

Supports Remotely Online measuring power consumption.

Overload/Phase loss alert by SMS.

Supports Modbus TCP, can integrate to SCADA, HMI, DSC directly

GSM/SMS/GPRS/3G/4G/Ethernet Cellular Electricity Power IoT RTU (3P3W and 3P4W Power Monitoring)



KING PIGEON



S257 User Manual

Ver 1.0

Date Issued: 2018-10-25

King Pigeon Hi-Tech. Co., Ltd.

www.GPRS-M2M.com

Measure Items: Phase voltage, current, active power, re-active power, apparent power, power factor, frequency, active power, reactive power, active energy, re-active energy.

Safety Monitoring: Phase loss or recovery, Overload or exceed pre-set value, fall down, burglar proof, oil level or temperature.

Cellular Electricity Power IOT RTU S257



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12. Warranty

This handbook has been designed as a guide to the installation and operation of S257 GSM/SMS/GPRS/3G/4G Cellular Electricity IoT RTU.

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

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

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【UPGRADE HISTORY】

DATE	CONFIGURATOR VERSION	FIRMWARE VERSION	HARDWARE VERSION	DESCRIPTION
2018.10.25	V3.0	V25	V1.3	The first version V1.0

Model List

Model	Description	DIN	AIN/PT100	Relay	TH	Measure Range	Port
S251	Cellular Single Phase Electric Measuring RTU	4	×	2	1	Default: 260VAC, 5A; Optional:100V, 450V, 1A, 20A, 50A, 100A.	GSM/GPRS/3G/4G/USB/Ethernet
S252	Cellular Single Phase Electric Measuring RTU (LED Display)	4	×	2	1	Default: 260VAC, 5A; Optional:110V, 2.5A, 10A, 15A, 20A, 30A.	
S253	Cellular 3-Phase Electric Measuring RTU (3P3W,3P4W, for Transformer)	4	4	2	1	Default: 500VAC, 10A; Optional:5A	
S254	Cellular BTS Electric Measuring RTU(separately measure the diesel generator power and electricity power parameters)	4	×	2	1	Default: 260VAC, 5A; Optional:70V,120V,450V, 1A	
S255	Cellular 2-Channel DC Electric Measuring RTU (LED Display)	4	×	2	1	Default: 60VDC, 100A; Optional:100V,260V,450V,500V, 5A,20A,50A	
S256	Cellular 5-Channel DC Electric Measuring RTU (LED Display)	4	×	2	1	Default: 60VDC, 100A; Optional:100V,260V,450V,500V, 5A,20A,50A	
S257	Cellular Electricity Power IoT RTU	2	×	2	1	AC100~400V,default 5A, other current range is optional	GSM/GPRS/3G/4G/NB-IoT/USB/RS485/Ethernet



Notice

1. Default version is GSM/GPRS module and Ethernet Module inside.
2. For 3G WCDMA, 4G LTE, NB-IoT version, please tell our sales where would you like to use them.
3. The S25x are powerful to extend additional I/O or meters, please contact us if you have special requirements.
4. If the measurement ranges are exceed the default and optional range, then should plus PT and CT.



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Cellular Electricity Power IOT RTU S257

➤ 1. Brief introduction



The Cellular Electricity Power IoT RTU is special designed for IOT Based Real Time Distribution Transformer Monitoring System(DTMS) and Electricity power monitoring system using Internet of Things (IoT), all monitoring parameters are processed and if any abnormality occurs, e.g.: overload or loss phase or exceed the pre-set value, it will alert by SMS, Voice call, Cloud, APP, Web Server, SCADA, HMI, DSC and recorded in system memory immediately.

The Cellular Electricity Power IoT RTU is special using for remote monitoring 100~400VAC of 3-Phase electricity power distribution safety and measurement, can measuring the 3-phase 3-wire, 3-phase 4-wire distribution power voltage, current, factor, watts, frequency, apparent power, active power, reactive power, active energy, reactive energy. Also, it provides Dual SIM, 2 digital inputs, 2 relay outputs, 1 ambient sensor input for monitoring onsite temperature and humidity, also 1 RS485 for extend I/O to monitoring oil level and temperature or read meters.

The Cellular Electricity Power IoT RTU is an industrial class, high reliability, high stability, and programmable Remote Terminal Unit (RTU). It embedded 32-Bit High Performance Microprocessor MCU, integrated special measurement chip and inbuilt industrial Cellular module(GSM/GPRS/3G/4G). It provides 1 RJ45 Ethernet port for connecting the internet over cables.

The Cellular Electricity Power IoT RTU also can monitoring and operates the I/O ports by SMS, APP, Web Server, internet, timers and programmed inter-lock events automatically.

The Cellular Electricity Power IoT RTU inbuilt TCP/IP protocol stack over cellular network or Ethernet to 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.

Typically Applications:

- IOT Based Real Time Distribution Transformer Monitoring System (DTMS)
- Power Distribution measurement and remote monitoring system
- Online Real Time Distribution Transformer Health Monitoring System (DTMS)

➤ 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

Power IoT RTU(3P3W and 3P4W,optional) X1; Micro USB X1; User Manual X1; PC Configurator X1 .

Note: The package does not include any SIM card.

Optional: AM230X temperature and humidity sensor



➤ 4. Mainly Features

4.1 Features

- Can be operated from anywhere, no distance limitation;
- Quad band 850/900/1800/1900Mhz, Dual SIM and GSM GPRS Module inside.
- 2G/3G/4G Modules are optional, LCD Display is optional;
- Modular design, can easily upgrade the cellular module if network upgrade;
- Embedded ARM® Cortex™-M4 32 Bit RISC Core, 168 MHz inside, RTOS system, reliable performance with anti-jamming and in-built watchdog;
- High isolate voltage, current and voltage input signal isolated by accuracy transformer, afford arrive DC2500V;
- Support dual SIM, SIM 2 back up to avoid missing SMS or call.
- Working Voltage: 60~500VAC or 70~800VDC;
- 3-phase 3 wires or 4 wires power parameter measurement, include voltage, current, factor, watts, frequency, apparent power, active power, reactive power, active energy, reactive energy, phase loss;
- Measurement range: AC100~400VAC, current range: 5A, other range should use CT;
- 2 digital inputs, compatibles dry and wet contact, 2 relay output (5A/30VDC, 5A/250VAC), compatibles pulse outputs;
- 1 ambient sensor input for monitoring onsite temperature and humidity;
- 1 RS485 port, supports Modbus RTU Master and Slave, can be used to extend I/O ports or meters;
- Provides 1 channel DC power source output for external device, saving wiring cost;
- Each parameter can setup threshold, when exceed or recovery will alarm immediately;
- Can monitoring phase loss, when occurs will alarm immediately;
- Inbuilt inter-lock logic programmer and powerful timer program function;
- Resend the data while communication failure and alert to users by SMS;
- Inbuilt TCP/IP protocol stack, supports cloud, APP and web server applications.
- Supports Modbus TCP, Modbus RTU protocol and transparent transmission, can be used as master and slaves, can integrate to SCADA, HMI, DSC directly.
- Supports USB setting, reading, records inquiry and firmware upgrade;
- Supports 100000 historical records for checking;
- Integrated 1 Industrial 10/100M adaptive Ethernet module inside, supports Modbus TCP;



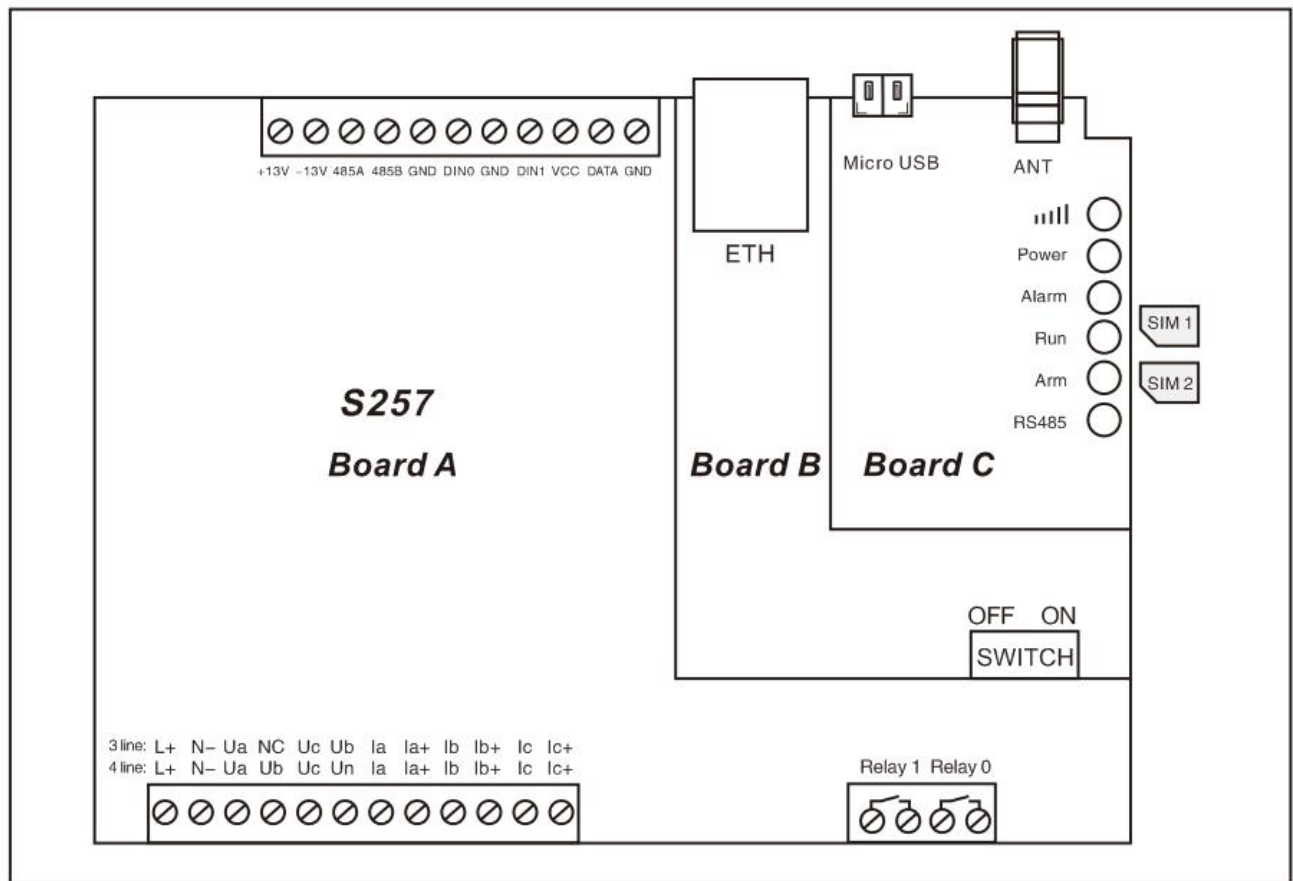
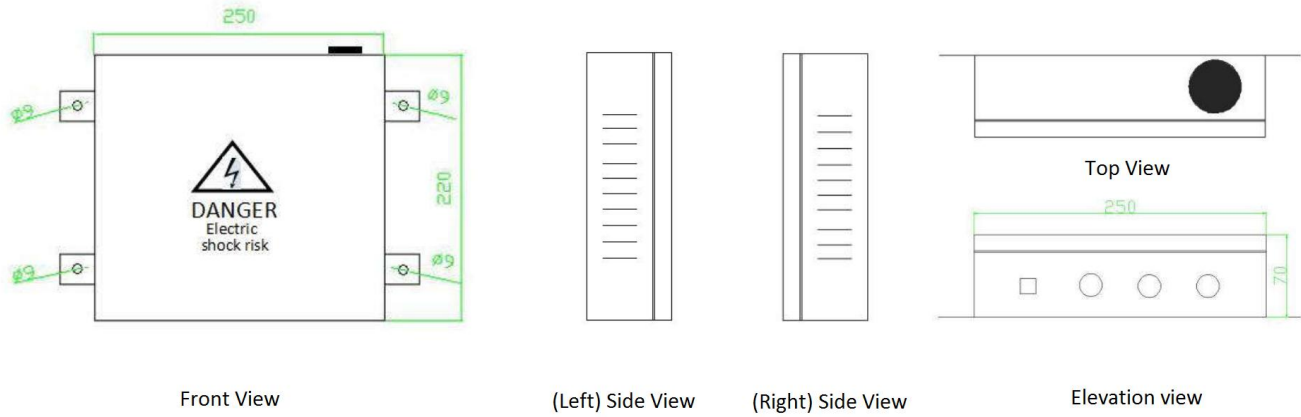
- Supports SMS Alert when overload, I/O triggered or recovery, and external power lost or recovery;
- Up to 10 SMS Alert and dial numbers, can program to receive specified alarm message.
- Inbuilt large capacity automatically rechargeable backup battery;
- Industrial class design suitable for long time work applications;
- using metal shell, protection class IP67. Metal shell and system security isolation, especially suitable for industrial applications in the field;
- L250 * W220 * H70mm, weatherproof metal enclosure.

4. 2 Specifications

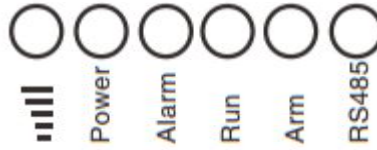
Item	Reference Scope
Power supply	60~500VAC/80~700VDC
Power consumption	≤5VA
GSM Frequency	850/900/1800/1900Mhz
2G/3G/4G	Optional: WCDMA/TDD-LTE/FDD-LTE
TCP/IP stack	TCP,UDP
SIM interface	Supporting 3V SIM Card, Dual SIM
External antenna	SMA Antenna interface, 50 Ohm, Gain: 3dB
USB	1 USB Port can be used for configuring and export records.
Ethernet	1 Industrial 10/100M adaptive Ethernet module inside, supports Modbus TCP.
RS485	1 RS485 port reserved supports Modbus RTU Master to extend I/O or Meters.
Protocols	SMS, GPRS UDP, TCP, Modbus RTU, Modbus TCP, transparent transmission and more equipment protocols can be added according to requirements.
Measure Range	AC100~400V, 1A(5)A, other current should use CT.
Measure Parameters	ABC: phase voltage, current, active power, re-active power, apparent power, power factor, frequency, active power, reactive power, active energy, re-active energy. Total: active power, re-active power, apparent power, power factor, active power, reactive power, active energy, re-active energy. Safety: Phase loss or recovery, Overload or exceed pre-set value, temperature and humidity.
Precision	Current Voltage: ±0.5%FS, Power:±1%FS,Active Energy: ±1.0, Re-Active Energy: ±2.0, Frequency: ±0.05Hz
Digital Inputs	2 Digital input, NC/NO type;
Temp.&Hum Inputs	Temperature range: -40°C to +80°C, Humidity Range: 0~100%RH;
Relay Outputs	2, Rated: 5A/30VDC,5A/250VAC
Memory Capacity	100000 historical data and events.
Power output	1* 13V DC output
Backup Battery	3.7V 900mAH
Temperature range	-25-+60 °C
Humidity range	Relative humidity 95% (condensation free)
Exterior dimension	250mm*220mm*70mm
Net Weight	1500g


➤ 5. Physical Layout and Installation Diagram

5. 1 IoT RTU Unit size(mm) and physical layout



LED Indicator Definition



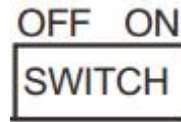
	Cellular network indicator. When 2G register network, off 2 seconds, on 0.5s and so on; When 3G 4G register network, on 2s, off 0.5s...Flicks quickly means register network or data transmission.
Power	RTU status indicator, LED ON when switched RTU on..
Alarm	Alarm Indicator, alarm will ON. Normally is OFF;
Run	RTU running status indicator, ON or OFF stands for RTU halted, flicks slowly stands for RTU running.
Arm	Arm/Disarmed Indicator, Arm is ON, disarmed is OFF.
RS485	When transmitting data by RS485, the LED will flick, otherwise, it is off.

SIM Card Definition



SIM Card	For SIM Card Installation, dual SIM, only supports 1.8V/3V SIM Card
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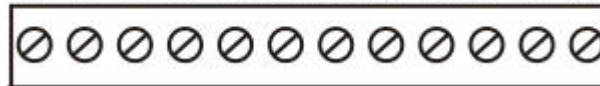
Power Switch Definition



Power switch	For switch ON or OFF the RTU
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Power Connector Definition

3 line: L+ N- Ua NC Uc Ub Ia Ia+ Ib Ib+ Ic Ic+
 4 line: L+ N- Ua Ub Uc Un Ia Ia+ Ib Ib+ Ic Ic+



Connector	Three phase four wire	Three phase three wire
L+	Power supply live wire	Power supply live wire
N-	Power supply null wire	Power supply null wire
UA	Phase A voltage	Phase A voltage
UB/NC	Phase B voltage	Reserved
UC	Phase C voltage	Phase C voltage
UN/UB	Null connector	Phase B voltage
IA	Phase A current output	Phase A current output
IA+	Phase A current input	Phase A current input
IB	Phase B current output	Phase B current output
IB+	Phase B current input	Phase B current input
IC	Phase C current output	Phase C current output
IC+	Phase C current input	Phase C current input

DC/RS485/DIN/TH Definition



+13V -13V 485A 485B GND DIN0 GND DIN1 VCC DATA GND

13V+	13V DC output, positive electrode.
-------------	------------------------------------



13V-	13V DC output, negative electrode.
RS485A	RS485 A port
RS485B	RS485 B port
GND	GND for digital inputs, negative electrode.
DINO	Digital input 0, positive electrode.
GND	GND for digital inputs, negative electrode.
DIN1	Digital input 1, positive electrode.
VCC	Temperature and Humidity Power
DATA	Temperature and Humidity Data
GND	GND, negative electrode.
Temperature & Humidity sensor AM230x input. Measurement Range: Temperature: -40°C to +80°C, Humidity: 0~100%RH.	
Ethernet Port Connector Definition	
ETH	RJ45 Ethernet port for connecting the internet
ATN Port Connector Definition	
ATN	GSM/3G/4G Antenna connector, 50Ohm, SMA male.
USB Port Connector Definition	
USB	USB port, for PC configuration and upgrading firmware and exporting historical data;

➤ 6. Settings & Operation

The Cellular Electricity Power IoT RTU is user-friendly design. The user can setup it or export historic data by the PC Configuration, and upgrade firmware by USB port. The Cellular Electricity Power IoT RTU also can be configured some basically parameters by SMS Commands, please refer to SMS Command 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 S257 page directly.
- Below is the steps to setup the parameters by PC Configuration, please follow it step by step.

6.1 Start to Configure:

Step1: Install the Configurator

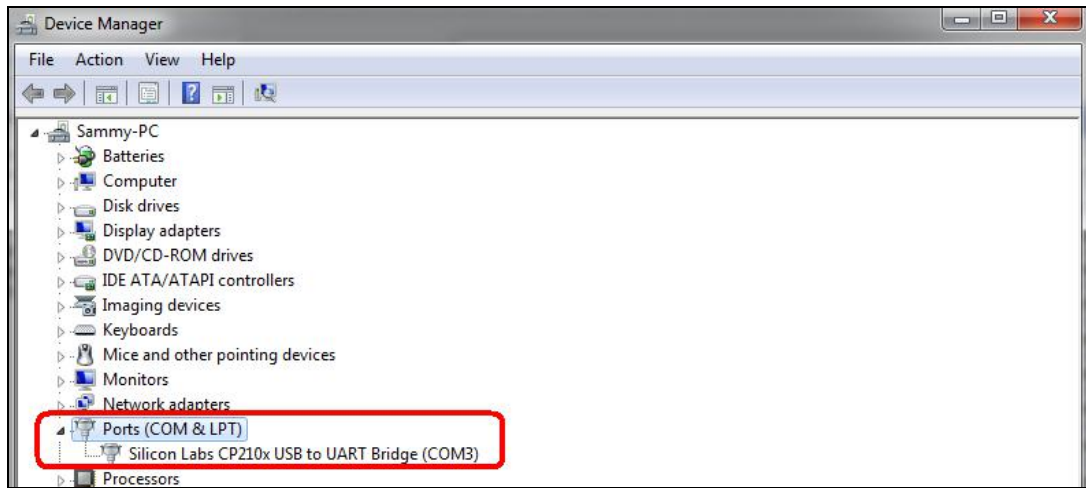
The Configurator in the CD or download from www.GPRS-M2M.com, then installs it on the computer.

Step2: Connection

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

Step3: Install USB Drvier

Install the USB Driver to the computer from the CD (Or download the universal drivers, eg: Drive TheLife) 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. <http://www.silabs.com>, the model is CP210x.

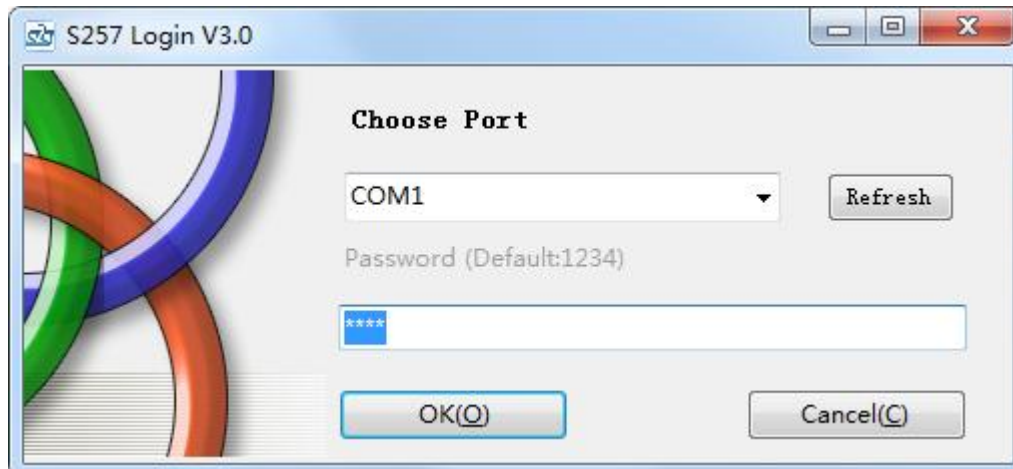


Step4: Run the Configurator (Compatible with Windows XP/7/8/10)

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

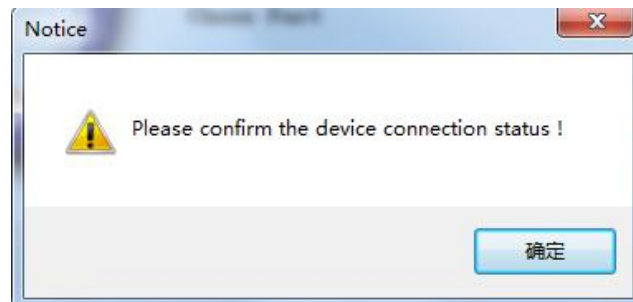


Please click **S257 Cellular Electricity** to run it. Enter the password, default is 1234. Then you can enter the configuration page as below:



Notice:

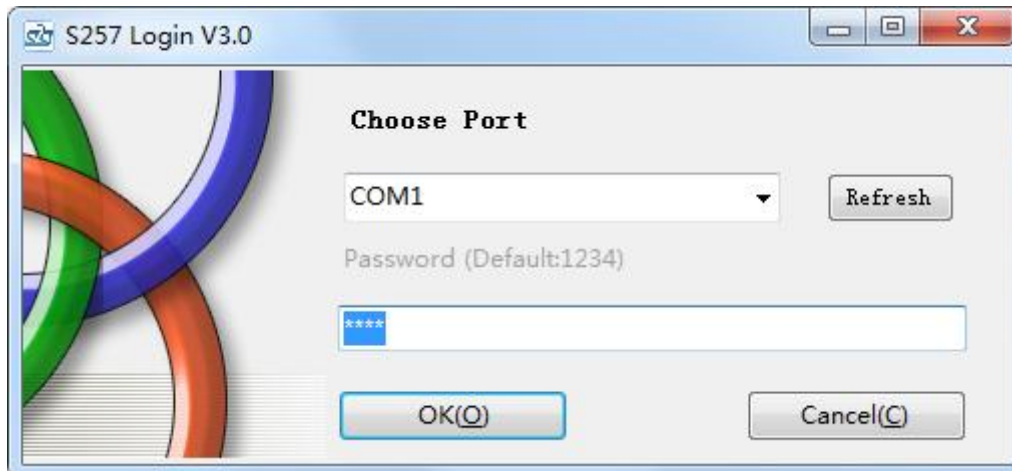
If display the below windows, then means the RTU connect to the PC failure. The reasons are below:



- 1) USB Driver installation failure;
- 2) USB Cable connection is disconnected;
- 3) Power Switch switched off or DC Power Connection is disconnected.

Step5: Choose the correct "COM port" in device manager above, enter the password(default is 1234),click the "OK" to connect and start to program

Details please check the picture as below:



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.

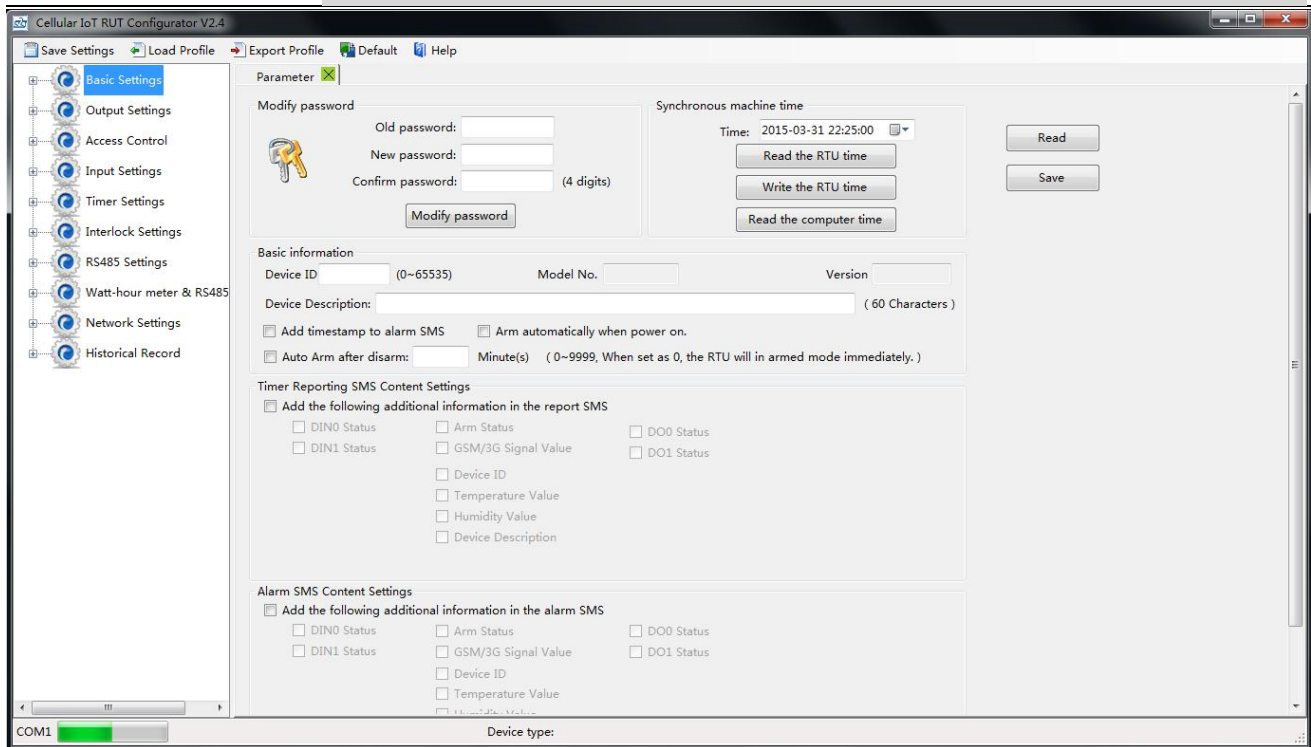
Setting Self-checking

Phenomenon	Possible Reason
Can't enter software	1. USB Driver installation failure; 2. COM Port not correct or USB driver installation failure;
After switching panel on, only Power light on, panel can't work	1. SD card fall out from the slot. Solution: Shake panel to listen if there is voice or not---->If yes, open to check;
Can't find COM Port	1. Have not installed driver; 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".
The device not response the Modbus command	Have not set the device ID. Solution: In setting mode, set device ID---->Save it.
After switching panel on, not running according to parameter setting	After parameter setting, although clicked "Save" in every page, but missed the 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 Electricity Power IoT RTU

Cellular Electricity Power IoT RTU, Distribution Transformer Monitoring System (DTMS), Modbus RTU, Modbus Master, Modbus Slave, Modbus TCP, Arm, Disarm...

Configurator software interface and running



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

Load Profile: Click it to load additional Profile to the PC Configurator;

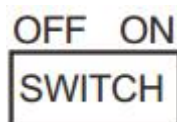
Export Profile: Click it to save the present configuration parameters as a profile for next RTU configuring or backup the parameter settings.

Tips: *The Load Profile and Export Profile 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.*

Default: Click it to recovery the parameters to factory defaults.

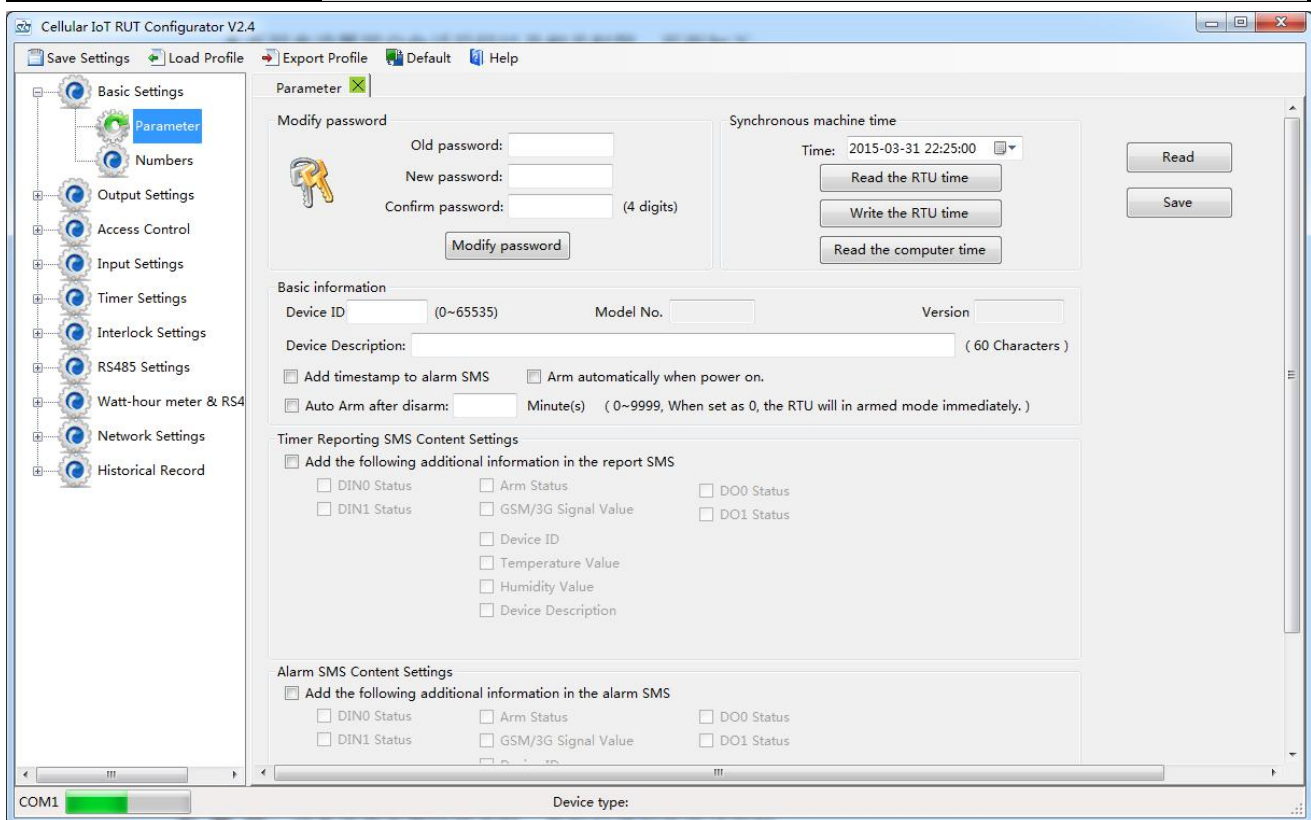
Notice:

1. After setting or revising parameter, need to click the "Save" button of this page, then click "Save Settings" in menu for saving parameters in device
2. Before S257 export profile, 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. Reboot the device, switch the Power Switch to OFF, then switch it to ON, the device will enter into normal running mode after that.



6.2 Basic Settings

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



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

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

Device ID: Non-necessary. This is mainly for monitoring center to identify the RTU; If communicate via Modbus protocol, device ID only can be 1~247.

Device description: This is the description of the RTU, e.g.: installation address, usage instructions and so on.

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

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

Auto Arm after disarmed: Fill the timeout to enter into Armed Mode automatically after disarmed operation. This is useful for security protection applications.

Tips:

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

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

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

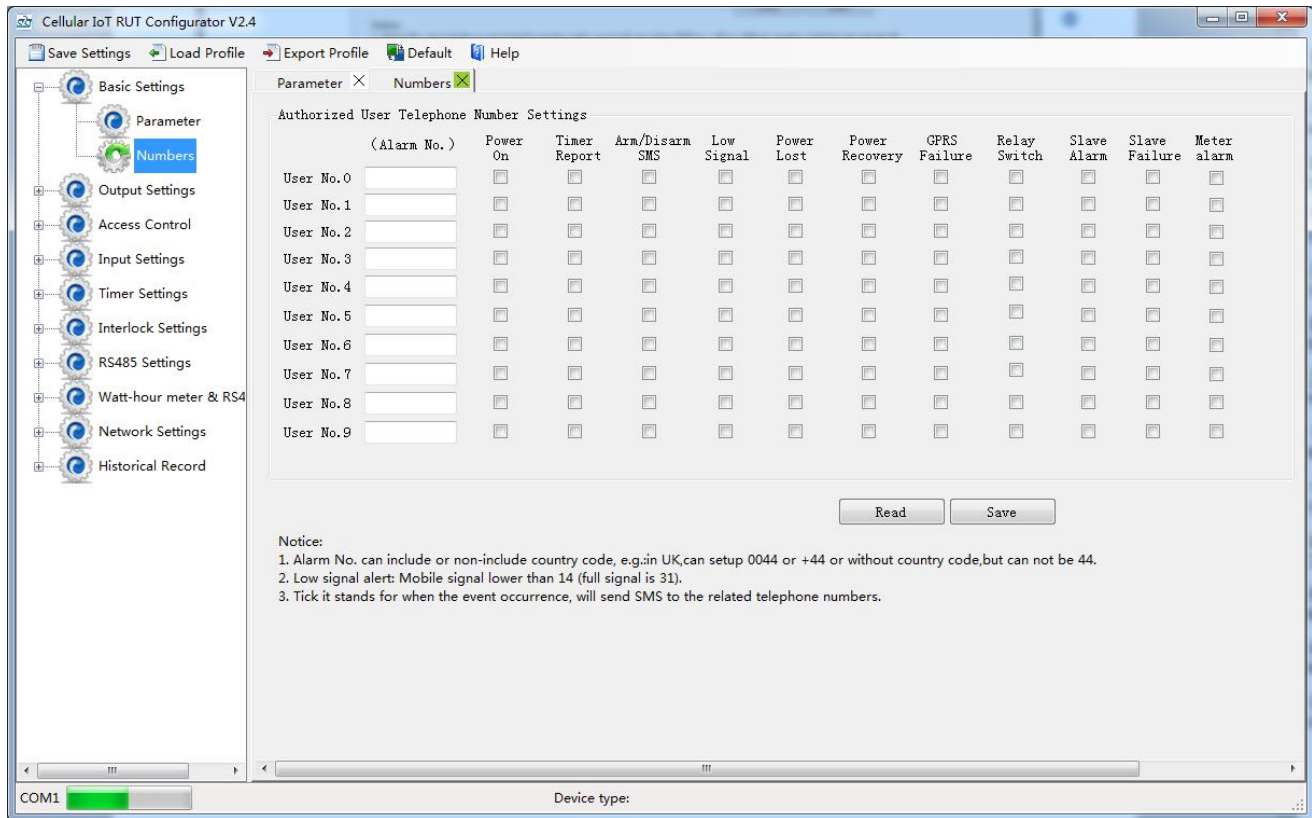
Alarm SMS Content Settings: Ticks the related items to add its value/status to the Alarm SMS Contents.

6.3 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.



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 slave 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.

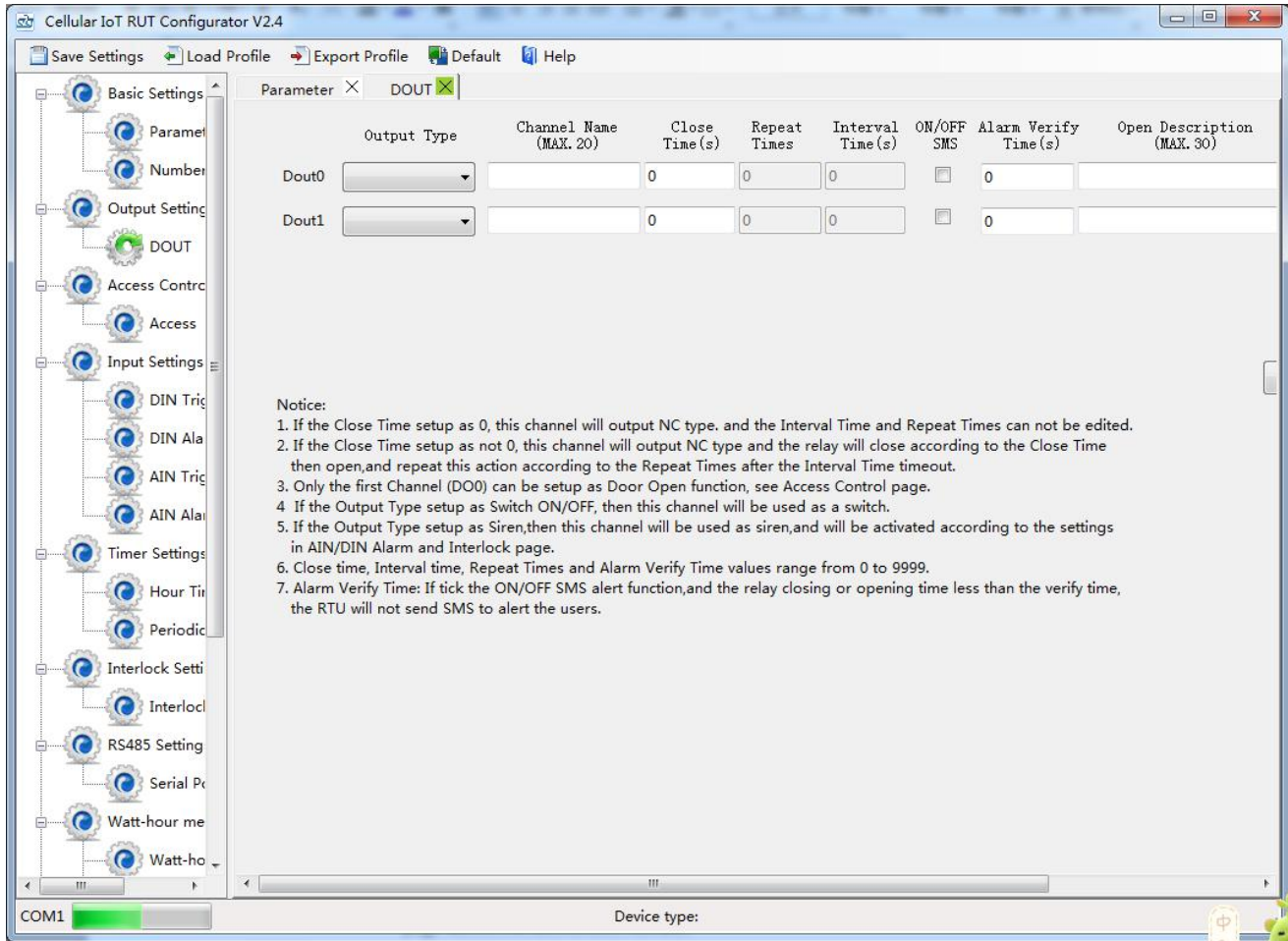
Meter alarm: Tick it stands for while the meter related parameter alarm occurrence will send SMS to this number.

Output Settings

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

Reminder:

DO0,DO1 default Switch ON/OFF.



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

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

Notice:

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

Application:

When RTU installed in generator room, many workers out and in, not convenience and safe for everyone taking keys. This function can authorize the person to remotely control the door and disarm the device within appointed time, avoid fault anti-thief alert. After worker maintenance the generator room, can touch the inside Arm/Disarm switch button to arm device, DIN1 can do this.

- 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;

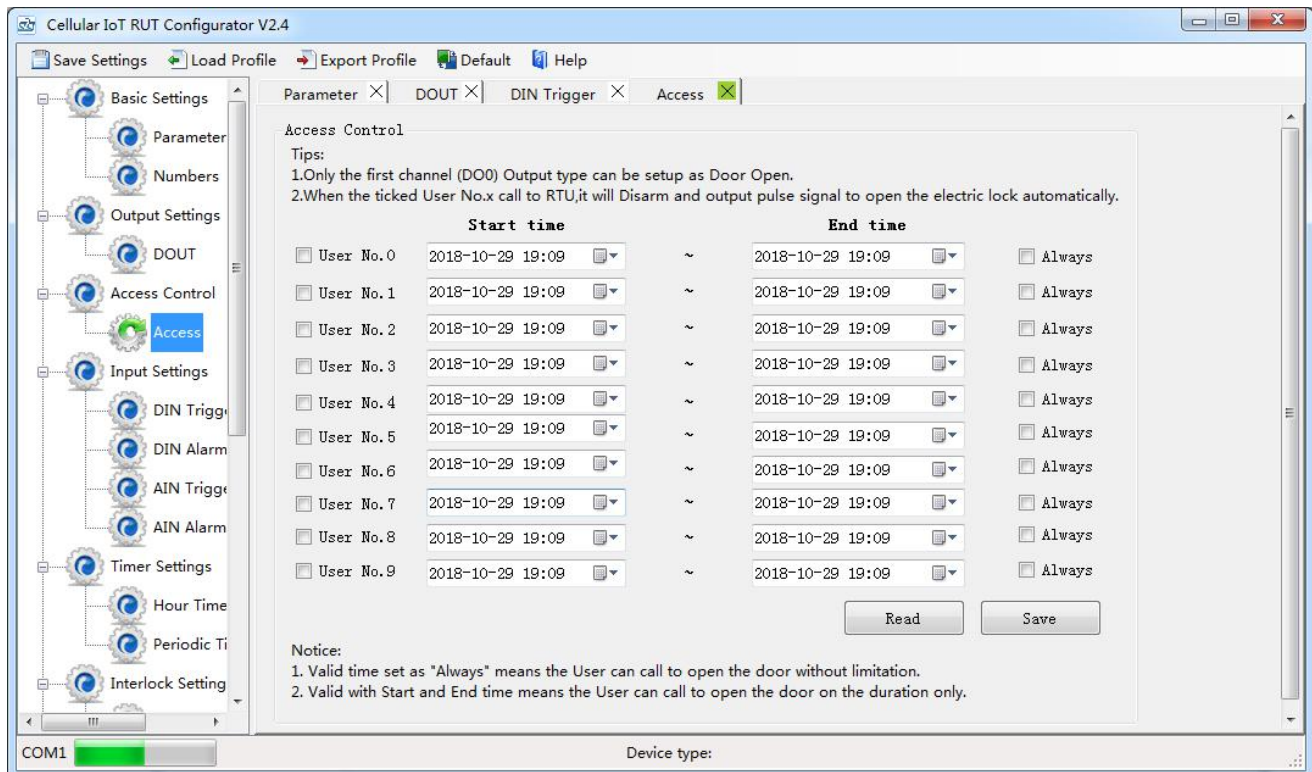
Access Control Settings

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

Only when the output types of the first channel (DO0) setup as **Open Door** can dial to control it.

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

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



Cellular IoT RUT Configurator V2.4

Parameter X | DOUT X | DIN Trigger X | Access X

Access Control

Tips:


1. Only the first channel (DO0) Output type can be setup as Door Open.
2. When the ticked User No.x call to RTU, it will Disarm and output pulse signal to open the electric lock automatically.

	Start time		End time	
<input type="checkbox"/> User No.0	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.1	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.2	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.3	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.4	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.5	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.6	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.7	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.8	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always
<input type="checkbox"/> User No.9	2018-10-29 19:09	~	2018-10-29 19:09	<input type="checkbox"/> Always

Read Save

Notice:

1. Valid time set as "Always" means the User can call to open the door without limitation.
2. Valid with Start and End time means the User can call to open the door on the duration only.

COM1  Device type:

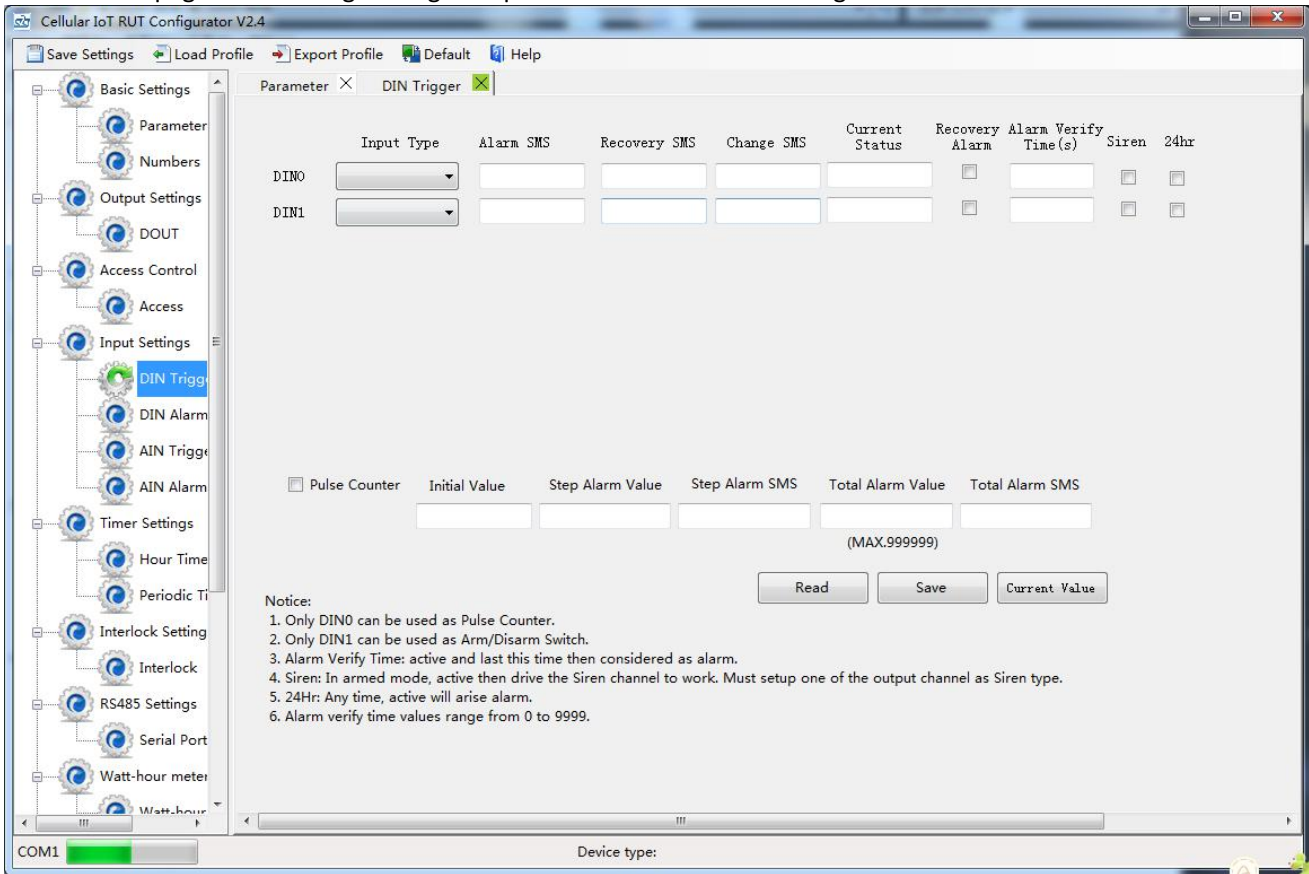
Start Time: Stands for from what time this authorized number can dial in to control it.

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.

DIN Trigger Settings

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



	Input Type	Alarm SMS	Recovery SMS	Change SMS	Current Status	Recovery Alarm	Alarm Verify Time(s)	Siren	24hr
DINO	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
DIN1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

Pulse Counter

Initial Value	Step Alarm Value	Step Alarm SMS	Total Alarm Value	Total Alarm SMS
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

(MAX.999999)

Buttons: Read, Save, Current Value

Notice:

1. Only DINO can be used as Pulse Counter.
2. Only DIN1 can be used as Arm/Disarm Switch.
3. Alarm Verify Time: active and last this time then considered as alarm.
4. Siren: In armed mode, active then drive the Siren channel to work. Must setup one of the output channel as Siren type.
5. 24Hr: Any time, active will arise alarm.
6. Alarm verify time values range from 0 to 9999.

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:** Only the first channel (DINO) can be used as counter. It can be used for pulse counter usage. 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 DIN0 as counter, the value begin to count.

Step Alarm Value: DIN0 as counter, under Arm or 24hr status, when counter value arrive

"Step Alarm Value" will send SMS to authorize number.

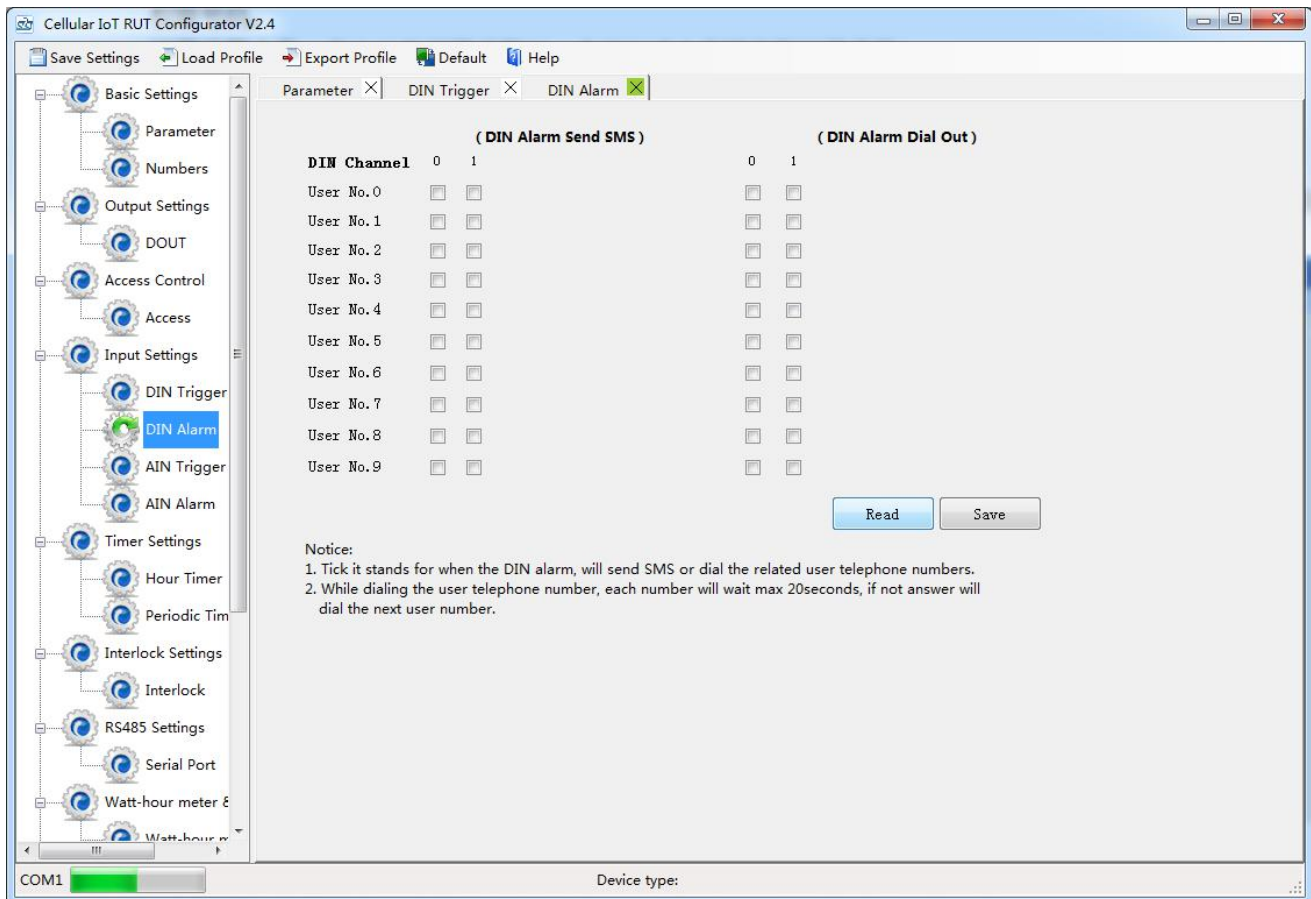
Total Alarm Value: When counter value arrive "Total Alarm Value", will automatically refresh it to "Initial Value". Under Arm or 24hr status, will call and SMS to authorize number.

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.

DIN Alarm Settings

This page is for setup while DIN alarm, send SMS & Dial to which authorized numbers. Tick it stands for enable to send SMS or dial the related authorized number.

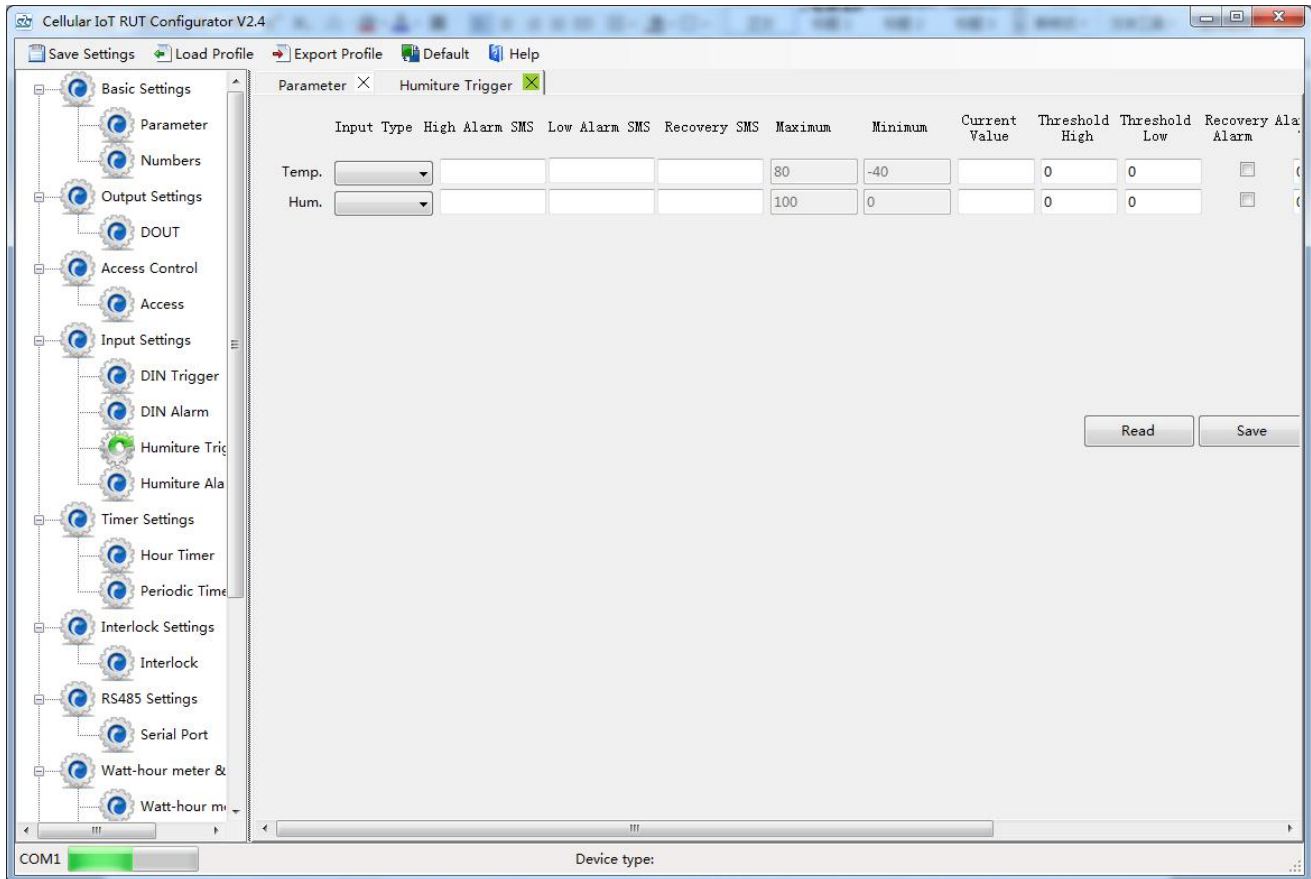
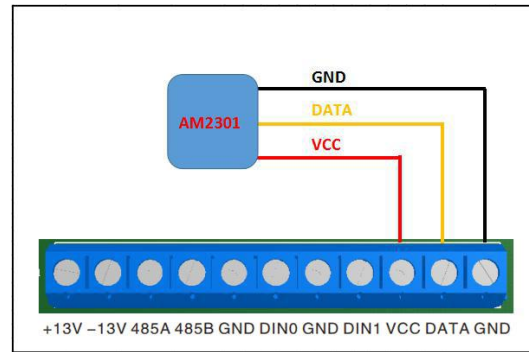
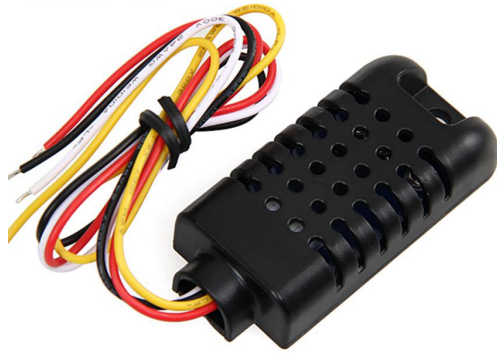


DIN Channel	(DIN Alarm Send SMS)		(DIN Alarm Dial Out)	
	0	1	0	1
User No. 0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User No. 9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notice:
 1. Tick it stands for when the DIN alarm, will send SMS or dial the related user telephone numbers.
 2. While dialing the user telephone number, each number will wait max 20seconds, if not answer will dial the next user number.

Humiture Trigger Settings

This page is to setup the temperature/humidity input alarm conditions t parameter. It can be used for monitoring temperature and humidity, can be connected as below:

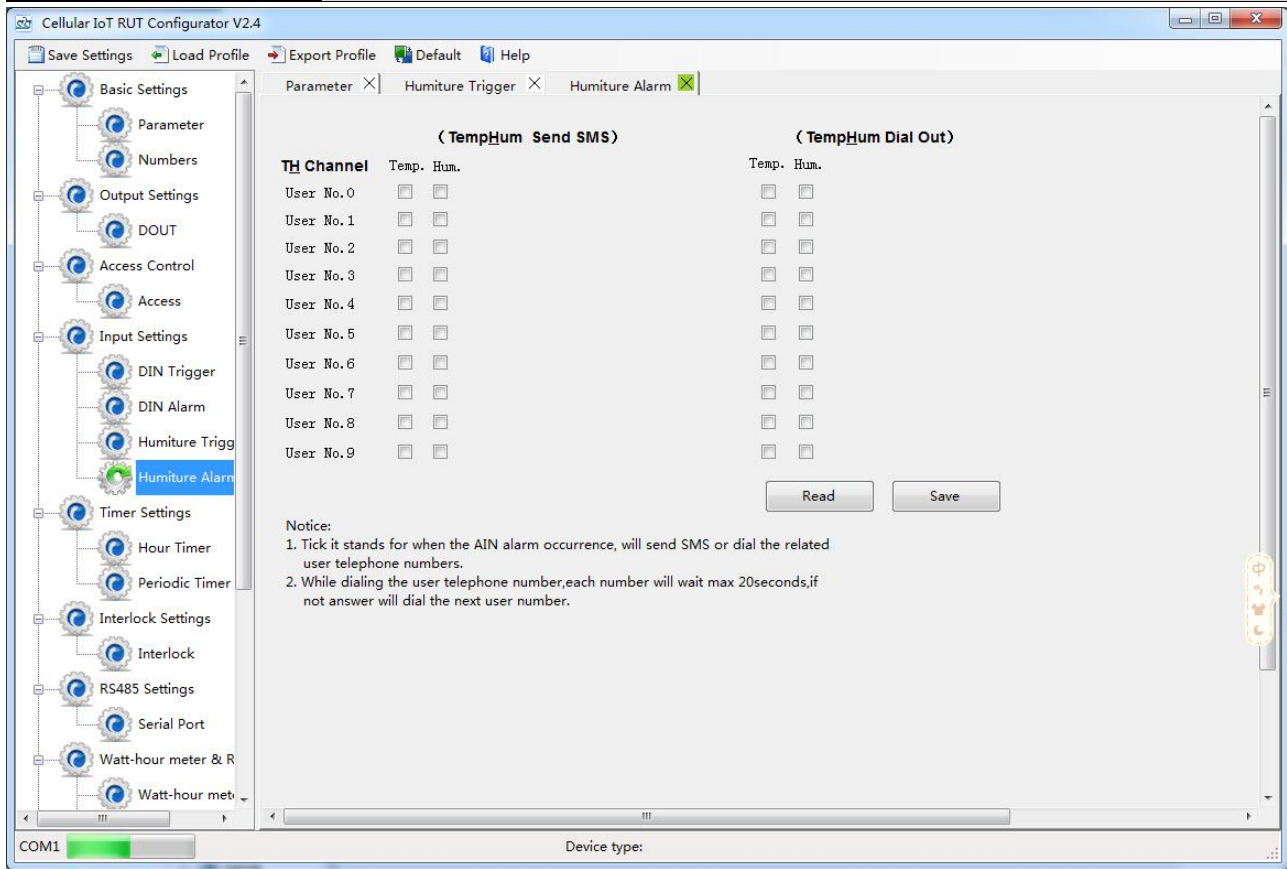


Reminder:

Humiture default Disable.

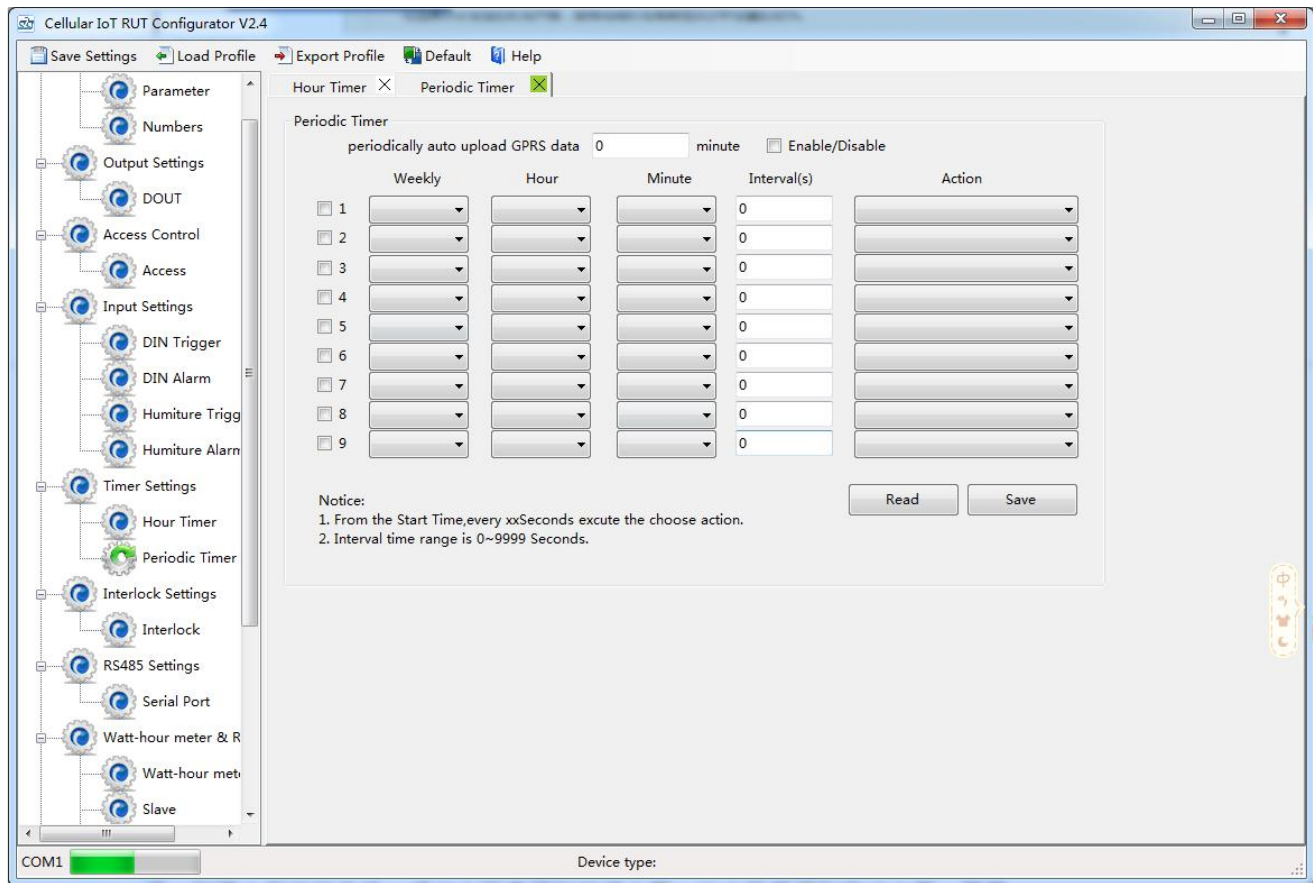
Humiture Alarm Settings

This page is for setup while temperature/humidity alarm, send SMS & Dial to which authorized numbers. Tick it stands for enable to send SMS or dial the related authorized number.



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. Tick it stands for enable this timer event:



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.

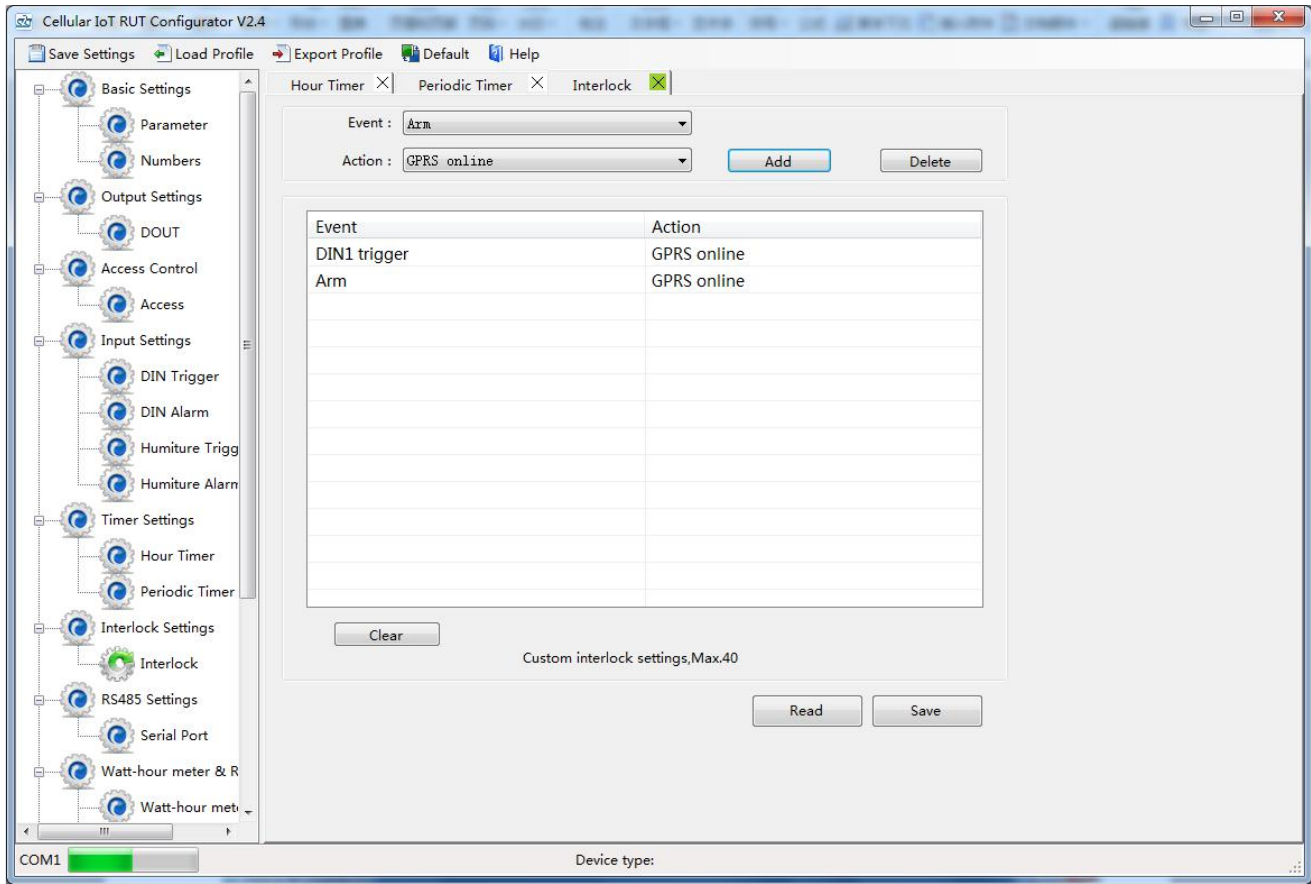
Action: Stands for what action does the RTU should to execute at the specified time.

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.

Interlock Settings

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

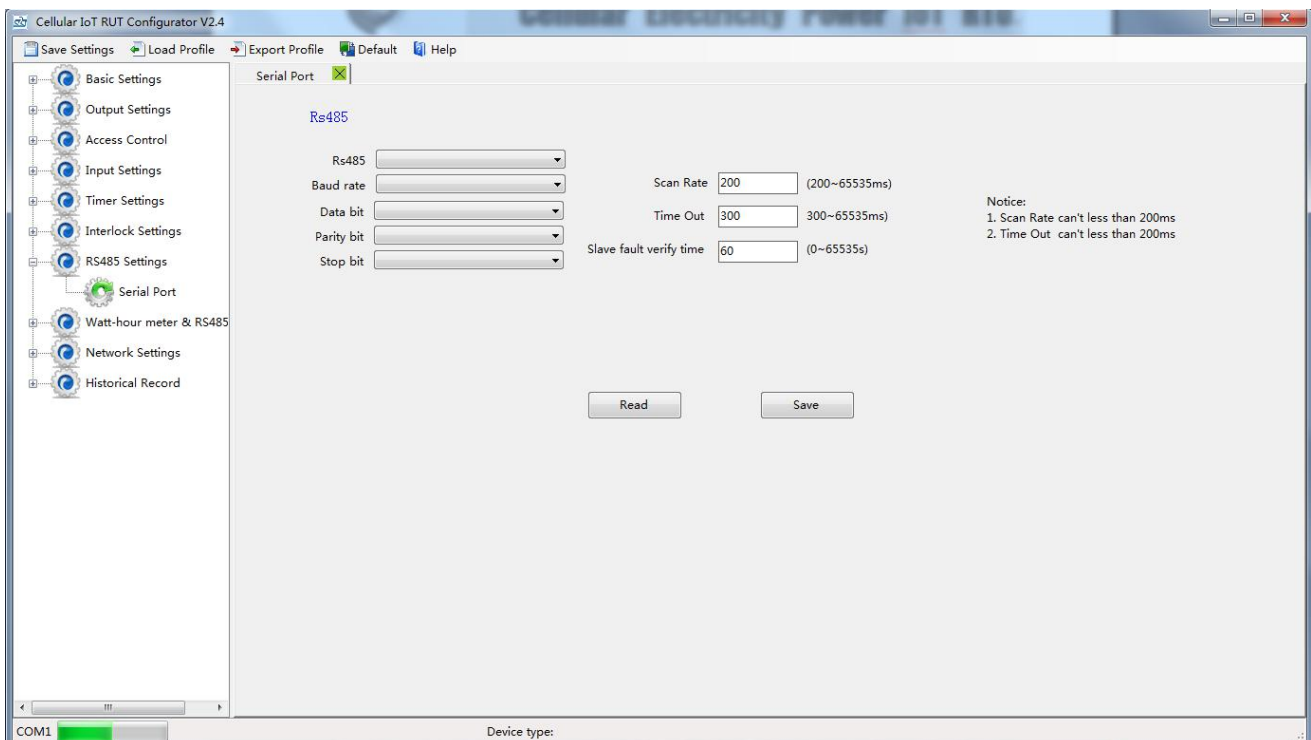


Event: Stands for if this occurrence.

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

RS485 Serial Port Settings

This page is for setup the serial port parameters. Over the RS485, the S257 RTU can be used as Modbus RTU Slave, Modbus RTU Master and transparent transmission.





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.

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

Watt-hour Meter Settings:

This page is for setting and reading the watt-hour meter parameters. It can measure the 3-phase 3-wire, 3-phase 4-wire distribution power voltage, current, factor, watts, frequency, apparent power, active power, reactive power, active energy, reactive energy, all monitoring parameters are processed and if any abnormality occurs, e.g.: overload or loss phase or exceed the pre-set value, it will alert by SMS, Voice call, Cloud, APP, Web Server, SCADA, HMI, DSC and recorded in system memory immediately.

The detail registers address and modbus function code, pls refer to ["S257 Register"] table at manual bottom.

The screenshot shows the 'Watt-hour meter' configuration window in the Cellular IoT RTU Configurator V3.0. The window contains a table with the following columns: Modbus Address, Channel Name, Current Value, Alarm Verify Time, Threshold high, Low Alarm SMS Content, High Alarm SMS Content, Low Alarm SMS Content, Recovery SMS Content, Enable Recovery SMS, Relay0, Relay1, and Enable. The table lists 20 rows of parameters for phases A, B, and C, including total active, reactive, and power values. At the bottom, there are input fields for 'CT' (set to 1) and a checkbox for 'Read the current value periodically'.

Modbus Address	Channel Name	Current Value	Alarm Verify Time	Threshold high	Low Alarm SMS Content	High Alarm SMS Content	Low Alarm SMS Content	Recovery SMS Content	Enable Recovery SMS	Relay0	Relay1	Enable
20128	A Phase C...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20130	B Phase C...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20132	C Phase C...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20134	A Phase V...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20136	B Phase Volt	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20138	C Phase Volt	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20140	Total Act...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20142	Total Re...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20144	Total App...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20146	Frequency	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20148	Total Act...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20150	Total Re...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20152	Total Pow...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20154	A Phase A...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20156	B Phase A...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20158	C Phase A...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20160	A Phase R...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20162	B Phase R...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20164	C Phase R...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20166	A Phase A...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20168	B Phase A...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20170	C Phase A...	0	2	0	0	High Alarm	Low Alarm	Recover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Modbus Address: Stands for the address which Modbus protocol data stored in (Decimal), data type is "32Bit Int".

Channel Name: Stand for meter parameter name, user defined. When alarm, the user defined name (default content if not set) will send to authorize number via SMS.

Current value: Stand for meter parameter's current value.

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



Threshold High: When current value above higher than this value, will send SMS alarm to authorize number. Default 0 will not cause alarm.

Threshold Low: When current value above lower than this value, will send SMS alarm to authorize number. Default 0 will not cause alarm.

High Alarm SMS Content: When threshold high alarm happen, will send user defined content to authorize number. Default: Threshold High Alarm.

Low Alarm SMS Content: When threshold low alarm happen, will send user defined content to authorize number. Default: Threshold Low Alarm.

Recovery SMS Content: When alarm recovery, send user defined content SMS to authorize number. Default: Alarm Recovery (Need to Enable Recovery SMS first).

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

Relay X: X=0~1, abnormal value will alarm-link relative relay.

Enable: Tick it stand for enable alarm function.

Read the current value periodically: Enable will refresh meter current value automatically.

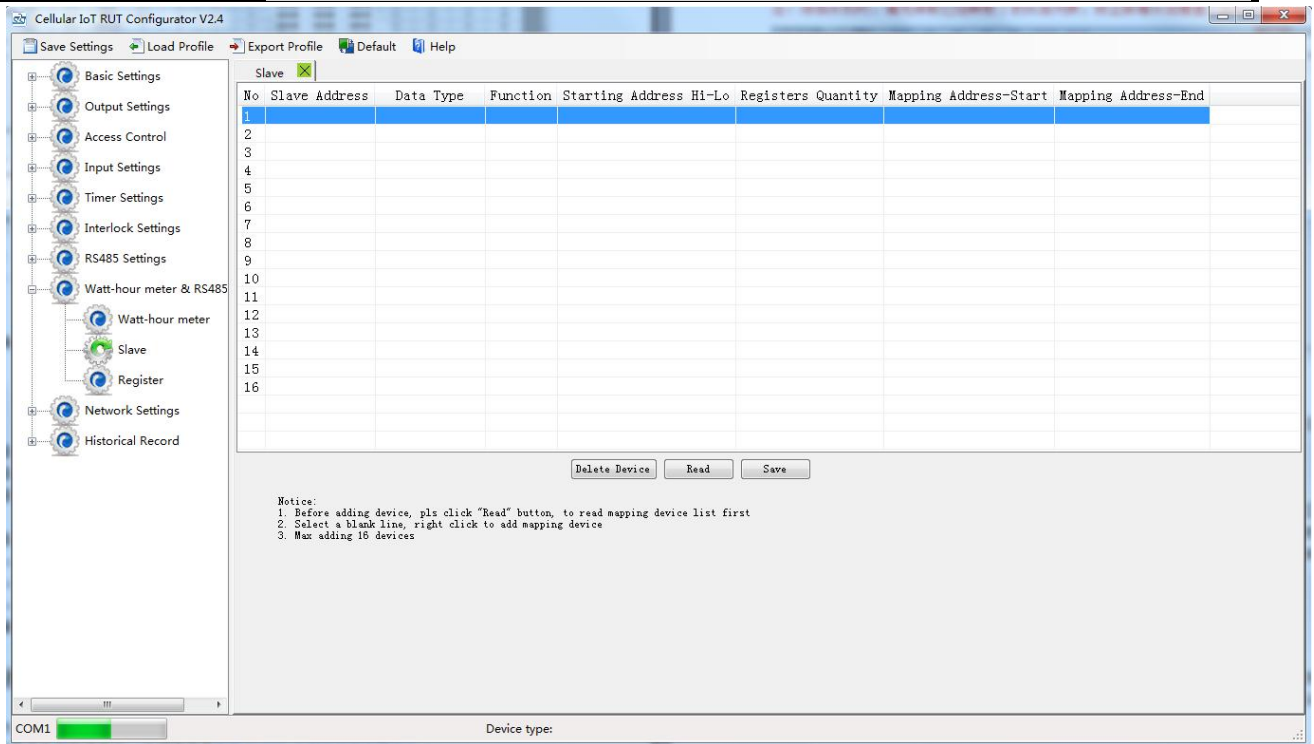


Slave Settings:

When S257 as Modbus RTU Master, can extend 286 I/O tags, registers mapping as below, details Refer to ["S257 Slave Mapping Register Address"] at manual bottom.

Function code	Data Type	Starting Address	Ending Address	Register Quantity
1	Boolean	64	127	64
3	16bit	20000	20127	128
3	32bit	20196	20255	30
3	64bit	20256	20511	64

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



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.

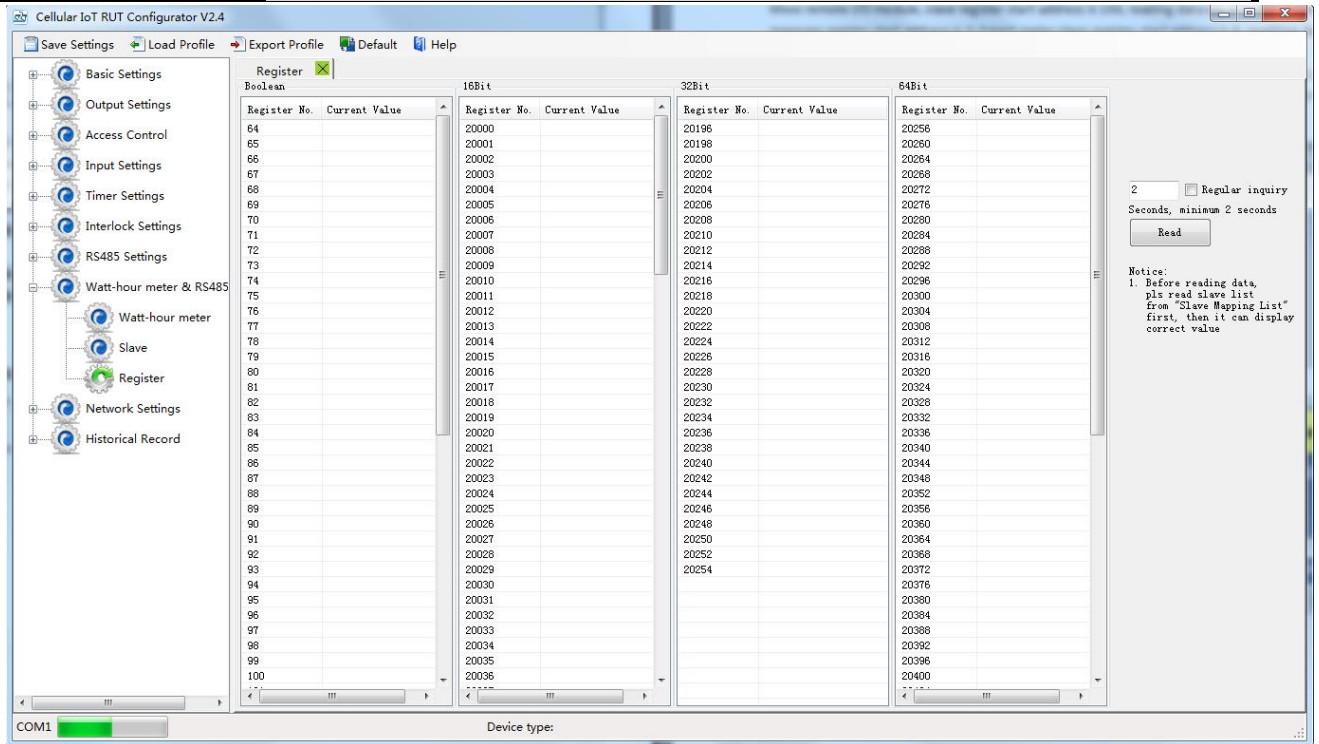


Inquiry Slave Current Value:

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:



6.4 Network Settings

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

- 1) Modbus RTU Protocol, means Modbus RTU over TCP, communication with upper computer system. For example, connect to www.my-m2m.com cloud server. Domain: modbus.dtuip.com, Port: 6651.
- 2) Modbus TCP Protocol, communication with upper computer system. For example, connect to www.my-m2m.com cloud server. Domain: modbus.dtuip.com, Port: 6655.



6.4.1 Cellular Network:

The screenshot shows the 'Cellular IoT RTU Configurator V2.4' software interface. The 'Cellular network' tab is selected in the left sidebar. The main window displays the following configuration options:

- Communication Date: Disable
- Protocol: TCP
- Access Point Name: (Max60)
- GPRS User Name: (Max60)
- GPRS Password: (Max60)
- Server 1 IP/DNS: (Max60)
- Server 2 IP/DNS: (Max60)
- Server Port: 8080 (0-65535)
- Server Port: 8080 (0-65535)
- Server choose ways: Prefer server 1
- server offline or unresponse 3 times, device reconnection time ways: 600 (1-999s)
- Login Message: ASCII (Max60)
- Login ACK Message: ASCII (Max60)
- Logout Message: ASCII (Max60)
- Heartbeat Message: ASCII (Max60)
- Heartbeat ACK Message: ASCII (Max60)
- Heartbeat Interval: 3 (1-9999s)
- No Response Resend Times: 1 (1-9)
- Login Message Strategy: Send Once When Login Server

Buttons: Read, Save

Communication Data: "Disable", "Modbus RTU protocol", "IoT RTU protocol" or "Modbus TCP protocol" optional.

Protocol: TCP or UDP optional.

Access Point Name: APN, GSM operator provide.

GPRS User Name: User Name, GSM operator provide.

GPRS Password: Network password, GSM operator provide.

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

Port: Stands for the server's port.

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

Server Offline 3 times, Reconnection Time: Connecting server fail 3 times, then the interval time of next time reconnecting

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.my-m2m.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".

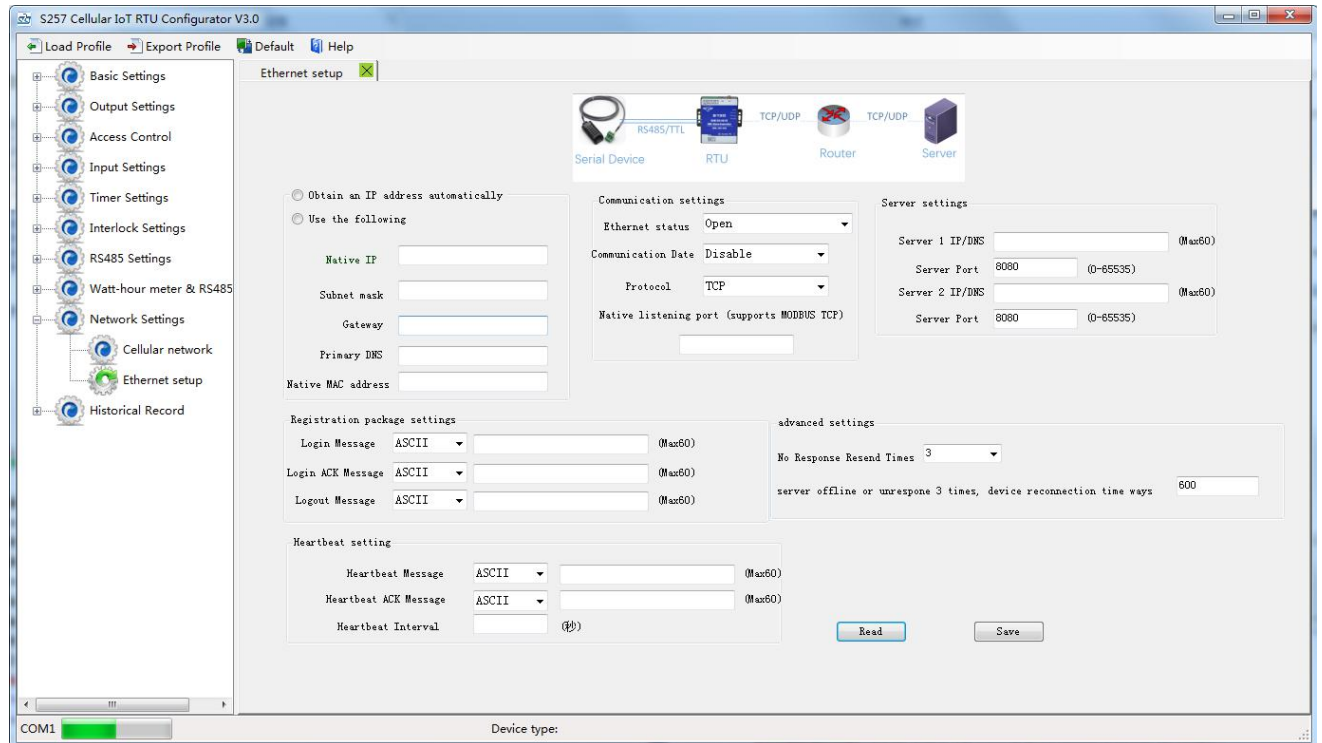
Heartbeat Interval: Network keep online heartbeat interval time.

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.

6.4.2 Ethernet Network:



Obtain IP Address: "Obtain an IP address automatically" and "use the following" can be chosen to obtain IP address, gateway and DNS etc..

Ethernet Status: "Open" or "Close" optional.

Communication Data: "Disable", "IoT RTU protocol", "Modbus RTU protocol" or "Modbus TCP protocol" optional.

Protocol: TCP or UDP optional.

Native Listening Port: Port can be set to listen visitor's data, default 502.

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

Port: Stands for the server's port.

Notice:

The server 1 is main server, server 2 is backup, the main server priority when connect. If connection failure more than 50s, then try to connect the other one, the device Ethernet only connect one server in once time.

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.my-m2m.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.

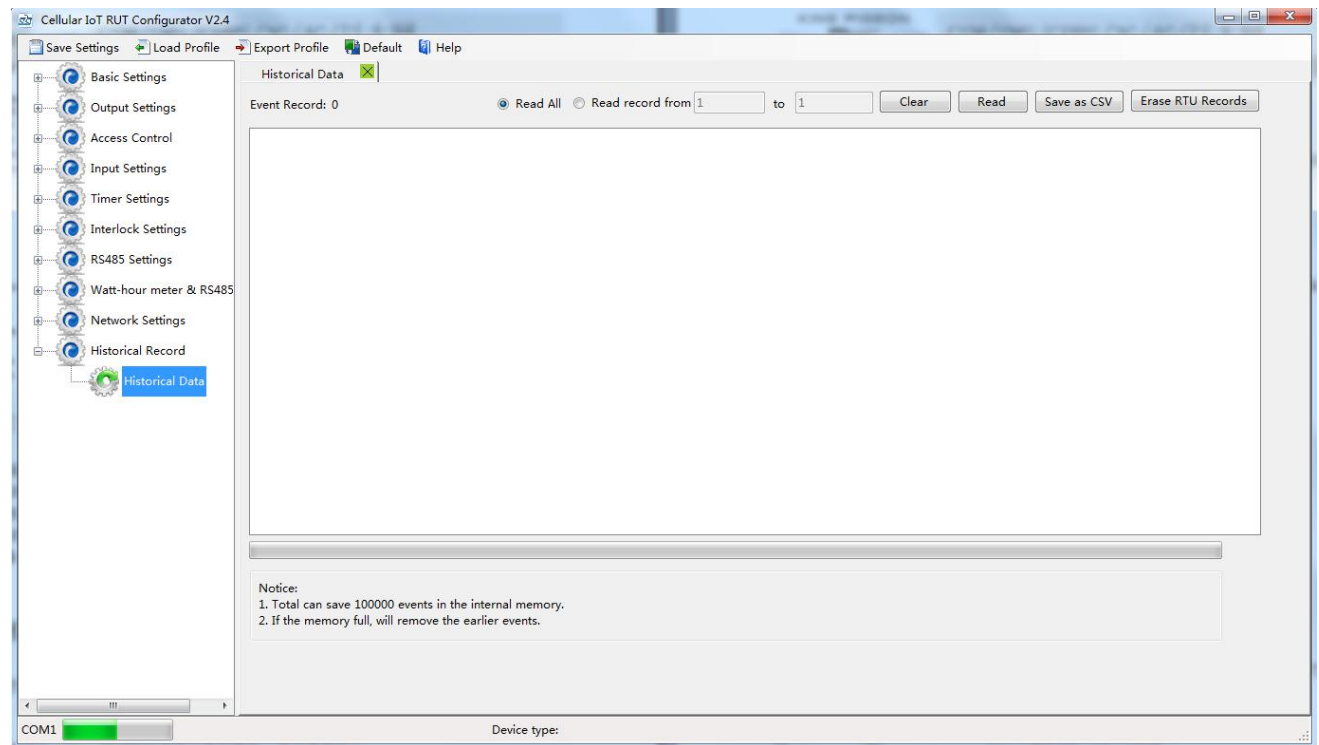
No Response Resend Times: After setting heartbeat and login message, if server no response, the times which server will send data.

Server Offline 3 times, Reconnection time: Connecting server fail 3 times, then the interval time of next time reconnecting.

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.



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.

SMS Command

The user can send SMS commands to setup or operate the device, refer to ["S257 SMS Command"] at bottom, please notice below:

1. Devide password default is 1234, can be set by SMS command;
2. The "PWD" in SMS command means device password, eg: 1234;
3. The "+" in SMS command is not for SMS content, please not add any space or other symbol;



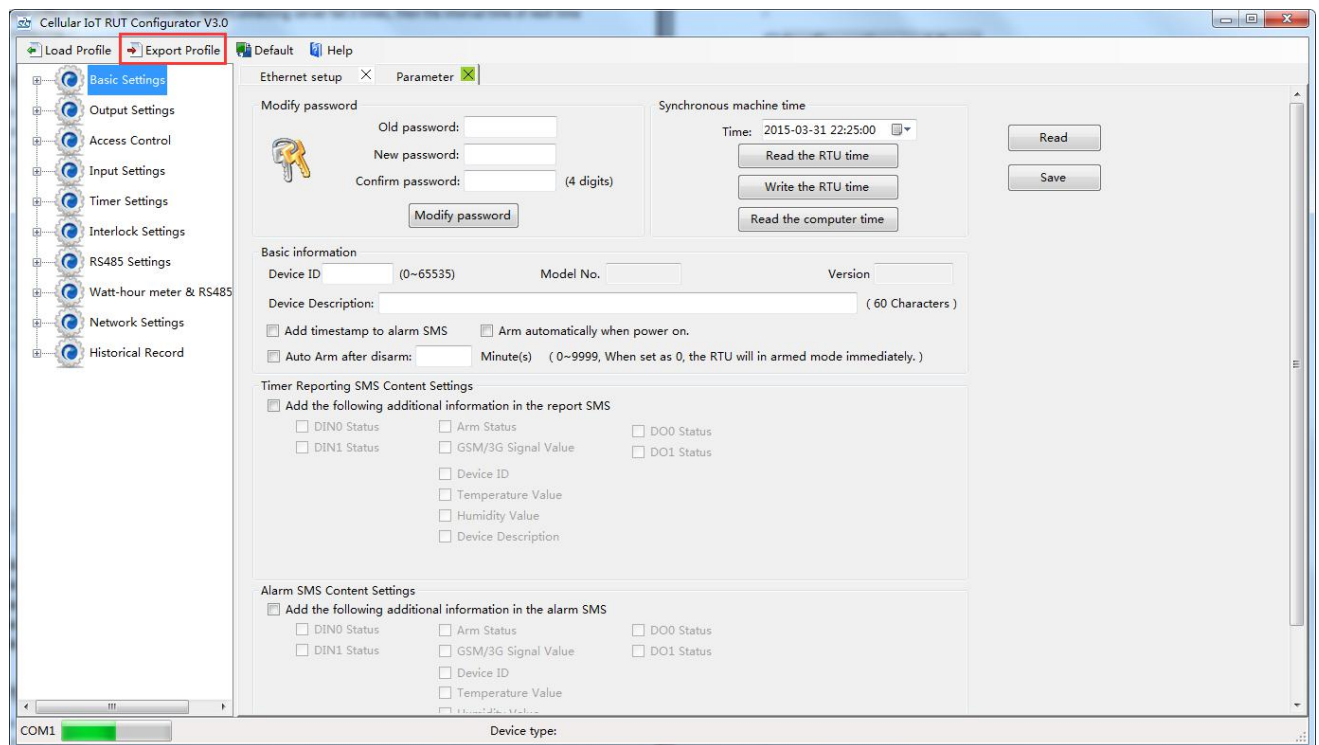
4. Capital letters is necessary for SMS command, eg: "PWD" can't be "pwd";
5. If password correct, but SMS command error, device will return: "SMS Format Error, Please check Caps Lock in Command!";
6. If password error, no returns;
7. Device will return SMS after receiving SMS command, if not, please check if password correct, signal normal or not.

Configuration and Reset

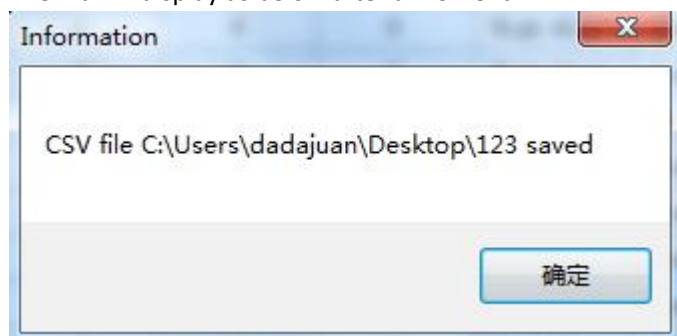
The Load Profile and Export Profile is very useful while you need to program bulks of RTU with similar parameters. The "Default" function can reset the device to factory default status.

Export Profile:

Click "Export Profile" button----> *chose the path and input the name to save.*

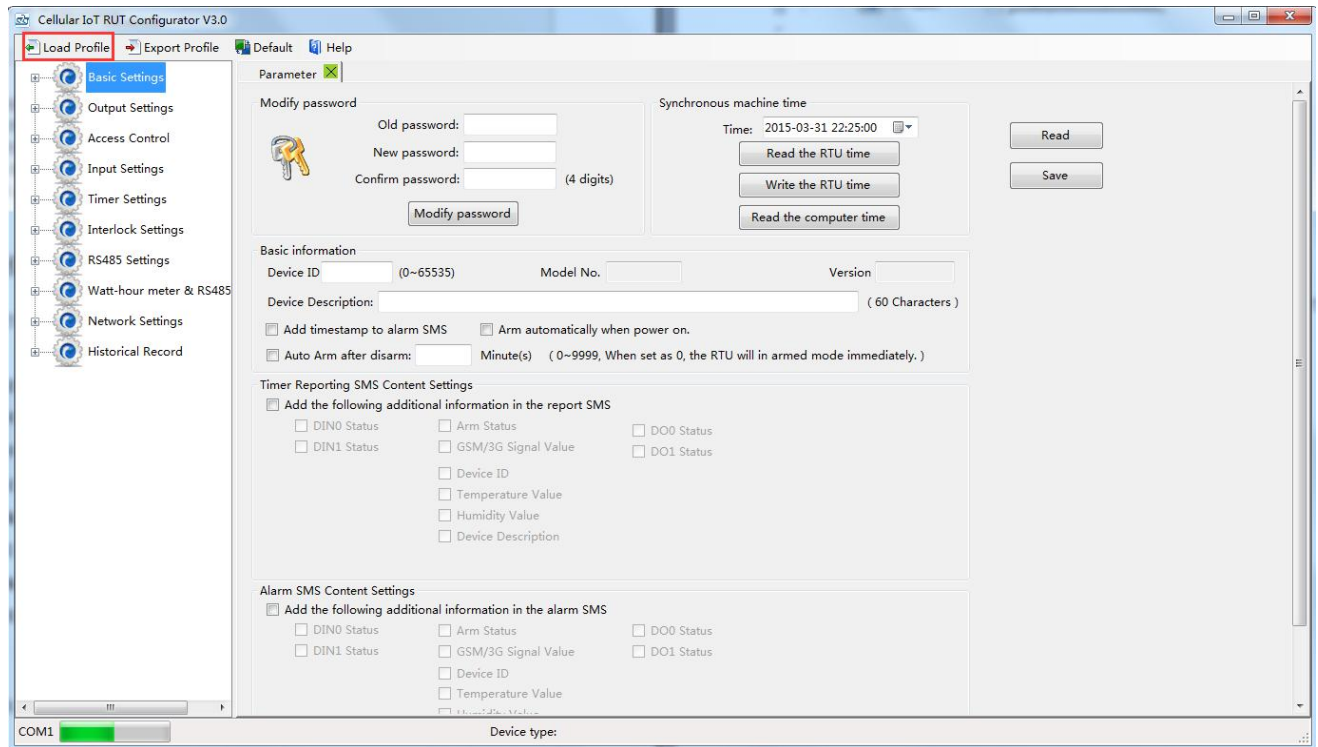


Then it will display as below after a moment:

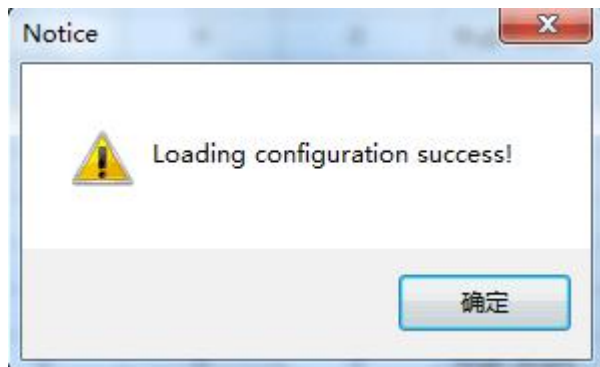


Load Profile:

Click "Load Profile" button----> *chose the file which need to load.*



Then it will display as below after a moment:



Reset:

There are 3 ways as below which can reset the device to default:

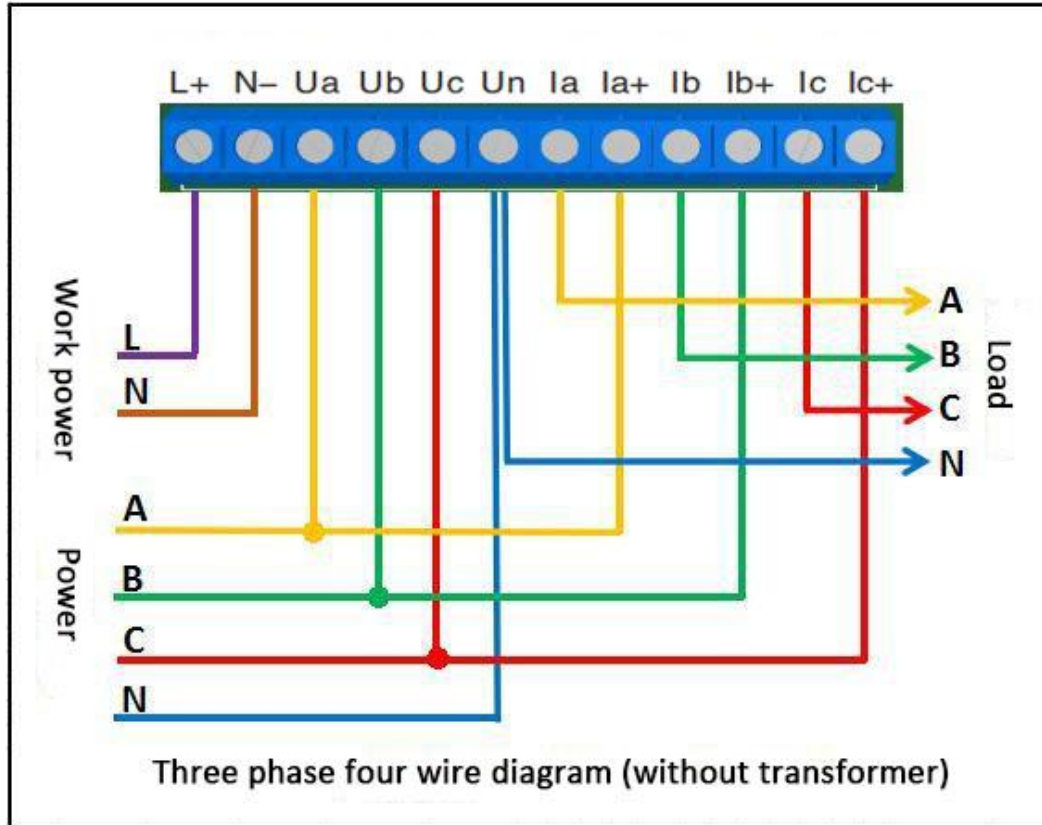
- 1) When device is on, connect the PC configurator, click the "Default" button on software to reset;
- 2) Send SMS command "PWD + RESET" to remote reset;

➤ 7. Connection and Application

7.1 Connection

Power wire connection:

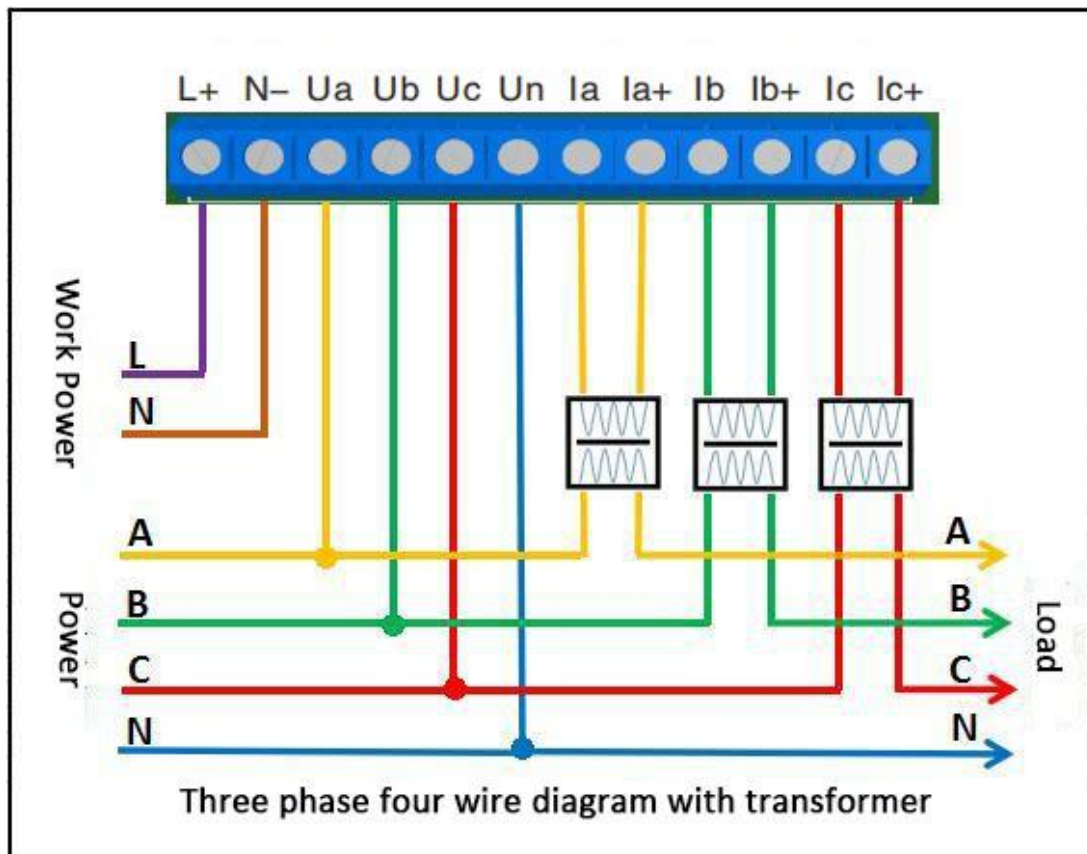
a. Three phase four wire connect directly wire diagram.



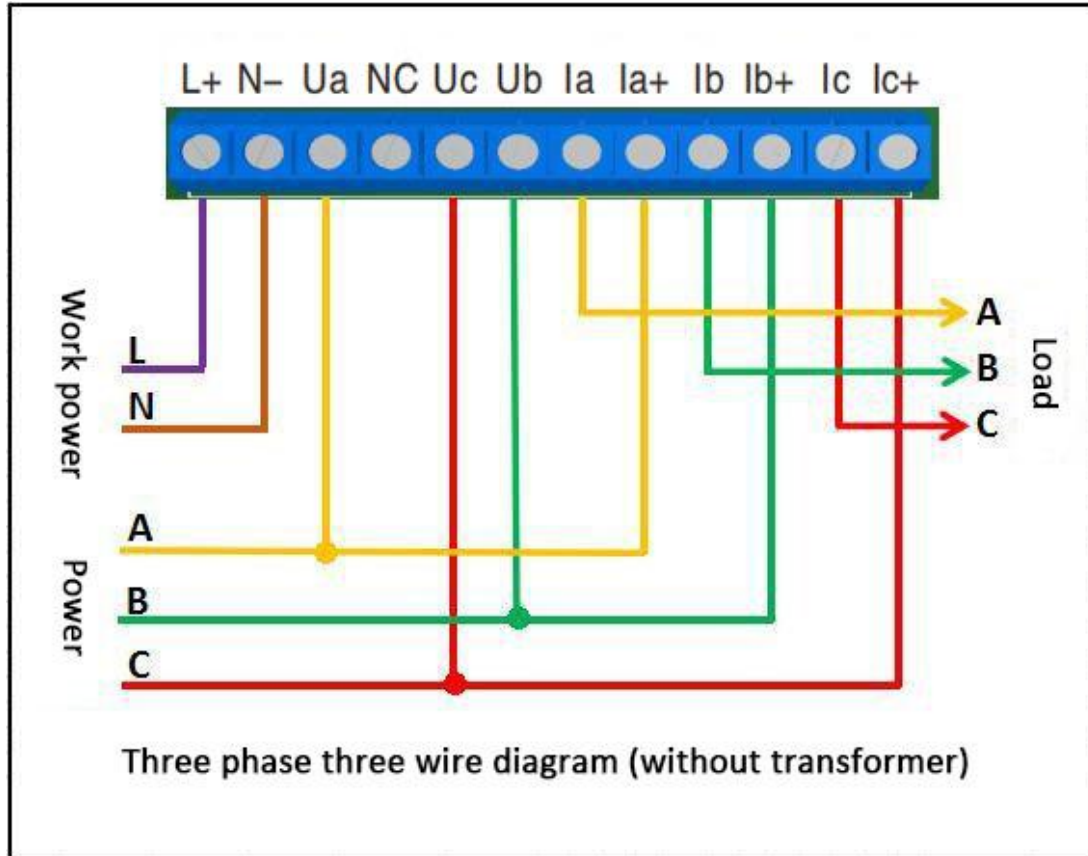
b. Three phase four wire with current transformer wire diagram.

Tips:

Pls note the direction of current transformer input and output.



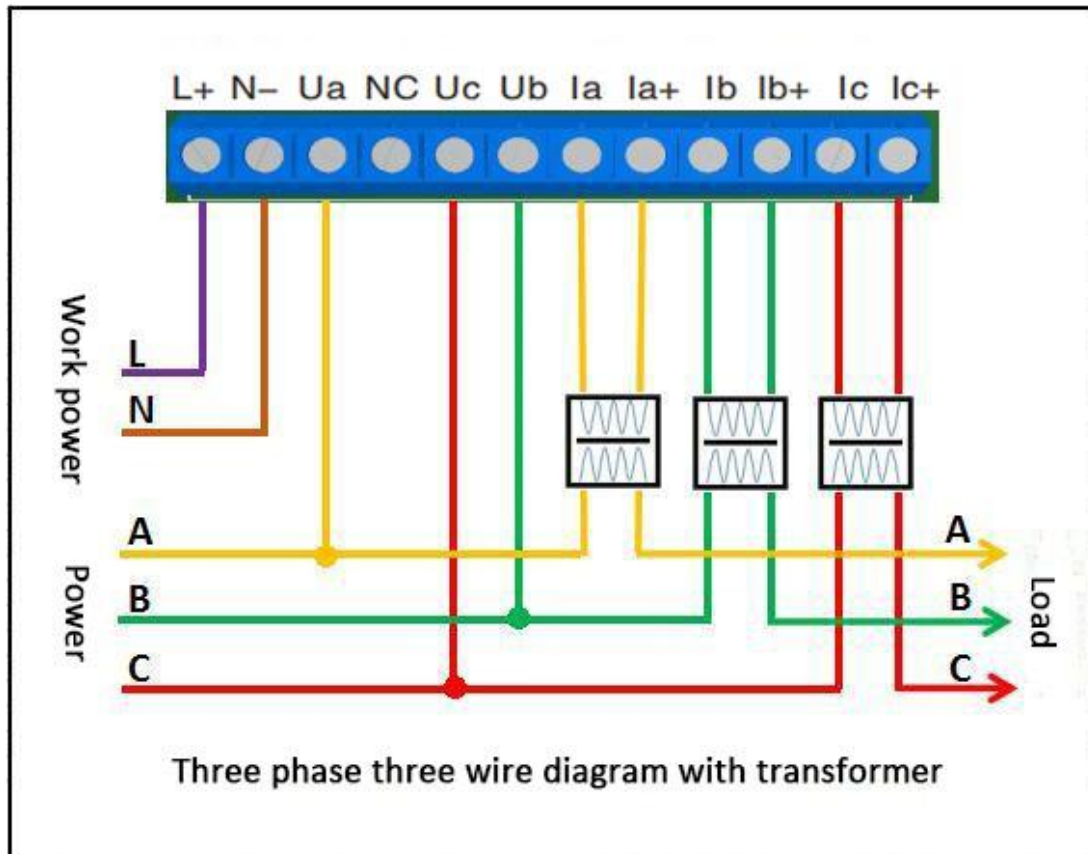
c. Three phase three wire connect directly wire diagram.



d. Three phase three wire with current transformer wire diagram.

Tips:

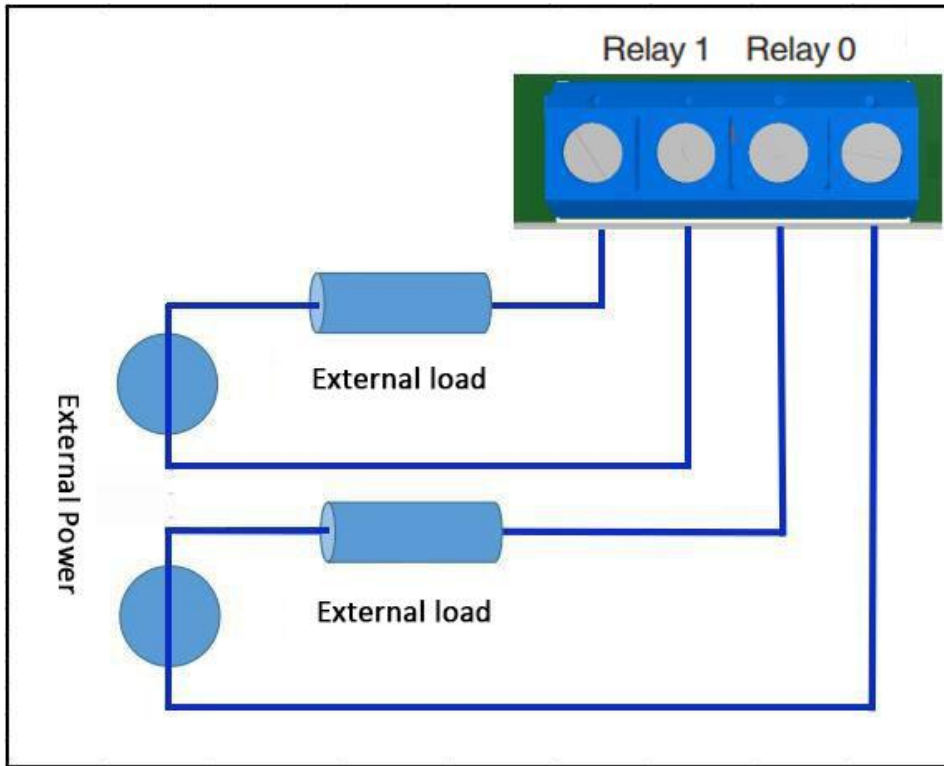
Pls note the direction of current transformer input and output.





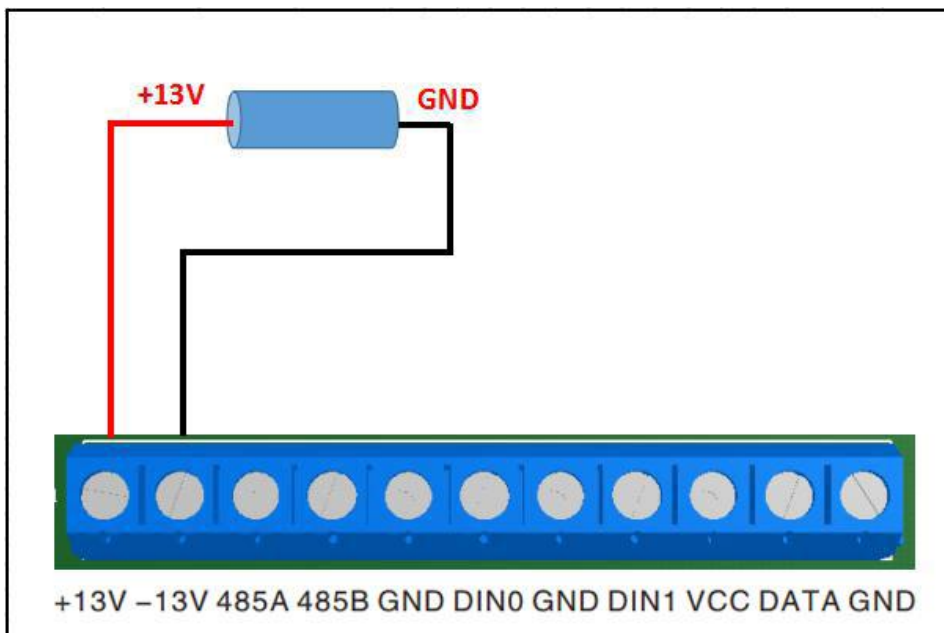
DO:

S257 support two dry contact digital outputs. External power can be AC or DC power, the connection as below. And the max current, voltage DO output is 5A/30V DC, 5A/250V AC or 10A/125V AC.



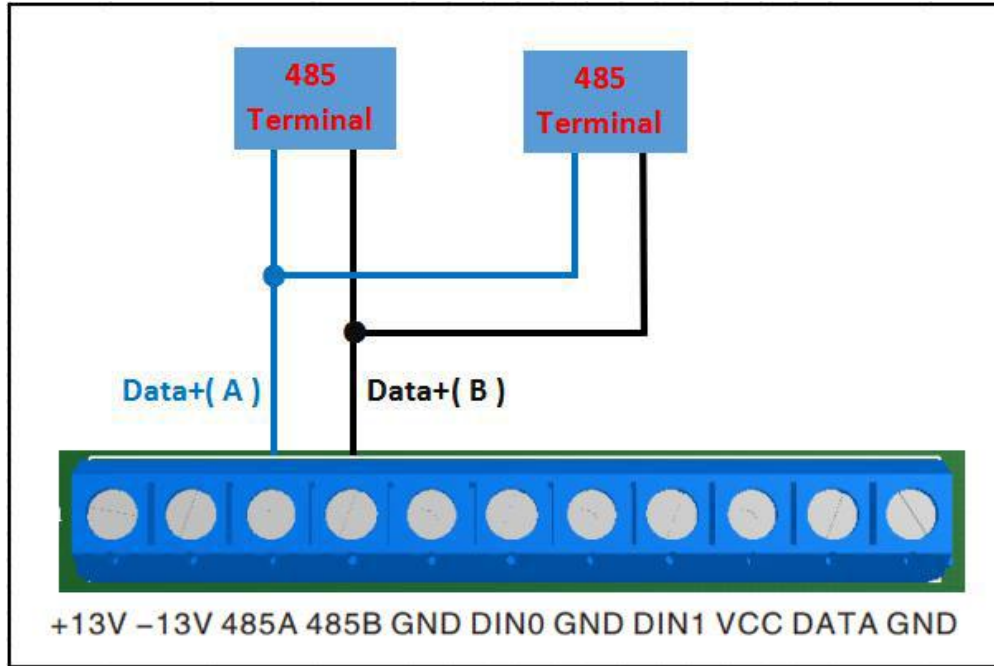
DC output:

S257 support 13V DC power, the max output is 5W, please note the max power of load can't more than 5W, the connection as below:



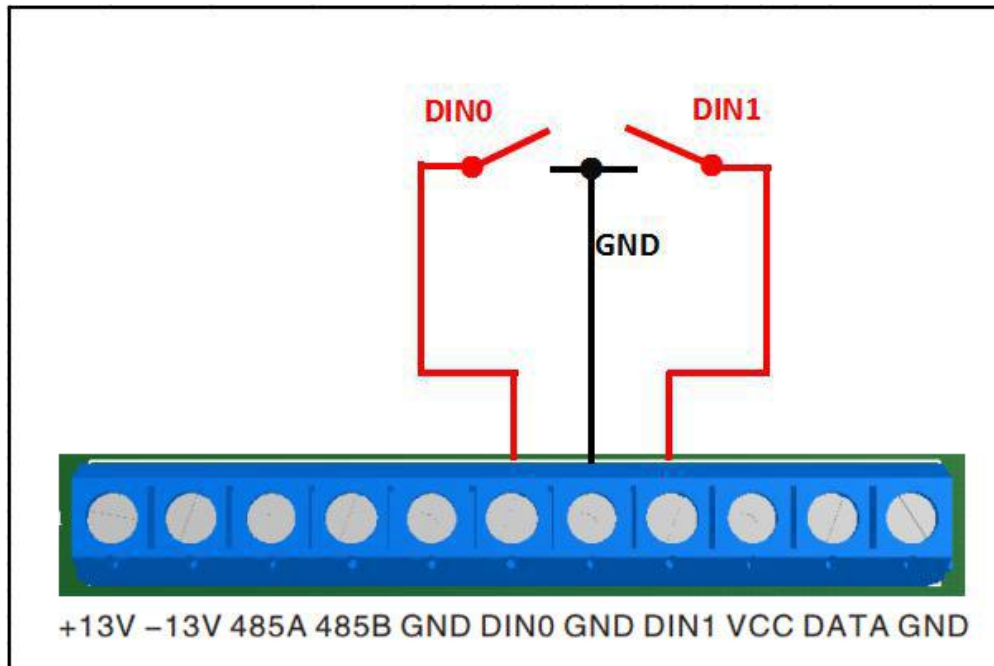
RS485 :

S257 support one RS485 port for communication, connection as below:



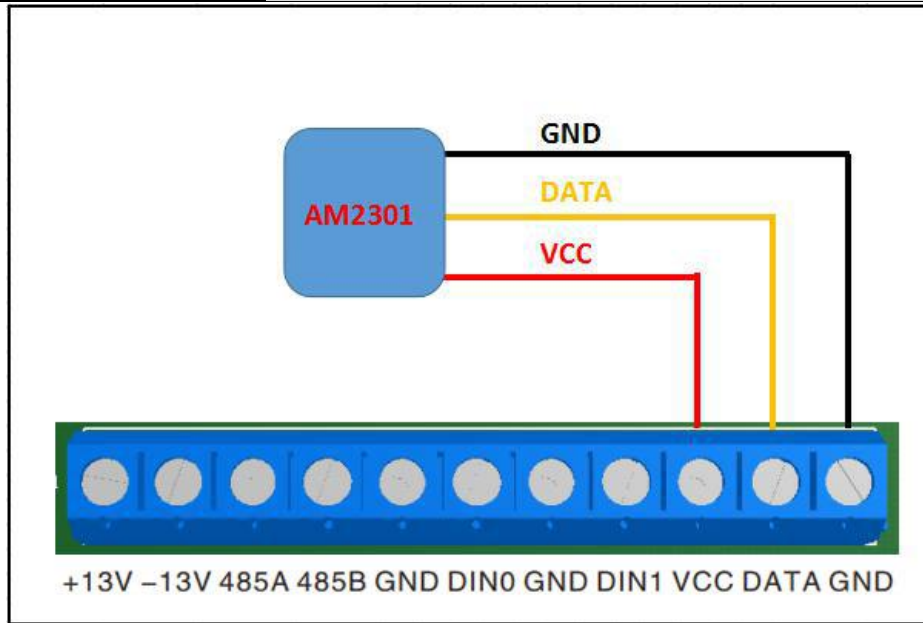
DIN :

S257 support two digital inputs, compatible dry and wet contact, wire connection as below:



Humiture :

S257 support one channel temperature and humidity input for sensor AM230X as below:







7.2 Keyboard Settings


Three phase four wire and three phase three wire mode switch:

S257S (with LED display) support three phase four wire and three phase three wire mode switch, three phase four wire set to three phase three wire steps as below:

Switch device on to display---->Press return button  ("Data" display) ---->Press down button  ("Set"

display) ---->Press enter button  ("0001" display) ---->Press 3 times down button  ("LINE-3P4"display)



---->Press enter button  ("LINE-3P4"ficks) to switch mode---->Press down button  (change

to"LINE-3P3"and flicks) ---->Press enter button  ("LINE -3P3"stop flicking) ---->Reboot device with power off, then device change to three phase three wire mode.

Tips:

"LINE -3P4"and"LINE -3P3" stands for three phase four wire and three phase three wire mode.

Check electricity parameter:

After switching device on, it will display current voltage value of each phase. Press down  or up  button, LED will display different electricity parameter in sequence.

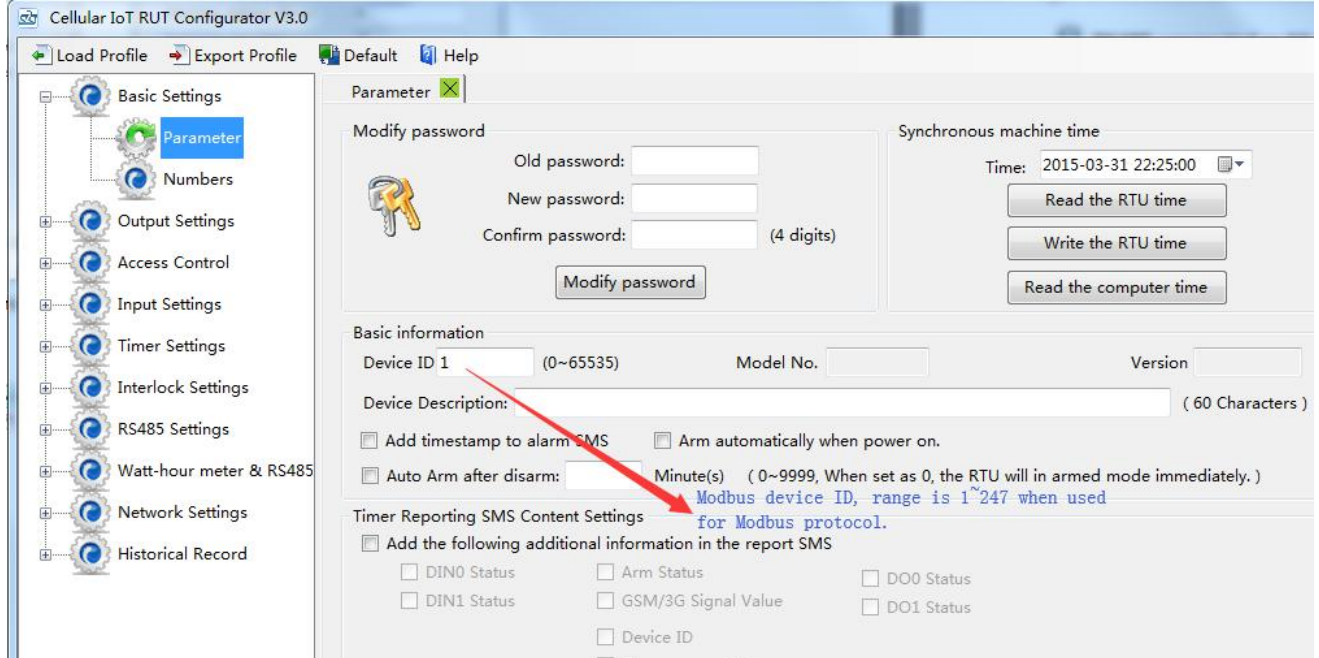
7.3 Modbus RTU Slave Application:

Device support Modbus RTU slave function, can connect to HMI, SCADA, DCS, MES system to monitor device

DIN, DO, Humiture and elctricity parameter. It can be used for fieldbus data acquisition, remote SMS alarm, remote dial alarm and GPRS/3G/4G to cloud...

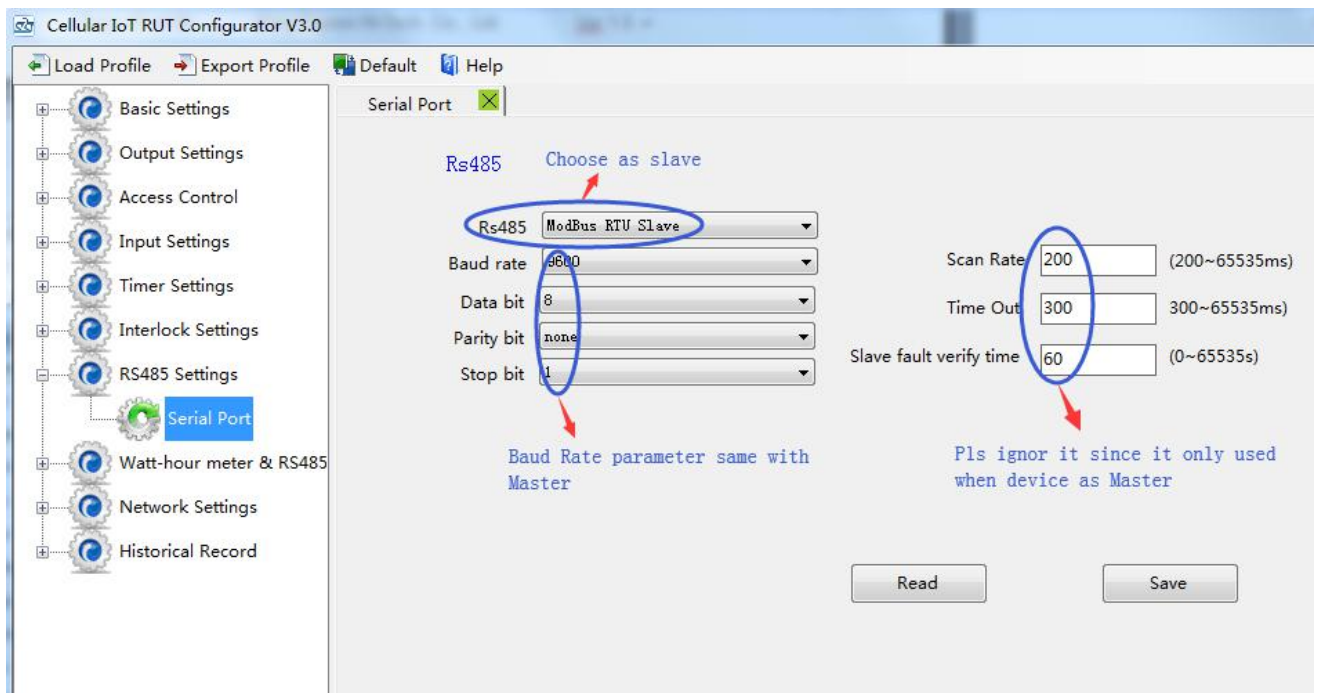
For example, when device as Modbus RTU slave, connect to HMI as below:

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



(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 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.





- (4) In HMI configurator software, set the Modbus RTU Register address of device. Refer to ["S257 register"];
- (5) Switch the device on, enter into working mode, device running according parameter setting.

Read device relay DO status:

Device's relay DO register address as holding coil, address 0~1, refer to ["S257 Register "] at bottom.

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
DO Origin Register Address	2	00 00H	Range: 0000H-0001H
Read DO Register Qty	2	00 02H	Range: 0001H-0002H
16CRC Verify	2	BD CB	CRC0 CRC1 low byte in front, high byte in behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	01H	Read holding coil
Return Byte Length	1	01H	Return Data Length
Returning Data	1	02H	Returning Data
16CRC Verify	2	D0 49H	CRC0 CRC1 low byte in front, high behind

Example: Read 2 relays DO status, device address as 1 :

Server send: 01 01 00 00 00 02 BD CB

01= Device address; 01= Read relay function code; 00 00= DO register starting address;

00 02= Read serial 2 DO status; BD CB = CRC Verify.

Device answer: 01 01 01 02 D0 49

01= Device address; 01= Read relay function code; 01= Return data byte qty; 02= Returning data, stands for Binary 0000 0010 high 4 byte invalid, low 4 byte 0010, sort as DO1 DO0 status as:

reserved	reserved	DO1	DO1
reserved	reserved	1	0
reserved	reserved	Close	Open

D0 49=CRC 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

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	05H	Write single holding coil type, function code 05
DO Register Address	2	00 00H	Range: 0000H-0001H
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

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
DO Register Address	2	00 00H	Range: 0000H-0001H
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

01= Device address; 05= Control single relay command; 00 00= DO0 Address; FF 00= DO0 close; 8C 3A= CRC verify.

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

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

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

2) Multi control DO outputs

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to setting address
Function Code	1	0FH	Write multi holding coil, function code 15



DO Starting Register Address	2	00 00H	Range: 0000H-0001H
Control Relay Qty	2	00 02H	Range: 00001H-0002H
Write Byte Qty	1	01H	Write 1 byte, since device only 2DO, use 2 binary can do it
Writing Data	1	03H	Send DO status data which need to control
16CRC Verify	2	9E 96H	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 setting address
Function Code	1	0FH	Write multi holding coil
DO Starting Register Address	1	00 00H	Range: 0000-0001, stands for DO0-DO1
Active Relay Qty	1	00 02H	Range: 00001H-0002H, stands for how many relays already activated
16CRC Verify	2	D4 0AH	CRC0 CRC1 low byte in front, high behind

Example: Close device 2 DO at same time, then:

Server send: 01 0F 00 00 00 02 01 03 9E 96

01= Device address; 0F= Control multi relay; 00 00= Relay DO0 starting address; 00 02= Control 2 relays; 01= Send data qty; 0F= Data sent converter to binary 0000 1111 high 4 byte invalid, low 4 byte 1111 sort to match DO1 DO0, 1 stands for close relay.

reserved	reserved	DO1	DO0
reserved	reserved	1	1
reserved	reserved	Close	Close

9E 93=CRC verify.

Device answer: 01 0F 00 00 00 02 D4 0A

01= Device address; 0F= Control multi relay; 00 00= Relay DO0 starting address; 00 02= Activated 2 relays; D4 0A 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.



Read device DIN status:

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	02H	02 read input coil DIN status
DIN Starting Register Address	2	00 00H	Range: 0000H-0001H, stands for DIN0-DIN1
Read DIN Register Qty	2	00 02H	Range: 0001H-0004H, read qty of DIN status
16CRC Verify	2	F9 CBH	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	02H	02 read input coil DIN status
Return Bytes Qty	1	01H	Return data length
Returning Data	1	03H	Returning DIN data
16CRC Verify	2	E1 89H	CRC0 CRC1 low byte in front, high behind

Example: Inquiry device 2 DIN data at same time, then:

Server send: 01 02 00 00 00 02 F9 CB

01= Device address; 02= Inquiry DIN status; 00 00= DIN starting address; 00 02= Serial reading 2 DIN status; F9 CB= CRC verify.

Device answer: 01 02 01 03 E1 89

01= Device address; 02= Inquiry DIN status; 01= Returning data bytes qty; 03= DIN status, every byte stands for one DIN status, 03H converter to binary 0000 0011 from high to low byte, stands for DIN1-DIN0 status, 0= Close, 1= Open, high 4 byte 0000 invalid, low 4 byte 0010 sort to match DIN1 DINO status:

reserved	reserved	DIN1	DINO
reserved	reserved	1	1
reserved	reserved	Open	Open

E1 89= 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 temperature and humidity 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
Register Starting Address	2	00 18H	Temperature address: 0018H, humidity address: 0019H
Read Register Qty	2	00 02H	total 2* 16 Bit register address
16CRC Verify	2	F1 CC	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	04H	04 read input register
Return Bytes Qty	1	04H	Return data length
Returning Data	4	0B 0E 19 DC	Returning temperature and humidity value
16 CRC Verify	2	92 6AH	CRC0 CRC1 low byte in front, high behind

Example: Inquiry device address, 2*16 Bit register start from 18H. Match to device temperature, humidity, then:

Server send: 01 04 00 18 00 02 F1 CC

01= Device address; 04= Read input register value; 00 18= Temperature starting register address; 00 02= Serial reading 2 input register value; F1 CC= CRC verify.

Device answer: 01 04 04 0B 0E 19 DC 92 6A

01= Device address; 04= Read input register value; 04= Returning data bytes; 0B 0E 19 DC= Returning temperature and humidity value. 2 bytes in front stands for temperature, 2 bytes behind stands for humidity, and the value expand 100 times (Real value= this value/100). Converter to Decimal as:

Temperature	0B 0E	2830	Real value= this value/100
Humidity	19 DC	6620	Real value= this value/100

So temperature and humidity real value is 28.3 °C, 66.2%.

92 6A= CRC verify.



Read device watt-hour meter 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	03H	03 read holding register
Register Address	2	4E A0H	Watt-hour meter starting register address
Read Register Qty	2	00 40H	Read 32 Electricity parameter, use 64* 16 Bit register address

When RS485 as Modbus RTU Master, can extend I/O tags, support slaves for connecting Remote I/O data acquisition module, Smart meter, Power monitoring moduel, Smart transduce...; 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.

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 S257, the S257 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 S257 itself refer to "Modbus RTU Slave Application" above.



Slave Settings:

Step1: Connect the slave to device RS485 port.

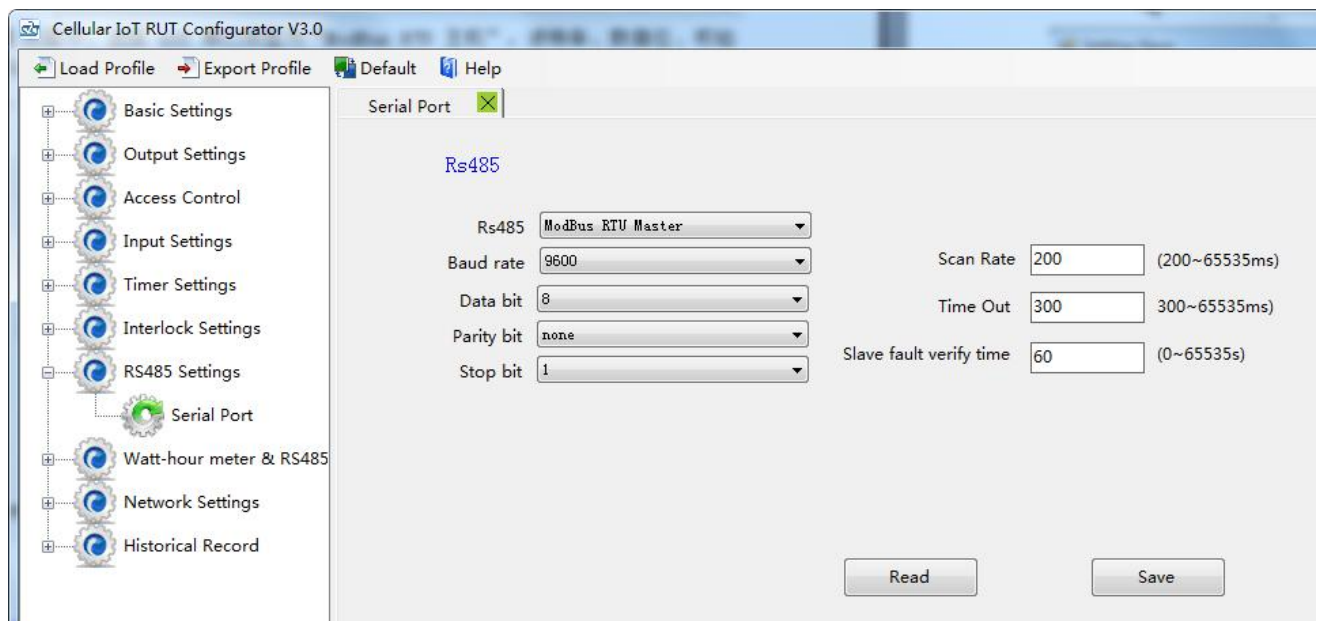
Step2: Find the salve port communication parameter and register address from user manual.

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

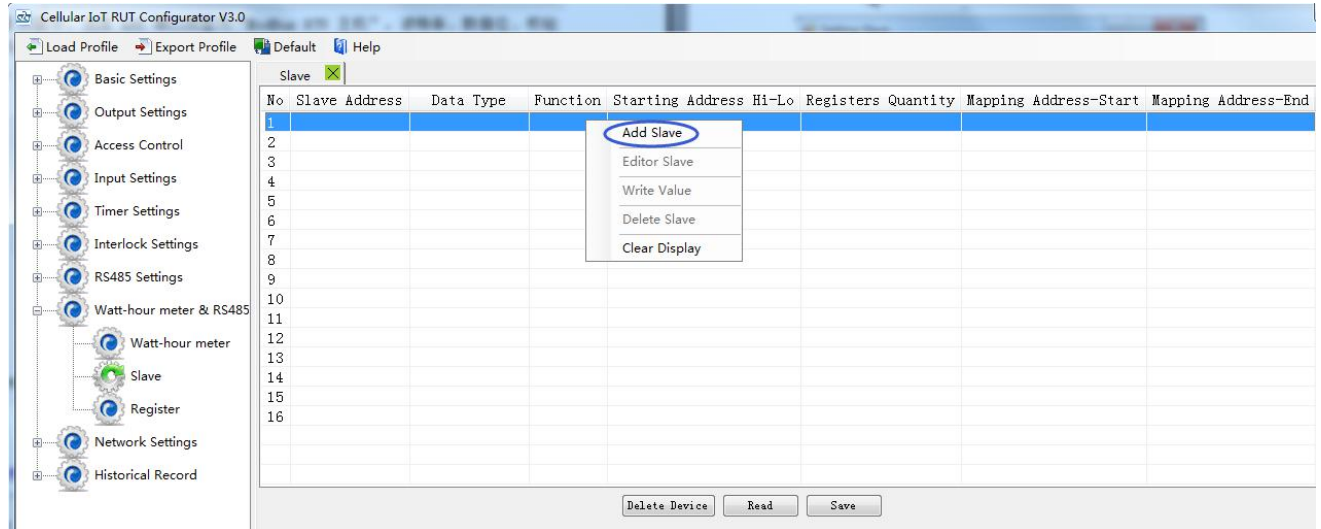
Step4: Set RS485 port as Modbus RTU Master, then set polling and time out parameter, refer to "port setting" part.

Serial Port Setting:

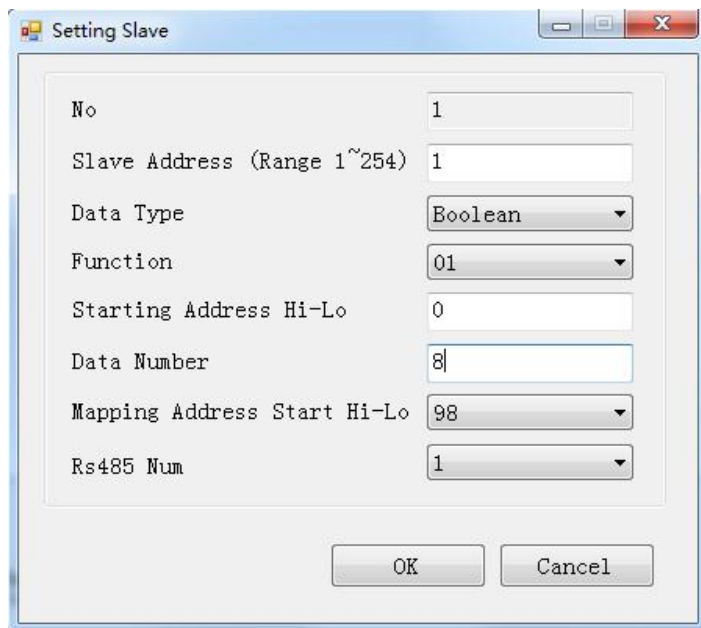
In "Serial Port" setting page, choose RS485 port as "Modbus RTU Master". Baud Rate, Data Bit, Parity Bit and Stop Bit parameter need to be same as connected device; Scan Rate, Time Out and Slave Failure Verify Time can be set as default:



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



Click Add Slave as below:

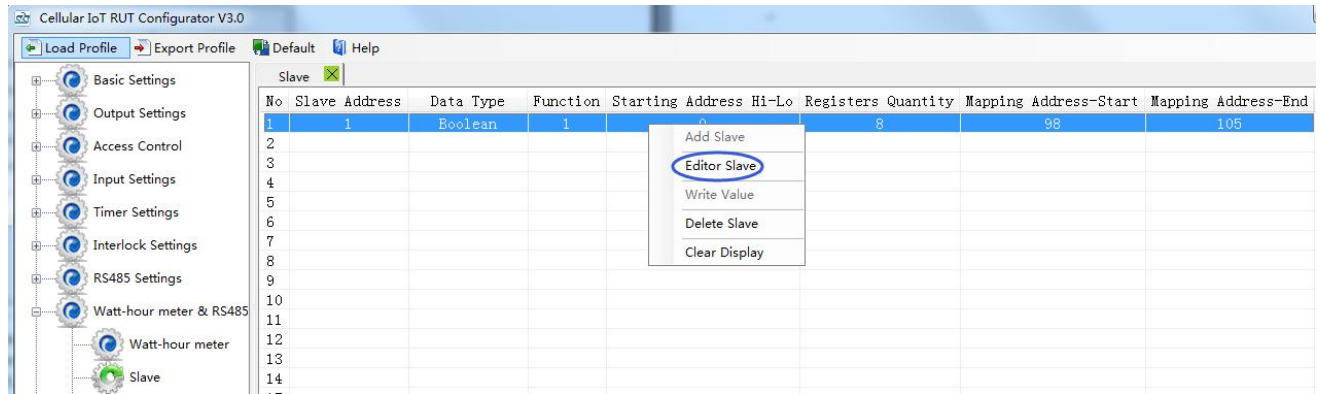


If one slave have multi register, then need to add seperately according to register type; For exmaple, Mxxx remote I/O module, with digital and analog inputs, need to add the digital(Boolean) first, then add the analog(16 Bit).

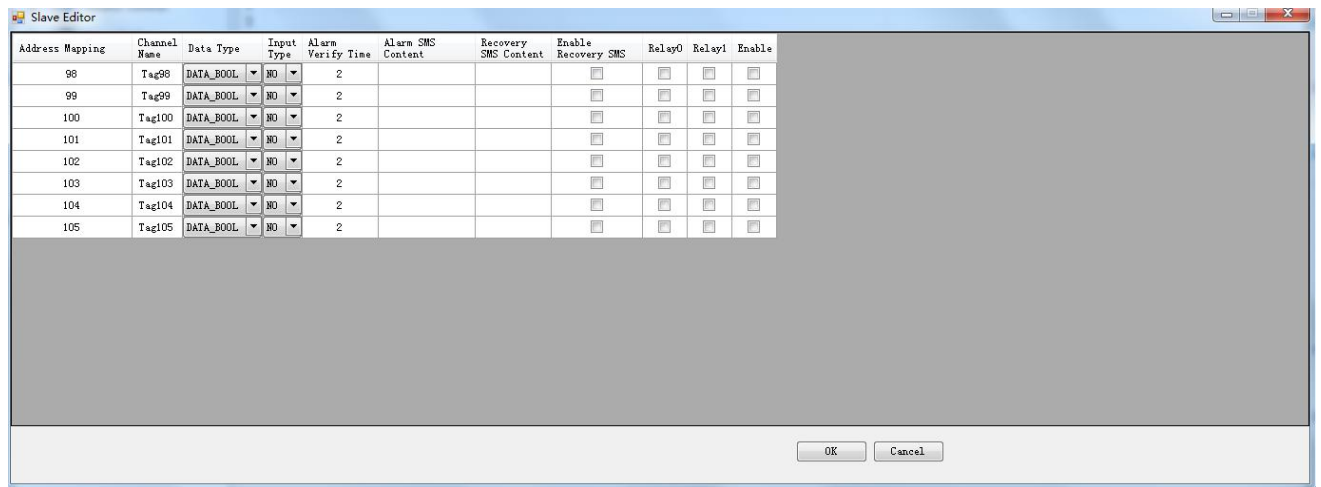
Step6: Right click the line to edit the slave.



GSM/SMS/GPRS/3G/4G Cellular Electricity Power IoT RTU



Click the "Editor Slave" to set channel name, alarm SMS content, recovery SMS content and relay active etc. as below:



Step7: Restart the device, enter into working mode, device running according parameter setting, include alarm SMS and call. If set the network communication function, then can remote transmit data to cloud server via GPRS/3G/4G.

Reminder:

After adding slaves, device switched off/on to restart is necessary.

Read Boolean Mapping Address Data:

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	01H	Read holding coil type, function code 01
Boolean Register Starting Address	2	00 40H	Range: 0040H-007FH, address refer to ["S257 Mapping Register Address"] at manual bottom
Read Register Qty	2	00 0AH	Range: 0001H-0040H, total 64 address for Boolean mapping
16 CRC Verify	2	BD D9H	CRC0 CRC1 low byte in front, high byte in behind

Receiver Return Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, according to the data Master send
Function Code	1	01H	Read holding coil
Return Byte Length	1	02H	Return Data Length
Returning Data	2	73 01H	
16CRC Verify	2	5D 0CH	CRC0 CRC1 low byte in front, high behind

Example: Start from address 64, read 10 Boolean mapping data value, then:

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

01= Device address; 01= Read holding coil; 00 40=Read Boolean data start from address 64; 00 0A = Serial to read 10 Boolean status;

BD D9= CRC verify.

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

01= Device address; 01= Read holding coil; 02= Return Byte Length; 73 01= Return 10 Boolean status. High byte stands for low address data, low address stands for high address. According to Modbus protocol, fix 73 01H real value to be 01 73H, converter to Binary as below:

Register mapping address	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	73	72
Value	0	0	0	0	0	0	0	1
Register mapping address	71	70	69	68	67	66	65	64
Value	0	1	1	1	0	0	1	1

The address value higher than 10 digits will be seen as invalid.

5D 0C =CRC verify.

Modify Boolean Mapping Address Data:

If control relay status which connected to RS485, need to add slave in slave list of configurator. Write command 15 for mapping, when mapping address value modified, will write to RS485 matched slave address.

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, function code 05H
Boolean Mapping Register Address	2	00 40H	Range: 00 40H-00 7FH, address refer to ["S257 Mapping Register Address"] at manual bottom
Write value	2	FF 00H	This value: FF 00H or 00 00H, FF 00H stands for write 1; 00



			00H stands for write 0
16 CRC 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
Boolean Mapping Register Address	2	00 40H	Range: 0040H-007FH
Write value	2	FF 00H	This value: FF 00H or 00 00H. FF 00H stands for write 1, 00 00H stands for write 0.
16 CRC Verify	2	8D EEH	CRC0 CRC1 low byte in front, high behind

Example: Modify Boolean mapping address 64 status, modify to 1, then:

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

01= Device address; 05= Write Boolean value; 00 40=The mapping address which need to revise; FF 00 = Write 1;

8D EE = 16 Bit CRC verify.

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

01= Device address; 05= Write Boolean value; 00 40= The mapping address which need to write; FF 00= Write 1.

8D EE = 16 Bit CRC verify.

If need multi modify, please check function 15 of Modbus protocol.



Read Data Type Mapping Address Data:

Master Send Data Format:

Content	Bytes	Data (H: HEX)	Description
Device Address	1	01H	01H Device, Range: 1-247, according to setting address
Function Code	1	03H	Read holding coil, function code 03
Mapping Register Starting Address	2	4E 20H	One address can read 2 bytes. Mapping data type address range, refer to ["S257 Mapping Register Address"] at manual bottom.
Read Mapping Register Qty	2	00 0AH	Read input register qty.
16 CRC 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, according to the data Master send
Function Code	1	03H	Read holding coil
Range Data Bytes	1	14H	One address can read 2 bytes
Returning Data	20	00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2AH	Returning Data
16 CRC Verify	2	FB 34H	CRC0 CRC1 low byte in front, high behind

Example: Mapping address start from 20000, read 10 address data, then:

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

01= Device address; 03= Read holding coil; 4E 20=Mapping register starting address, current is Decimal data 20000; 00 0A = Read 10 register value;

D3 2F = 16 Bit 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

01= Device address; 03= Read holding register; 14= Returning 20 byte; 00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A = Returning data.

Register Mapping Address	20000	20001	20002	20003	20004	20005	20006	20007	20008	20009
Value	00 14	00 1E	00 28	00 32	00 4B	00 41	00 0A	00 25	00 14	00 2A

FB 34 = 16 Bit CRC verify.



Modify Data Type Mapping Address Data:

If need to revise slave data which RS485 connected, need to add slave in slave list of configurator. Write command 16 for mapping, when mapping address value modified, will write to RS485 matched slave address.

If address 20000 mapping slave data type is Signed Int, sort 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, function code 06
Mapping Register Address	2	4E 20H	Address range: 4E 20H-50 1CH. Mapping data type address range, refer to ["S257 Mapping Register Address"] at manual bottom.
Write Data	2	00 64H	Data writing value is Decimal data 100



16 CRC 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, according to the data Master send
Function Code	1	06H	Write single holding register
Mapping Register Address	2	4E 20H	Address range: 4E20H-501CH, mapping data type address range.
Write Data	2	00 64H	Write 100 successfully
16 CRC Verify	2	9E C3H	CRC0 CRC1 low byte in front, high behind

Example: If address 20000 mapping slave data type is Signed Int, sort AB, modify mapping address 20000 register to 100, then:

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

01= Device address; 06= Modify single holding register value; 4E 20=Modify address 20000 register value; 00 64 = Write Decimal value 100; 9E C3 = 16 Bit CRC verify.

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

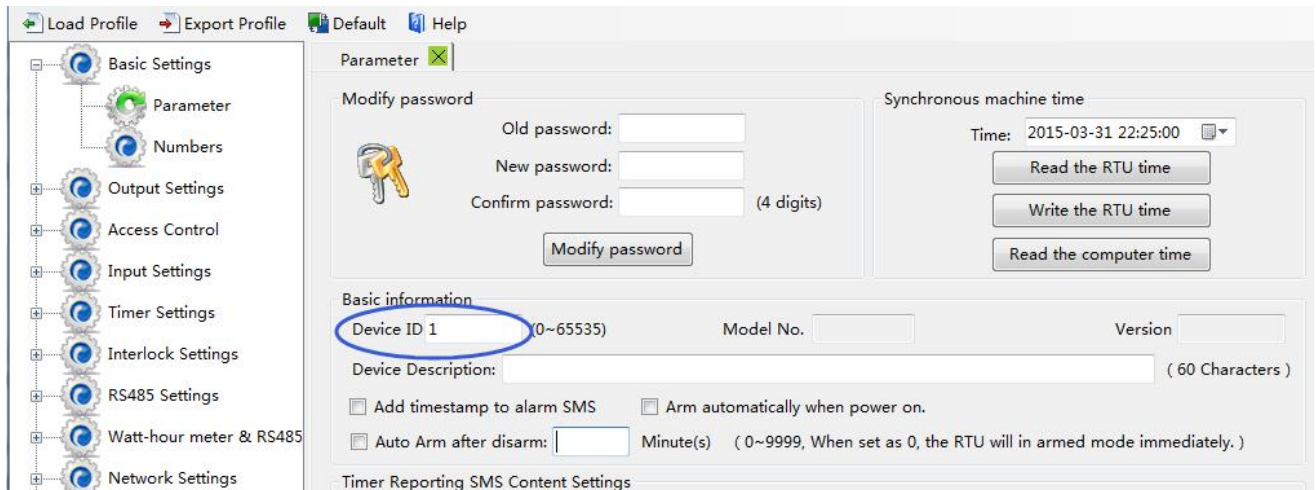
01= Device address; 06= Modify single holding register value; 4E 20= R Modify address 20000 register value; 00 64= Modify to Decimal value 100. 9E C3 = 16 Bit CRC verify.

If need to modify multi data type mapping address, please check function code 16 in Modbus protocol.

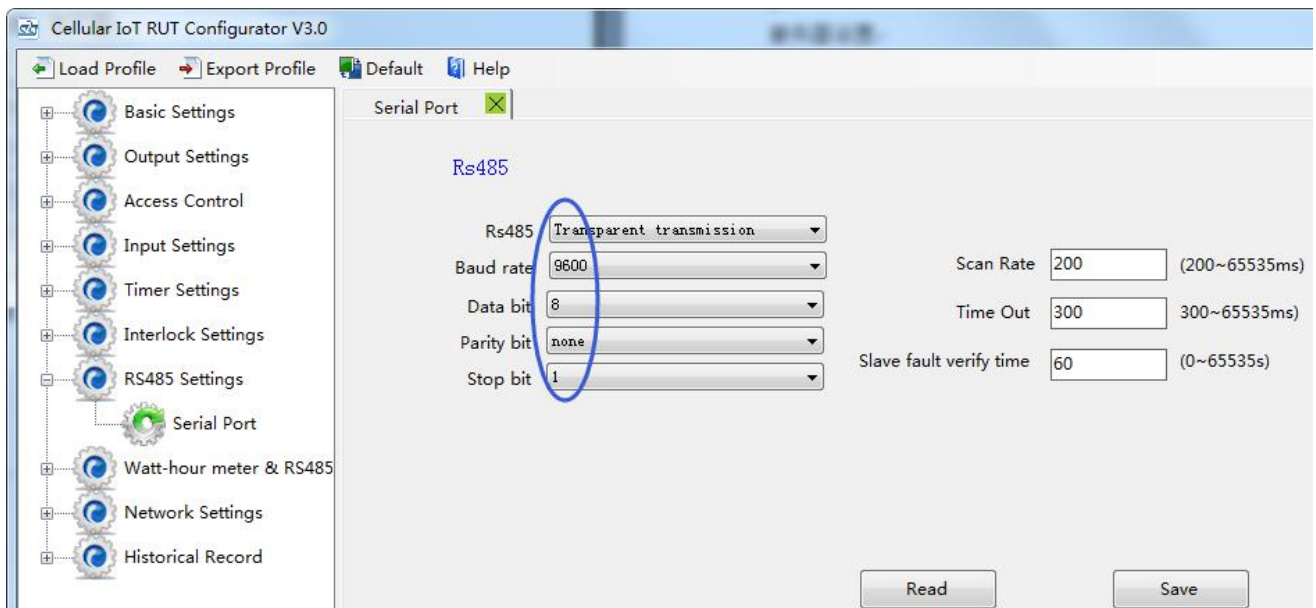
7.4 Transparent Transmission DTU Application:

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 without deal with. Once device receive data from RS485, also transmit to cloud server directly via GPRS/3G/4G. 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 page to set device ID;



(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.

Reminder:

The device ID which connect to RS485 can't be same with S257's device ID.

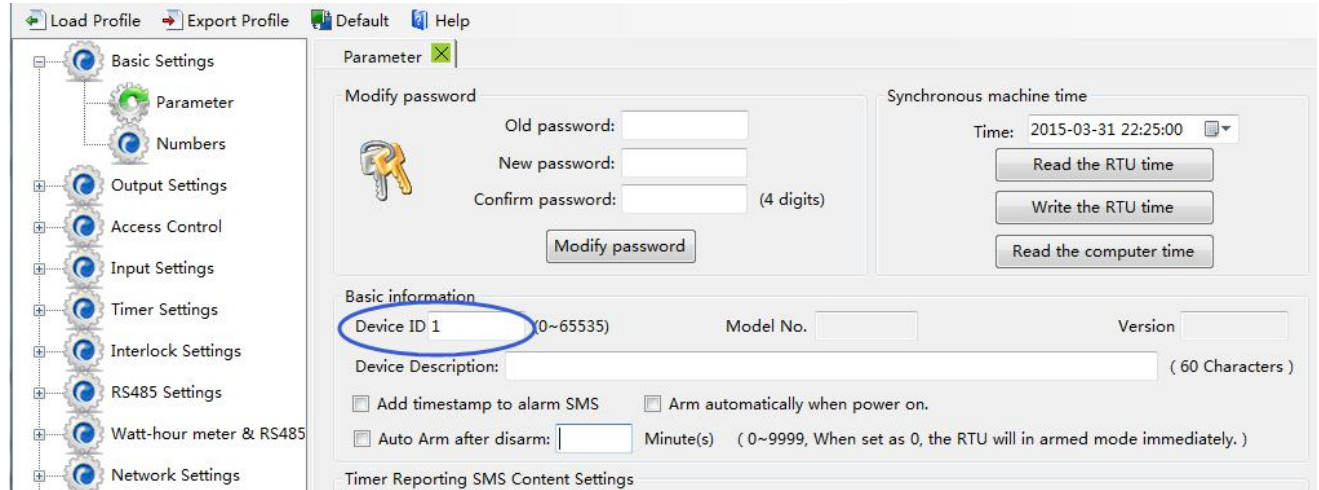
7.5 Device connect to cloud Application:

Device can connect to cloud platform and SCADA via GPRS/3G/4G network, connecting to your own server and connecting to King Pigeon cloud platform V2.0 (www.My-M2M.com) are both supported. The followings take King Pigeon cloud platform V2.0 (www.My-M2M.com) as an example :

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

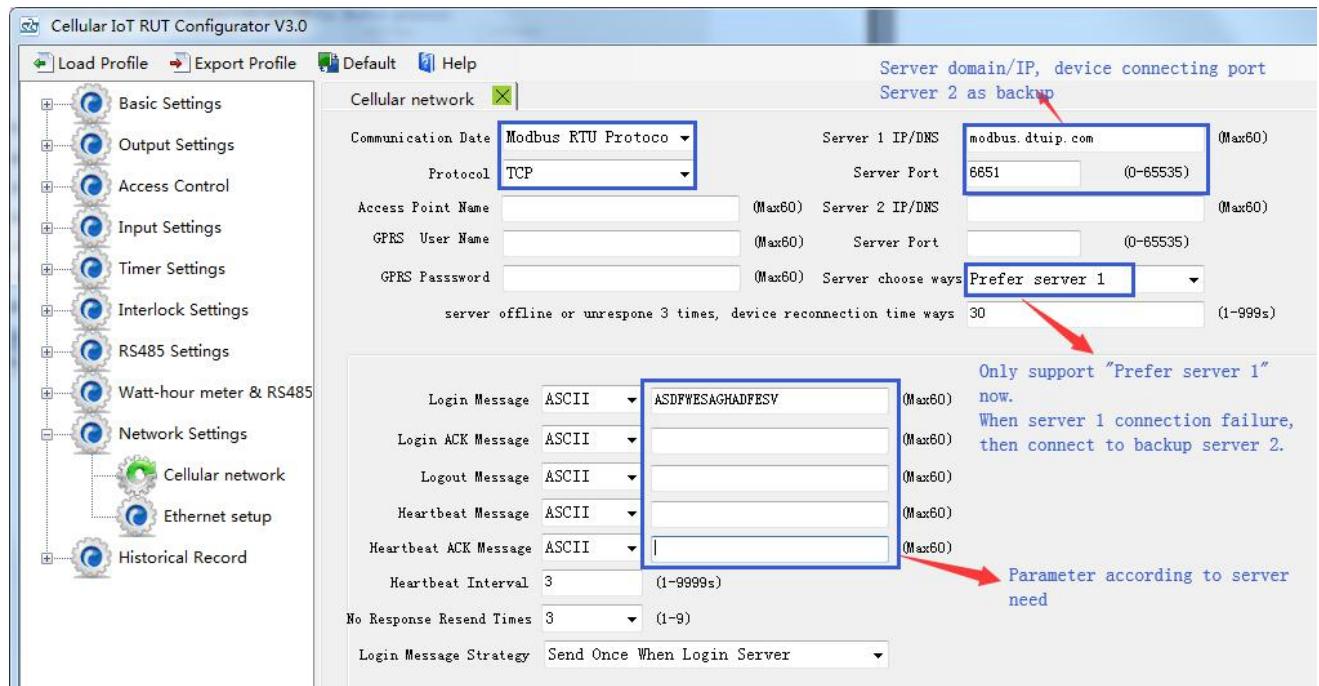


(1) In "Basic Parameter" setting page, set device ID, range 1~247 in Modbus RTU protocol as below:



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

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



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

(4) Switch the device on, enter into working mode, then Slave and Master I/O can connect to network.

➤ 8. Device SMS Command

SMS Command List:

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

1) **Modify Password, 4digits, default is 1234**

SMS Command	Return SMS Content
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Old Password + P + New Password

This is the New Password, please remember it carefully.

2) Reboot device

SMS Command	Return SMS Content
Password + Reboot	No SMS Return

3) Arm/Disarm SMS Command

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

4) **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)

5) Inquiry Current Status SMS Command

SMS Command	Return SMS Content
password+EE	Armed/Disarmed Model: Version: IMEI: GSM Signal Value:

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

SMS Command	Return SMS Content
Setup	password + A + series number + T + tel number Notice: Series number = 0~9
Inquiry	password+A
Delete	password+A+series number

7) **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: password + B + series number + S + start time + E + endtime Always can access control: password + B + series number + P Notice: Time format is 201505231230, stands for year, month, date, hour, minute.
Inquiry	password+B
Delete	password+B+series number

8) Setup Daily Report time

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



Delete	password+DRDEL	
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9) Inquiry DIN Status

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

10)SMS Control Digital Output

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

11)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	

12)Set Cellular Network Parameter APN/USER NAME/PASSWORD

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

13)GPRS Online

SMS Command	Return SMS Content
password+GPRSONline	GPRS always online

14)Delete Historical Data

SMS Command	Return SMS Content
password+HISDEL	Delete all historical records

15)Clear Pulse Counter Value

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

➤ 9.1 S257 Register and Slave Mapping Register

9.1 S257 Register

Tips: All address in S257 Register Table displayed as Decimal data.

Read and Write Holding Coil (Function Code 01, Function Code 05, Function Code 15.)			
Register Address (Decimal)	Definition	Data Type	Description
0	First digital output data, DO0	Bool	
1	Second digital output data, DO1	Bool	

Read Input Coil (Function Code 02: Read Coil)			
Register Address (Decimal)	Definition	Data Type	Description
0	First digital input data, DI0	Bool	
1	Second digital input data, DI1	Bool	

Read Input Register (Function Code 04: Read Input Register.)			
Register Address (Decimal)	Definition	Data Type	Description
24	Temperature	16bit int	$Y=X/100$
25	Humidity	16bit int	$Y=X/100$
26	Device DINO count value	32bit uint	Count model valid

Tips: In description, the parameter definition as below:

Y = Real value; X =The value stored in register; CT =Current Ratio, default 1, users can set definitely.

" $Y=X/100$ " means "Real value= Current value stored in register/100".

Read holding Register (Function Code 03.)					
Register Address (Decimal)	Definition		Unit	Data Type	Description
	3 phase 4 wire	3 phase 3 wire			
20128-20129	Phase A current	Phase A current	A	32bit int	$Y=X/1000 * C_T$
20130-20131	Phase B current	Phase B current	A	32bit int	$Y=X/1000 * C_T$
20132-20133	Phase C current	Phase C current	A	32bit int	$Y=X/1000 * C_T$
20134-20135	Phase A voltage	Uab voltage	V	32bit int	$Y=X/10$
20136-20137	Phase B voltage	NC	V	32bit int	$Y=X/10$
20138-20139	Phase C voltage	Ubc voltage	V	32bit int	$Y=X/10$



20140-20141	Total active power	Total active power	W	32bit int	$Y=X/10*CT$
20142-20143	Total reactive power	Total reactive power	Var	32bit int	$Y=X/10*CT$
20144-20145	Total apparent power	Total apparent power	VA	32bit int	$Y=X/10*CT$
20146-20147	Frequency	Frequency	Hz	32bit int	$Y=X/100$
20148-20149	Total active energy	Total active energy	Kw.h	32bit int	$Y=X/10*CT$
20150-20151	Total reactive energy	Total reactive energy	Kvar.h	32bit int	$Y=X/10*CT$
20152-20153	Total power factor	Total power factor	NC	32bit int	$Y=X/1000$
20154-20155	Phase A active power	Phase A active power	W	32bit int	$Y=X/10*CT$
20156-20157	Phase B active power	NC	W	32bit int	$Y=X/10*CT$
20158-20159	Phase C active power	Phase C active power	W	32bit int	$Y=X/10*CT$
20160-20161	Phase A reactive power	Phase A reactive power	Var	32bit int	$Y=X/10*CT$
20162-20163	Phase B reactive power	NC	Var	32bit int	$Y=X/10*CT$
20164-20165	Phase C reactive power	Phase C reactive power	Var	32bit int	$Y=X/10*CT$
20166-20167	Phase A apparent power	Phase A apparent power	VA	32bit int	$Y=X/10*CT$
20168-20169	Phase B apparent power	NC	VA	32bit int	$Y=X/10*CT$
20170-20171	Phase C apparent power	Phase C apparent power	VA	32bit int	$Y=X/10*CT$
20172-20173	Phase A power factor	Phase A power factor	NC	32bit int	$Y=X/1000$
20174-20175	Phase B power factor	NC	NC	32bit int	$Y=X/1000$
20176-20177	Phase C power factor	Phase C power factor	NC	32bit int	$Y=X/1000$
20178-20179	Phase A active energy	Phase A active energy	Kw.h	32bit int	$Y=X/10*CT$
20180-20181	Phase B active energy	NC	Kw.h	32bit int	$Y=X/10*CT$
20182-20183	Phase C active energy	Phase C active energy	Kw.h	32bit int	$Y=X/10*CT$
20184-20185	Phase A reactive energy	Phase A reactive energy	Kvar.h	32bit int	$Y=X/10*CT$
20186-20187	Phase B reactive energy	NC	Kvar.h	32bit int	$Y=X/10*CT$
20188-20189	Phase C reactive energy	Phase C reactive energy	Kvar.h	32bit int	$Y=X/10*CT$
20190-20191	Phase loss DX	Phase loss DX	NC	32bit int	<u>Phase loss</u>

Tips: The phase loss description as below:

Three phase four wire:

- Phase A normal, Phase B normal, Phase C normal ----> then, DX=0;
- Phase A normal, Phase B normal, Phase C phase loss ----> then, DX=1;
- Phase A normal, Phase B phase loss, Phase C normal ----> then, DX=2;
- Phase A phase loss, Phase B normal, Phase C normal ----> then, DX=3;
- Phase A phase loss, Phase B normal, Phase C phase loss ----> then, DX=4;



Phase A phase loss, Phase B phase loss, Phase C normal ----> then, DX=5;
 Phase A normal, Phase B phase loss, Phase C phase loss ----> then, DX=6;
 Phase A phase loss, Phase B phase loss, Phase C phase loss ----> then, DX=7;

Three phase three wire:

Phase A normal, Phase B normal ----> then, DX=0;
 Phase A normal, Phase C phase loss ----> then, DX=1;
 Phase A phase loss, Phase C normal ----> then, DX=2;
 Phase A phase loss, Phase C phase loss ----> then, DX=3;

9.2 S257 Slave Mapping Register Address

Boolean Slave Register Assignment Table

Holding Coil (Function Code 01, Function Code 05, 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

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

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

Support 03/06/16 function code, 1 data take two address in Modbus protocol, total can mapping 30 slave data.

Holding Register			
32 Bit Register Address (Decimal)	Definition	Data Type	Description
20196	32 Bit data 20196	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.
20198	32 Bit data 20198	Same as above	Same as above
20200	32 Bit data 20200	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.

Holding 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

➤ 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.

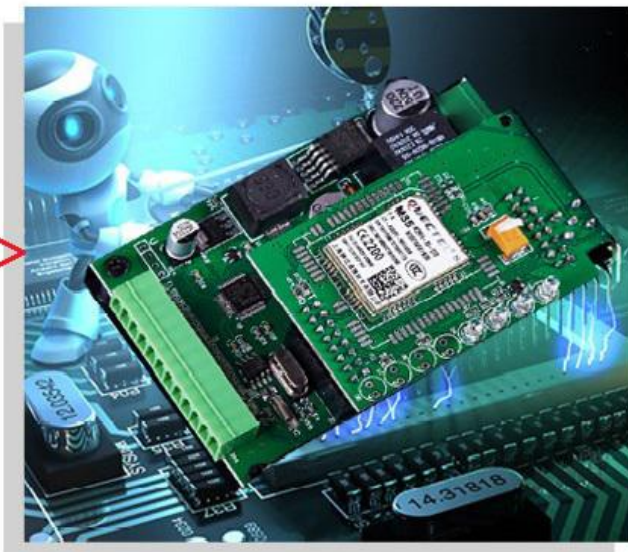
➤ 11. Cellular Module Upgrade

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.GPRS-M2M.com](http://www.GPRS-M2M.com)