeat this ac he first Channel (DOO) Output Type setup as I Alarm and Interlock time, Interval time, Re Verify Time: If tick the | ot 0, this channel will tion according to the can be setup as Doc Switch ON/OFF, then Siren, then this chann page. peat Times and Alarr ON/OFF SMS alert f | output NC typ e Repeat Time or Open functi this channel v el will be used n Verify Time | pe and the r is after the In ion, see Acce will be used d as siren,and values range | elay will close nterval Time ti ess Control pa as a switch. d will be activ. e from 0 to 99 | accordin imeout. age. ated acco | g to the Close Tim ording to the settin | e gs | | |

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.

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

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.



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

| 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 | |
| Alarm Numbers | DIO | • | | | | | | 0 | | | |
| Output Setting | DI1 Disabl | e | | | | | | 0 | | | |
| 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 | | |
| Periodic Timer | DI1 Counter | | | | | (MAX.999999) | | | (MAX | ms .2000) | |
| 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.



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

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:

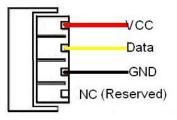
| ation file 🛛 🚽 Export Configuration Fil | e 🔛 Fa | actory | Reset | 🗐 He | lp | | | | | | | | | | | | | |
|--|-------------------|---------|----------|--------|-----|--------|----------|-----|-------|-------|----------|--------|------|------|---|--|--|--|
| tting 🔺 Alarm Numbers | × D | 0 × | Acce | 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 | | | | | | | | | | | |
| User No. 6 | | | | 3 8 | | | | | | | | | | | | | | |
| User No. 7 | | | | | | | | | | | | | | | | | | |
| Alarm User No.8 | | | | | | | | | | | | | | | | | | |
| tting User No.9 | | | | 1 0 | | | | (m) | | | F | | | | | | | |
| m | | | | | | | | | | _ | | | _ | | | | | |
| ng Nution | | | | | | | | | | | Read | | | Save | | | | |
| 9 Notice: Timer 1. Tick it star 2. While dial dic Timer dial the ne | ng the u | ser tel | ephone | | | | | | | | | | | I | | | | |
| iger | | | | | | | | | | | | | | | | | | |
| t | | | | | | | | | | | | | | | | | | |
| apping L + | | | | | | | | | | | | | | | | | | |

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.



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

Data Bit: 8 bit.

Parity Bit: None, Even and Odd optional.

Stop Bit: 1 or 2 stop bit optional.

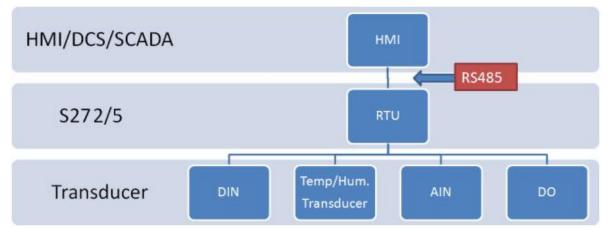
Scan rate: When RS485 used as Master, the interval time between two polling command.

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.)



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

| 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) | | | | |

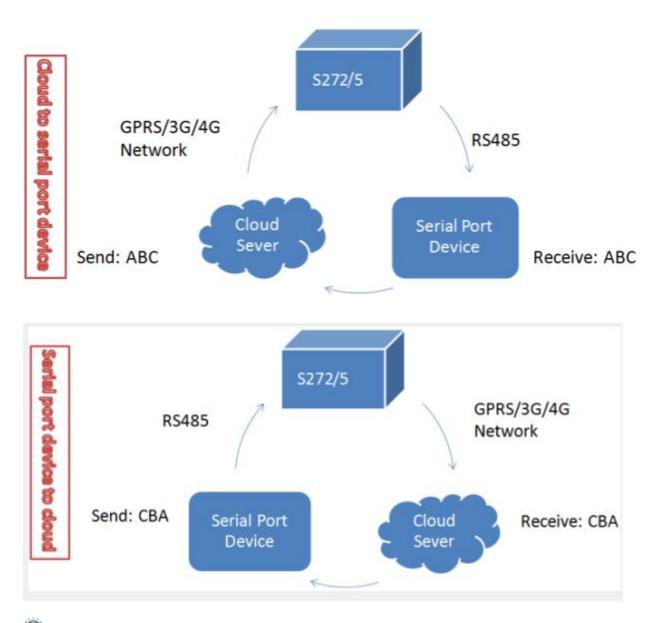
Stransparent Transmission:

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

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

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 | | | | |

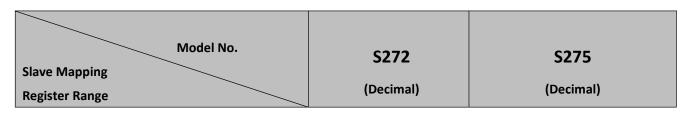
64 Bit Slave Register Assignment Table

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.



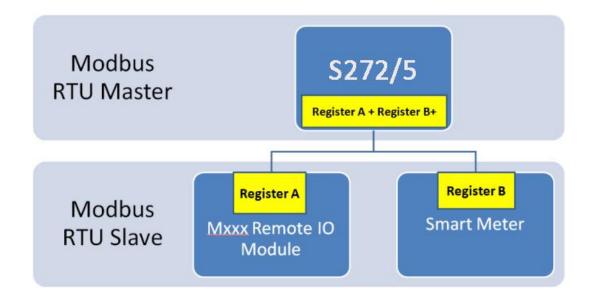
GSM/SMS/GPRS/3G/4G Cellular Iot Modbus Rtu

| 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 | | | | |
| | | | | |
| | | | | |
| | | | | |



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

| 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.

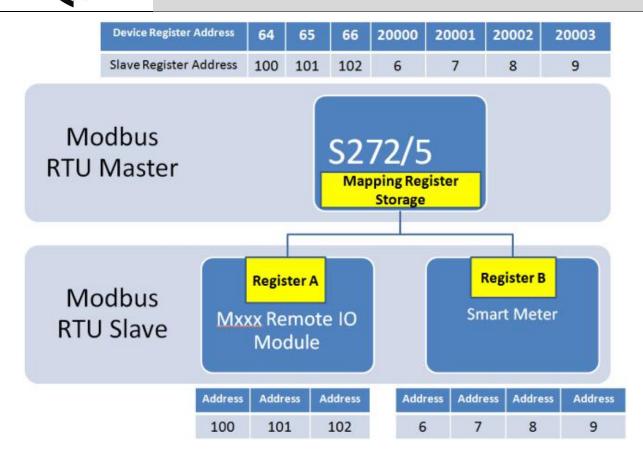
The example of Mapping Register as below:

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.



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



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.

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

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 | | |
| Historical Record Add the following ac DIN0 Status DIN1 Status DIN2 Status DIN2 Status DIN3 Status DIN4 Status DIN5 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 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 | 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 | | |

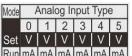
(2) Under "Number Settings" page, write authorize number and tick the times needed. For example, if need power on, external power off/recovery SMS, then tick and write as below:



(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:

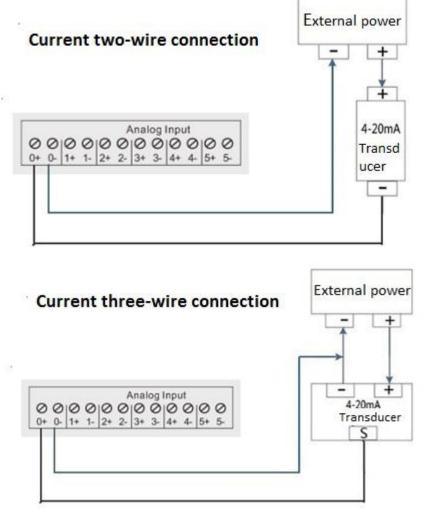
If AINO need to connect a temperature transducer, transducer output 4~20mA signal, measurement range: -40~100 $^{\circ}$ C, when temperature last 2 seconds higher than 35 $^{\circ}$ C need to alarm, last 2 seconds lower than 20 $^{\circ}$ C also need a alarm, then set as below:



(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:





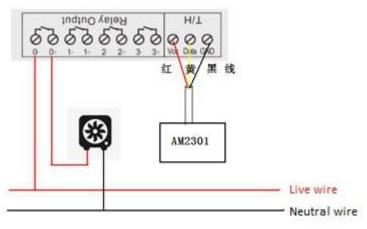
(8) Switch the device on, then device enter into working mode.

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;

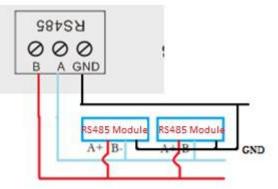
(2) According to M100 user manual, set port Baud Rate and device ID as below:

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.

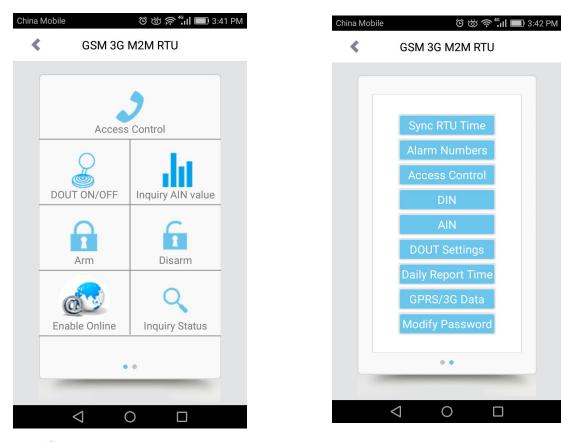
The Android APP search "M2M RTU" or click to download link: http://nc-apk.wdjcdn.com/9/c8/1fd8e70a8634e9b4763a6a7114888c89.apk

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

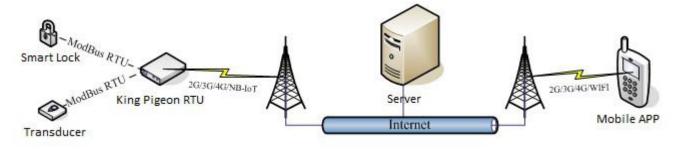
| SMS Command | Return SMS Content | | | | | |
|--------------------------------------|-------------------------------|--|--|--|--|--|
| password+HISDEL | Delete all historical records | | | | | |
| 17)Clear/Inauiry Pulse Counter Value | | | | | | |

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

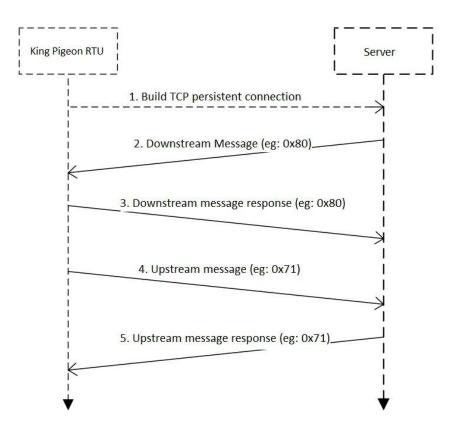


After TCP long connection, send definition 【Login Message】 for login verify data to server



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 | |

KING PIGEON

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

| | | | 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:

KING PIGEON

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

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 |

KING PIGEON

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

| | | | 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.

🌻 мотт

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

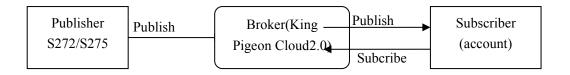
KING PIGEON



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

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)

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

```
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

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

(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