# KING PIGEON

# Smart
## GSM+SMS
## GPRS+3G
## M2M RTU

# GSM 3G M2M RTU

# KING PIGEON

**User Manual**

Ver 2.1

S270/S271

Date Issued: 2016-12-28

# Table of contents

This handbook has been designed as a guide to the installation and operation of GSM 3G RTU S270 and S271.
Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.

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

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King Pigeon Communication.Co.,Limited. its employees and distributors, accept no liability for GSM/3G Network upgrading or SIMCard upgrading due to the technology specifications contained in this handbook.

| Model | GSM/3G | Precision | DIN | AIN | PT100 | DO | T/H | Register | Record | Port |
|-------|--------|-----------|-----|-----|-------|----|----|----------|--------|------|
| **S270** | V | 12bit | 2 | 2 | 0 | 2 | 1 | X | 200 | USB |
| **S271** | V | 12bit | 4 | 4 | 0 | 4 | 1 | X | 200 | USB |
| **S271-PT** | V | 12bit | 4 | 0 | 4 | 4 | 1 | X | 200 | USB |
| **S271-PTA** | V | 12bit | 4 | 2 | 2 | 4 | 1 | X | 200 | USB |
| **S272** | V | 12bit | 8 | 6 | 0 | 4 | 1 | X | TF Card | USB/RS232/RS485 |
| **S273** | V | 12bit | 8 | 6 | 0 | 4 | 1 | 64 | TF Card | USB/RS232/RS485 |
| **S275** | V | 16bit | 8 | 6 | 0 | 4 | 1 | 64 | TF Card | USB/RS232/RS485/RJ45 |
| **Notice** | 1. For 3G Version, support 3G UMTS/HSDPA; <br> S27xW 900/2100@UMTS 900/1800@GSM; <br> S27xC 850/1900@UMTS 850/900/1800/1900@GSM; <br> S27xT 850/2100@UMTS 850/900/1800/1900@GSM; <br> 2. T/H: temperature & humidity input for environment monitoring, Range: -40~80 ℃, 0~100%RH. <br> 3. The standard package: <br> 1x RTU, 1x GSM Antenna, 1x AC/DC Adaptor,1x Android APP, 1x PC Configuration Software, <br> 1x USB cable, 1x User Manual, 1x Backup battery inside, Terminals for Connection. <br> 4. The standard package not includes: SIMCard , Temperature+Humidity sensor AM2301. | | | | | | | | | |

<div align="center">

**Warning Tips:**

**Please Read the user manual firstly before any configurating and operating.**

</div>

## 1. Brief Introduction

The GSM 3G M2M RTU(Remote Terminal Unit) S270/S271 inbuilt quad band GSM/GPRS module (or 3G UMTS/HSDPA) and ARM® Cortex™ 32 Bit RISC Core. It is a multi Isolation I/O port remote terminal unit. It is special for remote control and remote data acquisition, Base Transceiver Stations monitoring, access control, ATM, generator monitoring, Pump station monitoring, weather satiation monitoring and other applications.

The S270/S271 GSM 3G M2M RTU is designed as a cost effective remote control system alert device. It monitors up to 2/4 digital inputs and 2/4 solid relay outputs and 2/4 AD inputs and power status, onsite temperature and humidity. All of the inputs and outputs are isolation. User-defined SMS is sent to pre-configure mobile phone numbers when a pre-defined alarm condition happens. These pre-configured mobile phone numbers can belong to technicians or engineers who are responsible in handling corresponding alarms. With the aid of this GSM 3G M2M RTU, the alarm condition brings attention to in-charge personnel immediately. Besides it allows those mobile phone users to trigger any relay output by using SMS. The output can be connected with alarm indication device, such as alarm, and others.

Moreover, the GSM 3G M2M RTU can be used as a smart PLC(Programmable Logical Controller) by the interlock function. And be used as a remote access control, the authorized users can open the gate or turn on the machine with a free charge call at specified time.

The GSM 3G M2M RTU supports Modbus TCP, TCP/UDP protocol over GPRS/3G network.

**The GSM 3G M2M RTU can be used as:**

- **A SMS Alarm Controller.** The IO activations or deactivations can be reported by SMS and optionally confirmed by phone calls. Each input can have its own message texts and the message can be programmed by users.

- **A Switch with SMS Remote Control**. SMS texts for switching particular terminals on/off or pulse output are configurable.

- **A Timer-Switch which can be activated automatically**. It can be setup when to performs preset logic events, e.g.: timer reports its status, timer switch on/off device or equipments automatically.

- **An Access Control unit.** Up to 10 authorized tel. numbers can be authorized for dial to access control and open the electricity door directly with free charge.

- **A PLC Automation Control system.** Upton 40 programmable logic events can be preset by users. E.g.: Each input alarm or recovery can link to one or more output actions, this is very useful when the temperature up to appointed value, need switch on the air-conditioning immediately, or when water overflow and need switch on the dryer, or when somebody broken into the door or windows need to start the CCTV and Siren.

- **A SMS reporter.** The GSM 3G M2M RTU can setup daily automatically report one or more times of its current status to users automatically.

- **A Pulse Counter.** The digital inputs can be used as the pulse counter, the user can setup both of interval value activated alarm and total value activated alarm.

- **A Data Logger.** The unit can save all of the events or acquisition data in internal memory storage, the historical data can export to CS format via USB port or upload to server by GPRS /3G network according to schedule, no distance limitation.

- **A Wireless Data Acquisition to SCADA or HMI or Monitoring Center.** The unit can acquisition variety data(E.g.: Pressure, Level, Current, Voltage, digital input status, pulse counter, digital relay output status, temperature value, humidity value and other) and upload to the SCADA(supervisory control and data acquisition) or HMI or Monitoring Center by SMS/GPRS/3G, no distance limitation.

## 1.1 Typically Applications



**Typically Application Diagram:**
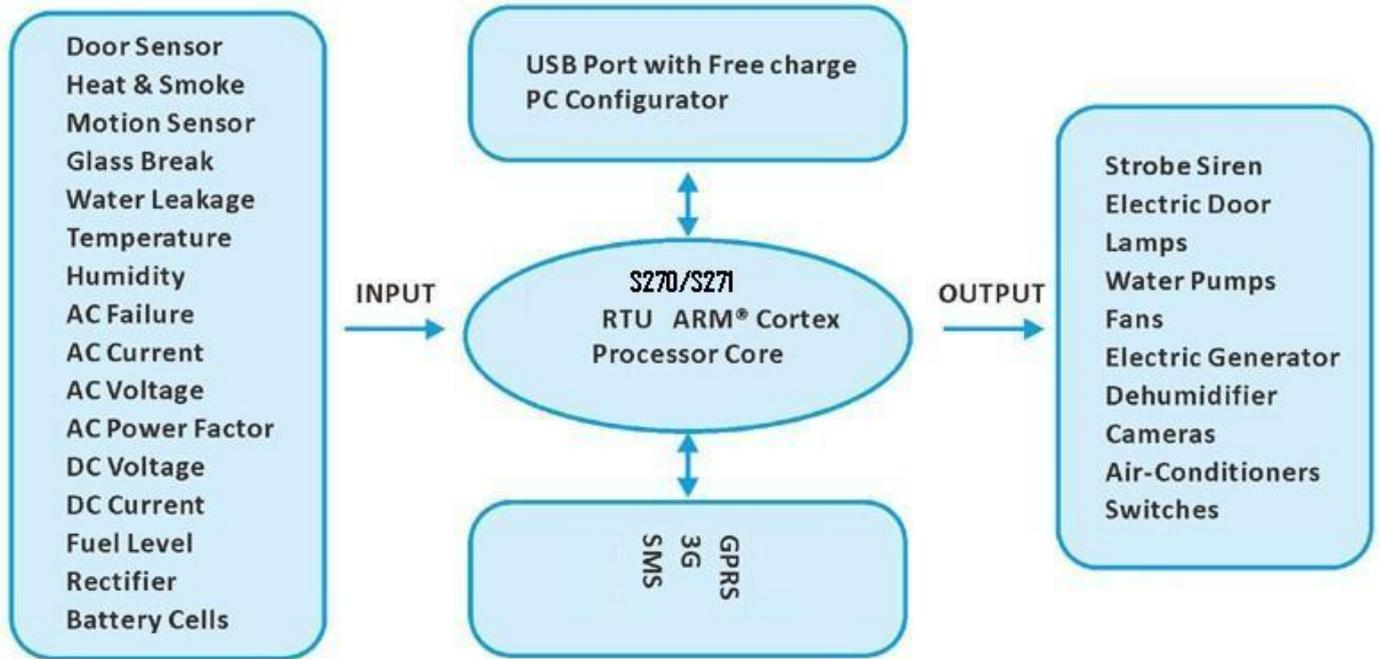
## Suitable Applications:

| | |
|---|---|
| 1. Security Alarm System applications; | 2. Supervision and monitoring alarm systems |
| 3. Automatic monitoring system; | 4. Vending Machines; |
| 5. Pumping Stations; | 6. Buildings and Real Estate; |
| 7. Weather Stations remote control and data logging; | 8. River Monitoring and Flood Control remote control; |
| 9. Oil and gas pipelines remote control and data logging; | 10. Corrosion protection |
| 11. Valve controls; | 12. Wellheads; |
| 13. Energy saving,street lights control system; | 14. Tanks, levels, temperatures,water leakage applications; |
| 15. Transformer stations; | 16. Unmanned machine rooms; |
| 17. Control room application; | 18. PLC and Automation System, M2M; |
| 19. GSM Access Control System, GSM Gate Opener, etc. | |

## System Schematic Diagram
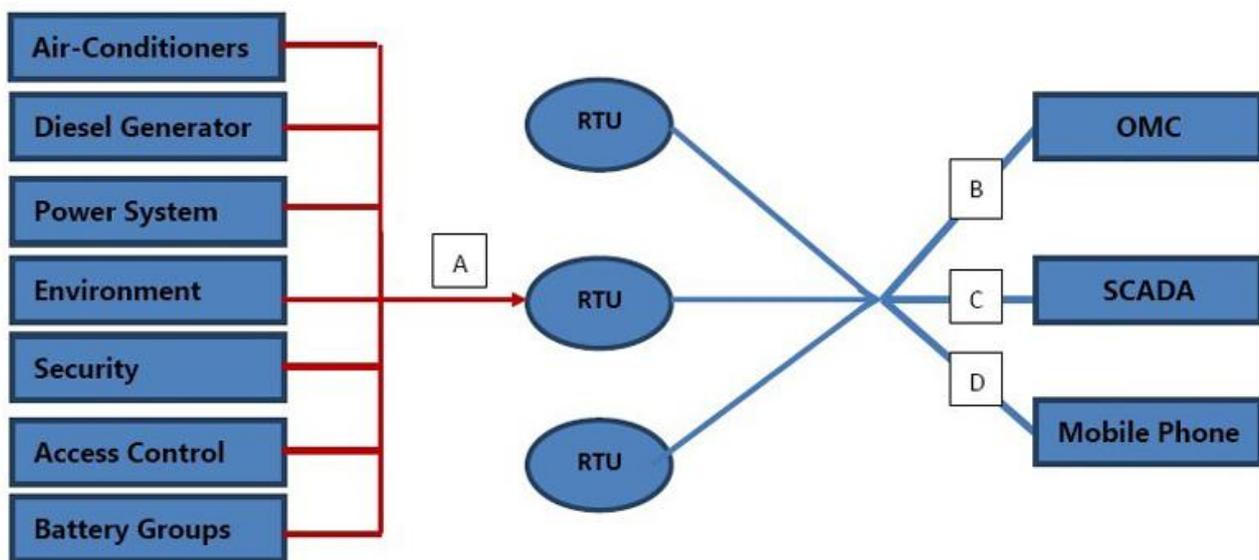


A: I/O port connections;

B: Through GPRS or 3G to HMI, OMC, the TCP/IP protocol is KingPigeon Definition Protocol.

C: Through GPRS or 3G to SCADA,HMI, DCS, OPC Server, Under this condition, the RTU performs Modbus Slave. And the TCP/IP Protocol is Modbus TCP.

D: Using SMS to control the RTU, or receive SMS alarm alert, or through voice communication to open the door

or receive alarm calling.

## 1.2 Mainly Features

1) ARM® Cortex™-M4 32 Bit RISC Core, RTOS system;

2) Quadband 850/900/1800/1900Mhz GSM GPRS Module inside, 3G UMTS/HSDPA Modules are optional.

3) Widely Rated voltage range, 9~36VDC, Inbuilt large capacity rechargeable backup battery;

4) Large internal memory to save 200 historical records, USB port for configuration and upgrade firmware;

5) 2/4 analog inputs, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output transducers;

6) 2/4 solid relay outputs, rated capacity is 5A/30VDC,5A/250VAC;

7) 2/4 digital inputs, compatible to dry contact or wet contact inputs. Logic level: 0~0. 5V or short circuit treated as close, +3~30V or open circuits treated as open. One of the input can be used as counter, sampling frequency is 1Khz;

8) 1 temperature & humidity sensor input for monitoring onsite environment, the sensor model is AM2301, Measures temperatures from -40-80°C,0.5°C accuracy, Relative Humidity from 0-99RH%, accuracy is 3%;

9) All of the I/O ports with electromagnetic isolation protection;

10) 2 IP data centers, supports Modbus TCP,TCP/IP protocol over GPRS/3G network;

11) Automatically resend the data while GPRS/3G communication interrupt or failure, GPRS/3G failure will alert by SMS text to users.

12) Supports remotely restart the RTU, and configure& operate it by SMS commands remotely;

13) Supports over voltage protection and phase-reversal protection, provide DC power sources for external transducers or sensors to save wiring cost.

14) 10 SMS Alert and auto dial numbers for receiving alarm message, can program to receive specified alarm message. The authorized numbers also can dial to open the door or turn on/off machine with a free charge call at the specified time.

## 1.3 Specifications

| Item | Reference Scope |
|---|---|
| DC Power supply | Standard adapter: DC 12V/1.5A    Range 9-36VDC |
| Power consumption | Standby:12V/70mA;    Working Max.: 12V/300mA |
| GSM/3G Frequency | 850/900/1800/1900Mhz/3G (UMTS/HSDPA) |
| Transmit power | Class 4 (2W) at EGSM 900 and EGSM 850<br>Class 1 (1W) at GSM 1800 and GSM 1900 |
| GPRS connectivity | GPRS multi-slot class 10 |
| GPRS Data Transmission | GPRS data downlink transfer: max. 85.6 kbps<br>GPRS data uplink transfer: max. 42.8 kbps<br>Coding scheme: CS-1, CS-2, CS-3 and CS-4 |
| TCP/IP stack | TCP,UDP |
| SIM interface | Supporting 3V SIM Card |
| External antenna | SMA Antenna interface, 50 Ohm |
| Alarm Phone Numbers | 10 telephone numbers for SMS Alert and Dial while alarm. |
| Serial Interfaces | 1 USB Port with ±15KV ESD Protection. |
| Protocols | SMS, GPRS UDP,TCP, Modbus TCP |
| Digital Inputs | 2/4 Digital inputs, dry contact or wet contact. Logic level: 0~0. 5V or short circuit treated as close, +3~30V or open circuits treated as open. One of the input can be used as counter, sampling frequency is 1Khz; |
| Analog Inputs | 2/4 analog inputs, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output transducers; |
| Temp.&Hum Inputs | AM2301, Range: Temperature: -40 ℃ to +80 ℃, Humidity: 0~100%RH; |
| Relay Outputs | 2/4 Solid Relay outputs, Rated Capacity: 5A/30VDC,5A/250VAC |
| Power Outputs | 1 Port, for external device (Transducers or detectors or sensors). |
| Memory Capacity | Internal Memory inside, can save 200 historical events. |
| Backup Battery | 3.7V 1200mAH, standby 8-16hours. |
| Temperature range | -10-+70 ℃ |

| I/O Isolation | Electromagnetic |
|---|---|
| Power input/Out | Over voltage protection and phase-reversal protection |
| Humidity range | Relative humidity 95% (condensation free) |
| Exterior dimension | 168mm*113mm*26mm(external Maximum size) |
| Net Weight | 1000 g |

## 2.Safety Directions

**Safe Startup**

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

**Interference**

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

**Avoid Use at Gas Station**

Do not use unit at a gas station. Power off RTU when it near fuels or chemicals.

**Power it off**      **near Blasting Places**

Please follow      relevant restrictive regulations. Avoid using the device in blasting places.

**Reasonable Use**

Please install the product at suitable places as described in the product documentation. Avoid signal shielded by covering the mainframe.

**Use Qualified Maintenance Service**

Maintenance can be carried out only by qualified maintainer.

## 3. Physical Layout

## LED Indicator Definition



| | |
|---|---|
| **Power** | RTU status indicator, LED ON when switched RTU on. OFF when switched RTU off |
| **Alarm** | Alarm Indicator, alarm will ON and flick quickly. Normally is OFF; |
| **Arm** | Arm/Disarmed Indicator, Arm is ON, disarmed is OFF. |
| **Run** | RTU running status indicator, ON or OFF stands for RTU halted, flicks slowly stands for RTU running. |
| **.ıl** | GSM/3G module indicator. Flicks quickly(less than 1second per time) stands for searching GSM/3G Network or no SIMCard inside or SIMCard connection is not good or cannot register to GSM/3G network successful. Flicks slowly (about 1sencond per time)stands for GSM/GPRS/3G stands for registered successful and GSM/3G Module standby. |

## Power Connector Definition



| | |
|---|---|
| **DC IN+** | External DC Power input port, Connect to 1.5A@9~36V DC power, positive electrode. |
| **DC IN-** | External DC Power Input port, contact to negative electrode |
| **DC Out+** | Power source output port, positive electrode. Provides power from RTU to external transducers or sensors or detectors. The output voltage and current is the same as the power from DC IN inputs. |
| **DC Out -** | Power source output port, Negative electrode. |

## DIP Switch Definition



| | |
|---|---|
| *For S270, 2 and 3 switches are useless.* | |
| **SET/RUN** | For setting the RTU Mode is in Configuration Mode or Run mode. Switch it to upside is Set Mode, under this mode, the user can use PC Configurator via USB cable to configure the RTU Parameters or Read Parameter settings. |

| | |
|---|---|
| | Switch it to Downside is Run Mode, under this mode, the RTU is in Running mode. |
| 0/V/mA | The 1$^{st}$ channel of analog input type switch. If not use this channel then no matter is upside or downside.<br>Switch it to upside stands for the 1$^{st}$ analog input should connect to 0~5V voltage output transducer.<br>Switch it to Downside stands for the 1$^{st}$ analog input should connect to 0~20mA or 4~20mA current output transducer. |
| 1/V/mA~3/V/mA | The 2$^{nd}$ ~4$^{th}$ channel of analog input type switch. If not use this channel then no matter is upside or downside.<br>Switch it to upside stands for the related analog input should connect to 0~5V voltage output transducer.<br>Switch it to Downside stands for the related analog input should connect to 0~20mA or 4~20mA current output transducer. |

## Analog Input Definition
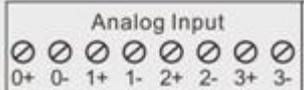


*Analog inputs, 12bits resolution, supports 0-5V, 0-20mA, 4-20mA output transducers, please refer to abovementioned DIP Switch Definition to connect the correct transducers.*
*For S270, 2+/2- and 3+/3- ports are useless.*

| | |
|---|---|
| 0+/0- | The 1st Channel Analog input. + stands for positive electrode, - stands for negative electrode. |
| 1+/1- ~ 3+/3- | The 2$^{nd}$ ~4$^{th}$ Channel Analog input. + stands for positive electrode, - stands for negative electrode. |

## Digital Input Definition



*Dry contact or wet contact. Logic level: 0~0. 5V or short circuit treated as close, +3~30V or open circuits treated as open. One of the input can be used as counter, sampling frequency is 1Khz.*
*For S270, 2/3 and GND ports are useless.*

| | |
|---|---|
| 0 | The 1st digital input, positive electrode. |
| 1~3 | The 2$^{nd}$ ~ 4$^{th}$ digital input, positive electrode. |
| GND | GND for digital inputs, negative electrode. |

## ATN Port Connector Definition

| | |
|---|---|
| ATN | GSM/3G Antenna connector, 50Ohm, SMA female. |

## USB Port Connector Definition

| | |
|---|---|
| USB | USB port, for configuration and upgrading firmware and exporting historical data; |

## Temperature&Humidity Sensor Port Definitions



| | |
|---|---|
| T/H | Temperature & Humidity sensor AM2301 inputs. Measurement Range: Temperature: -40°C to +80°C, Humidity: 0~100%RH. |

## Digital Solid Relay Output Connector Definition
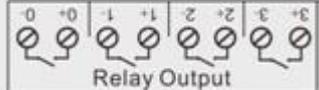


*Solid Relay inside for outputs, Rated Capacity: 5A/30VDC,5A/250VAC.*
*For S270, 2+/2- and /3+/3- ports are useless.*

| | |
|---|---|
| 0+/0- | The 1st Channel Solid Relay Output. + stands for positive electrode, - stands for negative electrode. |
| 1+/1- ~ 3+/3- | The 2$^{nd}$ ~ 4$^{th}$ Channel Solid Relay Output. + stands for positive electrode, - stands for negative electrode. |

| Backside Switch&Button Definition | |
|---|---|
| SIMCard Holder | For SIMCard Installation, only supports 3V SIMCard, not supports 5V Simcard. |
| Power Switch | For switch ON or OFF the RTU. |
| Upgrade Firmware Switch | For upgrade firmware purpose only. Only when upgrade new firmware version will use it. Please keep it at Work Side all the time. |
| Reserved Button | Reserved Button, Useless. |
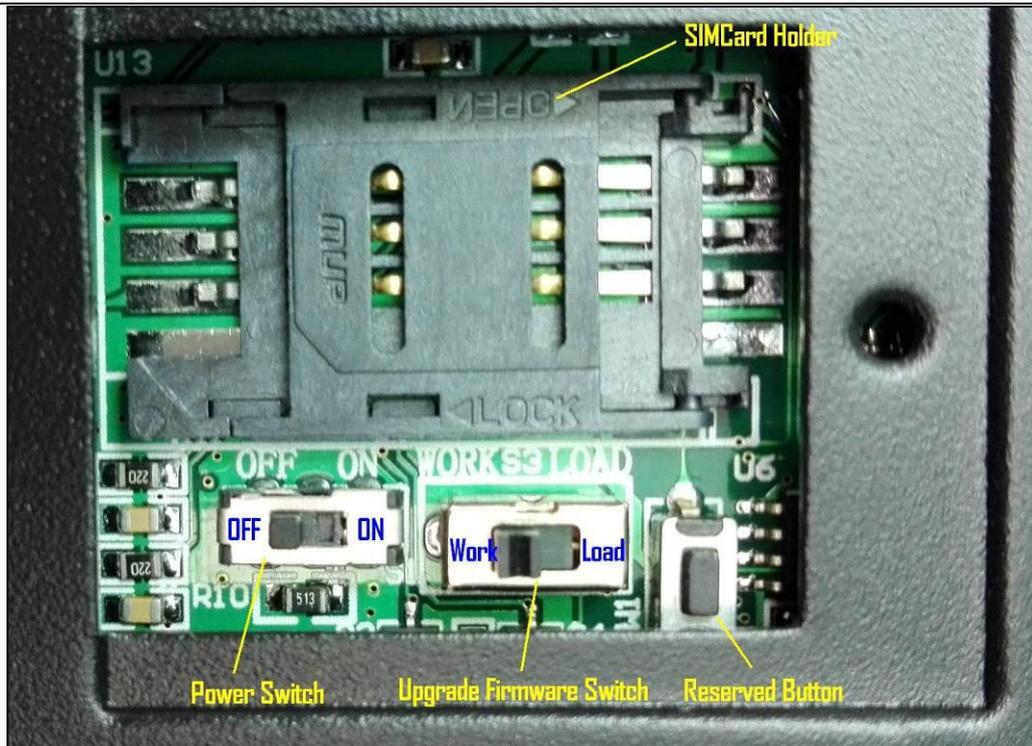
# 4. Setting

The GSM 3G M2M RTU is user-friendly design. The user can setup it or export historic data by the PC Configurator through USB cable, and upgrade firmware by USB port. The GSM 3G M2M RTU also can be configured some basically parameters by SMS Commands or Android APP and IOS APP, please refer to **Chapter 5.**

*Tips!*

1) *Please insert the SIMCard firstly, and install the GSM Antenna, please power on to check the LEDs status according to abovementioned LED Definitions, then switch off it before you program it by PC Configurator.*

2) *The PC Configurator in the CD, please click it to run it. Also can download from www.GPRS-M2M.com under S270/271 page directly.*

3) *The PC Configurator cannot run until it contacted to the GSM 3G M2M RTU successful.*

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

## Start to Configure the RTU :

**Step1:** **Install the GSM 3G M2M RTU Configurator**

The GSM 3G M2M RTU Configurator in the CD or download from www.GPRS-M2M.com, then installs it on the computer.

**Step2:** **Connection**

Please insert the SIMCard, and install the GSM/3G Antenna.

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

Switch it to upside is Set Mode, under this mode, the user can use PC Configurator via USB cable to

configure the RTU Parameters or Read Parameter settings.

*Notice:*

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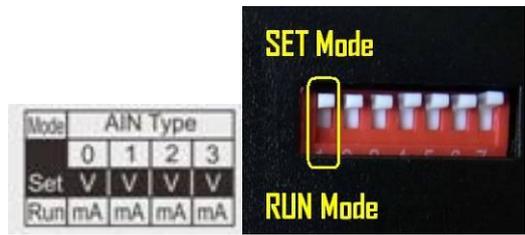


**Step4:** **Connect the RTU to the PC by USB Cable. And connect the external DC Power to DC Power Ports, see below:**
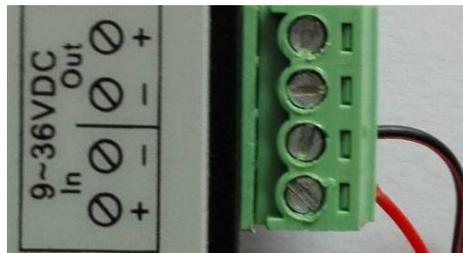


**Step5:** **Power On the RTU by the Backup side Power Switch. See below:**

*Notice:*

*The Upgrade Firmware Switch must at Work Side. See below picture.*
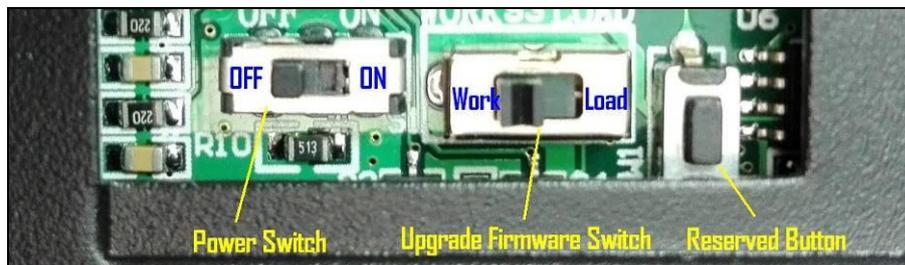


**Step6:** **Install USB Drvier**

Please Contact the unit to the PC by USB Cable, and then install the USB Driver to the computer from the CD firstly. When successful, it can be found out at the device manager of the XP or Windows 7 or 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.
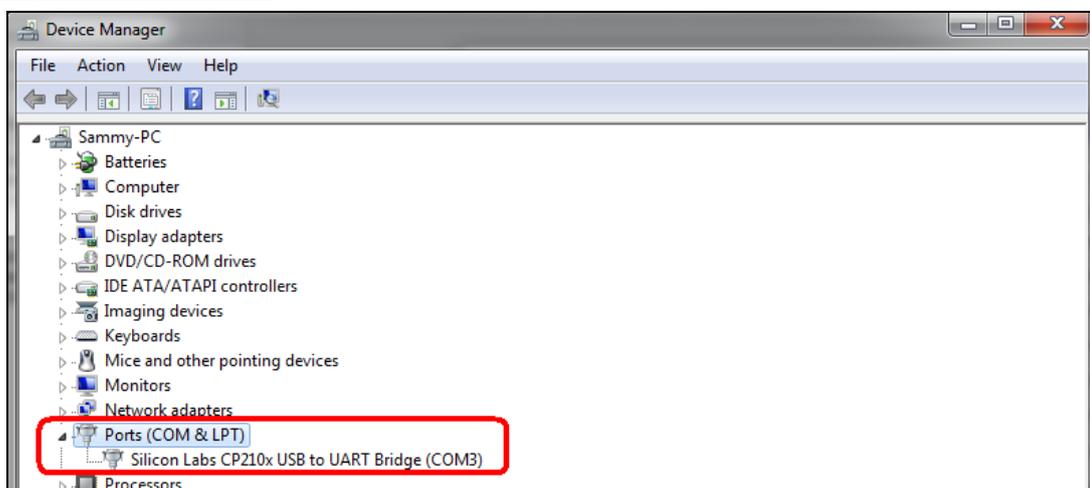


**Step7:** **Run the GSM 3G M2M RTU Configurator**

Open the Root of PC Configurator, there are 3 files, **the last 2 files must be in the same root**, the

WindowsInstaller3.1 is not necessary, it is a Service Pack file for windows OS. Click the **Setup.exe** to install the PC Configurator.

**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.*



After installation successful, on the desktop please click  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) The DIP Switch in RUN mode, not in SET mode;
4) The Upgrade Firmware Switch at Load side, not at Work side.
5) Power Switch switched off or DC Power Connection is disconnected.
6) Must reboot the RTU after change the dip switch or Load switch.

Step8: **Configuration Parameters**

After above-mentioned operations, it is possible to program the parameters of the RTU. The details please see below instructions.

⚙ **Basic Settings**

**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 configurating 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.

## ⚙ Parameter Settings

**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
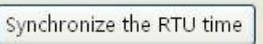
[Synchronize the RTU time] , the RTU will be synchronous the same time as the PC.
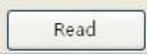
[Read] : Click it to read out the RTU's present page parameters to PC Configurator.
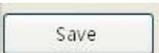
[Save] : Click it to download the present page parameters from PC Configurator to RTU.
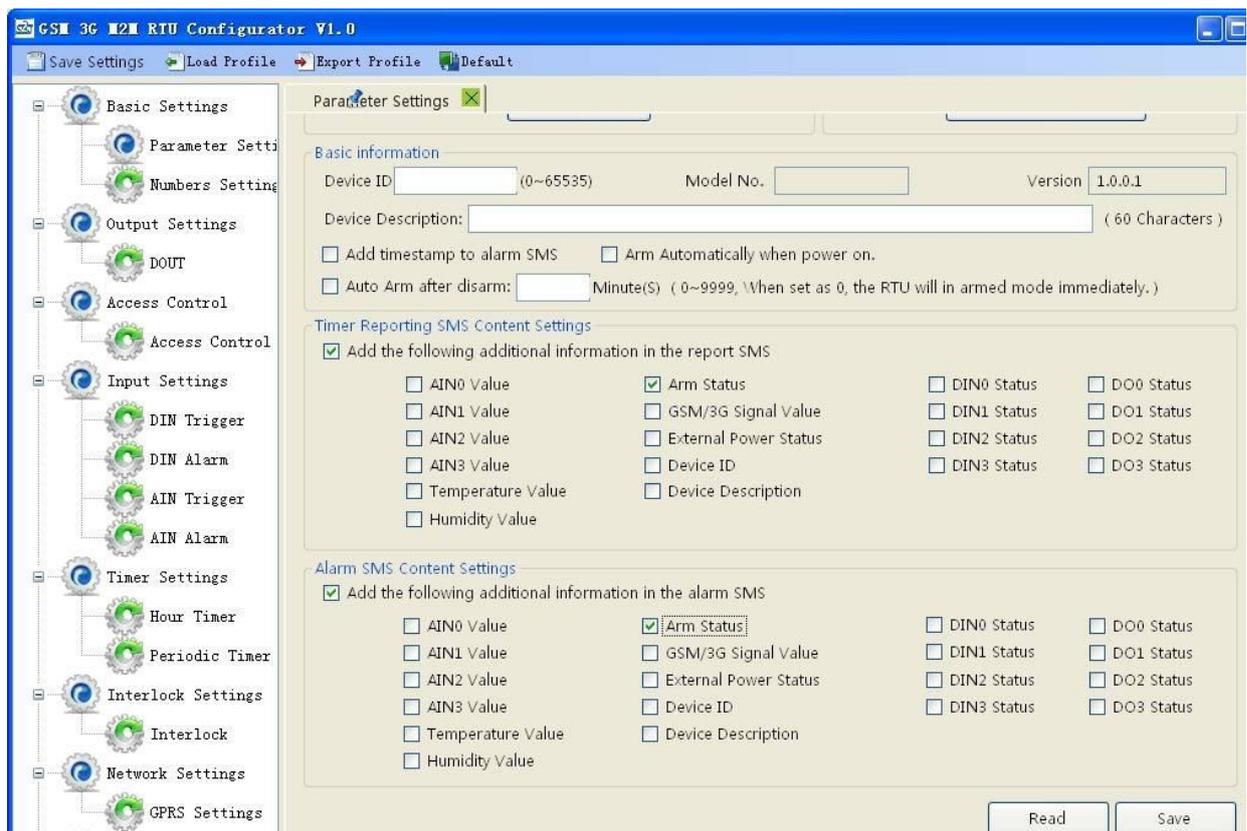
**Device ID:** non-necessary. This is mainly for monitoring center to identify the RTU, if the application no needs to identify the RTU, and then no need to fill any thing in it.

**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 usefully for security protection applications.

**Tips:**

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

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

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

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

## ⚙ Number Settings

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.



**Alarm No.:** Set the alarm receiver numbers, please includes the country code, e.g. in China is 0086, input 008613570810254, if cannot received the SMS or dial, then try to set as +8613570810254, but cannot be 8613570810254. Also, some GSM/3G Operators not required input country code, so please remove country code, e.g. in China is 0086, and China Mobile not required country code, so can set as 13570810254.

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

**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 or 3G 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 of while the Digital Solid Relay Output action will send SMS to this number.

### Digital Solid Relay Output (Dout) 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.
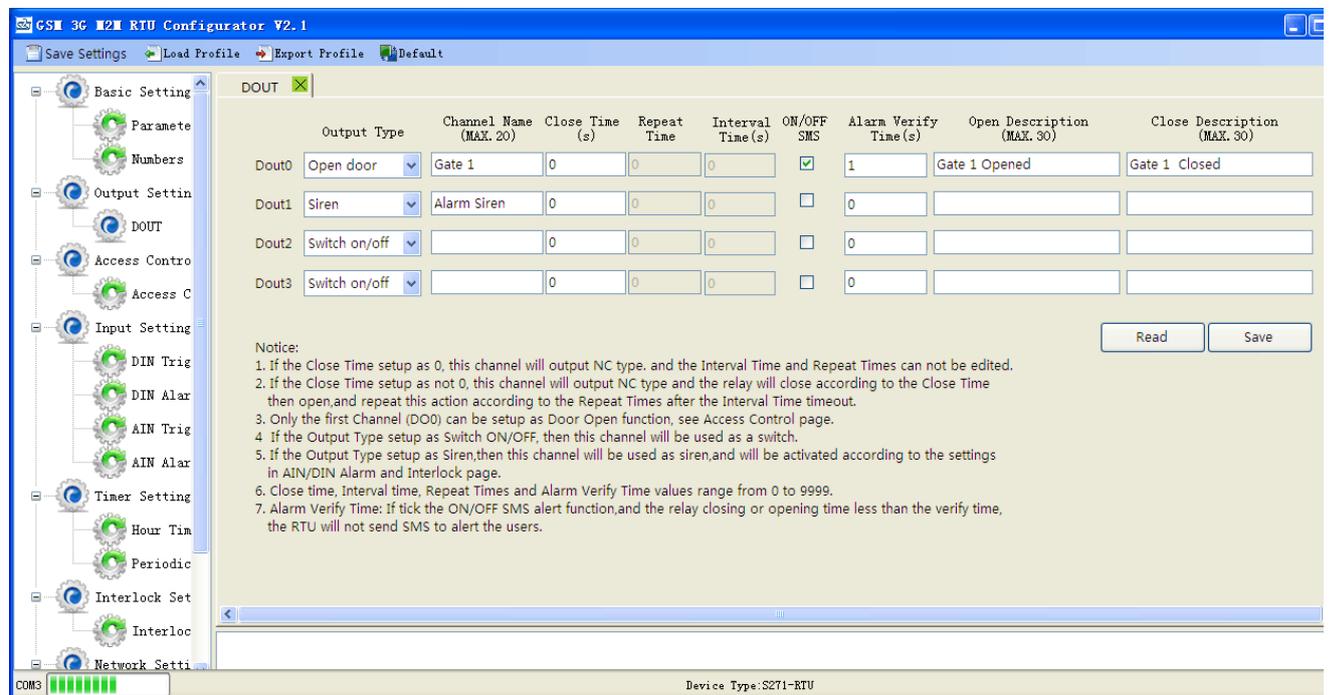


**Output Type:** Default is NO output type. The user can choose the Output Type for the relay outputs, includes Open Door, Switch ON/OFF, Siren and Video-interlock.

1) Open Door: Only the first Channel(DO0) can be setup as Open Door, use it for electric lock. If setup as Open Door, then the authorized number calls in RTU, can open the electric Lock directly or output a pulse signal and disarmed the RTU directly. See Access Control page about the authorized number. (If close time set as 0, when call in, the relay will keep closed.)

2) Switch ON/OFF: For switch on/off device.

3) Siren: this is for output pulse signal for siren sounds, If setup as Siren, then while the RTU alarm and ticked the Siren function in AIN or DIN trigger pages, then this channel will execute the setting parameters.

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

**Close Time:** Stands for the relay close and last time.

**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.

**ON/OFF SMS:** Tick it stands for while the Recovery action, will send SMS to the authorized numbers;

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

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

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

## ⚙ 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.
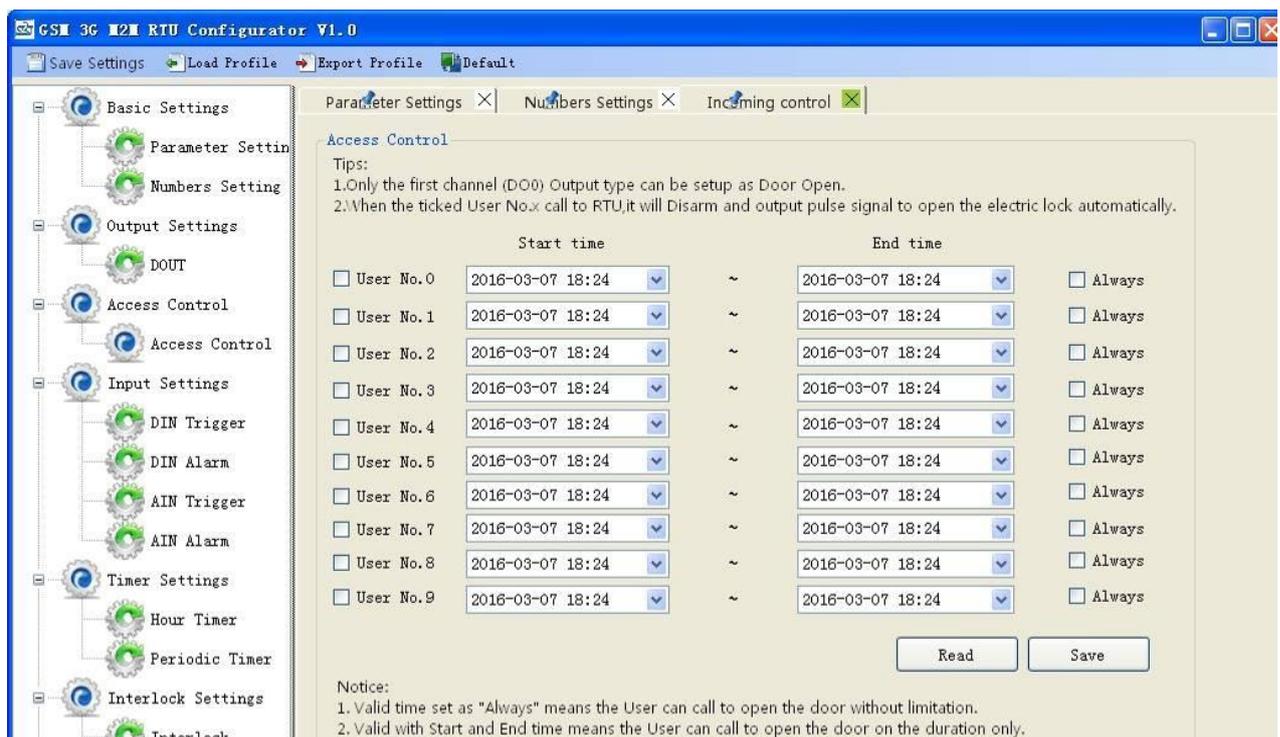


**Start Time:** Stands for from what time this authorized number can dial in to control it.

**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. The Digital input can be used as Armed/Disarmed Button, and also can be used as pulse counter, sampling frequency is 1Khz. and contact both of Wet-Contact and Dry Contact types digital detectors. If the input is wet contact then the logic level: 0~0. 5V or short circuit treated as close, +3~30V or open circuits treated as open.

**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) **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.
   3) **NC:** For connecting Normal close type detector, open will alarm.
   4) **NO**: For connecting normal open type detector, close will alarm.
   5) **Change**: For connecting normal open or normal close type detector, once the status changed, will be treated as alarm.(This function was reserved in this version)
   6) **Counter**: Only the first channel (DIN0) 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.(When the counter reach to Total Alarm Value, will send SMS alarm, after that ,clear to Initial Value automatically.)

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

**Current Status:** Stands for input's current status.

**Recovery Alarm:** Tick it stands for when the digital input recovery, will send SMS to the authorized numbers.

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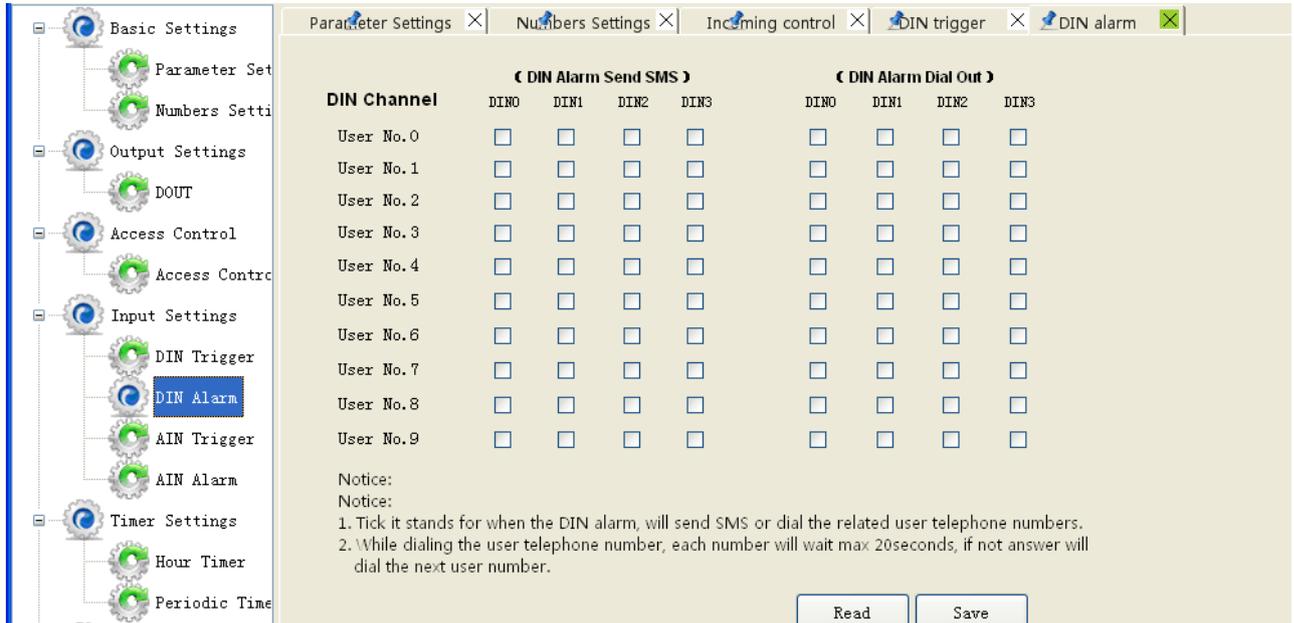
**24Hr:** Tick it stands for no matter the RTU is in Arm or Disarmed mode, this digital input triggered will alarm.

**Repeat Times:** Stands for how many times does the RTU should repeat to send SMS to authorized numbers.

**Interval Time:** Stands for interval how many seconds then resend the alarm SMS again.

⚙ **DIN/AIN Alarm Settings**

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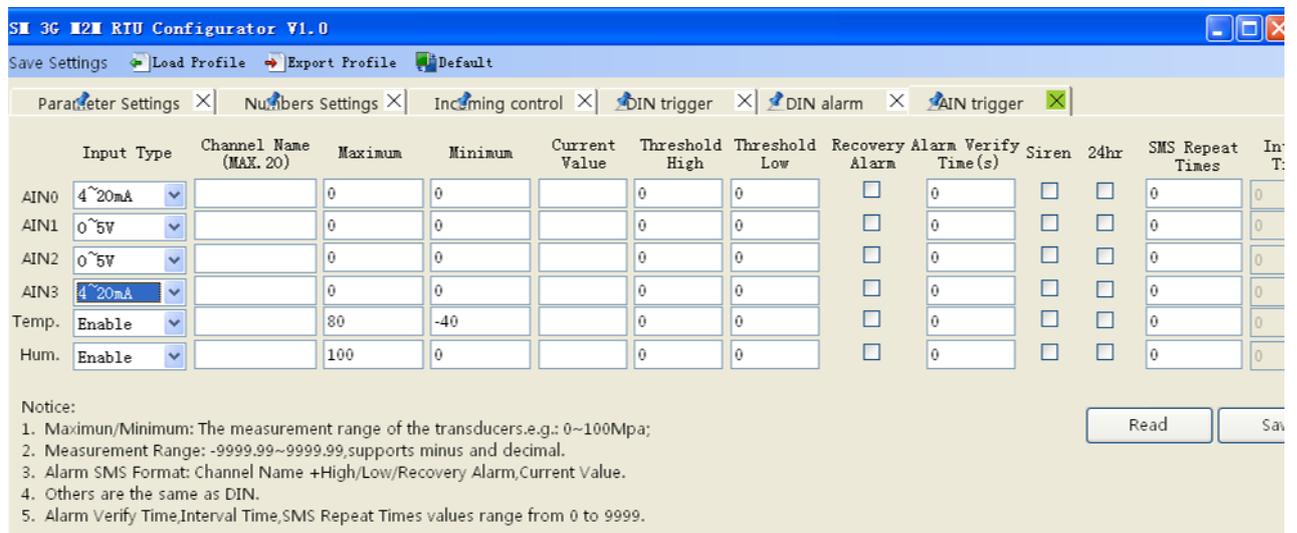


## AIN Trigger Settings

This page is to setup the analog input alarm conditions and analog input types.



**Input Type:** Default is AIN0 and AIN3 is 4~20mA, AIN1 and AIN2 is 0~5V. The user can choose the input type for related channel. Includes: Disable, 0~5V, 0~20mA, 4~20mA.

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

**Channel Name:** to setup the input channel name, e.g.: Voltage or Current and so on, in order to identify it in SMS Contents.

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

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

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

**Threshold High:** The higher value need to alarm, like 50Celsius degree;

**Threshold Low:** The low value need to alarm, like -50Celsius degree;

**Recovery Alarm:** Tick it stands for when the analog input recovery, will send SMS to the authorized numbers.

**Alarm Verify Time:** Stands for when the analog input exceed the threshold value and 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 input triggering, the DO that output type was setup as **Siren** will execute the its output parameters.

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

**Repeat Times:** Stands for how many times does the RTU should repeat to send SMS to authorized numbers.

**Interval Time:** Stands for interval how many seconds then resend the alarm SMS again.

## ⚙ Timer Setting—Daily Timer

This page is for setup daily timer, it is useful for scheduling when to execute what action automatically. Total can program 10 scheduling events. Tick it stands for enable this timer event:
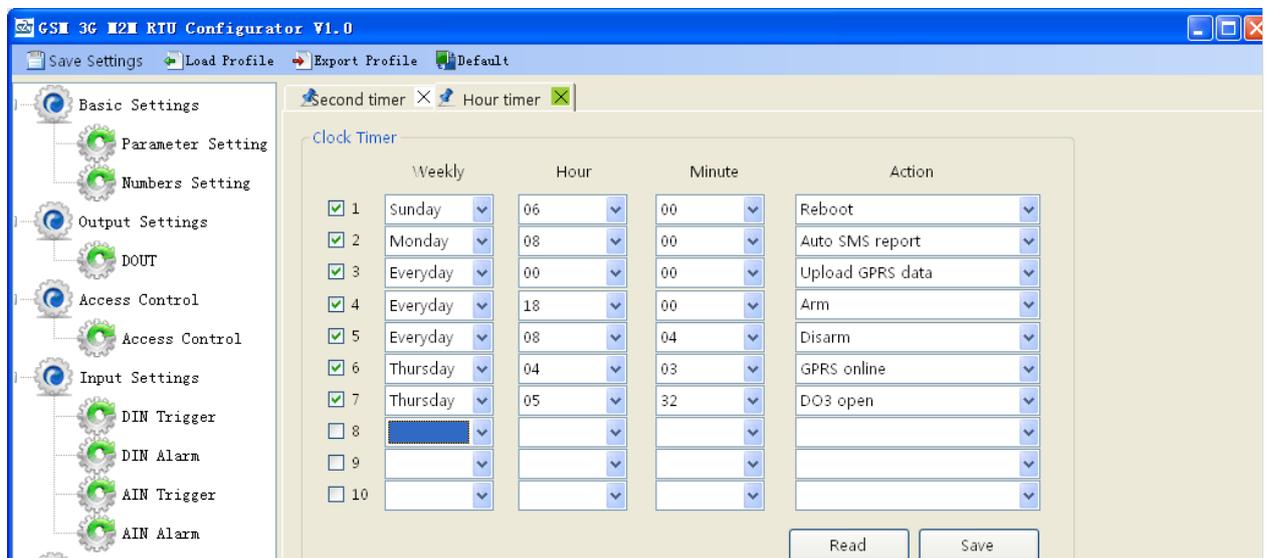


**Weekly+Hour+Minute:** Stands for what day and at what time does the RTU should execute the action.

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

**E.g.:** as abovementioned,

Every Sunday 06:00, RTU automatically Reboot.

Every day 00:00, RTU upload data by GPRS to server.

Every day 18:00, RTU armed automatically.

Every Monday 08:00, RTU automatically send SMS reports to authorized numbers.

**Tips:**

**Action:** *If the action is for DOUT (relay),then the relay working time, interval&repeat time is depend on the DOUT parameter. So, if want to use the DOUT to working periodically, then just setting in here.*

## Timer Setting—Periodical Timer

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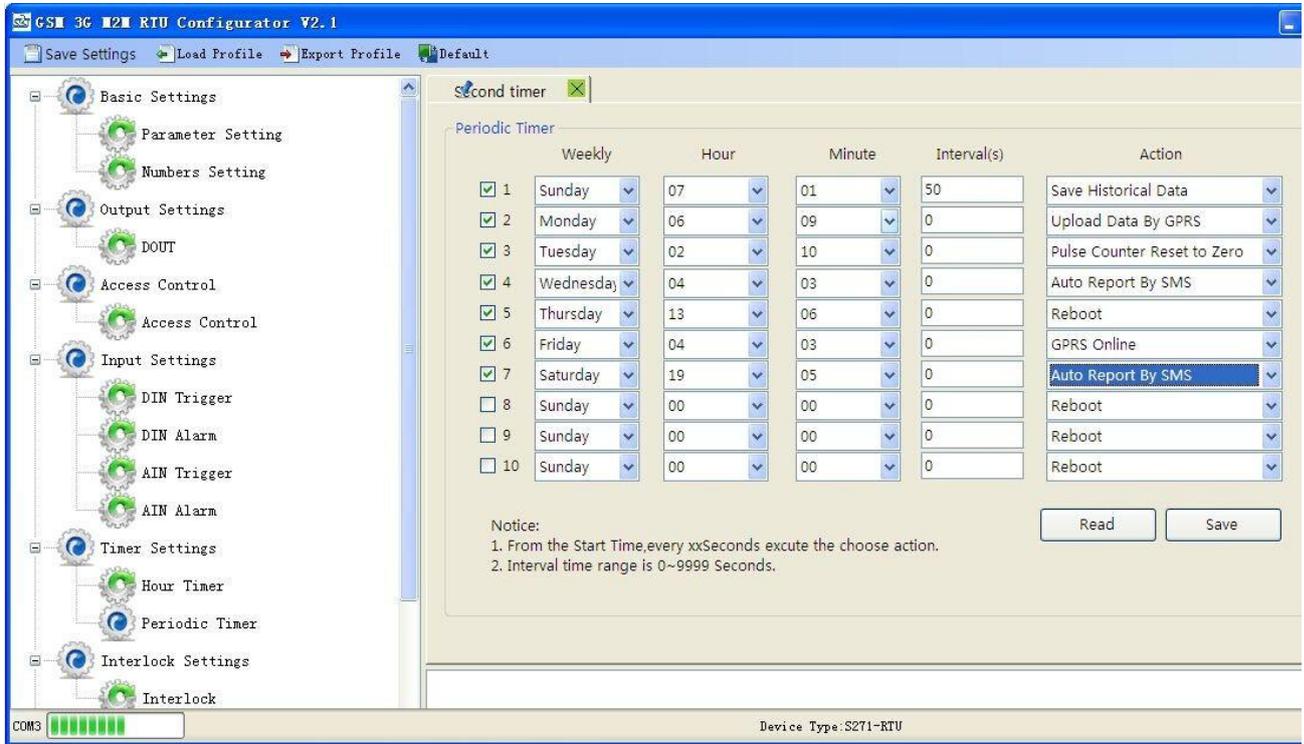


**Weekly+Hour+Minute:** Stands for what day and at what time does the RTU should start to execute the action and interval how many seconds then repeat to execute the action.

**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.

**E.g.:** as abovementioned,

From the coming Sunday 07:01 start to save historical data, and executes this action every 50 seconds.

## 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 32 logic events for automatically control purposes.
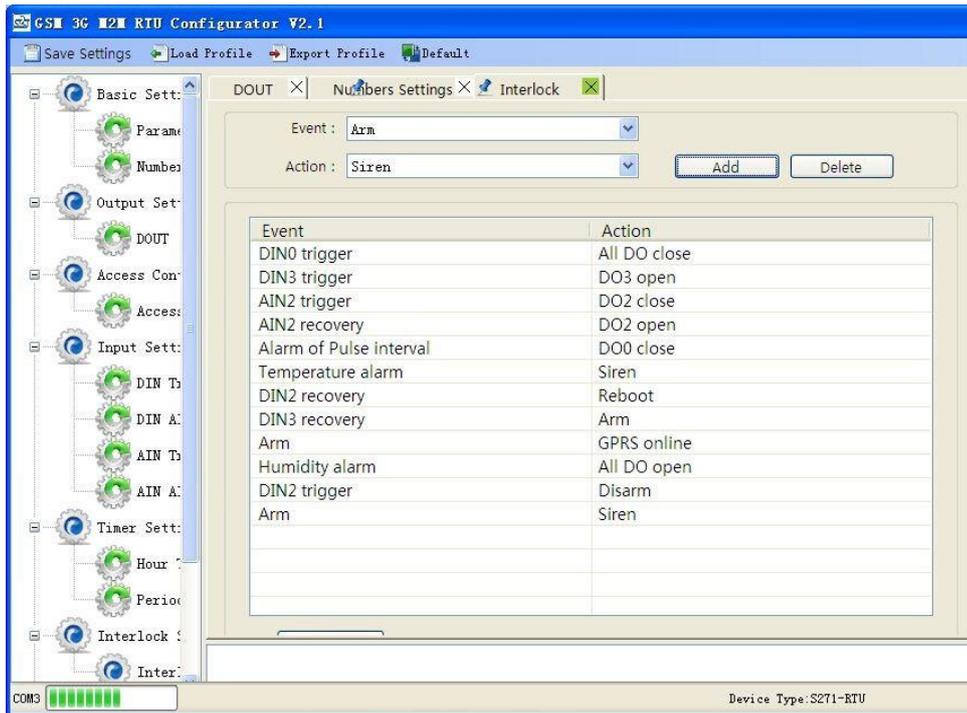
**Event:** Stands for if this occurrence.

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

## GPRS &Server Parameter Settings

This Page is for setup the GPRS online parameters, GPRS Transport data protocol and Server information. Only when you have Server or need to use GPRS to transmit data then need to setup these parameters. The GPRS Protocol details please refer to <S27x GSM 3G M2M RTU GPRS/3G Protocol Instruction>.
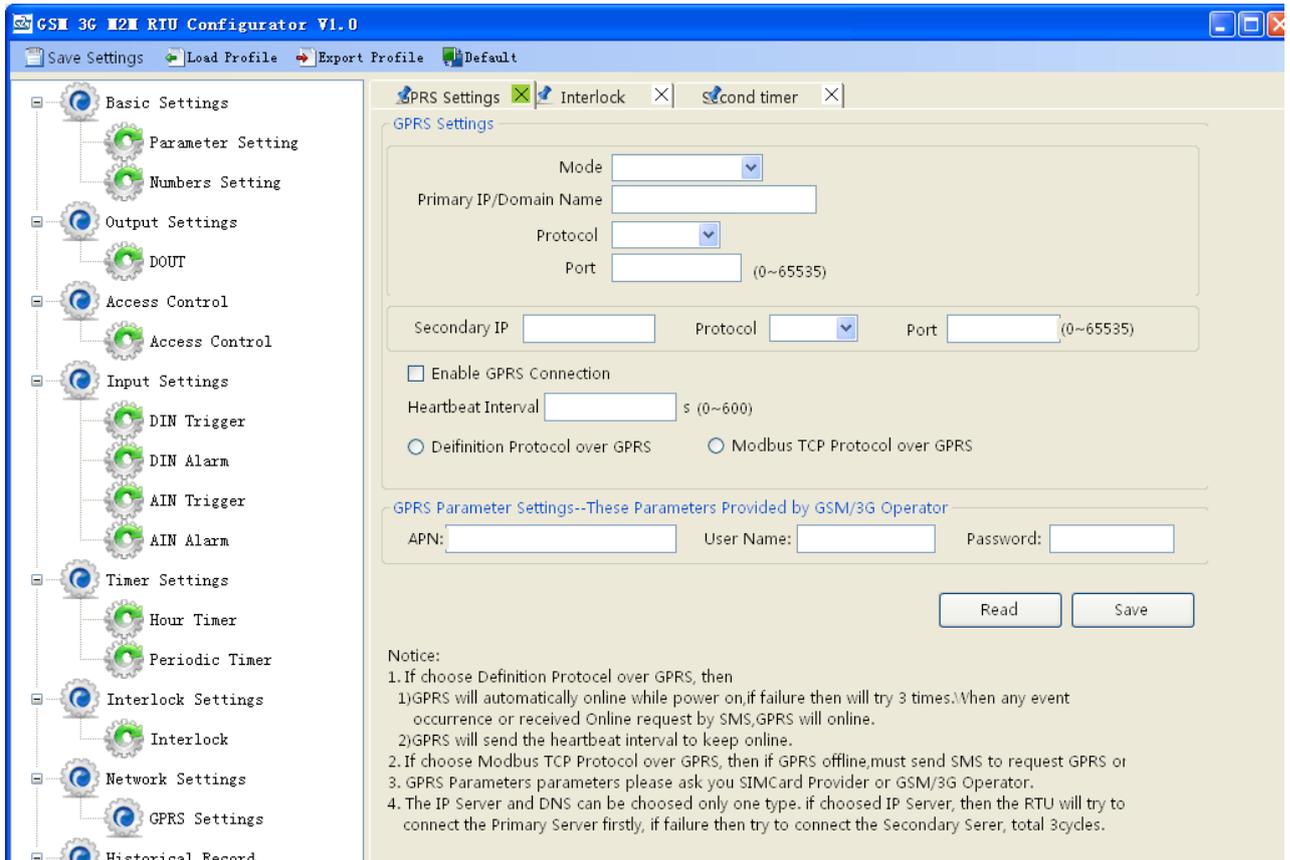


**Mode:** To choose which type of Server will be used, includes IP Address Server and DNS Server. If

setup Use DNS as Server, then the RTU only supports this DNS as Server, if setup IP Connection type, then stands for using IP Address as server, and the Secondary IP Server also can be used.

**Primary IP/Domain Name:** Stands for primary Server IP address or DNS.
**Protocol:** Stands for the GPRS transmission using TCP or UDP protocol;
**Port:** Stands for the server's port.
**Secondary IP:** Stands for secondary Server IP address;
**Enable GPRS Connection:** Tick it stands for enable GPRS communication.
**Definition Protocol over GPRS:** Tick it stands for the protocol via GPRS is KingPigeon RTU protocol.
**Modbus TCP Protocol over GPRS:** Tick it stands for the protocol via GPRS is Modbus TCP protocol.
**Heartbeat Interval:** GPRS keep online heartbeat interval time.
**APN:** GPRS Access Point Name, provided by GSM/3G Operator.
**User Name:** GPRS User Name, provided by GSM/3G Operator.
**Password:** GPRS Password, provided by GSM/3G Operator.

**Tips:**

1) *If setup as IP Connection mode, the RTU will upload data to the primary IP firstly, if failure will try to transmit data to the secondary IP server. If the secondary IP server still failure, will try to connect the Primary IP, total 3 times.*

2) *The RTU only supports one of the IP Address and DNS as Server. Cannot use both of them at the same time.*

## Historical Record

This page is for manage and read out the historical record from the RTU, and can save as CS format for other purpose usage.

For historical record, the RTU total can save 200 records. Once it full, will automatically remove the earlier 100 records for new records.

The records only include alarm events, not includes power loss events, timer events.
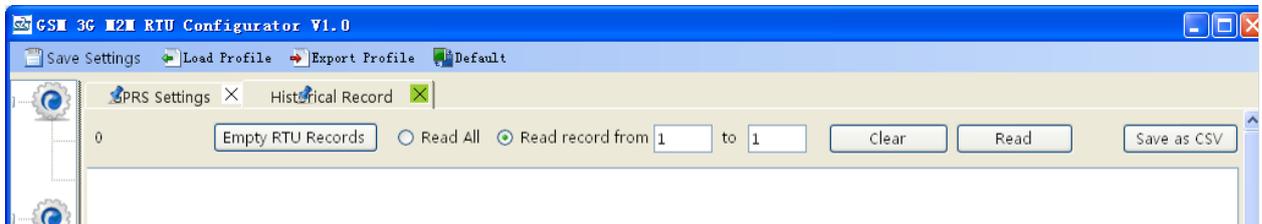


## Start to Work:

**Step1:** In order to save you time to program it, please click Export Profile to save these configurations as a profile.

**Step2:** Exit the Configuration, and Switch OFF the RTU.

**Step3:** This Step is for you first time to use this RTU, or you're not sure if the configurations are save successful. Run the PC Configurator, and Switch ON the RTU again, enter password and try to read out the previous settings. If can read out all of the settings, then stands for you previous settings are successful.

**Step4:** Switch OFF the RTU, and remove the USB Cable, then please remember switch the 1st DIP Switch to RUN mode. See below picture.
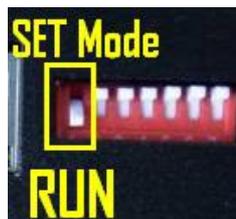


**Step5:** Switch ON the RTU, the RTU will make a long beep "DI~" for 10 seconds. If hasn't heard the Di sounds then means somewhere with mistake settings. Please refer to above-mentioned steps to check it carefully. And reference to the **LED Definitions** to check if it enters running.

## 5. *SMS commands & APP (Cannot Setting the Timer&Interlock).*

The user can send SMS commands to setup or operate the GSM 3G M2M RTU, also can use the APP to control it easier. The APP is under SMS communication, but their makes the program and operation easier than edit SMS every time.

The Android APP download link:
https://play.google.com/store/apps/details?id=com.jinge.gsmseniorhelper_s275
The IOS APP download link:
https://itunes.apple.com/us/app/gsm-3g-m2m-rtu/id1095288504?l=zh&ls=1&mt=8

Or use Android smart phone/Iphone to scan the QR Bar code:



Or search it at Google Play/APP Store by name: **S27x GSM 3G M2M RTU Controller**
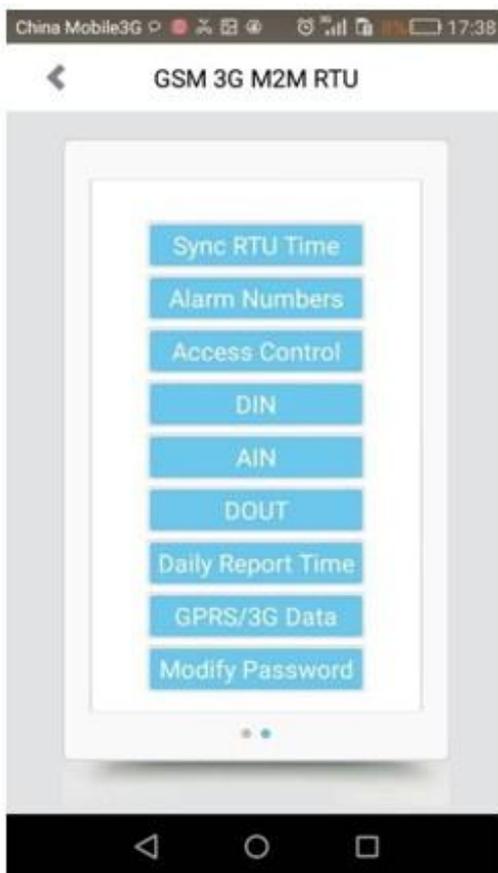


The SMS commands will be used for remote control the RTU are below:

### 1) *Commands error return SMS*

| Event | Return SMS Content |
|---|---|
| Any incorrect Command | SMS Format Error, Please check Caps Lock in Command! |

### 2) *External DC Status*

| Event | Return SMS Content |
|---|---|
| External DC goes off | External DC Power Goes OFF |
| External DC Power Goes ON | External DC Power Goes ON |

### 3) Modify Password, 4digits, default is 1234

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

### 4) Arm/Disarm SMS Command

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

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

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

### 6) Inquiry Current Status SMS Command

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

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

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

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

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

### 9) Setup Daily Report time

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

### 10) Setup DIN Name (For recovery alert then the SMS will plus "Recovery")

| SMS Command | | Return SMS Content |
|---|---|---|
| Set DIN Name | password+DIN+channel number+T+ DIN Name<br>**Notice:** channel number= 0~3, DIN Name max 40 characters;<br>E.g.: 1234DIN0TDoor alarm | DINx: |
| Inquiry DIN Name | password+DIN+series number<nnnn><br>**Notice:** nnnn stands for channel number | |
| Delete DIN Name | password+DIN+series number+DEL | |
| Inquiry Status | password+DINE | DIN1:Open/Close<br>DIN2: Open/Close<br>----- |

11) ***Setup AIN Name***(For recovery alert then the SMS will plus "Recovery")

| SMS Command | | Return SMS Content |
|---|---|---|
| Set AIN Name | password+AIN+channel number+T+AIN Name<br>**Notice:** channel number= 0~3, AIN Name max 40 characters;<br>E.g.: 1234AIN0TDoor alarm | AINx:xxxx |
| Inquiry AIN Name | password+AIN+ channel number<nnnn> | |
| Delete AIN Name | password+AIN+ channel number+DEL | |
| Set Threshold | password+AINR+channel number+Lxxx+Hxxx | AINx:   Low:xxx,High:xxx. |
| Inquiry Threshold | password+AINR+ channel number<nnnn> | AINx:   Low:xxx, High:xxx.<br>AINy:   Low:xxx, High:xxx. |
| Delete Threshold | password+AINR+ channel number+DEL | |
| Set AIN measurement range | password+AINM+ channel number+Lxxx+Hxxx | AINx: Min:xxx,Max:xxx |
| Inquiry measurement range | password+AINM+ channel number<nnnn> | AINx: Min:xxx, Max:xxx.<br>AINy: Min:xxx, Max:xxx. |
| Delete measurement range | password+AINM+channel number+DEL | |
| Inquiry AIN Current Value | password+AINE+channel number<nnnn> | AINx：xxxx ,+【Normal/Higher/Lower】 |
| Inquiry All AIN Current Value | password+AINE | AIN0：xxxx ,+【Normal/Higher/Lower】<br>AIN1：xxxx ,+【Normal/Higher/Lower】<br>---- |

12) ***SMS Control Digital Output***

| SMS Command | | Return SMS Content |
|---|---|---|
| Set DO Name | password+DO+channel number+T | DOx:xxxx |
| Inquiry DO Name | password+DO+ channel number<nnnn> | |
| Delete DO Name | password+DO+ channel number+DEL | |
| Switch ON(Close) | password+DOC+ channel number<nnnn><br>**[The relay working time is always closed]** | DOx: ON<br>DOy:ON |
| Switch OFF(Open) | password+DOO+ channel number<nnnn> | DOx: OFF<br>DOy:OFF |
| Switch ON(Close) numbers of relay | password+DOLC+ channel number<nnnn><br>**[The relay working time is depend on the setting in DOUT parameter]** | DO1: ON<br>DO2: ON<br>DO3: ON<br>DO4: ON |
| Inquiry DO Current | password+DOE+ channel number<nnnn> | DOx: ON/OFF |

| Status | | DOy:ON/OFF |
|---|---|---|
| Inquiry all DO Current Status | password+DOE | DO1: ON/OFF<br>DO2:ON/OFF<br>--- |
| 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 |

### 13)SMS Command for Current Counter

| Remark | SMS Command | Return SMS Content |
|---|---|---|
| Clear the counter to start value | password+DIN0CLR | Clear OK |
| Inquiry current counter | password+PR | Current Counter:xxxxxx |

### 14)Delete all the History Data

| SMS Command | Return SMS Content |
|---|---|
| password+ HISDEL | Delete Successfully |

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

| | SMS Command | Return SMS Content |
|---|---|---|
| Set Server IP | password+IP+ IPaddress+P+Com port | Server:<br>Port: |
| Inquiry | password+IP | |
| Delete | password+IPDEL | |

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

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

### 17)Wakeup GPRS Online

| SMS Command | Return SMS Content |
|---|---|
| password+GPRSonline | No SMS Return |

18)**Remote upload historic data via GPRS**: Send this command, the unit will upload historic data via GPRS.

| SMS Command | Return SMS Content |
|---|---|
| password+HIS | Automatically upload all historic data to server via GPRS. |

# 6. Communication Protocol

The GSM 3G M2M RTU supports TCP/IP communication via GPRS/3G. It is very useful for users to create remotely server. It inbuilt Modbus TCP protocol and definition protocol(KingPigeon RTU Protocol), the user can connect the GSM 3G M2M RTU to the present HMI, OPC Server, SCADA directly.
For GPRS Communication protocol, please refer to <S27x GSM 3G M2M RTU GPRS/3G Protocol Instruction>.

# 7. Registers Assignment Table

The registers assignment of the RTU and its IO will definite in the < S27X GSM 3G M2M RTU Register

Assignment Table>, please refer to it.

## 8. Upgrade Firmware

The GSM 3G M2M RTU supports upgrade firmware via USB port directly. If we upgraded the firmware functions of the RTU, we will inform you to upgrade the firmware if you required. If there any new requirements of the present functions caused it should update the firmware, the user can upgrade them directly by USB port. If you required upgrade, please contact us to modify the firmware according to you requirements, and we will provide the upgraded firmware to you to upgrade them.

## 9. Warranty

1) The RTU was warranted to be free of defects in material and workmanship for one year from the date of purchase.
2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions.
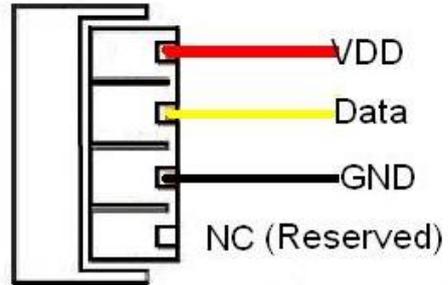
## 10. Wiring Connection Diagram:

## 1.Analog Transducer:
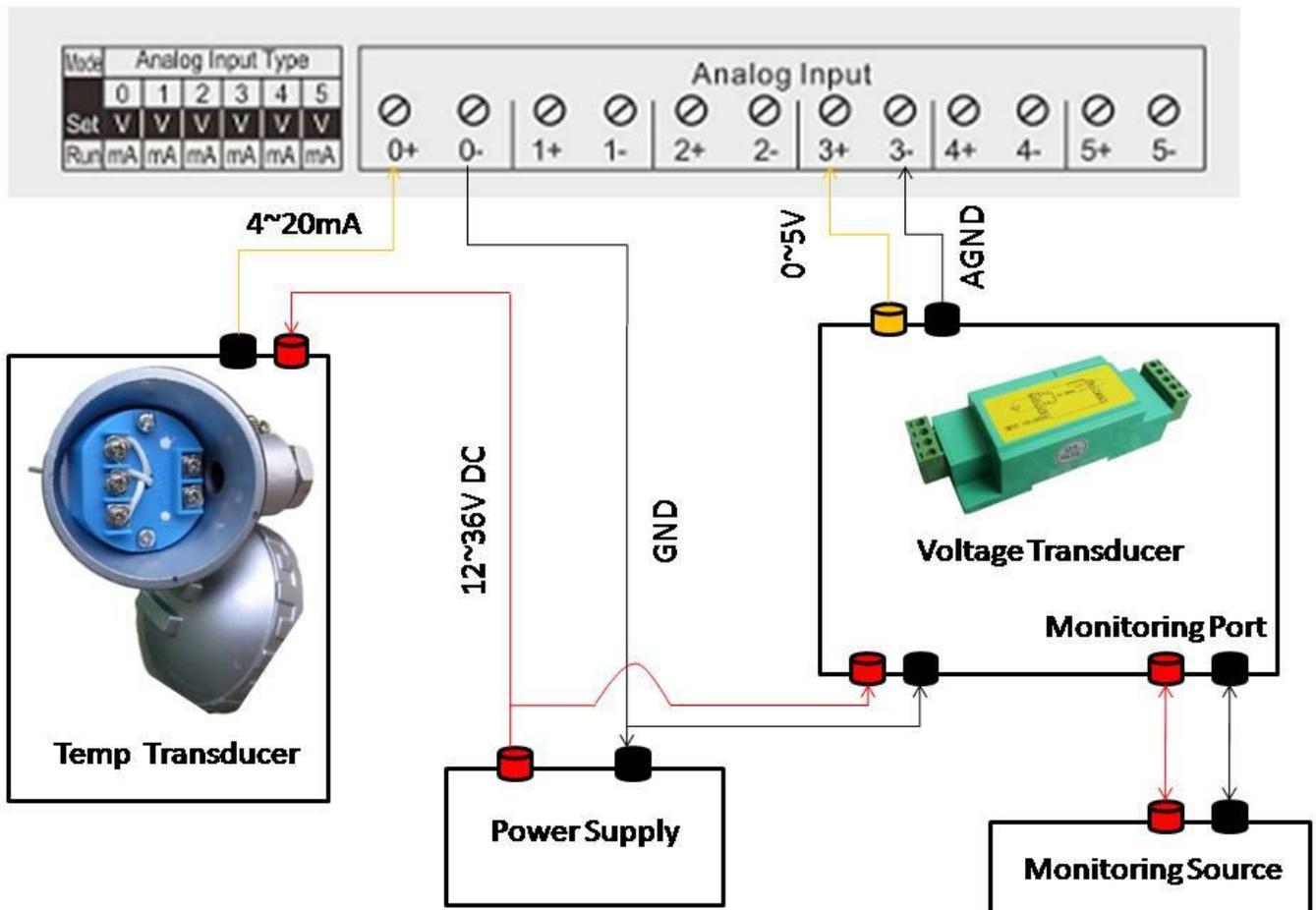


## 2.T/H input Sensor (Temperature&Humidity for Environment):

**AM2301 PIN Difinition**

| Temp&Hum Input | VDD | Connect to AM2301 Sensor VDD wire. Red wire. |
|---|---|---|
| | Data | AM2301 Data wire. Yellow wire. |
| | GND | AM2301 GND, black wire. |

*- END-*