DDC Temperature Controller
2 Independent Loops

W500T2-W500T2MB

MODEL	DESCRIPTION
W500T2	P+I+D Digital temperature controller - 230 Vac
W500T2MB	P+I+D Digital temperature controller with Real Time Clock and Bus RS485 - 230 Vac

CE

DESCRIPTION

Digital temperature controller (P+I+D) with 2 Independent Loops: SR1 sensor input for Analogue 1 Loop and Digital 1, SR2 sensor input for Analogue 2 Loop and Digital 2, input for Limit sensor or for Compensation sensor (configurable function).

APPLICATION AND USE

W500T2/24 controllers are employed in conditioning, thermov-entilation and heating plants for temperature control (air and heat conductor fluids).

OPERATION

The controller is provided with two 0-10Vdc outputs and two relay outputs, which adjust, two by two, two separate control sensors independently.
The 4 outputs can operate in 4 different ways:

- Mode 1: Heating action
- Mode 2: Cooling action
- Mode 3: Heating/Cooling action (S/W changeover through digital input)
- Mode 4: Heating/Cooling sequence (output 0-5, 6-10) for analogue loops.
  Timed output (on/off switching) for relay outputs.

Main function

The device is able to carry out two independent control Loops on the basis of the two SR1 and SR2 temperature sensors.
SR1 sensor enables the control of AO1 analogue output and DO1 relay output.
SR2 sensor enables the control of AO2 analogue output and DO2 relay output.

Compensation function

This function can be enabled if the SC/SL analogue input has been configured for Compensation (SC) sensor.
The Compensation sensor enables the function and the compensation curve in order to define the compensated Operating Set.

Limit function

This function can be enabled if the SC/SL analogue input has been configured for the Limit sensor (SL). The Limit sensor enables the function and the max. and min. limit setting.
If the limit or compensation sensor is not connected, the functions are automatically disabled, unless such values are communicated via LinkBus. The sensors connected via LinkBus can be selected, if present, from the suitable menu.
The outputs have direct or reverse action (Mode 1 and 2) and they can carry out a sequence of changeover heating/cooling type (Mode 3), even only on one analogue output, by using the actuator range in sequence (0-5Vcc and 6–10Vcc Mode 4). In this case it will be possible to carry out a C+F+ReHeating control with only two analogue outputs.

Real Time Clock (RTC) function (W500T2MB only)

In case of RTC, it will be possible a time start according to a daily schedule with 4 time changeover and a weekly schedule, which will enable the daily programme or one of the three possible fixed modes (Stop, Comfort, Reduced).
It is possible to set an independent weekly and daily programme for AO1 and DO1 and AO2 and DO2 control Loops.

Override function

During plant start-up, it is possible to use this function to override individually the two analogue outputs (AO1 and AO2) to the 0% (0V) or 100% (10V) value and the two digital outputs (DO1 and DO2) to ON or OFF.

Connection to supervision centre (W500T2MB only)

W500T2MB controller can be connected to a supervision centre through serial RS485, with RTU MODBUS communication protocol.
The database is available on request.

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Data display

The screen on the controller enables to display the temperature detected by the two control sensors, of the third configurable sensor (Limit or Compensation) and the value of the two analogue outputs.
The controller has also two Leds which display the status of the 2 relay outputs and a Led which allows to identify the mode of the two Loops (Switched off = Stopped; Blinking = Reduced; On = Normal). The displayed mode is referred to the control Loop displayed on screen.
The information viewing during navigation will be subjected to the sensor presence and to the various enabled functions.
Navigation is subdivided into 2 levels:
Level 1: viewing and setting of the values related to the enabled functions.
Level 2: definition of the operating mode and function enable.

LINK BUS

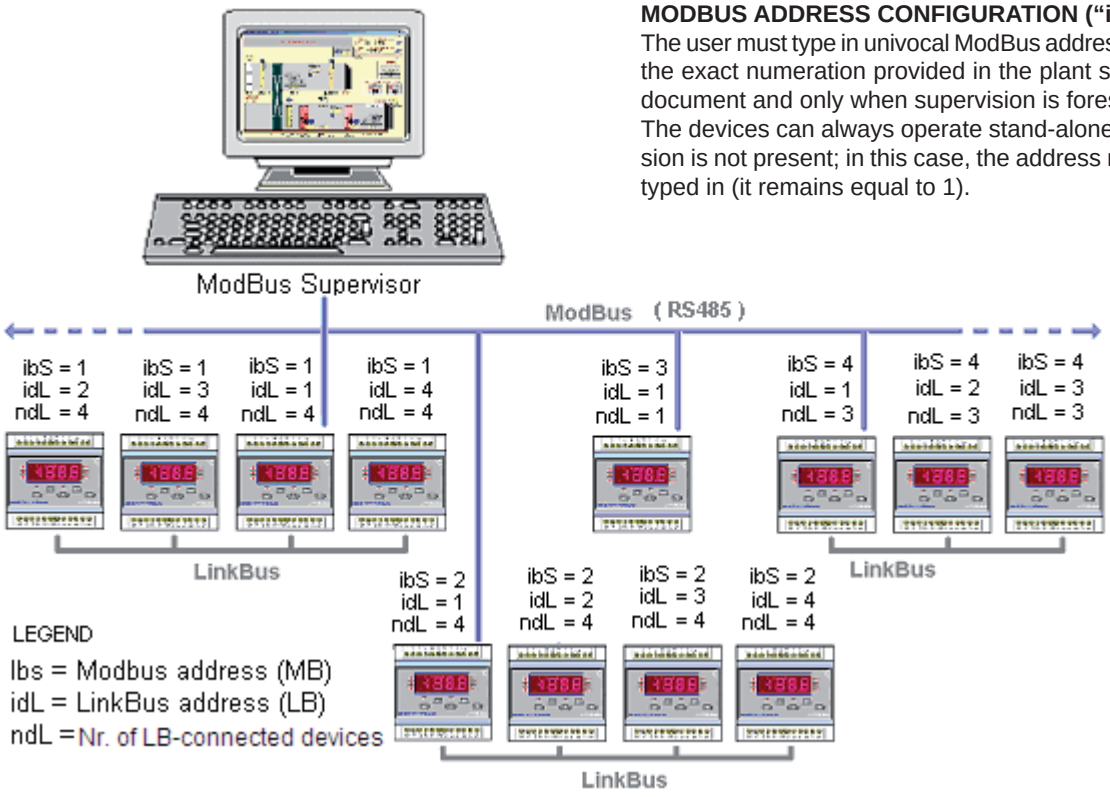
All models are provided with an internal communication bus, called “Link”, for value interchange. It enables sensor saving on field (example: only one external compensation sensor).

It is possible to interconnect up to 4 controllers max.

All sensors are PTC-type and they can share data between the connected controllers via LinkBus.

Note: if the Slave controllers are configured to use the Master (ABO = ON) Controller mode, they use the mode stated by the weekly programme 1 and the time schedule.

Example of connection to supervision system:



MODBUS ADDRESS CONFIGURATION (“ibS”)

The user must type in univocal ModBus address, following the exact numeration provided in the plant specification document and only when supervision is foreseen.
The devices can always operate stand-alone, if supervision is not present; in this case, the address must not be typed in (it remains equal to 1).

“LINK BUS” ADDRESS CONFIGURATION (“idL” - Nr. 4 max)

The device must be configured as number and position, in order to be able to operate together with the others: Number is the number of devices connected to the LinkBus, while Position indicates the device location between the *n*.

MAX. SYSTEM CONFIGURATION

- ModBus address 1 to 255 shared by the device with ModBus board (W500T2MB)
- LinkBus address 1 to 4 univocal for each device (ModBus board must have idL = 1)
- 3060 sensors, 2040 digital inputs, 2040 analogue outputs, 2040 relay outputs for a total of 9180 points.

Sensors connected to W500T2 (See data sheet)

SPTC-A	room
SPTC-A5	room with set point adjustment
SPTC-C	pipe (water)
SPTC-CR	immersion with stick enclosed
SPTC-D	duct (air)
SPTC-E	outside
SPTC-F	strap-on
SPTC-V	duct (air)

MANUFACTURING CHARACTERISTICS

The electronic board is inserted in a thermoplastic shockproof case, for DIN rail assembly.

TECHNICAL CHARACTERISTICS

Supply	230 Vac 50/60Hz ± 10%
Consumption	3 VA
Material	ABS (UL94-V0 flame class)
Dimensions	70x85x61 mm.
Protection degree	IP 20
Mounting	DIN rail or on wall
Weight	300 gr.
Operating room temp	T50 °C
Storage temperature	-25T70 ºC
Operating room and storage humidity	0...95% R.H. non-condensing
Terminal board	screw terminals for max 2,5 mm^2 leads.
Inputs	3 inputs PTC 1K 2 digital inputs
Outputs	2 SPDT relay outputs 8(3)A 250 Vac Data display on 3 1/2-digit display with digit 12,5 mm high
Data storage	on EEPROM

Communication with supervisor:

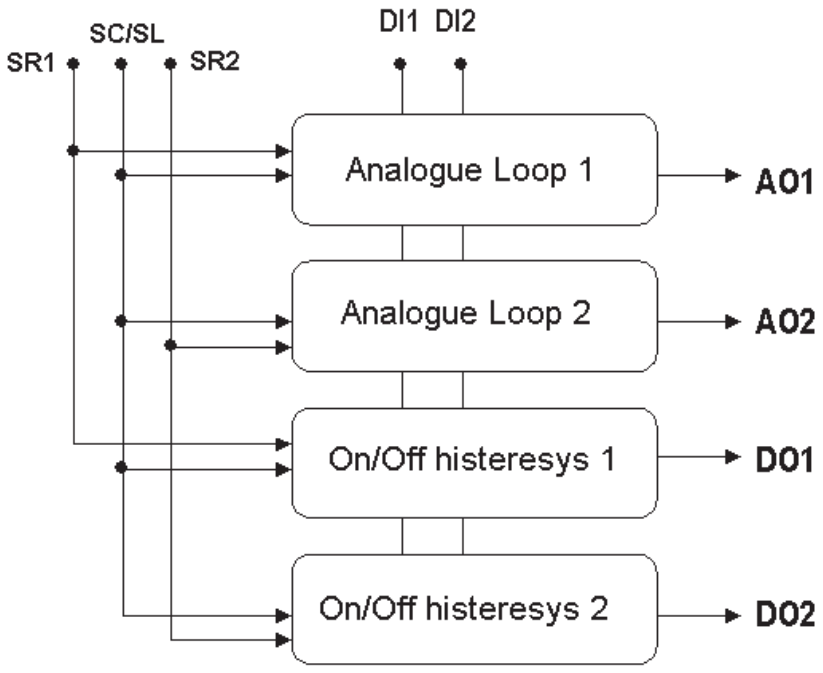
Interface	RS485
Communication protocol	Modbus RTU
Max cable length	1Km
Internal Communication	LinkBus (max length 10m) (up to 4 controllers)

Product conforms with EMC89/336 directive according to the following standards:

- for emission EN50081-1
- for immunity EN50082-1

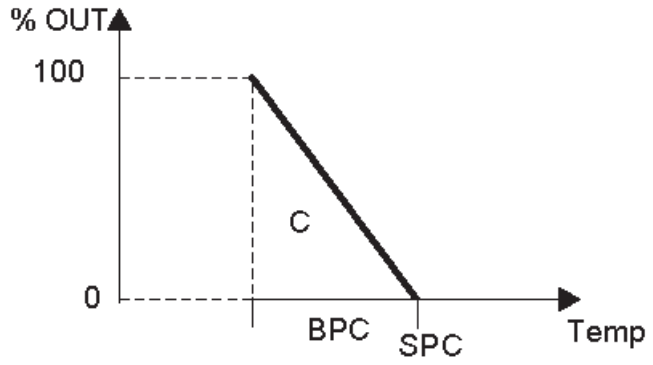
Product in compliance with LVD directive, according to: EN 60730

OPERATION DIAGRAM



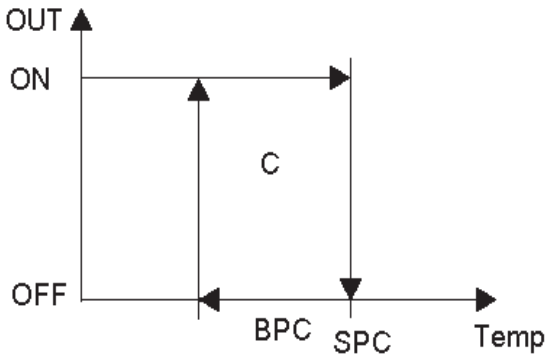
Heating Loop (analogue outputs)

Operating mode 1



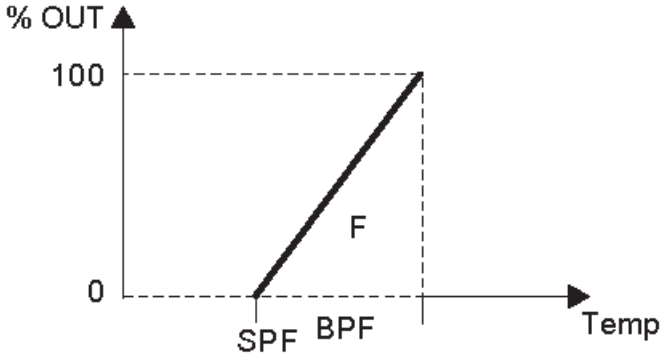
Heating hysteresis (relay outputs)

Operating mode 1



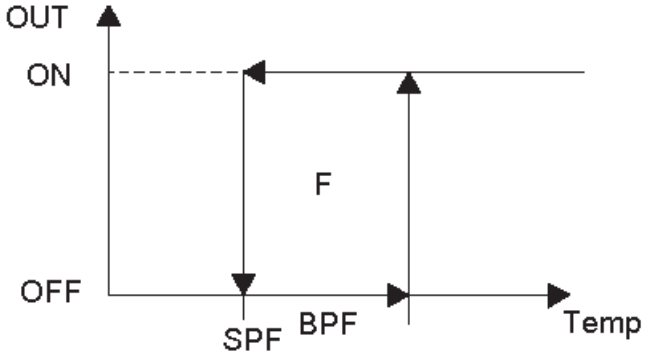
Cooling Loop (analogue outputs)

Operating mode 2



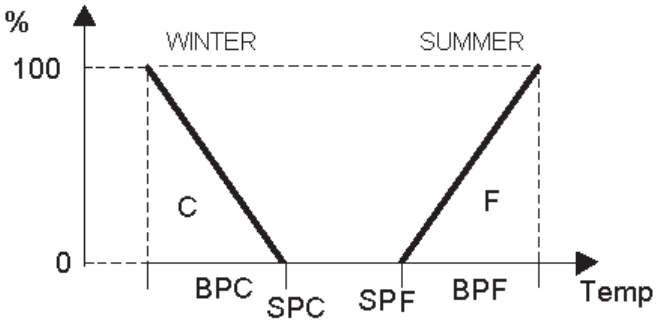
Cooling hysteresis (relay outputs)

Operating mode 2



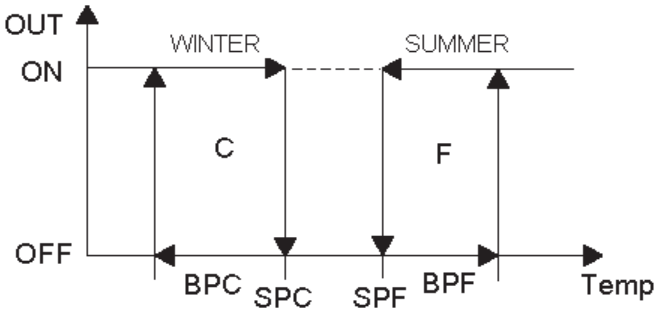
Heating/Cooling Loop (analogue outputs) with S/W changeover from digital input 2

Operating mode 3



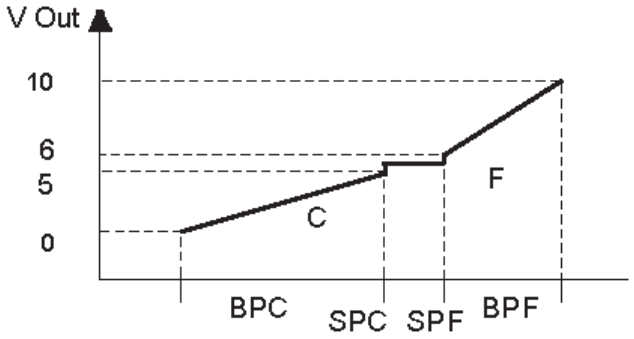
Heating/Cooling hysteresis (relay outputs) with S/W changeover from digital input 2

Operating mode 3



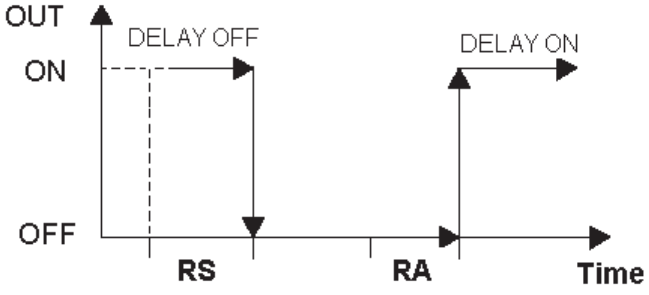
Heating/Cooling sequence (analogue outputs)

Operating mode 4



On/off delays (relay outputs)

Operating mode 4



WIRING

Legend
1 GND
2 Control sensor “SR1”
3 Compensation/ Limit sensor “SC/SL”
4 Control sensor “SR2”

5 GND
6 Digital input 1
7 Digital input 2

8 Link Bus +
9 Link Bus -

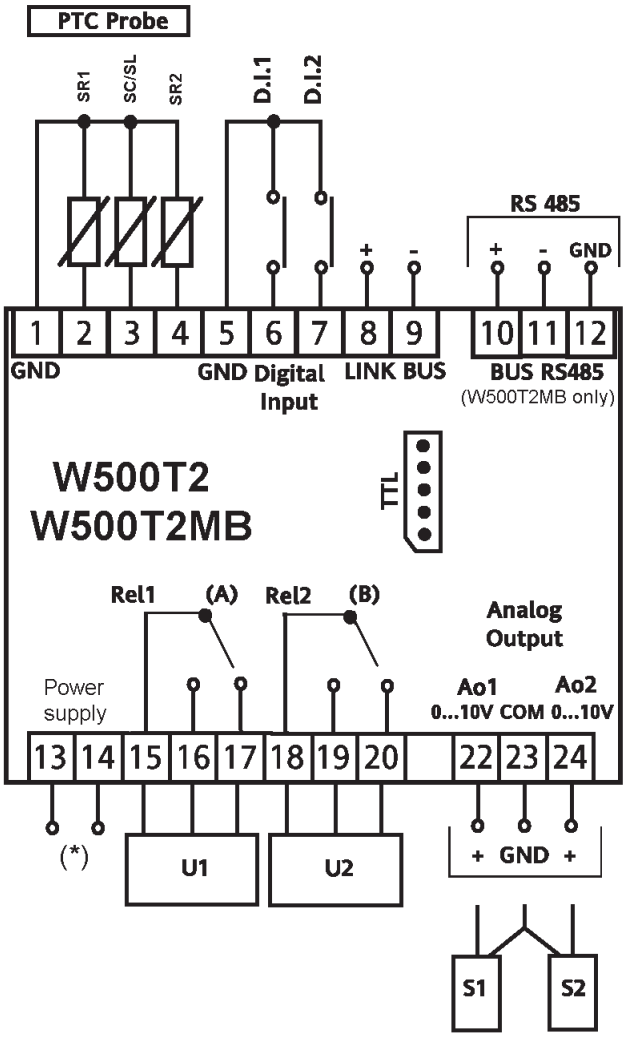
10 RS485 +
11 RS485 -
12 GND 485

13 | Power supply: 230 Vac *
14 |

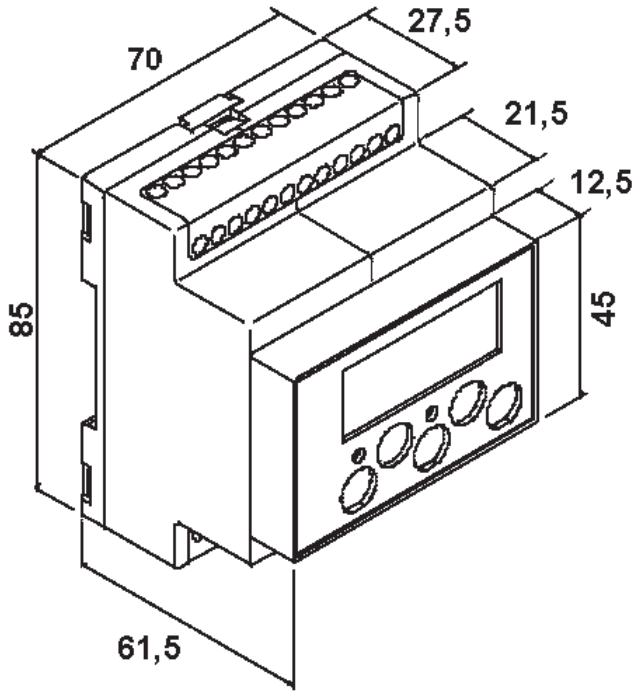
15 Common |
16 NO contact | Relay 1
17 NC contact |

18 Common |
19 NO contact | Relay 2
20 NC contact |

22 0..10V output Ao1
23 Common
24 0..10V output Ao2



OVERALL DIMENSIONS (mm)



The performances stated in this sheet can be modified without any prior notice due to design improvements