

TELE-LOG "C3"

The heating GSM remote control.

Doc v.00e sw 3.03 28/08/2005



PRESENTATION.

With reference to the previous basic version "Tre" the "C3" has been equipped with:

- two inputs to detect alarms, typically the burner abnormal signal and (maybe) a burglar alarm,
- Three outputs 1 (A) thermostat, 2 (B) auxiliary out and 3 (C) enabled to supply a pulse.

The "C3" new model has been also appreciated in the professional field of centralised heating surveillance. The Pt100 sensor with adequately lengthened cable can measure pipe temperature up to 100C and send the essential information of the heating plant.

The high reliability and in particular: the periodic battery test, double temperature sensor and all the care we have taken to ensure uninterrupted proper working in unmanned sites make the "C3" an excellent choice both for the second house and for the remote surveillance of large heating plants as well. All of this with simplicity and easy of use.

INSTALLATION AND USE.

For the use in the second house it is advisable to conserve the existing ambient thermostat because the equipment is not provided with local buttons to set the temperature; in practice you need to intercept the wires to the thermostat and to connect them as in figure 1.

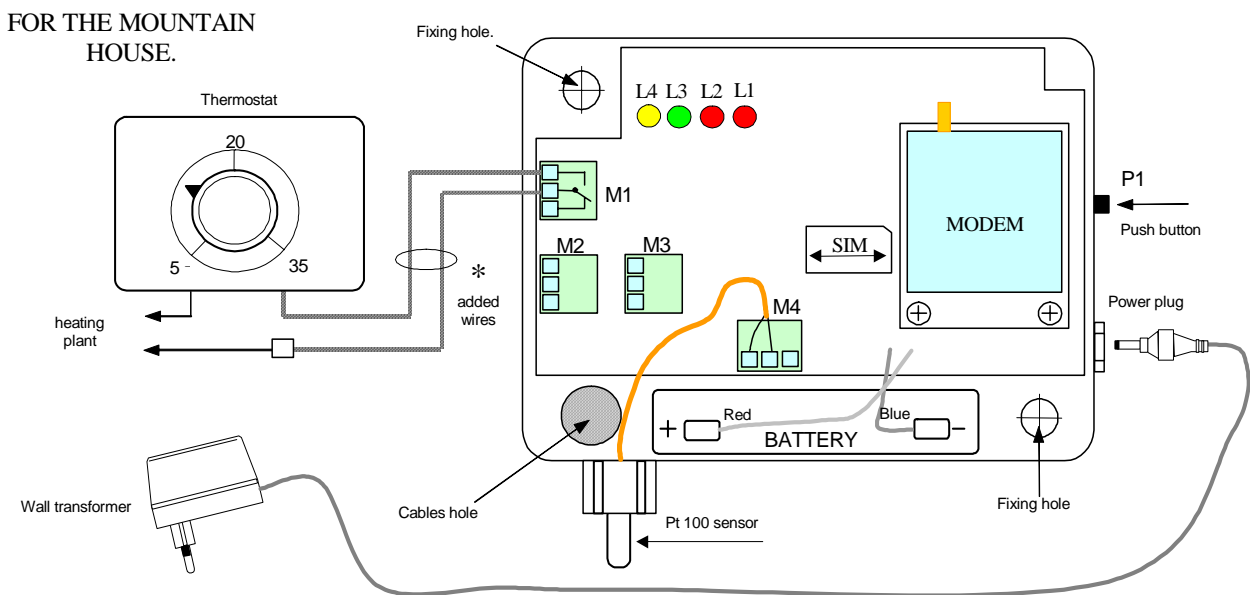


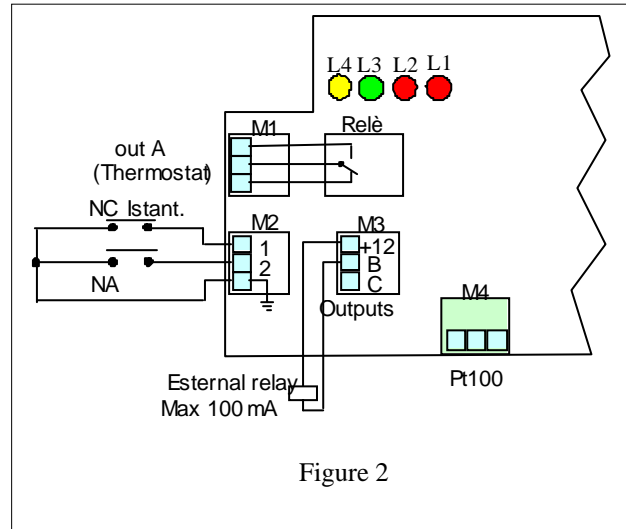
figure 1

* Added wires shown with dashed lines.

Ambient temperature will be normally controlled by your thermostat as far as the output contact is closed on your command. When you are present you can close and open (activate or switch off) using lateral switch P1 or:

The output 1A (thermostat enable) can be remotely commanded with a SMS containing “on” or “off”.

To connect the inputs you have to keep in mind that the generic alarm at the point M2-1 is in normal condition when closed to ground and its intervention is immediate (few seconds), while the input M2-2 usually assigned to the burner malfunction, is normally open . Its intervention is deferred two minutes to prevent false alarms.



PRELIMINARY TEST

You need a SIM enabled and active. To make it sure test the SIM on a self phone; make a call to it with another phone and check the call arrives regularly.

- **Important:** the “PIN CODE” must be disabled before the SIM is inserted in the equipment.

This can be done through the menus of any phone.

Verify you can make a call using the SIM in your phone and, most of all, check the possibility of receiving and sending SMS's.

If the SIM has been purchased expressly for the Tele-log, remember that it is not immediately active. It takes an amount of time depending by the provider.

Attention! Before to apply power insert the SIM as in picture 1. Never extract or insert the SIM with the power already applied. Then :

- Insert the power jack in the lateral plug
- Connect the power plug in a 230 Volt outlet
- Connect battery wires, red to the plus black to the minus.

Beware! The reversed polarity can cause severe damage to the equipment.

The LED's will lit sequentially and the red one marked L1 will begin to show an “I” in Morse code: two short flashes.

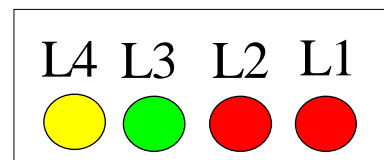
You can immediately change the output states that have now been restored as they were at the moment of the last power off. Pushing sequentially the button verify that LED L3 changes its state. You will hear also the “click” of the relay. Every two changes of state of L3 there will be a change of L4, allowing you to reach any combination of outputs by means of a single button.

Meanwhile the red LED L1 will pass through the initialisation phases showing the letters A (dah di), B (dah di), C (dah di dah di) and finally D (dah di di).

The red LED L2 will show now the GSM signal strength with a sequence of short flashes, from none to seven.

The overall sequence could take twenty or thirty seconds or even more, depending on the network.

While the main supply is missing (working with the sole battery) light intensity is reduced to save energy.



Using your self phone, make a call to the number of the SIM you've inserted in the Tele-log. The call will be rejected (no charge) and the LED L1 will suspend its blinking. Within a few seconds, normally, you will receive on your phone a message like this:

| | |
|----------------------------|---|
| Out1=on | actual state of the output A |
| Out2=off | actual state of the output B |
| measured=21.4C | temperature as sensed by the Pt100. |
| int=22.3C | temperature from the sensor in the box. |
| field=21 | GSM field strength scale from 0 a 32 |
| thermst1=7.0C | set value for the antifreeze function, probe pt100 out1 |
| thermst2=5.0C | set value for the antifreeze function internal sensor out 2 |
| batt. 6762mV 12.2mA | voltage and current measured on the battery |

BASIC COMMANDS

Using the lateral push button P1, leave the LED L3 and L4 off .

Now send, using your self phone, the simple message **"on"**.

You can use capital letters or not, or even other forms. No preambles, passwords or other requirements.

Here follows all the forms the tele-log can recognise for the switch-on command.

ON, ACCENDI , ACC , ACCND, ACCNDI , INPIZA, IMPIE, INPISA, INPIZ , APPICCIA, APPIC , INVISCA, ENVISCA, NVISCA , ALLUMEZ, MARCHE, ALLUME , ON. All of them are equivalent.

Wait the necessary time to deliver and to receive the message... The green LED L3 will lit and the output relay will be energised.

Now try to switch off using one of the following:

OFF, SPEGNI , SMORZA, SMORSA , STUTA , STUDE, DISTISA, DISTISSA, DESTISA , DSTS, ARRETE .

The basic simple commands on and off are to be sent alone, that means one in a SMS, if such a command is found at the beginning of a message the remainder of it is simply ignored.

RESTRICTING UNAUTHORISED ACCESS.

The device so far accepts commands coming from any self phone because no number has been registered yet. To limit the access to your phones only, you have to enrol one or more numbers, up to five.

These will be the sole to be recognised and authorized. All the calls from any other number will be ignored and all SMS will be simply cancelled.

In order to set your numbers in the tele-log you have send a message with the following format:

+++ N1nnnnnnnnnn N2mmm....

And so on up to five numbers; the sequence in unnecessary, you can mention N5 as the first and modify one to five number in a single SMS, in any order. It is advisable to use the international prefix but not necessary if the phone is the Italian +39; it is necessary in any other case to complete with the preamble.

Beware! Check the correctness of the numbers you are going to issue or you could even lock the device on inexistent numbers. Always load at least two numbers. To simply cancel a number use the form N1 or N2 or other position followed by three spaces.

The preamble +++ can be substituted by *** ore by the word SET. They are perfectly equivalent.

This preamble is necessary to issue the commands to modify the enrolled number or even to modify the minimum temperature. After the preamble the message can comprehend up to six commands in any order.

As a reference example you can cancel the numbers in position 3 and 1 and, at the same time load the number +393331234567 at position 4 with the message:

"SET N1□□□N43331234567 n3□□□"

Please note the three space indicated by the little empty squares.

Whenever a number is modified the device will answer a message like this:

| | |
|--------------------------------|--------------------------------|
| tele-log.com rev. 3.03u | model and software level . |
| N1=+393481234567 | I° registered number |
| N2=+393494661224 | II° registered number |
| N3= | III° number, empty. |
| N4= | IV° |
| N5= | V° |
| IMEI=350165005155194 | IMEI the same on the GSM label |
| BaTest=OK | battery test result |
| drop=-145mV | |

In order to get the above mentioned message without altering the previously stored numbers you can use the command "LIST" located at the beginning of the SMS.

MINIMUM TEMPERATURE THERMOSTAT.

The intervention temperature, the one when reached the output relay is activated despite it is commanded "off", can be set by the command T1 or T1= within a command message, after the preamble "+++" or the equivalents "SET" or triple asterisk.

If for instance you want to set the minimum temperature at ten degrees:

+++T1=10

The symbol "=" can be substituted with a space or simply omitted. All the following examples are equivalent

set t1 10 *t1=10 +++t110 +++T1 10 SETT1=10 sett110**

When the output is activated because of temperature below the set minimum value the green LED L3 blinks.

CHECKING ELECTRIC ENERGY PRESENCE.

The equipment is capable of proper working for several hours after a power loss, If the battery is still in its full efficiency, more than a day.

After ten minutes since the power drop an alarm message is sent **at the first three phone numbers** in memory.

The model "C3" does not send messages automatically upon electric power return, you can enquire it with a voice call following the urgency or relevance of the situation.

Two outputs A and B can be separately set with the lateral button P1 and by mean of SMS as well. In the latter case the commands "on" and "off", if sent so simply without specifying "what" are directed to the output "A". If the commands are intended to switch a specific output or both you'll need to specify by means of one of the following forms preceded by "on" or "off".

To indicate both outputs:

tutto tut all , 1 e 2, 2 e 1, 1 & 2, 2 & 1 , uno e due , 1e2 2e1 1&2 2&1 , both, tout.

Only the second B:

2 , due, two, deux, dui, du.

The first A only, nothing or:

1, uno, one, un

Here some valid examples:

on, on 1, on2, on both, off, off two

The temperature sensor used to activate the B output when commanded off is the internal one, less accurate than the Pt100 probe but equally useful for the antifreeze scope.

The command to set this temperature in a SMS is T2 analogous to T1.

The second output allows to control for instance an emergency electric heater (not directly, a power relay is required to handle the large current), any kind of load of your choice or even a second apartment.

The LED's L3 and L4 show respectively the state of outputs A and B.

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The intervention temperature, the one at which the output relay is activated despite it is commanded "off", can be set by the command T1 or T1= within a command message, after the preamble "+++" or the equivalents "SET" or triple asterisk.

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ALARMS.

The device prompts messages to the first three phone numbers (N1,N2,N3) whenever one of the following occurs:

1. Lack of energy since ten minutes.
2. Input 1 activated (closed to ground) continuously since two minutes, typically burner malfunction
3. input 2 activated (open) for five seconds, generic alarm.
4. Temperature measured below two degrees less than the set value on T1, risk of **FROZEN PIPES**.

The condition must persist for three minutes, else is ignored.

The delays are to prevent false alarms.

All of the four alarm conditions are completed with a time counter expressed in hours and minutes to measure the time since the occurrence of the condition itself.

These counters are reported in the SMS together with the condition if actual and are reset to zero at the return to normal.

REMOTE ENQUIRY

You can get a SMS in response from "C3" simply making a call to the SIM.

The response is sent only if the phone was previously enrolled or, to any phone if none has been registered yet.

The call is rejected (no voice communication takes place), the answer message is delivered typically within a few seconds.

Sometime the network does not perform the caller identification protocol; in this case you can send an empty SMS, or not containing any valid message. This message will permit the identification of the recipient.

TIPICAL MESSAGE FORMAT.

The format is common for both the cases: unsolicited or requested from the user.

The message is divided in five sections:

- Abnormal (attention) conditions
- Output state
- Measured temperatures and signal strength
- Battery measurements and eventual malfunction

Example of a complete message, the five parts of it are discussed further

| | |
|---------------------------|-------------------------------------|
| ALAR. since 1h 13m | open input |
| Out1=off | output state of relay, |
| Out2=on | output state of relay driver M1 1,2 |
| measured=18.9C | measured with the Pt100 sensor |
| int=20.1C | measured within the box |
| f. strength 21 | radio field strength 0 - 30 |
| therms1=5C | set value 1 |
| therms2=7C | set value 2 |
| batt.6770mV 00.1mA | battery measures |
| FF490000FF69 | diagnostic information |

ABNORMAL CONDITIONS

All of them , if actual, are reported as message heading together with the elapsed time since their beginning.

Examples:

Cold ! since 32m
Block! since 5m
ALAR. since 1h 13m
Lacks 230V! since 3h 12m

The abnormal conditions not actual at the moment of message delivery are not reported, that is the normal condition is not mentioned.

OUTPUTS STATE.

The outputs are two. The first is equipped with the internal relay while the second comes from the connecting points +12 and B of M3 is connectable to an external relay rated 12V 100mA max. current. Excellent are for instance some solid state relay (SSR) to control an electric heater.

The outputs are intrinsically a thermostat controlled by the set values and by the sensors: T1 and Pt100 for the output 1, T2 and the internal sensor for the output 2.

The outputs can be forced in the "always on" state disregarding the measured temperature by means of "ON" command.

If a sure off state (disabled) is desired it is possible to set the temperature below the minimum possible value – 20, for instance –21.

The setting of T1 has also the effect to determine the temperature at which the alarm will be sent, two degrees below the set point.

For instance if T1=5.0 the output a will be activated at five degrees and will be switched off at 5.5C, the alarm will be sent at 3C and sent to the first three numbers.

The state of the outputs are signalled on the LED 3 for the A output and LED4 for B output.

When the on state is caused by the temperature the leds are blinking.

The value set on T2 does not cause any temperature alarms.

MEASURED TEMPERATURES

Two sensors, one is a Pt100 ranging from –20 to 100C. The probe can be placed at a few meters from the box simply lengthening the wires. We recommend the use of large section cable like one or two square millimetres.

The second sensor is mounted internally, it has a range from –10 to 70C. Its main purpose is to compensate the battery charge for longer life and reliability. Whenever the Pt100 main sensor is not removed the second can be used as a reference with improvement of the reliability.

GSM FIELD STRENGTH.

It is expressed in a range from 0 to 32. Values of 7 , 8 or 9 are sufficient. This indication is can be useful to locate the best position in the case of scarce signal.

THERMOSTATS SETTING

Remember that at two degrees below the set point an alarm SMS will be sent ; once after two minutes and a second time after forty minutes.

T2 parameter does not cause alarms. It can serve to use the output 2 (B) as a further thermostat. If not desired you can set its temperature below the possible range, for instance -21. The output shall change state on command given by means of SMS or local button.

BATTERY MEASURES.

Voltage and current are reported respectively in millivolts an mill amperes. With the battery fully charged the voltage can vary from 6500mV if it is hot, close to 30 degrees, and 6900mV at a few degrees. The current is reduced to a few milliamp at end of charge. Sometimes it possible to observe a little negative current.

With main power off, a typical idle current is -40mA while the voltage slowly goes down. The internal electronics can work at 5volts.

Eventually battery problems reported are:

- | | |
|----------------------------|--|
| 1. BATTERY UNCONNECTED | forgot it? Also a faulty battery can cause this warning. |
| 2. CAN'T REACH FULL CHARGE | maybe an element is shorted or there has been repeated losses of power with incomplete charge, wait one more day of charge, if the problem persists, change the battery. |
| 3. INSUFFICIENT CAPACITY | Remaining capacity (not level of charge) is periodically evaluated. The battery is still probably able to withstand a few hours blackout but have better to change it. |

TO CONTROL A CENTRALIZED HEATING

The device C3 has found the interest of professional operators in the building heating field. The design was primarily oriented to the single apartment or house, but with a couple of inputs and the capability to measure a pipe temperature it is fully feasible to keep a plant under control, and at very competitive cost.

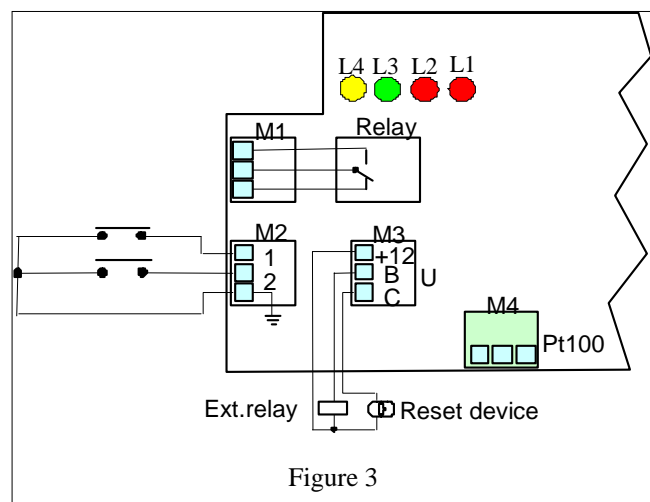
The input at 1-M2 is expressively delayed to manage a burner abnormal.

The input at 2-M2 is immediate an can be used as a generic alarm.

OUTPUT 3 (C) RESET PULSE

This output is intended for devices that need a pulse for any reason, The pulse has a 2 second duration upon a command:

RES ,RESET
RIP , RIPRISTINO



After the performed command the C3 sends back a SMS claiming "reset done".

CHARACTERISTICS

| | | |
|-------------------------------------|---|---------------------------------------|
| Dimensions | . | mm 160x100x85 |
| Weight | . | 800g (battery included) |
| Container protection | . | IP 55 |
| Operating temperature range | . | - 10 °C ÷ +60°C |
| Supply | . | 12V DC (10-18V) |
| Consumption in idle state | . | 1W approx. |
| Consumption during battery recharge | . | 5W . |
| Consumption during connection | . | 4W . |
| GSM | . | EGSM 900/1800MHz |
| Antenna | . | INTERNAL LOOP |
| Temperature probe | . | Pt100 cl. A (0.15°C max error at 0°C) |
| Output contact rating | . | 250 V a.c. / 3A |
| Battery | . | SLA 6V – 1,2 Ah |
| Main probe temp. range | . | - 20°C ÷ +100°C ± 0,5°C max error |
| Internal probe temp. range | . | - 10°C ÷ +70°C 1,1°C max error |

Warranty/Disclaimer

The device is fully guarantee against any defective parts or malfunctions since 24 months from its demonstrable date of purchase. The battery is excluded since it can be damaged if left deeply discharged for a long time.

The equipment Tele-log model “C3” has been designed, manufactured and tested with the maximum care and attention to its reliability but the “ Zanotto applicazioni microprocessori” declines any responsibility for the damages eventually caused for the missing or erroneous performance of the device.

In particular the equipment is intended to make remotely available the measurements to the user, but it is his responsibility to use it and ascertain the service has not suspended for any reason.

