SIKOM®

GSM FIXI SMS

SMS-operated Switch Control

User and installation manual

We thank you warmly for purchasing this GSM-operated remote control system, which will bring you more comfort, security and new energy saving opportunities.

Overview of GSM Fixi SMS:
- Up to 5 potential-free 16A relays/outputs (of which 2 are built-in).
- 2 inputs for temperature measurement, surveillance and thermostatic regulation.
- 1 digital input for an alarm detector.
- Power outage warning feature.
- Protected by a personal access code.
- Standard GSM network (900/1800MHz).
- Mounting on DIN rail.
- Controllable remotely by SMS or via a Web-based application on my.EcoStarter.com

Contents

INSTALLATION

1. Package contents

- GSM Fixi SMS
- GSM antenna
- 2 protection lids
- 1 temperature sensor (with 8m cable)

2. SIM card and Connections

The terms "relay" and "output" are used as synonyms in this document.
A "temperature sensor" is a cable with a sensor on one tip, which is to be placed in the room where temperatures are to be monitored and/or regulated with the thermostat built into GSM Fixi SMS.

2.1. Preparation of SIM card

GSM Fixi SMS needs a SIM card to be able to send and receive SMS messages. SIM cards from any mobile phone operators will work, both pre-pay and subscription based.
NB: with prepay cards, communication credits have to be followed up; we recommend against using prepay cards, which cannot be reloaded without withdrawing from GSM Fixi.

NB: once the SIM card is installed, it is recommended that only qualified people manipulate it to avoid damaging the unit.

GSM Fixi requires the SIM card PIN code to be deactivated. This is achieved by temporarily inserting the SIM card into a normal GSM mobile phone inside which the PIN code of the SIM card will be deactivated. The exact procedure will be described in the manual of your mobile phone.
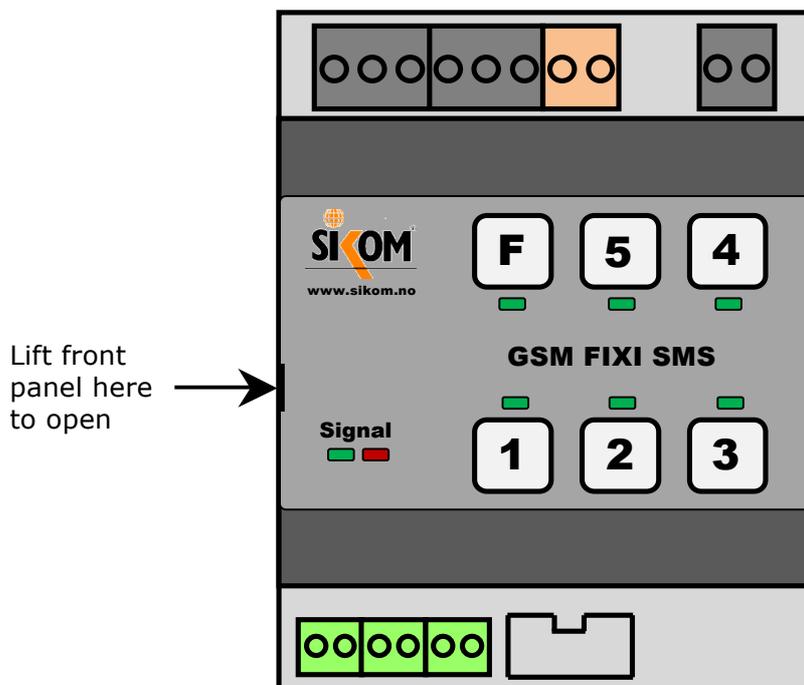
Lift front panel here to open

Figure 1: *How to open the unit for inserting the SIM card*

2.2. Insertion of SIM card

Always ensure that the unit is entirely powered off when manipulating the SIM card. This is done most easily by switching off the circuit breaker or fuse that admits power to the unit. To open the front panel, gently lever it up with a screwdriver in the slot in the middle of the left edge (see Figure 1 above).
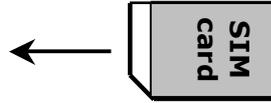
Figure 2: Installation direction of SIM card

Insert the SIM card into the holder below the front panel and slide it in leftwards until it clicks into position. The SIM card shall be placed with its gold contact side facing down, and the notch in the lower left corner (see Figure 2 above). If you later wish to withdraw the SIM card, gently push it inwards until a click signals that the locking mechanism is open.

The unit can be powered on once the SIM card has been installed and all connections have been made.

2.3. Connections

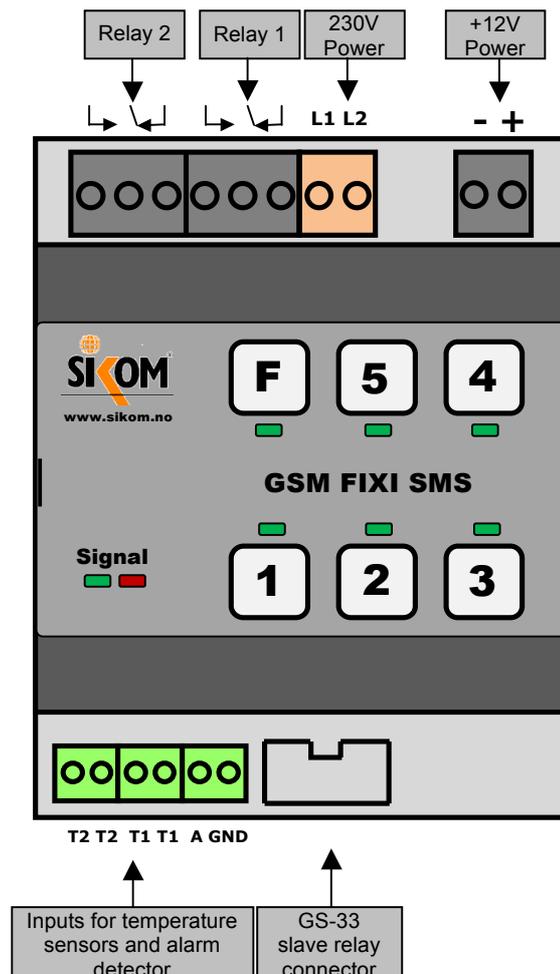GSM Fixi SMS should be mounted into a metal-framed distribution board (fuse box).

Figure 3: Connection terminals of GSM Fixi SMS

Preliminary note on installation safety:
For safety reasons, ensure that all phase (live) conductors connected to GSM Fixi have breakers (or at least fuses). Be especially cautious in environments without a neutral conductor, such as in IT earthing systems (relatively rare in European homes), where all conductors are live and must therefore have breakers.

Fuses must be rated 16 A or less, depending on the installation and local regulations.

Power supply:
A two-pole circuit breaker is recommended to control the power supply of GSM Fixi SMS. Connect a 230V/50Hz supply to the orange terminals. Optionally add a 12-15V DC supply if power outage alarms are required (typically a backup battery including a charger, which can be purchased from Sikom).

Outputs (relays):
GSM Fixi SMS has two built-in potential-free relays, each one supporting a load of 16 A. They are controlled by SMS messages and with the push-buttons on top of the unit. The relay connectors may be used for remote control of electric appliances like stoves, hot water systems, floor heating systems, or yet other equipment.

Relays 1 and 2 have change-over contacts, i.e., their central (*common*) contact moves from right (*normally closed*) to left (*normally open*) when the relay is activated.
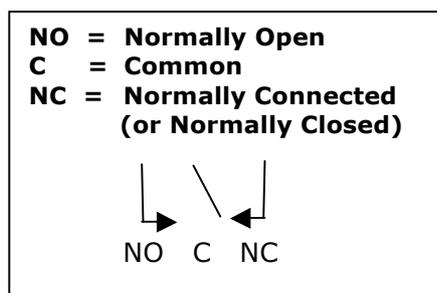


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NO  =  Normally Open
C   =  Common
NC  =  Normally Connected
       (or Normally Closed)


        NO   C   NC
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Figure 4: *Explanation of relay contacts (shown in the inactive state)*

If you need more than the two built-in relays, you may purchase an additional *slave relay* (Sikom GS-33), which provides three additional potential-free 230V 16A relays. Connect it to the *slave relay* output of GSM Fixi SMS through a dedicated ribbon cable, which comes with the slave relay. A total of five relays are then controlled by GSM Fixi SMS.

Only the two relays built into GSM Fixi SMS support the thermostatic control function. Moreover, a temperature sensor has then to be connected on the corresponding input (T1 for thermostatic control on relay 1, and T2 for thermostatic control on relay 2). Target temperatures are set separately for each of the relays.

NB! When using a 230 V AC power supply, the voltage applied at any of the two relays must also be 230 V AC. Add auxiliary relays or contactors when necessary. Slave relay GS-33 is able to control 230 V AC and extra-low voltage (50 V and lower) loads simultaneously.

Adjust the protection lid over the 230 V terminals once all connections are made.

Temperature sensor inputs:
Up to 2 temperature sensors can be connected to the terminal pairs T1/GND and T2/GND. They can be used for driving the corresponding relays as thermostats, or simply for reading off or for surveillance of ambient temperatures.

Temperature sensor cables must not be laid out alongside 230V leads and should be kept as far away as possible from any sources of electrical interferences. Thermostatic regulation and temperature reading may otherwise be perturbed. The temperature sensor should therefore not be used as a floor sensor for floor heating installations, as this would require shielded sensors (also available from Sikom). Similarly, whereas it is possible to extend a temperature sensor, it would also induce a loss of precision of measurements.

Alarm input:
GSM Fixi SMS has an alarm input (A/GND) into which usual detectors with standard potential-free output relays may be connected, e.g. smoke, flooding, gas, burglary, or more specialized ones like fault indicators. It can also be used to retransmit by SMS the alarms of an existing alarm system.

This input requires a detection loop with a resistor mounted as shown below. The resistor must be in the range of 10kOhm to 27kOhm. An alarm will be triggered each time the detection loop is either short-circuited or opened, depending on whether it is mounted as "normally open" (NO), respectively "normally closed" (NC)[1]. For further details, please also refer to the installation instructions enclosed with the detectors.
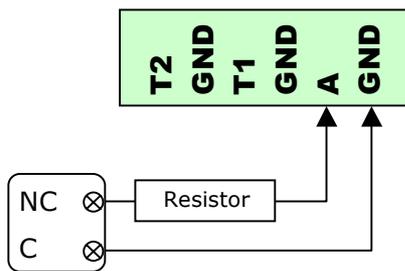
Normally closed (NC) detector loop:
Resistor mounted in series with the detector.
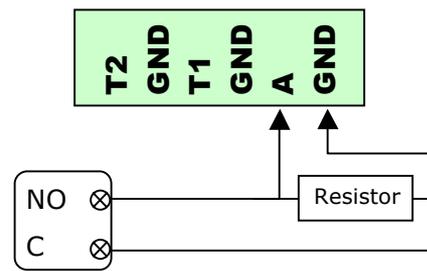
Normally open (NO) detector loop:
Resistor mounted in parallel to the detector.

GSM antenna:
Finally connect the GSM antenna (be careful if the antenna is to be taken out again). Try to place the antenna as high as possible in a vertical position. Please note that the antenna must NOT be placed directly on a metal surface or close to metal items, as this may block the GSM signal. Any GSM antenna with MMCX connector can be used as long as it covers the required GSM frequencies.

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[1] The use of an NO-type detector requires a GSM Fixi with software version « NOC ».

3. Start-up

3.1. Powering on

Once GSM Fixi SMS is powered on, it will initiate its start-up procedure. Thereafter the LEDs will show the status of the relay outputs. The red and green Signal LEDs will first be lit, and then the other LEDs will turn on. When the green Signal LED is lit, the unit is ready.

3.2. Possible errors

If no SIM card has been inserted, or if it is faulty, or its PIN code still active, the Signal LED will start flashing green. If so, please check the SIM card and follow the instructions of point 2.1 again. In case of doubt, insert the SIM card into a mobile phone and verify that you able to send an SMS message with it.

If the Signal LED starts flashing red, an internal fault has been discovered during the self-test of GSM Fixi SMS: contact your dealer.

3.3. Signal strength

The Signal LEDs show the strength of the GSM signal:

1. Green   Good signal.
2. Red   Medium quality signal.   (-93->dB)
3. Off (no light)   Bad or no signal.   (-103-> dB)

In case situation (2) or (3) occurs, try re-orienting the antenna to obtain a better coverage. Failing that, a better antenna may be purchased from Sikom.

3.4. Change of personal access code

GSM Fixi SMS is configured and controlled using regular SMS messages sent from mobile phones. A personal access code protects your unit from unauthorized access. It is factory-set to "1234". You should set a new access code as soon as possible – and remember it !

Send the following SMS message to GSM Fixi SMS (without the quotes):
"**1234 Cxxxx S**"
where xxxx is your new personal access code, which must be a 4-digit sequence. You will shortly receive a reply by SMS, which shows the current settings of GSM Fixi SMS; this confirms that your initial SMS has been received and processed by the unit.

All SMS messages sent to the unit have to start with the personal access code.

It is always possible to revert to the factory-set code by following the instructions of point 4.2.

3.5. GSM numbers to which alarm messages will be addressed

GSM Fixi SMS is now ready for use. SMS control is performed as explained in Chapter 4.GSM Fixi SMS needs to know to which mobile phone number it is to send its alarm messages (temperature surveillance, alarms, error messages as in case of overload). This is how that phone number is given to the unit:

Send the following SMS to your unit:
"**1234 Nxxxxxxxx# S**"
where xxxxxxxx is the chosen number to which the unit shall send its messages, and *S* is a command which requests a status message for verification.

Do not forget the international dialling code if your unit is to send messages to phones with a foreign SIM card (e.g. prefix +47 for Norway, +41 for Switzerland, etc.).

E.g.: "**1234 N+41123456789# S**" stores a Swiss number and verifies the result.

OPERATION

4. Front panel and local controls

4.1. Front panel
The front panel of GSM Fixi SMS offers the following interaction tools:

- **5 switches (push-buttons):**
  Numbered from 1 to 5, for turning the relay outputs on or off (switches 3-5 are only usable when slave relay GS-33 is connected).

- **'F' (function switch):**
  When the 'F' button is pressed, the LED below it will turn on, and LEDs 1-5 will show system status as follows:

  LED 1: Relay 1 is in thermostatic regulation mode if this LED is green; otherwise it is in explicit on/off mode.
  LED 2: Relay 2 is in thermostatic regulation mode if this LED is green; otherwise it is in explicit on/off mode.
  LED 3: Unused.
  LED 4: Power outage warning is active if this LED is green.
  LED 5: The alarm input is active if this LED is green.

  To change these statuses, press the corresponding button. E.g., pressing the button 1 now will toggle relay 1 between thermostatic regulation and manual on/off mode.
  Press 'F' again to return to the normal panel functionality.

- **5 LEDs for relay status**
  Relay 1 and 2 for GSM Fixi SMS and relay 3-5 for GS-33.
  A green light indicates that the relay is active (or in comfort mode if thermostat is active).
  No light means that the relay is inactive (or in eco mode if thermostat is active).
  Comfort and eco modes are only possible on relays 1 and 2.

- **2 Signal LEDs**
  They show the signal strength (See point 3.3).

4.2. Reset of personal access code
GSM Fixi SMS comes with the factory-set access code "1234".
Should you lose or forget your code, the following procedure will reset it to "1234":
  1. Power off GSM Fixi SMS.
  2. Press and hold push-button 1 (for relay 1).
  3. Power on again while keeping the push-button depressed.
  4. Continue to hold push-button 1 for another 5 seconds.

When completed, LEDs 5 and 'F' will flash three times to confirm the reset.

NB: After a reset, all relay outputs will be shortly turned off, and then revert to the same state as before the reset.

5. SMS commands

GSM Fixi SMS is configured and controlled using regular SMS messages sent from GSM mobile phones. Address your SMS messages to GSM Fixi SMS by using the phone number of the SIM card inside it. The factory-set "1234" personal access code will be used in the following examples. Do not copy the quotes around the examples.

SMS messages must always contain the following:
- First, the 4-digit access code.
- Then, any configuration/control commands (possibly several of them per SMS, separated by a space character).

Overview of control and configuration commands:
> **R = Switch relay on or off.**
> **B = Trigger a 2-seconds activation pulse on relay.**
> **T = Timer control.**
> **K = Activate/deactivate thermostatic control.**
> **M = Set target (eco and comfort) temperatures.**
>
> **S = Request a status message.**
> **C = Change the personal access code.**
>
> **N = GSM number to which the unit will send alarm messages.**
> **O = Activate/deactivate power outage alarms.**
> **A = Activate/deactivate alarm input.**
> **P = Define alarm message.**
> **J = Set high and low limits for temperature surveillance.**
> **L = Activate/deactivate temperature surveillance.**

R – Switch Relay (output) on or off

R is followed by relay number (1-5) and **1** for *on* or **0** for *off*.
Please note that if thermostatic regulation is active for the specified relay (1 or 2), this command will toggle between eco and comfort temperatures.

E.g.:   "1234 R11"   switches relay **1 on**.
E.g.:   "1234 R10"   switches relay **1 off**.
E.g.:   "1234 R30"   switches relay **3 off**.

B – Pulse activation of relay

B is followed by relay number (1-5).
The specified output will then be activated for 2 seconds, and thereafter deactivated.
This command will have no effect if thermostatic control is active on that relay.

E.g.:   "1234 B1"   triggers a 2-seconds pulse on relay **1**.

T – Timer control

T is followed by relay number (1-5) and a 2-digit number of hours (e.g., 01 = 1 hour).
All relays can be activated independently for different durations from 1 to 99 hours.
NB: This command will deactivate any current thermostatic regulation mode before the countdown; if needed, the thermostat must be reactivated afterwards with command K.

E.g.:   "1234 T501"   switches on relay 5 for 1 hour.
E.g.:   "1234 T135 T203"   switches on relay 1 for 35 hours and relay 2 for 3 hours.

K – Activate/deactivate thermostatic regulation

K is followed by relay number (1-2) and **1** for *on* or **0** for *off*.
Relays 1 and 2 can operate as thermostats. A temperature sensor must then be laid out to the same room as the heater being regulated. Use command M to change the target temperature.

E.g.: "1234 K11" activates the thermostat on relay 1.
E.g.: "1234 K10" deactivates the thermostat on relay 1.
E.g.: "1234 K21" activates the thermostat on relay 2.

M – Set eco and comfort target temperatures

M is followed by relay number (1-2) and the desired "eco", then "comfort" target temperatures (always a '+' or '-' sign followed by a 2-digit value).
An "eco" and a "comfort" target temperature can be specified for thermostatic control. GSM Fixi SMS will then try to maintain the given ambient temperature by repetitively turning the regulated heater on and off.

E.g.: "1234 M1+08+20" sets +08˚C as eco and +20˚C as comfort on relay 1.
E.g.: "1234 M2+18+25" sets +18˚C as eco and +25˚C as comfort on relay 2.

S – Request a status message

When GSM Fixi SMS receives command **S1** or **S2**, it will reply to the requesting phone number (not to the phone number stored with command **N**) with an SMS containing a status message, which will look like this:

With S1:
"Relay 1.Comf 2.Off 3.Off 4.Off 5.Off Temp1 +20 Temp2 X Term1 Eco +10 Comf +20 Num (48054500) Fixi SMS V3.0NOC"

With S2:
"Lim1 Off Hi:+49 Lo:-29 Lim2 Off Hi+49 Lo:-29 Power warn Off Alarm Off (Alarm) Num(48054500) Fixi SMS V3.0NOC"

"Relay" shows which for each relay, if it is "On" or "Off", or the number of remaining hours when in timer "T" control. If thermostatic regulation is active, it will show which one of "Eco" or "Comf" is the current target temperature.

"Temp1" and "Temp2" show the temperature at the given sensor, or "X" if no sensor is connected.

"Lim1" and "Lim2" show if temperature surveillance is "On" or "Off" and the upper "Hi" and lower "Lo" limits set for this.

Certain information appears only when the related function is active. This concerns "Term1" and "Term2", which show the related "Eco" and "Comf" target temperatures.

"Num" shows the phone number that is to receive alarm messages.

E.g.: "1234 S1"
E.g.: "1234 S1 S2"

C – Change the personal access code

C is followed by a new 4-digit personal access code.

E.g.: "1234 C9898" changes the code from 1234 to 9898.

N – GSM number receiving alarm messages

GSM Fixi SMS needs to know to which mobile phone number it is to send its alarm and error (in case of an overload) messages. In contrast, normal status messages are returned as replies directly to the phone, which sent the request (command "S"). The phone number is always terminated by a "#" character.

When an alarm is triggered on the alarm input, a message with a customized text (see command P) will be sent.

E.g.: "1234 N12345678#" stores phone number 12345678.

O – Power outage warnings

GSM Fixi SMS can send an alarm message in case of power outage on its 230VAC power supply, and send another message when the power is restored. This requires an optional backup battery to be connected to the 12-15V DC power supply.

E.g.:   "1234 O1"   activates power supply warnings.
E.g.:   "1234 O0"   deactivates power supply warnings.

A – Alarm input

GSM Fixi SMS has a digital input for transmitting alarms by SMS. Command **A** activates and deactivates this input; when deactivated, the input is simply ignored. When an alarm is triggered, the unit will address a message to the phone number previously stored with command N.

E.g.:   "1234 A1"   activates the alarm input.
E.g.:   "1234 A0"   deactivates the alarm input.

P – Text for alarm messages

Command P changes the text that will be sent each time an alarm is triggered through the alarm input. The text can be up to 25 characters long; always terminate it with character "#".

E.g.:   "1234 PIntrusion in the hall#"

J – Limits for temperature surveillance

GSM Fixi SMS can monitor the temperature and send an alarm message when a given limit is exceeded. A lower and an upper limit (between –28ºC and +49ºC) can be set. NB: each time a limit is reached and an alarm message sent, temperature surveillance will be **deactivated**. Use command L to reactivate it if necessary.

Up to two temperature sensors can be employed, each with its own surveillance limits.

E.g.:   "1234 J1+05+30" sets +5˚C as lower and +30˚C as upper limits on sensor 1.
E.g.:   "1234 J2-07+25" sets -7˚C as lower and +25˚C as upper limits on sensor 2.

L – Activate/deactivate temperature surveillance

NB: For temperature surveillance to be possible, one or two temperature sensors must be connected to the unit, and the receiver of alarm messages defined with command N. Should you want surveillance of only one limit, then set the other limit low or high enough to ensure that it will never be exceeded. Please also read the caveats below.

L is followed by the temperature sensor input (1-2) and by **1** for *on* or **0** for *off.*
Remember to check the limits and, if necessary, to adjust them with command J.

E.g.: "1234 L11"   activates temperature surveillance on sensor 1.
E.g.: "1234 L10"   deactivates temperature surveillance on sensor 1.
E.g.: "1234 L21"   activates temperature surveillance on sensor 2.
E.g.: "1234 L20"   deactivates temperature surveillance on sensor 2.

5.1. Caveats

- In an SMS, 1 always means *ON* and 0 (zero) is always *OFF.*
- Uppercase and lowercase letters can be used equally in commands.
   E.g., "S" is the same as "s".
- The 4-digit personal access code always comes as the first 4 characters of a message.
- Space characters (blanks) may be used between commands, but not inside a command: "1234 R11 S" is valid, but "1234 R 11 S" will not be understood.
- When a message contains several commands, the unit will execute them sequentially from left to right.
- Temperatures can only be read if a sensor is connected. Temperatures can be measured in the range of -28ºC to +49ºC. Status messages will show an "X" instead of a temperature whenever a sensor is missing.
- Measured temperatures depend on the location of the sensor. There may be a difference of 2-3 degrees, depending on whether the sensor is placed high or low in a room. The precision of the sensor is +/- 2 degrees.
- Always wait 1 minute or more between each SMS message sent to GSM Fixi SMS (in case of network overload).
- An alarm message will be sent each time the alarm input senses a change (either a short-circuit or an interruption, depending on the kind of detection loop), provided that the input has been activated (command A). The input will be reset when the alarm condition ceases. This means that only one message will be dispatched as long as the input has not reverted to its normal state.

6. Preconditions and Advice

For your system to work satisfactorily, a **good coverage of the relevant GSM network** is needed. No contact can be established if the coverage is too weak. This also is a requirement for sending SMS messages. Once a message has been sent off by the device, it is under the control of the current network operator. The SMS will not be delivered in case of errors within the GSM network, or similar issues under the responsibility of the operator. When the GSM network is heavily loaded, it may take several minutes (or even hours) for an SMS message to be delivered. These are conditions that Sikom AS cannot do anything about. The dispatch date and time of the message are nevertheless visible at delivery.

In conformance with legal regulations, network operators are free to cease certain GSM services. Sikom AS is not a provider of GSM services and can therefore not be held liable for any changes of such services. Notifications should nevertheless be published long before such events take place (2 years or so).

If you opt for a **prepay** solution, remember that it must be recharged with communication credits before use. Information on this procedure comes with the SIM card. If the credit gets exhausted, GSM Fixi SMS will give no information about this, since it will then not be able to send out any SMS message. To check the remaining credit, it is sometimes necessary to pull out the SIM card and insert it into a usual mobile phone; instructions on how to do this follow your mobile phone and/or SIM card.

In the event of an **overheating** condition, GSM Fixi SMS will send an SMS message with the text "Warn!". The device will then enter a special mode where all LEDs will blink and no local or remote control will be possible. It is then necessary to power off the unit and check the load.

The slave relay module GS-33 has its own internal protection, which will trigger a pause and then restart the module once the internal temperature is back to normal levels.

7. Frost Protection: Important Information

The thermostatic regulation offered by Sikom devices may be used to maintain a base temperature in your premises, but **must not be taken as an infallible frost protection**.

Indeed, any electronic equipment is vulnerable to power surges and other perturbations that may come from the electricity network, e.g. due to lightning. In such an event, if the electronics is damaged, it may no longer ensure the thermostatic regulation, and hence the frost protection.

Therefore, if frost protection is a critical requirement (such as around water pipes), it is recommended to add a security mechanism. These are some alternatives:
- Use an additional heating system, with its own thermostat, to ensure frost protection in critical premises.
- Install a protection against power surges and other perturbations from the electricity network.
- Set up a bimetal thermostat in parallel with your Sikom unit.

Sikom and its representatives will not assume liability for any damage due to frost!

8. Technical specifications

Manufacturer:	Sikom AS, Norway
Type/Model:	GSM Fixi SMS / 300-8090V18 and 300-8090V19
Power supply:	230V/50Hz or 12-15 V DC
Consumption:	60mA (in standby with no active relays)
	Each relay consumes 30mA
Output relays:	2 on GSM Fixi SMS, extensible to 5 with one GS-33 module
Max switching power:	16A/230V (resistive, each relay)
Inputs:	2 analogic (for temperature sensors) and 1 digital (alarm)
Temperature sensors:	10K NTC at 25°C
Temperature reading:	–28ºC to +49ºC ±2°C
GSM standard:	Dualband 900/1800 MHz
Antenna:	GSM with MMCX connector
Operating temperature:	-20ºC to +50ºC
Storage temperature:	-40ºC to +70ºC
Dimensions:	70 x 90 x 58 mm (4 DIN modules)
Weight:	375g

GSM Fixi SMS is designed for indoor (distribution board/fuse box) installation only.
This equipment complies with the European R&TTE directive.
Further information may be obtained by contacting www.EcoStarter.com or the manufacturer:

> Sikom AS (www.sikom.no)
> Neptunveien 6
> 7650 Verdal
> Norway

9. Warranty

Sikom A.S. products are covered by a two years warranty against any faults due to material flaws or manufacturing errors, which limit or render useless certain functions described for the product. The warranty requires the customer to present the original bill, with date of purchase and type of equipment clearly readable.

What is covered by the warranty?
During the warranty period, Sikom A.S. reserves the right to repair the product or to replace defective parts with functionally equivalent parts. If, after several attempts, Sikom A.S. is unable to correct the problem, and the product does not work as described in the manual, Sikom may elect to refund the purchase price or to replace the product with a functionally equivalent one. All replaced parts and products become the property of Sikom A.S.

What is not covered by the warranty?
- Indirect damage to life, health, property, revenue and environment caused by circuits and appliances connected to the unit (install and use this product responsibly).
- Costs related to (re)installing, transporting and dismantling units; recycling may be governed by special rules (see the relevant chapter).
- Damages caused by use outside of the operating conditions specified in the manual.
- Malfunctions caused by transport damages.
- Any unauthorized repair, modification or disassembly.
- Use of non-original parts.
- External factors, such as lightning, power supply issues, mobile network issues, flood damage or fire.
- Units with modified, removed or unreadable serial number.

Sikom assumes no responsibility for any errors that may appear in this manual.
Information contained herein is subject to change without notice.

10. Recycling information

Waste Electrical and Electronic Equipment (WEEE) Symbol

The WEEE (Waste Electrical and Electronic Equipment) symbol indicates that this product must not be disposed of along with other household waste. It is the customer's responsibility to dispose of the product properly by taking it to a designated site for recycling. To locate a recycling/disposal site near you, contact your local city recycling program, your regular waste disposal service or the agent from whom you purchased this product.

For Switzerland, this product includes in its purchase price a contribution (the advanced recycling fee) to the SWICO Recycling Warranty, which means that used equipment can be handed in free of charge for recycling. Collection sites are listed at www.swicorecycling.ch.