

QK-G031 Temperature GSM Remote Controller Manual



Designed in UK



Features

- Runs of 12.0V mains or Liquid cell battery
- Remote temperature monitoring and control by mobile phone GSM SMS message
- 2 alarm inputs and 3 Relay outputs
- Automatic notification by SMS message when alarm input is triggered
- Remote control of 3 Relay outputs by SMS message
- Automated control of 2 Relay outputs activated by alarm inputs
- Automated control of 3 Relay outputs activated by temperature sensors and temperature ranges.
- Scheduled control of 3 Relay outputs by SMS message
- In-built clock for programming scheduled switch state
- Status request and response by SMS
- Remote manual override
- Android APP interface
- Up to 4 mobile phones can monitor and control each unit
- Easy to install and configure via SMS or Android APP (no PC required)
- Compatible with all major 2G SIM networks
- Mains power/battery drop off notification
- Mains power recovery notification when within 60 seconds or when using backup battery power.
- 12.0V liquid battery options for main power source and/or back-up power with battery charging.

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1. Setup overview

You will need:

SIM card:

- **SIM must operate on the GSM (2G) network for this version.** Check with your SIM supplier.
 - **Credit on the SIM (we recommend automatic top-ups)**
 - **The SIM is not PIN protected**
 - **The SIM is set to disable voicemail**
 - **Avoid SIM cards that deactivate automatically if the SIM is not used often.** If your G031 is likely to be unused for long periods of time, you will have to send the G031 an update request periodically to keep the SIM card active. The time limit is often three months.
- 2. Power supply cable:** long enough to reach your device in its final location.
 - 3. Check there is mobile network reception for your SIM card** in the location that your device will be installed (you can check the SIM card in a mobile phone).
 - 4. Temperature sensors (included)** which come in 1, 2 and 6 metre lengths and can be shortened or extended (we recommend a maximum of 8 metres).
 - 5. Optional liquid cell 12.0V battery:** Can be plugged into G031 for backup power.

Installation

- 1. Download and install the APP** <https://www.quark-elec.com/downloads/APPs/>
- 2. Select G031 location:** location must be indoors and not exposed to water or high humidity.
- 3. Connect the relays outputs** (if required): check relay setup for whether you want relays in normal open (NO) or normal closed (NC) position. See back page.
- 4. Connect alarm inputs** (if required) to the correct terminal: alarm inputs (INT) 1/2 will activate relay 1/2 respectively. The G031 is compatible with inputs that send signals as a switch (by closing the circuit) and alarm inputs that send a low voltage signal.
- 5. Connect temperature sensors** by inserting the connector block into the slots at the back of the G031. Good practice is to label each sensor and its corresponding relay. This will help later on.
- 6. Insert your SIM into the G031 device** (make a note of the SIM number first for reference).
- 7. Connect to power:** Check LEDs are working correctly.

- **Blue Network LED:** LED will flash blue at start up as it is connecting to a network. Once connected, the LED will flash once every 2 to 3 seconds.
- **Red System LED:** will flash at 1 second intervals once the system has finished initialization. The LED will not flash while the G031 is processing a command.

8. Hold down reset button for 10 seconds.

9. Register the main phone number that will control the device within 10 minutes of powering up the G031 by texting '88888888' from your chosen phone to G031 SIM card. If registration is successful, the module will reply with 'Your phone has been registered'. If unsuccessful, the module will reply with 'registered disabled'. If registration is unsuccessful, Hold down reset button for 10 seconds and reattempt registration within 10 minutes. The system LED will flash at one second intervals once the registration is completed. You can add up to three additional control mobile phones (check the manual for full list of text command codes).

You can send commands and receive updates by SMS text or the text generating android APP.

- **Remember; the device processes one command at a time. Each command will have a reply to confirm the command has been received and executed. You must wait for a reply message before sending another command.**

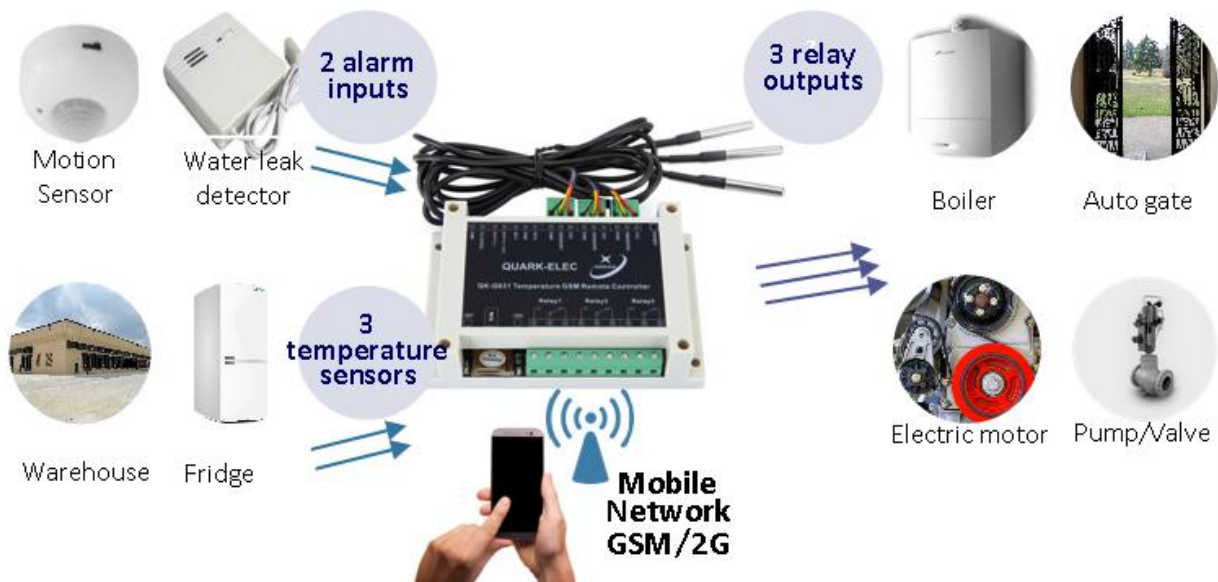
(This is an overview only. Familiarize yourself with the manual before installation.)

2. Introduction

The G031 series remote controller is a versatile device which can be attached to many electronic devices in homes, offices, plant or wherever required. It includes three independent relay switches and two digital alarm inputs. It allows operators to control/monitor remote temperatures or equipment using SMS (Short Message Service) via the GSM network. It also allows for automated temperature or alarm activated action. Up to 4 mobile phone numbers (SIM card numbers) can be registered with the remote controller. These mobile phones can belong to technicians, engineers or individuals who have a requirement to control and/or monitor corresponding devices.

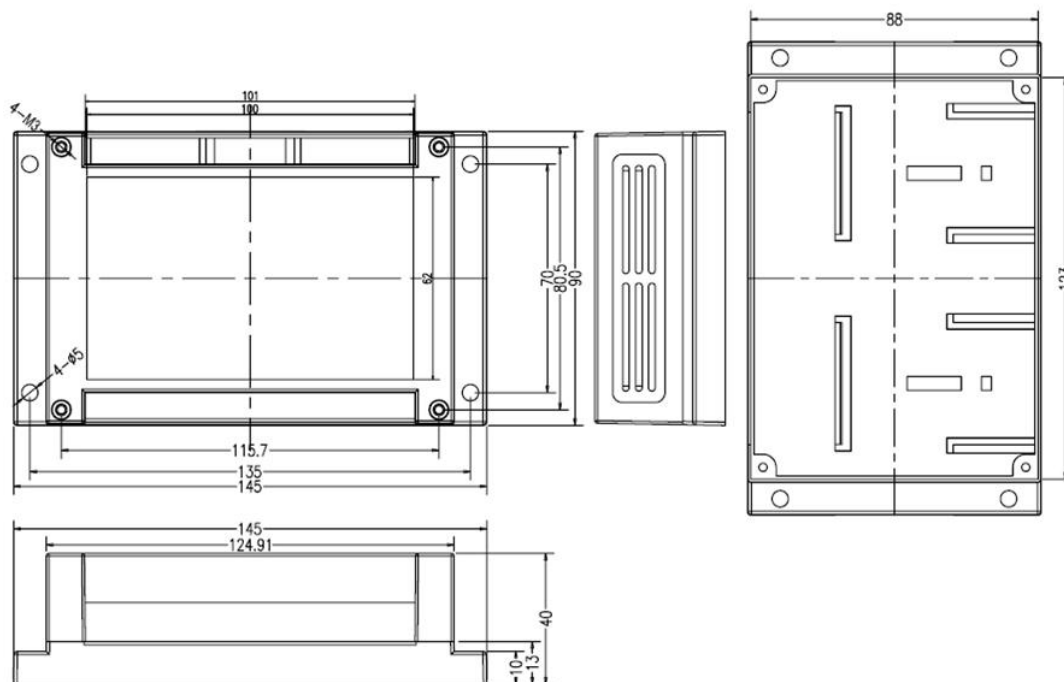
The G031 features:

- **Three relay output connections:** for connection to the equipment that is to be controlled
 - Relay 1: Manual SMS control, Automated control, Daily timer
 - Relay 2: Manual SMS control, Automated control, Daily timer
 - Relay 3: Manual SMS control
- **Three thermistor temperature sensors:** with three linked relay outputs.
- **Two digital alarm inputs connections:** for connection to various inputs to be monitored (an alarm SMS can be received when either alarm input is triggered. The alarm input can also be set to trigger automated control of the machinery connected to the Relay outputs 1 and/or 2).
- **Four control mobile phones:** one main control terminal and up to 3 additional control terminals can be registered with G031.
- **Android APP:** the device can be controlled by either SMS text message codes or the text generating APP for Android phones. This is a touch sensitive, user friendly interface.
- **Optional battery input:** to allow the device to keep running during a power break. it has the Added benefit of battery charging once the power is restored.

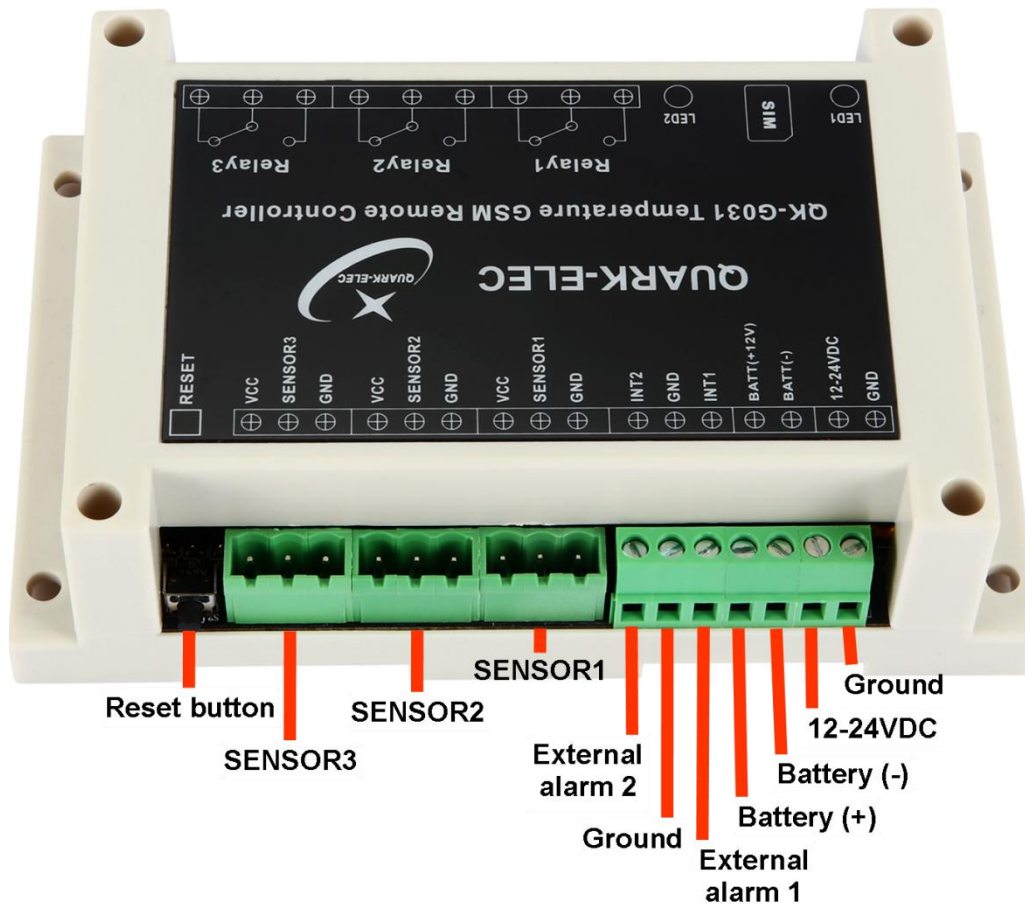


3. Enclosure

The enclosure is made of IP56 Insulation Class 2 plastic. External dimension: 145 x 90 x 41 mm.



4. Power connections



4.1. 12.0V DC power connection

The G031 module can be supplied by 12.0-24.0V DC power. Connect a 12.0V DC power supply to the power input screw terminals and switch on the power supply. The red system LED will flash at 1 second intervals once the system has finished initialization. The blue network LED indicator will initially flash quickly and, once logged onto the network, it will flash more slowly, approximately once every 3 seconds.

4.2. Battery connections

The G031 supports backup battery inputs. The battery can be an auxiliary power supply for operation during mains power failure. A 12.0V rechargeable Li-ion or Lead-acid battery can be connected to battery input terminals on the G031.

Connection to a battery can allow the G031 to operate for up to a few days (depending on the battery capacity) without mains power. The G031 will alert the operator when mains power has been lost and recovered. The battery will recharge when power is restored. When recharging the battery, the mains power input should be at least 2.0V higher than the battery's full voltage level. Therefore, the mains power supply voltage should be 14.0-24.0V.

5. Status LED'S

The device has two working LED's to notify the user of its operations.



- **Blue Network LED** – Blue LED will flash at start up as it looks for a network signal. Once a signal has been found the LED will flash much slower, every 3 seconds.
- **Red System led** – Red led will flash at 1 second intervals once the system has finished initialization. It will not flash while it is processing a command.
- Remember, the device processes one command at a time. Each command will have a reply to confirm the command has been received and executed. You must wait for a reply message before sending another command. **All SMS text commands must always be sent using CAPITAL letters. Do not add spaces or any other characters.**

6. Preparing SIM card

Please ensure:

- **The SIM must operate on the GSM (2G) network.** Most network providers provide 2G cover, check with your supplier.
- **There is credit on the SIM (we recommend automatic top-ups)**
- **The SIM is not PIN protected**
- **The SIM is set to disable voicemail**
- **Avoid SIM cards that deactivate automatically if the SIM is not used often** (usually after 3 months inactivity). If your SIM will do this and if your G031 is likely to be unused for long periods of time; send the G031 an update request periodically to keep the SIM card active.

Register the SIM card; ensure there is sufficient credit on the SIM card for programming confirmation texts to be sent from G031 module.

The PIN request option should be disabled from the SIM card before inserting it into the G031 module. To check the PIN request status of your SIM card, place the card in an unlocked mobile phone and switch the phone on. If normal calls can be made without entering a PIN number, then it is disabled. Please also make sure voicemail is disabled before inserting the SIM card into the module.

If a 'pay as you go' (PAYG) SIM card is used, it is recommended that users choose to automatically 'Top-Up' when the credit falls below a certain limit. Some PAYG SIM cards will be de-activated by the network if they are not used to make an outgoing voice call or send an SMS text message within a specific period. To prevent this, simply send the G031 a text for example '**DQSJ**' (this can be done through the APP) and G031 will reply with the local time by text message. This should be done periodically to keep the SIM card active if required by your SIM provider.

6.1. Insert SIM into the SIM card slot

1. **Write down SIM number before inserting into the G031**
2. **The SIM card should be inserted into the SIM card slot before applying the power.**
3. **Power Up** (See next chapter)

6.2. Registration of Main SIM Controller

Users can setup the authorized telephone numbers within G031. The controller will verify the incoming number if they are indexed in the registered SIM numbers, then the G031 controller will hang up and then execute the actions.

The following steps are required to configure G031 for first time use:

- Insert the SIM card into controller box
- Power up and hold reset button for 10 seconds
- Within ten minutes of resetting Text '**88888888**' by SMS to the G031 controller. If successful, the user will receive the message '**Your phone has been registered**'. This command should be received within the first **10 minutes** after powering up G031, otherwise the message '**registered Disabled**' will be received. If this happens reset.

6.3. Registering additional SIM controllers

You can add up to three additional control mobile phones. When adding additional numbers to the unit you must enter them in the correct format used by the Network service provider of the SIM that you have entered into the G022. For example, if the UK number 07123456789 needs adding; then we have three formats to try (Using the UK country code '44').

1. +447123456789
2. 00447123456789
3. 07123456789

The most commonly used, is format 1, this will work with most providers. To store your number, text **'BD1+447123456789F'** to the device. If you are able to send commands from the new number but do not receive messages back, try one of the other formats.

You can now control the device by either:

- Manually entering the codes by SMS text message
- Using the phones Android APP interface. Using the APP, simply select the action you want and the APP formulates and sends the SMS message for you.

App sent messages will be charged at your normal text rate.

7. Resetting

The G031 has two types of reset. You can:

- Factory reset the module itself.
- Reset the main SIM controller SIM number (main mobile number in control of module), whilst keeping other settings.

7.1. Factory reset G031 memory

1. Hold the reset button for 10 seconds – the red LED should stay constantly on.
2. You now have 600 seconds to send the message **'88888888'** to the SIM card in the G031
3. This will register you as the main SIM controller.

You can also reset the Main controller SIM remotely, For example when the main SIM controller number has changed or you need to reset permissions for the main controller. This code allows you to remotely remove and reset all mobile phone numbers stored in the device.

7.2. Reset main controller SIM number

1. Send **'XGZHM'** command via text to the G031 SIM.
2. send **'88888888'** within 600 seconds to the G031
3. The module will reply with **'Your phone has been registered'**.

If the G031 replies with the message **'registered disabled'** or **'Registered not allowed. Please Factory reset G031 module first'** then repeat factory reset steps.

8. Alarm function connections

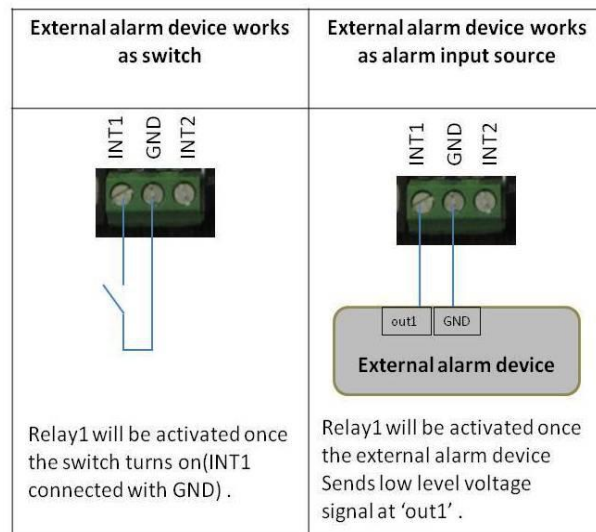
G031 has two external alarm input connectors and various inputs can be connected to them. For example, door/windows sensors, smoke alarms, carbon dioxide detectors, motion sensors, thermostats, temperature/wind detectors, and moisture detectors.

Using these sensors/detectors, G031 can be setup as a protection/alarm and response system.

Alarm input port	Corresponding relay number
External alarm 1 (INT1)	Relay 1
External alarm 2 (INT2)	Relay 2

There are two typical ways the external alarm inputs can communicate with G031. External alarm devices can be used as,

1. Switch
2. Alarm input source (low level voltage signal)



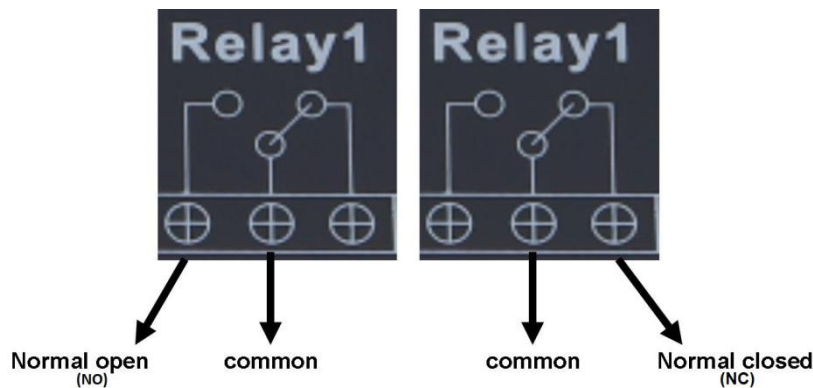
G031 external alarm inputs are active when a trigger pulse or a constant level of 0.0V is applied. If the sensor/detectors are triggered (low level signal (0.0V) to G031); G031 will send out an SMS to the registered mobile terminals. Meanwhile, the corresponding relays setup will be activated.

- To disable the external alarm input, text 'EXTGBn' (replace 'n' with the relay number).
- To enable all external alarm inputs, text 'EXTRT'.

9. Relays

The G031 has three digital output relays for connection to the equipment to be controlled. The relays can be setup in normal open and normal closed positions. Depending on the relay setup you choose will determine how the G031 operates. For example a cooling setup must be setup using Normal closed. For a heating setup it must be setup in normal open.

9.1. Relay wiring



- **Normal open position** – if common and normal open are wired then relay 1 will be off when powered up. To activate relay 1 either a message or a command must be received from the user or from input 1. This activates the relay and closes the circuit turning on the output of relay1. Use this method for heating setup
- **Normal closed position** – if common and normal closed are wired then relay 1 will be active while the G031 is powered up. This can be useful for fail safe systems where the power going off in the G031 will close relay 1 and activate the output of relay 1. Use this method for cooling setup.

- **It is important to understand that relays wired in 'normal closed' position will operate in the opposite way than expected. In this setup 'Relay OFF' in the app/SMS will power the equipment ON. This needs to be taken into account when setting up and designing the system.**

9.2. Daily timer setting

Daily timer settings are for Relays 1 and 2. They support a daily timer function to control the actions of the output. This is useful for turning the relays on and off without having to message the device.

The relays will switch to ON/OFF states according to the timer settings. These two relays also support two working modes, self-lock and latching control.

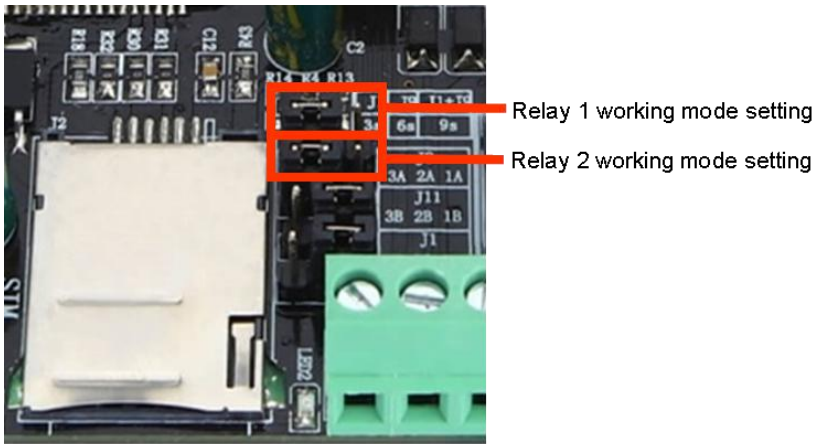
9.3. Relay working mode (relay 1 and 2)

The G031 allows for two different working modes:



- self-lock control
- latching control

Self-lock allows for the usual function of the relay where a command from the operator or the device to change is needed. The G031 is set to latching mode by default.

With latching controls, the device will return to its normal status after a period of seconds determined by the user. This is useful for output devices that don't need or want to be on for a long time after they have been turned on. For example alarm horns which might only need to be on for 12 seconds to alert the user.



To change between self-lock and latching control, the jumpers must be moved from one connection to another. Carefully lift the jumper unit up vertically from the unit. Be very careful not to damage components or the jumper pins. Ideally use tweezers to lift and lower jumpers into the correct place. There are three pins on each set of jumpers, by moving the jumper over the pins on the set will give either relay 1 or 2 different working methods. See the table below to help with changing jumpers

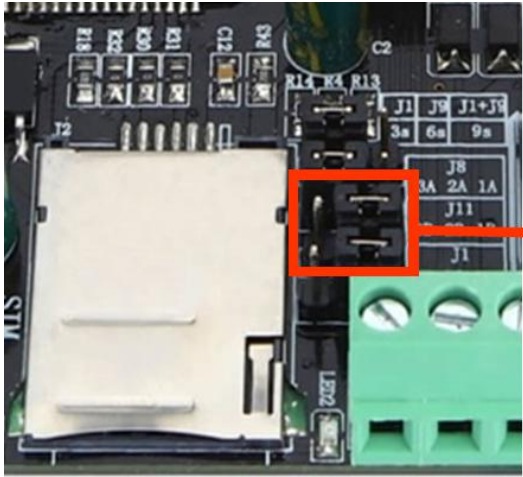
	Self-lock control – normal operation of relay on or off by command from user or device timer
	Latching control - which means relay go back to normal status after a period of action (3, 6, 9 or 12) Seconds.



When an alarm is triggered, the relay will stay locked ON until the command “EXTRT” to reset alarm is sent (even if set to latching mode).

9.4. Latching mode settings

Working in latching mode, operators can configure G031 with different action times for Relay 1 and Relay 2 by setting the delay time jumpers.



Action timer settings for Relay 1 and Relay 2. Both relays will have the same timer function if set up in latching mode.

	action timer set as:12 seconds
	action timer set as:9 seconds
	action timer set as:6 seconds
	action timer set as: 3 seconds

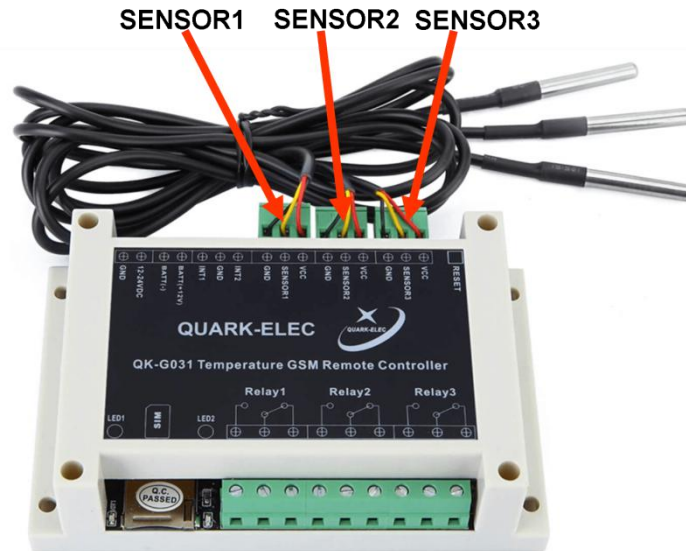
The G031 provides a one off action timer command. SMS commands in '**ONOFFRnxxx#**' format support action times (from 001 second to 999 seconds).

- 'n' indicates the relay number (1, 2, 3)
- 'xxx' means the delay times (from 001 to 999 seconds)
- '#' needed to end the command

More details about this command can be found in chapter [Command and Response list](#).

10. Temperature monitoring & control

The G031 has three attached temperature sensors each with a corresponding relay. They can be used to control three individual zones via GSM /APP. These industrial standard sensors provide typical accuracies of $\pm 0.5^{\circ}\text{C}$ over the -55°C to $+125^{\circ}\text{C}$ (-67°F to $+257^{\circ}\text{F}$) temperature range. Its stainless steel probe head makes it suitable for any wet or harsh environment.



Temperature sensor and output relay mapping table

sensor1	Relay1
sensor2	Relay2
sensor3	Relay3

Details of the sensor cable can be found at:

<https://www.quark-elec.com/product/ds18b20-temperature-sensor-cable-two-metre-cable/>

10.1. Setting Temperature Ranges

The G031 is designed primarily for a heating setup but can also be used for cooling. The wiring is different depending on whether you are using the relay for a heating or cooling function.

The ON temperature must be at least 1°C lower than the OFF temperature.)

HEATING: For heating connect your equipment to the G031 in the **normal open** configuration as seen in the table below.

Relay ON: the lowest heating activation temperature. (When colder than '+/-xxx', turn on.)

Relay OFF: the highest heater operating temperature. (If warmer than '+/-xxx', turn off.)

COOLING: For cooling, reverse the way the relays are wired. Connect your cooling equipment in the **Normal closed** configuration as seen in the table below.

It is important to understand that relays wired in 'normal closed' position will operate in the opposite way than expected. In this setup off will turn the relay on. This needs to be taken into account during setup.

APP and SMS Settings provided in the next chapter.

10.2.Relay wiring and temperature settings example

There are two ways to set temperature ranges using either the APP or GSM text commands. This chapter provides examples for both methods.

APP Temperature Settings:

To use the APP to set temperature ranges; navigate to 'OTHER' in the bottom right hand corner of the APP. There will be a sub heading marked for each relay and its corresponding temperature sensor. Each relay and temperature sensor can have individual temperature ranges. See example in next chapter.

Heating: For heating connect your equipment to the G031 in the **Normal Open** configuration as seen in the table below.

In the Android APP, in the 'OTHER' section: set your temperature ranges to the relevant relays.

- **Relay ON:** the lowest heating activation temperature. (When colder than 'xx', turn on.)
- **Relay OFF:** the highest heater operating temperature. (If warmer than 'xx', turn off.)

(The ON temperature must be at least 1°C lower than the OFF temperature.)

Cooling: For cooling, reverse the way the relays are wired.

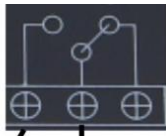

Connect your cooling equipment in the **Normal Closed** configuration as seen in the table below.

It is important to understand that relays wired in 'normal closed' position will operate in the opposite way than expected. In this setup off will turn the relay on. This needs to be taken into account during setup.

In the Android APP, in the 'OTHER' section: set your temperature ranges to the relevant relays.

- **Relay OFF:** the highest cooling activation temperature. (When warmer than 'xx', turn on.)
- **Relay ON:** the lowest cooling operating temperature. (If colder than 'xx', turn off.)

(The ON temperature must be at least 1°C lower than the OFF temperature.)

Example setting and wiring to maintain temperature at 25-40°C		
Connected Device	Heater	Cooler
APP ON	25°C	35°C
APP OFF	30°C	40°C
Relay configuration		

This is an example of a possible setup only. Your configuration will be different to the one shown.

SMS Temperature settings:

To use the text commands to set temperature ranges, you need to send a SMS command to the G031. As above, the temperature settings correspond to a particular relay.

Set the temperature ranges by texting **TEMPnxxxtoxxxx#**

- n=corresponding relay number
- xxxx=temperature using the format + or - XXX (X=single digit).

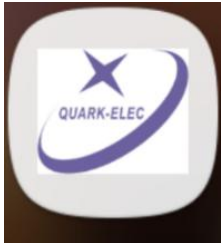
It should look something like ; +035. **TEMP2-005to+035#**

For more information about text commands see [chapter command and response SMS list](#).

11. App on Android

The G031 APP provides a touch sensitive, user friendly interface that will write the text messages for you and send them from your mobile device to control the G031. The app allows for up to two G031 devices to be controlled from a single mobile operator. You will still be charged at your normal text rate for the messages created by this app.

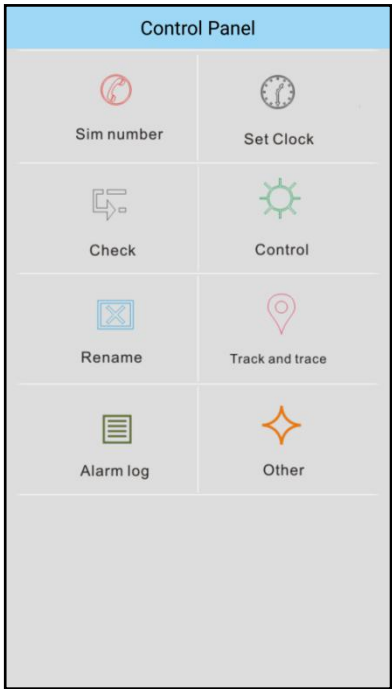
To download the app:



Android: The latest Android G031 APP can be downloaded from the link below. The Android platform should be at least Version 2.1 or higher:

<https://www.quark-elec.com/downloads/apps/>

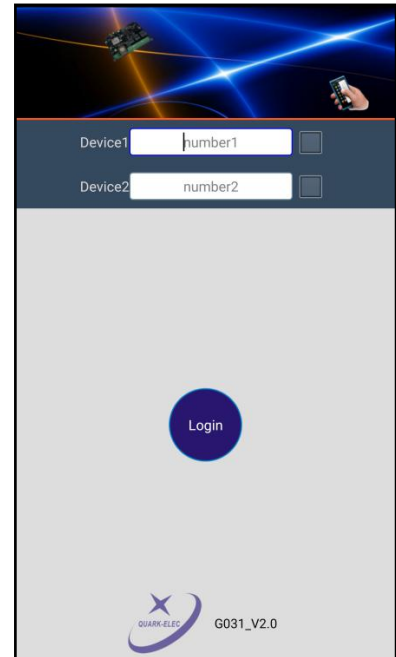
- This is the main screen of the app. From here you can control all of the functions of the G031.



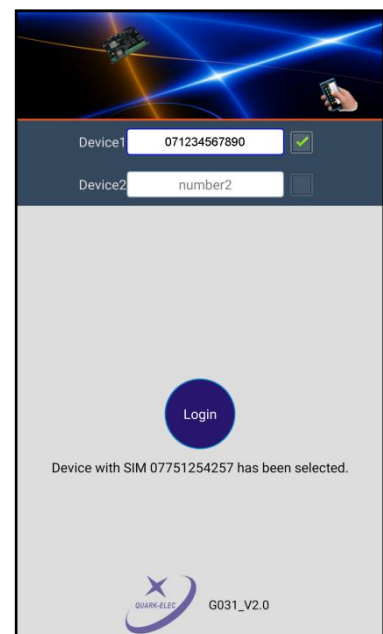
11.1. Setup Main Controller SIM Number

The first page you will see when opening the app is the login page. Here you can set two different SIM numbers (for 2 different G031 devices). Enter the telephone number of the SIM card that you inserted into the G031 where it says '**Device 1**' in the app. If you have 2 QK-G031 devices then you can enter the second SIM card number where it says '**Device 2**'. The app will save these numbers so you don't have to keep entering them.

- Input the number of the SIM card which is inserted into the G031 into '**Device 1**'. All command SMS messages will be sent to this number via the APP.



- Check the tick box to the right of the number you would like to control. Then press the '**login**' button.
- Once the SIM card number have been stored, the APP will reply with a confirmation message



11.2. Register SIM cards

G031 allows one mobile phone to function as the main controller and up to 3 additional phones to function as control terminals. The following interface allows the operator to register, delete and check the SIM card numbers:

- **Register myself as main SIM card:** When starting the G031 for the first time you will need to add the main controller SIM number to the device. Do this by entering the mobile number you would like to be the main controller or '**click register myself as main SIM card**'. There must always be a main controller for each device.
You will have ten minutes to register the main controller SIM once you power up the G031. If not repower the device and retry.
- **Register 1st, 2nd, 3rd additional SIM card:** click this button to register additional SIM cards. These additional SIM numbers are authorized to control the G031
- **Check registered SIM numbers:** this will give the user a list of the telephone numbers that are authorized to control the G031
- **Replace the main SIM numbers:** this allows for the main controller SIM to be reset. Once this message is received by the G031, the user will have 10 minutes to register the main SIM.

11.3. Setting the clock on the QK controller

G031 can automatically execute actions at the time set by the operator. To do this, the real time clock on the G031 controller must be set. This page allows the operator to check and set the time on G031 internal clock.

- **Set clock on QK controller:** To set the time on the G031 enter the current time in the white box. The time format is 24hour (i.e. 11.55.00). When complete click submit to set this as the G031's time.
- **Check the clock on QK controller:** To request the time on the G031, click request at the top of the page. This will send a message saying the time relative to the G031's internal clock.

11.4. Check relay working mode

G031 has three individual relays which support two working modes, self-lock and latching control. When working in latching mode, the relay will action a command from a user determined amount of time (depending on the time setting on the jumpers on the board. See chapter 11.4) and then reverts back to the previous state. When working in self locking mode, the relay will stay active until the next command is received. The G031 can also report the relay working status And check the temperature for each sensor via the app.

- **Relay working mode:** This will inform the user which **relays** are in self-lock or latching mode. This is for relays 1 and 2
- **Relay working status:** This tells the users which relays are on/off (if wired in the normal open position)
- **Temperature:** This tells the user the temperature ranges for each relay and whether the temperature sensor is enabled or disabled for that relay.

Check relay working status

Relay working mode

Check

Relay working status

Check

Temperature

Check

Back

11.5. Rename control terminals

The control terminals can be renamed as a meaningful name. For example 'Heater' or 'fan'.

- **Relays 1, 2 and 3:** Click the white box of the relay or switch that you would like to rename. You will receive a pop-up in your mobile to change the name. Type in the new name and click enter.
- **RF switch 1, 2, 3 and 4:** The RF switch option has been discontinued and is there for customers who still have RF switches.

Rename control terminals

Relay 1	Relay 1
Relay 2	Relay 2
Relay 3	Relay 3
RF switch1	RF switch1
RF switch2	RF switch2
RF switch3	RF switch3
RF switch4	RF switch4

Back

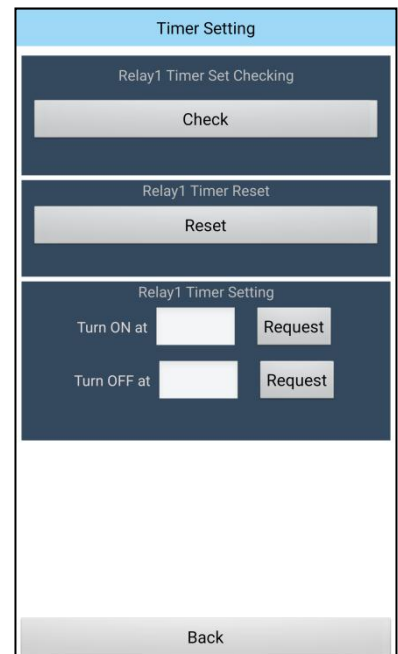
11.6. Control panel

The control panel provides the main operating interface for turning relays on and off and setting timers. By clicking 'ON' in the app, a message will be sent to the G031 turning the specific relay on. This is the same for the 'OFF' button.

- **Relay 1, 2 and 3 on/off:** clicking 'on' button will send a message to the G031 controller to turn the relay into the **normal open** position. You must wait for the command to be received before issuing another command to the controller. The 'off' button operates the relay to the normal closed position.
- **Relay 1 and 2 Timer:** only relays one and two have timer functionality. See next step for timer instructions.



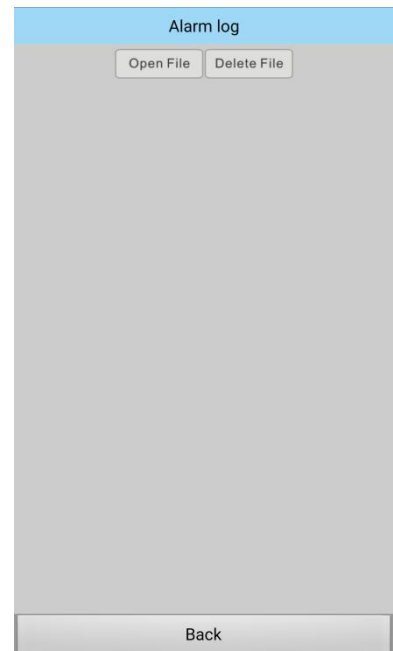
- **Relay timer settings:** set the time at which you would like the relay to turn on and off. This is a 24 hour format (i.e. 13.55.00)
- **Relay timer set checking:** Check the current setting of the timer
- **Relay timer reset:** Switches off the Timer setting. This does not affect the internal clock.



11.7.Alarm log

The alarm log page will show all the alarm alerts and when they were activated. The app will store these logs within your mobile device.

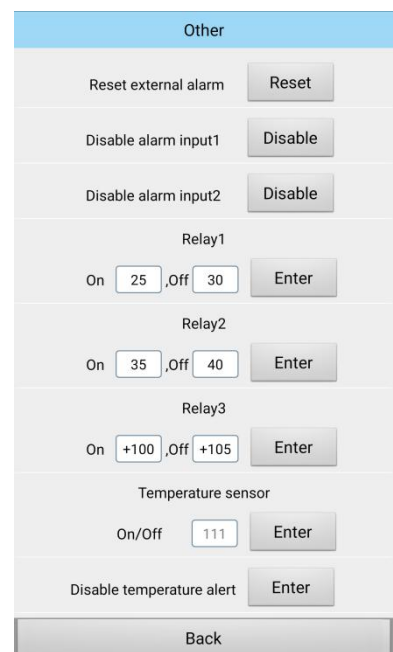
- **Alarm log:** once alarms have been triggered this page will become populated with your alarm trigger times.



11.8.Other

The 'other' Tab within the app gives you controls for setting small delay timers, disabling alarms and there inputs. This can also be used for setting the temperature values of the relays and resetting alarms.

- **Reset external alarm:** It will reset the alarm input allowing a command to be received by the G031. This command will usually be followed by either '**Disable alarm input**' or '**relay off**' command
- **Disable alarm input:** this will disable the alarm input of the chosen relay (relays 1 and 2)
- **Enable alarm input:** this will enable the alarm input of the chosen relay (relays 1 and 2).
- **Setting temperature values:** input the on and off temperature for the chosen temperature sensor. The chosen Relay will action depending on the temperature chosen either switch on or off
- **Temperature sensor on/off:** This function allows users to disable the temperature sensors from taking readings. The format for this command is 3 numbers. Enter either a **1** for temperature sensor **enabled**, or **0** for temperature sensor **disabled**. To turn sensor 1 off and the other 2 on would look like **011**.



- **Disable Temperature alerts:** This command stops temperature alerts being sent to the controllers. **The G031 will still automatically initiate the corresponding relay once Temperature range is exceeded. However the notifications for temperature changes will be disabled.**
- **Enable temperature alert:** this command enables temperature alerts being sent to the controllers.
- **Disable alarm alert:** this command stops input alarm alerts being sent to the controllers. This is very useful because for every alarm input triggered. The G031 will send a text message to the controllers notifying them of this. **The G031 will still automatically initiate the corresponding relay once alarm input is externally triggered. However the notifications will be disabled.**
- **Enable alarm alert:** command enables input alarm alerts being sent to the controllers.

The screenshot shows a web interface with a blue header bar labeled 'Other'. Below the header, there are several sections with input fields and 'Enter' buttons:

- Relay3:** A section with 'On' and 'Off' settings. The 'On' field has a value of '+100' and the 'Off' field has a value of '+105'. There is an 'Enter' button to the right.
- Temperature sensor:** A section with an 'On/Off' field containing the value '111' and an 'Enter' button.
- Disable temperature alert:** A section with an 'Enter' button.
- Enable temperature alert:** A section with an 'Enter' button.
- Disable alarm1 alert:** A section with an 'Enter' button.
- Disable alarm2 alert:** A section with an 'Enter' button.
- Enable alarm1 alert:** A section with an 'Enter' button.
- Enable alarm2 alert:** A section with an 'Enter' button.

At the bottom of the interface is a 'Back' button.

12. Command and response SMS list

Remember that all SMS text commands must always be sent using CAPITAL letters. Do not add spaces or any other characters.

Function	Command	Note
Register SIM cards		
Register main SIM card	88888888	Register the main mobile terminal with G031 module by sending ' 88888888 ' to G031 model. If registration is successful, the module will reply with ' Your phone has been registered. ' Each G031 module can only have one main registered SIM card number. This message should be received within the first 600 seconds once G031 powered up, otherwise ' registered disabled ' message will be send back to inform the failure of the main SIM registration.
Replace main SIM card	XGZHM	The registered main mobile terminal can send ' XGZHM ' command at any time if a new SIM card needs to be replaced as the main mobile. After G031 module receives ' XGZHM ', it will allow any mobile terminal to replace the main mobile number by sending ' 88888888 ' within 600 seconds.
Register additional SIM cards	BDn(mobile number)F n=1, 1 st additional mobile n=2, 2 nd additional mobile n=3, 3 rd additional mobile	Once the main mobile terminal is registered with G031, another three mobile terminals can be paired with G031. For example, by sending ' BD107919157124F ', the first additional mobile terminal (number is 07919157124) has been paired with G031. Similarly, ' BD207909135124F ' means pairing G031 with the second additional terminal (whose number is 07909135124). The message ' Your number n phone has been registered ' will be returned by G031, if mobile terminal n is successfully paired.
Delete additional SIM cards	DELn n=1, 1 st mobile terminal n=2, 2 nd mobile terminal n=3, 3 rd mobile terminal	The registered SIM cards can be deleted from the authorized SIM list by sending DELn . The deleted SIM terminals can no longer control G031.
Check registered SIM numbers	WHORED	G031 will reply with the authorized SIM list in the following format: 'No.1 SIM is xxxxxxxx; No.2 SIM is xxxxxxxx; No.3 SIM is xxxxxxxx.'

Switching relay & mode checking		
Switching relay ON	DKYn n=1, Relay 1; n=2, Relay 2; n=3, Relay 3.	G031 will reply with the relay state information in the following format: 'Port n ON' ,---working in self-lock mode 'Port n has been triggered' ---working in latching mode Where n is the relay number.
Switching relay OFF	GBYn n=1, Relay 1; n=2, Relay 2 n=3, Relay 3.	G031 will reply with the relay state information in the following format: 'Port n OFF' , ---working in self-lock mode 'External triggered, no action on relay n' , ---working in latching mode Where n is the relay number.
Check relay working mode	RMODE	G031 will reply with the relay working mode information in the following format: 'MMMM1MMMM2' , where MMMM could be INCH or SELF. INCH refers to Latching control mode (relay will act for 3 seconds and then revert to the normal position), and SELF refers to Self-lock mode. For example, INCH1SELF2 means, relay 1 works in Latching control mode and relay 2 works in Self-lock mode.
Check relay working status	WHOACTIVE	G031 will reply with the relay working status information similar to the following format: 'R1, R2, R3: ACTIVE; DEACTIVE; ACTIVE.' Where ACTIVE means the related relay has been triggered (COM port connected to NO port), DEACTIVE means the related relay is on the normal status.
One-off relay switch toggling	ONOFFRnxxx# n=1, Relay 1; n=2, Relay 2. xxx range from 001 to 999, indicating the delay time in seconds. *From Aug 2018, this command has changed to be ' ONOFFRnxxx# '; this allows the maximum time can be 999 seconds.	For example, by receiving ONOFFR175# , the first relay (Relay 1) will be triggered on for 75 seconds and then switched off, whether G031 is working in Latching mode or in Self-lock mode. G031 will reply with the relay information in the following format: 'Port 1 is ON and will be OFF 75 seconds afterwards' . This is a one-off command, only valid for one time action. The APP does not support this command, so the operator should use SMS to send this message.

Timer		
Set time on QK-021/022	SThhmmss# Where hhmmss is the current time	For example, by sending ' ST153000# ', the operator set G031 time as 15:30:00. G031 will return the message ' Time setup successful ' to accept this setting. If the operator sends the wrong time format, G031 will return the message 'Time setup failed'.
Check the local time on QK-021/022	DQSJ	By sending ' DQSJ ', the operator will receive the local time. The message received would be ' Time at terminal is 12:30:32 '.
Set Switching Relays ON time	ONnhhhmmss# n=1, Relay 1 n=2, Relay 2 hhmmss is the Switch ON time.	For example, by sending ' ON2163000# ', the operator set Switch Relay 2 ON at 16:30:00. Message as ' Port 2 will switch ON ' will be returned to operator if the setting successful.
Set Switching Relays OFF time	OFnhhhmmss# n=1, Relay 1 n=2, Relay 2 hhmmss is the Switch OFF time.	For example, by sending ' OF2194500 ', the operator set Switch Relay 2 OFF at 19:45:00. Message as ' Port 2 will switch OFF ' will be reply to operator if the setting successful.
Check the current setting of the timer	RELAYnTIMER n=1, Relay 1 n=2, Relay 2	For example, by sending ' RELAY2TIMER ', the timer setting on reply 2 will be reply to operator. The replied message will be similar as ' Port 2 will switch ON at 12:30:00 and switch OFF at 13:30:00 '
Switch off the Timer setting	GDSn n=1, Relay 1 n=2, Relay 2	Message ' Timer on Relay n has switched OFF ' will be returned to the operator if the setting is successful; where n is '1' or '2'. Note: The local time will not be affected by switching off the timer.
Monitoring/alarm input		
Releases relay status which is triggered by the external signals.	EXTRT	After it has been triggered by the alarm input, the related relay will be locked in the normal state. By sending ' EXTRT ', the relays will be unlocked and available for responding to SMS commands again.
Disable the function of been triggered by external signals.	EXTGBn n=1, Relay 1 n=2, Relay 2 n=3, only available for PIRwireless PIR detector (QK-G022P variant)	By sending ' EXTGBn ', the external alarm input n will be disabled. Message ' Alarm input n has been disabled. ' will be returned to the operator if the setting is successful, where n is '1' '2' or '3'. By sending ' EXTRT ' all external alarm inputs will be active. This disable status doesn't affect by re-powering up the module, only ' EXTRT ' can.
G031 has two digital input ports which can be used to monitor external signals. These two external input ports can accept 0.0 V to 24.0 V voltage levels. Should the input voltage level be below 1.0 V, the main mobile terminal will receive the warning message 'Port n has been triggered', where n is the relay number. The relay n will switch to the normal state (NC will be the closed state and NO will be the open state). Sending 'EXTRT' will release the relays and make them available for responding to SMS commands.		

Temperature sensor		
Check the temperature on the sensors	DQWD	G031 will reply with the sensor temperatures and the relay on/off setting temperatures similar to the following; 'Ch1:25[15to27], Ch2: Off [21to32], Ch3:26[25to36]' . This sample message indicates that, sensor 1 is measured as 25°C, and relay 1 is set to switch on at 15°C and switch off at 27°C. Sensor 2 has been disabled and relay 2 is set to switch on at 21°C and switch off at 32°C. Sensor 3 is measured as 26°C and relay 3 is set to switch on at 25°C and switch off at 36°C. Example messages 2: 'Ch1:Notavailable[15to25], Ch2:off[21to32], Ch3:36[25to37]' This message indicates that sensor1 has not been fitted or is damaged, sensor2 has been disabled and sensor 3 is measured as 36°C.
Disable the temperature sensors	GBWDxxx# x=1 indicates 'enable the sensor' while 0 means 'disable the sensor'.	For example, by sending ' GBWD101# ', sensor 1 will be enabled, sensor 2 will be disabled, and sensor 3 will be enabled. A message similar to ' Channels have been set as Ch1:On, Ch2:Off, Ch3:On ' will be returned to the operator if the setting is successful.
Set the temperature limit for relays	TEMPnxxxxtoxxxx# n=1, Relay 1; n=2, Relay 2; n=3, Relay 3. Xxxx is a 4 bit signed number ranges from -055 to +155, indicating the setting temperature. The first xxxx is the 'switch on' temperature setting and the second one is for 'switch off' temperature setting.	For example, by sending ' TEMP1-005to+035# ', relay 1 will be switched on if the 'sensor 1' temperature is at or lower than -5°C, and the relay will be switched off when the temperature is at +35°C or higher. Message ' Channel 1 has been set as On at 25 and Off at 35 ' will be returned to operator if the setting is successful.
Disable temperature notification messages	GBTEMPBJ	By sending this message, G031 will not send the operator the following message (or similar) if one of the sensors reaches the limit temperature (relay takes action): Ch1:22[26to32], Ch2:Off[21to32], Ch3:25[25to36] Message ' Temperature warning messages function disabled ' will be sent to the operator if the setting is successful.
Enable temperature warning message	DKTEMPBJ	Message ' Temperature warning messages function enabled ' will be sent to the operator if the setting is successful.

Mains/Battery power supply		
Mains power dropout warning		If the main power supplier drops out, G031 will automatically switch to using the backup battery and the following message will be sent to the operator: 'Main power has been lost' . G031 is now powered by battery only. Current battery level is 12.2V (requested minimum level is 10.5V).
Main power recovered message		When the mains power is restored G031 will automatically switch back to using mains power. The following message will be sent to the operator. 'Mains power has been restored' . G031 is powered by mains again now.

13. Specification

Item	Specification
Frequency bands	Quad-band: GSM850, EGSM 900, DCS1800, PCS1900.
SMS	MT, MO, CB, test and PDU mode
Operating temperature	- 25°C to + 80°C
Storage temperature	- 40°C to +85°C
DC supply	12.0-24.0V (+/-5%)
Average supply current (typical quiescent)	40 mA
Maximum supply current (during SMS transceiver activity)	600 mA
GSM receiver sensitivity	-107 dBm
GSM transmitting power	Class 4 (2 W) at GSM850, EGSM 900. Class 1 (1 W) at DCS1800, PCS1900.
Temperature sensor working range	-55 to +125°C
Rated voltage on relay	9.0 V – 245.0 V

14. Limited Warranty and Notices

Quark-elec warrants this product to be free from defects in materials and manufacture for one year from the date of purchase. Quark-elec will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour. The customer is, however, responsible for any transportation costs incurred in returning the unit to Quark-Elec. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs. A returns number must be given before any unit is sent back for repair. The above does not affect the statutory rights of the consumer.

Disclaimer

It is the user's responsibility to use this product prudently. Neither Quark-, nor their distributors or dealers accept responsibility or liability either to the products user or their estate for any accident, loss, injury or damage whatsoever arising out of the use or of liability to use this product.

Quark- products may be upgraded from time to time and future versions may therefore not correspond exactly with this manual. The manufacturer of this product disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

Document history

Issue	Date	Changes / Comments
V1.0	04-12-2016	Initial release
V1.01	13-07-2018	Correct command error: OFFnhhmmss, should be OFnhhmmss#
V2	24/10/2018	New 2018 format
V3	28/11/2018	

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