GSM RTU 8X8+4AD+1X232

User Manual

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Website: http://www.communica.co.za

CONTENTS

I Preface

Thank you for using the 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

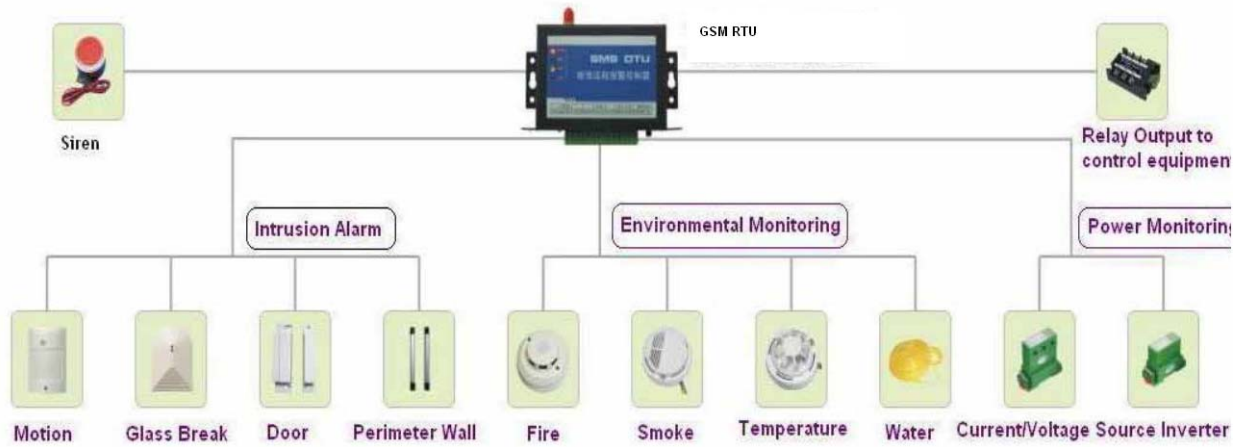
	
GSM RTU	RS232 cable

		
12V Adaptor	GSM antenna	CD

II Introduction

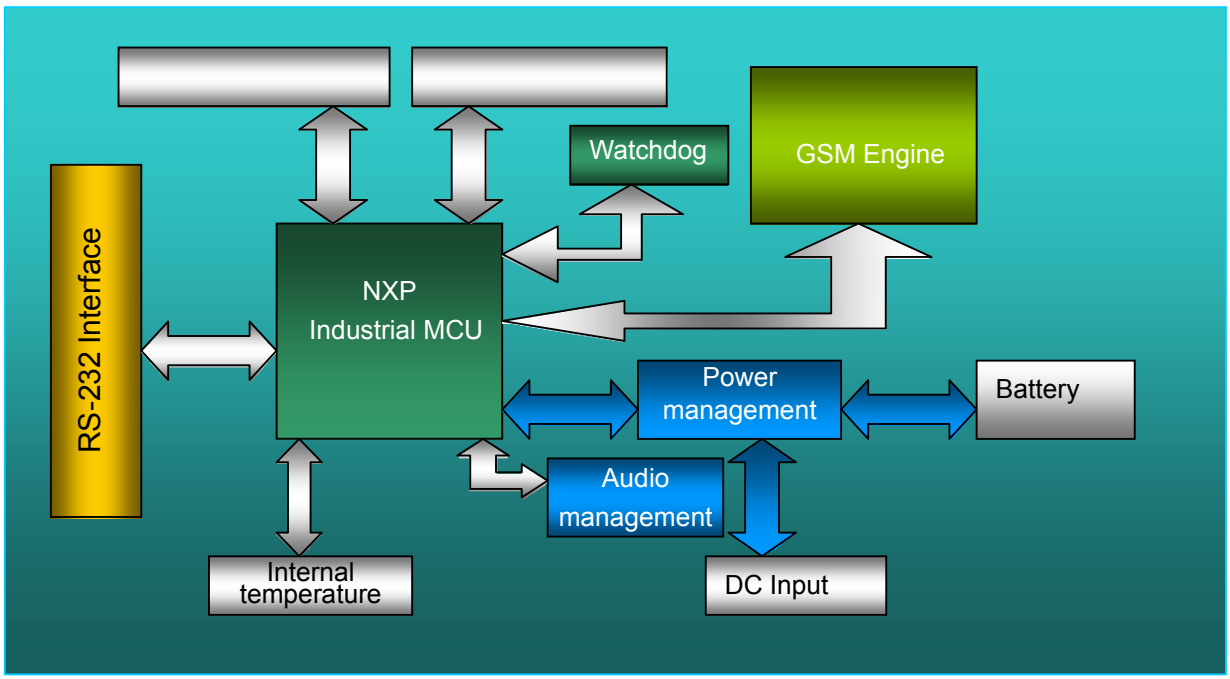
GSM RTU is designed as a cost effective remote control system alert device. It monitors up to 8 dry contacts and 8 drivable relay outputs and 4 AD input. User-defined SMS is sent to pre-configure mobile phone numbers when a pre-defined alarm condition happens. These pre-configured mobile phone numbers 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.



Features

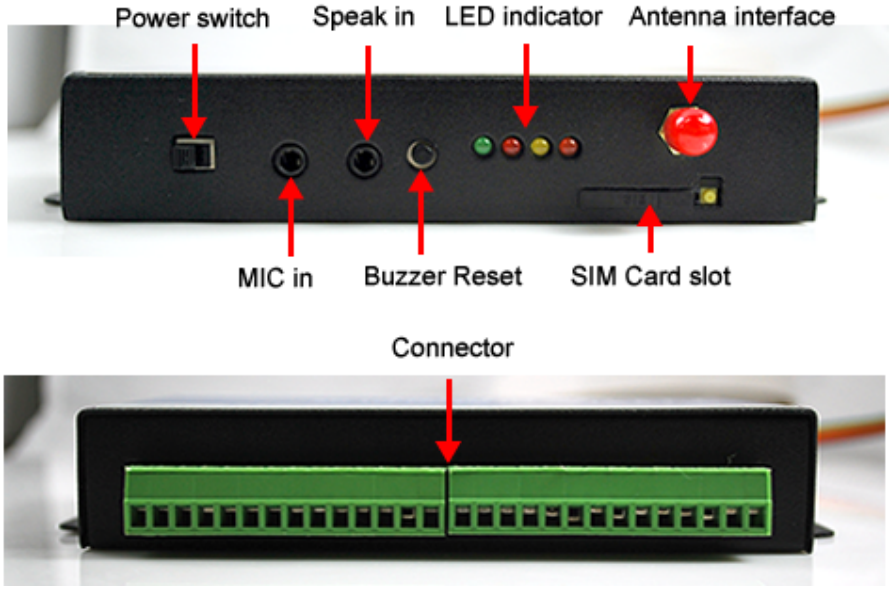
- 8 digital inputs, connect dry contact device
- 8 relay drivable outputs(12V-24V),drive electricity <0.2A
- 4 Analog input, 0-53 Ma,10 precision
- Reliable performance with built-in double watchdog
- Automatic device condition report through SMS every 24 hour interval
- User-defined alarm condition (normally close or open), alarm and recovery SMS message for each alarm point; Supporting drive relay output
- Maximum of 10 mobile phone numbers can be programmable
- Supporting voice monitoring
- Inside temperature sensor (optional)
- Being available for internal battery and providing power cut off alarm (optional)
- Configuration can be done via COM port.



Parameter

Parameter item	Reference scope
DC Power supply	9-28V DC (Standard adapter: DC 12V/1.5A)
Power consumption	12V input Max. 50mA/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	-20-+70 °C
Humidity range	Relative humidity 95%
Output drive voltage	Equal to input DC voltage
Output drive power	Drive voltage ≤35V, drive current ≤200mA
On state input current	Max. 0.33mA
Input signal	Dry contact
Exterior dimension	130×80×25mm
Weight	330 g

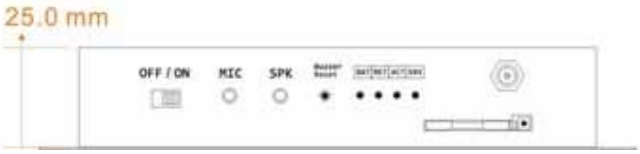
GSM RTU interface



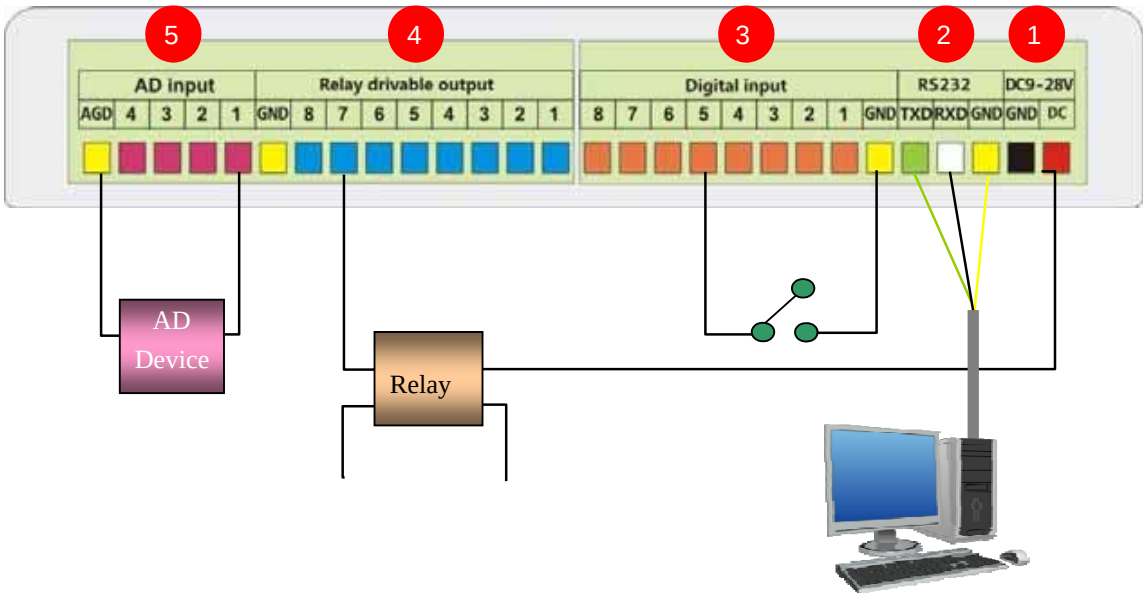
GSM RTU interface

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 receives or sends short messages 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



Terminal Description



1. ［**DC9-28V**］

Terminal	Description
DC	positive terminal of the DC power supply (+)
GND	Negative terminal of the DC power supply (-)

2. ［**RS232**］**:**Connecting computer RS232 to config

3. **8 Digital input:** Digital input connecting open or close contact

4. **8 relay drivable output:** driving relay close or open, Output drive voltage Equal to input DC voltage

Positive pole of relay coil connecting DC, negative pole of relay coil connecting DO,

5. **4 AD input:** connecting analog device and receive 0 to 53 mA signal.

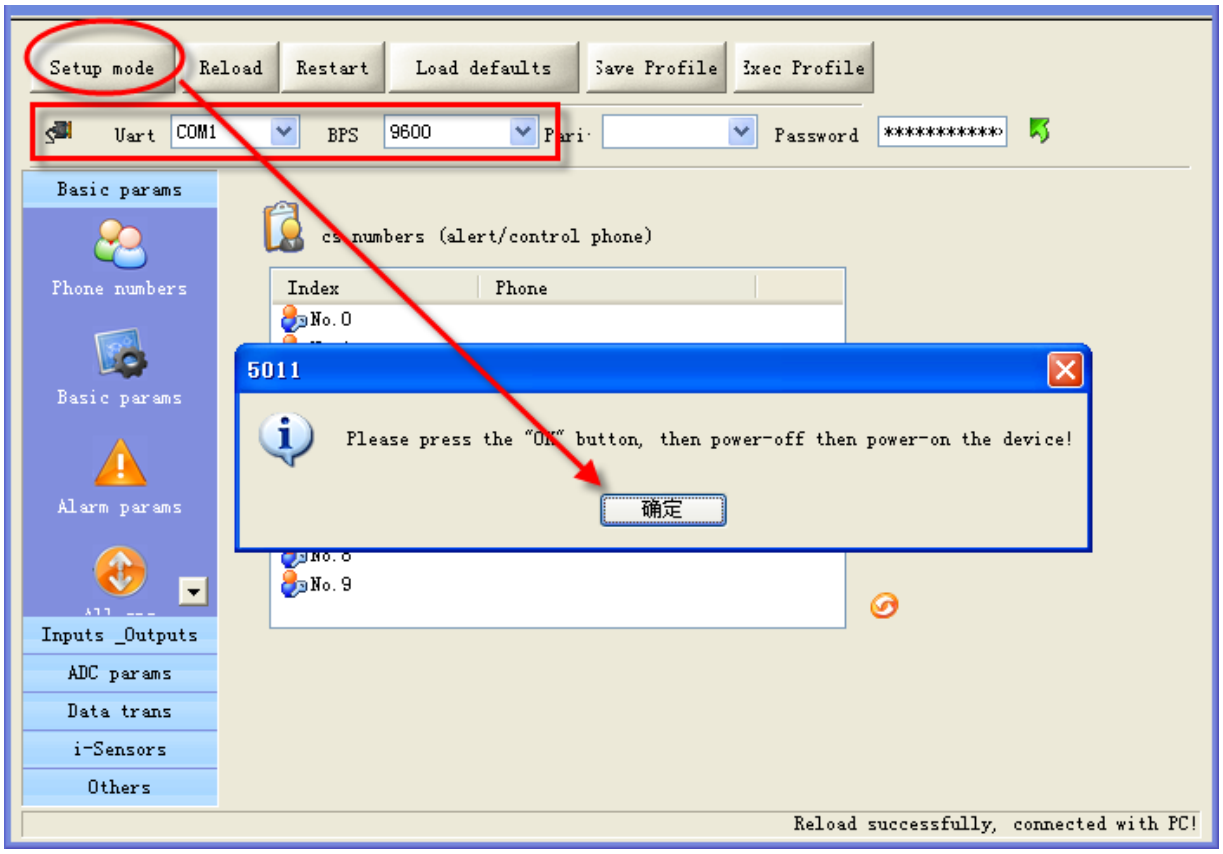
III Configuration guide of GSM RTU

Basic Parameters

3.1 Access setup mode

Connect GSM RTU with RS232 of the computer and open the configuration software, make GSM 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 is disabled, only to set parameters. And GSM RTU must be restart to enter working mode.
In working mode, all functions is enabled, the GSM RTU can alarm and control.

NOTE

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

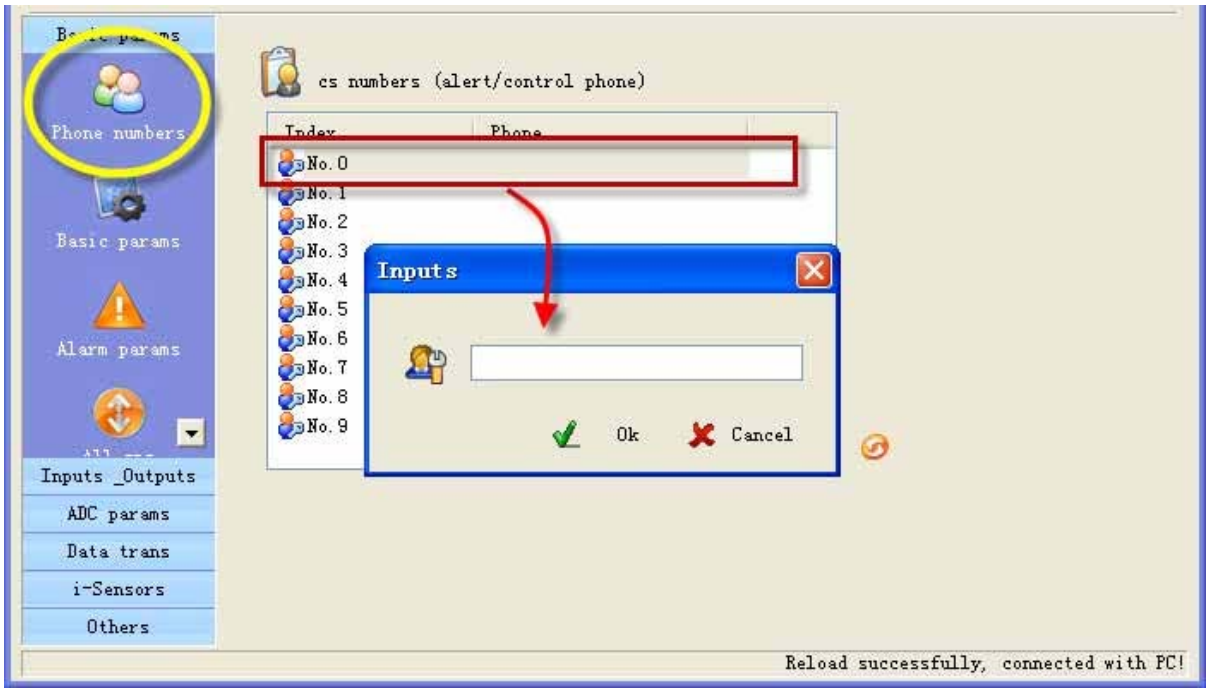
How to know current mode:

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

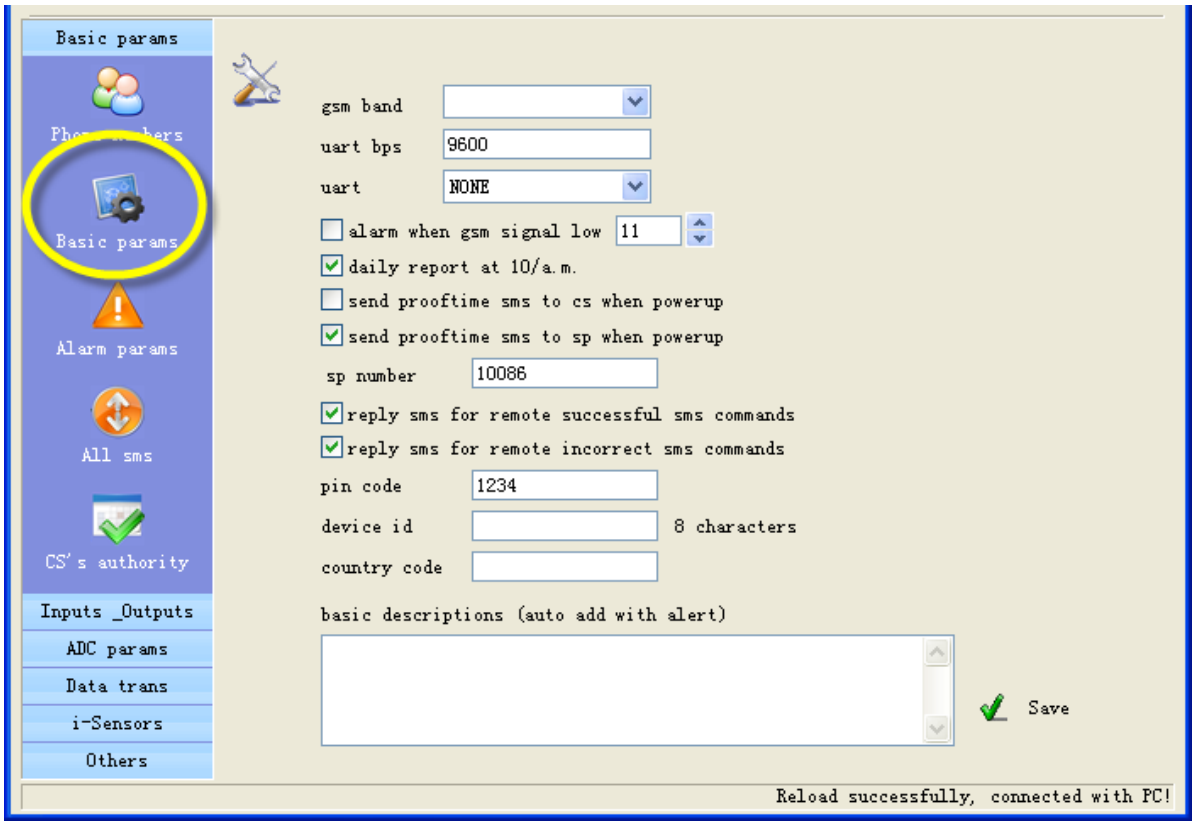
Method 2: Check the information from the serial port, if the character string of “dtu come in setup mode” occurs, it means that GSM RTU is under the setup mode.

3.2 Add “CS number”

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



3.3 Basic parameter configuration



Attention：gsm band, uart bps, uart, pin code, country code please using the default parameter

1. Alarm for GSM signal low: GSM signal normal range is 18-32,GSM RTU will send alarm sms to user when GSM RTU's GSM signal value below 11

2. Daily report: When the daily report function is used, GSM RTU will send a report sms to all CS numbers at 10:00 every morning for reporting current states, through which the user can make sure the normal operation of GSM RTU.

3. Prooftime

Prooftime is keeping the GSM RTU's os (operation system) has correct time. GSM RTU can execute daily report, timing arm or disarm, timing output at correct time.

Send prooftime sms to cs when powerup: when GSM RTU powerup, it send a sms to CS0 to request prooftime, CS0 can reply sms"999" to GSM RTU to complete prooftime.

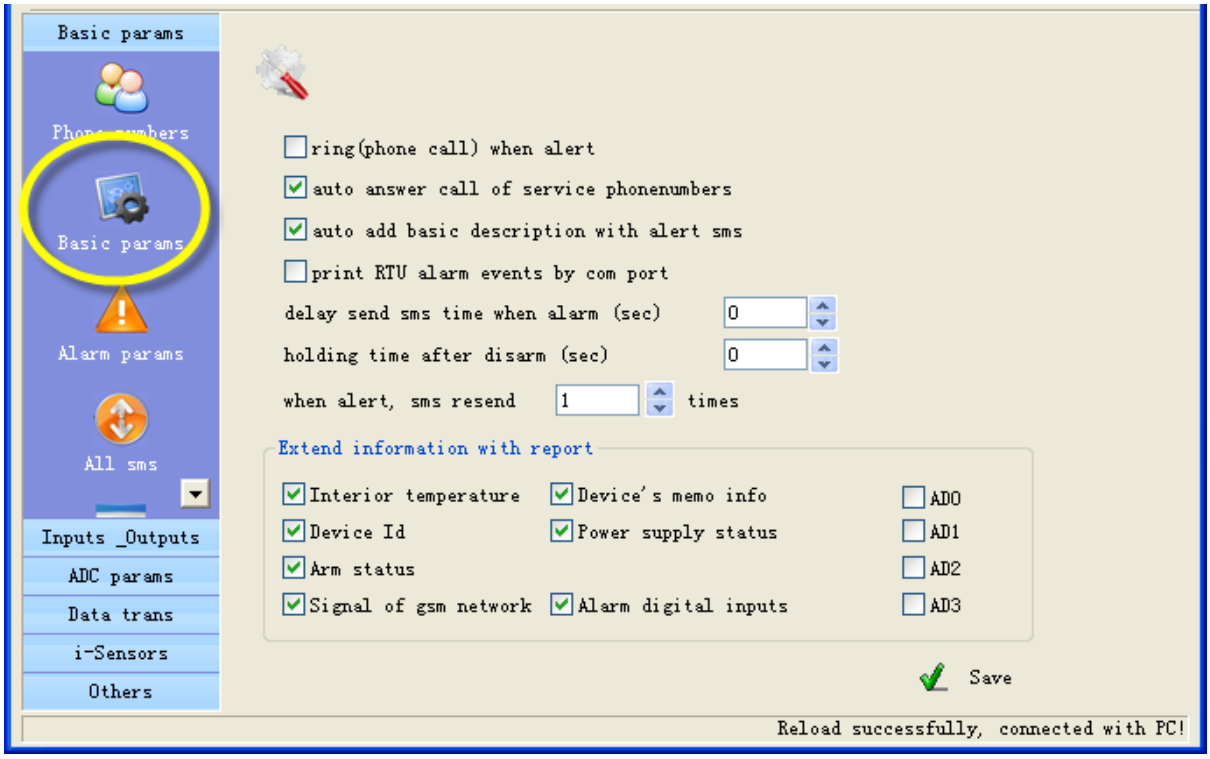
Send prooftime sms to sp when powerup: sp number is a service number of GSM operator, when GSM RTU powerup, it send a sms to sp, and waiting sp reply a sms to complete prooftime.

Attention：if GSM operator has not provide sp number or such services, you need not enable the option

4. Device description: you can add description with GSM RTU (such as install position , user information),the description will show in sms which GSM RTU send to you

5. Device ID: The device ID is a 8-byte ASCII characters which will be showed in the short-message received by CS, for example:

3.4 Parameters for alarm



1. ring when alert

Enable this option, GSM RTU will give CS number a phone call then send sms when alarm

2. auto answer call for service phonenumber

Enable this option, GSM RTU can auto answer call for service phone number, if MIC and speaker have been connected, user can monitor voice and speaking.

3. Auto add basic description with alert sms

Enable this option, the description (such as install position, user information) that have been defined by user will show in sms which GSM RTU send to service phone number.

4. print RTU alarm events by com port

Enable this option, when GSM RTU alarm, it send the alarm data to com port in RTU_IO data format

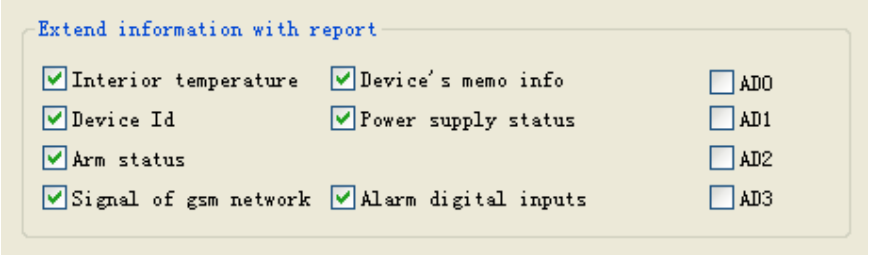
5. Arm delay and disarm delay

Define the time of “delay send sms time when alarm” (disarm delay time), in this way, you have an enough time to set GSM RTU in disarm mode when you go into the monitor area.

Define the time of “holding time after disarm” (arm delay time), in this way, you have an enough time to set RTU5010 in arm mode when user leave the monitor area.

6. 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 have chance to know the RTU is stilling working and main status of the RTU.



Multi parameters can be selected into daily report, include:

a. Interior temperature: if your GSM RTU has added internal temperature sensor, the temperature value will show in the daily report.

Attention：A standard GSM RTU has no internal temperature sensor

b. Device Id: enable this option, ID will show in the daily report.

c. Arm status: enable this option, arm or disarm status will show in the daily report.

d. Signal of gsm network: enable this option, GSM signal value will show in the daily report.

e. Device's memo info: enable this option, Device description will show in the daily report.

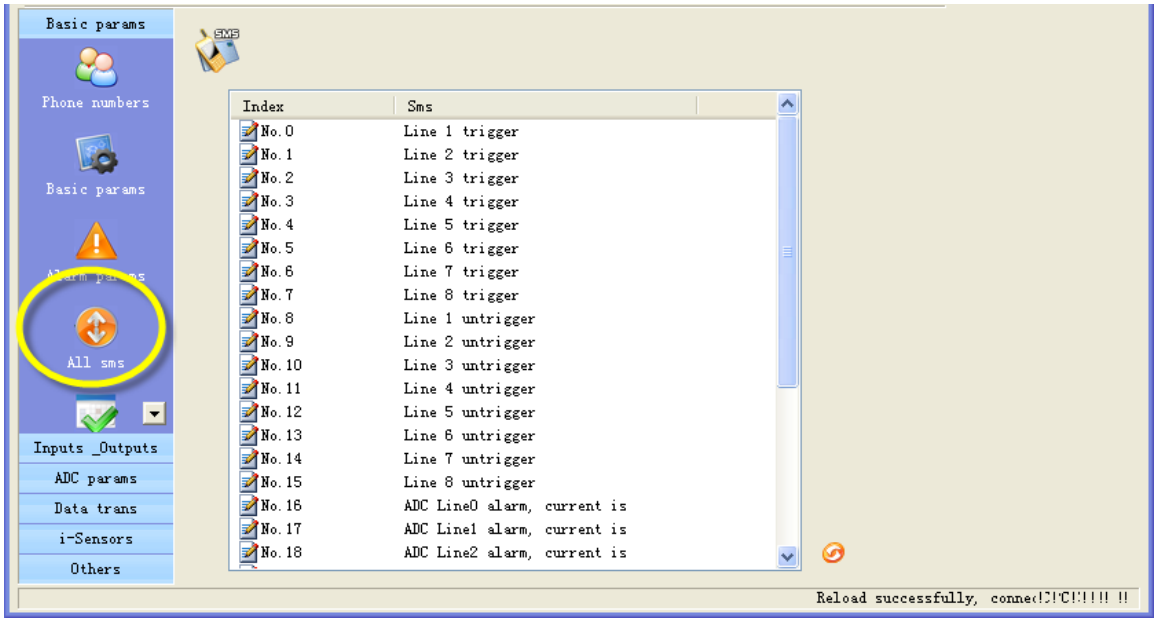
f. Power supply status: enable this option, the daily report will show power supply status

g. Alarm digital inputs: enable this option, all digital input status (on or off) will show in the daily report.

h. AD0~AD3: enable those options, all the value of AD input will show in the daily report.

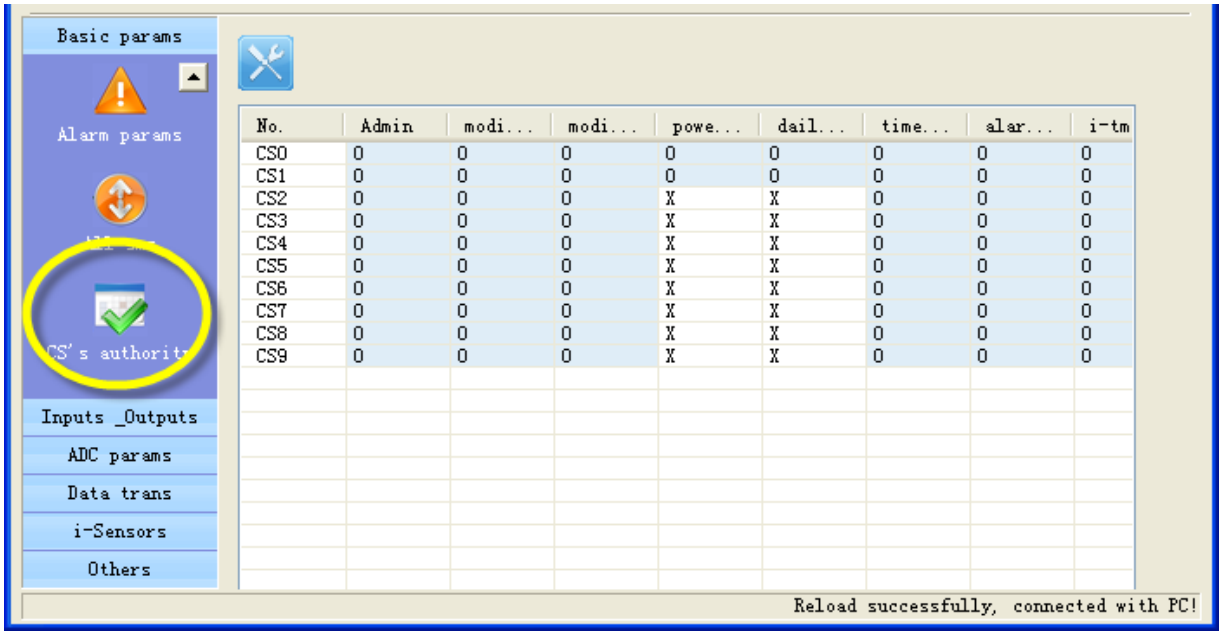
From: +8613480165874
Equipment Id: 00000001
Time: 9:58
Signal value: 27
Power supply: Normal
Computer temperature: 30.5
Description: Machine Room A1, Floor 4, Building 3
AD input0: 12
AD input1: 27
AD input2: 32
AD input3: 11

3.5 ALL SMS



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

3.6 CS's authority

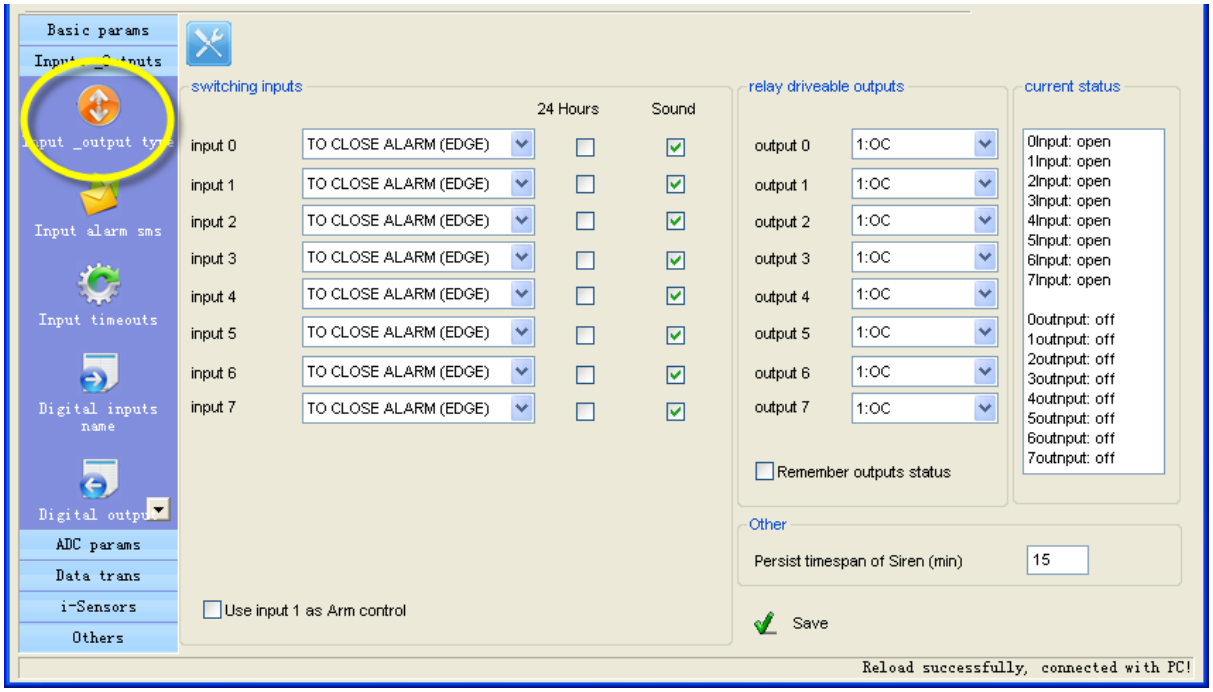


The explanation of the CS's authority ("O" is enable, "X" is disable)

Authority	Explanation
admin	Can Arm/disarm or not
Modify by sms	This CS number can be modify by sms command or not
Modify servers	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	Can receive the daily report or not
Timer mms	Null
Alarm mms	Null
I-tmp sms	Can receive the alarm sms or not when internal temperature sensor alarm
I-tmp ring	Can receive the alarm phone call or not when internal temperature sensor alarm
Battery fail sms	Can receive the alarm sms of power failure or not
Battery fail ring	Can receive the alarm phone call of power failure or not
Signal low alarm	Null
Sample sms	Null
M2M svr	Null
Arm notify	Null
PC alarm	Null

Inputs_Outputs

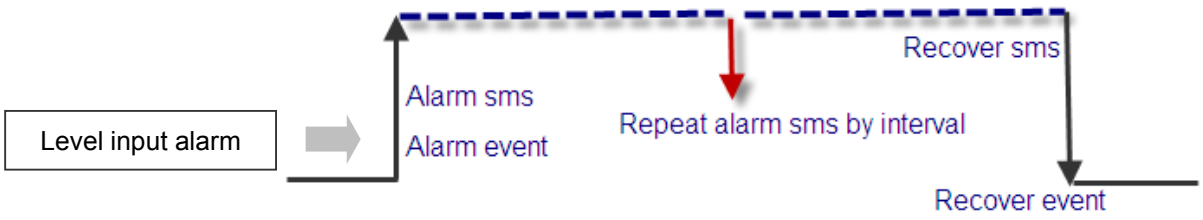
3.7 Inputs_Outputs types

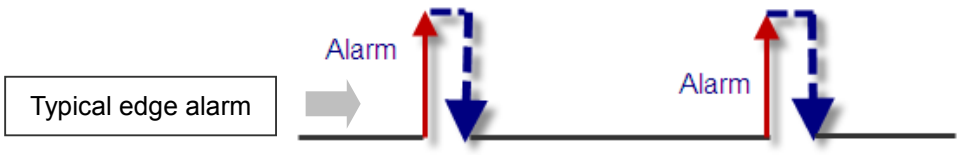


Digital inputs types

GSM RTU provide 8 digital inputs, input signals can be divided into two types, EDGE_IN (edge triggering) and LEVEL_IN (state triggering).

ATTENTION: The key deference between Level and Edge is Level input has recovery notify message and Level inputs can repeat alarm status sms notify by an interval.





"24 Hours" property: If checked, the digital input will execute alarm action (send alarm sms, interlock etc) when it is triggered, even GSM RTU is in disarm status.

"Sound" property:
Means this line alarm event will cause internal buzzer and extend buzzer or siren action.

"Use digital input 1 as arm control" property:
Enable this option, GSM RTU is in arm mode if digital input 1 is opened, GSM RTU is in disarm mode if digital input 1 is closed, so user can connect a button to switch mode for arm or disarm

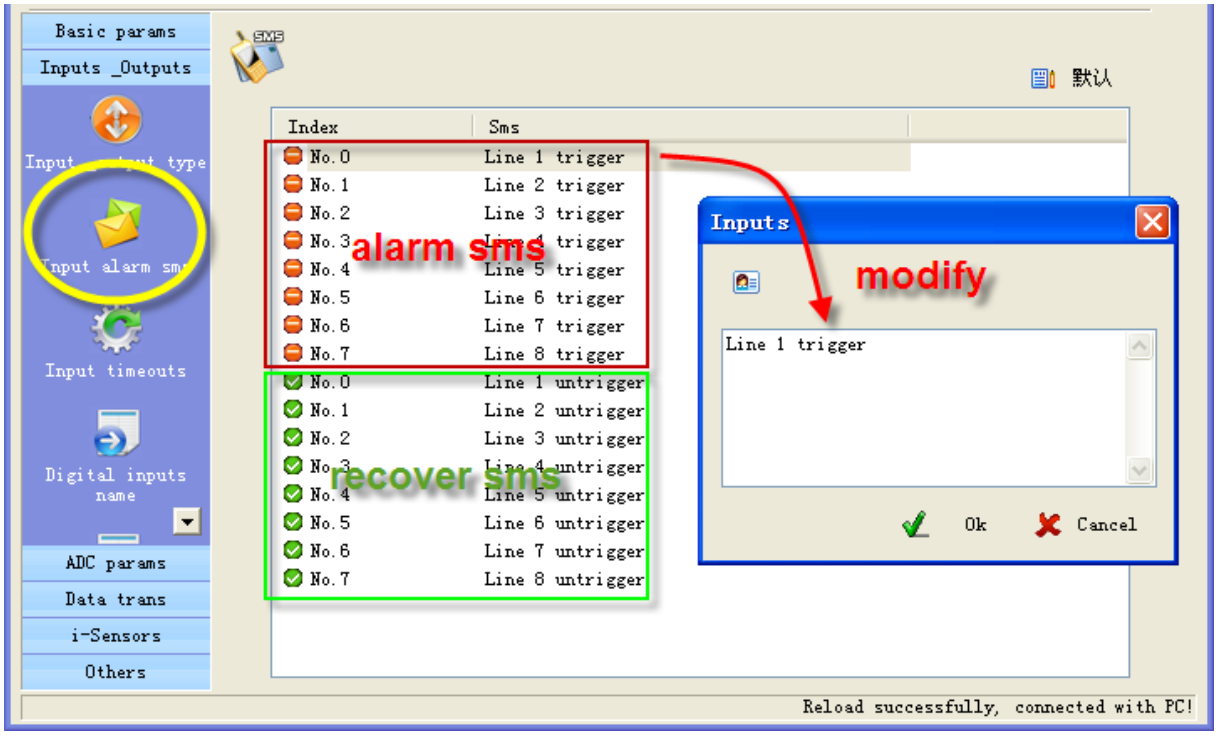
ATTENTION: Use digital input1 as arm control you need select the type of input1 is "TO CLOSE ALARM (LEVEL)" and delete the alarm/recover sms of input 1

Output types

0	disable	
1	relay drivable output	**8 relay drivable outputs,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	SNAPSHOOT	**This line wills shortly action when any alarm happens.**
4	**SIREN**	**This line continuously drives for 1 minute by default. And the interval can be user defined.**

Remember outputs status
GSM RTU's outputs default status is open; it is possible closed during working. After restart, the outputs will be reset, status is open. If check the option, output can recover the status that before restart.

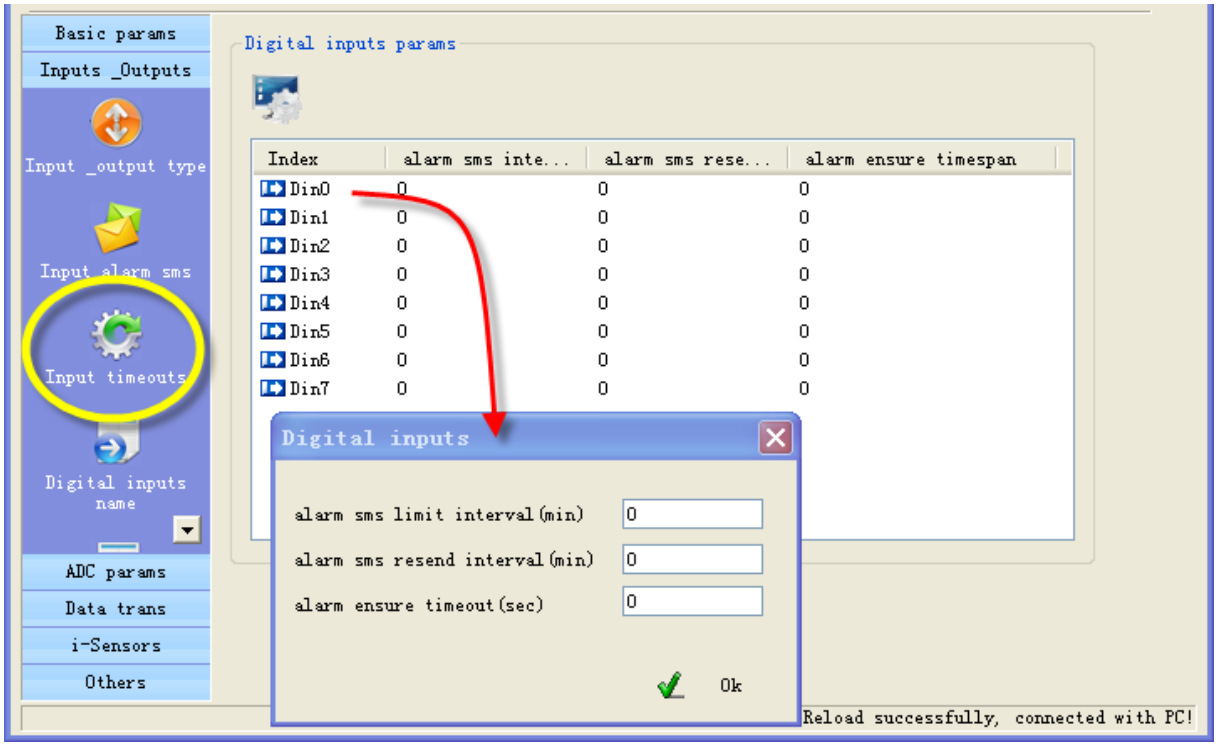
3.8 Define alarm and recover sms of digital input



All of the input line sms can be modify and re-define.

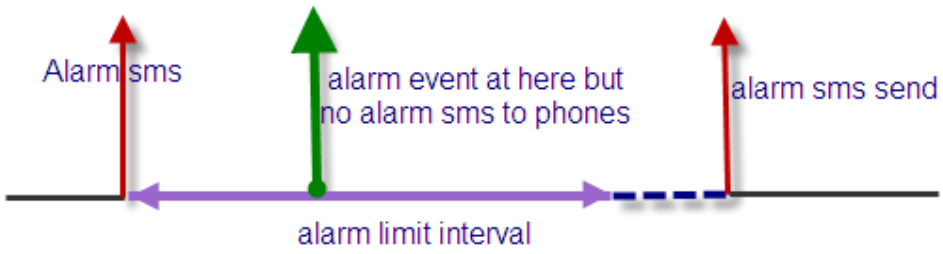
ATTENTION: a SMS composed of not more than 60 characters

3.9 Digital inputs timeouts

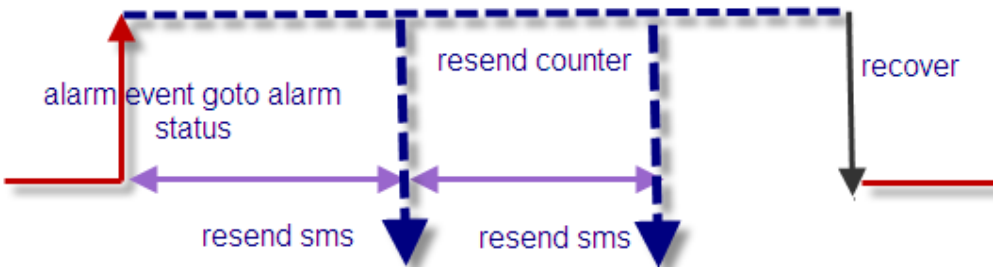


This page designed to setup input timeouts property. There are 3 interval related with inputs.

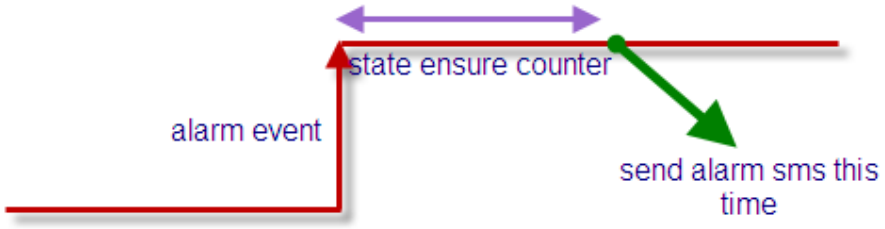
1. Alarm sms limit interval designed to avoid amounts of alarm/recover sms in a short time.



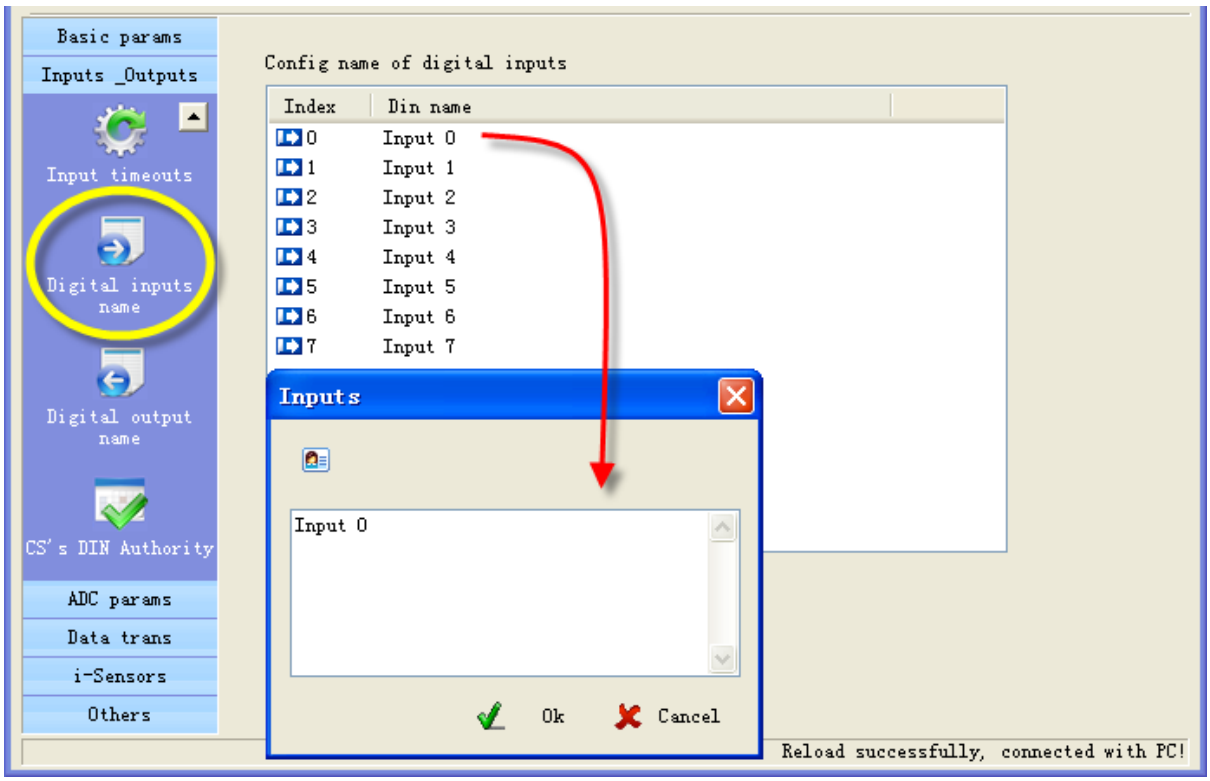
2. Alarm sms resend interval designed for repeat alarm status notifies to phones, 0 means disable repeat notification.



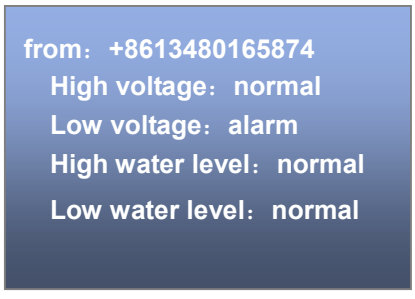
3. Alarms ensure timeouts is a counter of alarm status ensure timer, designed to avoid shake mistakes. 0 means no counter.



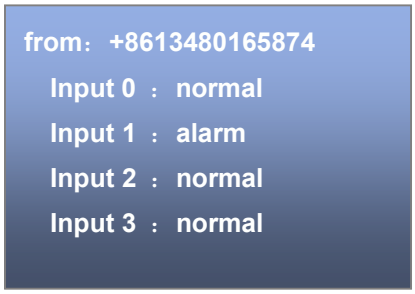
3.10 Config digital inputs/outputs name



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



Have configured input name

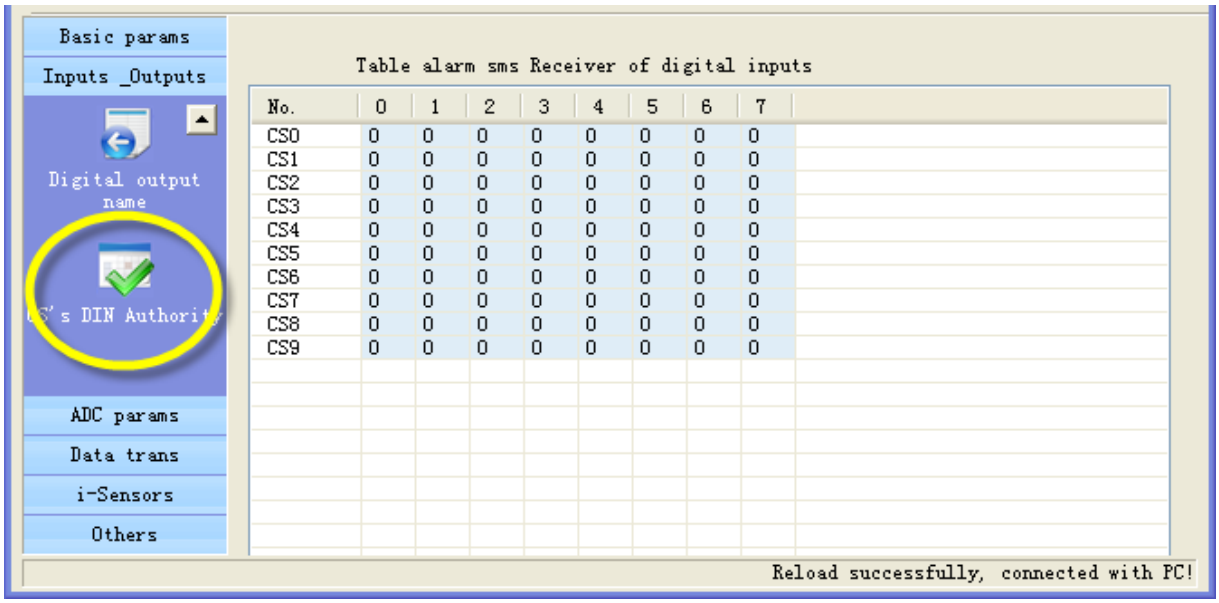


Have not configured input name

Config outputs name is same

3.11 CS's DIN authority

This page can setup the table of CS phone receive digital input line in alarm property.
"**O**" means this Cs phone will receive related line in sms, "**X**" means not.



Example:

No.	0	1	2	3	4	5	6	7
CS0	X	0	0	0	0	0	0	0
CS1	0	X	0	0	0	0	0	0
CS2	0	0	X	0	0	0	0	0
CS3	0	0	0	X	0	0	0	0
CS4	0	0	0	0	0	0	0	0
CS5	0	0	0	0	0	0	0	0
CS6	0	0	0	0	0	0	0	0
CS7	0	0	0	0	0	0	0	0
CS8	0	0	0	0	0	0	0	0
CS9	0	0	0	0	0	0	0	0

This settings means CS0 don't receive line0 alarm
CS1 don't receive line1 alarm sms.

ADC_Params

3.12 Analog input alarm

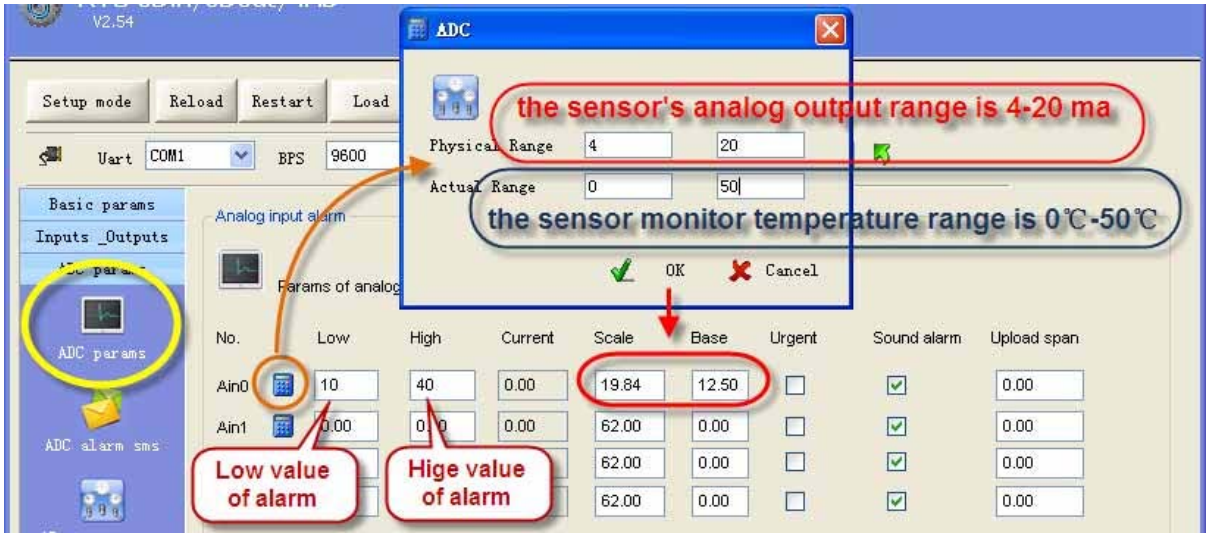
The analog inputs are designed to receive 0 to 53 mA signal from an analog sensor

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

Example:

GSM RTU connect a temperature transmitter, it analog output range is 4-20 ma for monitor temperature range is 0℃-50℃, you need get alarm and current temperature value when temperature is above 40℃ or below 10℃

Preset the values for “high”, ”low”, ”scale”, ”base” are:



“Urgent” property:

If checked, in any case, the GSM RTU will execute alarm action (send alarm sms, interlock etc) when the

AD input is over normal range, even GSM RTU is in disarm status.

“Sound alarm” property:

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

Upload span：

If the variation scope of AD input is more than the value of “upload span”, GSM RTU alarm

1. AINAS time : minimum time of twice AD alarm sms

After executed a alarm action (send alarm sms, interlock etc.)When AD inputs over normal range, in the AINAS time GSM RTU will not execute any alarm action (send alarm sms, interlock etc.) even AD inputs are over normal range frequently. The purpose of setting AINAS time is user will not receive many alarm sms in the time during the AD input is over normal range frequently. “0” is disable

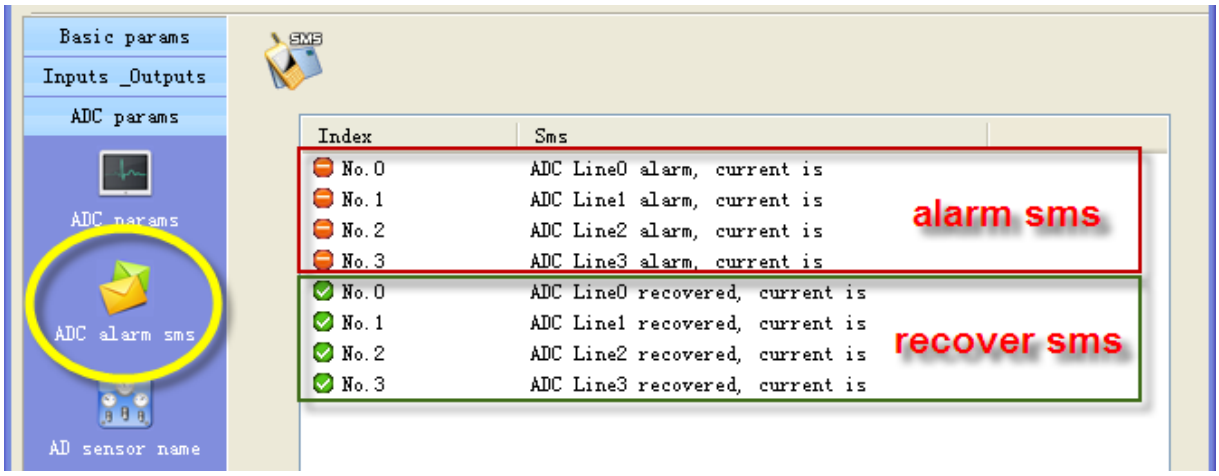
2. AINLS time: interval of resend AD alarm state sms

After executed a alarm action(send alarm sms, interlock etc.) when AD inputs over normal range, if the duration of the alarm signal overrun the AINLS time,GSM 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" is disable

3. AINDLY time: timespan of ensure AD alarm

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

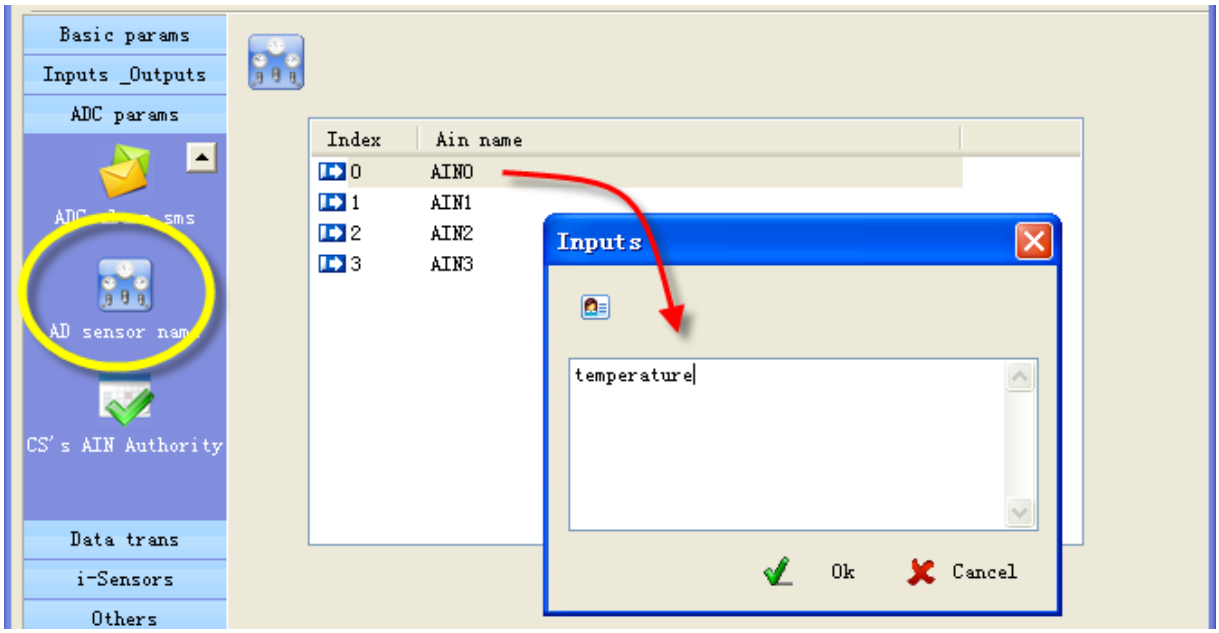
3.13 Define alarm and recover sms of AD input



The current value is showed automatically in end of alarm or recovers sms.

ATTENTION: a SMS composed of not more than 60 characters

3.14 Config AD inputs name

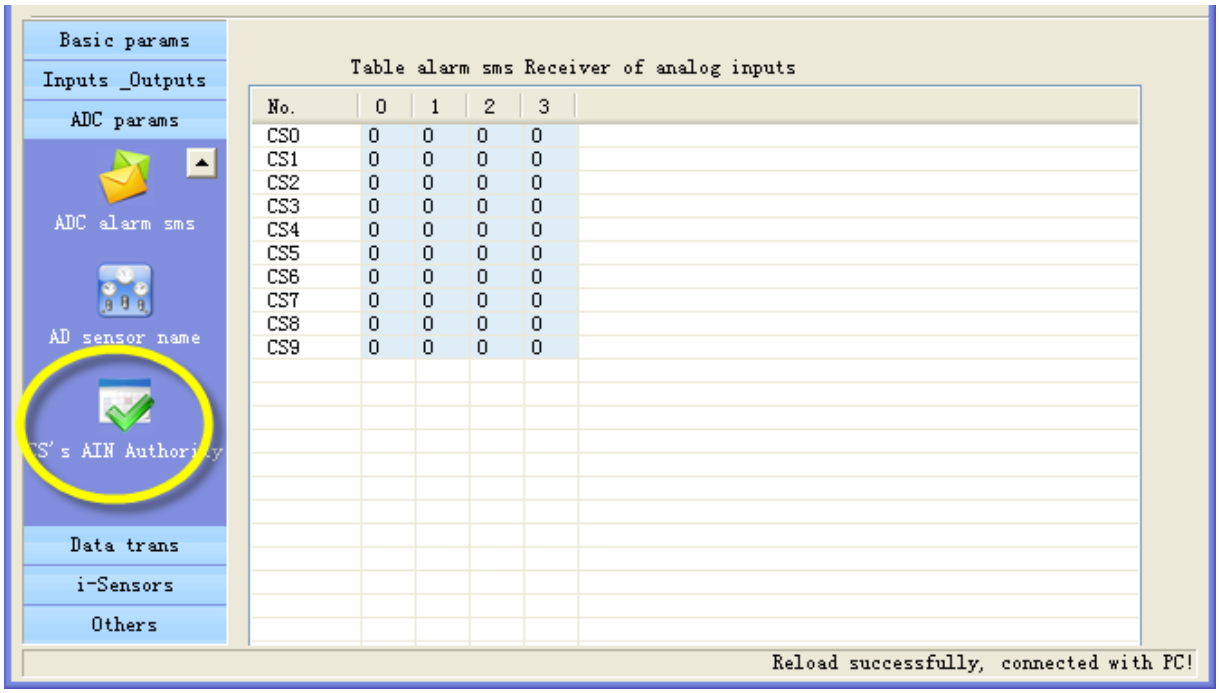


If you send sms command to require AD inputs value, the AD inputs name show in the sms
For example, set the AD input 0 channel name is “temperature”, the sms is:

ATTENTION: a name composed of not more than 24 characters

3.15 CS’s AIN Authority

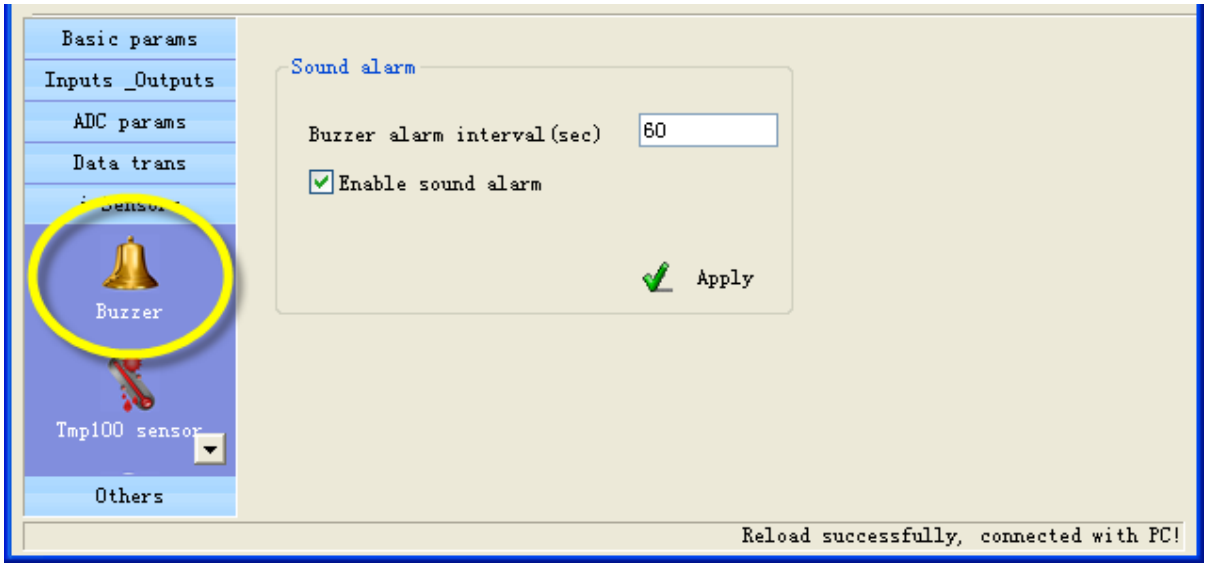
This page can setup the table of CS phone receive AD input line in alarm property.
“**O**” means this Cs phone will receive related line in sms, “**X**” means not.



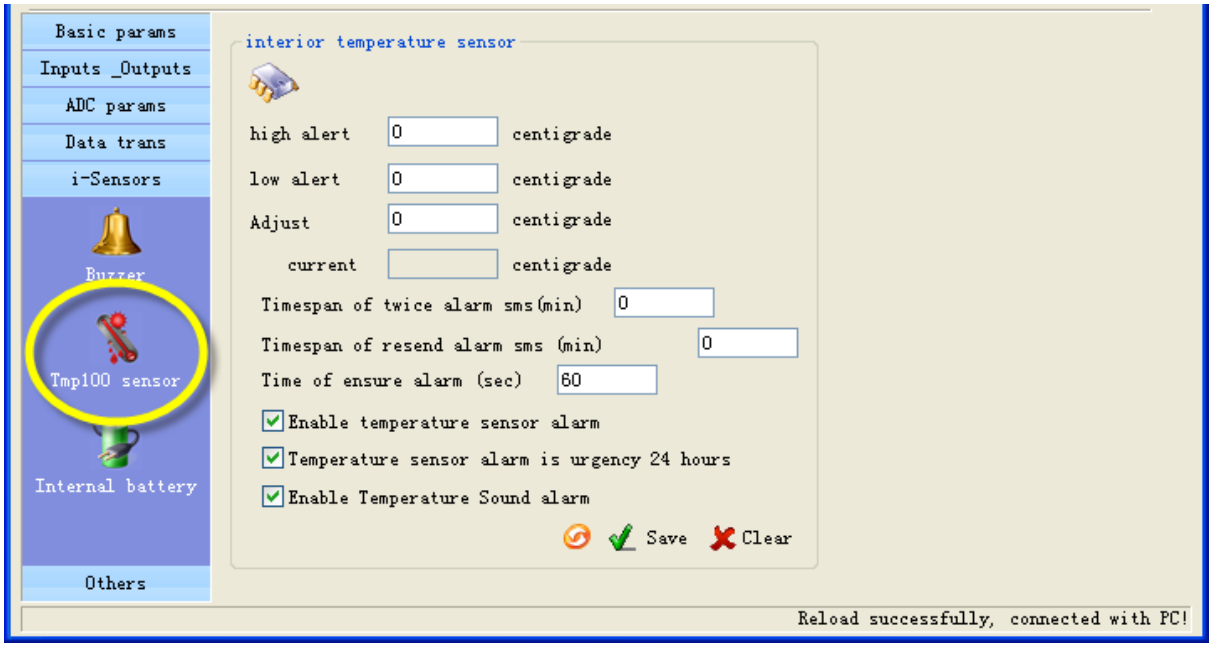
I-sensors

3.16 Buzzer

A buzzer is installed in the GSM RTU. The buzzer will be activated when alarm, it can be stopped by the buzzer reset button on GSM RTU panel, or through sending the command with CS number remotely. In this page, you can enable or disable the buzzer and set interval time of alarm



3.17 Tmp100 sensor (optional)



TMP100 as an optional temperature sensor can inside GSM RTU; you can preset a high and a low

temperature value, if temperature is over normal range, GSM RTU alarm. You can send sms command to GSM RTU to get current temperature value.

User can set “Adjust” value to calibrating temperature value

1. TMPAS time: timespan of twice alarm

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

2. TMPRS time: timespan of resend alarm sms

Designed for repeat alarm status notifies to phones, 0 means disable repeat notification.

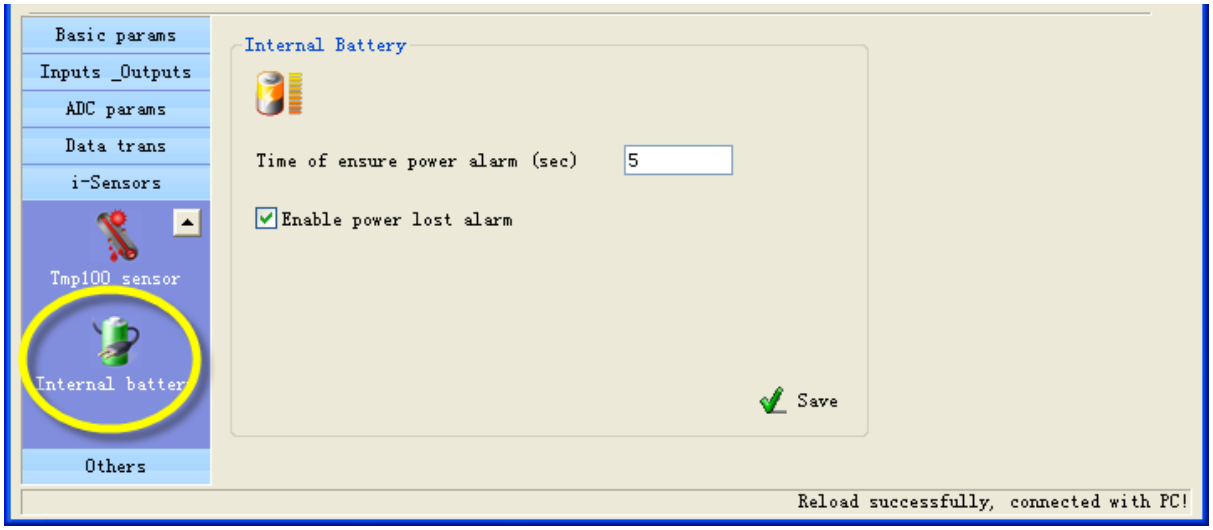
3. TMPDLY time: time of ensure alarm

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

3.18 Internal battery (optional)

The internal battery is optional attachment; it is designed to realize power lost alarm

When external power cut off, GSM RTU Powered by internal battery and alarm to user



POWDLY time: time of ensure power alarm

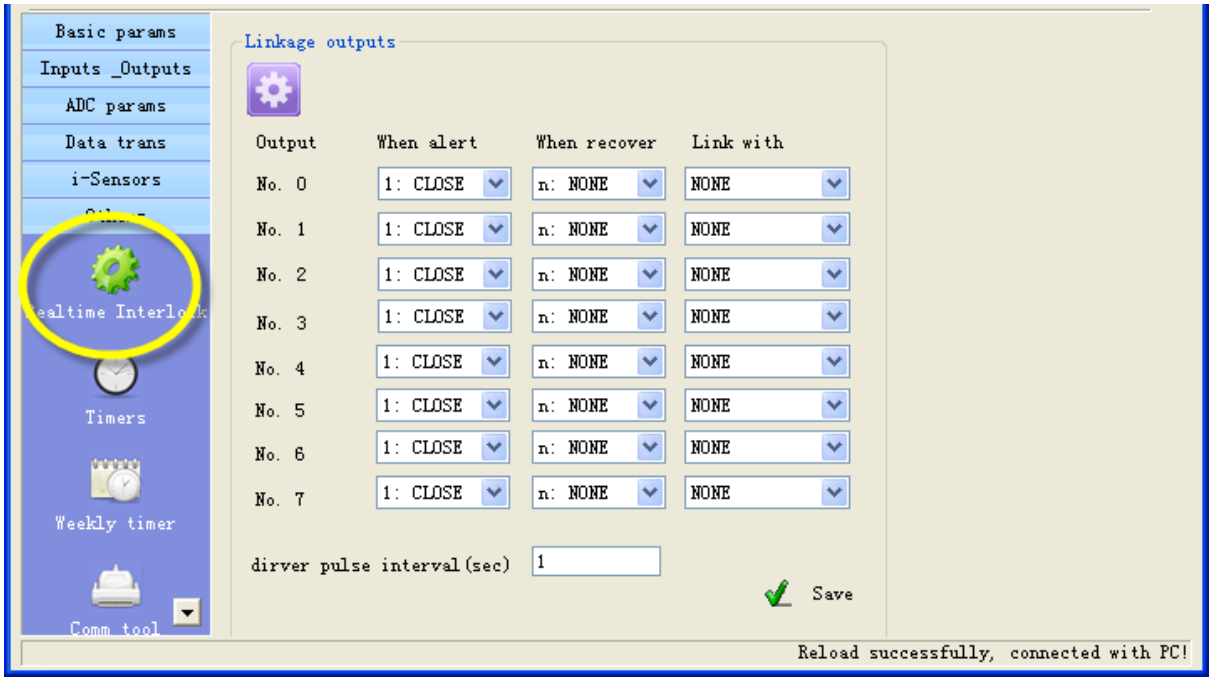
When the time of external power lost is over POWDLY time, GSM RTU alarm, “0” is disable

Battery parameter:

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

Other settings

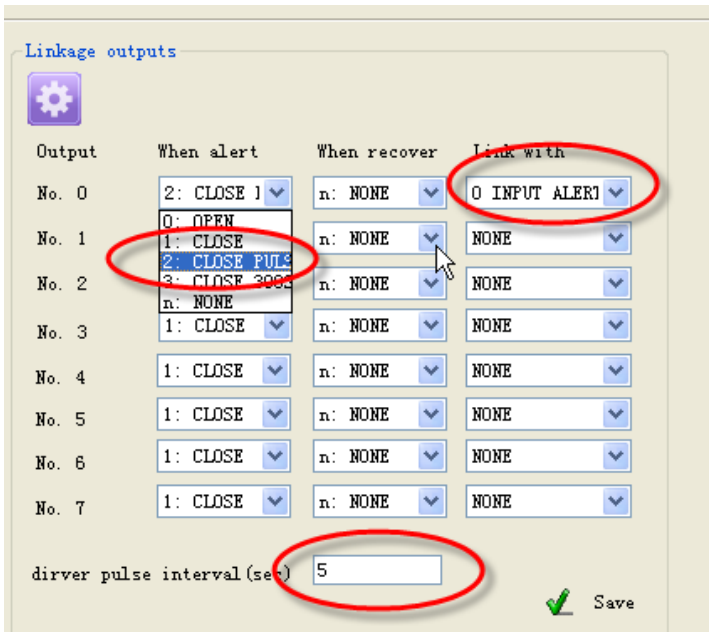
3.19 Realtime Interlock



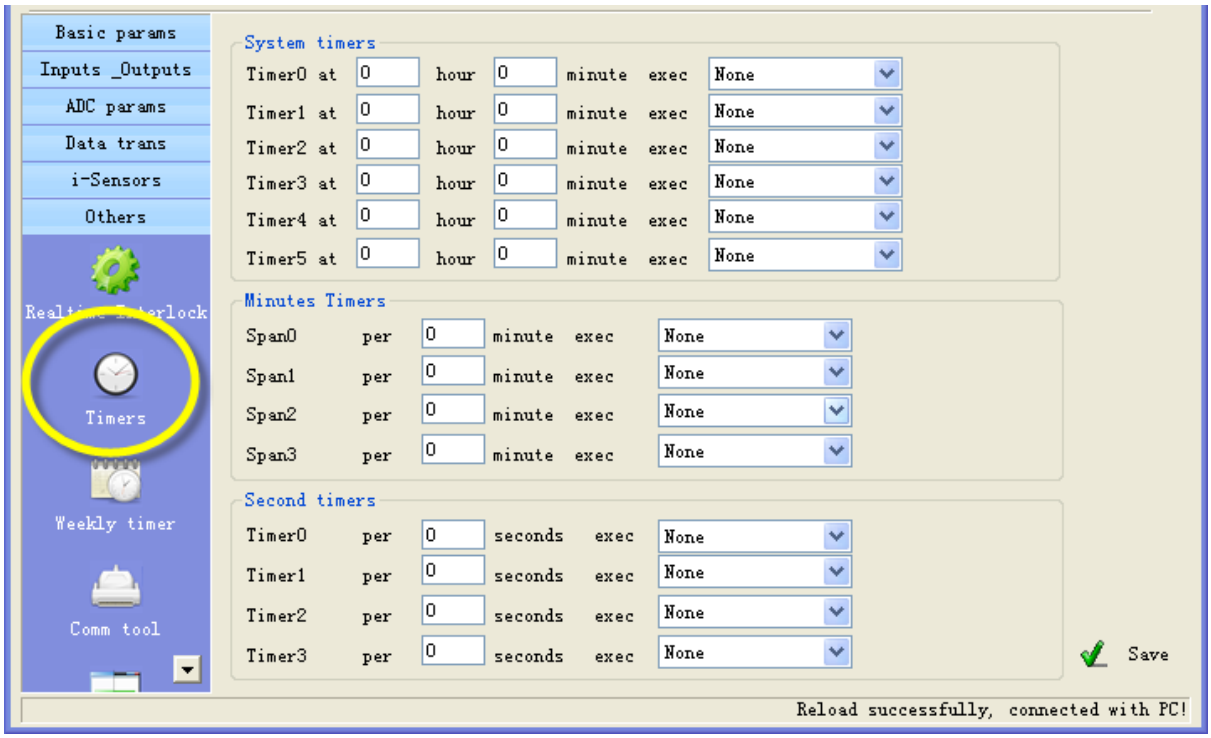
Realtime interlock is a local strategy, it is designed to outputs execute action automatically under some internal triggering conditions,

For example

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



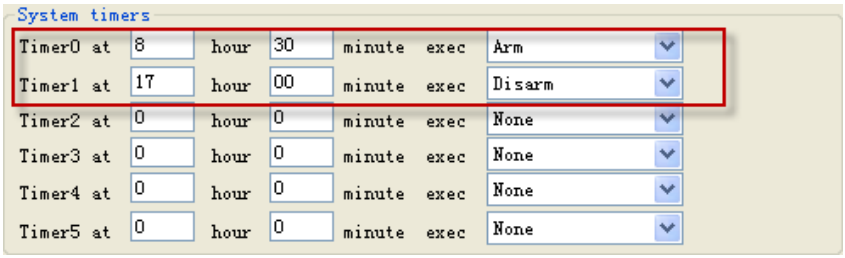
3.20 Timers



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

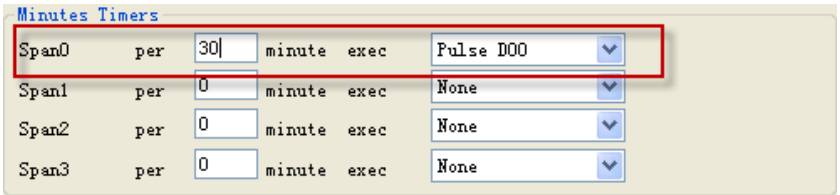
System timers

6 times can be set in a day, GSM RTU execute a task in each time. For example, at 8:30 execute arm, at 17:00 execute disarm.



Minutes timers

Set minutes value for the timers, GSM RTU execute a task every the interval time. For example, GSM RTU execute output 0 pulse every 30 minutes

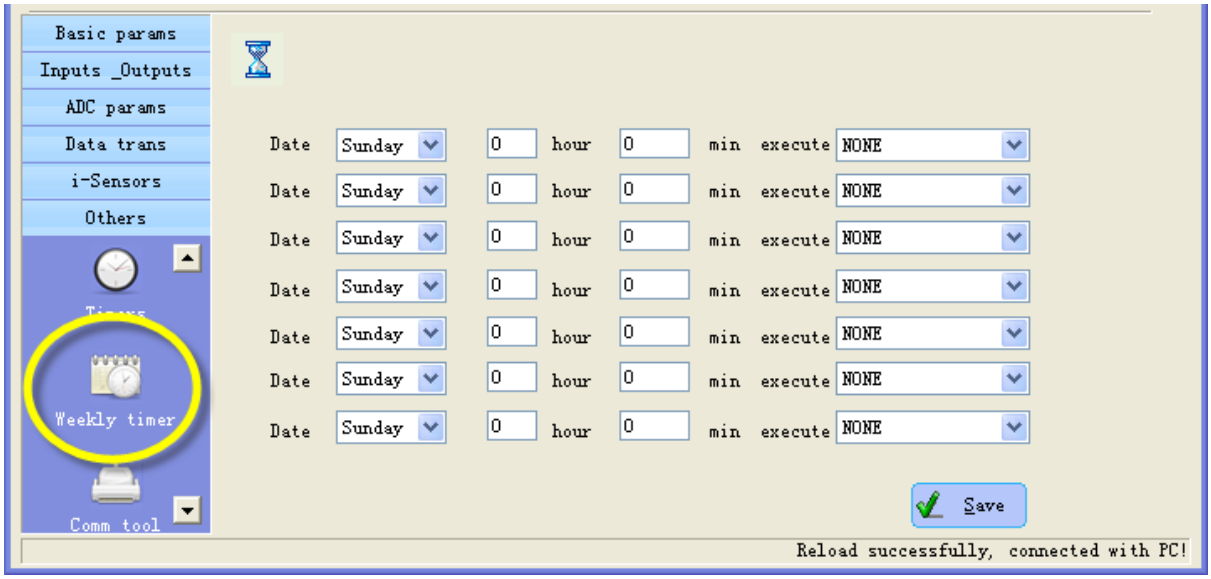


Second timers

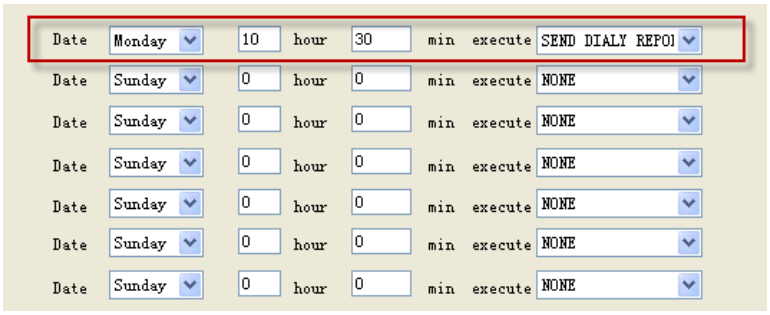
Set second value for the timers, GSM RTU execute a task every the interval time.

ATTENTION: before you the timers, you have to update GSM RTU's clock, the method of update clock please see "Basic parameter configuration" above

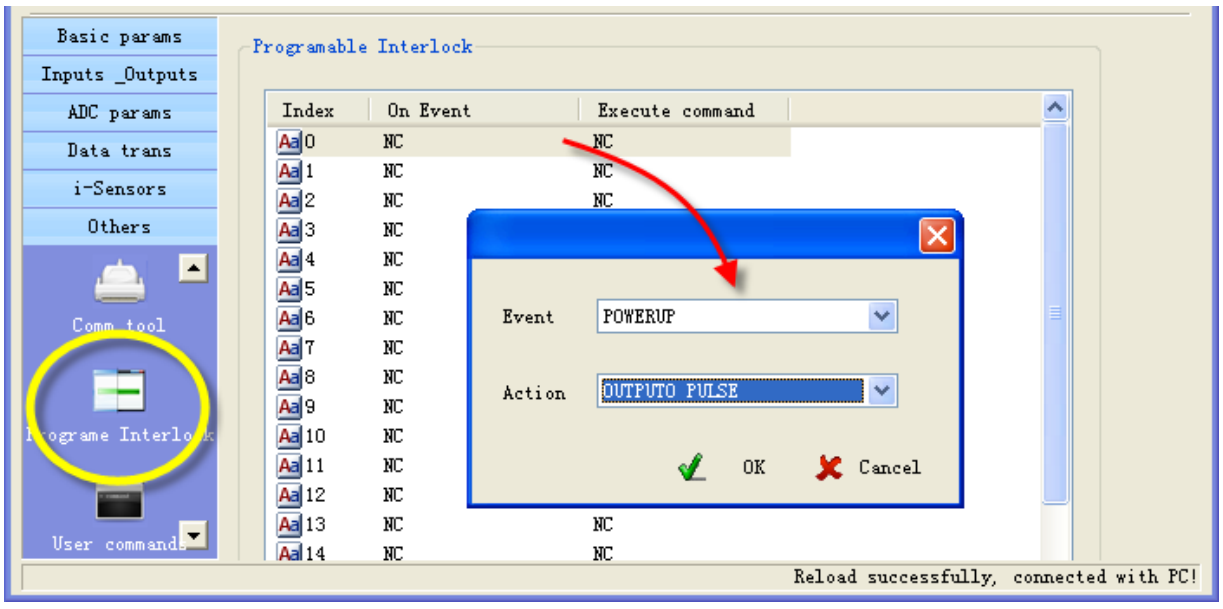
3.21 Weekly Timers



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



3.22 Program Interlock



Program interlock is a local strategy; it is stronger and more flexible than realtime interlock. You can set GSM RTU execute many actions automatically according to various types of system events. If event happens, GSM RTU execute action.

For example, if GSM RTU power up, output 0 pulse 1 second

3.23 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