GSM SMS Modem
MODEL: SKY RTU-1

User Manual

V1.02

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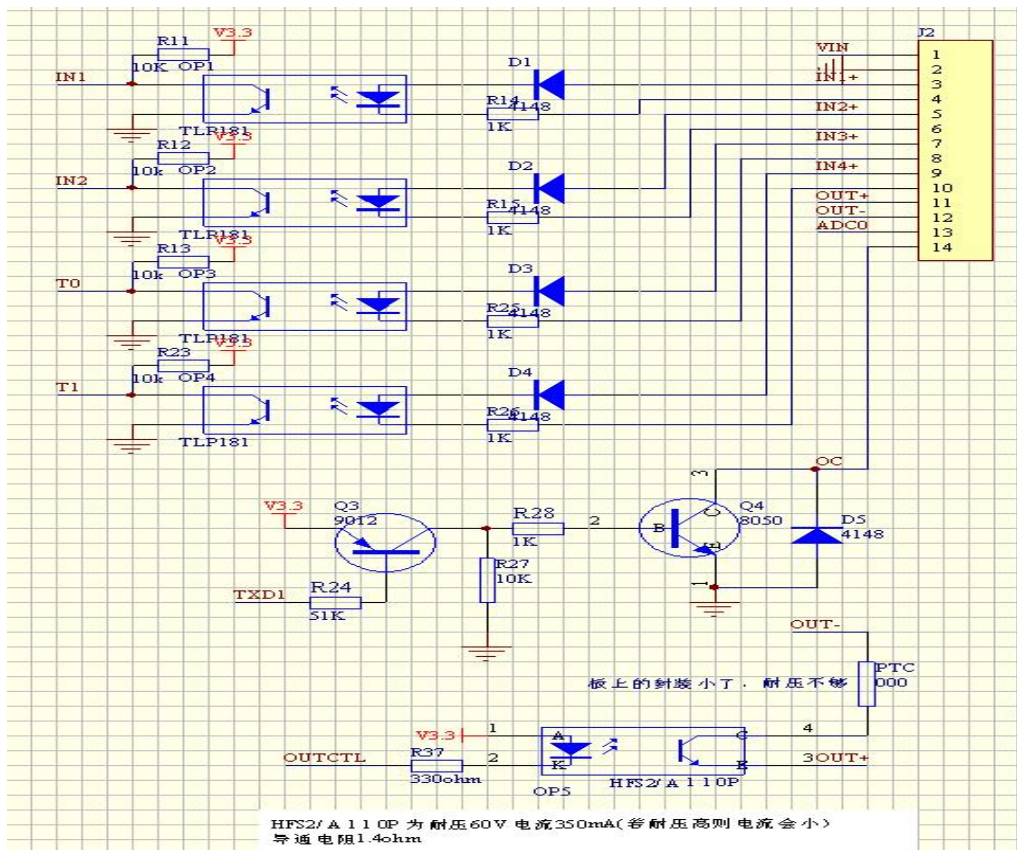1.2.2   OC gate output.

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>> Activated by a number over the limitation
>> Activated by a number under the limitation.
>> Activated by a timer.

1.4 RXD/TXD
Download the setting parameter.

Electrical Characteristics @25℃

Parameter	Min.	Max.	Typ.
Power Voltage	7.5V	25V	12V
Power Current		500mA	50mA
IN1-4+/- Optocoupler (Iso) Input Drive Voltage	2.5V	48V	
IN1-4+/- Optocoupler (Iso) Input Drive Curent	0.5mA	45mA (continuous)	
IN1-4+/- Reverse Patient Voltage		100V	
Output Current Drive ability *note*		<100mA	
Optocoupler (Iso) Output Patient Voltage *note*		60V	
Frequency of counting		10KHz	
Range of ADC Voltage		50V	0-5V
ADC Digit	8BIT		
ADC Precision			+/- 2%
ADC Input Impedance	50Kohm		
OC Drive Current		<500mA (continuous)	

2. Configuration

Open the software: "PRTUMODEMSET1123en.exe", and set relative parameters as you need.
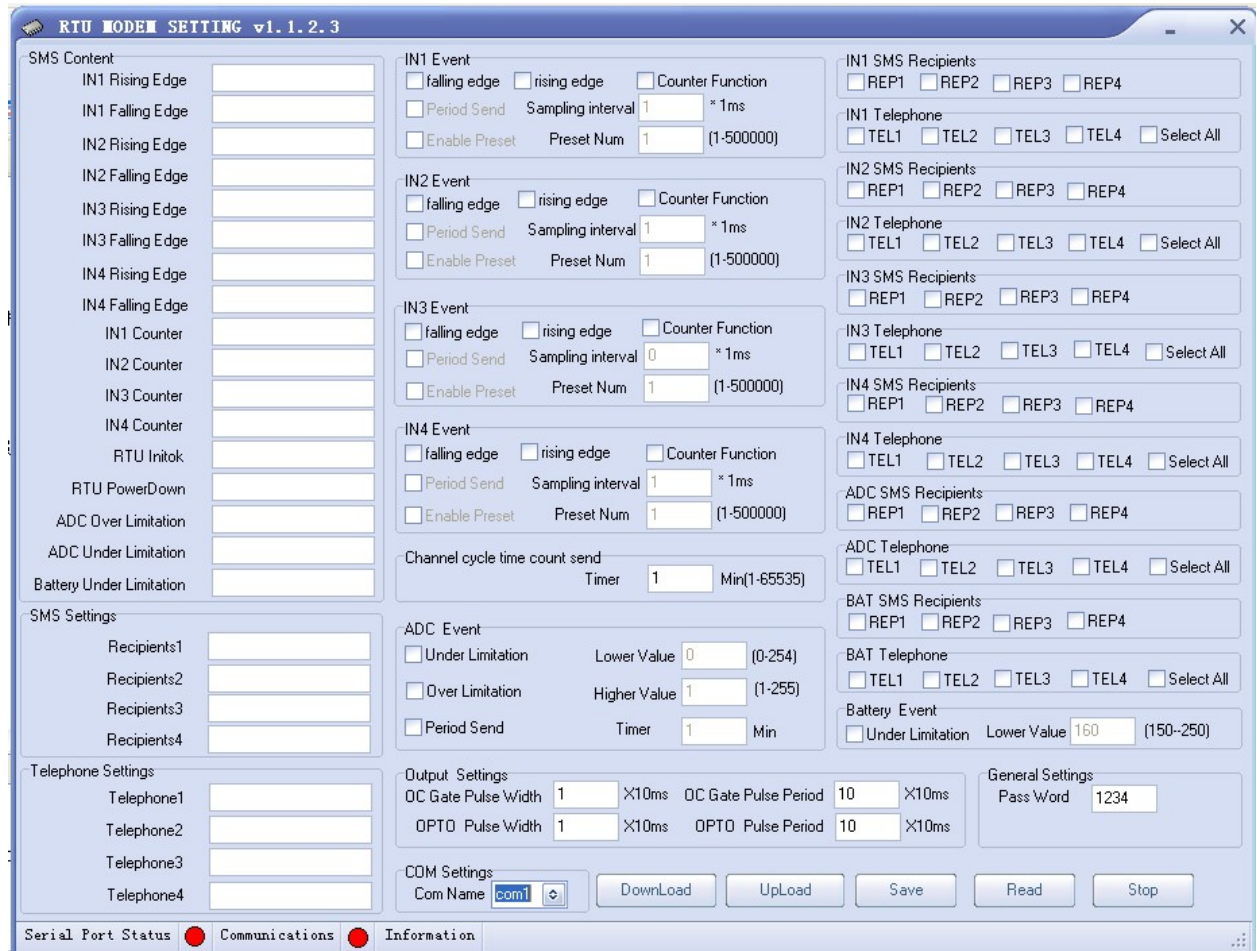
2.1 Setting

2.1.1 Fill the number of SMS Recipient 1-4 and Phone Call Recipient 1-4

◘ The recipients number: A maximum of 16 digits length.

   If there is country code, "+" must be added at the head.

◘ For each event, you can set 4 SMS recipient mobile-phone numbers and 4 call recipient telephone numbers at most.

◘ SMS Recipients: when the RTU is triggered by input, counter or alert of power down(or battery lower than limit), SMS will auto-send to the recipients number.

   Set up the recipients of the SMS at the "SMS Settings" section.

◘ Phone call Recipient: when the RTU is triggered by input , counter or alert of power down(or battery lower than limit), RTU will auto-call to the recipients number and hung up.

Set up the recipients of the call number at the "Telephone Settings" section.

2.1.2 Input : There are four factors that can activate the RTU,

◘ **The four Input channels: IN1+/-; IN2+/-; IN3+/-; IN4+/-;**

Both the rising edge and the failing edge can activate the RTU.

1) Choosing the triggering channel: IN1+/-; IN2+/-; IN3+/-; IN4+/-

2) Choosing the triggering mode: on "IN1-4"
> Rising edge
> failing edge
> rising and failing edge

3) Edit the SMS content replying on "SMS Content: IN1-4 Rising/Falling Edge_____":
The content of each event，no longer than 32 characters.

4) Choosing the SMS Recipient and Phone call Recipient

For example: if SMS are to be sent to Rep1 and Rep3 through channel 1, TEL1 and TEL3 are to be clicked on "IN1 SMS Recipients".

◘ **IN1-4+/- :** When choose "Counter Function", IN1+/-; IN2+/-; IN3+/-; IN4+/- are used as multiplexed counter channel, the falling edge and the rising edge of IN1+/-; IN2+/-; IN3+/-; IN4+/- will be invalid. The channel can be activated by a pre-setting value. If there is overflow, it will loop.

Switch back battery on to save the value having counted.

Period send: When time up the RTU will report the value via SMS to recipients, after reporting the counter will not reset to zero. When counting to 655360, auto reset to zero.

1) choose "Counter Function" >> ' Period send' , the IN1+/-; IN2+/-; IN3+/-; IN4+/- will count input trigger (or pulse), send the data periodically if clicked.

2) the period is set on 'timer__' ; min is 1min ; max is 65535min

3）Choosing the SMS Recipient and Phone call Recipient of the channel

For example, you select period send of IN1, IN2, IN3, IN4 Event and set the time 60mins, then after 60mins, modem will send SMS as below format:
C1=nnnnnn; C2=nnnnnn; C3=nnnnnn; C4=nnnnnn;   to recipients.

The C1=/C2=/C3=/C4= should be set and editable at "IN1 counter", "IN2 counter", "IN3 counter" and "IN4 counter".

For example:

A. You input C1= at IN1 counter, C2= at IN2 counter, C3= at IN3 counter, C4= at IN4 counter, and select period send function on IN1,IN2,IN3,IN4 event,

Then modem will send SMS like C1=nnnnnn; C2=nnnnnn; C3=nnnnnn; C4=nnnnnn; to recipients.

B. You input CAFEO at IN1 counter, blank at IN3 counter, and select period send function on IN1, IN3 event,

Then modem will send SMS like CAFEOnnnnnn; nnnnnn; to recipients.

(Note: The recipients number is decided by IN3 recipients only, it means the period send number is according to IN3 setting)

    Value send: After the counter counts to the preset value, RTU will be activated to send SMS to recipients and then the counter will reset to zero automatically.

1) choose 'Counter Function'>> 'Enable preset', If choose, the IN1+/-; IN2+/-; IN3+/-; IN4+/- will count trigger (or pulse), when counts to the preset value, RTU will be activated to send SMS to recipients()

2) the value is set on 'Preset Num____' range is 1~ 500000.

3) Edit the SMS content replying on "IN1 Counter__

                         IN2 Counter__

                         IN3 Counter__

                         IN4 Counter__"

The content of each event，no longer than 32 characters.

4) Choosing the SMS Recipient and Phone call Recipient of the channel.

For example:

A. You input C1= at IN1 counter, C2= at IN2 counter, C3= at IN3 counter, C4= at IN4 counter, and select Enable Preset function on IN1,IN2,IN3,IN4 event,

Then modem will send SMS like C1=nnnnnn;
                              C2=nnnnnn;
                              C3=nnnnnn;
                              C4=nnnnnn;   to relative recipients.

(Note: this is four messages.)

B. You input CAFEO at IN1 counter, select Enable Preset function on IN1 event,
Then modem will send SMS like CAFEOnnnnnn; to relative recipients.

Sampling Interval: range 0-255;   unit: ms

When the interval is "1", sampling period is 1ms, sampling frequent is 1000Hz, input inplus less than 500Hz

When the interval is "100", sampling period is 100ms, sampling frequent is 10Hz, input inplus less than 5Hz

2.1.3 Output:

There are two output channels: MOSFET Relay output (OPTO)

OC gate Output

Output mode: pulse

Outputs trigger by SMS commands: Send

Stop sending

Send designated numbers of pulses

The width and the period of the pulse can also be set.

OPTO Pulse Width___: the width for OPTO output pulse, unit is 10ms

OPTO Pulse Period___: the period for OPTO output pulse, unit is 10ms

OC Gate Pulse Width__: the width for OC output pulse, unit is 10ms

OC Gate Pulse Period__: the period for OC output pulse, unit is 10ms

2.1.4 ADC Input Detecting

The max sampling data of ADC is 255, it corresponds input is 5V

There are three events can trigger ADC function:

Note: if active the "ADC Event", but without ADC input, the value of voltage of ADC is 0v

◘ Over limitation:

If ADC input value is higher than the setting "higher value", the event will be activated.

1) Choose the 'Over limitation' ;

2) Fill value in "Higher value___".

3) Edit the SMS content replying on "ADC over Limitation_____":

The content of each event, no longer than 32 characters.

4) Choosing the SMS Recipient and Phone call Recipient

Note: the alert SMS reports once every 5mins

◘ **Under limitation triggering:**

If ADC input value is less than the setting "lower value", the event will be activated.

1) Choose the 'Under limitation';

2) Fill value in "lower value___".

3) Edit the SMS content replying on "ADC Under Limitation_____":
   The content of each event，no longer than 32 characters.

4) Choosing the SMS Recipient and Phone call Recipient

   Note: the alert SMS reports once every 5mins

◘ **Period sampling value send:**

If 'Period Send' is clicked, RTU will send the ADC input sampling value periodically.

1) Choose the 'Period Send';

2) Set the time interval of sending the ADC value on 'Timer___'. the min is 10 seconds

3) Choosing the SMS Recipient

   Note: sending SMS content：ADC=xxx
       xxx indicate ADC Sampling voltage value, value range is 0-255 (0-5V)

2.1.5 Battery event：

if there is built in battery, RTU detects that the power level is lower than the pre-setting "lower value", the event will be activated.

1) Choose the 'Under limitation' ;

2) Fill value in "lower value___".   (> 153: equal to 3.6v)

3) Edit the SMS content replying on "Battery under Limitation_____":
   The content of each event，no longer than 32 characters.

4) Choosing the SMS Recipient and Phone call Recipient

Note: >> when the battery is low about 3.4V, the device stop working. So the battery lower value should
           above 153.
       >> Formula of Battery voltage: LowValue= battery voltage/6*255 = 42.5 * battery voltage.
        >> the alert SMS reports once every 10 mins

2.1.6 RTU Initok

A. System initialization complete (by power supply or battery), send the SMS to recipient 1

B. Report when power supply on, while supported by back-up battery, send the SMS to recipient 1

Edit the SMS content replying on 'RTU Initok ___'.

Note: the initok SMS only report to "recipient 1"

2.1.7 Power down:

when the power supply disconnected or power off, the RTU will send SMS to recipient 1

Edit the SMS content replying on 'RTU Power down ___'.

Note: the power down SMS only report to "recipient 1"

2.1.8 Password:

Four digits，ASC code

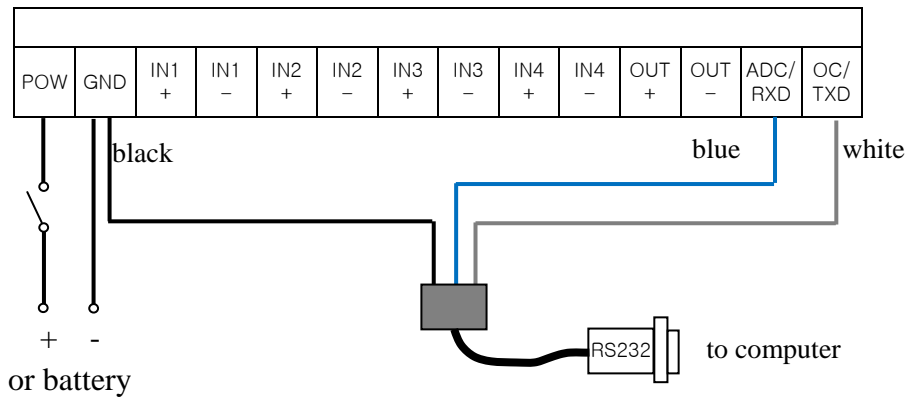## After Setting , press "save" to save the configure value.

Appendix:

'Upload' : press the key to read out the configure out from the RTU modem.

'Read' : open the configured file.

3. RTU configure

3.1 connecting the data cable to the modem and computer

		IN1 +	IN1 −	IN2 +	IN2 −	IN3 +	IN3 −	IN4 +	IN4 −	OUT +	OUT −	ADC/ RXD	OC/ TXD
POW	GND												

black   blue   white

+   -

or battery

RS232   to computer

3.2 Run the software "**RTU Modem Setting**". Select the files to download(by "**Read**" to open the saved file).

3.3 Click "download". the" Serial Port Status " turns to **green**

"Communication"   begins to flash

3.4 Power on the RTU modem (by power or battery). When the connection well for download, the "Communication" turns to **green**;

3.5 In 1~2 seconds, downloaded successfully, press" ok "

Information   ×

DownLoad Success

确定

All setup is OK, RTU will   initialize to detect all the conditions If the conditions are met, RTU   will check whether it is enabled. If it is enabled, RTU will look for the SMS recipients and send the pre-set SMS if the recipients do exist.

4. Immutable SMS Format

4.1. Modify PASSWORD

Send the SMS to the device：   Setup successful, it replies :

> xxxxEnnnn#

> Change Password Ok!

Note: >>xxxx refers old Password;   nnnn is new Password. It is constituted by 4 ASCII codes.
>> Factory default:1234.
>> The password is case sensitive

4.2. Set up SMS recipients by SMS :   **Max 4 recipients**

Send the SMS to the device: Setup ok, the reply SMS:

> xxxxRaaaaaaaaaaa;bbbbbbbbb
> bbb;ccccccccccc;dddddddddd#

> Change Recipients Ok!

Change or Cancel recipients: Re-set with new recipients. After sending the SMS, the setting contents will be instead to the last time

Note: >> xxxx: the Password

>> aaaaaa,   bbbbbbbbbbb……indicates the recipients mobile phone number.   1-16 ASC or digits.

>> the numbers are spaced between ' ; '

>> "+country code"   must be added when SMS format requires
    SMS Format: + Country Code and mobile phone number.

>> "R" in the SMS format must be capitalization

Exp: setting Recipients:

Sending SMS: 1234R+8613666504825;+23413666502528;13908333355#   or
    xxxxR+123456;+45679;45646;45646#123   (the num after '#' are invalid)

Setting successfully: Change Recipients Ok!

4.3. Set up Auto-call recipients by SMS： Max 4 recipients

Send the SMS to the device: Setup ok, the reply SMS:

xxxxTeeeeeeeeee;ffffffffffff;gggg
gggggggg;hhhhhhhhhhhhhhhh#

Change Recipients Ok!

Change or Cancel recipients： Re-set with new recipients. After sending the SMS, the setting contents will be instead to the last time

Note: >> eeeeeeeee, hhhhhh……indicates the recipients mobile phone or PSTN number.   1-16 ASC or digits.

>> the numbers are spaced between ' ; '

>> "+country code"   must be added when SMS format requires
    SMS Format: + Country Code and mobile phone number.

>> "T" in the SMS format must be capitalization

Exp: setting Recipients:

Sending SMS: 1234T+8613666504825;+23413666502528;13908333355#   or

xxxxT+123456;+45679;45646;45646#123   (the num after '#' are invalid)

Setting successfully: Change Recipients Ok!

4.4. Delay after auto-dialing (for leaving missing call to recipients)

Send the SMS to the device: Setup ok, the reply SMS:

xxxxDTnn#

Change Dial Delay Ok!

Note: >> xxxx   is the password

>> nn   indicates the relay after device call recipients;
        Unit: second
        Range: 05-40

>> the configure is 10secs

4.5   IN1/IN2/IN3/IN4+/-

A. Reset the counter to zero by SMS:

Sending SMS to RTU: setting successfully, reply to the setting number:

xxxxCC

Clear counter Ok!

Note: >> xxxx : Password

B. Period send method:

when IN1/IN2/IN3/IN4+/- are used as 'Period send' channel, the RTU will send to pre-setting recipients the SMS:

> C1=nnnnn;C2=nnnnn;C3=nnnnn;C4=nnnnn

> *Note:* nnnnn: indicates the counting value at that time, the range of counting is 1-655359,
> when counting to 655360, auto clear to zero.

C. Fixed Value send method

when IN1/IN2/IN3/IN4+/- are used as value trigger channel, the RTU will send to pre-setting recipients the SMS:

Sending Setting SMS: setting successfully, reply to the setting number:

> xxxxSCnnnnnn#nnnn#nnnnn#nnnnn#

> Set Precounter Ok!

Note: >> xxxx : Password
>> nnnnnn: Pre-setting count amount; the range is 1-500000
>> Count amount will not be lost after power off, save by working of battery.

When pulses from the sensor reach the pre-setting value, the GSM RTU send SMS to recipients:

> -------- C1=nnnnn OR
> C2=nnnnn OR
> C3=nnnnn OR
> C4=nnnnn

Note: >>nnnnn: indicates the counting value at that time, the range of counting is 1-655359
>> the counter will reset to zero automatically after reporting SMS , and then counts repeatly
>> The value have counted will not be lost if power off (supported by battery)

4.6 ADC:

Trigger ADC to 'Period Send', the RTU will send the voltage sampling value periodically to pre-setting recipients the SMS:

> ADC=xxx

Note: xxx: indicates the voltage value at that perod, the range of is 0-255

Query ADC

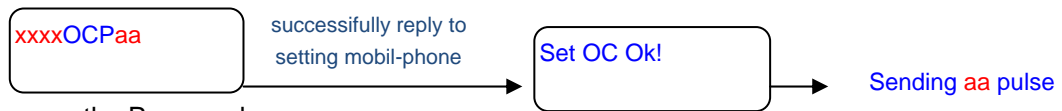Sending Setting SMS: successfully, reply to query phone:

> xxxxQA

> C=xxx

4.7. OC output channel setup

There is and OC gate for output. SMS commands can be used to enable the output. And SMS commands can designate the numbers of impulse to be sent.
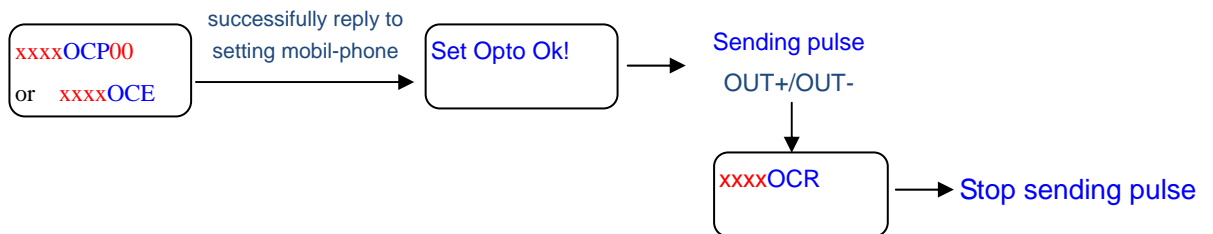
Send SMS to unit:

xxxxOCPaa → successfully reply to setting mobil-phone → Set OC Ok! → Sending aa pulse

Note: xxxx : the Password

aa: output pulse times; setting range is 01-99

pulse width/period: are optional.

when aa=00 the SMS unit send pulse constantly

xxxxOCP00 or xxxxOCE → successfully reply to setting mobil-phone → Set Opto Ok! → Sending pulse OUT+/OUT-

xxxxOCR → Stop sending pulse

4.8 OPTO Output Port (MOSFET relay): OUT+/OUT-

Send SMS to unit:
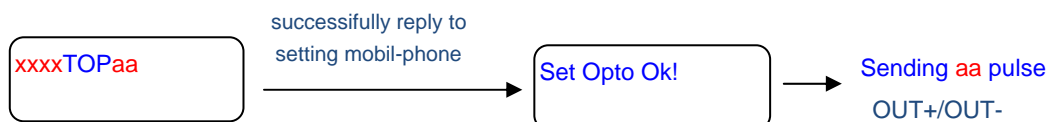
xxxxTOPaa → successfully reply to setting mobil-phone → Set Opto Ok! → Sending aa pulse OUT+/OUT-
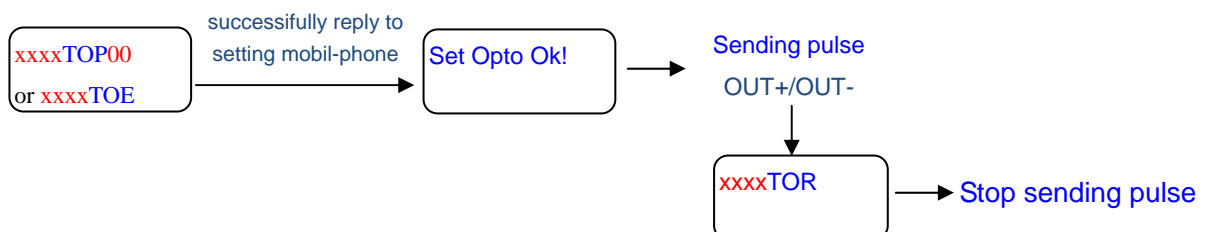
Note: xxxx : the Password

aa: output pulse times; setting range is 01-99

pulse width/period: are optional.

when aa=00 the SMS unit send pulse constantly

xxxxTOP00 or xxxxTOE → successfully reply to setting mobil-phone → Set Opto Ok! → Sending pulse OUT+/OUT-

xxxxTOR → Stop sending pulse

Wrong Message: when the PWD is right, but the format of the SMS command invalid, you will receive the prompt SMS:

Format Error!