Inquiry Network status with SMS!

Power Failure alarm by free phone call or SMS!

Interval Report Status to Your Mobile Phone by SMS!

GSM/GPRS/3G/4G/Cloud Network Fault Monitoring Alarm

220V AC Power on/off
DC voltage:0-36V

GSM/3G/4G LTE
Network Fault Monitoring Alarm

KING PIGEON

User Manual

Ver 1. 1

RTU5028E

Date Issued: 2020-01-07

www.iot-solution.com

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This handbook has been designed as a guide to the installation and operation of RTU5029S temperature& humidity&voltage&power Failure alarm and monitor.
Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.
We recommend that the advice of a registered electrician be sought before any Installation work commences.
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【UPGRADE HISTORY】

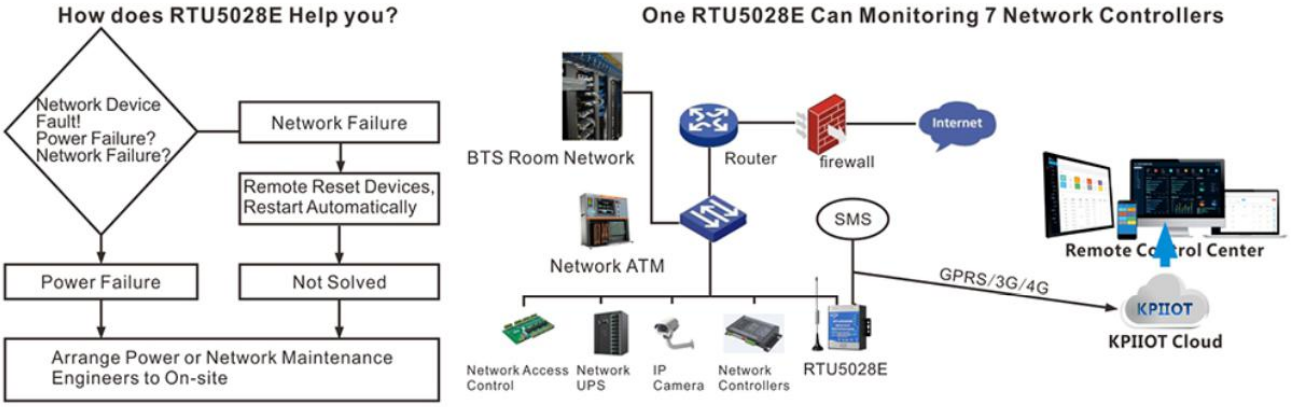
DATE	VERSION	DESCRIPTION
2019-07-18	Ver 1.0	RTU5028E Origin Version
2020-01-07	Ver 1.1	Optimized configuration software connection

【Model List】

Model	GSM/3G/4G	Description	Input/Output Type	DC Input
RTU5023	Optional	Environmental Monitoring Alarm	AM2301 Temperature&Humidity Sensor	9-36V DC
RTU5026		Temperature Monitoring Alarm	DS18B20 Temperature Sensor	
RTU5027A		Analog Transducer Monitoring Alarm	4~20mA Analog Input	
RTU5027V		Analog Transducer Monitoring Alarm	0~5V Analog Input	
RTU5028		AC/DC Power Monitoring Alarm	12VDC Output	
RTU5028E		Network Fault Monitoring Alarm	Relay output	
RTU5029SA		Phase Loss Monitoring Alarm	3 Phase Input,12VDC Output	
RTU5029SB		Phase Loss Monitoring Alarm	Single Phase Input ,12VDC Output	

1. Brief introduction

The Network Fault Monitoring RTU RTU5028E is an innovation product, it is special designed for remote monitoring Ethernet devices communication status and power supply status. It can detect the Ethernet device fault caused by power supply or network communication, if network communication fault ,it can remote or automatically restart the switch or Router or device to solve almost all of the problems,no need maintenance engineer to process,save time and maintenance costs. Support monitoring up to 7 network devices simultaneously;
The configuration software can be connected via a LAN,User-friendly configuration; It also can be set and inquiry by SMS commands.Moreover,it also can support Modbus RTU, Modbus TCP and MQTT protocol to connect to cloud Platform,automatic switching to cellular network when the wired network failed, then monitor the current status in real time through GSM/3G/4G network.



RTU502E power failure and network fault monitoring alarm, suitable for classrooms, public places, hospitals, stations, Food warehouses, offices, factories, libraries, laboratories, etc., and any place that requires and supports power and network monitoring.

2.Safety Directions

Safe Startup

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

Interference

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

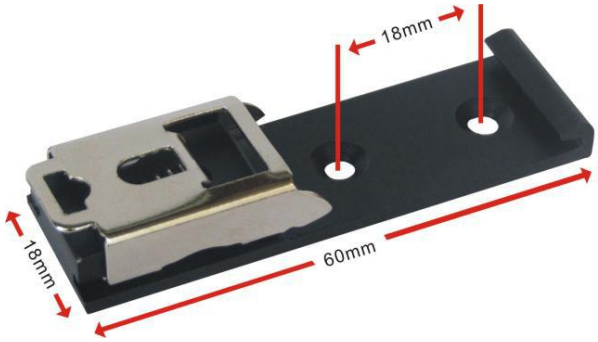
3. Standard Packing List

Monitor Alarm unit X 1; Antenna X 1; AC/DC adaptor(DC12V 1.5A) X1 ;User manual X 1.

Note: The package does not include any SIM card.

Optional:

DIN 35mm Standard DIN rail fixed Bracket



4. Mainly Features

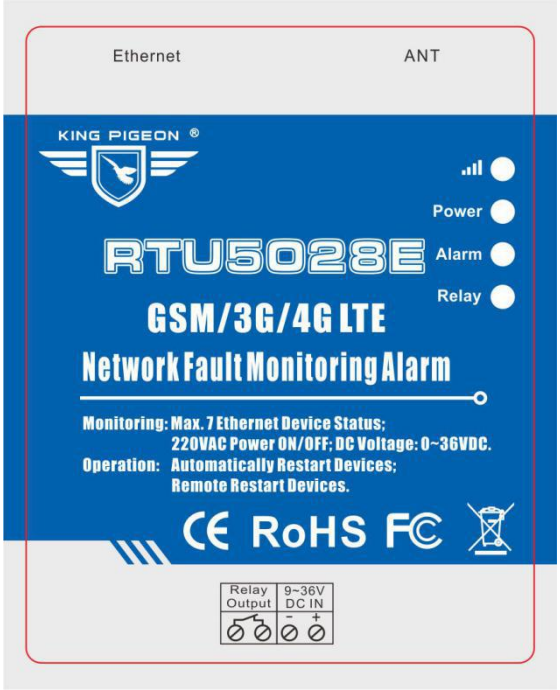
- GSM/GPRS/3G/4G/Ethernet network communication,automatic connect to cellular network when wired network failed;
- Network failure + power failure + network cable monitoring, remote monitoring the status of network device in many aspects;
- Support monitoring up to 7 network devices simultaneously;
- Inbuilt MCU monitoring power supply input voltage value, measure range is 0~36V, no need additional sensor to save cost;
- Up to 10 authorized phone numbers, can program to receive specified alarm message;
- Can set timer report and every x hours automatically send its status/value to the authorized number;
- Support remotely read 100 historic data via SMS or configuration software ;
- Rechargeable backup battery inside can last 6 hours;
- Modular structure design, replace a module can upgrade the network from 2G to 3G/4G or 3G to 4G;
- Compatible wall installation and DIN35mm industrial rail installation;
- Support Modbus RTU,Modbus TCP and MQTT protocol, can be connected to cloud platform.

5. Technical specifications

Item	Reference Scope
DC Power supply	Standard adapter:12VDC，Range 9~36VDC
Power consumption	Standby：12V/100mA；Working Max：12V/380mA
GSM/3G/4G	GSM frequency: 850/900/1800/1900MHz 3G/4G: Optional: WCDMA/TDD-LTE/FDD-LTE
Communication methods	SMS phone, GPRS/3G/4G wireless cellular network, Ethernet wired network
SIM interface	Support 3V or 1.5V SIM Card
External antenna	SMA Antenna interface, 50 Ohm, Gain: 3dB

Protocol	Modbus RTU,Modbus TCP,MQTT
Ethernet Port	1 RJ45,Support DHCP dynamic obtain IP or static fixed IP
Relay output	1 NC relay,Rated: 7A/125VAC,5A/250VAC,20A/14VDC
Backup Battery	3.7V/900mAh,can last 6 hours
Working temperature	-10℃~60℃
Working Humidity	Relative humidity 95% (condensation free)

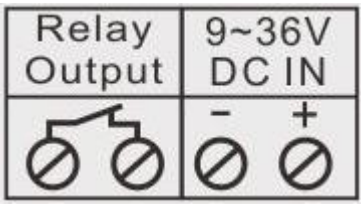
6. Physical Layout



6.1 LED Indicator Instruction

LED Indicator Instruction	
	**Cellular network indicator:** 2G module,flashing quickly (flash per 0.8s) means searching for cellular or no network; flashing slowly(flash per 2s) means registered successfully. 3G/4G module,when searching for cellular or no network ,the light will 2 seconds flick once; registered successfully will be on 2s,off 1s... Flicks quickly means data transmission.
	Power indicator: LED ON when connect power;otherwise,it is OFF
	Alarm Indicator:Alarm will ON ;Normally is OFF;
	Relay Indicator: Relay open will ON;Relay close will OFF.

6.2 Interface Instruction



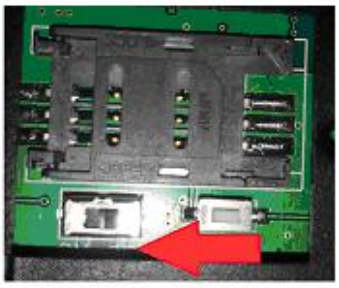
RTU5028E interface

Interface instruction		
9~36V DC IN	**+**	DC9~36V positive input
	–	DC9~36V negative input
Relay Output	Normally closed relay output, no polarity distinction	
Ethernet	1 RJ45	
ANT	GSM/3G/4G antenna interface	

6.3 Backside Switch & Card Slot

At the backside of the panel, please use the tool to remove the screw, and you can see switch button, RESET button(reset button has the function: 1.upgrade,press it and switch on the device will enter upgrade state;2.reset,press it then hold on 3 seconds in the state of power on will reset) and card slot as below:

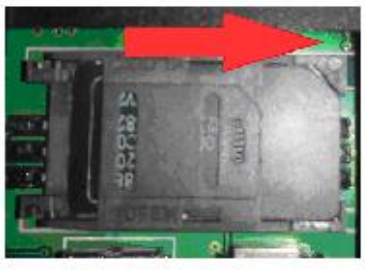
Switch OFF ***Switch ON***



Move left the card slot

Lift up the card slot

Install sim card
(chip faces down)



Move right to
fix card slot

7. Reset the unit

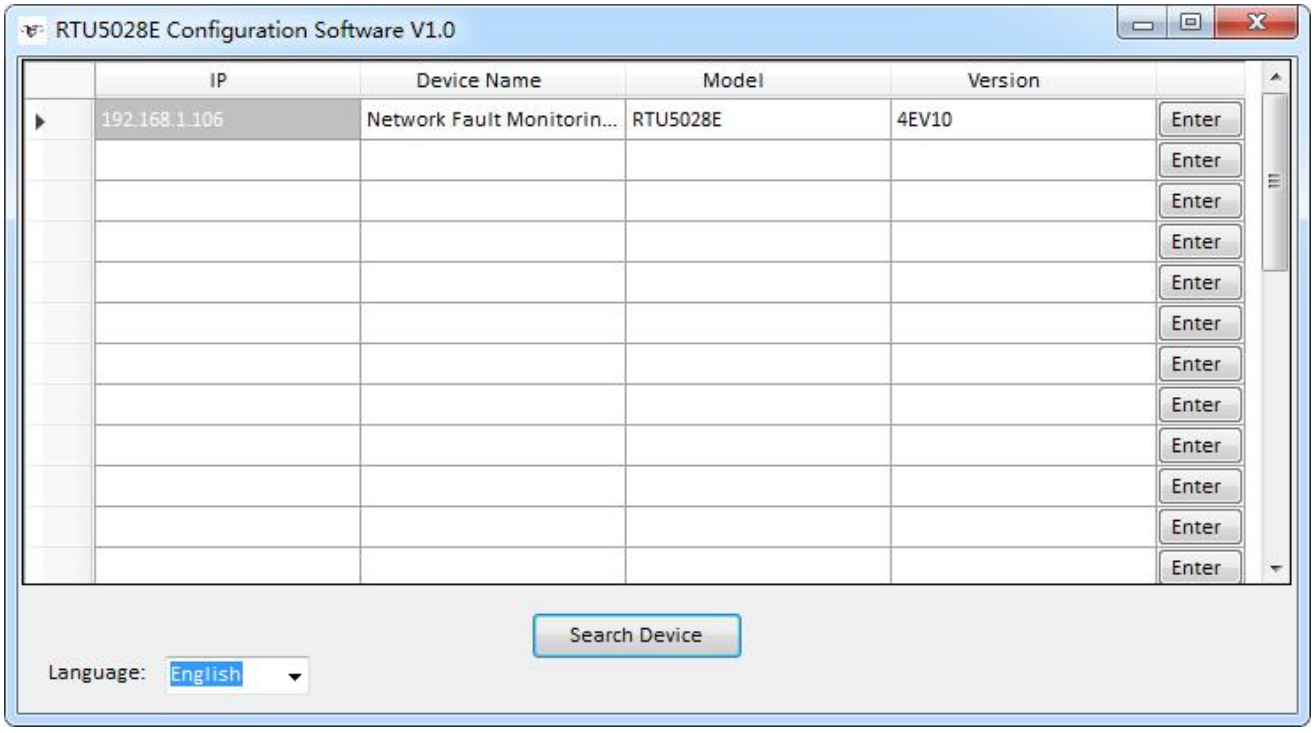
(1) Switch on the device,press and hold RESET button for 3 seconds,after power indicator flash 3 times ,the device will reset successfully.

(2) Sending SMS command "password+RESET ",receive returns SMS "Reset successfully",means device is reset successfully.

8. Configuration software

When connecting to the configuration software for the first time, connect the device to a router that enabled the DHCP automatic assign IP function.if the network connected to the device cannot automatically assign an IP,the device will use the following default network parameters after waiting for 1 minute:IP address 192.168 .1.111, subnet mask 255.255.255.0, gateway address 192.168.1.1.At this time, please set the computer network parameters to other IP addresses in the same network segment.if the device is directly connected to the computer, please use a crossover network cable,and configure the computer network parameters before connecting the device.

8.1. Search Device



Search Device: Click to search for all terminal devices in the LAN,Note that the computer and the device must be on the same network segment in the same LAN, and the subnet mask must be 255.255.255.0).

Enter: Click to enter the configuration interface of the corresponding device;

Language: Can switch configuration software language to Chinese or English.

Notice: *If the device cannot be searched, but the fixed IP of the device has been set, you can directly enter the fixed IP of the device in the IP input field.*

8.2. Selection Description

Device Password: Default is 1234

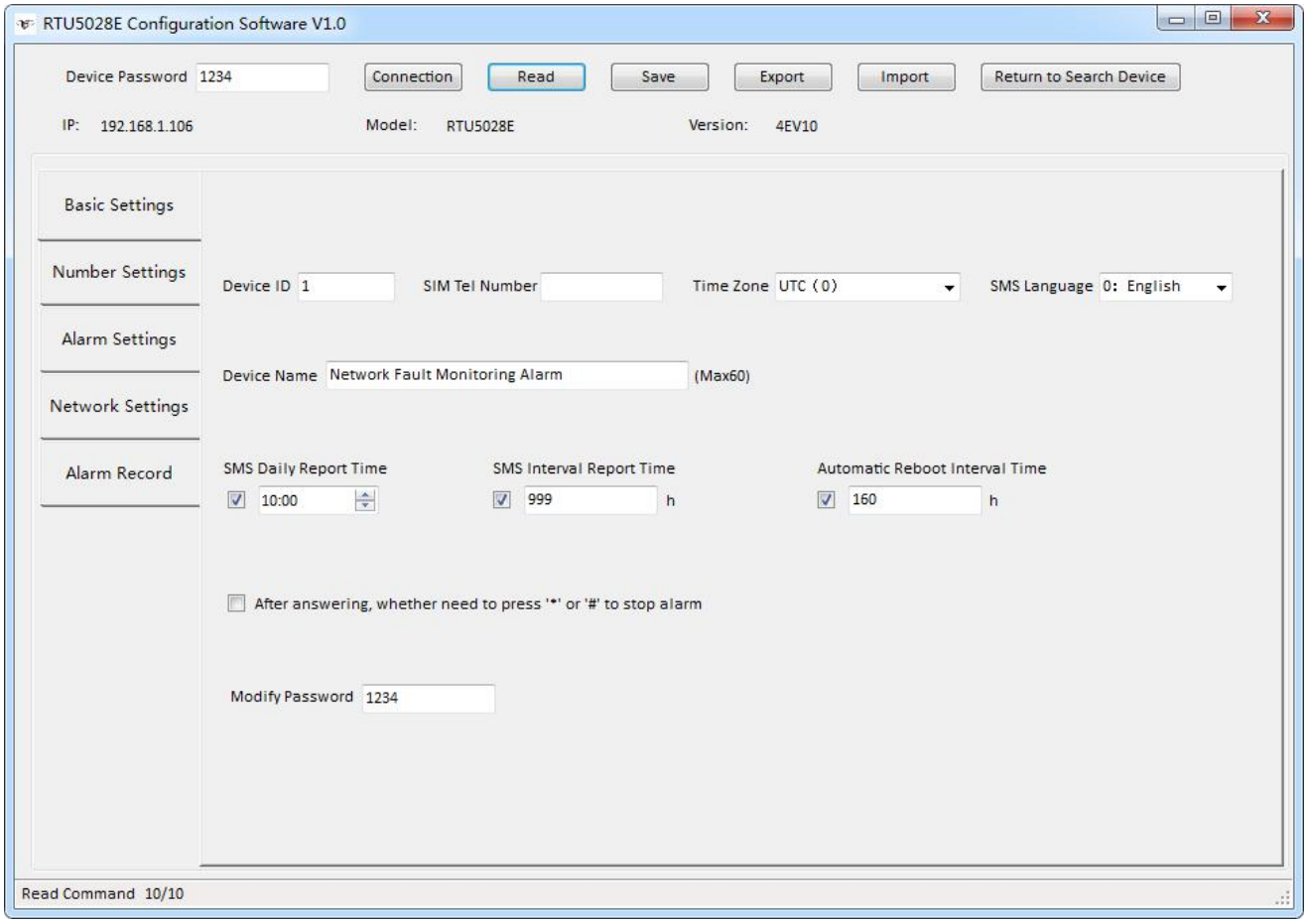
Connection : Only the password is correct can connect successfully, and can be configured after connection.

Read: Read the current configuration of the device and read it before editing the parameters.

Save: Write edited parameters to the device.

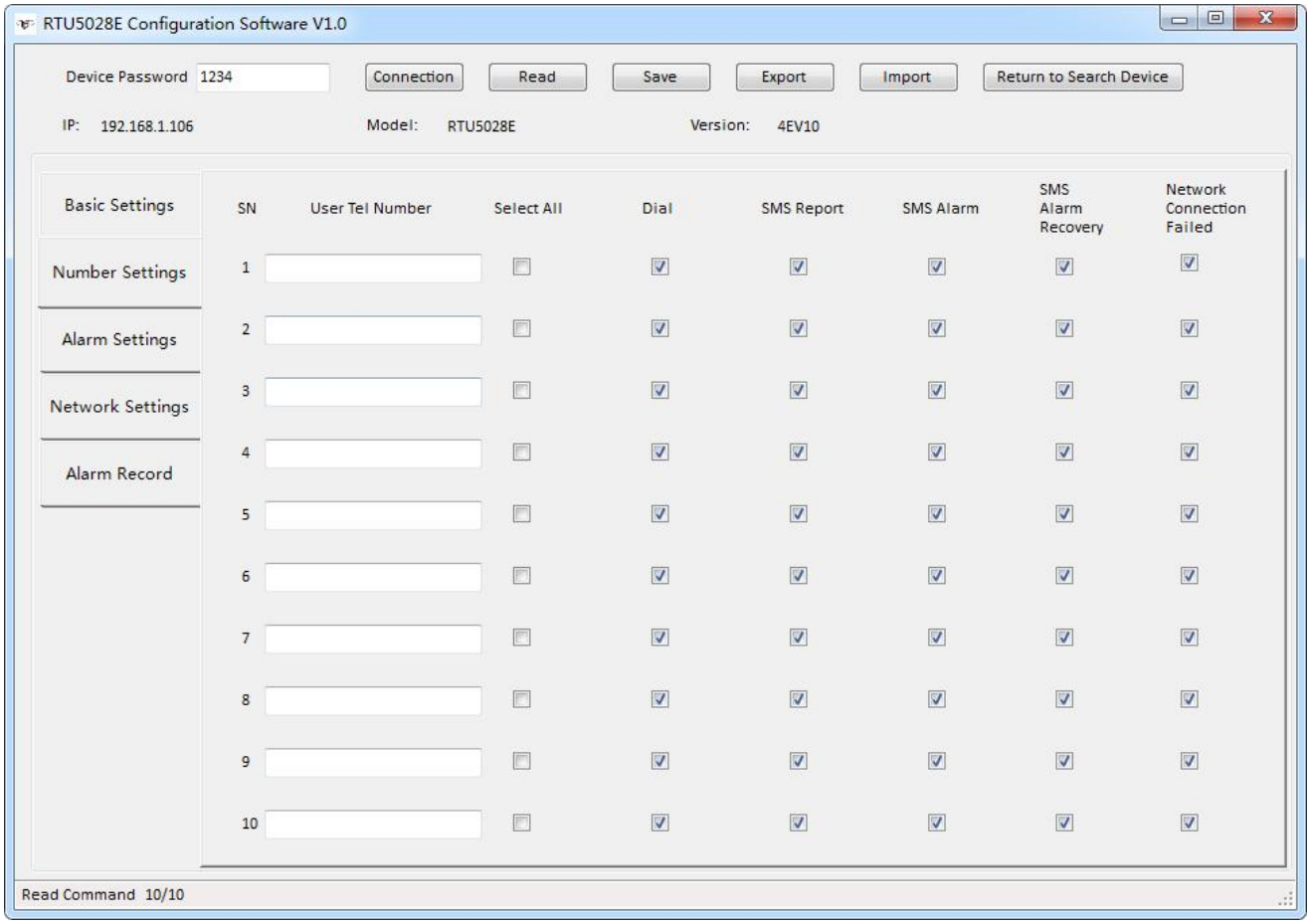
Export Profile: Export the edited parameters to the computer file for next time configuration.
Load Profile: Load previously exported configuration file parameters into current software.
Back to search device: After returning to the search device page, you can click again to enter other device configuration interface.

8.3. Basic Settings



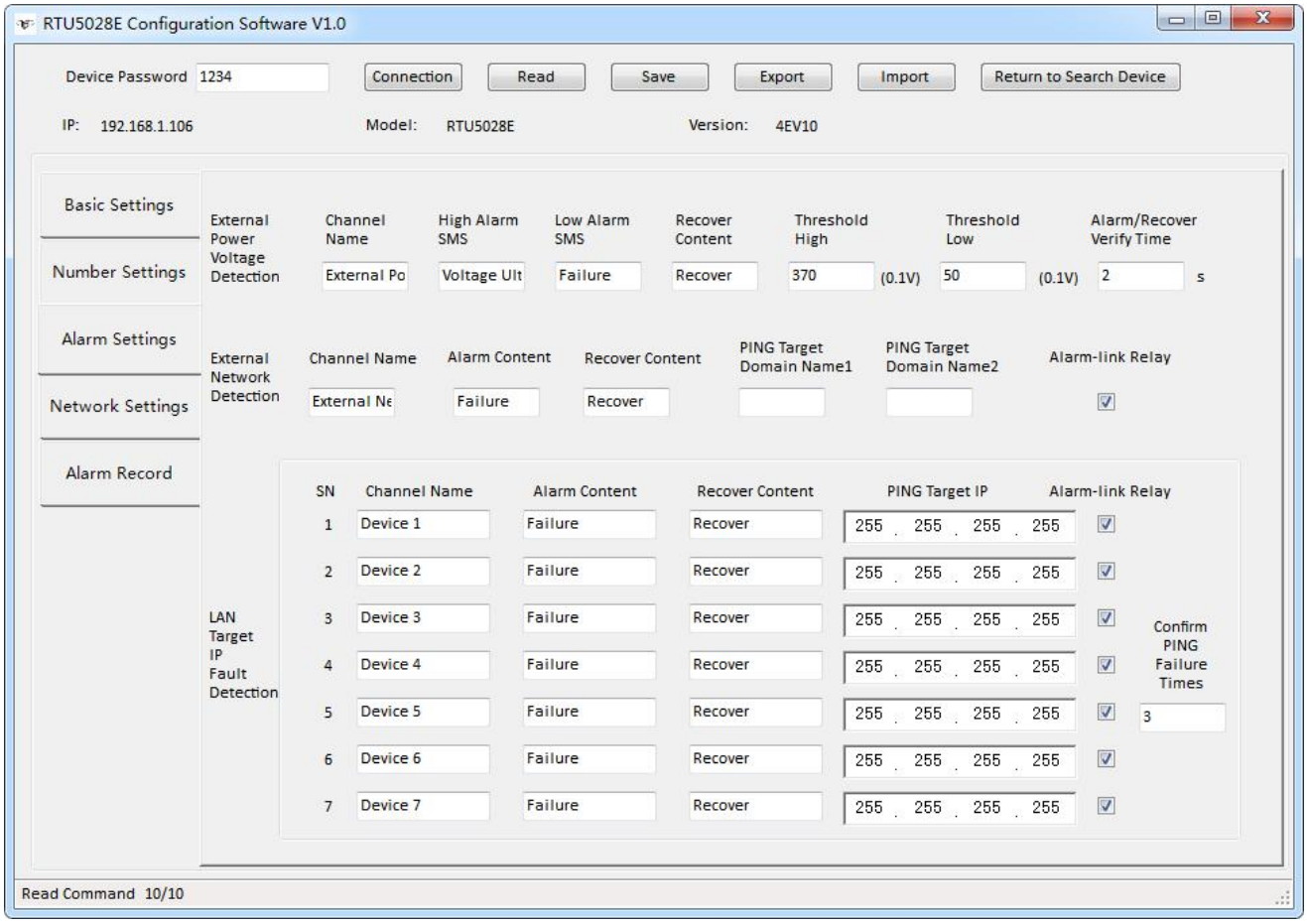
Device ID: Non-necessary. This is mainly for monitoring center to identify the RTU; If communicate via Modbus protocol, device ID only can be 1~255,default is 1.
Device Number: The SIM card number installed in the device ,max 21 digits, for automatic device calibration. If connected failure when turned on, the device will send a SMS to itself to obtain the SIM card carrier time.
Time Zone: When the network is connected successfully, it will automatically receive the GMT. The device will automatically convert to the correct time according to the selected time zone. Please select the correct time zone according to the current location of the device; If there is no corresponding time zone, you can directly enter the difference minute time between current time and the GMT, such as the difference between Beijing time and Greenwich Mean Time is +480 minutes, then enter "+480".
SMS Language: Chinese or English is optional.
Device description: This is the description of the device,(Max: 60 characters).
SMS daily report time: Daily timer report the current device status.
Interval SMS Report Time: Stands for interval how many hours to report the current status again,can be 0~999,default is 999,stands for disable report.
Automatic Restart Interval Time: Stands for interval how many hours to restart the device,can be 0~65535,default is 650 hours.
Press * or # to stop Dial:: Untick ,it will not continue to dial if someone answer;Tick it,Alarm dialling will dial continue if not press the button,until press the * or # button.
Modify Password: Can modify the device Password(4 digits, Default is: 1234).

8.4. Number Settings



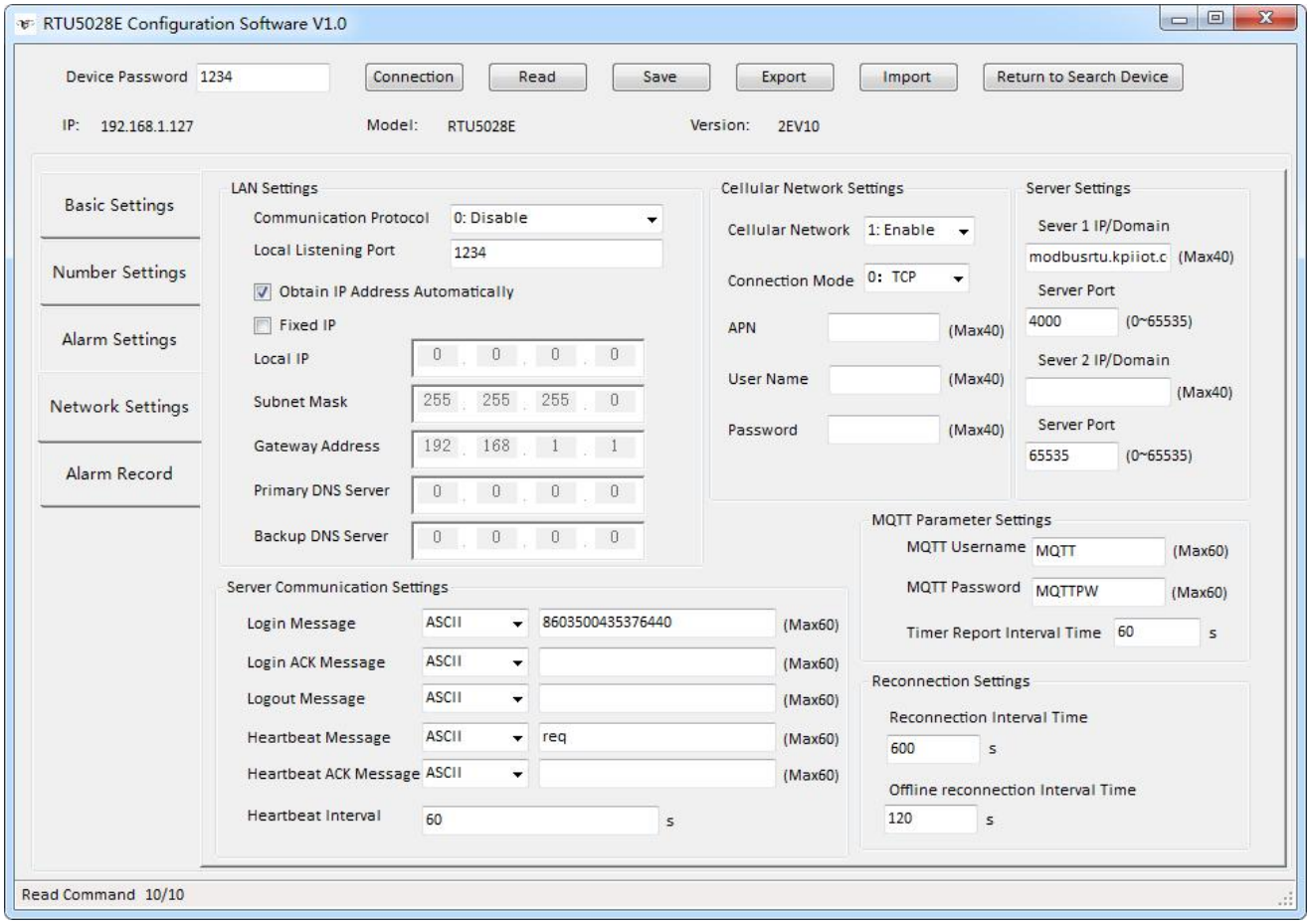
Alarm Tel Number: Set the alarm receiver numbers, please includes the country code, e.g: in China is 0086, input 008613570810254, if cannot received the SMS or dial, then try to set as +8613570810254, but cannot be 8613570810254. Also, some GSM/3G Operators not required input country code, so please remove country code, e.g. in China is 0086, and China Mobile not required country code, so can set as 13570810254.
Dial: Tick it stands for enable while alarm, Dial to the authorized numbers.
Timer-Report: Tick it stands for enable to SMS report to this authorized numbers.
Alarm: Tick it stands for enable while alarm, send SMS to the authorized numbers
Alarm Recovery: Tick it stands for enable the SMS notification when the alarm recovery to normal value.
GPRS Failure: Tick it stands for enable the SMS notification when the GPRS connection failure.

8.5. Alarm Settings



Channel Name: To setup the channel name.
Threshold High,Threshold Low,Recover content,Alarm content: The SMS content Can be defined.
High Alarm SMS,Low Alarm SMS: Once current voltage value higher/lower than threshold value will send this SMS content to authorized numbers.
Alarm Verify Time: Stands for delay 2 seconds to confirm alarm or recovery, to prevent false alarm,(0~65535s), default 2 seconds.
PING Target Domain Name 1,2: Can set 2 external network domain name or IP,Only if unable PING 2 external network IP will alarm.
PING Target IP: Can set 7 IP address,When set to 0.0.0.0 or 255.255.255.255,stands for the target IP is empty and the PING test will not be performed.
Confirm PING failure times settings: Can be set 1~255,default is 3,stands for confirm alarm if PING failure 3 times.
Alarm-link Relay: Tick it stands for when the network failure, the alarm link the output relay open for 2 seconds, if the network not recover,it will open for 2 seconds again, if still not recover 5 minutes later,will the last time open for 2 seconds.

8.6. Network Settings



LAN Settings:

Obtain IP Address Automatically: Tick it,the device will automatically obtain an IP address through DHCP.

Fixed IP: Tick it,Local connection settings can be defined.

Local IP, Subnet Mask,Gateway Address,Primary DNS,Back DNS Server: Local connection related settings, please set it according to your local area network.

Communication Protocol: "Disable", "Modbus RTU ", "Modbus TCP" or "MQTT protocol" optional.

Local Listening Port: The TCP client in the LAN can connect to the device through this port, and the device data can be acquired through Modbus TCP protocol.

Cellular Network Settings:

Cellular Network: "0:Disable",”1:Enable”(Cellular network will be enabled when LAN disconnect.)

Connection Mode: TCP,UDP

APN,user name,user password: GPRS parameters of the SIM card,if the customer SIM card can not access the internet,consult the local network operator and fill in the correct parameters.

Server Settings:

Server 1 IP/Domain,Server Port: Primary server address,supports 3 protocol:

1) Modbus RTU Protocol: connect to King Pigeon cloud platform. Domain: modbusrtu.kpiiot.com, Port: 4000.

2) Modbus TCP Protocol: connect to King Pigeon cloud platform. Domain: mbtcp.my-m2m.com, Port: 6655.

3) MQTT Protocol: connect to King Pigeon cloud platform. Domain: mqtt.my-m2m.com, Port: 1883.

Server 2 IP/Domain,Server Port: When server 1 disconnect, will connect to server 2 automatically.

Server Communication Settings:

Login Message: When the device is MQTT protocol, this item is MQTT client identifier (ClientID) and Topic

Name, this item used for device ID, provided by cloud. Contact King Pigeon sales if need to connect to King Pigeon cloud server.

Login ACK Message: Once set,the server need send message to the device,or device will be offline.

Logout Message: Once server send to device, device will be offline.

Heartbeat Message: Heartbeat content to avoid network offline.

Heartbeat ACK Message: Once set, device need response within 6 seconds after device send heartbeat message, otherwise it will continue send login message according to "Reconnection Times" ,still not response will offline once time, then try to reconnect, according to "Server Offline 3 Times, Device Reconnection Time".

Heartbeat Interval: Network keep online heartbeat interval time,can be set 0-9999,default is 60,0 stands for will not send.

MQTT Parameter Settings:

MQTT username,password:if need to connect to King Pigeon cloud platform,username default is MQTT, password default is MQTTPW; if connect to your own server, set the parameters according to the protocol.

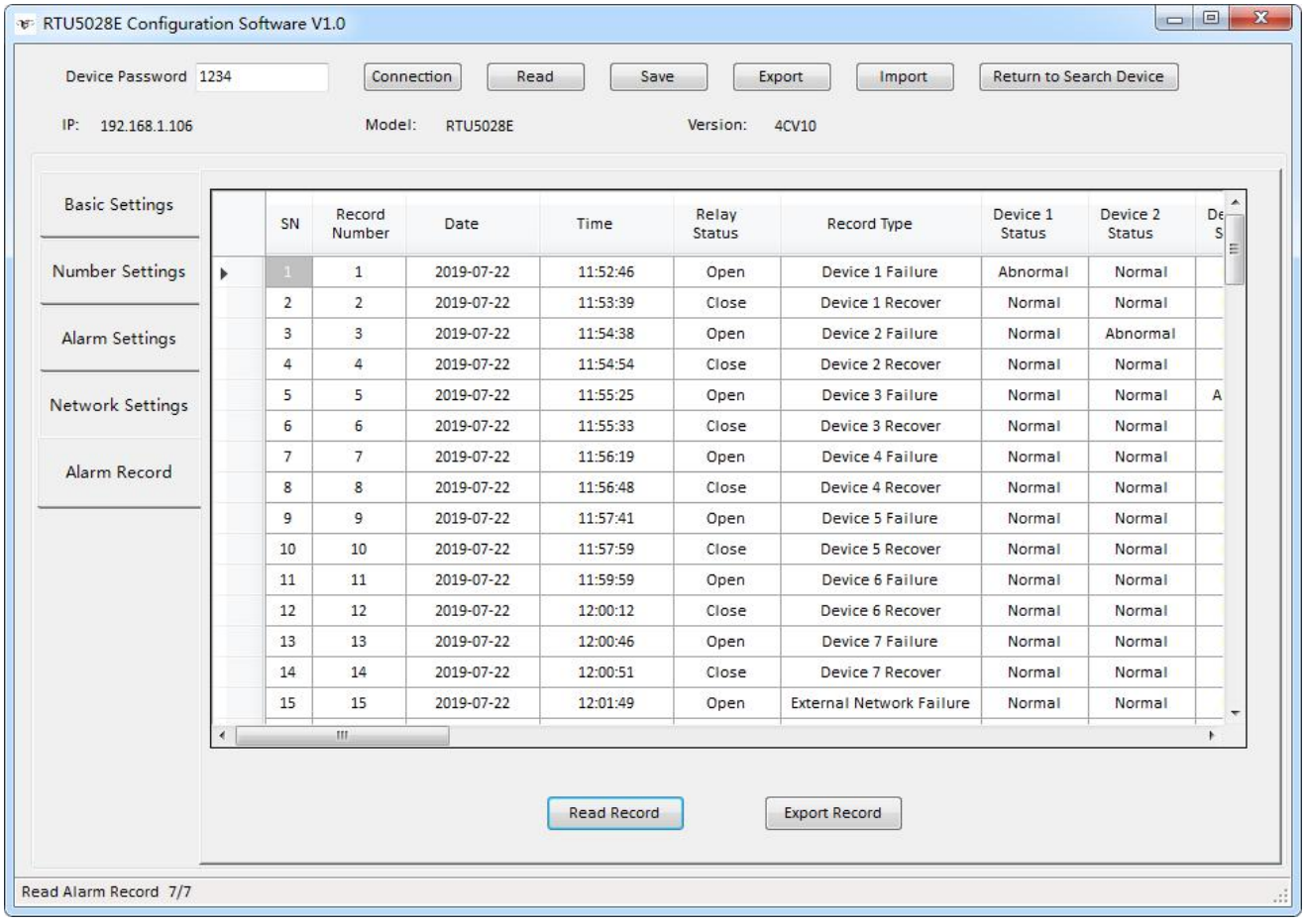
Timer Report Interval Time: Stands for interval how many seconds send data to server,can be set 0-65535s, default is 60s.

Reconnection Settings:

Reconnection Interval Time: Stands for setup the GPRS reconnection interval time after the GPRS connection failure.Range:0~65535s; Default:60.

Offline reconnection Interval Time: Stands for actively offline and reconnect to the server interval time after server did not send message to device .

8.7. Alarm Record



SN	Record Number	Date	Time	Relay Status	Record Type	Device 1 Status	Device 2 Status
1	1	2019-07-22	11:52:46	Open	Device 1 Failure	Abnormal	Normal
2	2	2019-07-22	11:53:39	Close	Device 1 Recover	Normal	Normal
3	3	2019-07-22	11:54:38	Open	Device 2 Failure	Normal	Abnormal
4	4	2019-07-22	11:54:54	Close	Device 2 Recover	Normal	Normal
5	5	2019-07-22	11:55:25	Open	Device 3 Failure	Normal	Normal
6	6	2019-07-22	11:55:33	Close	Device 3 Recover	Normal	Normal
7	7	2019-07-22	11:56:19	Open	Device 4 Failure	Normal	Normal
8	8	2019-07-22	11:56:48	Close	Device 4 Recover	Normal	Normal
9	9	2019-07-22	11:57:41	Open	Device 5 Failure	Normal	Normal
10	10	2019-07-22	11:57:59	Close	Device 5 Recover	Normal	Normal
11	11	2019-07-22	11:59:59	Open	Device 6 Failure	Normal	Normal
12	12	2019-07-22	12:00:12	Close	Device 6 Recover	Normal	Normal
13	13	2019-07-22	12:00:46	Open	Device 7 Failure	Normal	Normal
14	14	2019-07-22	12:00:51	Close	Device 7 Recover	Normal	Normal
15	15	2019-07-22	12:01:49	Open	External Network Failure	Normal	Normal

Record Number: Mark by record order,range:1~65535.

Date: Current date, year, month and day

Time: Current hour minute second

Relay Status: Current relay status close or open

Record Type: Alarm or recovery type

Device 1-7 status,Internet,External power: Normal or abnormal.

Power Voltage: External power voltage value.

Read: Read historical records.

Export Record: Export current display historical records to CSV format file

9. Settings&Operation

Notice:

1. *The default Password is **1234**.*
2. *The unit cannot support PIN Code Protected SIM Card.*
3. *You can program the unit with SMS commands using your phone.*
4. *Remember that commands must be **CAPITAL LETTERS**. It is PWD not pwd, CAP not Cap etc. Don't add spaces or any other character.*
5. *The PWD in the commands is means the password, when you use it, please in stand of it by the digital number; the capital letters **PWD** is the command letter, use PWD directly.*
6. *In some GSM/3G operators they use different SMS parameter; the units can't return the SMS confirmation in some gsm operators, but it can performance the functions correctly. Also, you can try to add the country code before the number, see the below settings:*

   For example:

   E.g.: the country code is **0086**, or **+86**.

   The user cell phone number is **13600000000** and has been assigned as a SMS Alert number, the sim card number in the panel is **13512345678**.

   When you setup the number as the authorized number, please setup as 008613600000000 or +86136000000000. Not 13600000000.

7. *If the password is correct but the command is incorrect, the RTU5029S will return:* **SMS Format Error, Please check Caps Lock in Command!** *So please check the Command, or add the country code before the telephone number or check the input is in ENGLISH INPUT METHOD and CAPS LOCK. If password incorrect then will not any response SMS.*
8. *Once the GSM/3G Unit received the SMS Command, will return SMS to confirmation, if no SMS return, please check your command or resend again.*
9. *The SMS commands that you will certainly use in the GSM units are the following:*

SMS Commands For Program and Operation the RTU5028E

1) Setup the RTU5028E SIM Card Number(Max 21 digits)

This number is used for automatically adjust the time from GSM Operator.

Command	Return SMS	Example

PWD+TEL+x+# x stand for the unit phone number,max 22 digits	Set success!	1234TEL008613570810254# Stands for the unit phone number is 13570810254

2) Setup RTU5028E system Time

Command		Return SMS	Example
Setup	PWD+D20xx-yy-zz+Thh:mm or PWD+Dxxyyzz+Thhmm Notice: xx(year),yy(month),zz(day),hh(hour), mm(minute)	xx(Y)xx(M)xx(D)xx(H)xx(M)	1234D2018-01-02T03:04 1234D180102T0304 Stands for 03:04, January 2,2018
Inquiry	PWD+D	xx(Y)xx(M)xx(D)xx(H)xx(M)）	

3)Modify Password(4 digits, Default is: 1234)

Command	Return SMS	Example
PWD+P+new password	[new password],This is the New Password, please remember it carefully.	1234P4321 stands for change password from 1234 to 4321

4)Time Zone

It will automatically get Greenwich Mean Time, the device will automatically convert to the correct time according to the set time zone.

Command		Return SMS	Example
Setup	PWD+TZ+s+x s stands for “+”or”-”, x stands for min;	Set success!	The minute difference between the time zone of the equipment and Greenwich Mean Time,1 time zone=60 min. Eg:Device located at Beijing,east 8 zone,+ 480 minutes difference from GMT,SMS command: 1234TZ+480

5) Setup Authorized User number (Total 10 authorized number, each number max 22 digits.)

Command		Return SMS
Setup	PWD+A+x+T+y (x= 01~10,must be 2 digits,stands for series number) (y stands for phone number,max 22 digits,supports add country code,e.g. +86 or 0086) e.g.: 1234A03T008613570810254 to setup 008613570810254 as the 3rd number.	1: --- 2: --- 3: 13570810254 4: ---
Inquiry	PWD+A	Return All numbers
Remove	PWD+A+x	

6) Setup Alarm Parameter 1

Command		Return SMS
Setup	PWD+AINR+x+L+y+H+z+# y stands for low threshold value;z stands for high threshold value,if y=z,will not alarm.voltage value should be setup at 10 multiples of actual value.	Voltage: Low: y,High: z.

	1234AINRL50H250# To setup voltage low threshold as 5V,high threshold as 25V.	
Inquiry	PWD+AIN	

7) Setup Alarm Parameter 2

Command		Return SMS
Setup Device Name	PWD+DN+x+T+y X=0~9,0 stands device,1~7 stands for network device,8 stands for internet,9 stands for external power, y stands for channel name,max 60 characters. 1234DN1Trouter To setup network device 1 channel name as "router"	Channel Name:y
Inquiry	PWD+DN+x	
Setup Alarm Verify Time	PWD+AINQ+y y=0~65535 seconds,default 2 seconds,0 stands for alarm immediately.	Alarm verify time: y Seconds
Inquiry	PWD+AINQ	
Setup Alarm Content	PWD+AINA+x+T+y x=1~10, 1~7 stands for network device1~7,8 stands for internet, 9 stands for external power voltage low alarm,10 stands for high alarm.y stands for alarm content,max 40 characters. Eg:1234AINA8Tfault to set internet fault alarm	Alarm Content : y
Inquiry	PWD+AINA+x	
Setup Recover Content	PWD+AINN+x+T+y x=1~9; 1~7 stands for network device 1~7,8 stands for internet,9 stands for external power, y stands for recovery alarm content,max 40 characters. Eg:1234AINN9Tfault to set internet recover alarm	Recover Content: y
Inquiry	PWD+AINN+x	

8) Setup Daily Report Time(Default is 10:00AM)

The content is same with return SMS of command "PWD+EE".

Command		Return SMS
Setup	PWD+DRT+hh:mm hh stands for hour;mm stands for minute,must be 2 digits	Daily SMS Report at:hh:mm
Inquiry	PWD+DRT	
Delete	PWD+DRTDEL	

9) Setup Interval Report Time

The content is same with return SMS of command "PWD+EE".

Command		Return SMS
Setup	PWD+DT+x (xxx=001-999hours, must be 3digits,default 999,stands for disable	Report status every xxx hours

	report)	
Inquiry	PWD+DT	

10) Inquiry Current Status

Command		Return SMS
Inquiry	PWD+EE Note:Only set to Ping device IP and internet IP,the return SMS will contain network device 1~7 and internet status	Current time; Device Name; External Power Normal/Failure/Voltage Higher: Current value; Device 1:Normal/Fault Device 2:Normal/Fault Device 3:Normal/Fault Device 4:Normal/Fault Device 5:Normal/Fault Device 6:Normal/Fault Device 7:Normal/Fault Internet:Normal/Fault Network cable:Normal/Fault GSM Signal Value: IMEI: Model: Version:

11) Setup continue to call next authorize number,even answering if without press a key(avoid alarm calling is transferred to voicemail leads to user missed alarm reminding)

Command		Return SMS
Not continue dialing (Default)	PWD+COFF# Once anyone answered, the device will not call next authorized number,if nobody answer will circular dialing for 3 times .	Set successfully
Continue dialing	PWD+CON# After answering, the device will continue to call next authorize number without pressing the key on the phone,press * or # will stop calling next authorize number	Set successfully

12) Setup Relay output

Command		Return SMS
Close Relay	PWD+CC	relay close
Open Relay	PWD+DD	relay open

13) Setup PING Device IP

Command	Return SMS	Example
PWD+PINGIP+x=y (x=1~7,stands network device 1~7,y stands for IP address)	IPx:y	1234PINGIP1=192.168.1.188 to set device 1 IP address as 192.168.1.188.
Inquiry	PWD+PINGIP+x	
Delete	PWD+PINGIPDEL+x	

14) Setup PING Internet IP or Domain

Command	Return SMS	Example
PWD+PINGPUB+x=y (x=1,2, y stands for Internet IP address,both 2 internet IP can not PING successfully to confirm network fault)	IP/domain x:y	1234PINGPUB1=www.baidu.com to set internet 1 domain www.baidu.com.
Inquiry	PWD+PINGPUB	
Delete	PWD+PINGPUBDEL+x	

15)Setup Local Connection

(Default is DHCP automatically obtain. If you need to set it as fixed IP, please set according to your LAN.)

Command		Return SMS
Setup Local IP and Listening Port	PWD+ETHIP+x+*+y (x=local IP, y=listening port,Used to listen for TCP client connections,acquire data via Modbus TCP after connection) 1234ETHIP192.168.1.101*1234 to set local IP as 192.168.1.101, port:1234	Local IP: x Port:y
Inquiry	PWD+ETHIP (If delete local IP address, the device will automatically obtain IP address through DHCP)	
Delete	PWD+ETHIPDEL	
Setup gateway address	PWD+GATE=x (x=gateway address) 1234GATE=192.168.1.1 To set gateway as 192.168.1.1	Set successfully
Setup Subnet mask	PWD+MASK=x (x=subnet mask) 1234MASK=255.255.255.0 To set subnet mask as 255.255.255.0	
Setup Primary DNS Server	PWD+DNS1=x (x=DNS server) 1234DNS1=114.114.114.114 To set primary DNS server as 114.114.114.114	
Setup Backup DNS Server	PWD+DNS2=x (x=DNS server) 1234DNS2=8.8.8.8 To set primary DNS server as 8.8.8.8	

16) Setup Cellular GPRS/3G/4G Parameter

Command		Return SMS
Setup	PWD+AP+x+#+y+#+z x stands for APN,y means user name,z means password	APN：x User name：y Password：z
Inquiry	PWD+AP	
Delete	PWD+APDEL	

17)Setup GPRS ON/OFF

(When enable, the cellular network will be switched when the network port disconnected; when disable, the cellular network will not be switched at any time.)

Command		Return SMS
Setup ON	PWD+GPRSON	GPRS/3G/4G :ON
Setup OFF	PWD+GPRSOFF	GPRS/3G/4G :OFF

18) Setup GPRS Online

Command		Return SMS
Setup	PWD+GPRSonline	GPRS Online

19) Setup the Reconnect time after disconnection

Command		Return SMS
Setup	PWD+RECONT+x x60~65535 seconds,default is 600 seconds,stands for no data is sent within 600 seconds after the device is connected to the server, and the server will be automatically disconnected and reconnected to the server.	Reconnect time:x seconds
Inquiry	PWD+RECONT	

20) Setup the Login Message

Command		Return SMS
Setup	PWD+RTP+x x stands for Login Message content,max 50 characters	Registration package:x
Inquiry	PWD+RTE	

21) Setup the Heartbeat

Command		Return SMS
Setup	PWD++HET+x x stands for Heartbeat content,max 20 characters,default is ACK	Heartbeat package content: x seconds
Inquiry	PWD+HEE	

22) Setup the Heartbeat Interval

Command		Return SMS
Setup	PWD++HT+x x=0~9999 seconds,default is 60 seconds,0 stands for not upload	Heart Pack Period:x seconds
Inquiry	PWD+HTE	

23) Setup Device ID

Command		Return SMS
Setup	PWD+ID+x x=0~65535,default is 1. If the device choose Modbus protocol,x=1~255	ID:x
Inquiry	PWD+IDE	

24) Setup Communication Protocol

Command		Return SMS
Setup	PWD+ETHON+x x=0,1,2,3;0 stands for disable,1 stands for Modbus RTU protocol,2 stands for Modbus TCP protocol,3 stands for MQTT protocol.	Network port:x
Tips: If choose Modbus RTU protocol, the Server will revert to the setting that domain name is modbusrtu.kpiiot.com, port is 4000; If choose Modbus TCP protocol, the Server will revert to the setting that domain name is mbtcp.my-m2m.com,port is 6655; If choose MQTT protocol, the Server will revert to the setting that domain name is mqtt.my-m2m.com,port is 1883; If want to connect own server,pls setup GPRS communication protocol first,then setup server parameter.		

25) Setup Server Parameter

Command		Return SMS
Setup	Server1:PWD+IP+x+*+y Server2:PWD+IPB+x+*+y (x= server IP or domain;y=port,range:0~65535) 1234IPmodbusrtu.kpiiot.com*4000 to setup server1 address As modbusrtu.kpiiot.com:4000	IP:x Port:y
Inquiry	Server1:PWD+IP Server2:PWD+IPB	
Delete	Server1:PWD+IPDEL Server2:PWD+IPBDEL	

26) Inquiry Historic Record (Only can inquiry the latest 100 alarm events.)

Command	Return SMS	Example
PWD+HIS+x (x=1-100,stands for inquiry qty)	[IMEI Code as Device ID] Record event 1: Record event 2: Record event 3: (Each SMS will include one IMEI Code as Device ID.)	PWDHIS8 to read the latest 8 historic record.

27) Setup Language

Reset the unit after changing the language. For the reset operation, please refer to "13. Remotely Resett")

Command		Return SMS
Setup	PWD+EN	English

English		

28) Remotely Reboot

Command		Return SMS	Example
Setup Periodicity Reboot	PWD++REBOOT+x (xxxx=0-9999 hours, default is 160 hours)	Reboot: x Hours	1234REBOOT3 The device will be reboot automatically for every 3 hours.
Inquiry	PWD+RE		
Reboot Manually	PWD+RT	No return SMS	

29) Remotely Reset

Command		Return SMS
Remotely Reset	PWD+RESET	Reset successfully

10. Data Communication Protocol

The RTU5028E supports GPRS/3G/4G data transfer to cloud server,supports Modbus RTU,Modbus TCP and MQTT protocol.

10.1. Modbus Protocol

Modbus Address Instruction				
Register Address	**Definition**	**Data Type**	**Function Code**	**Data Description**
0	Relay output	bool	1,5	0=open,1=close
0	Device 1 status	bool	2	0=fault,1=normal
1	Device 2 status	bool	2	0=fault,1=normal
2	Device 3 status	bool	2	0=fault,1=normal
3	Device 4 status	bool	2	0=fault,1=normal
4	Device 5 status	bool	2	0=fault,1=normal
5	Device 6 status	bool	2	0=fault,1=normal
6	Device 7 status	bool	2	0=fault,1=normal
7	Internet status	bool	2	0=fault,1=normal
8	External Power status	bool	2	0=fault,1=normal
9	Network cable status	bool	2	0=fault,1=normal
0	External Power voltage	16bit unsigned int	3,4	Actual=Register Value/10

10.2. MQTT Protocol

When the device connects to King Pigeon cloud platform with MQTT, the user could use it immediately, don't need to care about the MQTT protocol. If you need to connect to your own server, the following is the protocol for you.

10.2.1: MQTT Published Data Format

Only after seting PING device IP and internet IP,then uploaded data of device 1~7 and internet data will be displayed accordingly; Since the default PING IP is empty, there may be unconnected data points when connecting King Pigeon cloud platform,after setting PING IP , the data point can be connected.

Device publish topic:device serial number(The data filled in the “Login Message” parameter on the

configuration software.)

```
{
    "sensorDatas":
    [
        {                                   //Comment,Not included in the data
            "addTime":"2019-01-02 12:34:56",  //Timestamp
            "switcher":"1",                 //Switch type data, 0 is open, 1 is close
            "flag":"DO1"                    //DO identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI1"                    //Network device 1 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI2"                    //Network device 2 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI3"                    //Network device 3 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI4"                    //Network device 4 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI5"                    //Network device 5 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI6"                    //Network device 6 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI7"                    //Network device 7 identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
```

```
            "flag":"DI8"                    // Internet identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI9"                    //External Power    identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "switcher":"1",                 //Switch type data, 0 is fault, 1 is normal
            "flag":"DI10"                   //Network cable identification
        },
        {
            "addTime":"2019-01-02 12:34:56",
            "value":"12.3",                 //Numerical type data
            "flag":"AI1"                    //Voltage identification
        },
    ]
}
```

10.2.2: Data Format of Control DO Published by Server

Device will subscribe topic towards server, before the server can publish message to device for control the DO.

Device subscribe topic:device serial number/+

```
{
    "sensorDatas":
    [
        {
            "sensorsId": 211267,            //server sensor identification
            "switcher":0,                   //switch type data, 0 is open, 1 is close
            "flag":"DO1"                    //DO identification
        }
    ],
            "down":"down"                   //server downlink
}
```

11.Warranty

1) This system is warranted to be free of defects in material and workmanship for one year.
2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions. In no event shall the manufacturer be liable for any alarm system altered by purchasers.

The End!

Any questions please feel free to contact us .

Http://www.4G-RTU.com