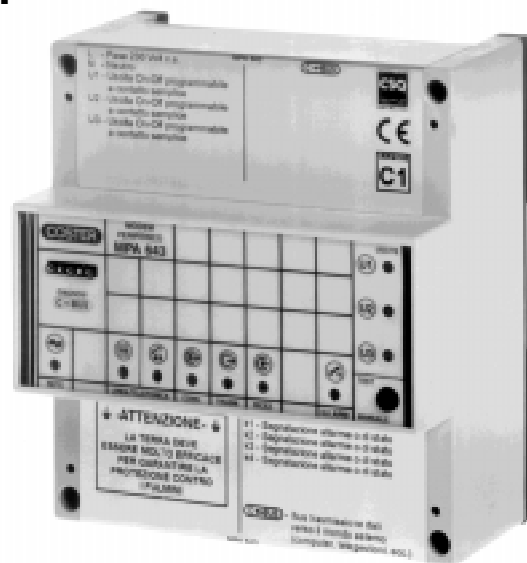## COSTER

REMOTE PANEL-MOUNTED MODEM WITH ALARMS & CONTROLS

C ← BUS

MPA 643 C2 Eng.

• **Provides easy & cheap telemanagement**

• **Complete with call discriminator**
• **1 C-Bus parallel communication output**
• **3 relay On-Off outputs for timed controls**
• **4 On-Off alarm inputs**
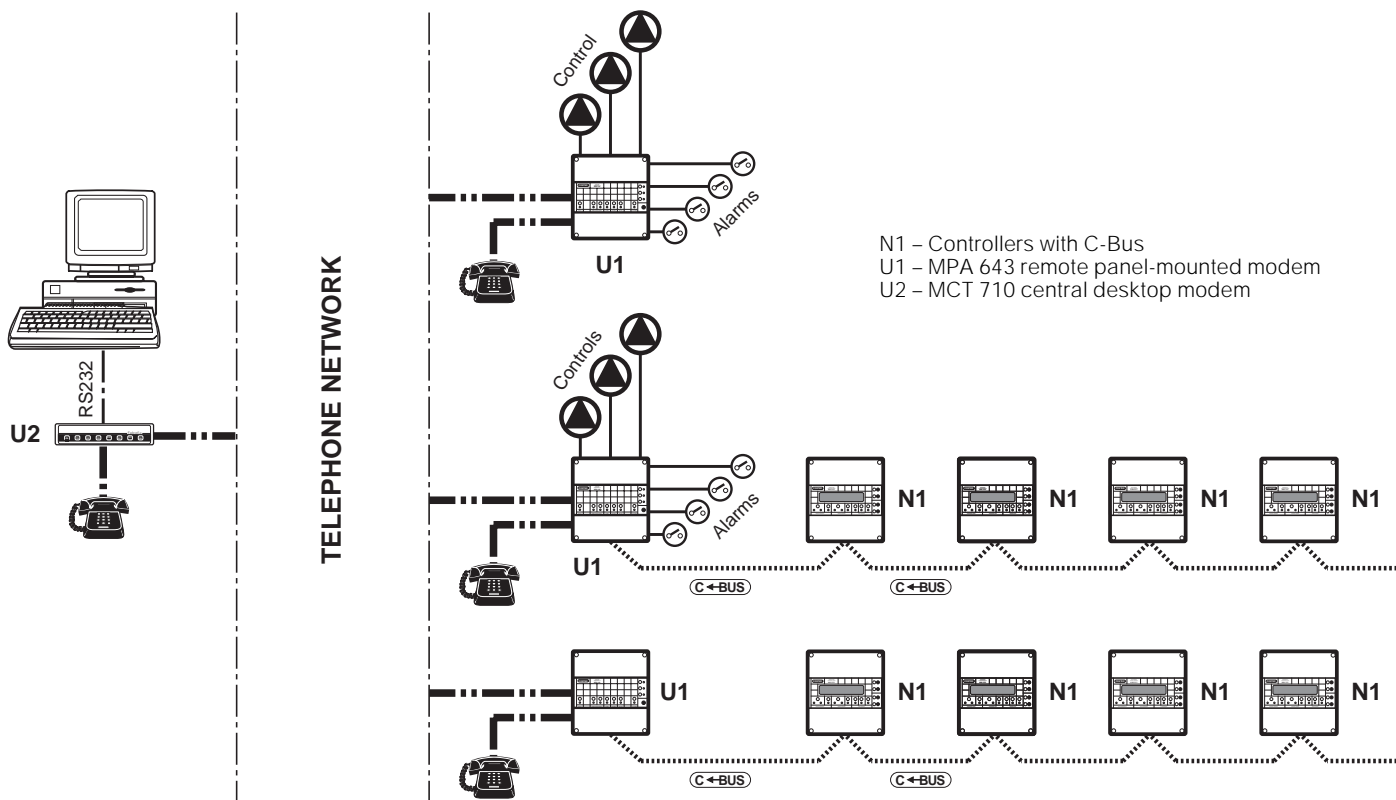• **DIN rail compatible**

CE

1.APPLICATION & FUNCTIONS

MPA 643 modem can be used for connecting boiler plants by telephone line to a telemanagement central computer. It permits :
– Acquiring 4 On-Off alarm signals ;
– Piloting 3 electric devices with timed On-Off controls;
– Connecting Coster C-Bus controllers.

The call discriminator with which it is equipped makes it is possible for MPA 643 to share a telephone line with a telephone set or a fax or another modem.
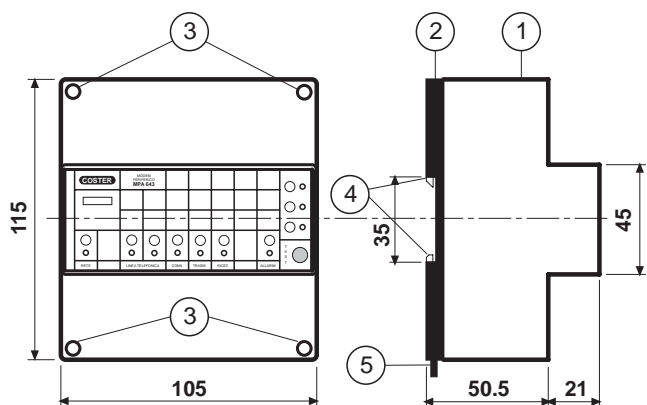
SCHEMATIC DIAGRAM

fig. 1

N1 – Controllers with C-Bus
U1 – MPA 643 remote panel-mounted modem
U2 – MCT 710 central desktop modem

TECHNICAL DATA

|	
Power supply	230 V ac ± 10%; 50 to 60 Hz
Consumption	3.5W
Protection	IP40
Construction standards	Italian Electrotech. Comm. (CEI)
Operating modem	Full Duplex
Call mode:	
- in multifrequence	ATDT
- pulses	ATDP
Transmission speed :	
- C-Bus	1,200 bps asyn.
- telephone line	1.200 bit/s
Voltage-free output contacts:	
- maximum switched voltage	250 V ac
- maximum switched current	5 (1) A
Ambient temperature:	
- operating	0 to 45°C
- storage	− 25 to + 60°C
Dimensions	105 x 115 x 71.5 mm
Weight	1 kg

OVERALL DIMENSIONS
fig. 2

1 - Protective cover
2 - Base
3 - Screws for securing cover to base
4 - DIN rail securing elements
5 - DIN rail release lever

2.WIRING DIAGRAM
fig. 3
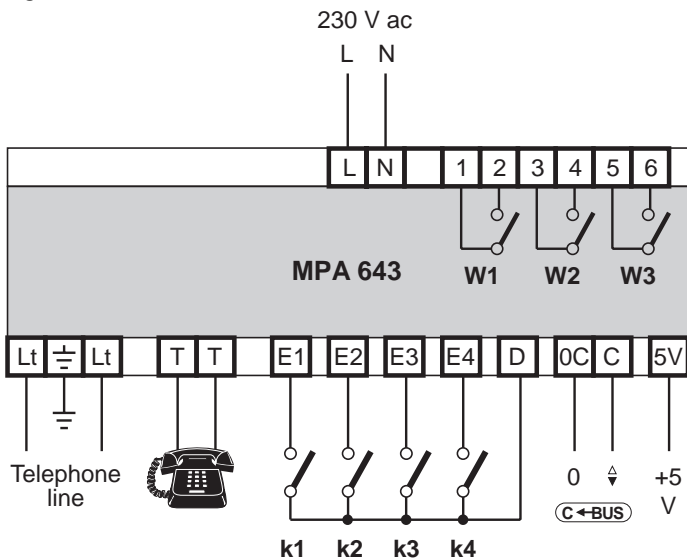
k1to4 – On-Off alarm contacts
L – Line 230 V ac
N – Neutral
W1to3 – On-Off programmable outputs
C-Bus – Telemanagement data transmission

3. INSTALLATION & WIRING
MPA 643 must be installed in a dry ambience having a temperature not above 45°C and as far away as possible from any water drips or sprays.
If positioned in locations classified as "Dangerous" it must be installed inside an enclosure for electrical equipment constructed according to current regulations for the type of danger involved.

FACIA
fig. 4
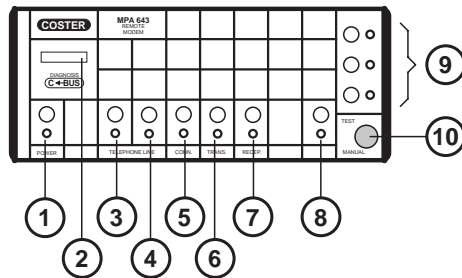
1 – Power LED
2 – Socket for connection to multitester
3 – LED indicating telephone line occupied by modem.
4 – LED indicating telephone line engaged by parallel telephone.
5 – LED indicating modem connected.
6 – LED indicatingmodem in transmission stage.
7 – LED indicating modem in reception stage.
8 – LED indicating On-Off alarm.
9 – LED indicating status of control relays.
10 – Test push-button.

MPA 643 can be wall-mounted on a DIN rail or on a DIN standard panel.
• Loosen the four screws (fig. 2.3) which secure the cover (fig. 2.1) to the base (fig. 2.2) and separate the two parts.
• Mount base on the DIN rail and check that securing elements (fig. 2.4) keep it firmly in place.
• Carry out electrical and telephone wiring in strict observance of the wiring diagrams given above and of current regulations .
• It is recommended not to insert more than two cables in a single terminal of the modem and to make use of external terminals.
• For power connections to modem and for control actuators from modem outputs it is recommended to use normal copper conductors having a cross-section of at least 1,5 mm^2.
• For wiring the communication (C-Bus) ring it is possible to use telephone cables with two wires. In order to ensure that the polarities are observed it is recommended to use wires of different colours.
• With a multitester check that there are no short or open circuits in the power circuit, C-Bus and control outputs.
• Apply power (230 V ac) and check with a multitester on terminals L - N that the voltage is correct.
• Remove power, replace the cover on the base and tighten the four screws.

4.C-BUS : COMMUNIC. WITH TELEMANAGEMENT
MPA 643 is provided with a parallel C-Bus output which permits telemanaging up to16 controllers with the C-Bus badge.
MPA 643 already has address 1 so that the other controllers must be addressed from 2 on.

4.1 C-Bus electric wiring
The **parallel** electrical connections between all the electronic units must be made using low-capacity **twin-core telephone cable** and in strict observance of the polarity 0C - C.
The wiring system can be:
– closed ring having a maximum wiring length of 4 km.
– linear or with stubs having a maximum wiring length of 2 km.
For longer distances **signal amplifiers can** be used.

C-BUS WIRING DIAGRAM

fig. 5

Modem MPA643 No. 1	Controller Address No. 2	Controller Address No. 3	Controller Address No. 4
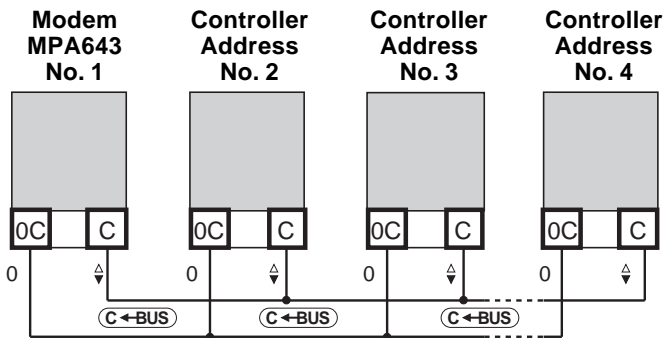
5.WIRING TELEPHONES

MPA 643 incorporates telephone line protection but in order for it to function effectively **there must be an efficient earth connection**. The input line must be connected to terminals Lt - Lt.

For the correct operation of the modem it is indispensable that MPA 643 is the first device connected to the line arriving from the telephone company; any other device sharing the line must be connected to output T - T.

6.TELEPHONE TEST

With MPA 643 switched off press the "Test" button and switch on MPA 643 keeping the button pressed.

Release the push-button :

MPA 643 will dial the number corresponding to the "Correct time services of the telephone company. If the call is successful it will be possible to hear (at low volume) the announcement of the correct time.

If it is not, check that telephone line and the connections to the terminal block of the modem and then repeat the test.

(N.B. At present MPA 643 is programmed with the number 161 for the telephone company in Italy. Obviously, this number must be changed for the U.K.)

7.ELECTRIC TESTING

Switch on the modem.

Press "Test" button (fig. 4.10) until the LED of output 1 (U1) ligths: after one minute maximum the output one relay should close.

Check that the output relay is connected to the required device. Repeat the same operations for the contact of output two (U2) and of output three (U3).

Press "Test" button until the three LEDs are out to end the testing. In any case the test is automatically interrupted after half an hour from last depression of the "Test" button.

8.OPERATION

8.1 General remarks

The output data transmission signals from the electronic devices (RS232 or Bus) are of the digital type (D.s.) since they can assume only two distinct levels:

1 –High signal, presence of voltage ;

0 – Low signal, absence of voltage.

The signals which flow along the telephone lines are of the analogue type (A.s.) because, within certain limits, they can assume over time any intermediate level.

The modem is the device which permits the conversion of digital signals into analogue signals (MODulation) and the reconversion of the analogue signals in digital (DEModulation).

The digital signal converted into analogue is called CARRIER;

fig. 6
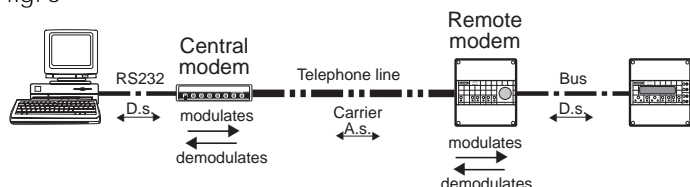
its amplitude, frequency or phase are the characteristics which render it comprehensible to the receiving device. It is a cyclical signal which is repeated at precise time intervals: the frequency with which the repetitions take place determines the transmission speed, expressed in BAUD or bps (bit per second).

Modems are divided into categories according to their capacity to dialogue and the two most common categories are :

• **Half - duplex** : the modem is able to transmit and receive, but not at the same time.

• **Full - duplex** : the modem is able to transmit and to receive at the same time.

8.2 MPA643

MPA 643 remote modem is of the full-duplex type and operates at a speed of :

• 1,200 bps, on communication port RS232 and Bus;

• 1,200 bps, on telephone line.

— TRANSMISSION:

MPA 643 can transmit with two different call tones, selected by switch 3 of the internal programmer (fig. 7), so as to permit the central modem to distinguish the telemanagement call not only from the vocal calls but also from calls from fax or from another non-Coster modem :

– "Standard" call tone (switch 3 on Off) : used when the central modem has a dedicated telephone line or one shared with a telephone set.

– "Coster" call tone (switch 3 on On) : used when the central modem has a telephone line shared with a fax or with a non-Coster modem. In this case the central modem must be configured for reception with Coster tone and all the remote modems for that telemanagment system must be configured to transmit with Coster tone.

— RECEPTION:

MPA 643 can **discriminate automatically** the incoming calls destined for telephone sets (max. 3) or for a fax or for another non-Coster modem connected to terminals T - T.

By means of switch 1 of the internal programmer (fig. 7) it is possible to obtain :

• call discrimination disabled (switch 1 on Off) : the modem does not recognise the type of call in arrival and always makes the connection.

• call discrimination enabled (switch 1 on On) : the modem analyses the type of call in arrival by discriminating the call tone selected with switch 4 :

– "Standard+Coster" (switch 4 on Off) call tone : used when the telephone line is dedicated or shared with a telephone set. The vocal calls are sent to the parallel telephone and the calls with Standard tone and with Coster tone are all sent to the telemanagment system.

– "Coster" (switch 4 on On) call tone : used when the telephone line is shared with a fax or with a non-Coster modem. In this case the central modem must be configured for transmission with Coster tone. The calls with "Standard" tone, coming from fax or from non-Coster modems are sent on the parallel line and only the calls with "Coster" tone are sent to the telemanagement system.

When the modem is switched off or faulty the telephone line is automatically switched to the device sharing the line.

PROGRAMMER

fig.7

Factory setting

1 – On : discrimination enabled
    Off : discrimination disabled
2 – On : error correction inactive
    Off : error correction active
3 – On :transmission with Coster tone
    Off :transmission with Standard tone
4 – On : discrimination calls with Coster tone
    Off : discrimination calls with Coster & Standard tone

programmer
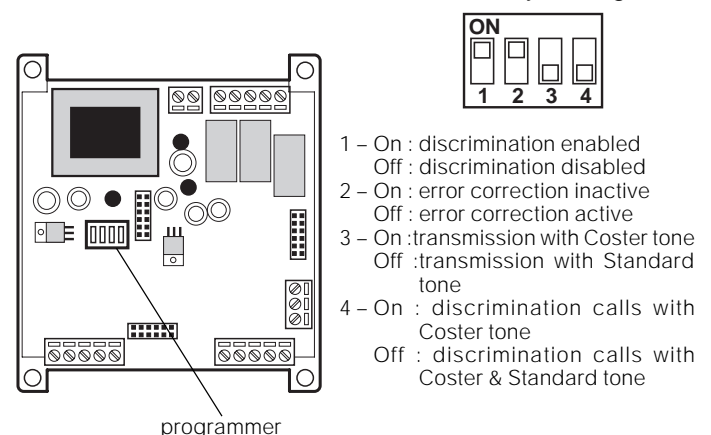
8.3 Examples of modem hookups & configuration

1 Central modem and remote modems with telephone set sharing the line (fig. 8).
– Central modem :
 - transmission with Standard tone
 - reception with Standard + Coster tone
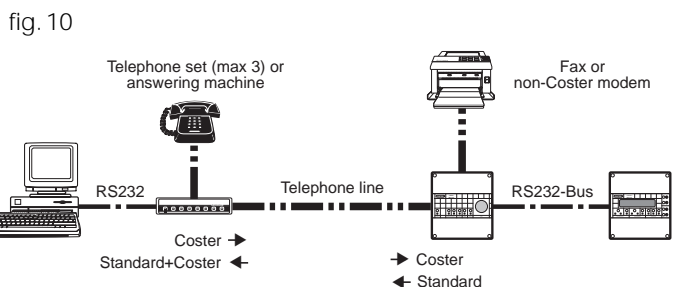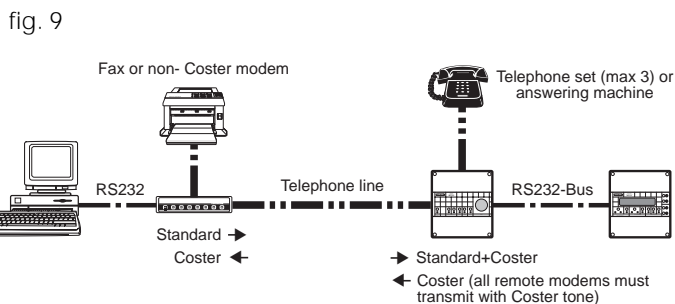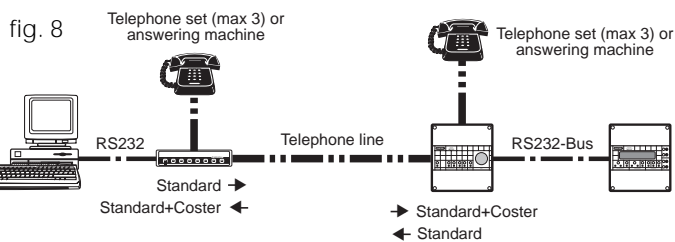– Remote modems :
 - transmission with Standard tone (3 on Off)
 - reception with Standard + Coster tone (4 on Off)

2 Central modem with fax or non-Coster modem sharing line and remote modems with telephone set sharing line (fig. 9).
– Central modem :
 - transmission with Standard tone
 - reception with Coster tone
– Remote modems :
 - transmission with Coster tone (3 on On). All remote modems must be configured for transmission with Coster tone.
 - reception with Standard + Coster tone (4 on Off)

3 Central modem with telephone set sharing line and remote modems (even if only one) with fax or non-Coster modem sharing line (fig. 10).
– Central modem :
 - transmission with Coster tone
 - reception with Standard +Coster tone
– Remote modems :
 - transmission with Standard tone (3 on Off).
 - reception with Coster tone (4 on On). The other remote modems can be set for reception with Coster or Standard + Coster tone.

fig. 8

Telephone set (max 3) or answering machine
Telephone set (max 3) or answering machine
RS232
Telephone line
RS232-Bus
Standard →
Standard+Coster ←
→ Standard+Coster
← Standard

fig. 9

Fax or non- Coster modem
Telephone set (max 3) or answering machine
RS232
Telephone line
RS232-Bus
Standard →
Coster ←
→ Standard+Coster
← Coster (all remote modems must transmit with Coster tone)

fig. 10

Telephone set (max 3) or answering machine
Fax or non-Coster modem
RS232
Telephone line
RS232-Bus
Coster →
Standard+Coster ←
→ Coster
← Standard

9.INPUTS & OUTPUTS

MPA 643, besides being a modem, is also a digital device which is provided with
– 3 programmable On-Off outputs (W1, W2, W3) which can be used for the control of electronic units;
– 4 On-Off inputs for the acquisition of lockout alarms.
The programming and the configuration of the alarms can be effected only by computer, either from a local or a remote site.
For connection of a local computer to MPA 643 the accessory TCB 908 must be used and connected to the socket on the facia of the modem (fig.4.2).
MPA 643 is delivered pre-programmed with standard times, the outputs controlled always Off and the On-Off inputs enabled for alarm signalling.

10.ON-OFF RELAY CONTROLS

It is possible to assign to each output (W1, W2, W3) one of the operating programmes (fig. 11.2) to be chosen from :
– 4 24-hour programmes : 24HOUR 1 to 4;
– 1 7-day programme;
– 1 multi-7-day programme.
On the modem the status of the outputs is indicated by three LEDs (fig. 4.9) which are also shown on the software (fig.11.1):
– On : On, contact closed;
– Off : Off, contact open;
Warning ! The On or Off control is executed after about a minute from the appearance of the same on MPA 643.

10.1 24-hour programmes 1 to 4

These can contain up to a maximum of three start times and three stop times (fig. 12.2). The times must be inserted in increasing order.

10.2 7-day programmes

These are set by assigning to each day of the week one of the 24-hour programmes available, or always On (On) or always Off (Off) (fig.12.1).

10.3 Multi-7-day programme

This consists of a sequence of three weeks.
It is set by assigning to each day of the weeks one of the 24-hour programmes available, or always On(On) or always Off (Off) (fig.12.3).
The multi-7-day programming is repeated cyclically.

11. MANAGEMENT ALARMS

11.1 On-Off inputs

MPA 643 can acquire and transmit to the telemanagment PC four On-Off alarm or status signals (k1, k2, k3, k4).
The acceptance of the alarms can be linked to a timed programme chosen from those already described at point 10.1, 10.2 and 10.3.
When an alarm is triggered (contact closed), the alarm LED (fig. 4.8) blinks and the number of consecutive blinks indicates the number of the contact in the alarm state :
– 1 : alarm contact k1 closed;
– 2 : alarm contact k2 closed;
– 3 : alarm contact k3 closed;
– 4 : alarm contact k4 closed.
The input with alarm status is indicated also by the telemanagement programme (fig.11.5).
If the single input is disabled (programme "NEVER", fig. 11.6) it can be used as a status indicator (fig.11.4).

11.2 Timeswitch alarm

When, for any reason, the timeswitch assumes illogical data and can no longer guarantee the correct operation of the timed programmes, the controller sends a "Timeswitch alarm" call to the telemanagement PC and puts the output relays in the condition predefined by the telemanagement programme (fig. 11.3). When the alarm is triggered the alarm LED (fig. 4.8) blinks five consecutive times.
To return to the normal situation the current time and date of the MPA 643 must be corrected by means of the telemanagement programme.

11.3 General

The transmission of the alarm to the telemanagement computer takes place after about 30 seconds from the local warning which takes place after about one minute. If, on the other hand, it is not enabled (fig. 13.1), it will not be sent.
In the event of lack of communication the transmission will be repeated for the number of times and at the intervals of time set on MPA 643 (fig.13.3.4).
It is possible to enable also the transmission of "Alarm ended" (fig.13.2).

TELEMANAGEMENT DISPLAY PAGES *(N.B. This page is not yet available in English but will be prepared shortly)*
fig. 11

Uscite Telecomandi

① Stato uscita — comando zona 1 ○OFF — comando zona 2 ○OFF — comando zona 3 ○OFF

② Programma — GIORNALIERO 1 ▾ Vedi... — GIORNALIERO 1 ▾ Vedi... — GIORNALIERO 1 ▾ Vedi...

③ con orologio in emergenza OFF ▾ — con orologio in emergenza OFF ▾ — con orologio in emergenza OFF ▾

Stati e/o Allarmi

	allarme fuga gas	Blocco bruciatore	Blocco pompa	blocco ricircolo
④	Stato ○ OFF	Stato ○ OFF	Stato ○ OFF	Stato ○ OFF
⑤	Allarme ○ OFF	Allarme ○ OFF	Allarme ○ OFF	Allarme ○ OFF
⑥	Programma voluto Vedi... GIORNALIERO 1 ▾	Programma voluto Vedi... GIORNALIERO 1 ▾	Programma voluto Vedi... GIORNALIERO 1 ▾	Programma voluto Vedi... GIORNALIERO 1 ▾

L' ora e il giorno che ho ricevuto dall'impianto — Vuoi renderla uguale a quella del computer ?

⑦ Ore 14 56 — Giorno GIOVEDÌ ▾ — Ora del Computer

fig. 12

Programmi giornalieri — Programma settimanale

	Giornaliero 1	Giornaliero 2	Giornaliero 3	Giornaliero 4
	On Off	On Off	On Off	On Off
1	06:30 12:00	06:30 12:00	08:00 11:00	08:00 12:30
2	13:00 18:00	13:30 17:00	13:30 16:00	--------- ---------
3	--------- ---------	--------- ---------	18:00 20:00	--------- ---------

Programma settimanale
- Lunedì GIORNALIERO 1 ▾
- Mardetì GIORNALIERO 1 ▾
- Mercoledì GIORNALIERO 2 ▾
- Giovedì GIORNALIERO 2 ▾
- Venerdì GIORNALIERO 3 ▾
- Sabato GIORNALIERO 4 ▾
- Domenica OFF ▾

Programma plurisettimanale

giovedì 11/09 GIORNALIERO 1 ▾	giovedì 18/09 GIORNALIERO 2 ▾	giovedì 25/09 GIORNALIERO 2 ▾
venerdì 12/09 GIORNALIERO 2 ▾	venerdì 19/09 GIORNALIERO 2 ▾	venerdì 26/09 GIORNALIERO 3 ▾
sabato 13/09 GIORNALIERO 4 ▾	sabato 20/09 GIORNALIERO 4 ▾	sabato 27/09 GIORNALIERO 4 ▾
domenica 14/09 OFF ▾	domenica 21/09 OFF ▾	domenica 28/09 OFF ▾
lunedì 15/09 GIORNALIERO 1 ▾	lunedì 22/09 GIORNALIERO 1 ▾	lunedì 29/09 GIORNALIERO 1 ▾
martedì 16/09 GIORNALIERO 1 ▾	martedì 23/09 GIORNALIERO 1 ▾	martedì 30/09 GIORNALIERO 1 ▾
mercoledì 17/09 GIORNALIERO 1 ▾	mercoledì 24/09 GIORNALIERO 2 ▾	mercoledì 1/10 GIORNALIERO 2 ▾

fig. 13

Impianto di appartenenza
Numero impianto 1

Allarmi
① Inviare gli allarmi NO ▾
② Inviare il cessato allarme NO ▾
Connessione LINEA TELEFONICA AD IMPULSI ▾
Telefono per invio allarmi 02,56100864764
③ Numero di tentativi per chiamanta allarme 5
④ Intervallo fra i tentativi 10 min.

COSTER

CUSTOMER NOTES:

CIe