

PT100- / PT1000 Temperature Controller

UM1

PT100- / PT1000 Measuring Transducer with limit value switch

Characteristics:

- Universal 2- /3- /4 –wire technology
- PT100 or PT1000 configurable
- Linearity error < 0,1%
- Temperature range -200°C to +850°C possible
- Measuring range free adjustable
- Configurable via illuminated LCD and buttons
- Current- or voltage output configurable
- Integrated limit value switch
- Min. / max. switch function
- Universal supply 20...253V AC/DC
- Supply 24VDC
- Mountable on 35mm cap rail TS35
- Clear terminal labeling
- Narrow design
- Shape 22,5mm
- High reliability, 5 years warranty



Description:

The devices of the series UM1 universal measuring transducers have been developed for analyzing and converting of PT100- resp. PT1000 signals. The modules have a true 4-wire measurement. But also sensors in 2- and 3-wire technology can be connected. The measurement range is -200...+850°C, it is freely adjustable in 1°C steps. The smallest measurement range is set at 50°C.

All necessary settings such as measurement range, switching threshold, switching hysteresis, switching performance and the output configuration can be comfortably done via an illuminated graphic display, with a resolution of 36 x 85 pixel, and buttons. Furthermore the devices have got a sensor monitoring, which is monitoring the sensor for wire breakage and short circuit. A relay (NO), which is switched as closed circuit contact and a LED (red) in front panel are signaling the proper state of the sensor. To get into the configuration mode push button ■ for at least 5 seconds. With buttons ↑↓ it is possible to navigate through the different directory trees, during this process the currently active value is displayed. To change a parameter push button ■ in the corresponding menu. Now with buttons ↑↓ the desired value can be changed. If one of the buttons ↑↓ are pushed for longer time, there will be a quick adjustment. After ca. 30 seconds without pushing a button, the device automatically gets back into the operation mode and the illumination is switching off. The modules are available in 3 types:

Temperature Controller UM1-R:

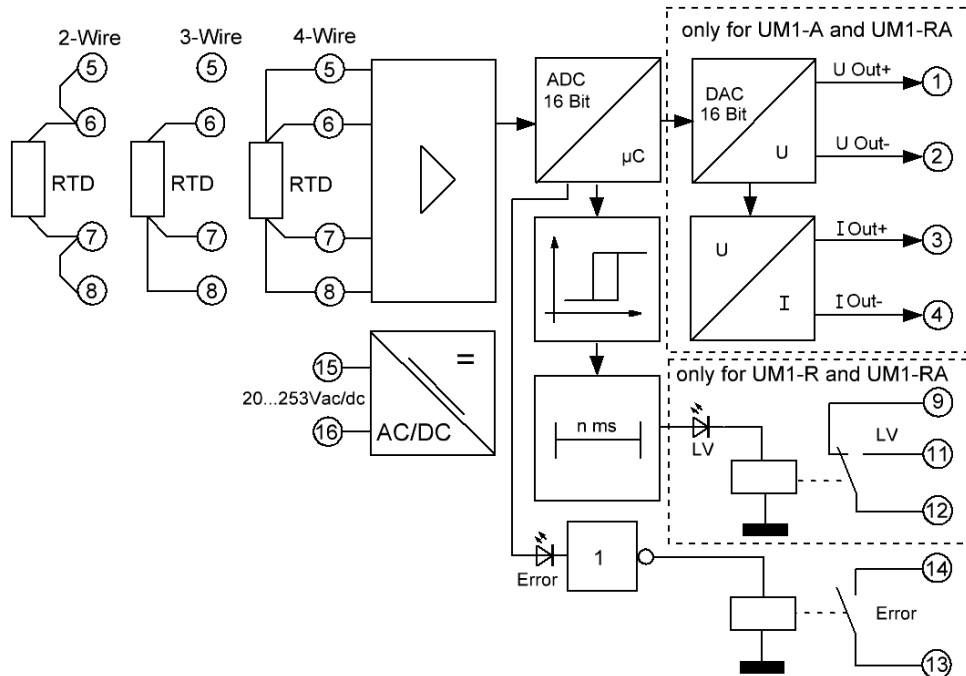
The device has been developed as a 2-level controller and is used for simple temperature control. The reaching of the set temperature is signaled via a potential free relay contact and a LED (green) in front panel. The switching hysteresis, the switching characteristic (minimum limit value or maximum limit value), as well as the switching delay are adjustable. An analog output is not available.

Temperature measuring transducer UM1-A:

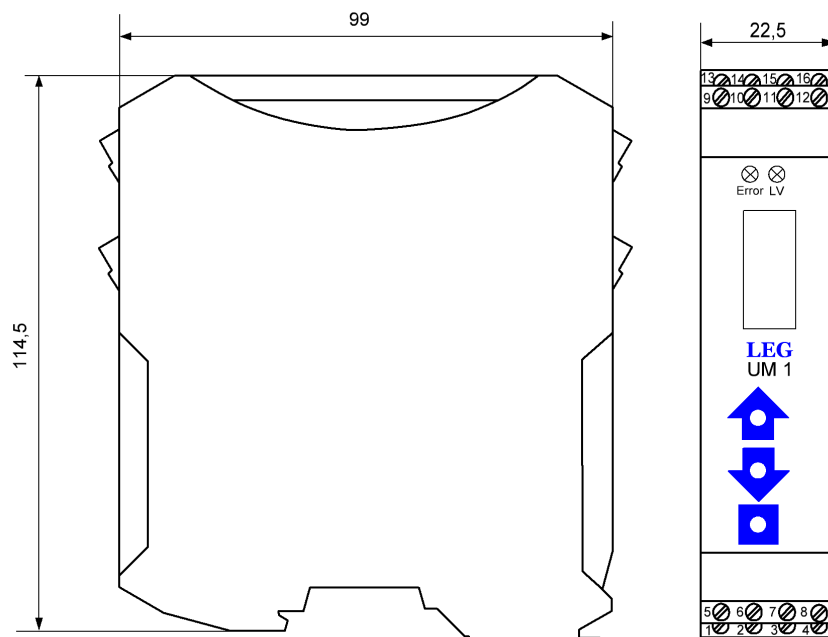
The devices are used for proportional converting of PT100 resp. PT1000 signals into temperature-linearized outputs of 0...10V or 0/4...20mA. A limit value switch is not available.

Temperature Controller with analog output UM1-RA:

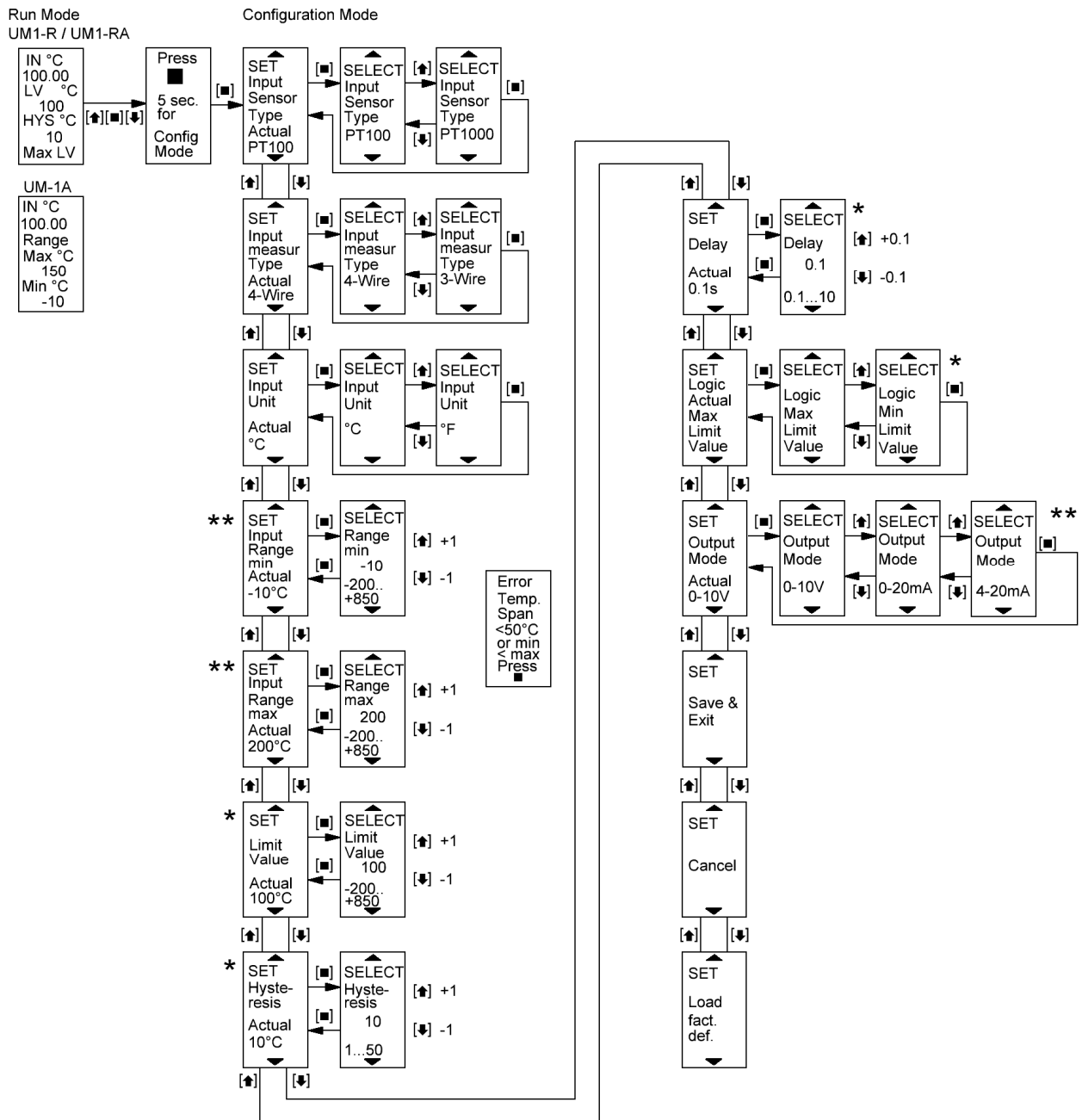
This devices have the same function as unit UM1-R auf, but are additionally provided with an analog output as UM1-A. So they are including both functionalities of UM1-R and UM1-A.



Note:
Voltage- and current output cannot be used parallel.



Menu flow chart



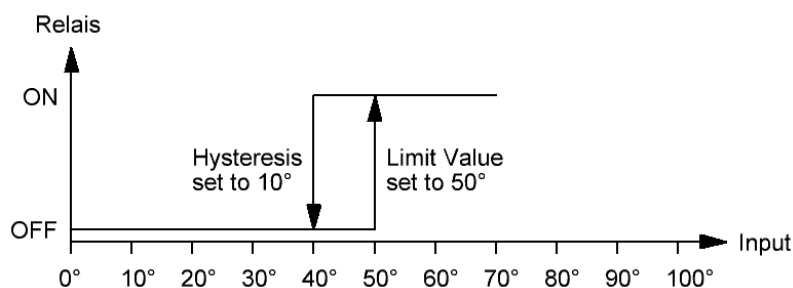
* only for UM1-R and UM1-RA

** only for UM1-A and UM1-RA

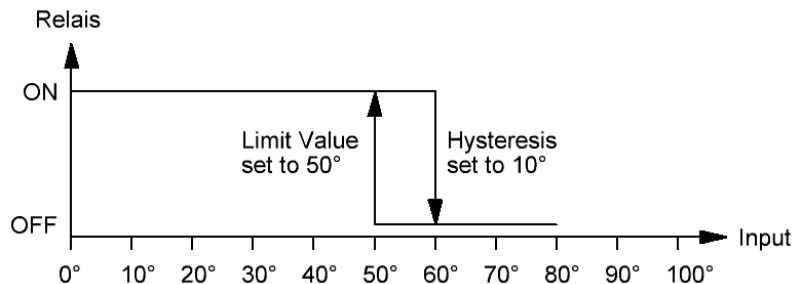
Menu (SET)	Function	Possible adjustments	Delivery condition
Input sensor type	Selection of the temperature sensor	PT100 PT1000	PT100
Input measure type	Selection of the measuring principle	3-wire 4-wire	4-wire
Input unit	Selection of the scale unit	°C / °F	°C
Input range min	Adjusting of the measurement range start	-200...+850°C -328...+1560°F	0°C 32°F
Input range max	Adjusting of the measurement range end	-200...+850°C -328...+1560°F	200°C 392°F
Limit value	Adjusting of the limit value	-200...+850°C -328...+1560°F	100°C 212°F
Hysteresis	Adjusting of the hysteresis	1...50°C / °F	2°C / 2°F
Delay	Adjusting of the on/off delay	0,1...10s	0,1s
Logic	Adjusting of the switching characteristics	Maximal limit value Minimal limit value	Maximal limit value
Output mode	Selection of the analog output	0...10V 0...20mA 4...20mA	0...10V
Save & exit	Saving of the adjustment and back to the „Run“ mode		
Cancel	Cancel all changes		
Load fact. Def.	Adjusting of the delivery condition		

The unit is equipped with a writable side cover on which the adjusted parameters can be recorded.

Switching characteristics at maximum limit value



Switching characteristics at minimum limit value



Technical data

Auxiliary power:

Supply voltage	:	20..253VAC/DC
Power consumption	:	2W / 4VA
Test voltage	:	2,5KV / 50Hz / 60s

Inputs:

Temperature sensor	:	PT100 or PT1000	
Measuring type	:	2-wire / 3-wire / 4-wire	
Sensor current	:	ca. 500µA	
Measurement range	:	-200°C...+850°C resp. -328°F...+1560°F	freely adjustable
Smallest measurement range	:	50°C	step: 1°
Measurement unit	:	°C or °F	
Max. wire resistance	:	50Ω each wire	
Reaction time	:	< 200ms	

Analog Outputs:

Voltage output	:	0...10V / max. 20mA
Current output	:	0(4)...20mA / load resistor max. 500Ω
Load resistor error	:	< 0, 01%
Output	:	as you like

Relay output:

Switch output	:	1 changeover 230Vac 2A / 24Vdc 1,5A	
Failure signal output	:	1 NO 230Vac 2A / 24Vdc 1,5A	
Limit value	:	-200°C...+850°C resp. -328°F...1560°F	step range: 1°
Switching hysteresis	:	1...50°	step range: 1°
Switch delay	:	0, 1...10s	step range: 0,1s
Switching	:		
Characteristics	:	Minimum limit value or maximum limit value	

Accuracy:

Linearity error	:	< 0, 1%
Resolution	:	16 Bit complies 0, 1°C
Temperature coefficient:	:	< 0, 01% / K

General data:

Operating temperature	:	0...50°C
Storage temperature	:	-25...+85°C, condensation before putting into operation is not allowed
MTBF	:	115 years mean time between failures – according to EN 61709 (SN 29500). Requirements: Stationary operation in clean rooms, average ambient temperature 40 °C, no aeration, continuous operation
CE conformity	:	EN 61326-1, EN 61000-4-2/3*/4/5/6*, EN 61000-6-4 *during measurements are small deviations possible

Body:

Dimension	:	22,5mm adjoin body, 22,5x114,5x104,5mm (with terminals)
Material	:	PA / V0
Protection category	:	IP20

Connection : M3-screw-type terminal 0, 14 - 2,5mm², flexible or inflexible
Fixing : Snap-on mounting for norm rail TS35
Weight : 150g

Note on safety:



Disconnect the power supply before attempting to open the unit.

During the operation of this module it is possible that parts of the module, even there is extra-low voltage, (for example shunt measurement) are under dangerous voltage! Therefore a non-observance of this caution may cause damage of property or physical injury.

Only trained qualified personnel should install or operate the unit. Before installation the qualified personnel should read the documentation and should familiarize themselves with the unit.

If there is visible damage to the body of the unit it should be immediately replaced and not put into operation.



Please ensure that there is a sufficient prevention against electrostatic discharge during installation of the unit.

Installation Information:

Pay attention and make sure the unit is far away from mounted sources that may disturb the device such as magnetic coils, transformers, frequency converters etc.

Wiring advice:

Use only shielded cables. The shield is to be connected extensively to ground. Do not mix power- and signal-wires/cables in the same cable tray.

Limited warranty:

The LEG Industrie-Elektronik GmbH warranted that the product does not have any material or processing defects in a period of 5 years after date of delivery.

It is up to the choice of LEG to repair or to exchange an inoperative unit.

Subsequent damages or any claim for indemnification above the functionality of the unit are excluded.

This limited warranty is only valid if ...

1. the product was installed and put into operation according to the LEG operation documentation;
2. the technical configuration of the power supply was abided;
3. the product was not used for unintended purposes;
4. there were no unauthorized modifications or manipulations, misuse or repairs without previous agreement from LEG .

Our Terms of Trade are based on the "General Conditions for the supply of products and services of the Electrical and Electronics Industry" including the "Complementary Clause: Extended Reservation of Property" of the ZVEI e.V. (German Association of Electrical Manufacturers).

Miscellaneous:

We expressly reserve the right, without previous notice, to correct errors contained in any data of this information brochure, and to make alterations to the program and technical modifications.