
EL35.017



GSM Remote Control

USER'S GUIDE

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Notes

All information contained in this manual is subject to change without prior notice.

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Acronyms and Definitions

SMS: Short Message Service

GSM: Global Standard for Mobile Communications

LED: Light Emitting Diode

SIM: Subscriber Identification Module

Foreword

Safety Information

The GSM EL35.017 remote control is a low-power radio frequency transreceiving device.

If the device is installed close to radios, televisions, telephones or electronic devices in general, it may cause interference.

Do not install the EL35.017 device close to pacemakers, auditory prostheses or medical devices in general, on aeroplanes, in the presence of inflammable gases or fumes.

The EL35.017 remote control operates by means of a radio signal, no mobile telephone operator is capable of ensuring a connection at all times. For this reason, the EL35.017 device is not suitable for use in systems providing emergency call service.

Installation Conditions

In order to ensure the operator's safety and the correct operation of the EL35.017 device, the device should be installed exclusively by qualified staff. The rules listed below should also be strictly observed.

Environmental conditions

The EL35.017 device (the instrument and all cables connected to it) should be installed in places far from:

- dust, humidity, great heat;
- direct exposure to sunlight;
- objects radiating heat;
- objects generating a strong electromagnetic field;
- liquids or corrosive chemical substances.

The EL35.017 device has been designed to operate at a temperature between -5°C and +45°C (standard working temperature).

Avoid sudden changes in temperature and/or humidity.

Degree of protection

During the installation of the EL35.017 device, the following degree of protection is to be ensured:

- IP40: minimum degree of protection, which must always be guaranteed;
- IP54: protection to be guaranteed when using the device outdoors.

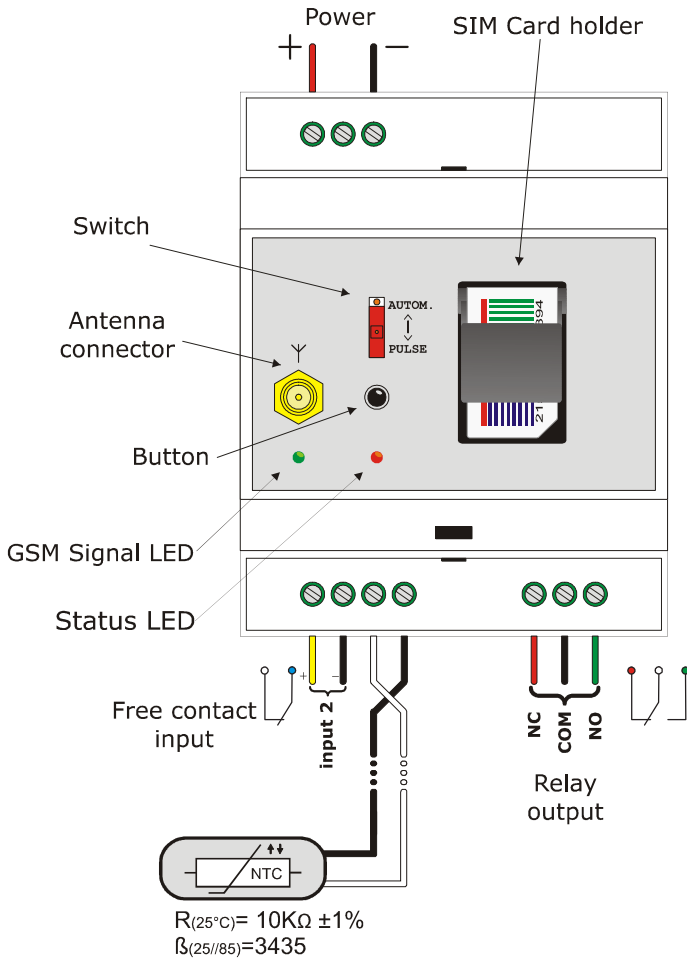
Power supply

Observe the following rules:

- do not use cables longer than 3 m;
- use an external power supply unit that complies with the EN 60950 Directive (electrical safety);
- do not invert the polarity of the power supply cables.

Installation

The following table shows the position of all inputs of EL35.017 remote control.



| Contact n° | Description | |
|------------|-------------|-------------------------|
| 1 | Not used | |
| 2 | + pole | n°2 input |
| 3 | - pole | |
| 4 | + pole | n°1 input: NTC probe |
| 5 | - pole | |
| 6-8 | Not used | |
| 9 | NC | n°1 output |
| 10 | COM | |
| 11 | NA | |
| 12-13 | Not used | |
| 14 | + pole | Power supply |
| 15 | Not used | |
| 16 | - pole | Power supply |
| 17-24 | Not used | |

Voltage-free contact inputs

Connect the following switches:

- mechanical and electromechanical with suitable ratings: 5V DC min. 500µA;
- electronic with suitable ratings: 5V DC min. 500µA. Observe the polarity given alongside.

Status:

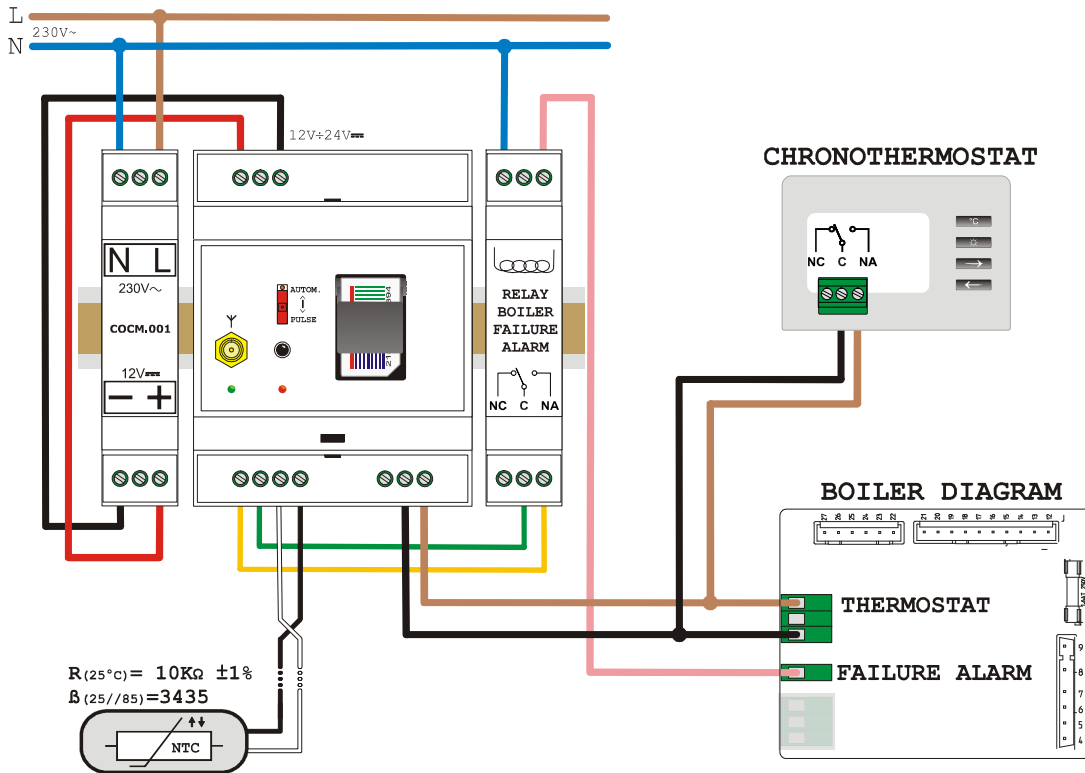
- ON : closed
- OFF : open

Installing the SIM CARD

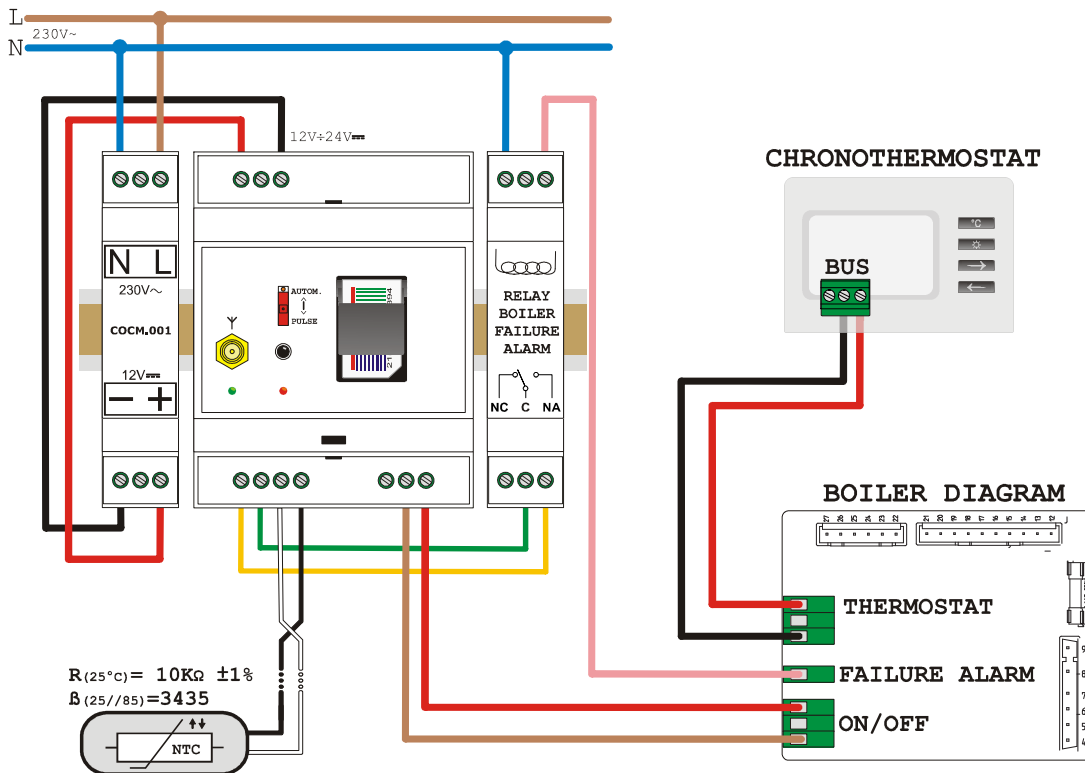
1. disable the PIN code of the SIM CARD using a mobile phone
2. disable all additional functions from the SIM card (e.g. answering machine or missed call notification, etc.)
3. insert the SIM Card in its slot

Most common installations

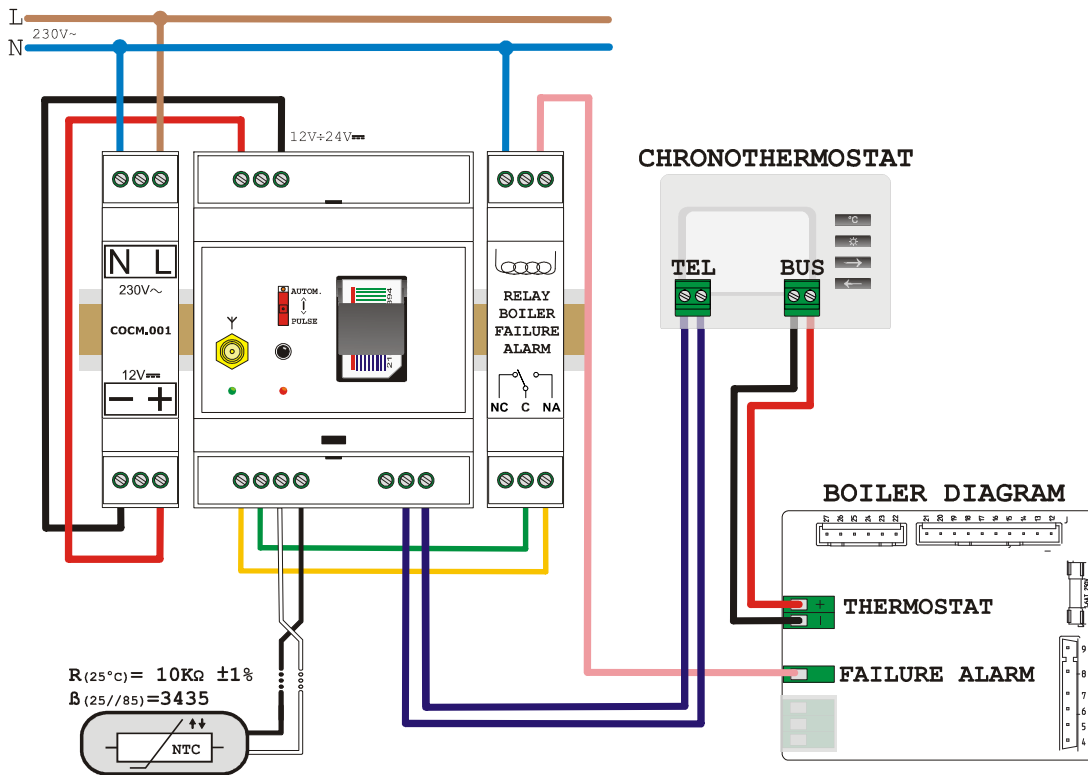
1. How to connect in parallel with the Chronothermostat.



2. How to connect directly a boiler with chronothermostat on BUS.

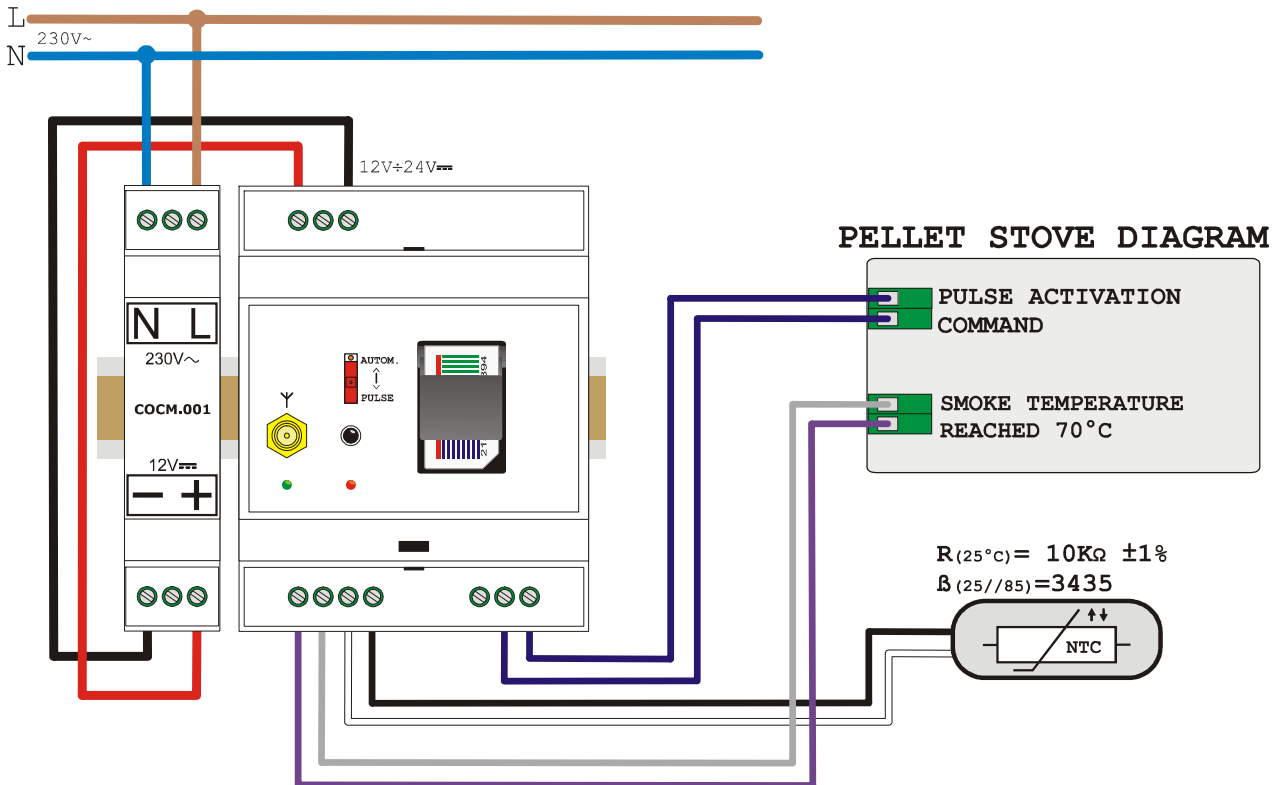


3. How to connect, through a phone line, a boiler with a chronothermostat on BUS.



NOTE: In this mode the AUTOMATIC and ANTI-FREEZING function cannot be used as the temperature control belongs to the external chrono-thermostat.

4. How to connect a pellet stove and receive the SMS confirming that the stoves reaches the working temperature.



EL35.017

The GSM EL35.017 remote control is used for remotely switch on/off devices such as boilers, heat pumps, pellet stoves, etc. by SMS or telephone RING.

The EL35.017 has:

- one output relay, (to switch the contact or generate a pulse);
- one free contact alarm input, able to send an alarm SMS up to three users, both on opening and closing the contact;
- external temperature probe. The device is able to keep an anti-freezing or a comfort temperature.

Working Mode (Automatic or Pulse)

AUTOMATIC Mode

This mode is usually used to switch on/off heating boilers.

It is possible to:

- switch on /off the output relay by SMS;
- check the temperature through an external NTC probe;
- switch on /off the output relay depending on the temperature (comfort or anti-freezing temperature).
- Receive an alarm SMS (Anti-freezing alarm) when the temperature reach one degree less than the anti-freezing temperature.

PULSE Mode

This mode is usually used to switch on the pellet stoves.

It is possible to:

- generate a pulse for 1 to 9 seconds, through a RING or an SMS;
- check the temperature through an external NTC probe;
- Receive an alarm SMS (Anti-freezing alarm) when the temperature reach one degree less than the anti-freezing temperature.

How to select the working mode

Select the working mode through the switch on the front panel (see page 4).



Status LED

The status Led (see page 4) shows the output relay status:

- RED light: N.O. and COM terminals open, N.C. and COM closed.
- GREEN light: N.C. and COM terminals open, N.O. and COM closed.

Alarm input

EL35.017 has an alarm input (see picture page 4) able to send an alarm SMS to up to three users (see users list), both on opening and closing the contact and also resuming the current status of input, output and which functions are on.

| Event | Reply |
|----------------|---|
| Input 2 closed | INPUT: CONTACT CLOSED OUT: ON Ta: +21,6C INPUT: CLOSED |
| Input 2 open | INPUT: CONTACT OPENED OUT: ON Ta: +21,6C INPUT: OPEN |

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It is possible to modify the alarm message text by SMS (max 100 characters):

| Command (password=0000) | Reply | Description |
|----------------------------|----------------------------|--|
| 0000#S1:xxxx | NEW SMS INSERTED: S1: xxxx | Modify the text of the CONTACT CLOSED message. |
| 0000#S2:yyyy | NEW SMS INSERTED: S2: yyyy | Modify the text of the CONTACT OPEN message |

User list

List of users enabled to the RING function and to receive the alarm and anti-freezing alarm SMS.

To use the RING function, that means to send the command by a phone ring (see RING function), to receive the alarm SMS (opening/closing of the input contact), and the Anti-freezing alarm, it must be set, by SMS, a list of enabled users, as shown in the following table.

In the first 3 positions you have to insert the phone numbers enables to both SMS function (to receive alarm SMS) and RING function.

In the positions from 4 to 9 you have to insert the phone numbers enabled only to the RING function.

| Command (password=0000) | Description |
|----------------------------|---|
| 0000#Ux:+39328035001 | Insert in the x position (from 1 to 3) the number enabled to SMS and RING functions |
| 0000#Ux:+39328035005 | Insert in the x position (from 4 to 9) the number enabled only to the RING function |
| 0000#Ux | Cancel the number in position x |
| 0000#U? | Ask the user list resume |

All the above mentioned messages are followed by a reply SMS with the user list.

AUTOMATIC Mode

The automatic mode let to switch on/off the output relay by SMS or automatically, depending on the room temperature (AUTOMATIC function).

The AUTOMATIC function close the output relay when the room temperature T_a is lower at least $0.5\text{ }^\circ\text{C}$ then the set temperature T_h (default 20°C) and open the relay when the room temperature T_a is $0.5\text{ }^\circ\text{C}$ higher than T_h .

The anti-freezing function T_f close the output relay when the room temperature T_a is lower than the set temperature T_f (default 6°C) and open the relay when the room temperature T_a is 1°C higher than T_f .

The anti-freezing alarm function sends an SMS to the enabled users (see user list page 8), if the room temperature reaches 1°C less than the anti-freezing T_f . The Message will be re-sent every 15 minutes.

Command SMS

EL35.017 receives the commands by SMS, sent to the phone number of the SIM inserted in the device. The command SMS format is:

| | | |
|----------|---|---------|
| PASSWORD | # | COMMAND |
|----------|---|---------|

PASSWORD : is the set password, composed by four digits (default: 0000)

or *.* : it is a separator (mandatory)

COMMAND : it is one of the command listed below

After receiving any command, the device reply to the number that sent the command, with an SMS to confirm the receipt of the command and summarizing the output relay status, the room temperature, the input status (IN: OPEN or IN:CLOSED) and if AUTOMATIC T_h , anti-freezing T_f and anti-freezing alarm T_n functions are enabled.

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| Command (password=0000) | Reply | Description |
|----------------------------|---|---|
| 0000#1 | OUT: ON Ta:+24,5C INPUT: OPEN | Switch on the relay output. It also disable the AUTOMATIC Th function. |
| 0000#0 | OUT: OFF Ta:+24,5C INPUT: OPEN | Switch off the relay output. It also disable the AUTOMATIC Th function. |
| 0000#? | OUT: OFF Ta:+24,5C INPUT: OPEN | Ask for the status of the device |
| 0000#A | OUT: ON Ta:+19,5C Th:+20C INPUT: OPEN | Enable the AUTOMATIC Th function at the set Th temperature (default 20°C). |
| 0000#Axx | OUT: ON Ta:+19,5C Th:+23C INPUT: OPEN | Set the Th temperature at the “xx” value (ex. 23; always two digits) and enable the AUTOMATIC function. |
| 0000#F | OUT: OFF Ta:+22C Th:+20C Tf:+6C Tn:ON INPUT: OPEN | Enable the ANTI-FREEZING Tf function (default 06°C). Also enable the ANTI-FREEZING ALARM Tn function. |
| 0000#Fxx | OUT: OFF Ta:+22,5C Th:+20C Tf:+xxC Tn:ON INPUT: OPEN | Set the Tf temperature at the “xx” value (ex. 06; always two digits) and enable the ANTI-FREEZING function and the ANTI-FREEZING ALARM Tn function. |
| 0000#F0 | OUT: OFF Ta:+22,5C Th:+20C INPUT: OPEN | Disable the ANTI-FREEZING Tf and the ANTI-FREEZING ALARM Tn functions. |
| 0000#N0 | OUT: OFF Ta:+22C Th:+20C Tf:+6C INPUT: OPEN | Disable the ANTI-FREEZING ALARM Tn function. |
| 0000#N1 | OUT: OFF Ta:+22C Th:+20C Tf:+6C Tn:ON INPUT: OPEN | Enable the ANTI-FREEZING ALARM Tn function. |
| 0000#P:xxxx | NEW PASSWORD: xxxx | Modify the password (ex. with old password 0000). WARNING: the password must be four digits. |
| 0000#L0 | OUT: OFF Ta:+24,5C INPUT: OPEN | Set the replies in the English language. |
| 0000#L1 | STATO: SPENTO Ta:+24,5C IN: APERTO | Set the replies in the Italian language (default) |

Note: “Ta” is the room temperature

RING function

The AUTOMATIC function can be enabled or disabled also by a RING from an enabled user (see User list page 8). When the device receive a RING, it enable (or disable, if it is already enabled) the AUTOMATIC function and sends, to the phone that did the RING, an SMS that summarize the relay status and the enabled functions.

Manual switching

It is possible to manually switch the output relay by pressing the button (see picture page 4) for 2-3s. **WARNING: the manual switching unable the AUTOMATIC function.**

PULSE Mode

In the pulse mode you can generate a pulse by SMS or RING (see user list page 8). The **Anti-freezing alarm function** sends an SMS **to the enabled numbers** (see User list page 8), when the room temperature reaches 5C. The SMS will be resend every 15 minutes.

Command SMS

EL35.017 receives the commands by SMS, sent to the phone number of the SIM inserted in the device. The command SMS format is:

| | | |
|----------|---|---------|
| PASSWORD | # | COMMAND |
|----------|---|---------|

PASSWORD : is the set password, composed by four digits (default: 0000)
or . : it is a separator (mandatory)
COMMAND : it is one of the command listed below

After receiving any command, the device reply to the number that sent the command, with an SMS to confirm the receipt of the command and summarising the output relay status (always OFF), the room temperature Ta, if the anti-freezing alarm Tn function is enabled and the input status (IN: APERTO or IN:CHIUSO).

| Command (password=0000) | Reply | Description |
|--------------------------------|--|---|
| 0000#Bx | PULSE OK: xs OUT: OFF Ta:+24,5C INPUT: OPEN | Generate a pulse “x” seconds long (from 1 to 9s). It is also set the pulse duration (for RING function) to “x” seconds. |
| 0000#N0 | OUT: OFF Ta:+24,5C INPUT: OPEN | Disable the anti-freezing alarm function |
| 0000#N1 | OUT: OFF Ta:+24,5C Tn: ON INPUT: OPEN | Enable anti-freezing alarm function at the temperature of 5°C. |
| 0000#? | OUT: OFF Ta:+24,5C Tn: ON INPUT: OPEN | Require the device status. |
| 0000#P:xxxx | NEW PASSWORD: xxxx | Modify the password (ex. with old password 0000). WARNING: the password must be four digits. |
| 0000#L0 | OUT: OFF Ta:+24,5C Tn: ON INPUT: OPEN | Set the replies in the English language. |
| 0000#L1 | STATO: SPENTO Ta:+24,5C Tn: ON IN: APERTO | Set the replies in the Italian language (default) |

RING function

When the remote control receives a RING from an enabled telephone (see User List page 8), it generate a pulse for the required duration (default 5s). After the RING, the device also send, to the phone that did the RING, an SMS resuming all the functions on.

Manual use

It is possible to generate a pulse by pressing the button (see picture page 4) for 2-3s.

Default settings

To reset the devise with all the default settings:

1. cut the power;
2. push and keep pushed the button;
3. power the device keeping the button pushed until the Status LED will be and remain red;
4. release the button.

Warning: the above procedure reset the password to 0000, disable all functions, reset di alarm SMS text and cancel the user list.

NTC temperature probe

WARNING: if the probe is missing or damaged (leaving the circuit open), the devise read and operate as if the temperature is -20C.

| | |
|------------------------------|--|
| Kind of NTC | $R(25^{\circ}\text{C})= 10\text{K}\Omega \pm 1\% \beta(25//85)=3435$ |
| Range of reading | $-20^{\circ}\text{C} \div +50^{\circ}\text{C}$ |
| Input 1 without probe (open) | -20°C |
| Input 1 shorted | $+50^{\circ}\text{C}$ |

| Temp (°C) | Resistance (Ω) |
|-----------|----------------|
| -20 | 67698 |
| -19 | 64527 |
| -18 | 61520 |
| -17 | 58670 |
| -16 | 55967 |
| -15 | 53403 |
| -14 | 50970 |
| -13 | 48661 |
| -12 | 46468 |
| -11 | 44386 |
| -10 | 42409 |
| -9 | 40530 |
| -8 | 38744 |
| -7 | 37046 |
| -6 | 35431 |

| Temp (°C) | Resistance (Ω) |
|-----------|----------------|
| -5 | 33896 |
| -4 | 32435 |
| -3 | 31045 |
| -2 | 29721 |
| -1 | 28461 |
| 0 | 27261 |
| +1 | 26118 |
| +2 | 25029 |
| +3 | 23991 |
| +4 | 23001 |
| +5 | 22058 |
| +6 | 21158 |
| +7 | 20299 |
| +8 | 19480 |
| +9 | 18698 |

| Temp (°C) | Resistance (Ω) |
|-----------|----------------|
| +10 | 17951 |
| +11 | 17239 |
| +12 | 16558 |
| +13 | 15907 |
| +14 | 15286 |
| +15 | 14692 |
| +16 | 14124 |
| +17 | 13581 |
| +18 | 13062 |
| +19 | 12565 |
| +20 | 12089 |
| +21 | 11634 |
| +22 | 11199 |
| +23 | 10782 |
| +24 | 10383 |

| Temp (°C) | Resistance (Ω) |
|-----------|----------------|
| +25 | 10000 |
| +26 | 9633 |
| +27 | 9282 |
| +28 | 8946 |
| +29 | 8623 |
| +30 | 8314 |
| +31 | 8017 |
| +32 | 7732 |
| +33 | 7459 |
| +34 | 7197 |
| +35 | 6945 |
| +36 | 6704 |
| +37 | 6472 |
| +38 | 6249 |
| +39 | 6035 |

| Temp (°C) | Resistance (Ω) |
|-----------|----------------|
| +40 | 5829 |
| +41 | 5632 |
| +42 | 5442 |
| +43 | 5259 |
| +44 | 5084 |
| +45 | 4915 |
| +46 | 4753 |
| +47 | 4596 |
| +48 | 4446 |
| +49 | 4301 |
| +50 | 4162 |
| | |
| | |
| | |

Ratings

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|----------|-----------|-----------------------|--------------|-------------|----------------|----------------------|---------------------|---------------|-----|--|-------------|-----------------------------|-----|------------------------------|---------|--|-----|------------------|------------|----------------------|------------------------------|--|----------------------------|------|--------|--------------------------------------|-------------------|---|--|---|--|
| Main characteristics | <ol style="list-style-type: none"> 1. Enclosure for EN-50022 rail, 4 modules, UL94V-0 2. max. conductor size: 2.5mm² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GSM section | <ul style="list-style-type: none"> • GSM Siemens TC35i module • Dual Band EGSM 900 and GSM 1800 • Certified for GSM Phase 2/2+ • Power output: <ul style="list-style-type: none"> - Class 4 (2W) for EGSM 900 - Class 1 (1W) for GSM 1800 • SMS: MO, MT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power supply | <ul style="list-style-type: none"> • Supply voltage: 12V÷24V DC • Current: 500mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output | <p>Contact data</p> <table border="0"> <tr> <td>Contact configuration</td> <td>1 CO contact</td> </tr> <tr> <td>Contact set</td> <td>single contact</td> </tr> <tr> <td>Type of interruption</td> <td>micro disconnection</td> </tr> <tr> <td>Rated current</td> <td>16A</td> </tr> <tr> <td>Rated voltage / max switching voltage AC</td> <td>240/400 VAC</td> </tr> <tr> <td>Limiting continuous current</td> <td>20A</td> </tr> <tr> <td>Maximum breaking capacity AC</td> <td>4000 VA</td> </tr> <tr> <td>Limiting making capacity, max 4 s, duty factor 10%</td> <td>30A</td> </tr> <tr> <td>Contact material</td> <td>AgNi 90/10</td> </tr> <tr> <td>Mechanical endurance</td> <td>> 5 x 10⁶ cycles</td> </tr> <tr> <td>Rated frequency of operation with / without load</td> <td>6 / 1200 min⁻¹</td> </tr> </table> <p>Contact ratings</p> <table border="0"> <tr> <td>Load</td> <td>Cycles</td> </tr> <tr> <td>20A, 250VAC, NO contact, 85°C, UL508</td> <td>6x10³</td> </tr> <tr> <td>Pilot duty A300 (NO contact), B300 (CO/NC contact), UL508</td> <td></td> </tr> <tr> <td>1hp @ 240 VAC, 1/2hp @ 120 VAC, NO contact, UL508</td> <td></td> </tr> </table> <p>We do not recommend exceeding a load of 10A per relay.</p> | | | Contact configuration | 1 CO contact | Contact set | single contact | Type of interruption | micro disconnection | Rated current | 16A | Rated voltage / max switching voltage AC | 240/400 VAC | Limiting continuous current | 20A | Maximum breaking capacity AC | 4000 VA | Limiting making capacity, max 4 s, duty factor 10% | 30A | Contact material | AgNi 90/10 | Mechanical endurance | > 5 x 10 ⁶ cycles | Rated frequency of operation with / without load | 6 / 1200 min ⁻¹ | Load | Cycles | 20A, 250VAC, NO contact, 85°C, UL508 | 6x10 ³ | Pilot duty A300 (NO contact), B300 (CO/NC contact), UL508 | | 1hp @ 240 VAC, 1/2hp @ 120 VAC, NO contact, UL508 | |
| Contact configuration | 1 CO contact | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contact set | single contact | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type of interruption | micro disconnection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated current | 16A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated voltage / max switching voltage AC | 240/400 VAC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Limiting continuous current | 20A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum breaking capacity AC | 4000 VA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Limiting making capacity, max 4 s, duty factor 10% | 30A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contact material | AgNi 90/10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mechanical endurance | > 5 x 10 ⁶ cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated frequency of operation with / without load | 6 / 1200 min ⁻¹ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Load | Cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20A, 250VAC, NO contact, 85°C, UL508 | 6x10 ³ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pilot duty A300 (NO contact), B300 (CO/NC contact), UL508 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1hp @ 240 VAC, 1/2hp @ 120 VAC, NO contact, UL508 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Voltage-free contact inputs | <ul style="list-style-type: none"> • Current ring: 5V DC min, 500µA min • Cable length < 30m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Current drawn (typical values) | | Power=9V | Power=30V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Standby | 50mA | 30mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Send\Receive SMS | 120mA | 65mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

CE Declaration of Conformity

ElettroTERM Srl hereby declares that the EL35.017 device complies with the essential requirements and other applicable provisions laid down by Directive 199/5/EC and, in particular, those indicated in the following Reference Standards:

EN 301 489-7 V1.1.1 (2000-09)

EN 301 511 V7.0.1 (2000-12)

EN 60950 (2000)

WEEE Eco-contribution paid where due – WEEE register no.: IT08020000003625