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07.97

CENTRAL DISPLAY UNIT FOR COSTERZONE CONTROL SYSTEMS

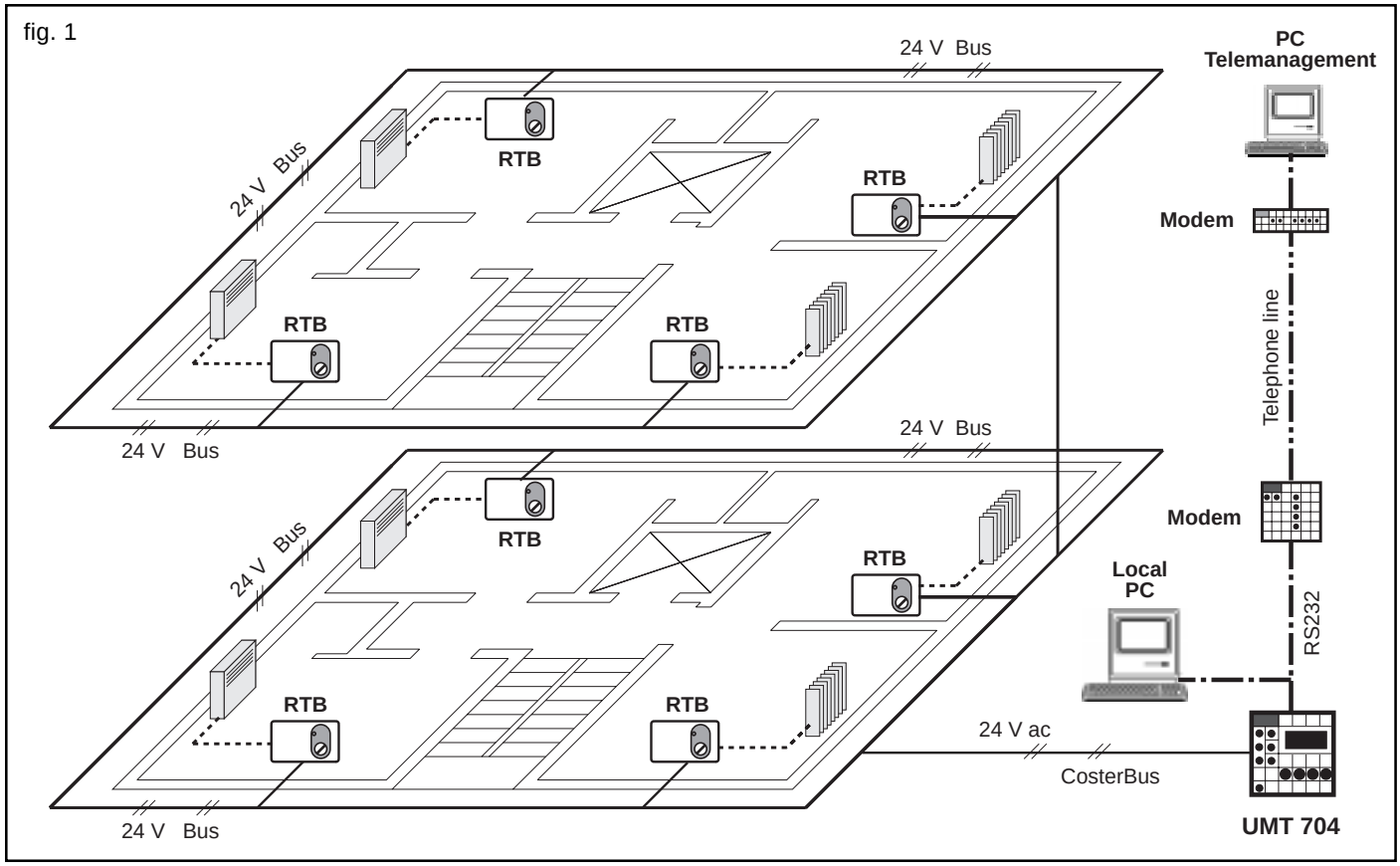
UMT 704 C 2 Eng.

- **Connection with up to 239 remote units (RTB).**
  – display of setting and programme data of each single remote unit connected.
  – programming with four operational keys with alphanumeric display.
  – 2 Output relays for On-Off controls in relation to thermal loads.
  – 1 CosterBus output (local) for connection to remote units.
  – 1 CosterBus output (principal) for connection to more than one Master.
  – 1 RS232 serial output for data transmission.
- **Option of insertion in a telemanagement system.**
  – direct connection to a computer or a modem.
  – warning of faulty alarm or of alarm not received.
- **DIN 144 x 144 panel mounting.**

CE

SCHEMATIC DIAGRAM

fig. 1



APPLICATION

UMT 704 is the central display unit of the CosterZone multizone control system.
It is able to manage, through the CosterBus parallel connection, up to 239 remote controllers.
The system is particularly suitable for heating and air handling plants in buildings where it is necessary to regulate the room temperature by zones, eg:
– Hotels and guesthouses;
– Commercial and office centres;
– Schools and public buildings.

OPERATION

The remote controllers (“Slaves”) are completely autonomous, each having its own operational intelligence (Stand-Alone), and are able to function without being connected to the central (“Master”) unit.
For communication with the Master, each Slave has to be identified by an address (progressive numbers from 1 to 239).
Communication can take place only on the initiative of the Master which interrogates the required Slave by sending its address through the Bus connection; only the Slave interrogated accepts the communication, and the others do not reply.
UMT 704, the Master, is able to interrogate all the remote controllers and to display and modify all the setting and programming data of each single remote controller.

POWER SUPPLY

UMT 704 is powered by 24 V ac and is provided with a lithium battery which, in the event of a power failure, ensures the correct time of day and stores the setting data for about 10 years. The device is supplied with the battery in place and the correct time of day set.

SECURITY JACK PLUG

On the UMT 704 facia is located a jack plug (fig. 2.10) which, if extracted, disables the + and – keys thereby preventing any modification of the data; it remains possible, however, to modify the data telematically.
In case of need, the engineer responsible can utilise an internal link (fig. 3) to re-enable the keys even without the jack plug.

ADDRESS OF THE REMOTE CONTROLLERS

The identification address must be assigned to each remote controller before this is connected definitely to the plant.

GROUPS

To facilitate the setting and programming operations, remote controllers of the same type can be grouped together in 9 different groups:
– Display page 23 - “Remote group”.
– With the + and – keys type the designated group (from 1 to 9).
This permits displaying and modifying an item of data for all the units in a group by means of a single operation: see “Displaying and modifying data”.

CHECK ROUND

At regular intervals UMT 704 calls up all the remote controllers in turn (1 unit every 2 seconds) in order to :
– Ensure the correct Bus connection.
– Check that the remote controllers have the correct time of day.
– Read the actual temperature measured by the detector and the values desired; these values are displayed only if a local computer is used.

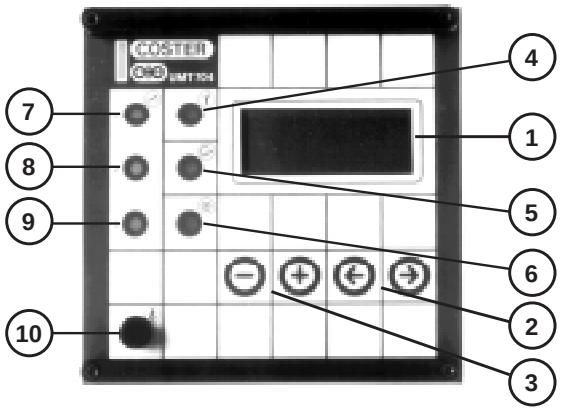
If one or more remote controllers do not reply correctly to the call, UMT 704 displays the number of controllers which have not replied (page 1 (5)) and activates output 3 relay to give a remote warning (if this is provided for).

DISPLAY AND MODIFICATION DATA

All the setting and programming data of the remote controllers can be viewed and modified on the central display unit :
– Display, using the ← or →, keys, the page containing the desired data.
– Position the cursor on point (1) ZONE No. ?? and select, with the + or - keys, the address of the unit to be interrogated.
If you want to modify data for a whole group, press the + key until GROUP No. ?? appears.

FACIA

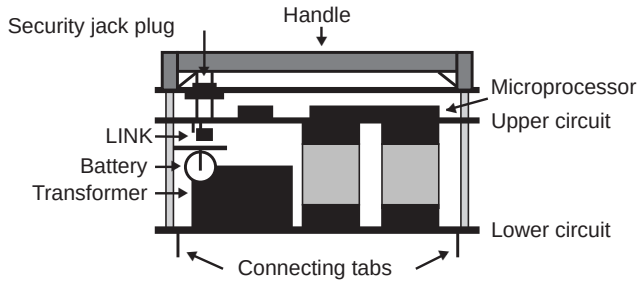
fig. 2



1 – Display
2 – Page scrolling keys ← and →
3 – Operating keys + and –
4 – Fault
5 – Data transmission
6 – Reception date
7 – Output 1 Heating
8 – Output 2 Cooling
9 – Output 3 Alarm
10 – Security jack plug

INTERNAL LINK

fig. 3



Without link : Data adjustable with security jack plug
With link : Data adjustable even without security jack plug

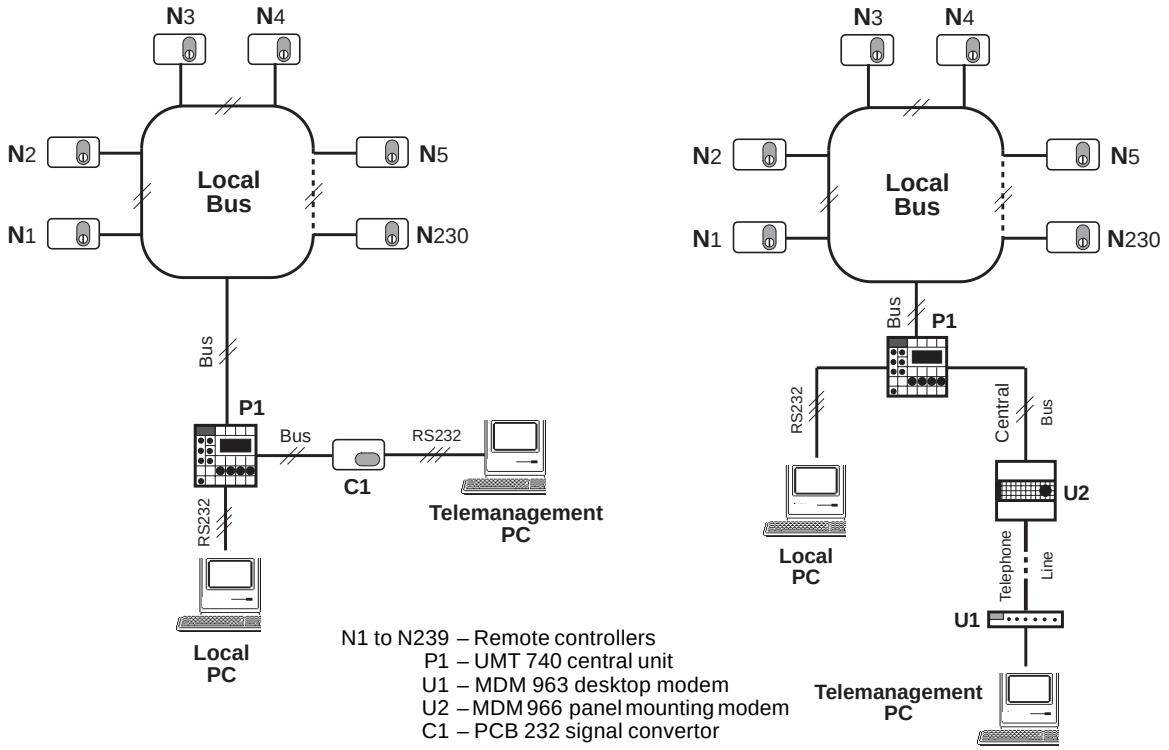
If you want to modify data for all the remote controllers press the + key until ALL THE ZONES appears.
– After the OK (point (2)) position the cursor, using the ← or → keys, on the item of data to be adjusted; with the + or – keys enter the desired value.
UMT 704 automatically sends the new item of data to the remote controller (at point (2) "**" appears).
If the transcription of the item of data has been successful, at point (2) “OK” appears; if it has failed "**.**" appears. In the event of failure, repeat the operation.

OUTPUT RELAY

UMT 704 is able to manage:
• 2 Output relays for On-Off controls in relation to the thermal loads : Heating - Output 1; Cooling - Output 2.
They permit controlling electrical devices (circulation pumps, burners, boiler sequencers, heat pumps, water coolers, etc) in relation to the thermal loads requested by the controllers.
The following must be set:
– The values of the activation thresholds of the output relays (display pages 27(2) and 28(2)).
– The minimum times for which the output relays remain On or Off, in order to avoid too frequent interventions (display pages 27(3) and 28(3)).
Examples :
– Circulation pump: Threshold = 0 %; T. min. = 1 min.
– Burner : Threshold = 0 %; T. min. = 5 min.
– Auxiliary burner : Threshold = 50 %; T. min. = 5 min.

BASIC LAYOUT

fig. 4



– Refrigerator : Threshold = 0 %; T. min. = 5 min.
– Auxiliary refrigerator : Threshold = 50 %; T. min. = 5 min.

• 1 Output relay for signalling external fault.
Permits remote signalling of faults in the system. When one or more remote controllers do not reply correctly to UMT's check round, besides signalling this by means of the fault LED (fig. 2.4), UMT 704 also activates the relay (contact 9-10 closes).

DATA TRANSMISSION

• Serial output RS232.
UMT 704 is provided with an RS232 serial output by which it can be connected directly to a local computer or, through a modem and telephone line, to a computer for telemanagement.

• CosterBus output.
UMT 704 is provided with a CosterBus (local) output which permits connection with the RTB remote controllers (max. 239); moreover, it is provided whith a second CosterBus output (principal) which permits connection to a local computer by means of a PCB signal convertor or, through a modem and telephone line, to a telemanagement computer.
When the local computer or that for telemanagement communicates with the UMT the latter is automatically excluded and becomes an RS232-CosterBus convertor (on the display the wording "CONNECTION TO LOCAL PC" appears); if CosterBus is used, on the display appears the wording "CONNECTION WITH BUS".
The computer carries out the regular check rounds and permits the display and modification of all the data of the remote controllers. If the computer is not used for a certain period of time (which can be set on the management programme), UMT excludes the connection and re-starts its normal functioning.
NB : When using serial RS232 the maximum distance between UMT and PC must not exceed 15 meters.
When using CosterBus with PCB installed near the PC, the maximum distance between UMT and PC must not exceed 2,000 m.

WARNING LEDS

• Faults (fig. 2.4): Flashes when one of the remote controllers does not reply correctly to the check round.
• Data transmission (fig. 2.5): Lights when the UMT transmits data to the remote controllers.
• Reception data (fig. 2.6): Lights when the remote controllers send data to the UMT.
• Output 1 (fig. 2.7): Signals the On state of the relay (in relation to the thermal load of the Heating plant).
• Output 2 (fig. 2.8): Signals the On state of the relay (in relation to the thermal load of the Cooling plant).
• Output 3 (fig. 2.9): Signals the On state of the alarms relay when there is a fault situation.

CONSTRUCTION

UMT 704 is constructed in a 144 x144 case meeting DIN 43700 standards (fig. 5). The case is in shockproof plastic material and contains on its base the two terminal blocks into which the connecting tabs of the printed circuit are inserted.
The electronic part is constructed according to Italian Electrotechnical Committee (CEI) standards as a single unit comprising the printed circuit and the controls facia, and is fitted into the case using light pressure.
The cover, in transparent plastic material, can be hinged on the left or right side of the case. UMT 704 is suitable for wall or panel mounting (fig. 5).

INSTALLATION

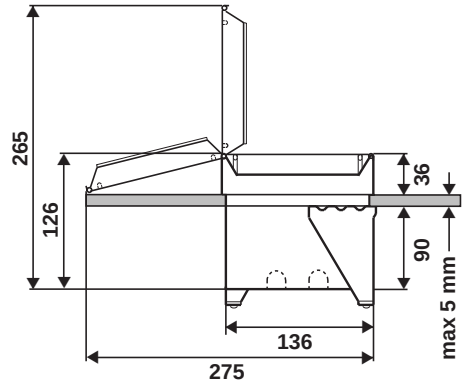
UMT 704 must be installed in a dry ambience with a temperature not above 35 °C, and away from possible water leakages or sprays.
If installed in ambiences classified as "dangerous" it must be mounted inside a cabinet for electrical appliances constructed according to the regulations in force for the type of danger involved.
The electrical connections must be made strictly according to the wiring diagrams (fig.7) and in observance of the safety regulations in force.

TECHNICAL DATA

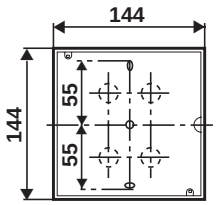
Power supply	24 V ac ±10%
Frequency	50 to 60 Hz.
Consumption	5 VA
No. of remote controllers connectable	239
Outputs contact:	
– maximum switched voltage	250 V ac
– maximum switched current	5 (1) A
Room temperature:	
– operation	0 to +45 °C
– storage	– 25 to +60 °C
Room humidity	Class F (DIN 40040)
Protection	IP 44
Weight	1.1 kg

OVERALL DIMENSIONS

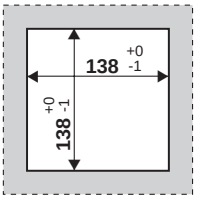
fig. 5



Facia dimensions



Cut-out for panel mounting



ELECTRICAL SYSTEM

fig. 6a

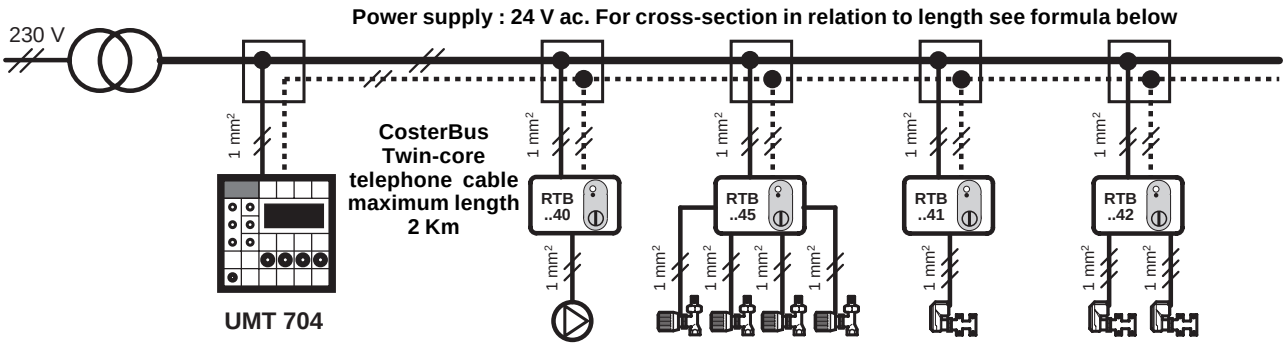
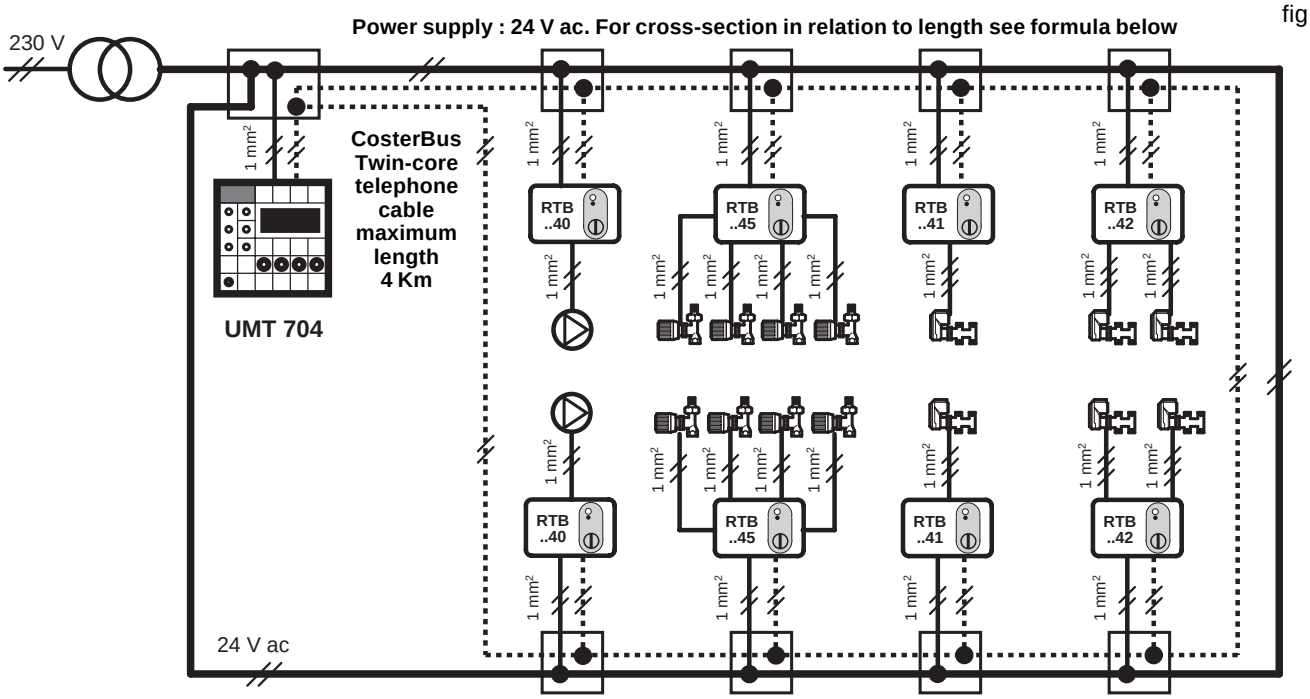


fig. 6b



FORMULA FOR CALCULATION MAXIMUM LENGTH OF 24 V ac POWER CABLES:

$$\text{D. MAX.} = \frac{S \times 1000}{N}$$

D. MAX. = Maximum distance from transformer
S = Cross-section of cable in mm²
1000 = Multiplier.
N = Total number of users (controllers and valves).

eg: $\text{D. MAX.} = \frac{1.5 \times 1000}{25} = 60$ m (bus circuit).

WARNING
In executing an electrical system it is recommended that for each branching a junction box is used (see fig.6) in order to avoid concentrating all the various electrical connections for power supply and bus in the controller base modules.
When executing a bus circuit (fig. 6a), the maximum distance is that derived from the formula. If, instead of a bus circuit, a ring circuit is used (fig. 6b), the maximum distance derived from the formula can be doubled.

TRANSFORMER
It is not essential to use a single transformer 230 > 24 V ac for the power supply; more than one transformer can be used (eg: one for each floor), in order to avoid using power cables with very large cross-section.

SETTING

Programming is organised in a system of pages which are scrolled on the backlighted alphanumeric display using the ← and → keys (fig. 2.3).
The data are pre-set and can be modified, if the security jack plug is inserted, using the + and – keys (fig. 2.2).
Whichever page appears on the display, at the end of every hour the 1st page returns to the display. To return quickly to the 1st page, press the ← and → keys at the same time.

Page	Display	Description
1	**12.18** (1) **THURSDAY**(2) **LOCAL CONTROL** **ZONE No. 1** (3) **→ OK**(4) **Not Received: 0** (5)	(1) Current time (2) Current day (3) No. of remote zone interrogated by check round (1 remote zone every 2 seconds) (4) Reply to interrogation: – * * : transmission under way. – OK : correct reply. – . . : no reply. – ?? : incorrect reply. (5) Number of remote zones which have not replied correctly. The Fault LED (fig. 2.4) flashes and activates the alarm output relay (fig. 2.9).

Press the → key. The display shows the data of the 1st zone. With the cursor on the point (1) select with the + or - keys the zone to be interrogated.

2	**ZONE No. 1** (1) **OK**(2) **T.Actual : 20.5** °**c** (3) **Prog.: PROG. 1** (4) **T. Adj. :** ± **0.0** °**c** (5)	(1) Remote unit selected : - ZONE No. x :To communicate with a single remote zone. – GROUP No. x : To send data to a group. – ALL ZONES : To send data to all remote zones. (2) As page 1(4). (3) Temp. measured by detector. Correction of measurement: Press + or – until "Corr.Td", appears, press + or – to set value of adjustment ± °C. (4) Selection of operating mode of controller : – PROG. 1 to 4: programmes with daily times. – 7-DAY : 7-day programme (pag.16). – DAY : continuous Day temperature (pag.6(1) or 9(1)). – NIGHT : continuous Night temperature (pag.6(2) or 9(2)). – FROST PROT. : In Heating mode always with temperature set on page 7. In Cooling mode turned Off – OFF: always off. (5) Rapid adjustment of temperature requested by current mode; (range: +15 °C to – 15 °C).
3	**ZONE No. 1 OK** **T. room used** **HEATING : 20.0** °**c** (1) **COOLING : 25.0** °**c** (2)	(1) Temp. desired by current Heating mode. (2) Temp. desired by current Cooling mode. Appears only if HEATING + COOLING appears on page 25(1)

Page	Display	Description
4	**ZONE No. 1 OK** **Current mode :** **DAY**	Current mode established by chosen programme : DAY, NIGHT, FROST PROTECT., OFF.
5	**ZONE No. 1 OK** **Heating +1h**(1) **0 m.**(2)	(1) Extension of heating period by 1 hour (the " + 1 hour" key key of SAB 210 or SCB 210 has been pressed). (2) Remaining minutes of extension period (from 60 to 0).
6	**ZONE No. 1 OK** **T. HEAT. desired** **Day : 20.0** °**c** (1) **NIght : 16.0** °**c** (2)	(1) Desired room temperature Heating for "DAY" mode. (2) Desired room temperature Heating for "NIGHT" mode.
7	**ZONE No. 1 OK** **T. HEAT. desired** **Frost protection.: 6.0** °**c**	Desired room temperature Heat. for "FROST PROTECTION" mode.
8	**ZONE No. 1 OK** **Heating** **Maximum local** **Adjust.t : + 0.0** °**c**	Limit of temperature increase by local set-point adjuster (0 to +5°c).
9	**ZONE No. 1 OK** **T. COOL. desired** **Day : 25.0** °**c** (1) **Night : - - .** - °**c** (2)	(1) Desired room temperature Cooling in DAY mode.. (2) Desired room temperature Cooling in NIGHT mode. The page appears only if on page 25 (1) HEATING + COOLING is selected.
10	**ZONE No. 1 OK** **Cooling** **Maximum local** **Adjust.t : – 0.0** °**c**	Maximum limit of temperature reduction by local set-point adjuster (0 to -5°c). The page appears only if on page 25(1) HEATING+COOLING is selected.
11	**ZONE No. 1 OK** **Type of action :** **WINTER**	Seasonal switching, valid for controllers with 1 output : – WINTER: Heating. – SUMMER : Cooling. – LOCAL CONTROL : switching effected by remote controllers. The page appears only if on page25 (1) HEATING + COOLING has been selected.
12	**ZONE No. 1 OK** **: 07.00** (1) **22.00** (2) **P1: - - .** - - (1) **- - .** - - (2) **: - - .** - - (1) **- - .** - - (2)	(1) Start times of DAY temperature in programme P1. (2) Start times of NIGHT temp. in programme P1.

A further 3 pages follow for programmes P2, P3 and P4.

16	**ZONE No. 1 OK** **7-day programme** **D: M T W T F S S** (1) **P: 1 1 1 2 2 A A** (2)	(1) Days of the week. (2) Programme assigned to each day of the week: – 1 to 4 = Programmes with daily times P1 to P4. – D = Day : with continuous Day temp. (page 6(3) or 9(3)). – N = Night : with continuous Night temp. (page 6(4) or 9(4)). – F = In Heating mode is Frost Protection, temperature on page (7(3)). In Cooling mode is Off.

Page	Display	Description
	TO CONTINUE KEEP "+" KEY PRESSED FOR 5 SECONDS	Change to the pages for setting the control parameters.
17	**ZONE No. 1 OK** **Info Controller** **Model . . . . . .** **SW version . .**	Identifying data of remote unit selected.
18	**ZONE No. 1 OK** **HEATING output . :** **Time Act. / Cycle÷2** **90 s.**	Heating output: Time of valve actuator run for Modulating controllers, or time for half cycle at half load for On-Off controllers (seconds).
19	**ZONE No. 1 OK** **HEAT. parameters :** **P.b. : +/– 1.0 °c** (1) **I.t. : 20 m.** (2)	Heating parameters : (1) Proportional band (± °C). (2) Integral time (minutes).
20	**ZONE No. 1 OK** **COOLING output :** **Time Act. / Cycle ÷ 2** **90 s.**	Cooling output : Time of valve actuator run for Modulating controllers, or time for half cycle at half load for On-Off controllers (seconds). The page appears only if on page 25(1) HEAT.+COOL. appears.
21	**ZONE No. 1 OK** **COOL. parameters :** **P.b. : +/– 0.5 °c** (3) **I.t. : 20 m.** (4)	Cooling parametrers : (1) Proportional band (± °C). (2) Integral time (minutes). The page appears only if on page 25(1) HEAT.+COOL. appears.
22	**ZONE No. 1 OK** **Heat. R 50%**(1) **U 50%**(2) **Cool. R 0%**(1) **U100%**(2) **T. Adj. : ± 0.0 °c**(3)	(1) Position of valve calculated by controller. (2) Actual position of valve (3) Repetition of page 2(5).
23	**ZONE No. 1 OK** **Remote group** **– – –**	Group to which remote controller belongs.

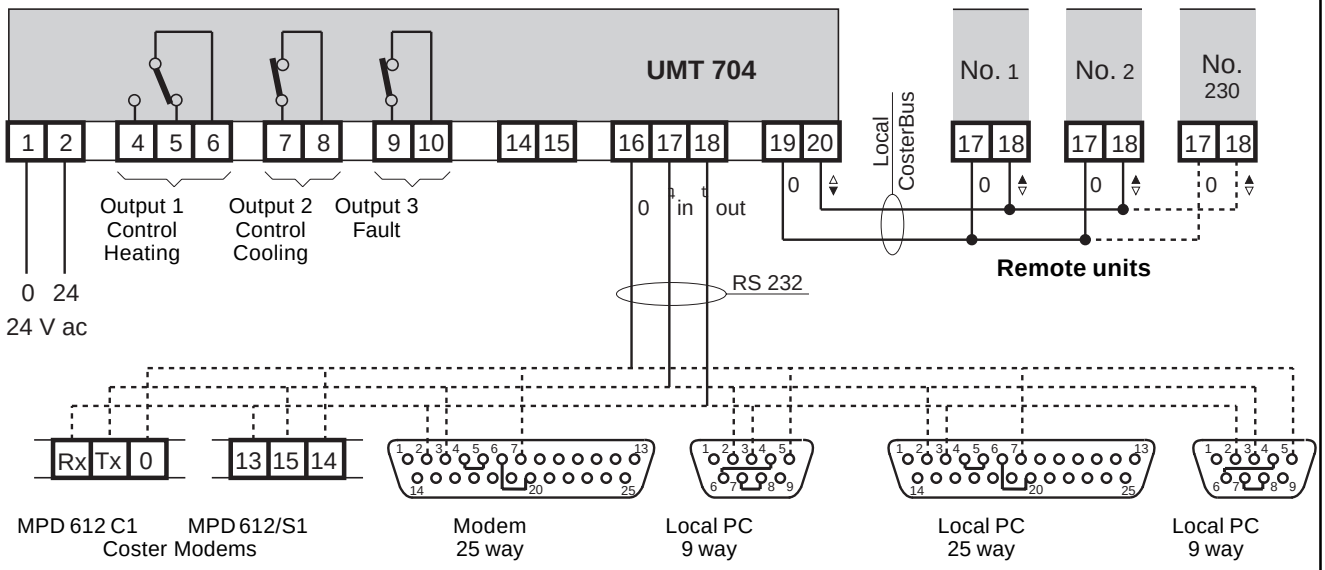
EACH OF THE PAGES DESCRIBED ABOVE APPEARS FOR EACH REMOTE CONTROLLER CONNECTED

	TO CONTINUE KEEP "+" KEY PRESSED FOR 5 SECONDS	Change to setting pages of UMT 704 central unit.
24	**UMT 704** **Current time and day** **10.22** (1) **TUESDAY** (2)	(1) Current time (2) Current day
25	**UMT 704** **Plant Type** **HEATING**(1) **Total zones : 1** (2)	(1) Plant Type : – HEATING : Plant for winter heating. On display pages only Heating data appear. – HEATING + COOLING : Plant for winter heating and summer cooling. On display pages Cooling data also appear. (2) Number of remote controllers connected to central display unit.
26	**UMT 704** **Address Master** **1**	If inserted in a system of telemanagement, assign address to Master (1 to 239).
27	**UMT 704 / Output 1** **Therld Heat. : 50 %**(1) **Threshold: 0 %**(2) **Min. time: 1 m**(3)	(1) Thermal load of Heating plant in relation to request of remote controllers. (2) Activation threshold of Output 1. – Threshold> Heating load: contact 6-5 closed and 6-4 open – Threshold< Heating load- contact 6-5 open and 6-4 closed (3) Minimum time activation of output (1 to 99 minutes).
28	**UMT 704 / Output 2** **Therld. Cool. : 0 %**(1) **Threshold : 0 %**(2) **Min. time: 1 m**(3)	(1) Thermal load of Cooling plant in relation to request of remote controllers. (2) Activation threshold Output 2. – Threshold > Cooling load : contact 7-8 closed. – Threshold < Cooling load : contact 7-8 open. (3) Minimum activation time of output (1to 99 minutes).
29	**UMT 704 C2 Eng.** **Vers. ...**	Identification data of device.

WIRING DIAGRAMS

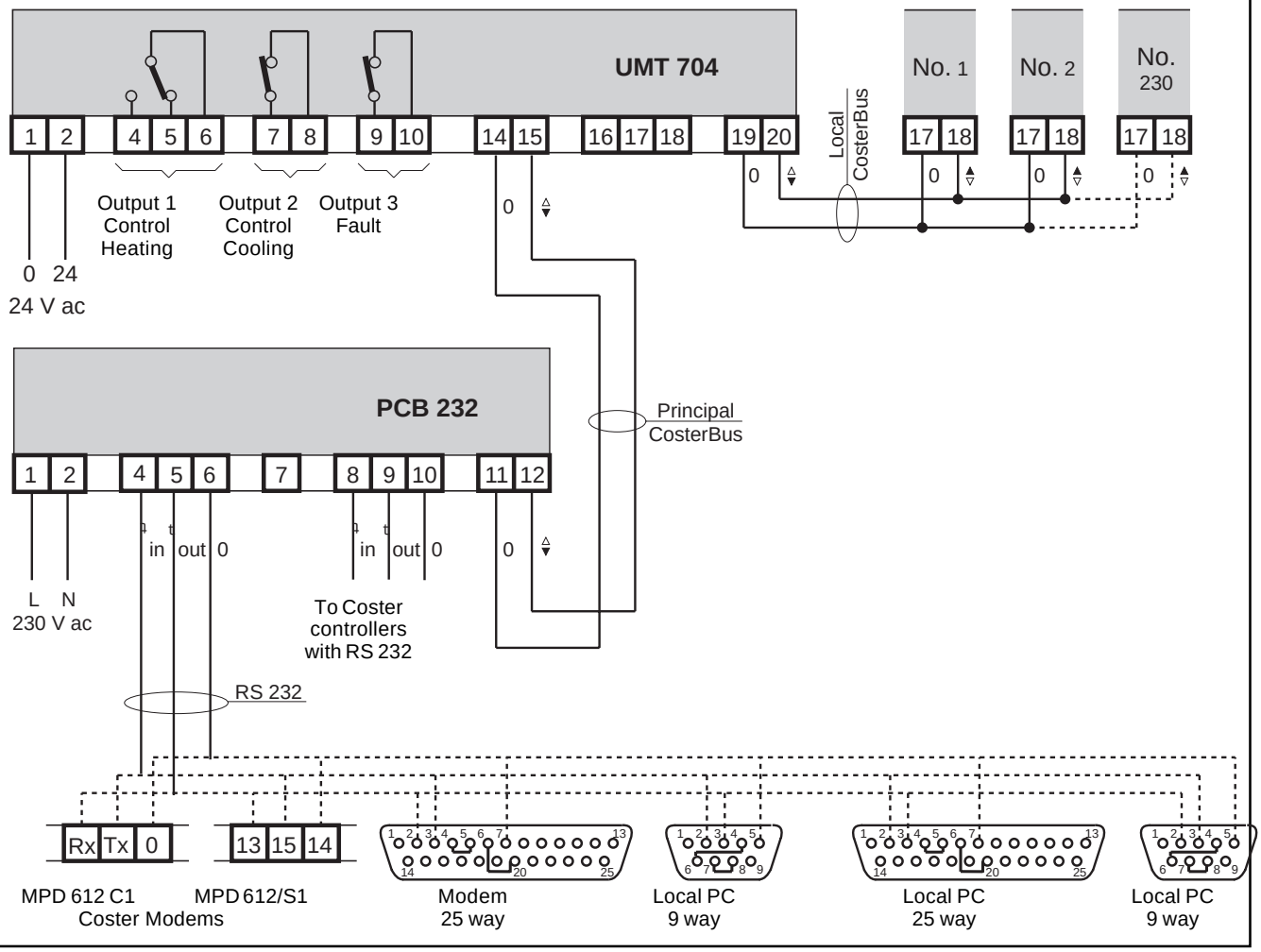
fig. 7

Reading Data from RS232



To connect either Modem or local PC switch RS232 line by three-pole switch.

Reading Data from CosterBus



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