

CWT5015**GSM RTU****USER'S MANUAL V3.0****CONTENTS**

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1 PREFACE

Thank you for using the CWT5015 GSM RTU. You will know well about the functions and operation methods of this product quickly through this User's Manual.

This product is mainly used for remote alarming and control application based on GSM network. Please use it according to the parameters and technical specifications in the User's Manual. Meanwhile, the Notes shall be considered for the usage of radio-control products, especially GSM products. Our Company bears no liability for property loss or bodily injury arising from abnormal or incorrect usage of this product.

Package list

product	quantity
CWT5015GSM RTU	1pcs
RS232 cable	1pcs
12V Adaptor	1pcs
GSM antenna	1pcs

2 INTRODUCTION

CWT5015 GSM RTU is designed as a cost effective remote control system alert device. It monitors up to 2 dry contacts and 3 relay outputs and 1 AD input. 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 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.

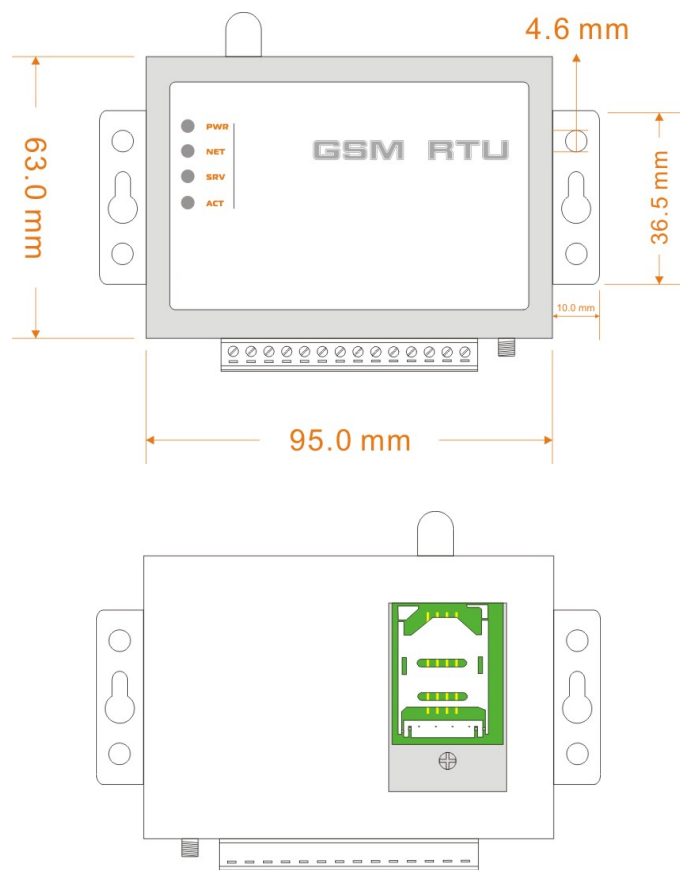
There is a built-in microprocessor chip running on a real-time operating system. It gives immediate response to any change in both inputs and outputs condition. A GSM modem is embedded in the GSM RTU, user has to subscribe a SIM card for the GSM RTU. The GSM RTU can be installed in any location under GSM coverage.

2.1 Parameter

Parameter item	Reference scope
DC Power supply	9-28V DC (Standard adapter: DC 12V/1.5A)
Power consumption	12V input Max. 150mA/Average 50mA
Frequency range	Dual-frequency 900/1800 or 900/1800/850/1900
SIM Card	Supporting 3V SIM Card
Antenna	50 Ω SMA Antenna interface
Serial	RS232
Temperature range	-30°C ~ +70 °C
Humidity range	Relative humidity 95%
Digital Input	2 digital inputs(Dry contact)
output	3 relay outputs(240V 2A)
Analog Input	1 analog inputs(4~20mA or 0~5V)
Exterior dimension	95x63x25mm
Weight	256 g

3 INSTALL

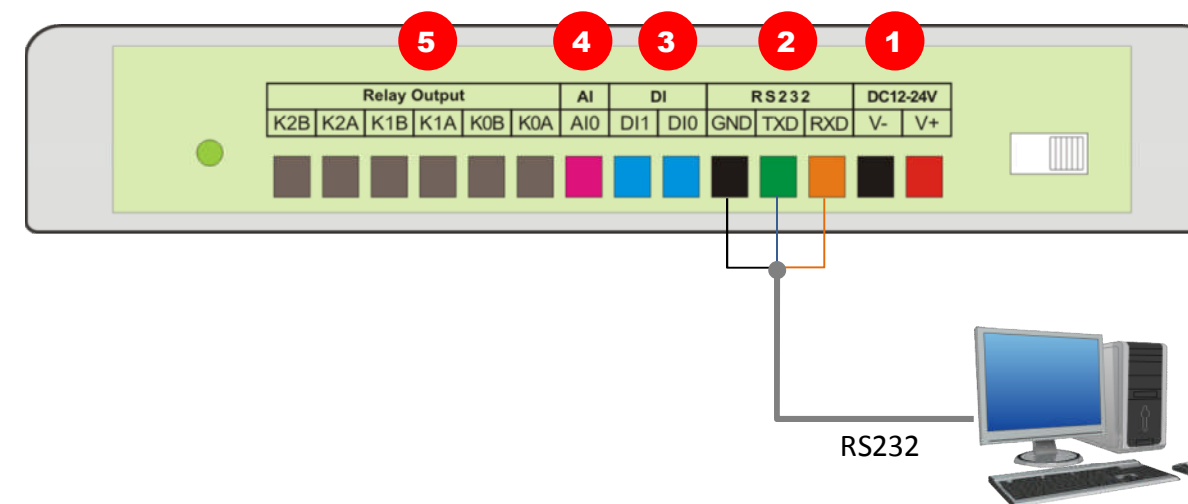
3.1 size



3.2 LED indicator description

Indicator	Status	Indication description
PWR (Red)	Normally light on	Indicator for power supply, which will be light on when the system is power on
NET (Green)	Flicker	SMS module signal indicator, which will flicker slowly after the system is registered in GSM network
SRV (Yellow)	Light on during handling	It will be light on when the system sends sms and light off when the handling is over
ACT (Orange)	Flicker	It will flicker periodically when the system is under operation, and the interval time is 6 sec
Side led (green)	Light on or off	Light on during the internal battery is charge up

3.3 Terminal Description



①. DC9-28V (power in)

DC V+	positive terminal of the DC power supply (+)
DC V-	Negative terminal of the DC power supply (-)

②. RS232

RXD	Receive Data	Connect RS232 cable red wire
TXD	Transmit Data	Connect RS232 cable green wire
GND	Ground	Connect RS232 cable black wire

③. 8 digital inputs (NO or NC)

DI0 ~ DI1	Connect NO or NC
GND	Connect COM

④. 1 analog inputs

AIN0	Connect analog device output (4-20mA or 0-5V)
------	---

Note: analog sensor output GND need RTU GND

⑤. 3 drivable relay outputs

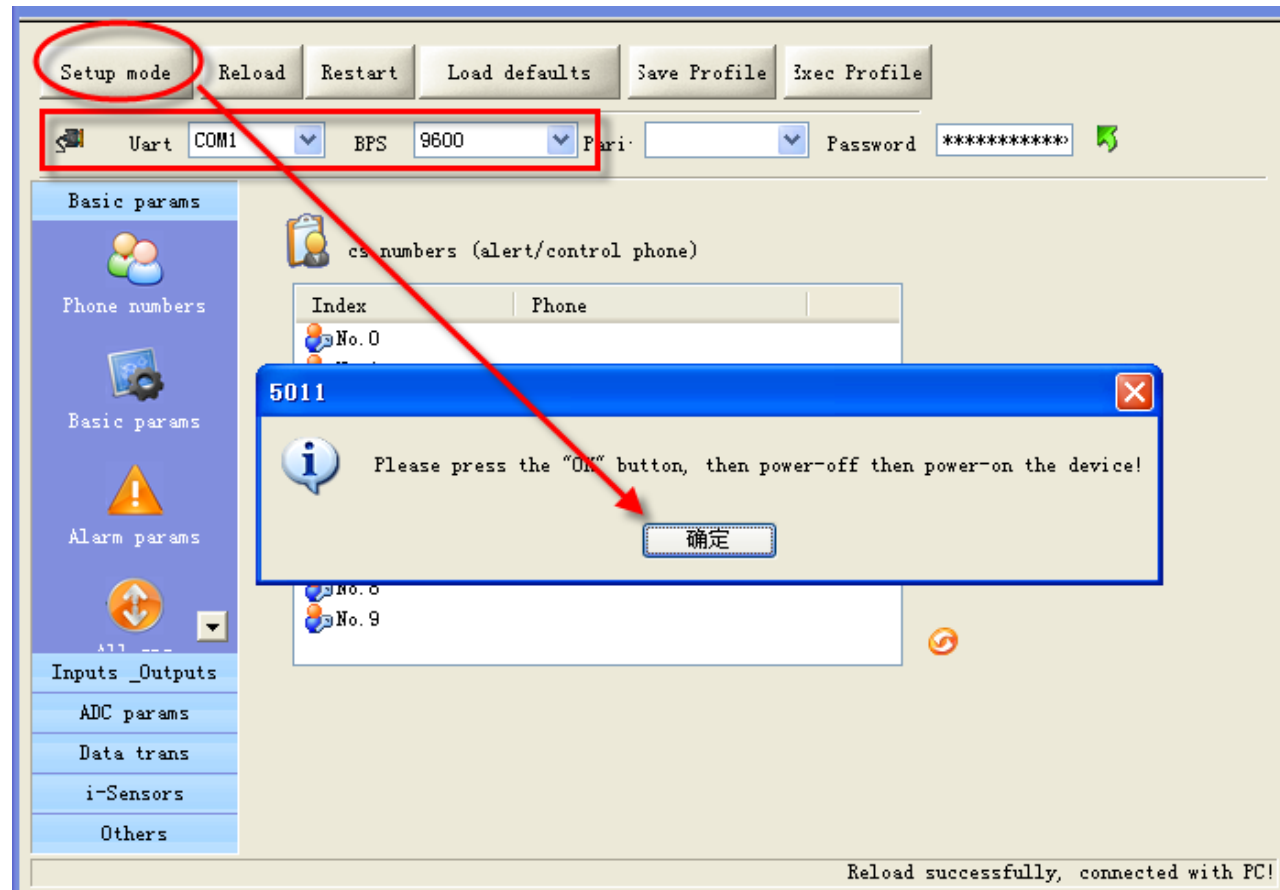
K A	Interior relay NO contactor
K B	Interior relay NO contactor

4 SETUP PARAMETERS FOR RTU

4.1 Access setup mode

Connect RTU to computer by RS232 cable, and run the configuration software, make RTU access setup mode according to the following figure.

⚠ Note: Please choose the serial port No. and rate correctly, the default communication rate is 9600; default password is "000000"



Definition: Working mode and setup mode

In setup mode, all functions are disabled, only to setup parameters. And RTU must be restart to enter working mode, all functions is enabled, the RTU can alarm and be control.

⚠ NOTE

Access setup mode, the simcard and antenna is no need, but access wording mode, the simcard and antenna is necessary.

⚠ How to know current mode:

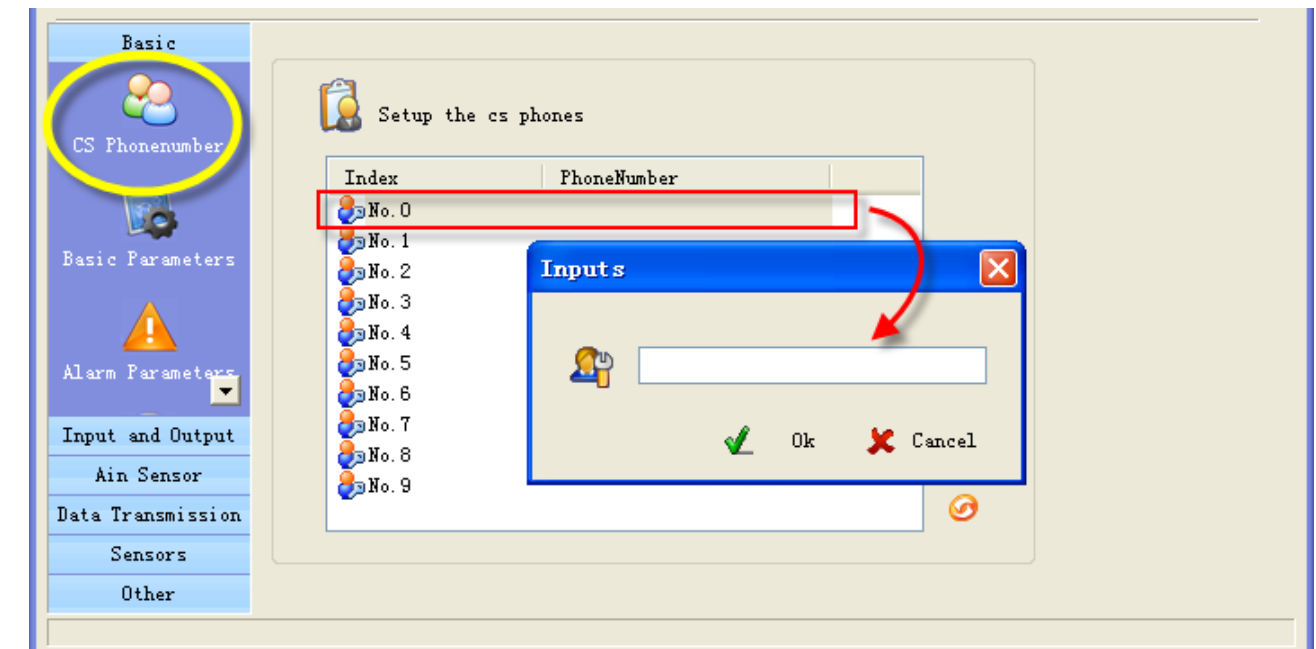
Method 1: Check the ACT light, if the ACT light flickers twice per second, that means it is under the setup mode; the flicker period of the ACT light can be up to 6 sec under the working mode.

Method 2: Check the information from the serial port, if the character string of "dtu come in setup mode" occurs, it means that RTU is under the setup mode.

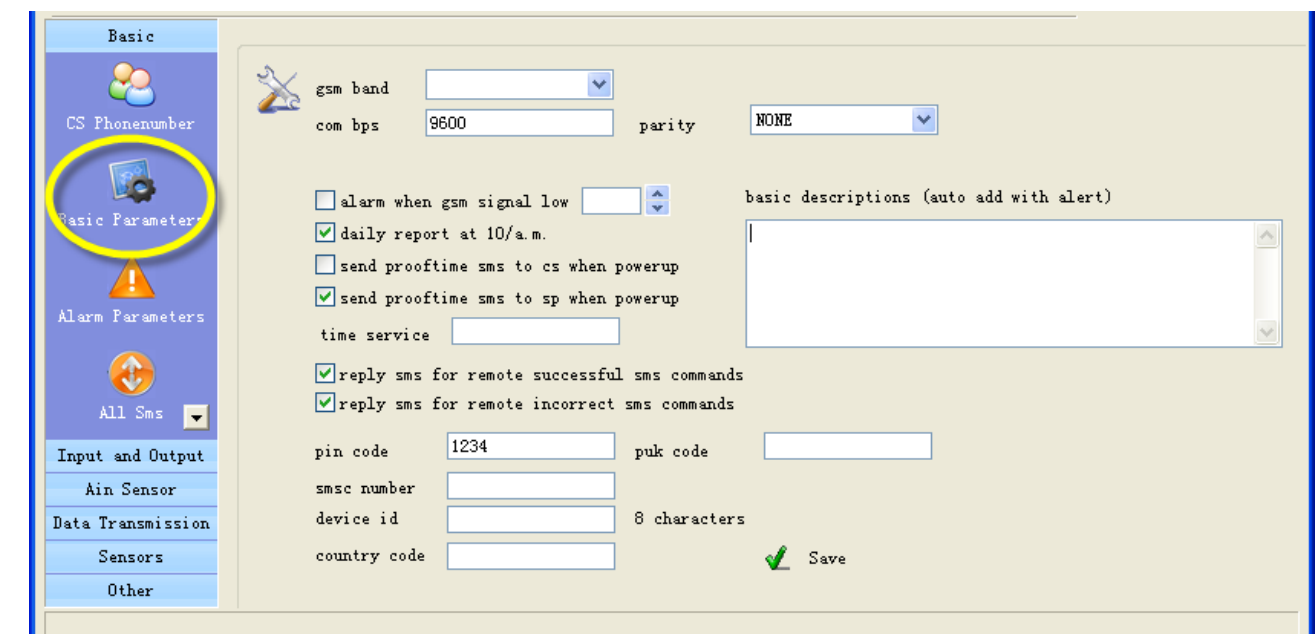
4.2 Setup basic parameters

4.2.1 Setup "CS number"

RTU under working mode, the "CS number" can send sms commands to control RTU and receive sms (include alarm sms, report sms etc). User can set 10 CS numbers, CS0-CS9



4.2.2 Setup basic parameters



⚠ Attention: gsm band, com bps, parity, pin/puk code, country code, smc number please using default

☐ Alarm for GSM signal low

GSM signal normal range is 18-32, RTU sends alarm sms to CS number when RTU's GSM signal value

below the preset threshold, the default is 11.

Daily report

If check the box, RTU sends report sms to CS number at 10:00 every morning for reporting current states, through which the user can make sure the normal operation of RTU.

Proof time

Proof time is making the RTU get correct time.

Send proof time sms to cs when power up

When RTU power up, it send a sms to CS0 to request proof time, CS0 reply sms"999" to RTU to complete proof time.

Send proof time sms to sp when power up

Set RTU own simcard number as "time service", when RTU starts, it send a sms to itself to update interior Clocker.

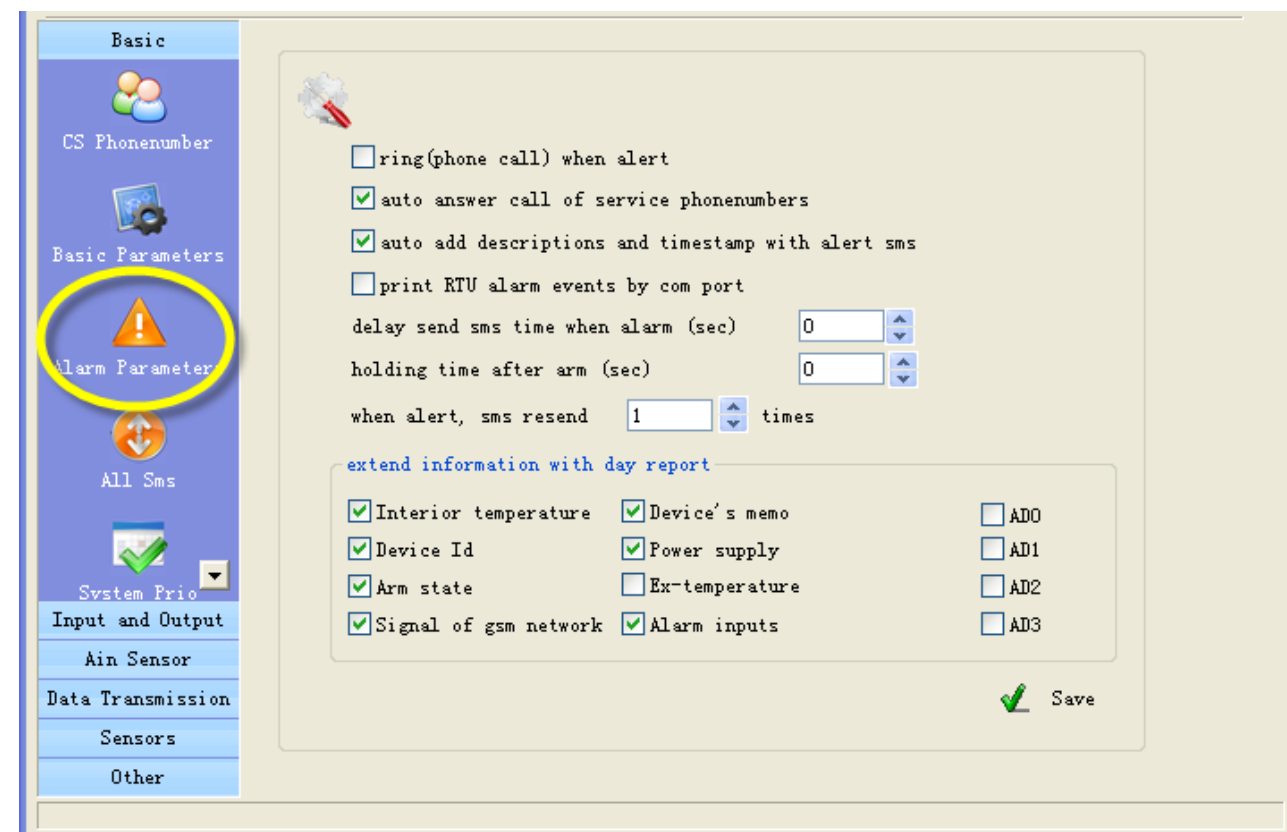
Device description

The description shows in alarm and report sms. It can be install position, user information etc.

Device ID

The device ID is an 8-byte ASCII characters which shows in state sms.

4.2.3 Alarm parameters



ring when alert

If check the box, RTU makes phone call to CS number when alarm

auto answer call of service phone numbers

⚠ Attention: This option is valid for the RTU models that have audio interface.

RTU auto answer CS numbers call for voice monitor and speaking, If MIC and speaker are installed.

Auto add end descriptions and timestamp with alert sms

The description can be edited in "basic parameters", the timestamp is automatically generated.

print RTU alarm events by com port

Enable this option, when RTU alarm, it sends the alarm data to com port with RTU_IO data format.

delay send sms time when alarm(disarm delay)

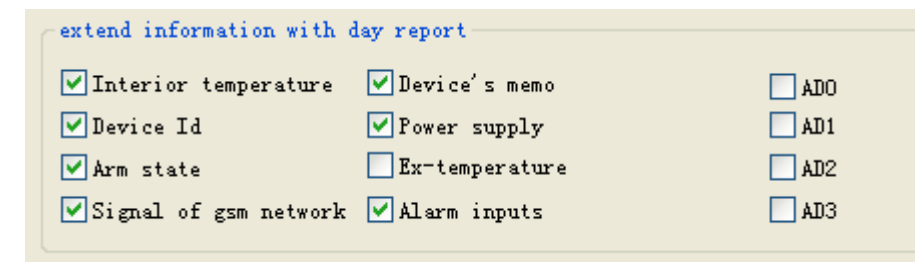
Set the time; you have an enough time to disarm RTU when you go into the monitor area.

Holding time after arm(arm delay time)

Set the time; you have an enough time to arm RTU when you leave the monitor area.

Extend information with report

RTU can send report sms to cs phones by timer or user's inquiry by sms command, this function is designed to let user know the RTU is stilling working and its status, enable or disable follow information to show in report.



- **Interior temperature:** The internal temperature sensor is optional, if RTU has added it, the temperature value will show in the daily report.

⚠ Attention: A standard RTU have not internal temperature sensor

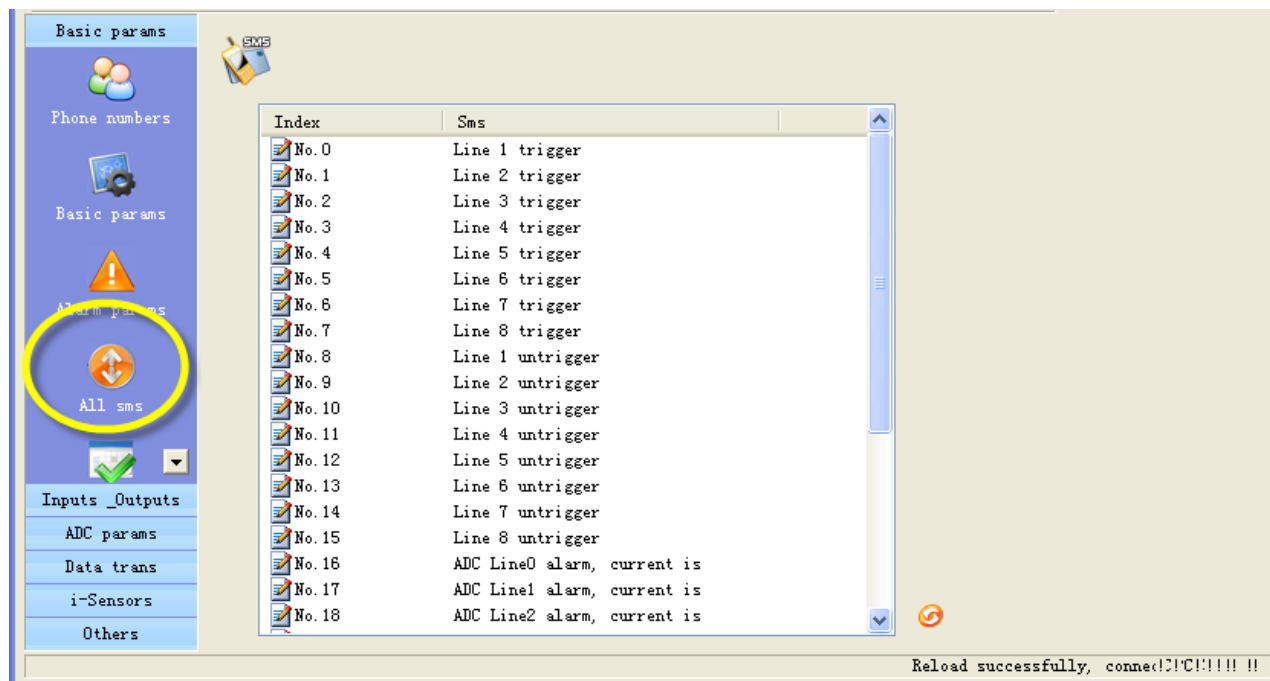
- **Device Id:** check the box, ID shows in the daily report.
- **Arm status:** check the box, arm or disarm status shows in the daily report.
- **Signal of gsm network:** check the box, GSM signal value shows in the daily report.
- **Device's memo:** check the box, Device description shows in the daily report.
- **Power supply status:** check the box, the daily report shows power supply status.
- **Ex-temperature:**

⚠ Attention: This option is valid for the RTU models that have temperature inputs (DS18B20 inputs).

Enable this option, all the value of extend temperature sensor will show in the daily report.

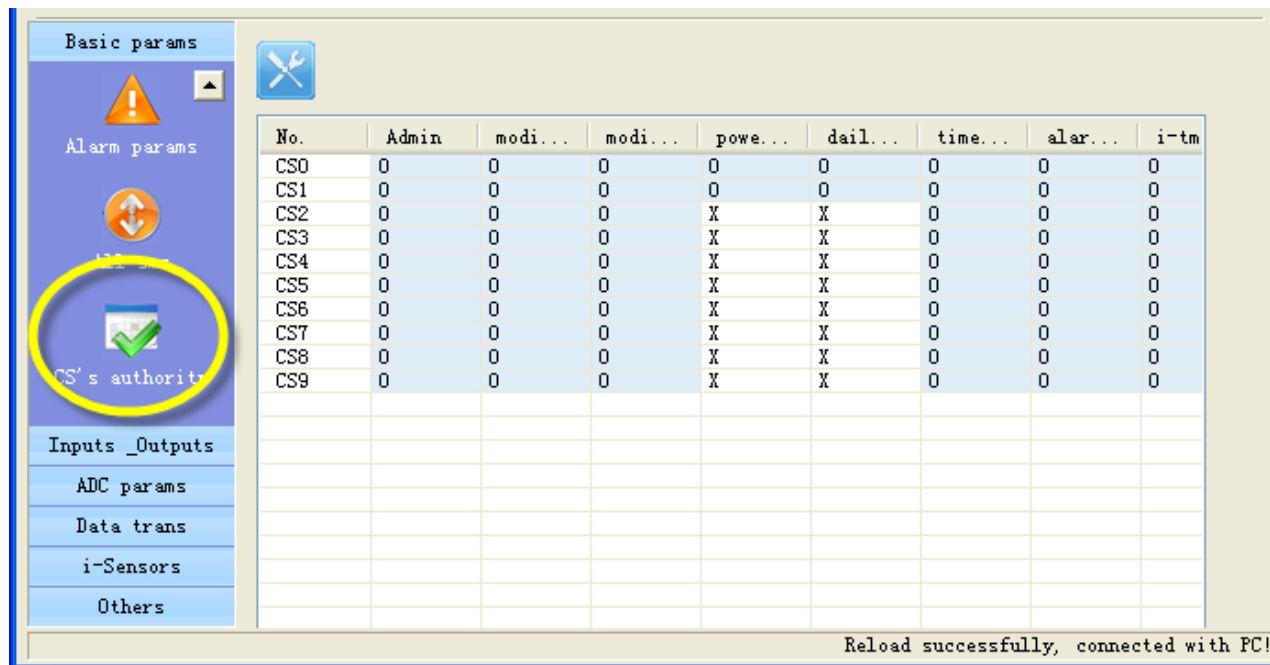
- **Alarm inputs:** check the box, the inputs that are in alarm status shows in the daily report.
- **AD0~AD3:** check the box, all the value of AD input show in the daily report.

4.2.4 ALL SMS



In this page, you can see all sms contents that you have defined, include digital inputs alarm/recover sms, AIN alarm/recover sms etc. you can Double-click it to modify.

4.2.5 System Prio



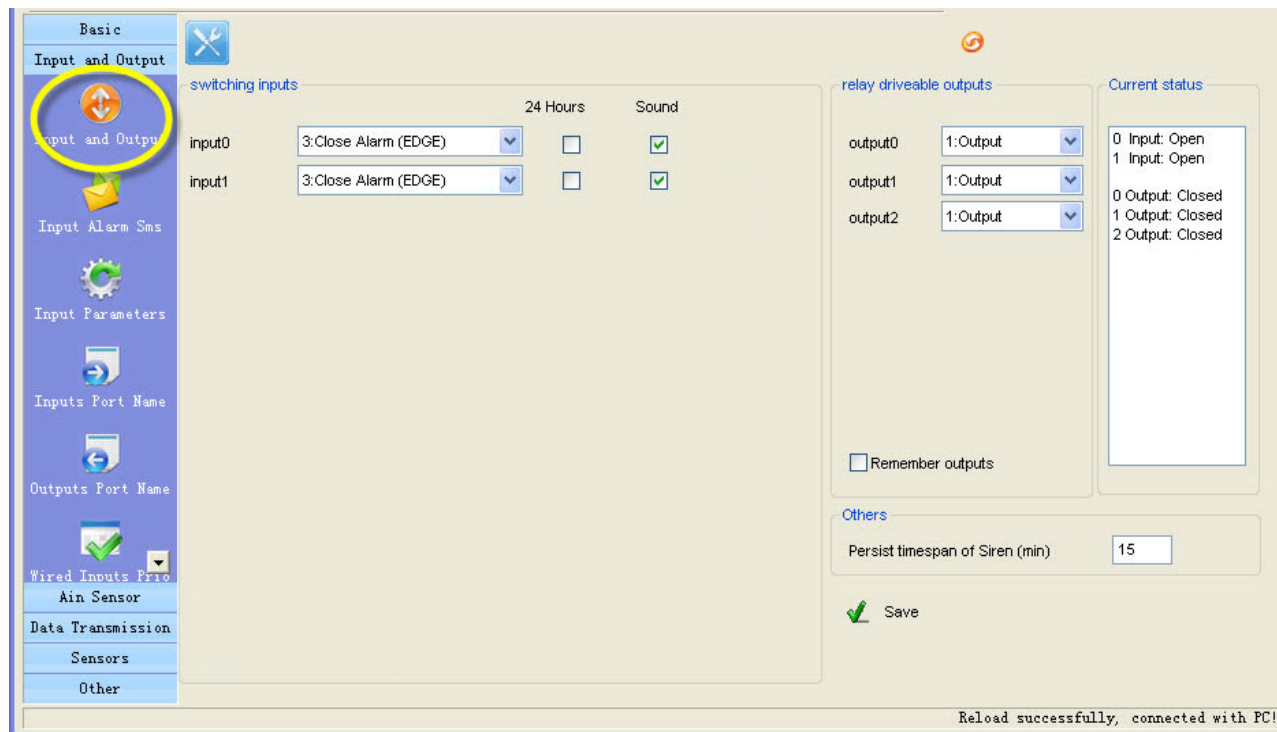
In this page, you can set authorization for CS numbers

“O” means enable authorization; “X” means disable authorization.

Authority	Explanation
admin	Can Arm/disarm or not
Modify by sms	This CS number can be modify by sms command or not
Change cs phones	This CS number can modify other CS number by sms command or not
Powerup sms	Can receive the status sms or not when RTU is restarted by sms command
Daily report sms	Can receive the daily report or not
Timer mms	Null
Alarm mms	Null
I-tmp alarm sms	Can receive the alarm sms or not when internal temperature sensor alarm
I-tmp alarm ring	Can receive the alarm phone call or not when internal temperature sensor alarm
Power fail sms	Can receive the alarm sms of power failure or not
Power fail ring	Can receive the alarm phone call of power failure or not
Signal low alarm	Null
Sample sms	Null
M2M svr	RTU send sms to the CS number with RTU_IO protocol
Arm notify	Can receive sms when RTU arm or disarm

4.3 Input and Output

4.3.1 Setup input and output types



Digital inputs types

Input signals have two types, EDGE_IN (edge triggering) and LEVEL_IN (state triggering).

ATTENTION: The key difference between Level and Edge is Level input has recovery sms message

24 Hours

If check the box, the digital input can alarm, even it is in disarm status.

Sound

Means this channel input alarm event can cause internal buzzer and extend buzzer or siren action.

Use digital input 1 as arm control

Enable this option, RTU is in arm mode if digital input 1 is opened, RTU is in disarm mode if digital input 1 is closed, so user can connect a button to switch mode for arm or disarm

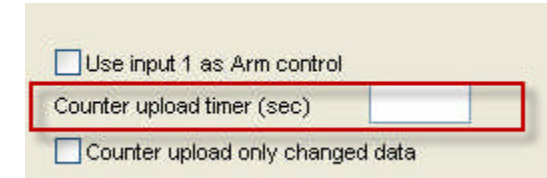
ATTENTION: Use digital input1 as arm control you need select the type of input1 is "TO CLOSE ALARM (LEVEL)" and delete the alarm/recover sms of input 1

Counter

Enable or disable this channel input as counter input which catch greater than 100ms plus.

Counter upload timer

Setup the counter GPRS upload interval



Counter upload only changed data

Automatic counter upload mode is a mode to Save GPRS, not report data if value not changed.

Attention: This option is valid for the RTU models that have GPRS function.

Output types

0	disable	
1	relay drivable output	Drive relay, drive electricity <0.2A Output drive relay voltage Equal to input DC voltage Output power: Drive voltage ≤35V, drive current ≤200mA
2	Buzzer	This line's actions will synchronize with internal buzzer.
3	SNAPSHOT	This line wills shortly action when any alarm happens.
4	SIREN	This line continuous drives for 1 minute by default. And the interval can be user define.

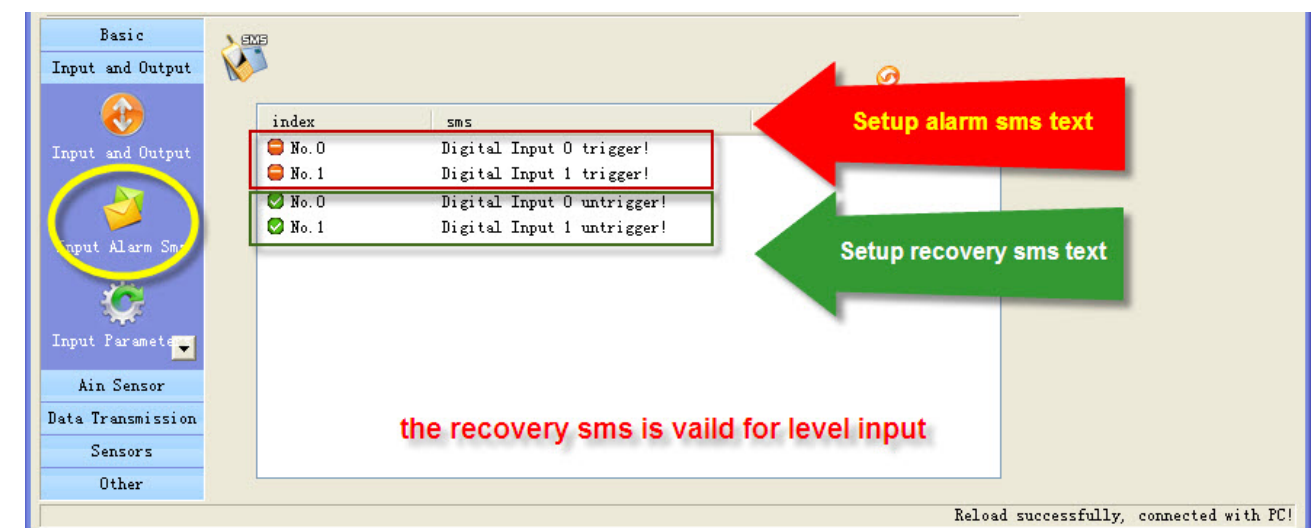
Others

Persist timespan of Siren (min) 15

Remember outputs status

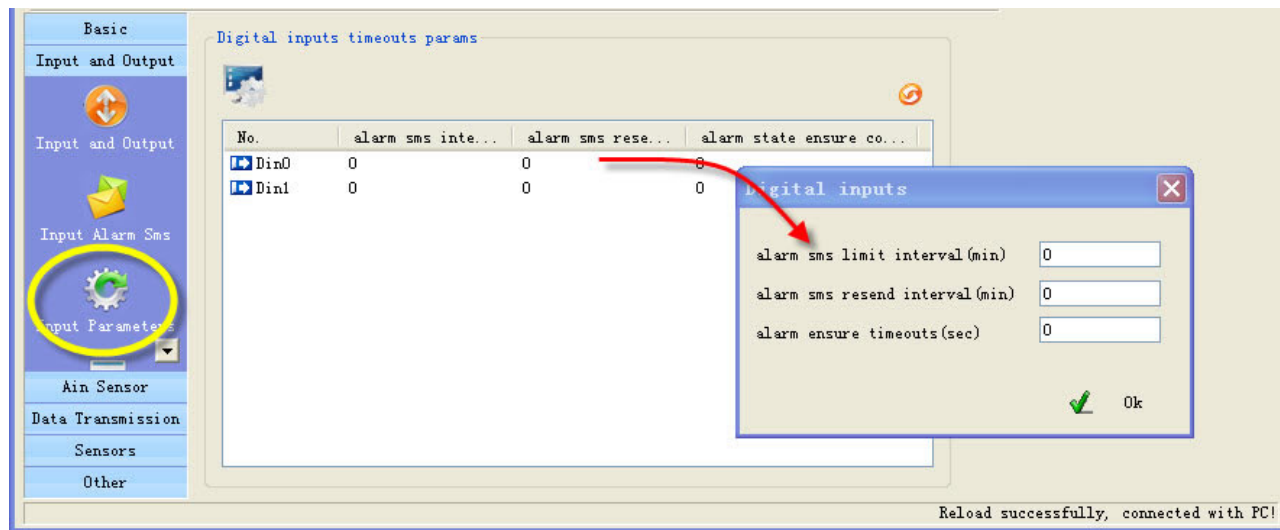
If check the box, output can recover the status that before restart.

4.3.2 Define alarm and recover sms of digital input



All of the input lines sms can be modify. A SMS composed of not more than 60 characters

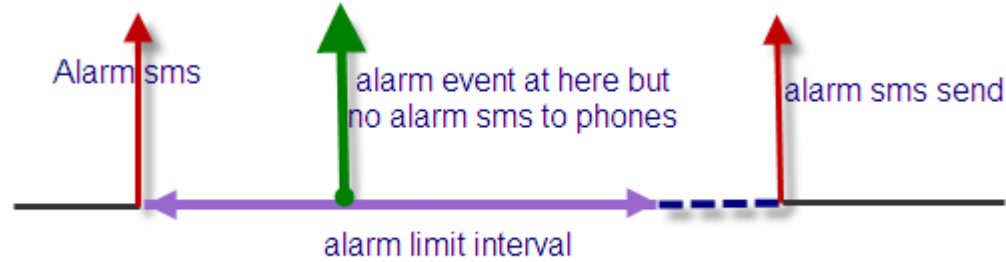
4.3.3 Setup inputs timeouts



This page designed to setup input timeouts property. There are 3 interval related with inputs.

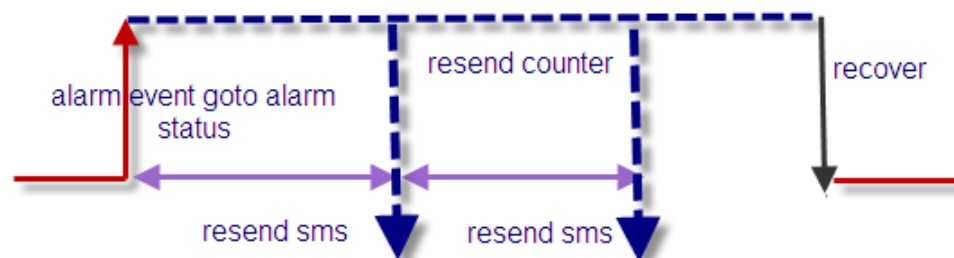
1. Alarm sms limit interval

It is designed to avoid amounts of alarm/recover sms in a short time.



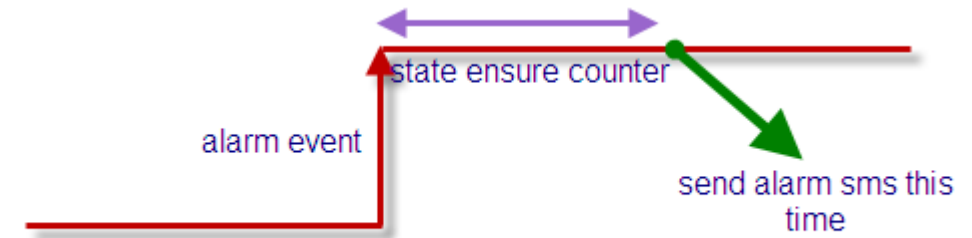
2. Alarm sms resend interval

It is designed for repeat alarm status notifies to phones, 0 means disable repeat notification.

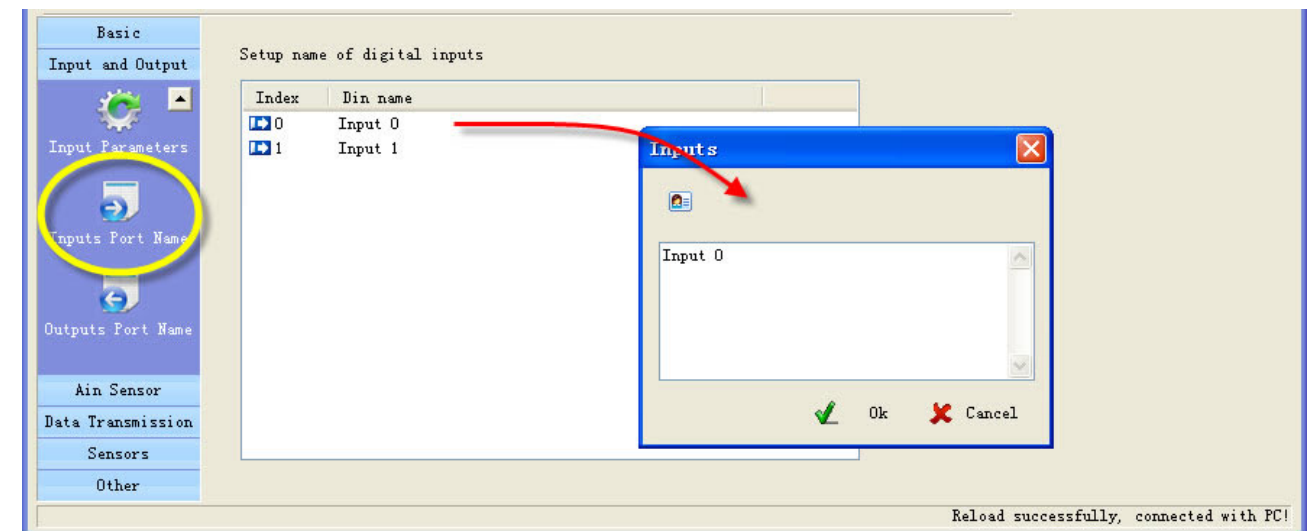


3. Alarms ensure timeouts

It is a counter of alarm status ensure timer, designed to avoid shake mistakes. 0 means no counter.



4.3.4 Setup digital inputs/outputs port name



If you send sms command to require inputs status, there is a contrast of returning

from: +8613480165874
 High voltage: normal
 Low voltage: alarm
 High water level: normal
 Low water level: normal

Have setup input name

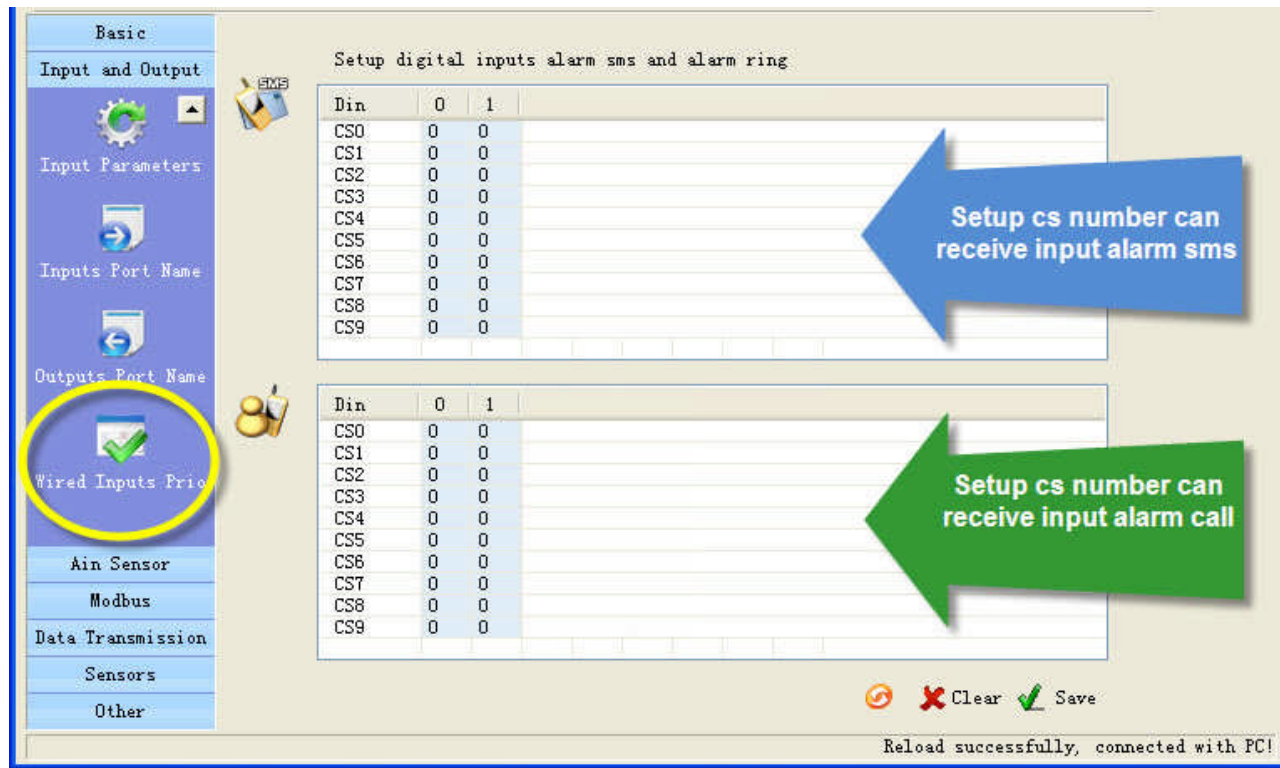
from: +8613480165874
 Input 0 : normal
 Input 1 : alarm
 Input 2 : normal
 Input 3 : normal

Have not setup input name

Setup outputs name is same

4.3.5 CS's DIN authority

This page can setup the authority of CS phone receive digital input alarm sms and alarm call "O" means this cs phone will receive related line in sms, "X" means not.



Example:

Din	0	1
CS0	X	0
CS1	0	X
CS2	X	0
CS3	0	0
CS4	0	0
CS5	0	0
CS6	0	0
CS7	0	0
CS8	0	0
CS9	0	0

This settings means CS0 don't receive input 0 alarm
 CS1 don't receive input1 alarm sms.
 CS3 don't receive input0 alarm sms.

4.4 Setup Ain parameters

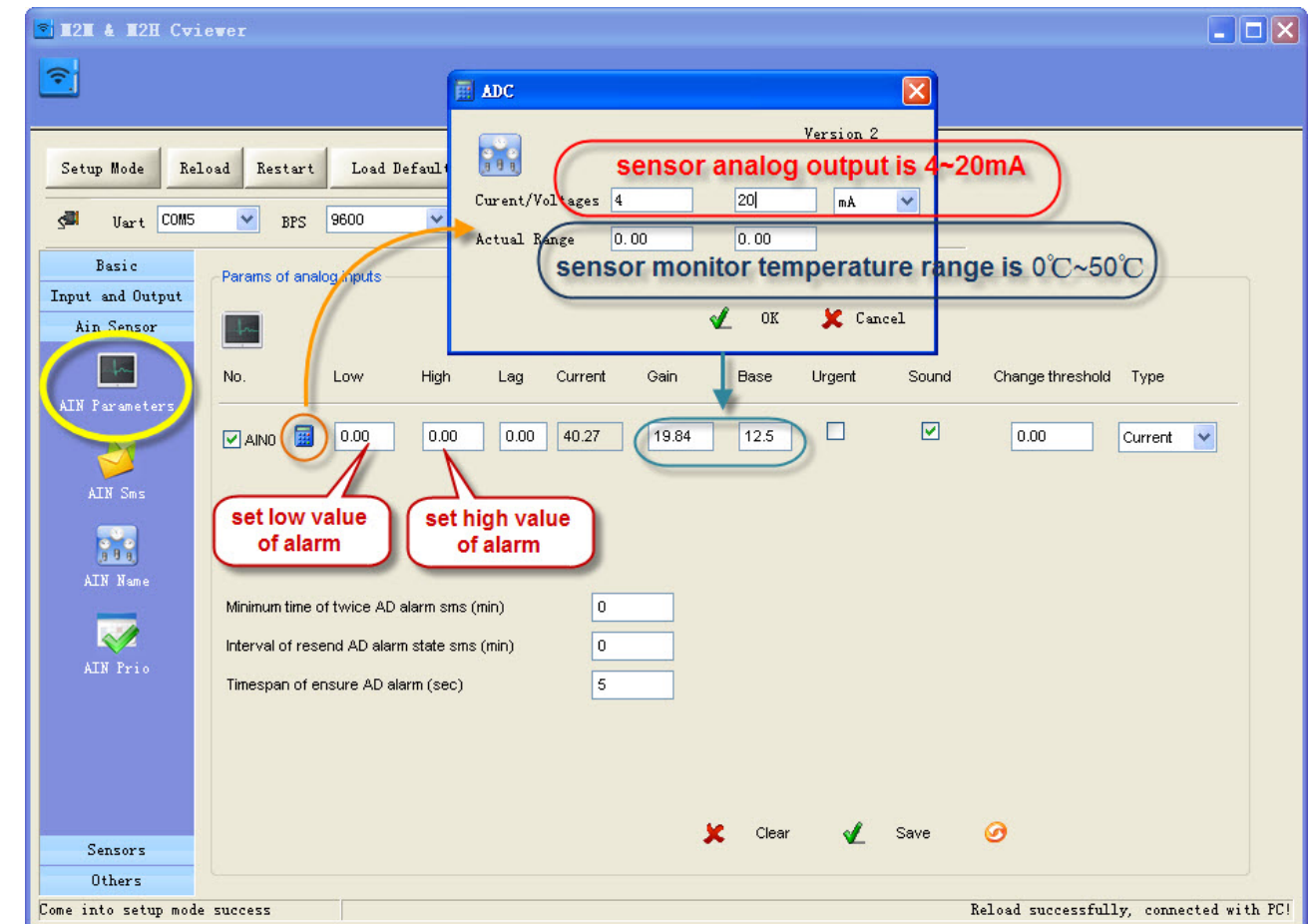
4.4.1 Setup Ain parameters

The analog input is designed to receive 0~20mA or 0~5V signal from an analog sensor

You can preset a high and a low level for every AD input, if current value is above the high level or below the low level, RTU alarm. You also can send sms command to RTU to get current value.

Example:

RTU connect a temperature transmitter, it analog output range is 4-20 ma for monitor temperature range is 0°C-50°C, you want to get alarm and current temperature value when temperature is above 40°C or below 10°C.



Urgent

If checked, in any case, the RTU will execute alarm action (send alarm sms, interlock etc) when the AD input is over normal range, even RTU is in disarm status.

Sound alarm

Means this line alarm event will cause internal buzzer and extend buzzer or siren action.

Change threshold

⚠ Attention: This option is valid for the RTU models that have GPRS function.

If the change of AD input is more than "change threshold", RTU upload current value to server by GPRS.

Minimum time of twice AD alarm sms (AINAS time)

After executed an alarm action (send alarm sms, interlock etc.) When AIN over normal range, in the AINAS time RTU will not execute any alarm action (send alarm sms, interlock etc.) even AIN are over normal range frequently. The purpose of setting AINAS time is user will not receive many alarm sms in the time when the AIN value is fluctuates at low value or high value. "0" means disable the function.

Interval of resend AD alarm state sms (AINLS time)

After executed a alarm action(send alarm sms, interlock etc.) when AIN over normal range, if the duration of the alarm signal overrun the AINLS time, RTU will execute a alarm action(send alarm sms, interlock etc.) again. The purpose of setting AINLS time is alarm to user repeatedly at regular intervals during the AD input is in state of over normal range. "0" means disable the function.

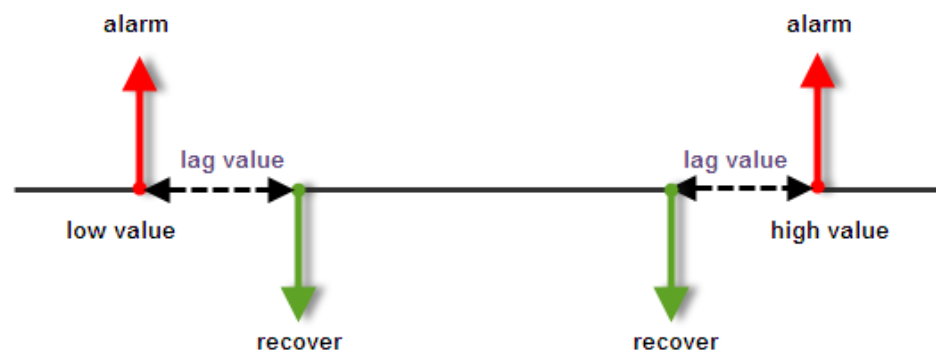
Timespan of ensure AD alarm (AINDLY time)

RTU will not execute any alarm action(send alarm sms, interlock etc.) in the AINDLY time even AIN over normal range, if the duration of the alarm signal overrun the AINDLY time, RTU will execute a alarm action(send alarm sms, interlock etc.). "0" means disable the function.

Setup lag

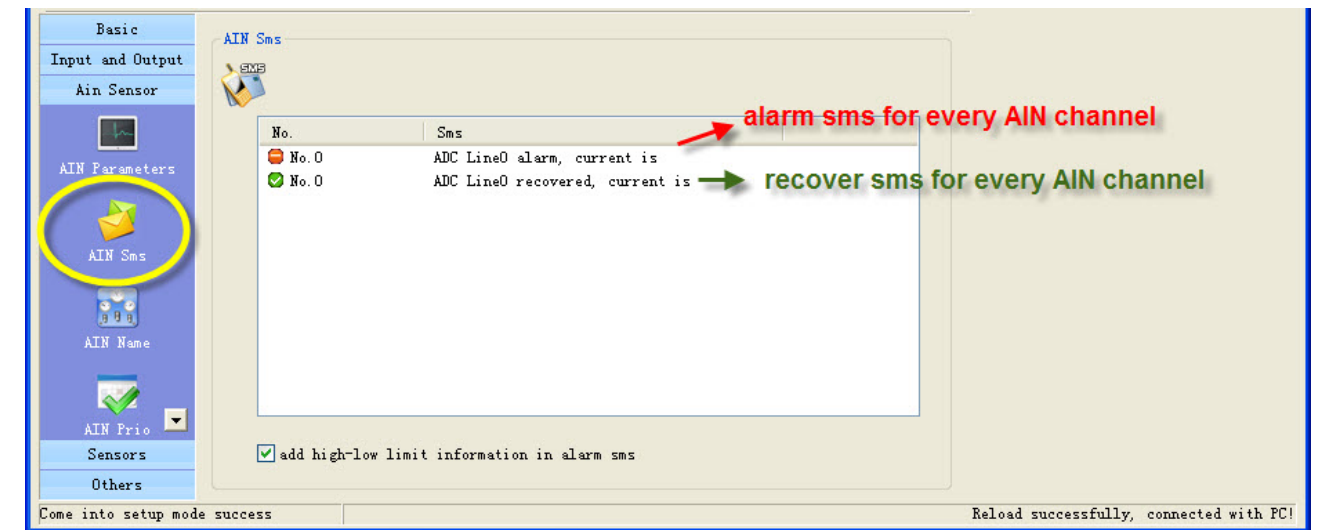
When AIN over normal range, RTU will alarm. But will not return to normal state before AIN return into range high value-lag and low value+lag.

For example: normal range is 10~40, lag is 5, RTU send alarm sms when AIN value is 10 or 40. But RTU send recover sms when AIN value is 35(40-5) or 15(10+5)



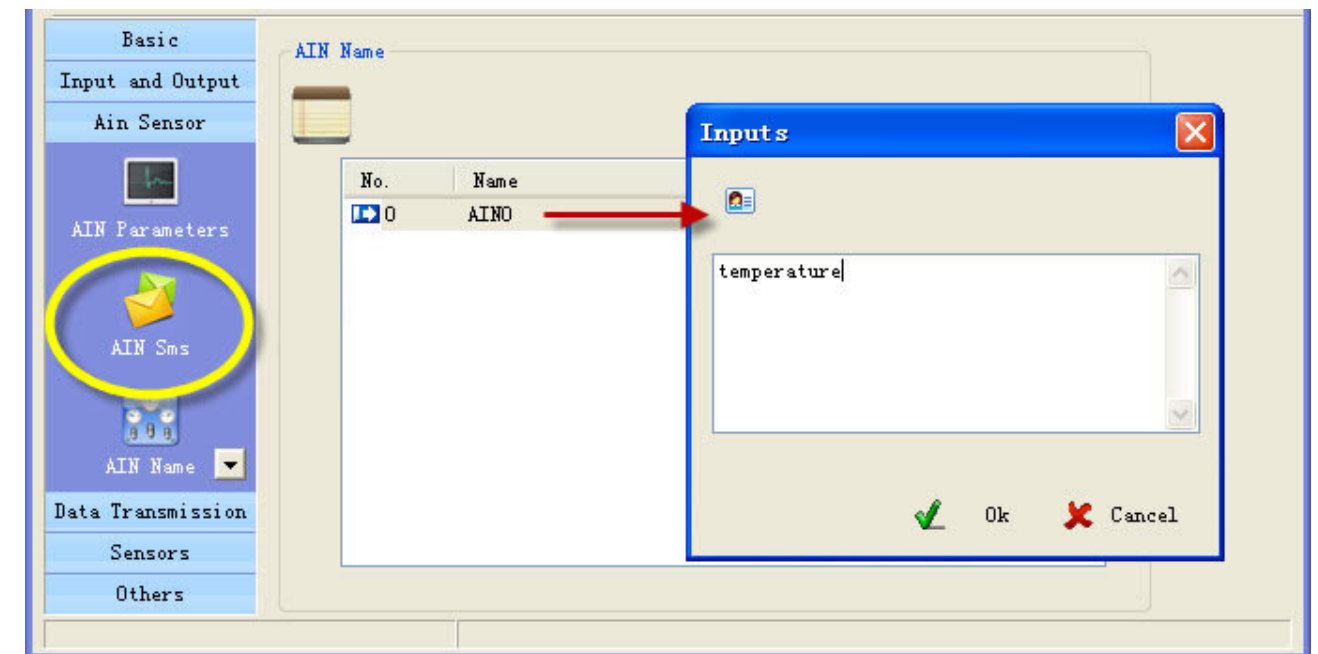
The purpose of setting lag is user will not receive many alarm when the AIN value is fluctuates at low value or high value. "0" means disable the function.

4.4.2 Setup AIN alarm and recover sms



The current value is showed in end of alarm or recovers sms. A SMS composed of not more than 60 characters.

4.4.3 Setup AIN name



If you send sms command to query AIN value, the AIN name show in the sms
For example, set the AD input 0 channel name is "temperature", the sms is:

```
From: +8613480165874
Temperature current value : 21.33
AD input 1 current value: 60
AD input 2 current value: 0
AD input 3 current value: 0
```

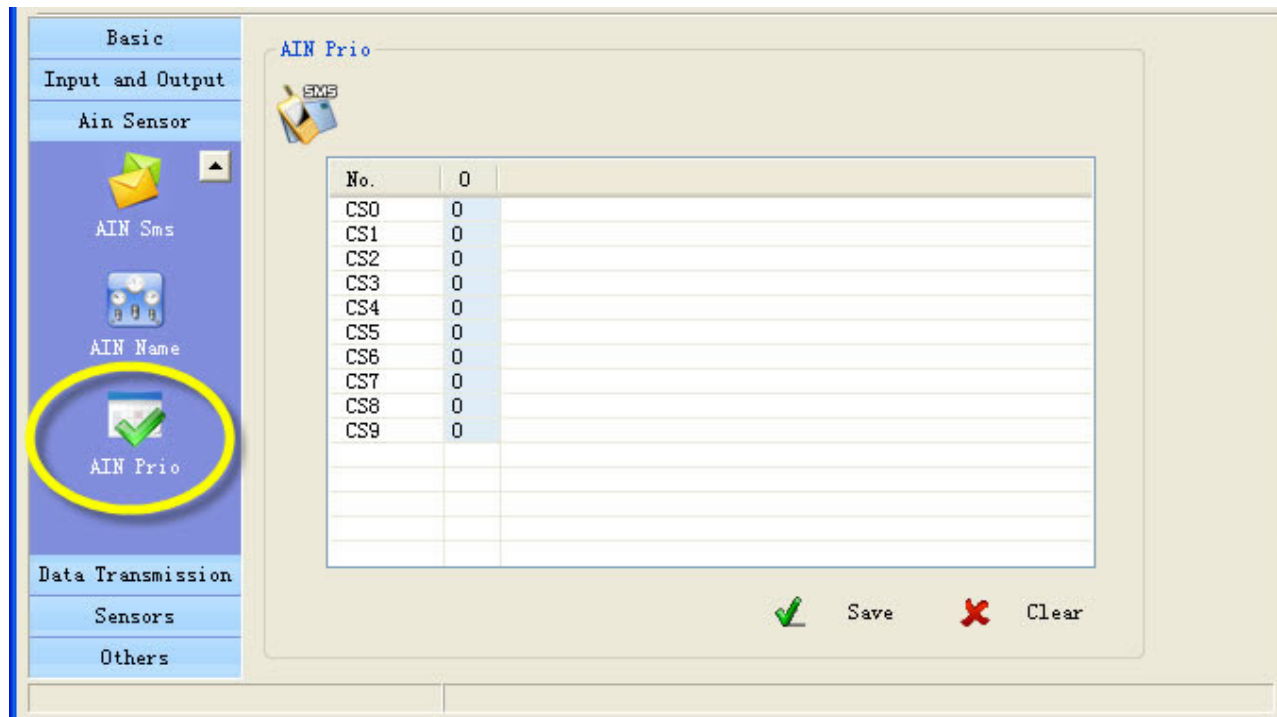
ATTENTION: a name composed of not more than 24 characters



4.4.4 CS's AIN Authority

This page can setup the table of CS phone receive AD input line in alarm property.

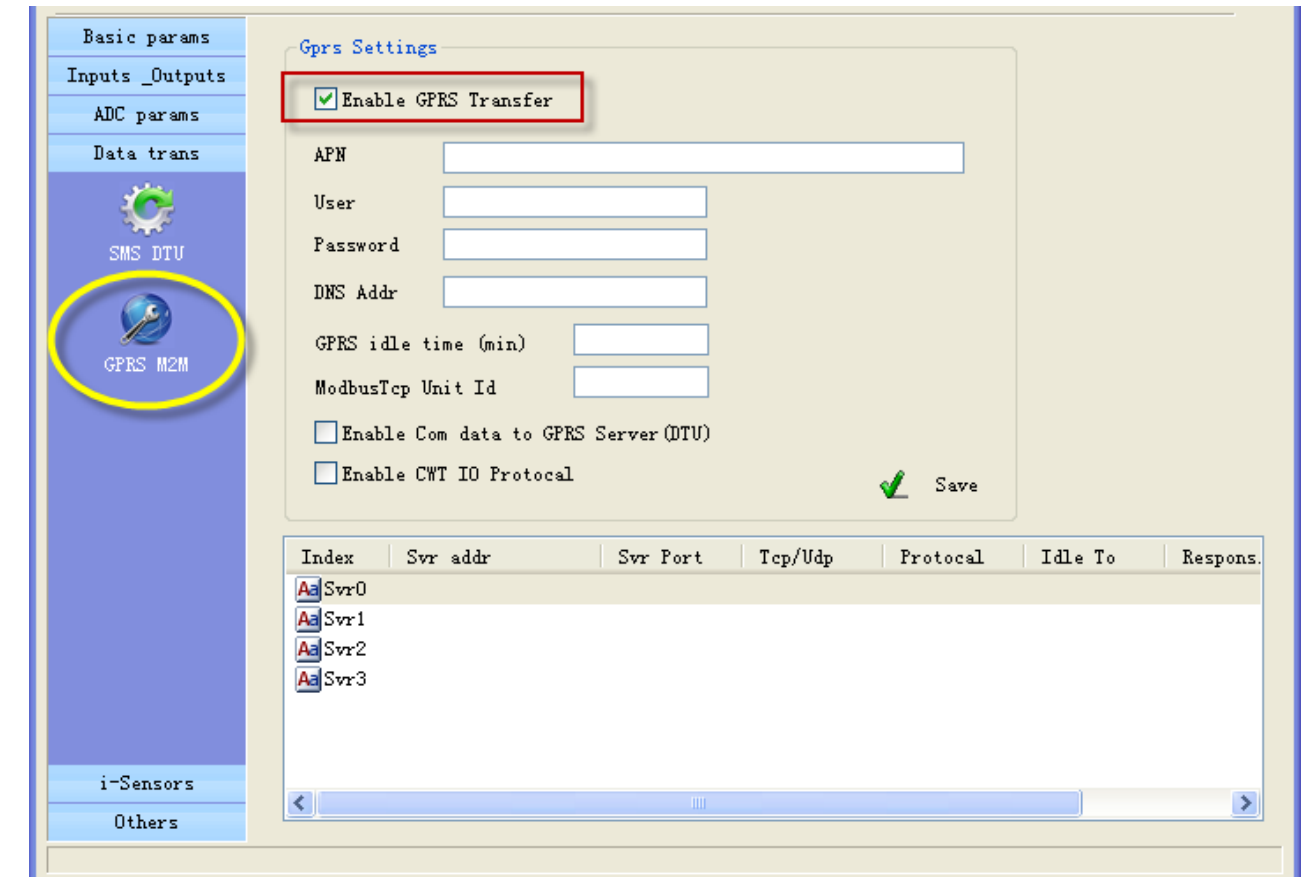
“O” means this cs phone will receive related line in sms, “X” means not.



4.5 GPRS parameters

4.5.1 GPRS parameters

In this page, you can set GPRS parameters.



“APN, user, password, DNS addr”, you can consult the GSM operation

❑ GPRS idle time

Means if GPRS RTU has no data transferred in the time, GPRS will off line, set the time to 0, means GPRS always on line.

❑ Modbus TCP unit ID:

It is valid if data transfer with Modbus TCP protocol

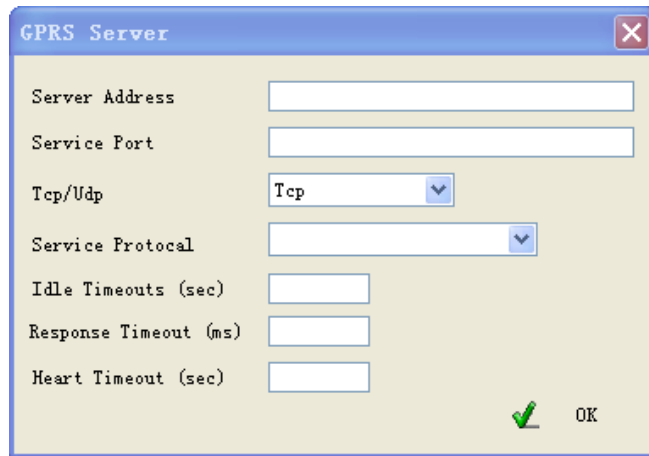
❑ Enable com data to GPRS server

GPRS RTU support RS232 Transparent Transmission

❑ Set parameters of server:

4 servers can be add, they can receive data from GPRS RTU at the same time

You can set parameters for every server



❑ Server address

It is an IP of server or domain names, IP must be a static and public IP address

❑ Service port

It is a TCP/IP port of applications on server

❑ TCP/UDP

You can select TCP/UDP transport protocols for sever

❑ Service Protocol

You can select communication protocols between GPRS RTU and server

They are Modbus TCP, CWT_IO and RS232 bidirectional transparent transmission

Important: CWT_IO and GRPS DTU protocols can support TCP or UDP; but MODBUS TCP protocol only support TCP; so if you use the CWT5002, the transport protocol must be TCP

❑ Idle timeout

It is valid for TCP server; it means if there is no data transferred in the time, the server is disconnected. Set to 0 to disable the function

❑ Response timeout

It is valid for CWT_IO and Modbus TCP communication protocols, it means after GPRS RTU send data messages to server if GPRS RTU have not received response data from server in the time, the GPRS RTU will send data again. Set to 0 to disable the function.

❑ Heart timeout

Reserve

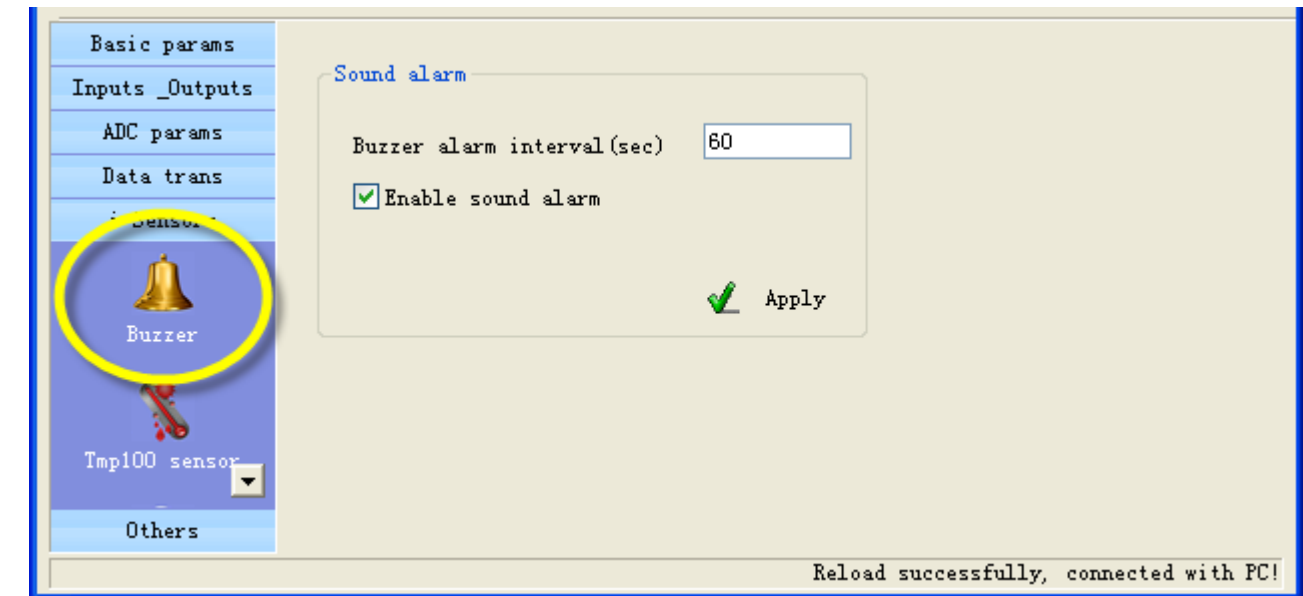
4.6 Setup I-sensors

4.6.1 Buzzer

⚠ Attention: This setting is valid for the RTU models that have buzzer.

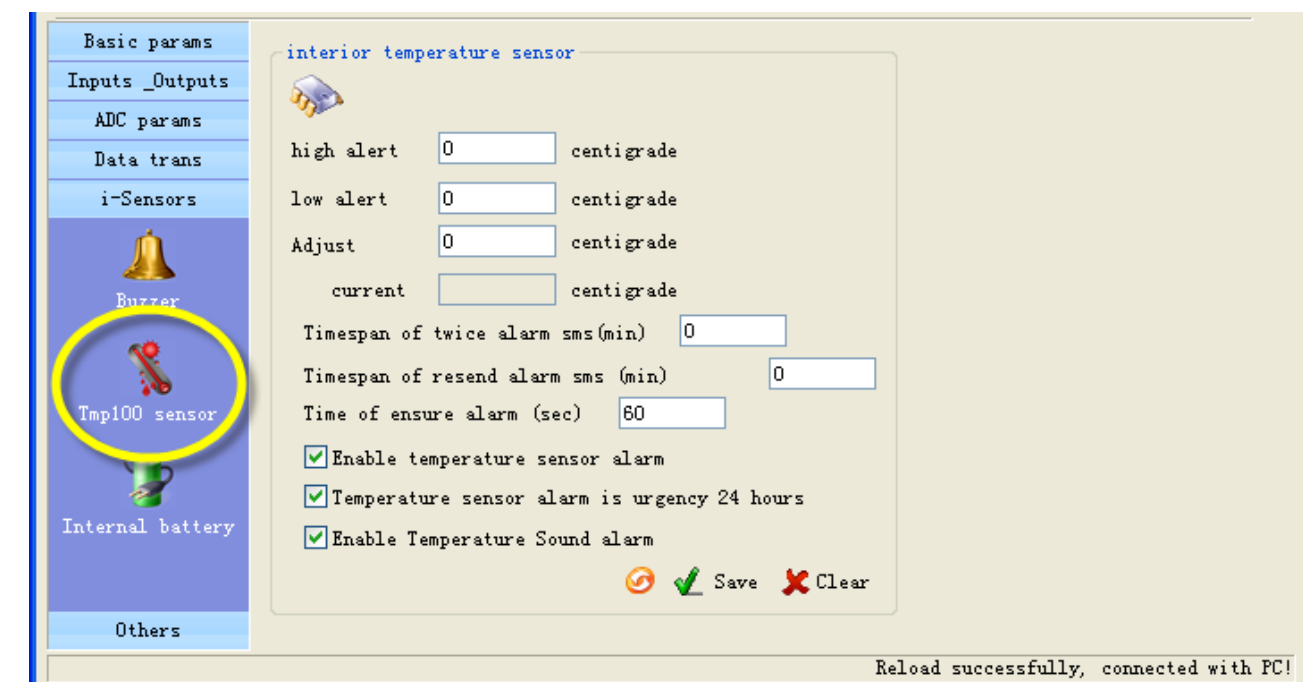
The buzzer can be activated when alarm.

In this page, you can enable or disable the buzzer and set interval time of alarm



4.6.2 Tmp100 sensor (optional)

⚠ Attention: This setting is valid for the RTU models that are added interior temperature sensor, the tmp100 temperature is optional, a standard RTU have not internal temperature sensor.



You can preset a high and a low temperature value, if temperature is over normal range, RTU alarm. You also can send sms command to RTU to get current temperature.

User can set "Adjust" value to calibrating temperature value

❑ Timespan of twice alarm sms

It is designed to avoid amounts of alarm/recover sms in a short time.

❑ TPRS time: timespan of resend alarm sms

It is designed for repeat alarm status notifies to phones, 0 means disable repeat notification.

❑ time of ensure alarm

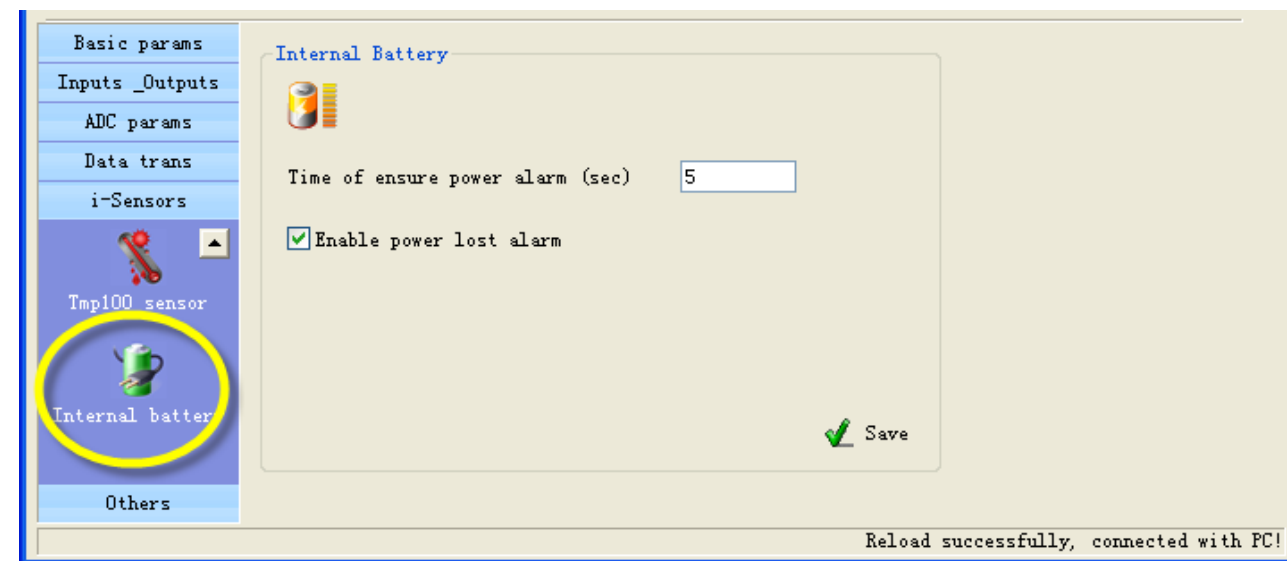
It is a counter of alarm status ensure timer, designed to avoid shake mistakes. 0 means no counter.

4.6.3 Internal battery (optional)

⚠ Attention: This setting is valid for the RTU models that are internal battery.

It is designed to realize power lost alarm

When external power cut off, RTU Powered by internal battery and alarm to cs numbers



❑ time of ensure power alarm

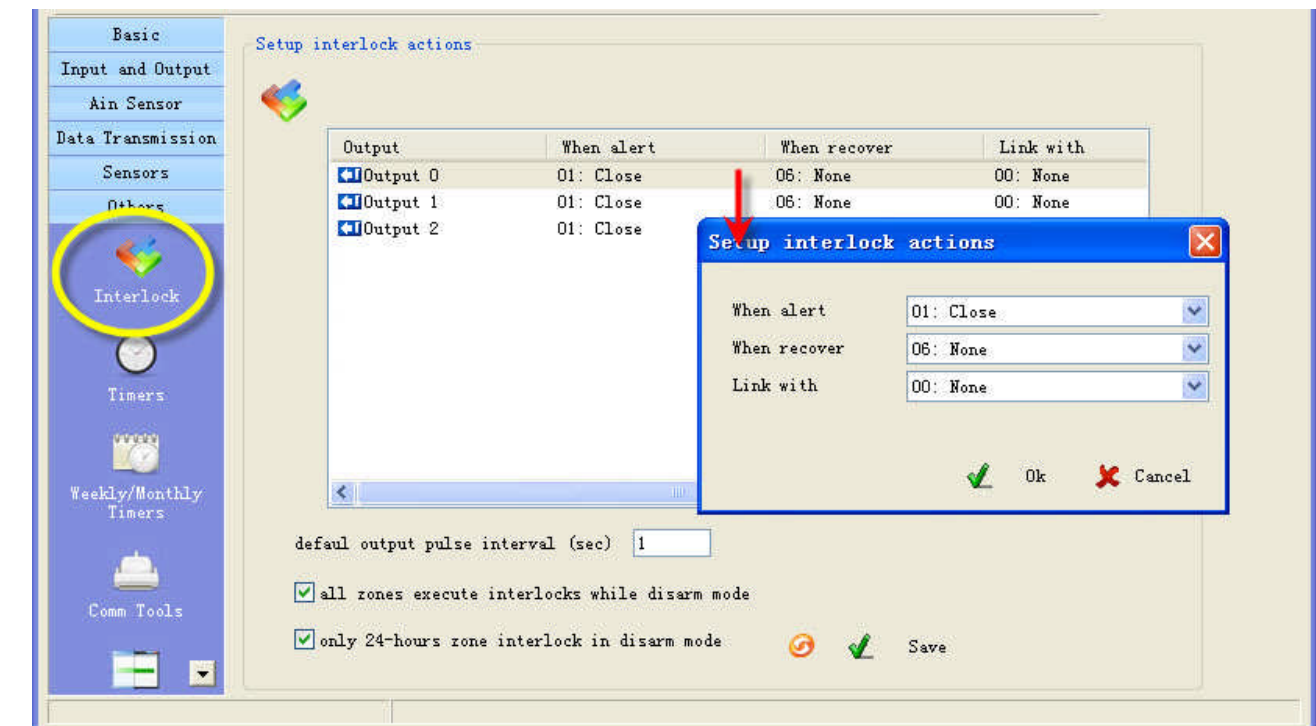
When the time of external power lost is over the time, RTU alarm, "0" means disable the function.

Battery parameter:

- Lithium battery
- Voltage: 3.7V
- Capacity: 800mAh
- Limited voltage for charging 4.2V
- Implementation standard GB/T 18287-2000

4.7 Others setting

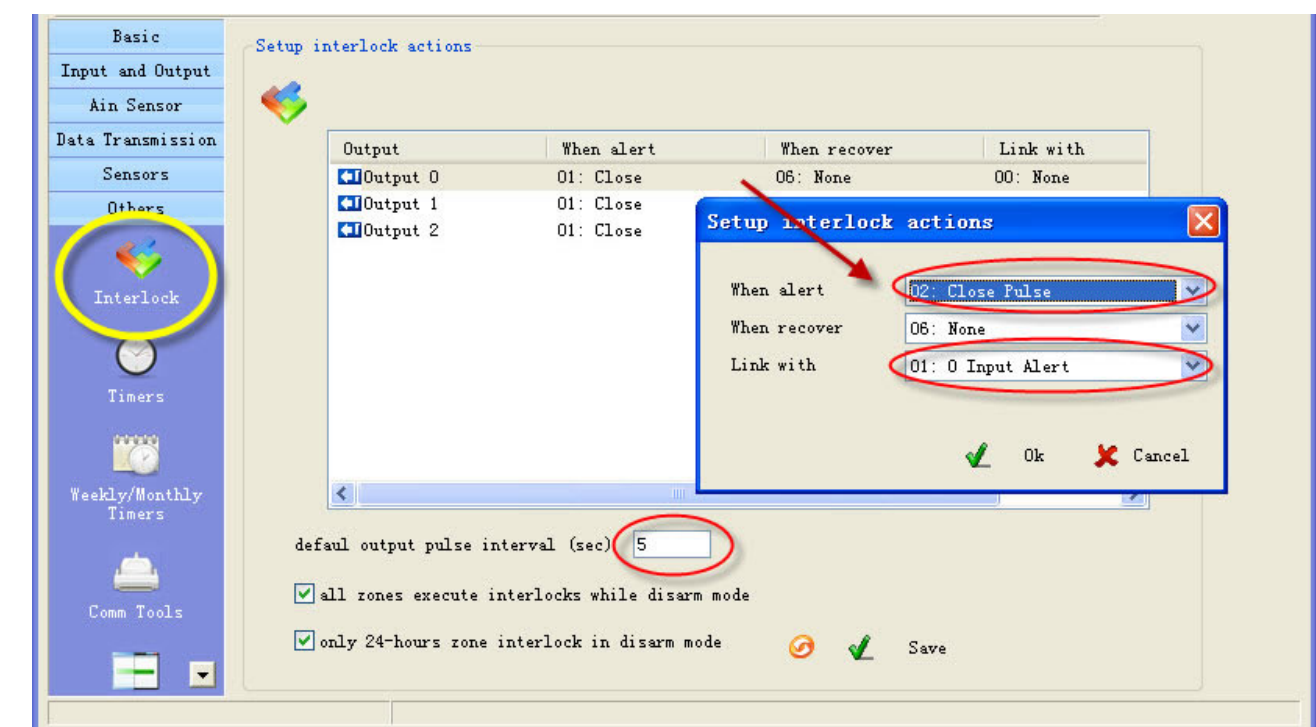
4.7.1 Realtime Interlock



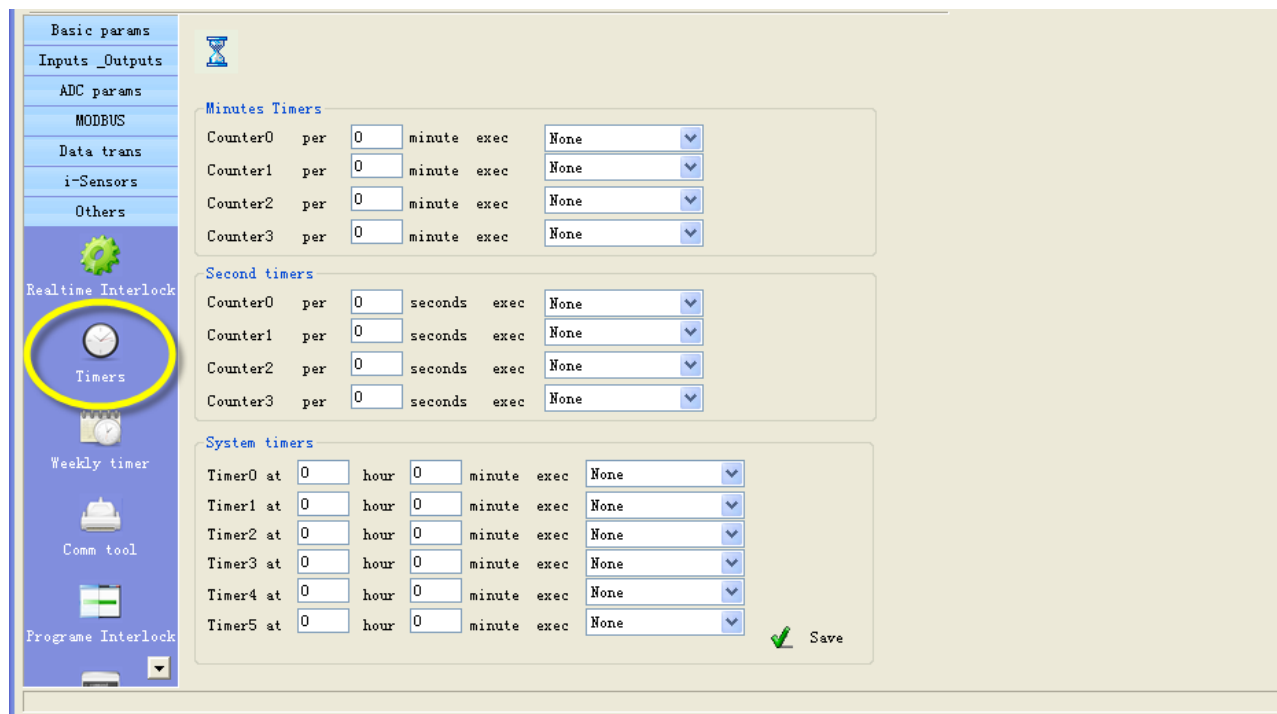
Realtime interlock is a local strategy, it is designed to outputs automatically execute action under some internal triggering conditions.

For example

If digital input 0 alert, output 0 close pulse 5 seconds.



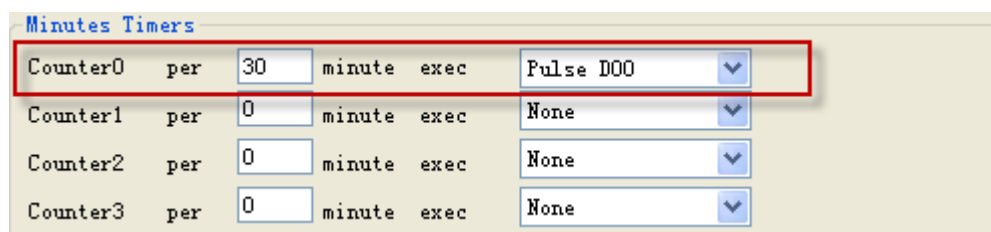
4.7.2 Timers



Timers is designed to time execute task, task include arm, disarm, open/close output etc.

Minutes timers

4 minute counters can be set, RTU execute a task every the minute interval.
For example, RTU execute output 0 pulse every 30 minutes

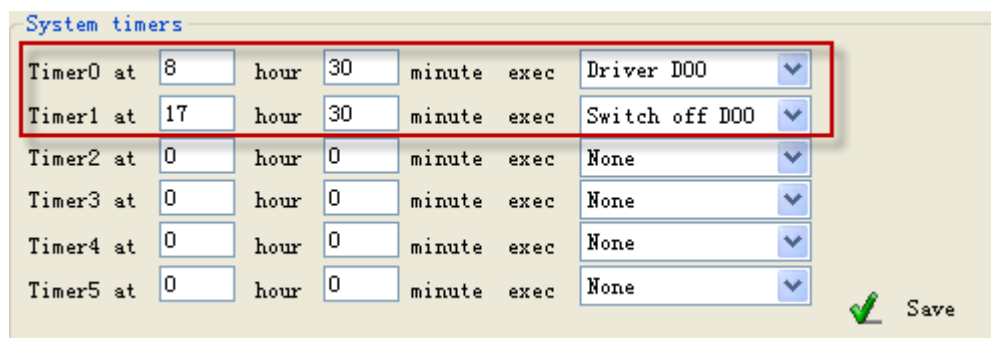


Second timers

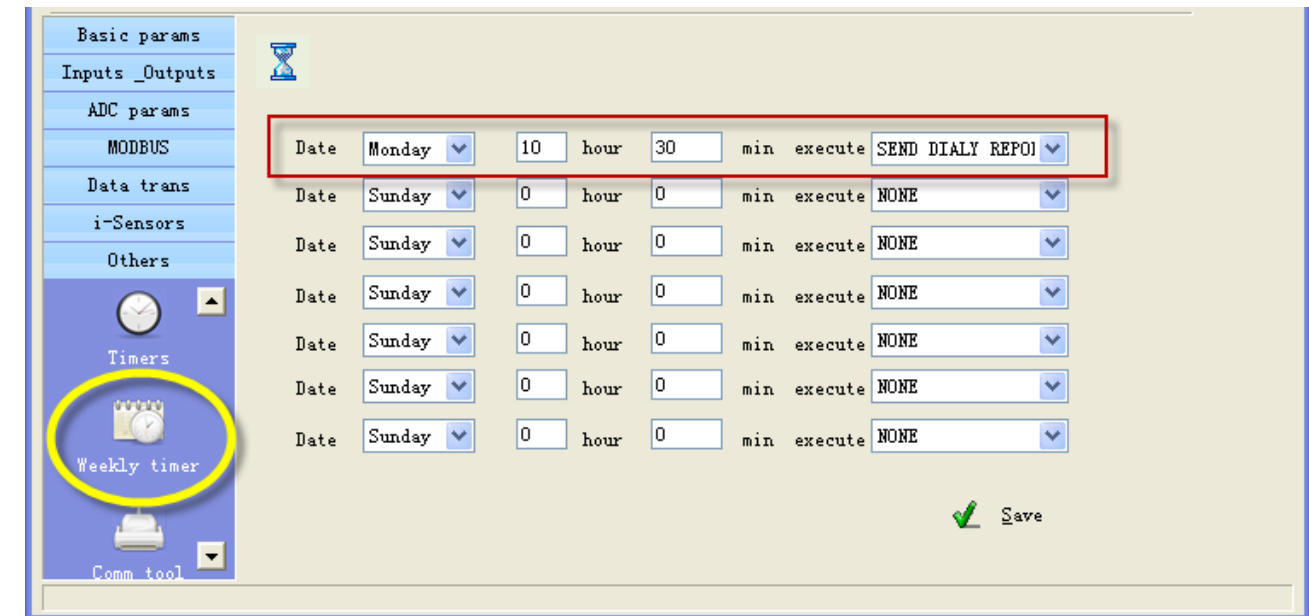
4 second counters can be set, RTU execute a task every the second interval.

System timers

6 times can be set in a day, RTU execute a task in each time.
For example, at 8:30 execute output 0 on, at 17:00 execute output 0 off.



4.7.3 Weekly timers



7 times can be set in a week, RTU execute a task in each time.
For example, execute send daily report at Monday 10:30 RTU

4.7.4 Define users commands

Users can define 6 commands instead of system commands.

For example, user set "close" instead of system command "IOOH", so user can send "close" to close output

