Apparecchiature ☒ **GM ELECTRONICS**

GM SISTEMI di Guarnieri Massimo via dell' Artigianato 29 SALIZZOLE (VR) P.IVA 03433220237 Tel. & Fax 6900919 Web www.gmelectronics.it
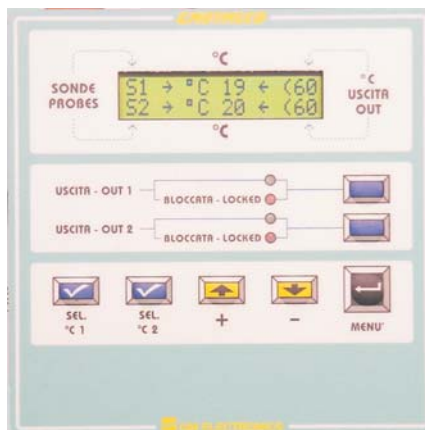
Temperature measurement module GMETMLCD

General Data:
 -MODEL : GMETMLCD
 -DESCRIPTION : TEMPERATURE CONTROL MODULE
 -POWER : 24VDC
 -OUTPUTS : 2 free exchange relays 0.5A at 30Vdc.
  1 negative open collector 0.5A at 30 Vdc
 -BUS LINE 485 (see software version)
 -DIMENSIONS: module GMETMLCD 125x125x55
 -ABSORPTION: min. 70 mA - max 250 mA
 -OPERATING TEMPERATURE: -5 / +45 °C
 -DISPLAY: LCD 2x16 + 4 LEDs
 -SETTINGS: through membrane keys
 -DEGREES MANAGED: 0-99 °C (see software version)

GENERAL DESCRIPTION

The temperature measuring system comprising the module GMETMLCD and the probes type: GMST70,GMST90,GMST100,GMST101 has been designed to measure temperatures in specific environments. The system is used in fire detection systems where it is not always possible to install smoke or flame detectors, etc...; (they are not intended for measuring temperatures in environments used for the preservation of foodstuffs, or similar). The GMETMLCD can be installed in one of the GM containers (es. GMCT2MS).

PANEL DESCRIPTION module GMETMLCD
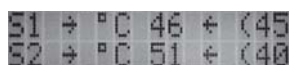
DISPLAY
The display consists of 2 rows of 16 characters each. In normal position (probe status) the first line displays the information relevant to probe no. 1; the second line displays the information relevant to probe no. 2 (see figure on the Left);

LED
Output 1 and *2* = green, when lit indicate that switch over has occurred according to the preset temperature.
U1 Locked and *U2 Locked* = red, when lit indicate that the output is in locked position (it cannot switch over).

BUTTONS
Lock Output 1 and *Lock Output2* = *used to* lock/release the output relays
Menu = allows you to access the option programming Menu
Page + and *Page* - = in a menu allow you to scroll the pages; during normal operation they are used to access the backlight of the display (it is timed to switch off)
Select °C1 and *Select °C2* = during normal operation they allow you to set the desired temperature for the outputs to switch over; in the menu they select or disable particular functions.
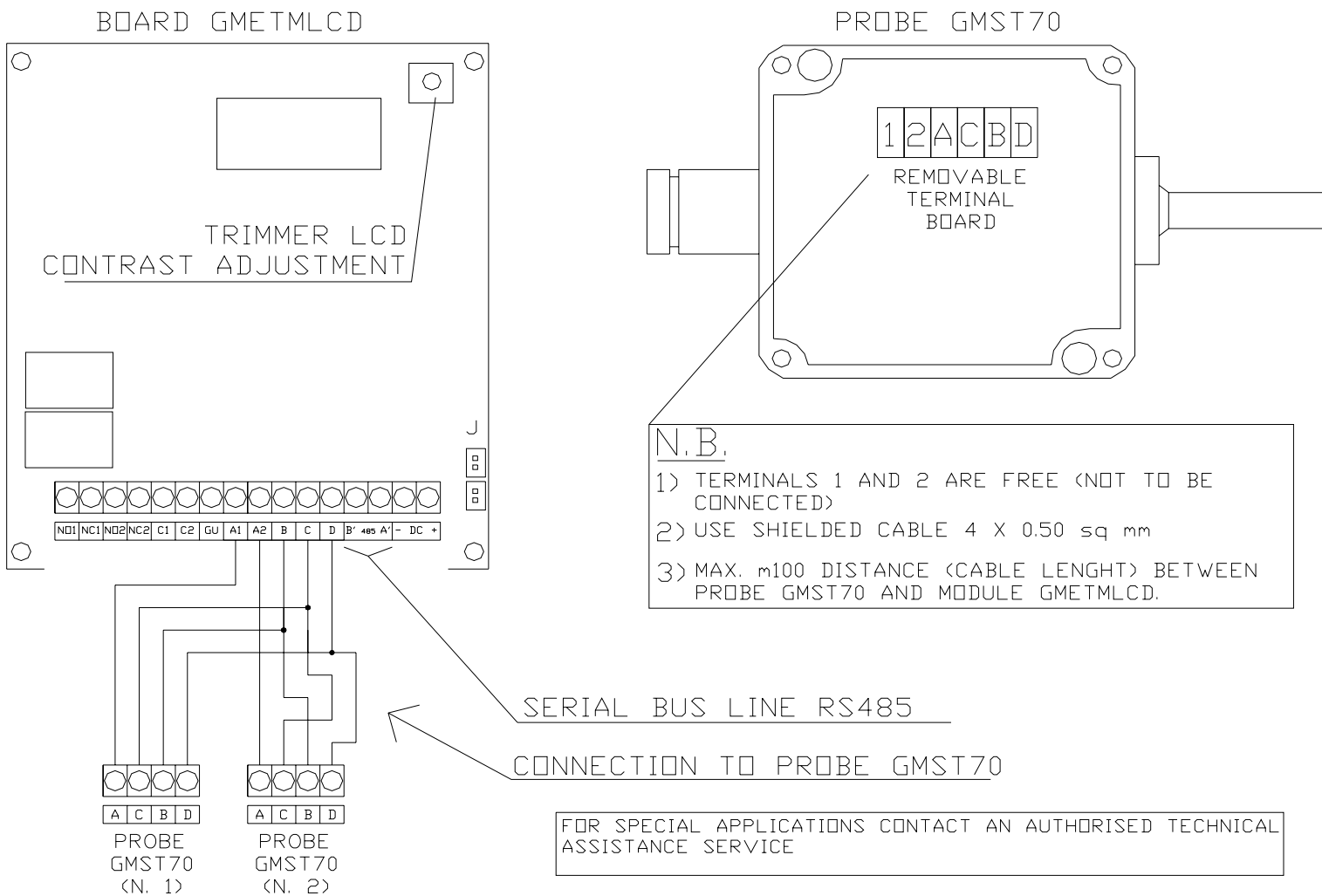
® **Equipment**

GM ELECTRONICS

PROBE CONNECTION DIAGRAM

BOARD GMETMLCD

PROBE GMST70

TRIMMER LCD
CONTRAST ADJUSTMENT

1 2 A C B D
REMOVABLE
TERMINAL
BOARD

| NO1 | NC1 | NO2 | NC2 | C1 | C2 | GU | A1 | A2 | B | C | D | B' | 485 | A' | - | DC | + |

J

N.B.

1) TERMINALS 1 AND 2 ARE FREE (NOT TO BE CONNECTED)

2) USE SHIELDED CABLE 4 X 0.50 sq mm

3) MAX. m100 DISTANCE (CABLE LENGHT) BETWEEN PROBE GMST70 AND MODULE GMETMLCD.

A C B D
PROBE
GMST70
(N. 1)

A C B D
PROBE
GMST70
(N. 2)

SERIAL BUS LINE RS485

CONNECTION TO PROBE GMST70

FOR SPECIAL APPLICATIONS CONTACT AN AUTHORISED TECHNICAL ASSISTANCE SERVICE

PROBE TERMINAL BOARDS (type GMST70,GMST90,GMST100) and CABLING

Fig. 5 — Terminal Board Internal

1 2 A C B D
REMOVABLE
TERMINAL
BOARD

T1   1 2 3   M2
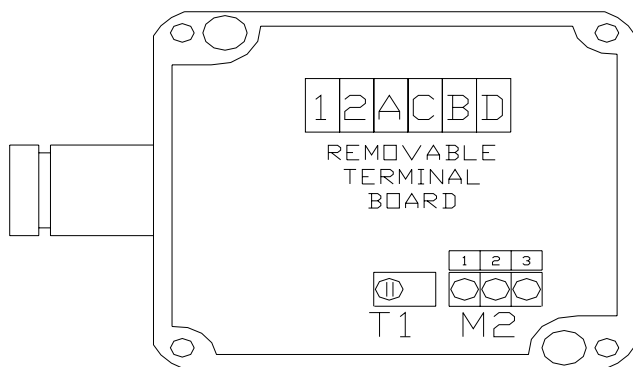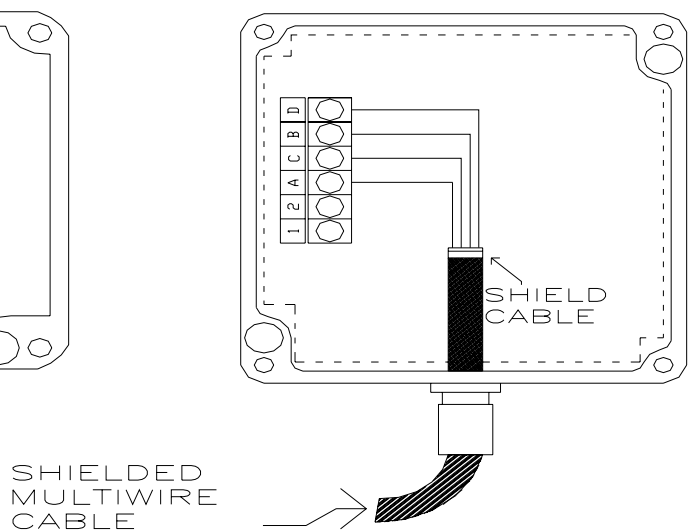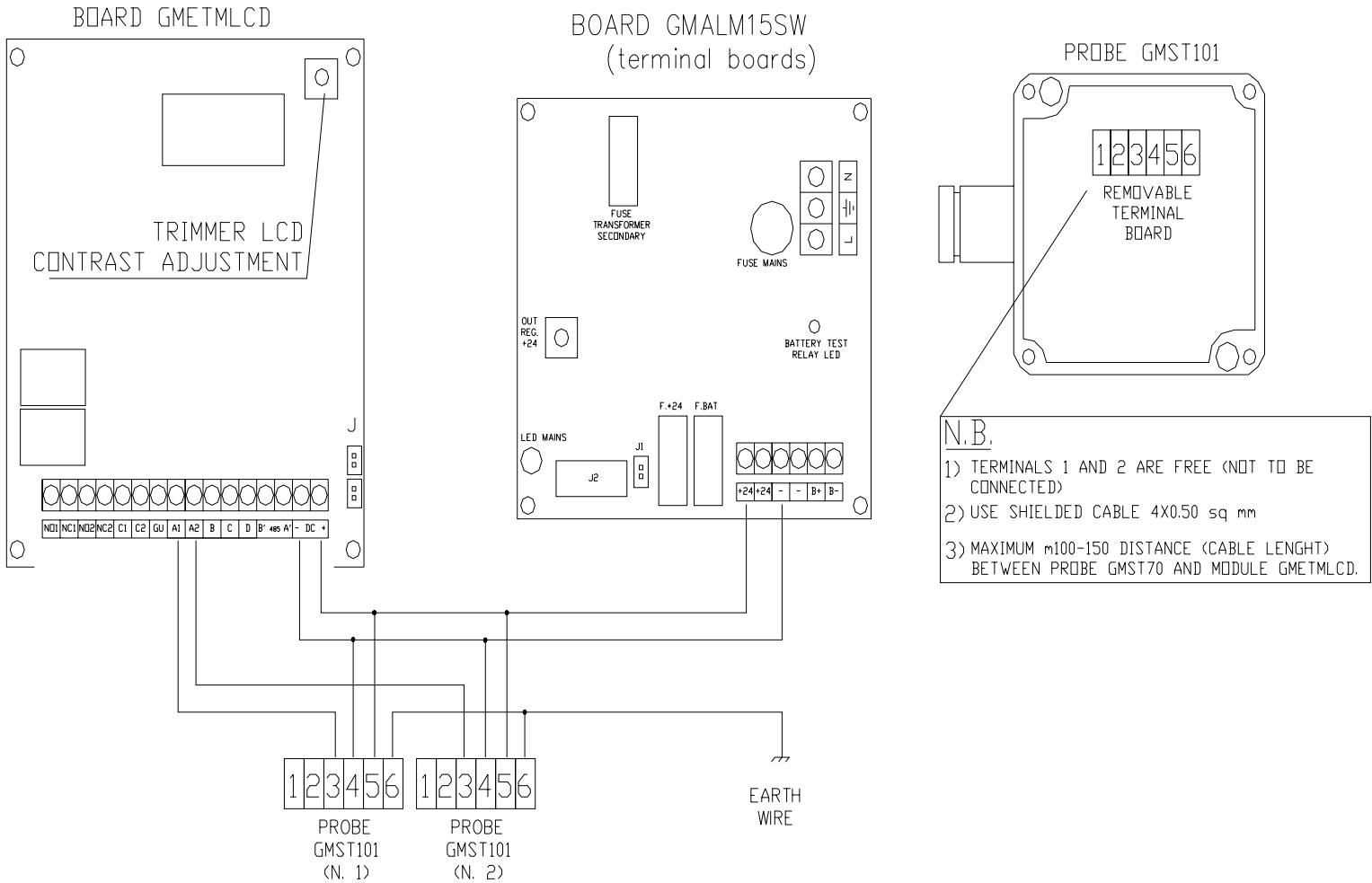
Fig. 6 — Cables Cabling

D C B A 2 1

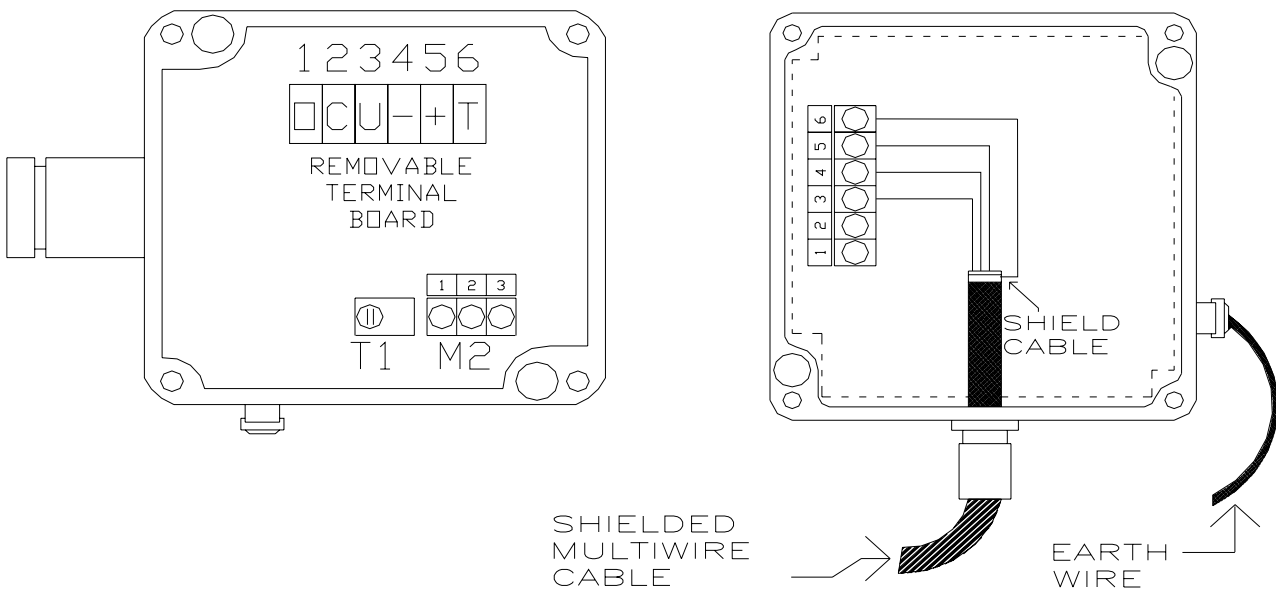SHIELD CABLE

SHIELDED
MULTIWIRE
CABLE

ELECTRICAL CONNECTIONS

1) use only shielded cables (aluminium shielding + copper braid around wires)
2) Wire section 4X0.50 or 2X0.50 (+ and - power supply) + 2X0.22 (other signals)
3) The "braid" of the shielded cable must be connected to the "earth" in the control unit
4) Choose a degree of isolation for the cable appropriate for ducts where it is positioned
5) Maximum length of line between Probes and GM ELECTRONICS control modules 150m

MODULE GMETMLCD WITH PROBES (3 WIRES)TYPE GMST101

BOARD GMETMLCD

TRIMMER LCD
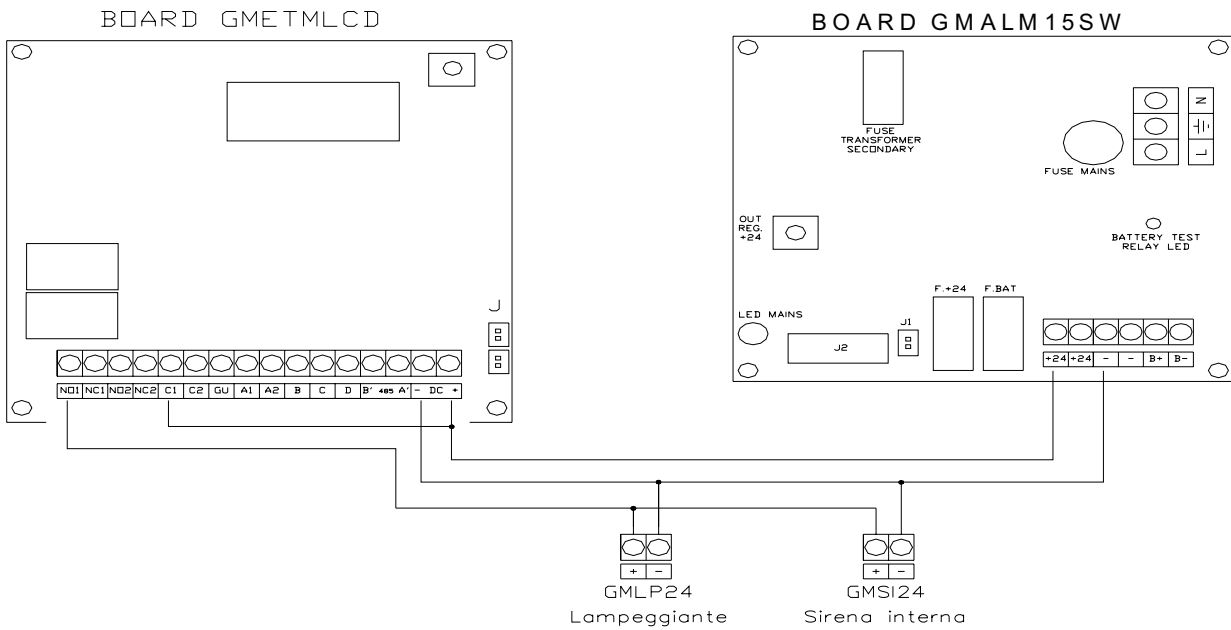CONTRAST ADJUSTMENT

J

NO1 NC1 NO2 NC2 C1 C2 GU A1 A2 B C D B' 485 A' - DC +

BOARD GMALM15SW
(terminal boards)

FUSE
TRANSFORMER
SECONDARY

N
⊣⊢
⏚

FUSE MAINS

OUT
REG.
+24

BATTERY TEST
RELAY LED

F.+24 F.BAT

LED MAINS

J1

J2

+24 +24 - - B+ B-

PROBE GMST101

1 2 3 4 5 6

REMOVABLE
TERMINAL
BOARD

N.B.

1) TERMINALS 1 AND 2 ARE FREE (NOT TO BE
   CONNECTED)

2) USE SHIELDED CABLE 4X0.50 sq mm

3) MAXIMUM m100-150 DISTANCE (CABLE LENGHT)
   BETWEEN PROBE GMST70 AND MODULE GMETMLCD.

1 2 3 4 5 6   1 2 3 4 5 6

PROBE   PROBE
GMST101   GMST101
(N. 1)   (N. 2)

EARTH
WIRE

GMST101 – Terminal Board Internal

1 2 3 4 5 6

□ C U – + T

REMOVABLE
TERMINAL
BOARD

1 2 3

T1   M2

GMST101 – Cables Cabling

6
5
4
3
2
1

SHIELD
CABLE

SHIELDED
MULTIWIRE
CABLE

EARTH
WIRE

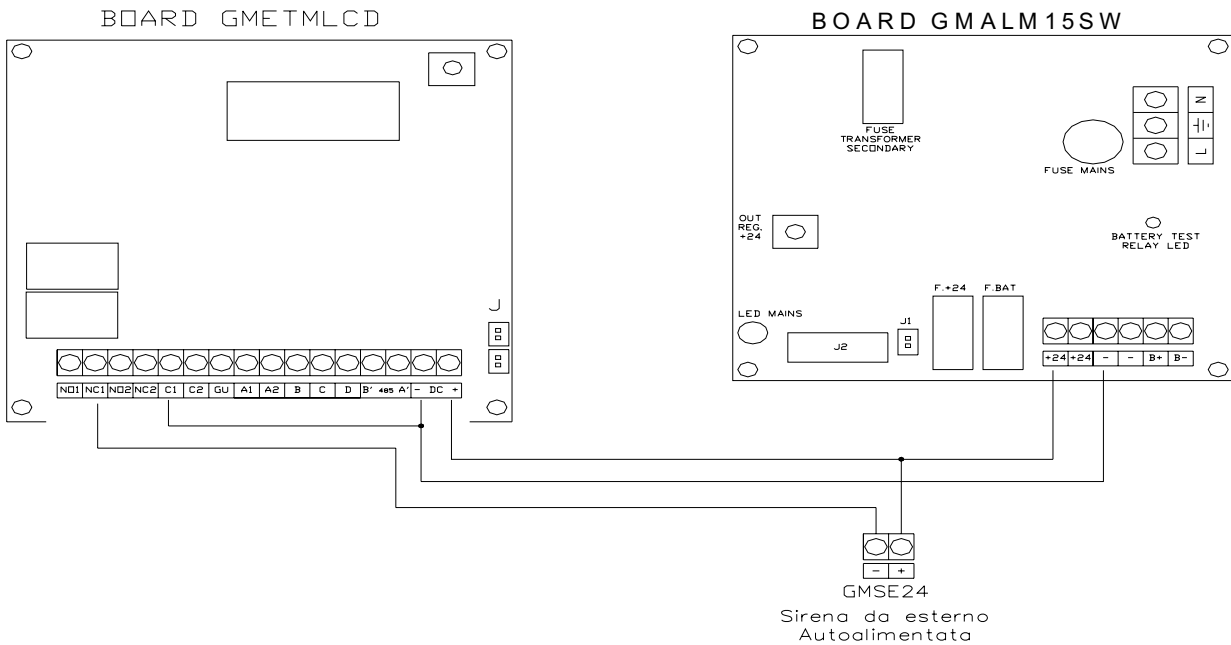## ELECTRICAL CONNECTIONS:

1) Use only shielded cables (aluminium shielding + copper braid around wires)
2) Wire section 4X0.50 or 2X0.50 (+ and - power supply) + 2X0.22 (other signals)
3) The "braid" of the shielded cable must be connected to the "earth" in the control unit
4) Terminal 6 (T) must be earthed
5) Choose a degree of isolation for the cable appropriate for the ducts where it is positioned
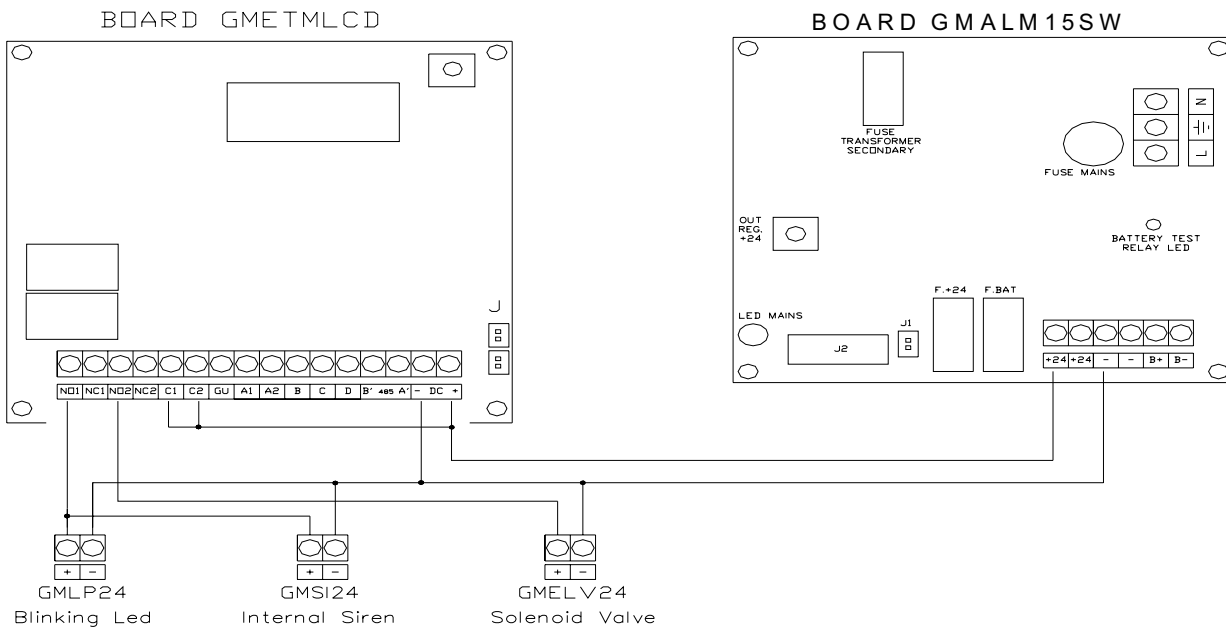6) Maximum length of lines between Probes and GM ELECTRONICS control modules 100-150m

EXAMPLE OF OUTPUT CONNECTION: INTERNAL SIREN + BLINKING LED ON OUTPUT 1

BOARD GMETMLCD

BOARD GMALM15SW

FUSE TRANSFORMER SECONDARY

FUSE MAINS

OUT REG. +24

BATTERY TEST RELAY LED

LED MAINS

J2   J1

F.+24   F.BAT

NO1 NC1 NO2 NC2 C1 C2 GU A1 A2 B C D B' 485 A' - DC +

+24 +24 - - B+ B-

GMLP24
Lampeggiante

GMSI24
Sirena interna

EXAMPLE OF OUTPUT CONNECTION: AUTOFED INTERNAL SIREN ON OUTPUT 1

BOARD GMETMLCD

BOARD GMALM15SW

FUSE TRANSFORMER SECONDARY

FUSE MAINS

OUT REG. +24

BATTERY TEST RELAY LED

LED MAINS

J2   J1

F.+24   F.BAT

NO1 NC1 NO2 NC2 C1 C2 GU A1 A2 B C D B' 485 A' - DC +

+24 +24 - - B+ B-

GMSE24
Sirena da esterno
Autoalimentata

EXAMPLE OF OUTPUT CONNECTION: INTERNAL SIREN + BLINKING LIGHT ON OUTPUT 1
e.g. 1st temperature threshold) SOLENOID VALVE ON OUTPUT 2 (2nd temperature threshold)

BOARD GMETMLCD

BOARD GMALM15SW

FUSE TRANSFORMER SECONDARY

FUSE MAINS

OUT REG. +24

BATTERY TEST RELAY LED

LED MAINS

J2   J1

F.+24   F.BAT

NO1 NC1 NO2 NC2 C1 C2 GU A1 A2 B C D B' 485 A' - DC +

+24 +24 - - B+ B-

GMLP24
Blinking Led

GMSI24
Internal Siren

GMELV24
Solenoid Valve

OPERATION

A new function has been added to this software version 3.0 of storing options on the EPROM memory which will save the set data even when the module is not energized, for a period of approx. 10 years. The only setting that will not be stored is the LOCK PROBES (if you wish to lock the line/probes definitively use the "DISABLE PROBES" function in t he options menu).

This version of module GMETMLCD combined with probe GMST70 does not measure temperatures below 1 °C. If the temperature drops below 1 °C the message **S1 OutOfRange-** will appear on the corresponding line of the display.

Fig. 1

When the module GMETMLCD is powered the display lights up, the code number of the module (GMETMLCD) and the software version (v. 3.0) appear on the second line for a few seconds, and if there are no problems the "probe status" appears on the display, such as in the example in figure 1.

Fig. 2
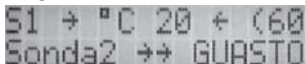
If only 1 probe is connected (to input 1), the message 'FAULT' will appear in the corresponding to probe 2 (see fig. 2). To eliminate the PROBE FAULT signal you need to execute the DISABLE PROBE function (see paragraph DISABLE PROBES), and the display will then show that probe 2 has been disabled (see fig. 3).

Fig. 3

In normal position (probe status) the programmed output switch over temperature is displayed on the right (in fig. 1 45 °C for probe 1 and 40 °C for probe 2). When the real temperature reaches this programmed value, the output switches over, and remains in this state until the temperature drops below this value.

OUTPUT SWITCH OVER TEMPERATURE SETTING

If you wish to set a temperature other than 60 °C (default setting), press push button SELECT °C1 for probe 1 or SELECT °C2 for probe 2; each time the button is pressed and released the value will change by 1 °C; press and hold down the button for the value to change continuously (the programmable limits are min. 1°C and max 99°C , on this software version).

LOCK OUTPUTS

The switching over of the outputs can be disabled (locked) by pressing the BL button. When you press the BL button the red LED comes on U1 Locked (or U2 Locked). To re-enable the outputs execute the same manoeuvre.

OUTPUTS

Every switchover of the outputs, caused by the change in temperature between the measured values and the set values, occurs with a fixed delay of 15 seconds. The delay applies both in the excitation and the drop-out of the relays. The 15 second delay time is expressed on the display by a " ." (dot) after S1 for output 1 and after S2 for output 2.

OPTIONS PROGRAMMING MENU

DISABLE PROBES (page 1 and 2)

The disable probe manoeuvre must be executed when there is only one probe connected and you need to disable the second input. The disable probe is displayed as shown in fig. 3 (Disable probe 2).

To disable probe 1 press the **Menu**   button followed by **Select °C1**
To disable probe 2 press the **Menu** button followed by Page 1 then **Select °C2**

ENABLE MAINS CONTROL FUNCTION (page 3)

This function can only be enabled if the module GMETMLCD is connected to original GM ELECTRONICS power supply units (GMALM12A, GMALM3SW). If the function is enabled check that the mains voltage (220V) signal on the power supply unit lights up. This function controls:

Fig. 4

-the presence of voltage upstream from the power supply unit (220Vac)
-the condition of the power supply unit's safety fuses
-the power supply unit's transformer

This function, if enabled, activates the General Fault output. The message flashes on the display as shown in fig. 4 and the continuous tone buzzer sounds. If the fault continues for an extended period of time, to reset the fault alarms you need to execute the disable manoeuvre To enable the mains control signal function press **Menu** followed by **Page+** twice **Select °C1** To disable the function repeat the manoeuvre.
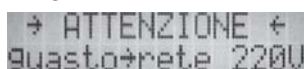
ENABLE BATTERY CHARGER FUSE CONTROL FUNCTION (page 4)

This function can only be enabled if the GMETMLCD module is connected to original GM ELECTRONICS power supply units (GMALM12A, GMALM3SW). When it is enabled it controls the presence of the voltage signal of the power supply unit's battery charger.

This function, if enabled, activates the General Fault output. The message flashes on the display as shown in fig. 5 and the continuous tone buzzer sounds. If the fault continues for an extended period of time, to reset the fault alarms you need to execute the disable Manoeuvre.

Fig. 5

→ ATTENZIONE ←
guasto batterie
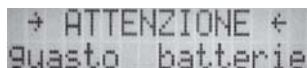
To enable the mains control signal function press **Menu** followed by **Page+** 3 times then **Select** °**C2** To disable the function repeat the manoeuvre.

## INVERSION OF OUTPUT RELAY POLARITY (page 5)

When this function is activated it inverts the contacts on the circuit terminal baord (NC becomes NO and NO becomes NC).

<u>To invert the polarity of Output 1</u> press **Menu** followed by **Page+** 4 times then **Select** °**C1**
<u>To invert the polarity of Output 2</u> press **Menu** followed by **Page+** 4 times then **Select** °**C2**
To re-invert the polarity (return to the default setting) carry out the same manoeuvre. It is signalled by means of an **"i "** next to the programmed temperature (see fig. 6) CAUTION. The polarity inversion can be programmed on each of the 2 outputs, independently, or on both simultaneously. Inverted outputs CANNOT be programmed if the outputs were previously programmed as Fig. 6 Dual Consent (page 6). In this case, firstly remove the Dual Consent Output function then program the inverted outputs. Programming of the polarity inversion always occurs with a delay of 15 seconds. Consequently, once it has been programmed, you always need to wait these 15 seconds to obtain the inversion of the polarity.

Fig. 6

S1 → °C 18 ←i(48
S2 → °C 11 ←i(20
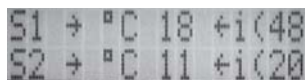
DUAL CONSENT OUTPUTS (page 6)

When this function is activated it modifies the operation of the outputs in the following way:
1) Output 1 switches over when ONE of the 2 probes reaches the preset temperature
2) Output 2 switches over when both probes reach the preset temperature.
To program the outputs as dual consent press **Menu** and followed by **Page+** 5 times then **Select** °**C1.**
<u>To return to the default setting</u> (single consent) carry out the same manoeuvre.
It is signalled by means of **"d"** next to the programmed temperature (see fig. 7)
CAUTION ! The dual consent function cannot be selected if previously the outputs were set as Inverted. In this case firstly remove the Inverted Output function then program the Dual Consent Output function.
When ONE of the 2 probes reaches the preset temperature, OUTPUT 1 switches over and you wish to lock it, simply press the lock BL button corresponding to the probe that exceeded the preset temperature (check the display). for example: probe 2 has reached 25 °C with a preset value of 20 °C; the green LED will come on OUTPUT 1.
To lock I" OUTPUT press the BL button corresponding to probe 2.

Fig. 7

S1 → °C 19 ←d(48
S2 → °C 11 ←d(20
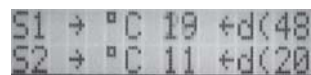
FAULTS

Module GMETMLCD features a General Fault Negative Open Collector NO Output capacity 0.5A at 30 Vdc. This output only switches over if the following occur:
-PROBE FAULT generated by the interruption of the connection between a probe and the module (cut cable, etc...);
-MAINS AND FUSE CONTROL (see corresponding paragraphs)when the fault output is activated, the cause for the fault needs to be eliminated (reconnect the probe, etc...). The fault is signalled by a continuous tone buzzer and the backlighting of the display remains lit; moreover, the fault is signalled in an alternating manner. The MAINS and BATTERY CHARGER FUSE fault does not affect the normal

SUMMARY OF PROGRAMMABLE OPTIONS MENU PAGES

page 1 = ENABLE - DISABLE PROBE 1
page 2 = ENABLE - DISABLE PROBE 2
page 3 = ENABLE - DISABLE power supply unit MAINS fault signal
page 4 = ENABLE - DISABLE power supply unit BATTERY CHARGER FUSE fault signal
page 5 = OUTPUT POLARITY SELECTION
page 6 = OUTPUT FUNCTION
page 7 = DISPLAY BOARD CODE NUMBER AND SOFTWARE VERSION

DEFAULT SETTINGS
-Probe 1 ENABLED -Probe 2ENABLED
-Output 1 ENABLED (Line Unlocked)
-Output 2 ENABLED (Line Unlocked)
-Output activation temperature = 60 °C
-Mains control DISABLED
-Battery charger fuse control DISABLED
-Output polarity NORMAL (NOT INVERTED)
-Dual consent output DISABLED

RESET SETTINGS
If any of the settings are changed, to reset the default values listed above, carry out the following operation: press **Menu** and in the Options Menu (on any page) press the **BL** button of Output **1**. The module will be reset and after several seconds it will return to the normal operating mode with the default data set in the EEPROM memory.

CONNECTION WITH GM ELECTRONICS POWER SUPPLY UNIT

If the module GMETMLCD is connected to a GM ELECTRONICS power supply unit the module must be powered with a 24Vdc voltage and if you wish to enable the mains and battery charger fuse

CONNECTION WITH CONTROL UNIT GM826SD

If the module GMETMLCD is supplied in combination with the control unit GM826SD simply power the module with 24Vdc voltage from the supply unit (it is not necessary to use the connector J, as the mains and battery charger fuse control function is carried out by the control unit).
If you wish, in the event that the outputs of module GMETMLCD are activated, to activate the control unit outputs (SI, SE, etc...) as well to use , for example the alarm times and the same acoustic optical warning devices, you must connect the outputs of the module GMETMLCD to the inputs of the control unit GM826SD (see diagram below, example of connection of output 1 of the GMETMLCD to input 1 of the control unit GM826SD).

TERMINAL BOARD MODULE GM826SD
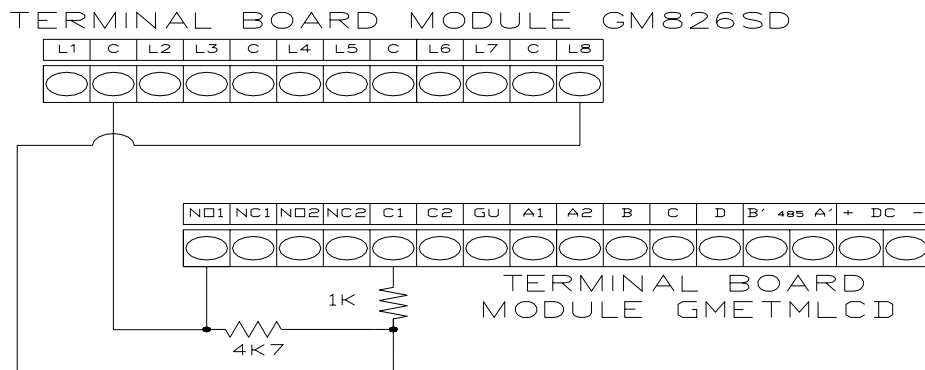
BLOCK DIAGRAM OF EQUIPMENT CONNECTION
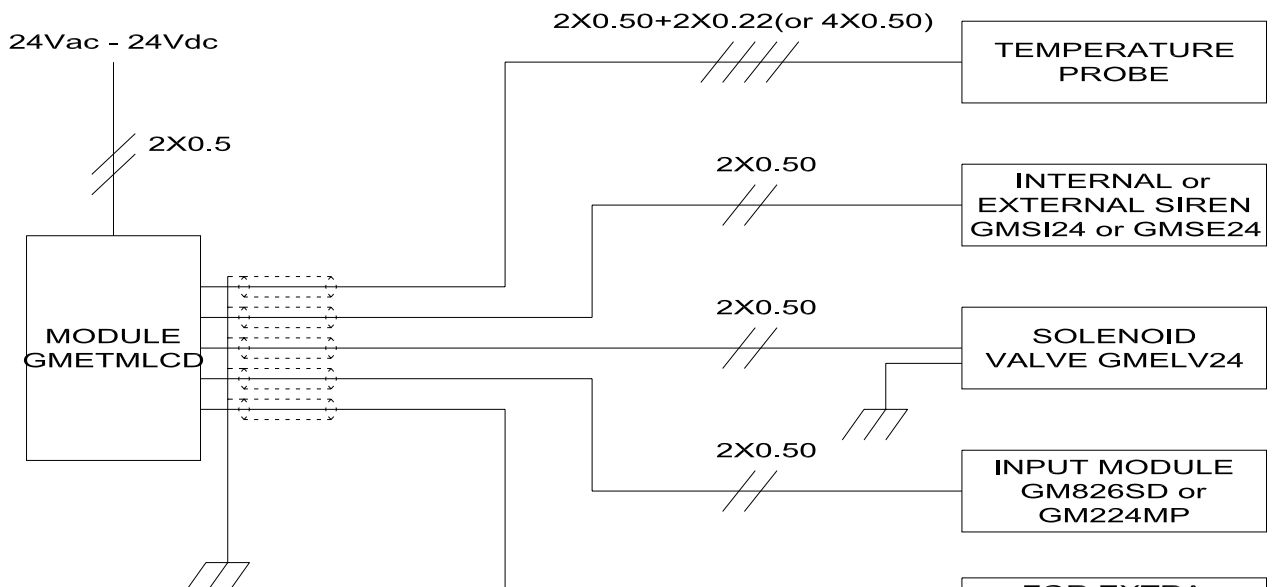
N.B. FOR ALL THE CONNECTIONS USE SHIELDED CABLES, FOR THE OTHER SPECIFICATIONS SEE INDIVIDUAL EQUIPMENT INSTRUCTIONS
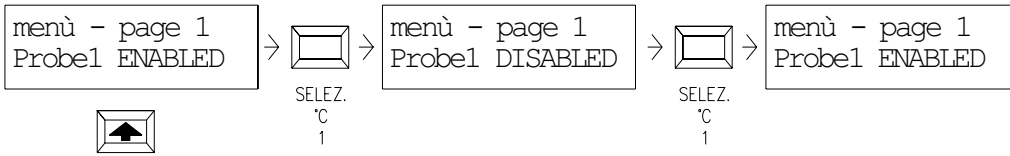
PROGRAMMABLE MENU' MAP

To access MENU'
Press

[↵]

↓

menù – page 1 Probe1 ENABLED	→	[⬚]	→	menù – page 1 Probe1 DISABLED	→	[⬚]	→	menù – page 1 Probe1 ENABLED
		SELEZ. °C 1				SELEZ. °C 1		

[⬆]

PAG.
+

↓

menù – page 2 Probe2 ENABLED	→	[⬚]	→	menù – page 2 Proble2 DISABLED	→	[⬚]	→	menù – page 2 Probe2 ENABLED
		SELEZ. °C 2				SELEZ. °C 2		

[⬆]

PAG.
+

↓

menù – page 3 MAINS –NO signal	→	[⬚]	→	menù – page 3 MAINS – signal	→	[⬚]	→	menù – page 3 MAINS –NO signal
		SELEZ. °C 1				SELEZ. °C 1		

[⬆]

PAG.
+

↓

menù – page 4 BATT –NO signal	→	[⬚]	→	menù – page 4 BATT – signal	→	[⬚]	→	menù – page 4 BATT –NO signal
		SELEZ. °C 2				SELEZ. °C 2		

[⬆]

PAG.
+

↓

menù – page 5 POL. G=N 1=N 2=N

(press for 2 sec.) → [⬚] SELEZ. °C 1 → menù – page 5
POL. G=N 1=I 2=N → (press for 2 sec.) → [⬚] SELEZ. °C 1 → menù – page 5
POL. G=N 1=N 2=N

(press for 2 sec.) → [⬚] SELEZ. °C 2 → menù – page 5
POL. G=N 1=N 2=I → (press for 2 sec.) → [⬚] SELEZ. °C 2 → menù – page 5
POL. G=N 1=N 2=N

(press together) → [⬚] + [⬚] SELEZ. °C 1 SELEZ. °C 2 → menù – page 6
POL. G=I 1=N 2=N → (press together) → [⬚] + [⬚] SELEZ. °C 1 SELEZ. °C 2 → menù – page 6
POL. G=N 1=N 2=N

[⬆]

PAG.
+

↓

continued..

Options menù continued

```
menù – page 6
U1 = S1   U2 = S2
```
→ SELEZ. °C 1 →
```
menù – page 6
U1&U2 = S1 or S2
```
→ The programmed temperature thresholds for U1 and U2 apply to both S1 and S2

PAG. +

→ SELEZ. °C 1 →
```
menù – page 6
U1=1or2 U2 = 1and2
```
→ "Dual consent on U2"
U1 actuated both by S1 and S2
U2 only with both

→ SELEZ. °C 1 →
```
menù – page 6
U1 = S1   U2 = S2
```
→ "Return to normal prog."
U1 actuated by S1
U2 actuated by S2

```
menù – page 7
GM–ETMLCD  v.3.3
```
→ "version Software module"
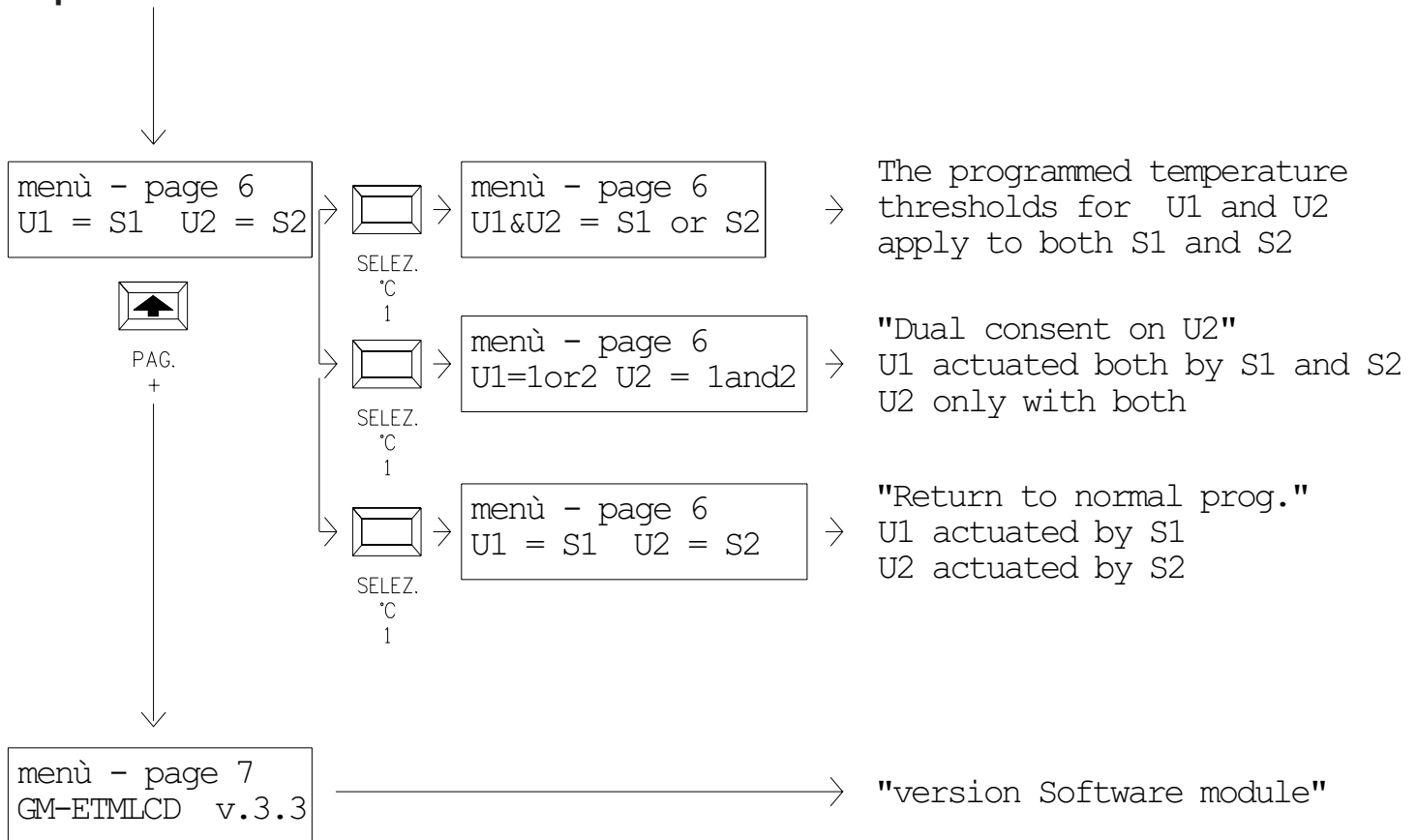
New functions (in this Software version)
1)   Menu page 5 : polarity
  a) General Fault Output (GU) by default Normally Closed, that is, with presence of
     negative (open collector type output with reference to -)
  b) The fault output can be reprogrammed as normally 'closed' or normally 'open'
2)   Menu page 6 : outputs
  a) the outputs can be programmed in 3 operating modes
     a-1) U1 = S1 , U2 = S2 , in this way output 1 is only commanded by Probe 1 input , and output 2 by
          probe 2 input.
     a-2) U1 = S1 or S2 , U2 = 1 and 2 , in this way output 1 is commanded by both Probe 1 and Probe 2
          inputs, whereas output 2 switches over when both probe exceed the programmed threshold
          (2) (dual consent function).
     a-3) U1 & U2 = S1 or S2 , in this way the outputs (that is, programmed temperatures) are
          commanded by either of the 2 Probe inputs Sonde, for example, if you set 2 maximum and
          minimum temperature set points (programmable indifferently on U1 or U2), the first of the two
          inputs to reach the minimum commands that output (that could be either 1 or 2), and in turn
          the first of the 2 inputs (or it can be the same one) to arrive at the maximum value
          commands the programmed output as the high threshold.

Apparecchiature ☑ **GM ELECTRONICS**

GM SISTEMI di Guarnieri Massimo via dell' Artigianato 29 SALIZZOLE (VR) P.IVA 03433220237 Tel. & Fax 6900919 Web www.gmelectronics.it

DECLARATION OF CONFORMITY

GM SISTEMI di Guarnieri Massimo

of via dell'Artigianato 29, SALIZZOLE (VR) ITALY

Tel. & Fax 045-6900919

DECLARES THAT

Equipment Name	: **TEMPERATURE MEASUREMENT MODULE**
Equipment type	: **TEMPERATURE CONTROL MODULE BY MEANS OF PROBES**
Model	: **GMETMLCD**

COMPLIES WITH THE REQUIREMENTS OF THE EMC DIRECTIVE AS DEFINED BY THE FOLLOWING STANDARDS:

IMMUNITY :
ESD(Electrostatic Discharge Immunity Test):	**IEC 1000-4-2 (1995)**
Radiated RF Electromagnetic Field Immunity Test:	**IEC 1000-4-3 (1995**
Electrical Fast Transient /Burst Immunity Test:	**IEC 1000-4-4 (1995**
Surge Immunity Test:	**IEC 1000-4-5 (1995**
Voltage Dips;	
Short Interruptions and	
Voltage Variations Immunity Tests:	**IEC 1000-4-11 (1995**
Immunity to conducted disturbances,	
induced by radio-frequency fields :	**IEC 1000-4-6 (1995), ENV 50141**

EMISSIONS:

Conducted Emissions:	**EN55011 (1991)**
Radiated Emissions:	**EN55011 (1991)**

The equipment has been tested under normal working conditions, and meets the requirements of the EMC specified above based on the tests and assessments executed.

GM SISTEMI

Legal Representative
Guarnieri Massimo