ER4

4G LTE Relay

User Manual

version1.0

ER4 4G LTE Relay

Thank you for purchasing the ER4

ER4 4G LTE Relay work with SIM card, compatible with 2G/4G network, can be remotely open your electricity gate or door by free calling. It can also be used to control other electricity equipment. Two lines control, each line max 16A 3500W loading.

Work with digital temperature sensor, ER4 can report temperature by SMS when temperature crossing the setting range, can be work as smart thermostat by connecting heater power or heater signal onto ER4

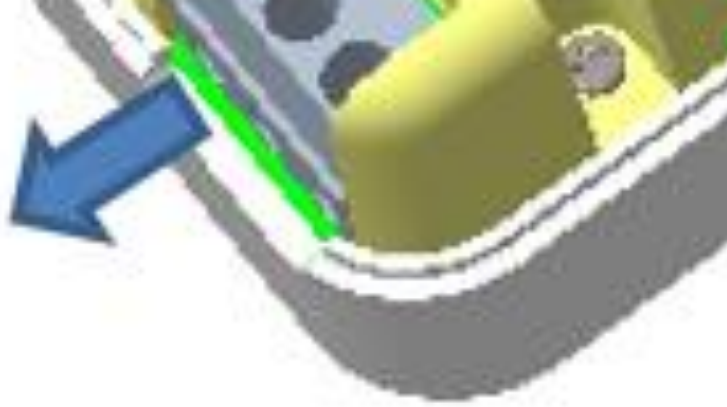
One wired sensor support, it will send SMS alarm when wired sensor trigger. NO/NC type wired water leak sensor, PIR motion detector or door sensor support.

All services and functions need to be supported by the 4G/GSM network and a SIM card.

This brochure suits for **ER4** model.

Details of the functioning and advanced operation of this device are described

in this instruction manual.



Line 2
NO
COM
NC

Ch

For your safety

- Before using this product, make sure that the mobile phones can be used well in the area, otherwise, do not put this product into operation.
- The power consumption of the appliances connected with the product cannot exceed 3500W and the current cannot exceed 16A.
- The product doesn’t guarantee safe power source disconnection, only functional switching of power is performed.
- The product must be mounted on wall at 2 meters height avoid human touch or install inside a suitable enclosure for safety protection.
- The product contains no serviceable parts, or internal adjustments. No attempt must be made to repair this product. Faulty units must be returned to supplier for repair. Improper use, disassembling or product modification causes warranty loss.
- This product must be installed by a qualified person. All electrical wiring must be carried out in accordance with the appropriate regulations for the place of installation.
- Before attempting any electrical connection work, please ensure all power sources have been cut off.
- This product is a wireless signal transmission device. Keep it away from electronic equipment likely to interfere with the wireless signals, in order to avoid signals interference.

- Keep the product and its accessories out of the children reach.

Exception clause

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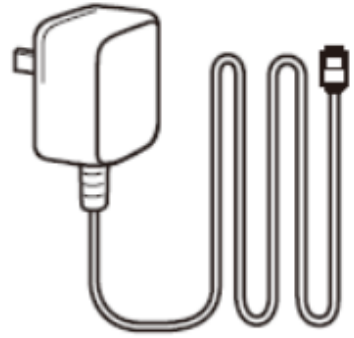
Chapter 1 Product instruction

1.1 Package contents

4G Relay （1 pcs）

Temperature sensor （1 pcs）



Power adaptor （1 pcs）

NC

-

1.2 Device instructions

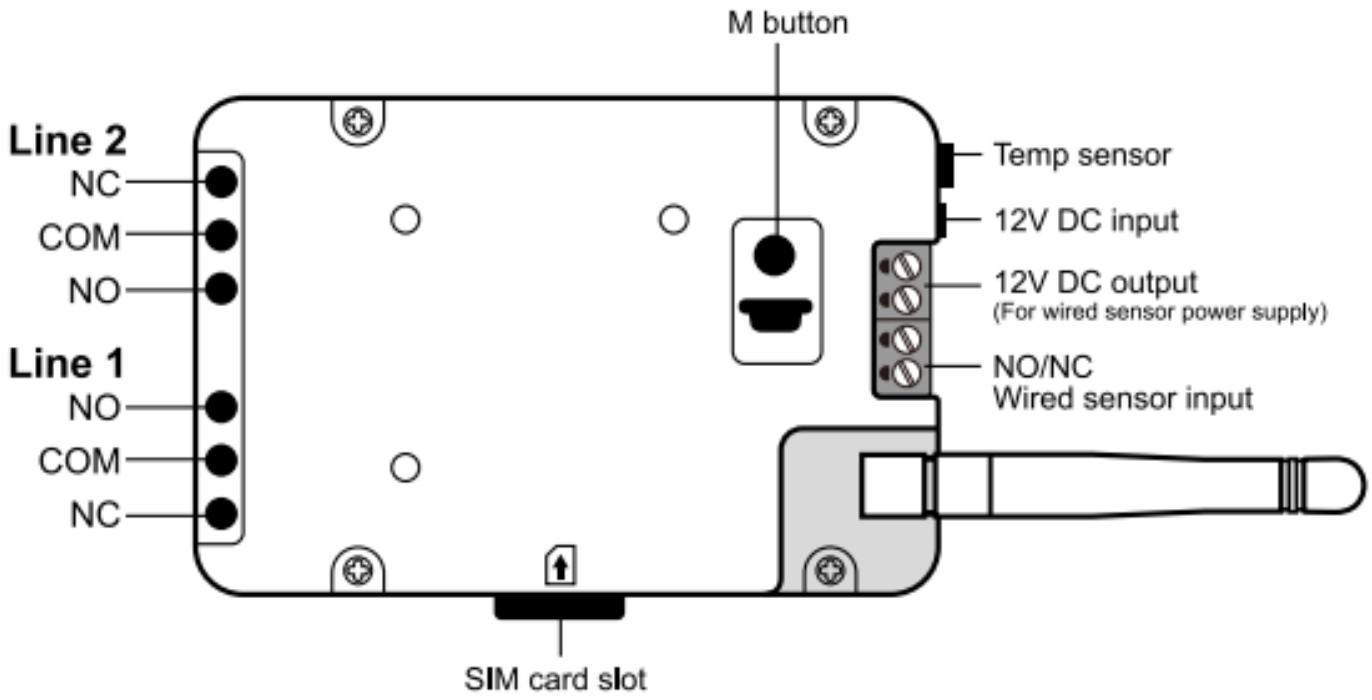
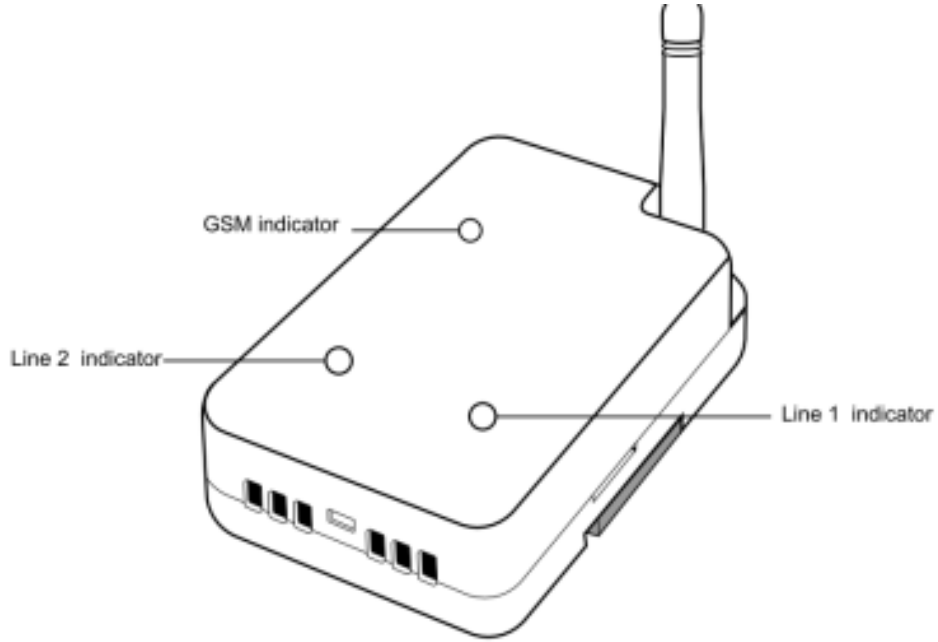


Figure 1: ER4 instructions

1.3 Light indicator

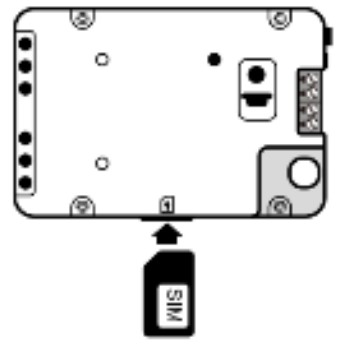


Indicator	Action	Status
Network indicator	Breath flash	Register GSM network and in standby mode.

(Blue)	Slow flash (1 time/ second)	Search GSM network
	Flash Fast (2 times/second)	■ Do not install SIM card. ■ Lost network connection. ■ Processing SMS command
Line1/2 Status light	Constant ON	Power ON status (COM and NO PIN connected)
	Constant OFF	Power OFF status (COM and NC PIN connected)

Chapter 2 Installation

2.1 Installing the SIM card



- Put the SIM card inside card holder, ensuring that the beveled corner is inside and the golden contact area facing down.

- Firmly push the SIM card until hearing a lock sound.

Note:

1. Purchase a SIM card from 4G/GSM mobile network service provider and install it on the device. This SIM card number is referred as ER4 number on this brochure.

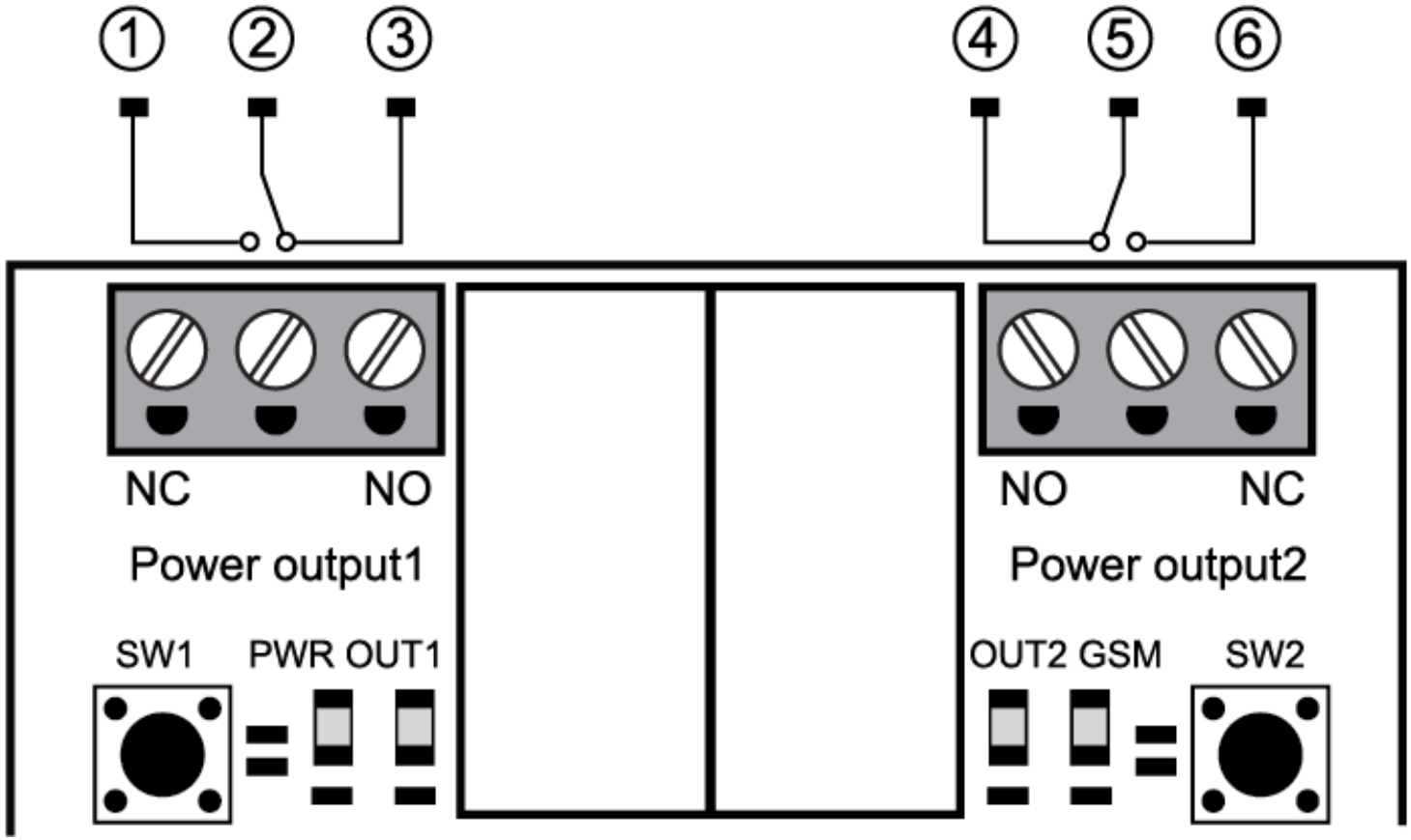
2. The user needs to activate the Caller ID Presentation function of the SIM card, and deactivate the PIN code of the SIM. Contact with mobile network service provider for support.

2.2 Control signal wiring

- The device can support two lines signal control, each line has three terminals. The middle terminal COM is public terminal, when power ON, it will make COM terminal connect with NO terminal, when power OFF, it will make COM terminal connect with NC terminal.

Warning: IF wired 220V power onto COM terminal, when set device power

ON, terminal NO will have power output; when set device power OFF, terminal NC will have power output.



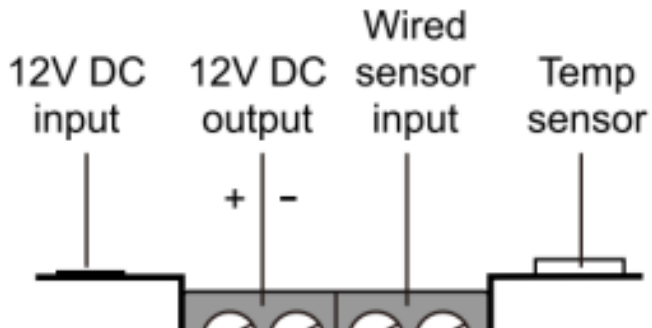
Both lines in NO mode (Com and NO terminal connected)

- Line 1: When set line 1 power ON, it will connect terminal ② (COM) and terminal ③(NO). When set line 1 power OFF, it will connect terminal ② (COM) and terminal ① (NC).
- Line 2: When set line 2 power ON, it will connect terminal ⑤ (COM) and terminal ④(NO). When set line 1 power OFF, it will connect terminal ⑤ (COM) and terminal ⑥ (NC).

Note:

The maximum current rating of outputs – 16A for resistive loads. Do not overload.

2.3 GSM Power inputs wiring



- **Device power:** 12V DC input. Power adaptor included in the package
- **Temperature sensor input:** audio jack connector, the temperature sensor included in the product package.
- **Wired sensor input:** two terminal input for wired sensor. Support NO/NC mode wired sensor.
- **12V DC output:** two terminal 12V DC output. It can use for wired sensor power supply.

2.4 Power on

Power on:

1. Upon completion of wiring and installation, plug power adaptor to 220V AC power sources.

2. You can verify operation by observing the LED indicators:

- When power on, the network LED will flash to search network, after mobile network has registered, it will beep and network LED breath flash.

Your ER4 is now ready for use.
The default status of two lines output is power OFF (NC).

Note:

1. If the network indicator always flashes fast, implying the SIM card is not working normally, all functions of the device are invalid.
2. Check mobile network signal of the using place. The mobile network's signal strength may affect the device performance.

Chapter 3 Start to use

3.1 Register Master number

All settings are program by sending SMS to device SIM card number, the SMS command format is: #code#content#.

When ER4 is being used for the first time, or it has been reset to factory settings, need to register Master number for this device.

Method: The user sends following SMS to:

Feature	Command
Register Master number:	#00#

3.2 Add another user number

Max 204 users and 1 Master can control the device, included 4 level-1 users and 200 level-2 users. Level-1 user number can receive SMS alarm and calling control the gate opener. Level-2 user only can be calling control gate opener.

There are two methods to register users.
Method 1: Master send SMS to add user's number.
Method 2: Master send SMS to make device work on register user number status, new user calling the device number, device will store incoming number as level-2 User number and allow these number calling control device.

Master sends following SMS command to add user number:

Feature	Command
Add Level-1 user numbers (Max 4 numbers)	#06#number1#number2#number3#
Add Level-2 user numbers (Max 10 numbers in one SMS)	#60#number1#number2#.....#number10#
Check user number list	#06#
User number learning mode - ON (Auto stop after 60 minutes)	#06#1#
User number learning mode - ON (Always in learning mode)	#06#2#

Feature	Command
User number leaning mode – OFF	#06#0#
Delete user number (Max 10 numbers in one SMS)	#15#number1#....#number10#
Delete all user number	#15#
Allow any number calling control – ON	#31#1#
Allow any number calling control – OFF (Default)	#31#0#

Note: phone number length is max sixteen digits.

Max 4 Level-1 users and 200 Level-2 users are allowed. When Master send SMS #06#1# to make device learning user number status, it will last 60 minutes from last user number registered. When more than 60 minutes do not user call in to register, device will auto exist number learning mode. When Master sends #06#2# to make device learning user number, it will always in learning mode, need to send #06#0# to stop learning function.

3.3 Calling to open door

Both line 1 and line 2 can be control by calling to open door. It will turn ON for three seconds, then turn OFF. If only need to control one line or need longer or shorter power on time, it can send SMS to change the settings.

For door open button which request turn OFF power to open, it can install the wired onto COM and NC terminal, in this way, calling will turn OFF power for some seconds, then turn ON.

The commands to change Calling Control function as following table:

Feature	Command
Turn on both lines for few seconds (Default)	#10#0#time#
Turn on Line-1 for few seconds	#10#1#time#
Turn on Line-2 for few seconds	#10#2#time#
Disable both lines calling control function	#10#0#
Disable Line-1 calling control function	#10#1#

Feature	Command
Disable Line-2 calling control function	#10#2#
Check calling control settings	#10#

Default calling turn on both lines for 3 seconds. Time range can be 0-3600, it means can be turn on 0-3600 seconds. When set time 0, it will permanently turn on/off power by calling.

3.4 Turn on/off power by SMS

It can send SMS to turn ON/OFF two lines power, device will reply confirm SMS when operation success.

Master or User number send following SMS to set:

Feature	Command
Both lines power - ON	#01#
Line-1 power - ON	#01#1#
Line-2 power - ON	#01#2#
Both lines power - OFF	#02#
Line-1 power - OFF	#02#1#

Feature	Command
Line-2 power - OFF	#02#2#

The SMS reply from device will included power ON/OFF status, automatically control status. When Delay Control in running, it will display character “-D”, when Schedule Control in running, it will display character “-S”, when Thermostat Control in running, it will display character “-T”.

For example:

Line 1: OFF -S-T

Line 2: OFF -T

It means Line-1 power status is OFF, Schedule Control and Thermostat Control in running. Line-2 power status is OFF, Thermostat Control in running. Auto control will turn ON/OFF the power when it reaches next operation point.

3.5 Delay control

3.5.1 Delay turn on output

- ER4 can be set to turn on/off power after some minutes.
- Delayed control have highest priority among all auto control function, it will ignore thermostat control and schedule control while delay control in running.

Master sends following SMS message:

Feature	Command
Turn on both lines after few minutes	#11#0#1#***Minutes***#
Turn on Line-1 after few minutes	#11#1#1#***Minutes***#
Turn on Line-2 after few minutes	#11#2#1#***Minutes***#
Turn off both lines after few minutes	#11#0#2#***Minutes***#
Turn off Line-1 after few minutes	#11#1#2#***Minutes***#
Turn off Line-2 after few minutes	#11#2#2#***Minutes***#
Set both lines delay control - OFF	#11#0#

Feature	Command
Set Line-1 delay control - OFF	#11#1#
Set Line-2 delay control - OFF	#11#2#
Check delay control status	#11#

- ***Minutes*** are time parameters, its range is 1-720,

3.6 Schedule control

3.6.1 Configure schedule control parameter

- ER4 can be set to auto turn on/off at setting time point.
- When device in schedule control, it can allow send SMS or calling to temporary change power status, it will process schedule control again when reach time point.
- Schedule control has lower priority than Delay control, but higher priority than Thermostat control. While Delay control in running, it will ignore schedule control operation.

Master sends following SMS message to set schedule control parameters:

Feature	Command
Set both lines Schedule Control - ON	#20#0#***WorkDay***#***StartTime***#***EndTime***#
Set Line-1 Schedule Control - ON	#20#1#***WorkDay***#***StartTime***#***EndTime***#
Set Line-2 Schedule Control - ON	#20#2#***WorkDay***#***StartTime***#***EndTime***#
Set both lines Schedule Control – OFF (Default)	#20#0#
Set Line-1 Schedule Control - OFF	#20#1#
Set Line-2 Schedule Control - OFF	#20#2#
Check Schedule Control settings	#20#

- ***WorkDay***: one digit, the values lie in the range of “0” to “8”.

The following table contains the descriptions of each value:

Value	Corresponding day
0	Everyday
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday
7	Sunday
8	Monday to Friday
9	Weekend

- ***StartTime*** and ***EndTime***: consist of each 4 digits (hh:mm) and works on a 24 hour clock. The ***StartTime*** and ***EndTime*** should be in the same day, and the ***EndTime*** must be later than ***StartTime***.
- The socket output will switch on at the ***StartTime*** and cut off at the ***EndTime***.
- For example: #20#0#0#0800#1800# , it means make both lines in schedule control, everyday turn on power at 08:00, turn off power at 18:00.

3.7 Thermostat control

3.7.1 Set thermostat control

- Connected temperature sensor onto ER4 device. It can be auto turn on/off power according to temperature. Can be connected heater power with ER4, then it can be control heater on/off according to temperature value.
- Thermostat Control has lower priority than Delay control and Schedule Control. When device set both schedule control and thermostat control, it will process thermostat control when schedule turn on power. It do not operate thermostat control when schedule control make power turn off.
- It will allow send SMS temporary turn on/off power, it will check thermostat control again when temperature cross the setting point.

Master sends following SMS message:

Feature	Command
Set both lines Thermostat Control - ON	#24#0#Mode#***Low-temp***#***High-temp***#
Set Line-1 Thermostat Control - ON	#24#1#Mode#***Low-temp***#***High-temp***#
Set Line-2 Thermostat Control - ON	#24#2#Mode#***Low-temp***#***High-temp***#

Feature	Command
Set both lines Thermostat Control – OFF (Default)	#24#0#
Set Line-1 Thermostat Control - OFF	#24#1#
Set Line-2 Thermostat Control - OFF	#24#2#
Check Thermostat control settings	#24#

- Mode: it can be 1 or 2, 1 means Warming mode, 2 means Cooling mode.

- Temperature range is -30 to 100C.

After these settings, ER4 will turn on or off the output automatically according to the temperature range setting.

- For example: set commands: #24#0#1#10#20#, if the environmental temperature is 9 degrees (bellow the limitation of 10 degrees on the command), both lines output will be switched on to power heating apparatus; and if the environmental temperature is 21 degrees (above the limitation of 20 degrees in the command), both lines output will be switched off and the heating apparatus stops working;

3.8 Temperature alarm

A range of temperature can be pre-set onto the device. When the surroundings temperature is detected out of the pre-set temperature range, device will send SMS to master's mobile phone.

Master sends following SMS message:

Feature	Command
Set temperature limits when alarm	#22#***Lower-temp***#***Higher-temp***#
Set temperature alarm - ON	#22#1#
Set temperature alarm – OFF (default)	#22#0#

- ***Temperature*** range -30 to 100 centigrade degree.
- Default ***Lower-temp*** is 15 and ***Higher-temp*** is 25 centigrade degree.

3.9 12V DC power monitor

ER4 can be monitor input 12V DC power. It will send SMS when power voltage lower or back to setting range. When use solar battery as power supply, It can monitor battery status.

Master sends following SMS message:

Feature	Command
Check input 12V DC voltage	#13#
Set voltage alarm - ON	#13#voltage#
Set voltage alarm – OFF (default)	#13#0#

- *Voltage value should be three digits, such as 115, it means 11.5V. The range is 90-120, means 9.0V-12.0V. When voltage lower or higher than setting value, it will send SMS.*

3.10 Open door when sensor trigger

It can set device open door when wired sensor trigger. It will turn on power for some seconds, then turn off. Default this function is OFF, need to send SMS to start this function.

Master sends following SMS message:

Feature	Command
Set both lines turn on some seconds when sensor trigger	#09#0#time#

Feature	Command
Set Line-1 turn on some seconds when sensor trigger	#09#1#time#
Set Line-2 turn on some seconds when sensor trigger	#09#2#time#
Set both lines sensor control power function - OFF (Default)	#09#0#
Set Line-1 sensor control power function - OFF	#09#1#
Set Line-2 sensor control power function - OFF	#09#2#
Check sensor control power settings	#09#

- Time range can be 0-3600, it means 0-3600 seconds. When set time 0, it will permanently turn on/off power.
- ***Noted****: It will be blocked one minutes for wired sensor alarm and sensor turn on power function. Only will process new wired sensor alarm or sensor turn on power after 1 minutes.*

3.11 SMS notification

3.10.1 SMS when power lost

ER4 default send SMS when 12V DC power lost, it only detects 12V DC power, do not detect power which wired with output terminals.

Master sends following SMS message to set:

Feature	Command
SMS when power lost - ON (Default)	#05#1#
SMS when power lost - OFF	#05#0#

3.10.2 SMS when sensor alarm

When connected wired sensor trigger, it will send SMS alarm. It can send SMS change turn off SMS alarm.

Master sends following SMS message to set:

Feature	Command
SMS when sensor alarm- ON(Default)	#17#1#
SMS when sensor alarm - OFF	#17#0#

Feature	Command
Alarm when sensor Closed & Open (default)	#44#3#
Alarm only when sensor Close	#44#1#
Alarm only when sensor Open	#44#2#
Check wired sensor status	#44#

3.10.3 SMS when weak mobile network signal

When mobile network signal is weak, the device may lose network connection and stop working. The mobile network signal level is 0-31, when value lower than 10, it may not work.

Master user sends following SMS message to set:

Feature	Command
SMS when weak GSM signal - ON	#27#1#
SMS when weak GSM signal – OFF (Default)	#27#0#
Check GSM signal	#27#

3.10.2 SMS when calling control

When user calling control the power, default do not send SMS, Master number can send SMS command to turn on SMS reply.

Master sends following SMS to set:

Feature	Command
SMS when calling control – ON:	#32#1#
SMS when calling control – OFF (Default)	#32#0#

3.10.2 SMS to User number:

Default only send alarm SMS to Master and user number registered by SMS. Master can change the setting to make it only send SMS to Master.

Master sends following SMS to set:

Feature	Command
SMS to user number – ON (Default)	#12#1#
SMS to user number – OFF	#12#0#

3.12 Check status

The **Master** user sends following SMS message:

Feature	Command
Check output status	#07#

3.13 Resetting the socket

This function resets all programmed settings to their original values, including cleaning all user number, timing parameter and temperature parameter. So this function needs to be used carefully as it also erases all setting values.
If the setting status is wrong or the malfunctions can't be corrected, users can restore the socket to its original status to make it work normally.
Method 1: Press **M** button for 5 seconds.
Method 2: The **Master** user sends following SMS message:

Feature	Command
Reset to factory settings	#08#***1234***#

A long "Beep" tone (if enabled) will be heard and it means resetting the socket successfully.

Chapter 5 SMS command list

Category	Functions	Command
Phone number settings	Register Master number	#00#
	Register Leve-1 User number	#06#number#
	Register Leve-2 User number	#60#Number1#....#number10#
	Check user number	#06#
	Set learning mode 60 minutes	#06#1#
	Set always in learning mode	#06#2#

	User number learning mode - OFF	#06#0#
	Deleted user number	#15#number#
	Deleted all user number	#15#
	Allow any number calling control – ON	#31#1#
	Allow any number calling control – OFF (Default)	#31#0#
Calling open door	Calling to turn on both lines power for some seconds	#10#0#time#
	Calling to turn on Line-1 power for some seconds	#10#1#time#
	Calling to turn on Line-2 power for some seconds	#10#2#time#
	Set both lines calling control - OFF	#10#0#
	Set Line-1 calling control - OFF	#10#1#
	Set Line-2 calling control - OFF	#10#2#
	Check calling control settings	#10#
SMS control	Both lines power - ON	#01#

power	Line-1 power - ON	#01#1#
	Line-2 power - ON	#01#2#
	Both lines power - OFF	#02#
	Line-1 power - OFF	#02#1#
	Line-2 power - OFF	#02#2#
Delay Control	Turn on both lines after some minutes	#11#0#1#minutes#
	Turn on Line-1 after some minutes	#11#1#1#minutes#
	Turn on Line-2 after some minutes	#11#2#1#minutes#
	Turn off both lines after some minutes	#11#0#2#***Minutes***#
	Turn off Line-1 after some minutes	#11#1#2#***Minutes***#
	Turn off Line-2 after some minutes	#11#2#2#***Minutes***#
	Set both lines delay control - OFF (Default)	#11#0#
	Set Line-1 delay control - OFF	#11#1#

	Set Line-2 delay control - OFF	#11#2#
	Check delay control settings	#11#
Schedule control	Set both lines schedule control - ON	#20#0#workday#start-time#end-time#
	Set Line-1 schedule control - ON	#20#1#workday#start-time#end-time#
	Set Line-2 schedule control - ON	#20#2#workday#start-time#end-time#
	Set both lines schedule control - OFF (Default)	#20#0#
	Set Line-1 schedule control - OFF	#20#1#
	Set Line-2 schedule control - OFF	#20#2#
Thermostat control	Set both lines thermostat control - ON	#24#0#mode#Low-temp#High-temp#
	Set Line-1 thermostat control - ON	#24#1#mode#Low-temp#High-temp#
	Set Line-2 thermostat control - ON	#24#2#mode#Low-temp#High-temp#
	Set both lines thermostat control -	#24#0#

	OFF (Default)	
	Set Line-1 thermostat control - OFF	#24#1#
	Set Line-2 thermostat control - OFF	#24#2#
	Check thermostat control settings	#24#
Temperature alarm	Set temperature alarm range	#22#Low-temp#High-temp#
	Temp alarm function - ON	#22#1#
	Temp alarm function - OFF (Default)	#22#0#
12V Voltage monitor	Check input power voltage	#13#
	Set input power monitor - ON	#13#voltage#
	Set input power monitor - OFF (Default)	#13#0#
Sensor turn on power	Set both lines turn on some seconds when sensor trigger	#09#0#time#
	Set Line-1 turn on some seconds when sensor trigger	#09#1#time#
	Set Line-2 turn on some seconds when sensor trigger	#09#2#time#
	Set both lines sensor control power -	#09#0#

	OFF (Default)	
	Set Line-1 sensor control power – OFF	#09#1#
	Set Line-2 sensor control power – OFF	#09#2#
	Check sensor control power settings	#09#
SMS notification	SMS when power lost – ON (Default)	#05#1#
	SMS when power lost - OFF	#05#0#
	SMS when sensor alarm – ON (Default)	#17#1#
	SMS when sensor alarm - OFF	#17#0#
	Alarm when sensor Close or Open	#44#3#
	Alarm only when sensor Close	#44#1#
	Alarm only when sensor Open	#44#2#
	Check sensor status	#44#
	SMS when weak GSM signal – ON	#27#1#
	SMS when weak GSM signal – OFF	#27#0#

	(Default)	
	Check GSM signal	#27#
	SMS when calling control - ON	#32#1#
	SMS when calling control – OFF (Default)	#32#0#
	SMS to user number – ON (Default)	#12#1#
	SMS to user number - OFF	#12#0#
	Check device status	#07#
Reset	Reset factory settings	#08#1234#

Chapter 6 Main Technical Parameters

Power Supply	12V AC/DC 1A
Relay type	Latching relay 16A 250V AC
Connecting type	Terminal block wiring
Operating temperature	-10℃~+35℃
Store temperature	-20℃~+60℃
Relative humidity	10-90%，without condensation
SIM card interface	SIM 1.8V/3.0V socket, size Mini
Temperature sensor range	-30℃~100℃
4G LTE working band	Cat 1 LTE FDD: B1, B3, B5, B7 ,B8 ,B20 LTE TDD: B40 2G GSM support.

ER4

4G LTE Relay