SMS alarm controller

User manual

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1 Description

Thank you very much for purchasing the G-Systems SMS alarm controller.
The controller is an easy-to-use standalone alarm system with alarm output via SMS. The device provides ten independent input / output ports.
By virtue of its many sensors and its individual terminal assignment, the controller meets all requirements. The controller offers additional functions such as the option to store a second phone number and to switch any standard 230 V device on or off via SMS.

1.1 Functions

- Alarm via SMS
  - Smoke detector
  - Motion detector
  - Water sensor
  - Temperature / RH monitoring
  - Magnetic contacts (for windows, doors, etc)
  - Power failure
  - GSE over-temperature timer box
  - External alarm system

- Automatic sensor detection at each of the ten ports.
- Data transmission security adjustable from normal to encoded
- SMS control of up to ten 230 V multi-socket outlets
- Minimum and maximum temperature and air humidity adjustable via SMS.
- Storage for up to two phone numbers
- Retrievable controller status
- Language selection German / English
- Adjustable delay time (0 … 180 seconds) before alarm is armed
- Use of external key switch is possible

2 Technical data

Power adapter:	100 – 240 V / 50 – 60 Hz
Supply voltage:	12 VDC +/- 10 %
Supply current:	Min. 500 mA
Temperature range:	10 °C to 50 °C
Humidity range:	0 % to 95 %
GSM frequencies:	900 / 1800 / 1900 MHz
Dimensions (L x W x H):	80 x 140 x 78 mm

3 Initial operation

Before operating the system for the first time, the following check points must be observed in order to guarantee a trouble-free function:

- SIM card configuration
    - Insert the SIM card that you want to use in any mobile phone and set the PIN code to 0000.
    - Please delete all SMS messages, or else they will be deleted by the SMS controller.
- After completing the SIM card configuration you can unscrew the lid of the controller and remove the lid.
- Insert the configured SIM card in the SIM card holder. Its chamfered edge must face the edge of the housing.
- Insert a 9 V block battery in the corresponding battery compartment
  Important: Verify the battery is connected with the correct polarity.
- Set the internal key switch to OFF
- Plug the power adapter supplied with the system into a wall outlet and connect the other end with the controller
- Wait for the controller to start up. This can be seen from the status LED which stops blinking and lights up continuously. Should, in addition, the error LED light up, refer to **section 7 (error messages)**.
- Now press the programming key (top right) once briefly so that the status LED resumes blinking. Now you have two minutes, while the status LED continues blinking, to use your mobile phone to call the SIM card inserted in the controller.
- Let the phone ring until the controller ends the connection. If this step is completed successfully, the power / status LED will again light continuously. After a short while, you will receive an acknowledgement via SMS.
- Disconnect the controller from the power supply and wait until it has shut down.
- Now fit back the housing lid and tighten its screws.
- Place the controller at a location with good GSM reception.
    - The controller sends an SMS if the reception quality falls below 20 %.
    - If the controller is unable to find a network, the error LED will light up and indicate the error number 5 (see **section 7 error messages**).
- Now plug in all sensors to be used at the controller.

The controller is now ready for operation and can be used. You may personalise the controller as needed to match your application by means of SMS configuration commands. These commands are described in detail in **section 5 (SMS commands)**.

4 SMS alarm controller

4.1 Port 1 – port 10

The SMS alarm controller provides ten independent input / output ports. Any sensor can be connected to any port. The controller detects and installs the sensors automatically when they are connected to a port.

4.2 LEDs

The controller provides ten port LEDs, one power LED and one error LED in order to indicate the operating mode, errors and sensor data.

- Power / status LED:
  This LED indicates the controller status.
  - If the LED lights continuously, the controller is ready for operation.
  - A slowly blinking LED indicates that the controller is starting up upon connection to the mains supply. After pressing the programming key, the same blinking pattern indicates that the controller waits for an incoming call to store the number. .

- Error LED
  The error LED indicates an error condition. The various errors are explained in **section 7 (error messages)**.

- Port 1 to port 10 LEDs:
  Each port has its own LED. It indicates the port status.
  - If the LED is not lit, no sensor is connected to the respective port.
  - If the LED lights continuously, a sensor is connected and has been detected by the controller.
  - A fast blinking LED indicates that the controller is armed and the sensor connected to this port has triggered an alarm. The LED stops blinking only when the controller is disarmed and the key switch is set to OFF.
  - A slowly blinking LED indicates that an external key switch is connected to the port and set to OFF position.

4.3 Internal key switch

The controller can be armed (on) or disarmed (off) by means of the internal key switch.

- When the switch is set to ON, the controller will be armed after the specified delay time. This delay time allows the user to leave the room without generating an immediate alarm.
  The delay time can be configured through an SMS command. **See section 5.6 (alarm delay)**.
  Once the delay time has expired, the controller changes to armed mode.
- When the switch is set to OFF, the controller is disarmed immediately. All alarms are reset, and the control system changes over to the disarmed mode.

4.4 Backup battery

A 9 V block battery must be inserted in the housing in order to prevent the armed controller from shutting down in the event of a power failure or when the power supply is disconnected.
If the power supply is no longer available while the controller is armed and with a backup battery inserted in the controller, an alarm message will be sent via SMS.
Subsequently, the controller shuts down until the power supply is restored.
It should be noted that, without mains supply, the sensors are no longer operative and the power supply to the controller needs to be checked on site.

4.5 Housing protection

When the controller is armed and the lid of the housing is opened, an alarm is triggered immediately and you will be notified with an SMS.
In order to prevent unwanted false alarms, ensure that the controller is disarmed before opening the housing.

4.6 Reset to factory settings

Follow the steps below to reset the controller to the factory settings:

- Connect the controller to the power adapter
- Set key switch to OFF position.
- Wait for the controller to start up
- Keep programming key pressed until the error LED (red) starts flashing quickly.
- Release the programming key and press it again briefly once within the next five seconds.

If the reset sequence has been correctly performed, the controller will restart twice and all values will be restored to the factory settings.

4.7 Storing phone numbers

Follow the steps below to store your phone number in the controller:

- Connect the controller to the power adapter
- Set key switch to OFF position.
- Unscrew the lid of the controller
- Press the programming key once briefly (press key only when the controller has started up and the power / status LED lights continuously).
- The status LED should now blink slowly. If this is the case, call the number of the SIM card inserted in the controller.
- Wait until the controller ends the connection. The status LED will now light continuously, and an SMS is sent to the stored number as an acknowledgement.
- Upon completion of this sequence, the number is stored in the controller.

If you want to store an additional number, please refer to **section 5.2 (storing an additional phone number)**.

4.8 Additional security

This setting allows to increase the security level of the communication between the user and the controller. It offers two options. On the one hand one can select that the controller connects to the mobile phone network only when a messages needs to be sent. Subsequently the connection is ended. As a result the controller remains connected to the network for not more than 45 seconds and, in most instances, the device cannot be located. The second option allows to send numerical codes in place of alarm texts via SMS. This has the advantage that only the user knows what has been sent and which alarm was triggered.

The security status can assume the following values:

- Security status: 0
  This is the standard security status. The additional security features are deactivated.
  Alarms are sent as texts, and the controller is permanently connected to the mobile phone network. This is the factory setting.

- Security status: 1
  If the security status is set to 1, the controller connects to the mobile phone network only if required to send an alarm message. The alarms are sent as texts. Since a connection needs to be established at first, the despatch of alarm messages is delayed by approximately 30 seconds.

- Security status: 2
  If the security status is set to 2, alarms are no longer sent as texts but as numerical codes. The controller is permanently connected to the mobile phone network.

- Security status: 3
  This is a combination of the settings 1 and 2. Alarms are sent as numerical codes and the controller connects to the mobile phone network only when required to send an alarm. Replies during the configuration process continue to be sent in text format. Since a connection needs to be made at first, the despatch of alarm messages is delayed by approximately 30 seconds.

Section 5.7 (additional security configuration) describes in detail the syntax to be followed for sending the configuration to the controller.

Important: If the security status is 1 or 3, the controller will not be able to receive or process any messages. This means that no further settings can be made. In order to re-establish the communication with the controller, the key switch must be operated as described below.
Key switch sequence to connect to the mobile phone network from OFF position: ON-OFF-ON-OFF and from ON position: OFF-ON-OFF. This sequence must be completed within two seconds. The controller connects to the network as soon as this command is entered (the connection will be established within approximately 20 s) and the controller can now be configured. As soon as the alarm is armed (ON), the controller will disconnect from the network.

4.8.1 Numerical codes

Numerical code	Description / alarm	Numerical code	Description / alarm
10	Smoke sensor	**34**	Lamp over-temperature sensor removed
11	Water sensor	**35**	Temperature and humidity sensor removed
12	Reed switch	**36**	External key switch has been removed
13	Motion sensor	**37**	Switchable multi-socket outlets removed
14	Lamp over-temperature	**50**	Controller opened
15	Over-temperature	**51**	Power failure / controller to standby
16	Under-temperature	**52**	Low battery voltage
17	Humidity too high	**53**	No battery connected
18	Humidity too low	**54**	Poor SMS reception
30	Smoke sensor removed	**55**	Programming key activated
31	Water sensor removed	**56**	Key switch inserted
32	Reed switch removed	**57**	Wrong key position See user manual
33	Motion detector removed		

4.8.2 Overview

Security index				Description
0	**1**	**2**	**3**	
X	X			Alarms will be sent as text messages
		X	X	Alarms will be sent as numerical codes
X		X		The controller is permanently connected to the mobile phone network.
	X		X	Controller connects to the mobile phone network for alarms only

5 SMS commands

Almost all controller settings can be made via SMS. As regards the SMS communication between user and controller one should keep in mind that each SMS must not comprise more than 160 characters. The controller does not support multi-part SMS.
Most of the samples listed below show three variants. These three variants show examples how to apply the command. You may opt for one variant: there is no need to send all three SMS variants. As an alternative, you may send multiple SMS commands within one SMS.

1.1 Status enquiry

This SMS command allows to retrieve the controller status at any time and recall the most important pieces of information.

Syntax for retrieving the current status:

- State
  Simply send the word 'State' to the controller.

If the message is correctly received, you will get a reply with following data:

- Alarm status: (On or off)
  - This value shows whether the controller is armed (on) or disarmed (off)

- Reception (0 – 100 %)
  - This value indicates the reception quality at the device

- Battery voltage (Value in volts)
  - Indicates the current battery voltage

- Sent alarms: (0 - 20)
  - Indicates the number of alarms sent since the system was last armed

If a temperature and humidity sensor is used, the following additional values are indicated:

- Temperature: (Temperature in degrees Celsius)
  - Indicates the current room temperature

- Humidity (Relative humidity in percent)
  - Indicates the current humidity in the room air

5.1 Change system language

The system language can be changed by sending an SMS command.
The controller can be operated in German and English language.

SMS syntax:

- Deutsch
  To change the system language to German

- English
  To change the system language to English

If no error occurred, the controller will send back an acknowledgement after a short while.

Factory setting: English

5.2 Storing an additional phone number

A secondary phone number can be stored in addition to the main telephone number. This can also be carried out by sending a configuration SMS. When a second number is used, all messages are always sent to both numbers. Both numbers can be used to carry out configuration changes.

SMS activation syntax:

- 2nd no (phone number of additional mobile phone)
  - Example: 2. nr = +4123456789
    2. nr : +4123456789
    2. nr +4123456789

  Choose one of the three variants to store and activate an additional telephone number.

SMS deactivation syntax:

- 2nd no [enter a 0 (zero) as phone number]
  - Example: 2. nr = 0
    2. nr : 0
    2. nr 0

  Choose one of the three variants to deactivate an additional telephone number.

Factory setting: 0 (deactivated)

Both commands will be acknowledged after successful completion.

5.3 Temperature and humidity sensor

Following parameters of the temperature and humidity sensor can be configured by sending SMS messages.
In order to use the sensor for temperature measurements only, the humidity function can be disabled by setting the maximum value to 100 % and the minimum value to 0 %.
The temperature and humidity ranges are as follows:

- Temperature: -50°C to 150 °C
- Humidity: 10 % to 95 % (not condensing)

SMS syntax for the maximum temperature value to trigger an alarm:

- Temp Max [maximum temperature in degrees]
  - Example: Temp Max = 30
    Temp Max : 30
    Temp Max 30

Range: -50°C to 150 °C

SMS syntax for the minimum temperature value to trigger an alarm:

- Temp Min [minimum temperature in degrees]
  - Example: Temp Min = -2
    Temp Min: -2
    Temp Min -2

Range: -50°C to 150 °C

SMS syntax for the maximum humidity value to trigger an alarm:

- RH Max [maximum humidity in percent]
  - Example: RH Max = 80
    RH Max : 80
    RH Max 80

Range: 0 % to 100 %

SMS syntax for the minimum humidity value to trigger an alarm:

- RH Min [minimum humidity in percent]
  - Example: RH Min = 30
    RH Min: 30
    RH Min 30

Range: 0 % to 100 %

Factory settings:

- Maximum temperature : 35 °C
- Minimum temperature: 16 °C
- Maximum humidity: 100 % (i.e. deactivated)
- Minimum humidity: 0 % (i.e. deactivated)

5.4 Switchable multi-socket outlets

The following commands can be used to control the switchable multi-socket outlets via SMS messages.

SMS syntax for the multi-socket outlets:

- Port [port number (1 – 10) to which the multi-socket outlet is connected] [followed by 1 for 'on' and 0 for 'off']
    - Example for switching on a multi-socket outlet connected to port 3:
        - Port 3 = 1
        - Port 3 : 1
        - Port 3 1
    - Example to switch off a multi-socket outlet connected to port 3:
        - Port 3 = 0
        - Port 3 : 0
        - Port 3 0

The controller sends back an acknowledgement upon successful completion of the command.

5.5 Alarm delay

This option is used to set two parameters. On the one hand the time between the arming command (key switch to ON position) and the actual arming of the controller. On the other hand the time after an alarm is triggered until the controller is disarmed (key switch to OFF position). Both times are equal and can be configured as described below.
Due to this delay time it is possible to leave the controlled area after arming the system and to enter the room without causing an immediate alarm. The disarming delay is restricted to the motion sensor and magnetic contacts. An SMS message will be sent immediately in the case of all other alarms.
This function can be deactivated by setting a time of 0 seconds.

Syntax to set the delay time:

- Delay time [time in seconds]
    - Example: Time delay = 30
      Time delay : 30
      Time delay 30

Range: 0 to 180 seconds
Factory setting: 15 seconds

5.6 Additional security configuration

This function allows to set the security index.

Syntax to set the additional security index:

- Security [security index]
  Example: Security = 2
  Security : 2
  Security 2

Range: 0 to 3
Factory setting: 0

6 Sensors

This section gives a brief overview of all sensors and their use. The controller is only compatible with G-Systems sensors. Only these sensors must be used. The function is no longer guaranteed if sensors are modified or if other sensors are used.

6.1 Smoke sensor

The smoke sensor is a photoelectric smoke detector. The sensor sends a silent alarm to the controller. It does not provide a siren.

Technical data:
Functional area: 20 m^2
Temperature range: 0 °C to 50 °C
Humidity range: 0 % to 95 %

Installation:

1. Use the included screws to fasten the holder to the ceiling at a suitable location, typically in the centre of the room.
2. Subsequently, insert the smoke sensor in the holder.
3. Route the cable to the controller and connect it to a free port.
4. You can now check the sensor function by blowing some smoke into the sensor or by pressing the test button located on the side of the smoke detector.

Information:

- The smoke detector cannot be used under adverse conditions,
  e.g. extremely cold or hot or hazy ambient conditions
- The smoke detector should be checked once per month
- Please clean the sensor once per six months with a soft brush or similar cleaning implements
  Subsequently, verify the functioning of the sensor

6.2 Switchable multi-socket outlet

The switchable multi-socket outlet is not a sensor capable to trigger an alarm. However, there is the possibility to switch any load on and off which can be connected to a standard socket outlet.
The switchable multi-socket outlet provides two connecting cables. There is one standard 230 V cable which can be plugged into a wall outlet. The second cable is fitted with a controller sensor plug for connection to a controller port. Up to ten switchable multi-socket outlets can be connected and operated at the same time.

Please read the instructions in **section 5.5 'switchable multi-socket outlets'** for information how to switch the multi-socket outlet on or off by sending SMS commands.

Important: The maximum permitted current is 10 A at cos φ = 1.

6.3 Motion sensor

The motion sensor is a passive infrared motion detector. The sensor detects the movement of a human or animal in the controlled zone. The sensor provides a thermal compensation as well as a white light and high frequency suppression.

Technical data:

Detection angle:	110°
Detection range:	12 m
HF suppression:	10 MHz … 1 GHz at 20 V/m
Sensor:	Dual element infrared sensor
Installation height:	1.7 m to 2.5 m (recommended height: 2.2 m)
Temperature range:	0 °C to 50 °C
Humidity range:	0 % to 95 %

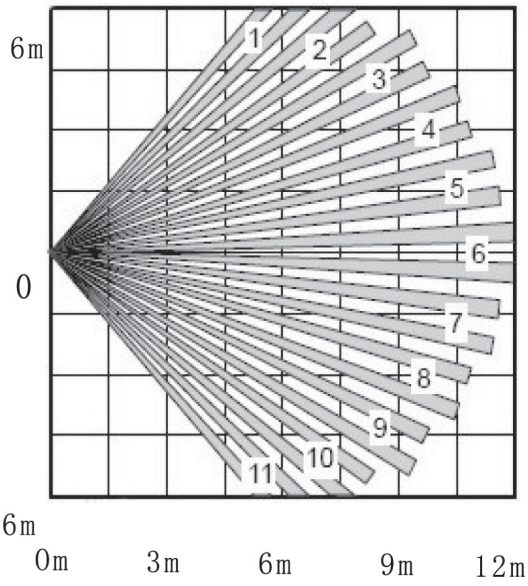
Installation:

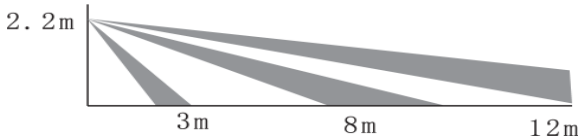
1. Use the included screws to fasten the holder to the wall at a suitable location. The sensor should not be mounted near to doors leading to the outside, or near to pets, direct sun radiation or moving objects.
2. Fit the motion detector to the holder
3. Route the cable to the controller and connect it to a free port.
4. After connecting to the controller, the sensor requires approx. 60 seconds to start up and perform a self-calibration.
5. Subsequently its functioning can be tested

Information:

- Never touch the sensor element inside the housing
- Clean the sensor every few months with a soft brush

Operating range:





6.3.1 Additional settings on the motion sensor

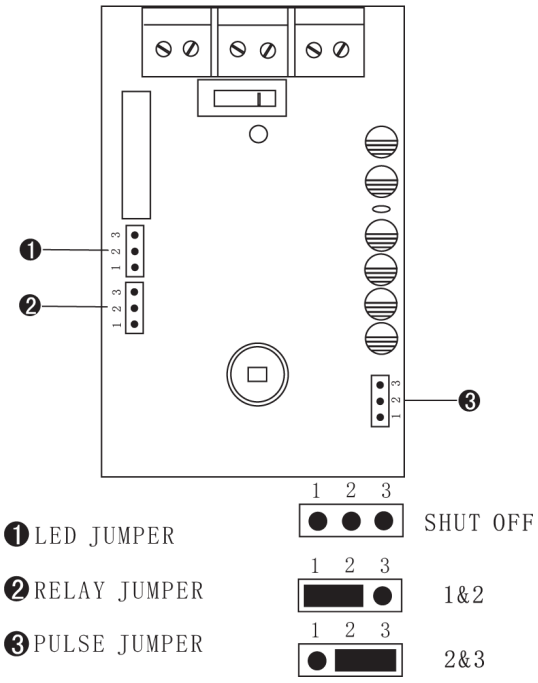
The sensitivity and the internal LED can be adjusted at the motion detector.
In order to carry out these adjustments, the housing of the motion detector has to be opened.
Important: At first verify that the sensor has been disconnected and is no longer energised. When the housing is open, take care not to touch the printed circuit board.

Three jumper sockets (1, 2, 3 see figure below) allow to change the following settings:

1. **LED jumper**
   This jumper is used to define whether the internal LED should light up during an alarm.
   - Jumper connecting 1&2: LED lights up during alarm and calibration
   - Jumper connecting 2&3: LED always off

2. **Relay jumper**
   This jumper must connect 2&3 or be set to N.C. Otherwise, a correct functioning with the controller cannot be guaranteed.

3. **Pulse jumper**
   This jumper can be used to define how sensitive the controller is when reacting to movements.
   - Jumper connecting 1&2: The motion sensor is set to maximum sensitivity
   - Jumper connecting 2&3: The sensitivity is set to a medium level. In addition, the high frequency suppression is set to high
   - Jumper open "shut off" The sensitivity is low and the High frequency suppression is set to high.



6.4 Water sensor

The water sensor triggers an alarm upon the contact with water. It can, for instance, be placed on the floor to trigger an alarm in the case of the room being flooded with water.
The water sensor has two sides. The top side with markings and connecting cable, and the bottom side with the sensitive sensor surface. A single drop of water on the sensor surface is sufficient to trigger an alarm.

Important: After an alarm, the sensor should be dried thoroughly to prevent subsequent false alarms.

6.5 External key switch

If an external key switch is used, the internal key switch will be disabled. Up to one external key switch can be connected. If an external key switch is connected, the internal key switch must be in ON position to ensure the correct functioning of the system. To find out whether an external key switch is in ON or OFF position, the LED status at the corresponding port can be checked. If the LED blinks slowly, the switch is in OFF position. If the LED lights continuously, the switch is in ON position.

- Installation in power-off condition:
    - Disconnect mains supply and wait for all LEDs to go off.
    - Set external key switch to OFF position. Plug in the switch.
    - Set internal key switch to ON position and remove the key.
    - Restore main power supply and start up the controller.
      External key switch can now be used. The internal key switch is now disabled.
- Installation in active condition:
    - Set the internal and external key switches to OFF
    - Plug in external key switch.
    - Set internal key switch to ON position and remove the key.
      External key switch can now be used. The internal key switch is now disabled.

The external key switch can be removed as follows:

- Removal in power-off condition:
    - Disconnect mains supply and wait for all LEDs to go off.
    - Set internal and external key switches to OFF position.
    - Disconnect external key switch.
      Restore main power supply and start up the controller.
      The controller can now be operated with the internal key switch,

- Removal in active condition:
    - Set external key switch to OFF position.
    - Set internal key switch to OFF position.
    - Disconnect external key switch.
      The controller can now be operated with the internal key switch,

6.6 Magnetic contact

The sensor is a two-piece magnetic switch. This sensor is especially suited for monitoring windows, doors, gates, hatches etc.
Mode of operation: The magnetic switch must be installed in a manner which ensures that the two parts separate when, for instance, the door opens.
No alarm is triggered when the two parts touch one another or when they are separated by a very small gap. An alarm will be triggered, however, as soon as the two parts separate.
Ensure that the sensor is well fastened to avoid unnecessary false alarms.

6.7 Temperature and humidity sensor

The temperature and humidity sensor is a digital sensor which measures the current temperature and humidity. If the temperature or humidity exceeds or falls below the preset alarm values, an alarm will be triggered. These alarm values for temperature and humidity can be configured as described in section **5.4 (temperature and humidity sensor)**.
Please place the sensor at a suitable location and connect it to any controller port.

Technical data:

Operating range, temperature:	0 to 50 °C
Temperature tolerance:	+/- 1.5 °C
Operating range, humidity:	10 % to 90% (not condensing)
Humidity tolerance:	+/- 6%

Limits:

Temperature:	-20 to 70 °C
Humidity:	below 95 % relative humidity (not condensing)

7 Error messages

The table below lists all error messages which the controller is able to display. When an error occurs, the error LED starts blinking for four seconds before it continues blinking in one-second intervals in accordance with the error number.

○ Error LED off

● Error LED is lit

Each dot stands for one second ‘on’ or ‘off’. In order to obtain the error number one has to count how many times during one cycle the error LED is 'off'.

Error no.	Error LED blinking pattern	Description
2	●●○●○●●●●●●○●○●●	There is no phone number available. Please refer to section ‘Storing a phone number’.
3	●●○●○●○●●●●●●○●○●○●●	No SIM card available. Check whether SIM card has been correctly inserted.
4	●●○●○●○●○●●●●●●○●○●○●○●●	Pin code has not been set to 0000. Please set pin code to 0000.
5	●●○●○●○●○●○●●●●●●○●○●○●○●○●●	No network found. Relocate the controller to a place with better reception.
6	●●○●○●○●○●○●○●●●●●●○●○●○●○●○●○●●	Startup failure. Restart the controller.
7	●●○●○●○●○●○●○●○●●●●●●○●○●○●○●○●○●○●●	There is more than one external key switch connected. Up to one external key switch can be connected.
8	●●○●○●○●○●○●○●○●○●●●●●●○●○●○●○●○●○●○●○●●	An error occurred during the configuration of the GSM module. Please restart the controller.