Touch screen

mod. 2T

mod. 2TR

USER MANUAL

2T–2TR DOUBLE TEMPERATURE CONTROLLER
RS485 MODBUS RTU Configuration

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When the device is turned - on its display shows the following text:

- **SEL** (upper display)
- **CAL** (lower display).

After a few seconds the upper display shows the value of the first probe (**t1)**;
the lower display shows the value of the second probe (**t2)**.

Setting the **T1** working temperature :

- Press the **S** button, so the upper display will show **SET** and the lower display shows t1" (the upper red led on the right flashes);
- Press the **S** button again and the upper display shows **SP** and the lower one will show the value set previously;
- Use the following buttons to adjust: ▼ and ▲

In order to set the temperature of the **t2,** do the following:

- Press **S** the upper display will show **SET** and lower will show **t1**;
- Press the ▼ button and the display will show: **t2** (the lower right red led will be switched on);
- Press the **S** button again and the upper display will show **SP** the lower one will show the value set previously;
- Use the following buttons to adjust: ▼ and ▲

To access the parameters using the password:

- Press the **S** button so the upper display will show **SET** and the lower display will show **t1**;
- Press the ▼ button again and the lower will show **t2**;
- Press the ▲ button and the lower **DEV ;**
- Press again the ▲ button so the lower display will show **PAS**;
- Press again the **S** button so the lower display will show **100** ;
- Use the ▲ ▼ buttons to set the password "**123**" ;
- Press the **S** button to select either **t1** or **t2** ;
- The ▼ button is used to modify the parameters of **t1** or **t2** ;
- Use the **S** button to select the right parameter;
  the ▲ ▼ buttons for its set.

The confirmation that the programming has been successfully completed will be shown by the flashing **9 9** on the display.

INPUTS and OUTPUTS:

The 2T device can work like two single temperature controllers, each with its own input to show the temperature (SP) and two digital outputs (OUT and ALARM).
The small clamps are used as in the following table:

T1 Regulation channel (SP)	
probe inputs	TC 1 (3 - 4+)
Outputs	SP1 (19 - 20)
Alarm	AL1 (17 - 18)
T2 Regulation channel (SP)	
probe inputs	TC 2 (1 - 2+)
Outputs	SP2 (15 – 16)
Alarm	AL2 (13 – 14)

Heating control:

If the adjustment channel has been set to heat mode, the temperature control is obtained by the complete PID algorithm or the ON-OFF algorithm with hysteresis.

The Act parameter must be set to Hot in order to select the heating action: the activation of the control output causes an increase in temperature because it is connected to a heating element .
The selection is made by setting the **proportional band (PB)** :

- Setting value 0 (zero) will enable the ON – OFF adjustment
- Setting any value other than **0** will enable the PID adjustment

The aforementioned settings are summarized in the table below:

	Simbolo	**ON-OFF**	**PID**
Proportional Band	**PB**	If is set to 0 it will enable ON-OFF	PB > 0 – proportional band PID
Integral Time	**Ti**		Integral Time PID
Derivative Time	**Td**		Derivative Time PID (Td=-1 automatic Td= Ti/4)
Positive Hysteresis	**HSO**	> 0.1°C	
Negative Hysteresis	**HSU**	< 0.1°C	
Output Time od Cycle	**Tc**		From 0 (zero) to 999”

Cooling control:

If the control channel is set to cooling mode, temperature control can take place only with algorithm **ON - OFF** with hysteresis.
The parameter Act must be set to the **Col** to select direct cooling action: enabling the output temperature control will result in a decrease in temperature because it is linked to a cooling element.
The PID parameters (see table above) are ignored as described above.

Manual modes (pulse generator)

The instrument has two **manual** modes that exclude the control algorithms and run the control elements at constant power:

- Manual mode always on (also with temperature probe);
- Manual mode only when there is an error with the temperature probe.

Select manual mode (always on) by selecting the parameter **MAN** = **1** (the **MPE** parameter is ignored).
To select manual mode only when there is an error with the temperature probe by selecting the parameter **MAN = 0** and **MPE = 1**.

In both cases the percentage of activation control output is set via the OUT parameter (percentage of the cycle time normally used).
Table (summary):

	MAN	**MPE**
Manual mode always on	1	
Manual mode in case of error of probe	0	1

ECO mode:

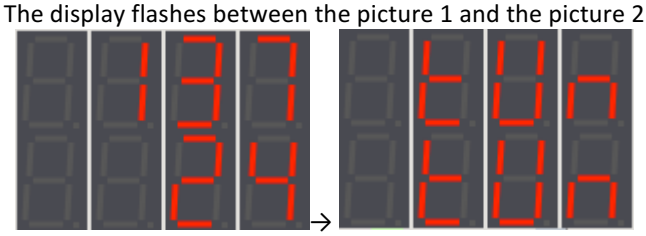
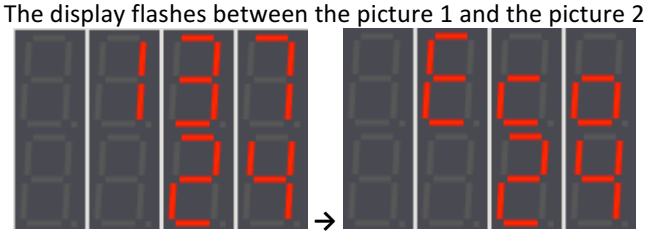
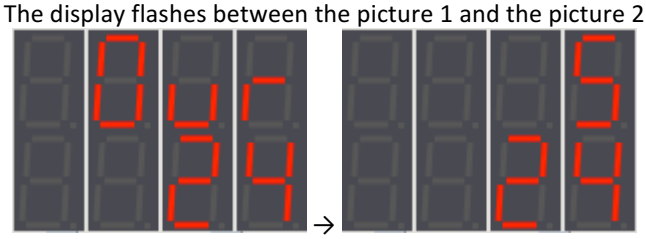
Turn on by setting **ECO > 0** .

- To enter and exit ECO mode toggle between and keep the ▲ and ▼ tabs depressed for at least 3 seconds
- It can also be set via the RS485 MOBDUS RTU.

Versions with front display

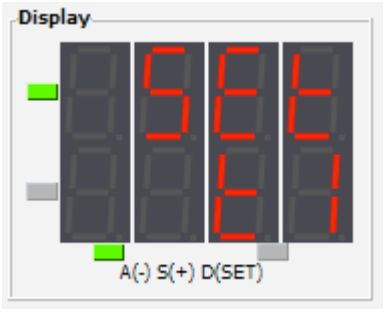
Alarms and indicators

The numbers in the below table (and images) are only shown as an example (illustrative purpose):

Temperature over-range	
Temperature under-range	
Autotuning	The display flashes between the picture 1 and the picture 2 
ECO mode	The display flashes between the picture 1 and the picture 2 
Manual mode in case of error of probe	The display flashes between the picture 1 and the picture 2 

Configuration

Enter the configuration mode, press the S button



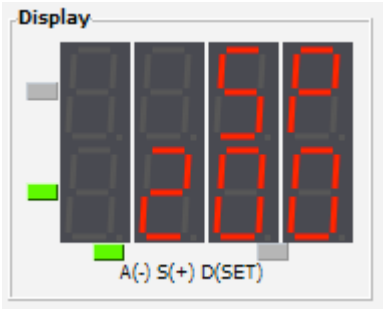
In this phase the side LEDS simply indicate which parameters are active.

The following options are available:

- **T1** to adjust the parameters of the first channel (the upper side LED will turn on)
- **T2** to adjust the parameters of the second channel (the lower side LED will turn on)
- **DEV** to adjust the general parameters of the instrument (RS485 MOBDUS RTU, tipo di tune ecc.) (no LED on, only visible once the password has been inputted)
- **PAS** input the password to access all parameters

After **8 seconds** of inactivity one automitically will exit the configuration mode

Press S to access the parameters of the selected set whose symbols are identical to the previous version.



The above picture shows the **setpoint** parameter of the second channel (**T2**, lower LED illuminates)

To return to the set parameters display:

- press S until you have run through all the parameters
- wait for approx: **8 secondi** without pressing any button

Returning to the "selection of set parameters" **does not save the new values**.

Inorder to save the values, return to the normal operating mode: wait **8 seconds** on the selection set parameter page.

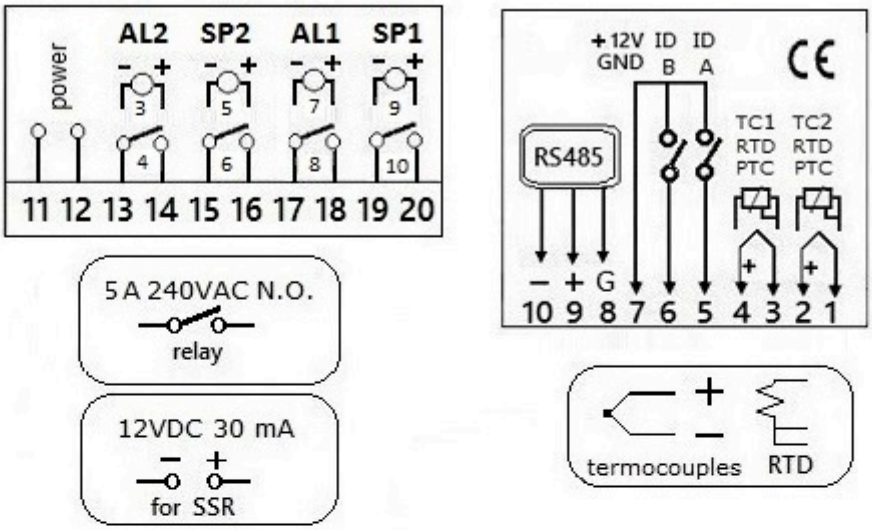
If no password has been inserted, only the setpoint and two alarms will be set and it is not possible to access the common parameters of the instrument **(DEV)**.

Parametri impostabili per ciascun canale di termoregolazione, scegliendo **T1** o **T2** nella pagina **SET.**

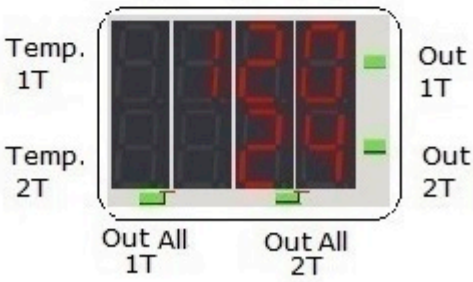
Parameter	Description	Values	Default	Note
SP	Setpoint	- 99 :: [maximum]	**20°C**	
To change the following parameters it is necessary to enter the password				
AL	Alarm	[minimum] :: [maximum]	**100°C**	
Int	kind of probe	**tcJ** Termocouple J **tcH** Termocouple K **tcb** Termocouple B **tce** Termocouple E **tcn** Termocouple N **tcr** Termocouple R **tcs** Termocouple S **tct** Termocouple T **pt1** Pt100 **p10** Pt1000 **ptc** PTC	**tcJ**	
Act	working method	**Hot** Heating **Col** Cooling	**Hot**	Setting "**COL**" the controller will work by ON/OFF method.
Eco	ECO mode	0 (off) :: 999	**0°C**	
BSC	Gradient of ramp	0 :: 1	**1**	The setpoint can automatically change
nSP	Minimum set point	- 99 :: 999	**- 30 °C**	
mSP	Maximum set point	- 99 :: 999	**400°C**	
Tc	Time of Cycle	0,1 :: 999	**15 s**	
PB	Proportional Band	0 (ON-OFF) : 100	**2 %**	
Ti	Integral Time	0 :: 999	**120 s**	
td	Derivative Time	- 1 :: 999	**30 s**	
OFS	Temperature Offset	- 100 :: +100	**0 °C**	
HSO	Positive Differential of SET	0 :: 999	**0 °C**	Only for ON-OFF method
HSU	Negative Differential of SET	0 :: 999	**1 °C**	Only for ON-OFF method
ALM	Relay Alarm mode	Absolute Band Alarm **Relay** - (**1 off / 2 on**) Deviation Band Alarm **Relè** - (**4 off / 3 on**)	**1**	
ALS	Setpoint Alarm	0 :: 1	**0**	
ALH	Absolute Hight Alarm	0 :: 999	**600 °C**	

ALL	Absolute Low Alarm	0 :: 999	**0 °C**	
MPe	Pulse generator (in case of error of probe)	0 :: 1	**0**	
MAN	Pulse generator	0 :: 1	**0**	
OUT	Percent Value	0 :: 100	**50 %**	
LSP	display functions	0 - 1 - 2	**0**	0 = probe value 1 = until set value 2 = SET value
dOn	Delay after switch-off	1….999 sec.	**2**	Only for Cooling
dOF	Delay between starts	1…..999 sec.	**20**	Only for Cooling
RCA	Delay at switch on	1…..999 sec.	2	Only for Cooling
dEC	Decimal Point	0…….1	0	Only for Cooling

Collegamenti elettrici / Electrical connections



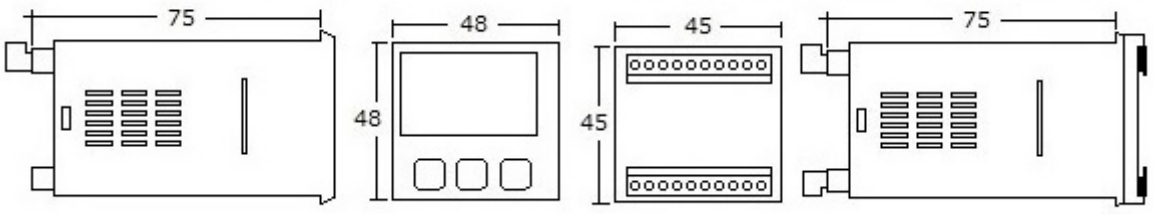
(version 2T)
signaling display



INPUT	RANGE
TC = J	0.. .999 °C 32...1830 °F
TC = K	0... 1370 °C 32...2498 °F
TC = S	0... .1750 °C 32...3182 °F
PT100	-200 ....850 °C -328..1562 °F
PTC	- 55....150 °C - 67....302 °F

versione da fronte quadro

versione da retro quadro con supporto guida DIN



2T / 2TR - CODICI PER ORDINE / CODES FOR ORDER