S1000

ELOTECH
INDUSTRIEELEKTRONIK

Limit controller

2-point switching controller with hysteresis

Installation depth: 112mm

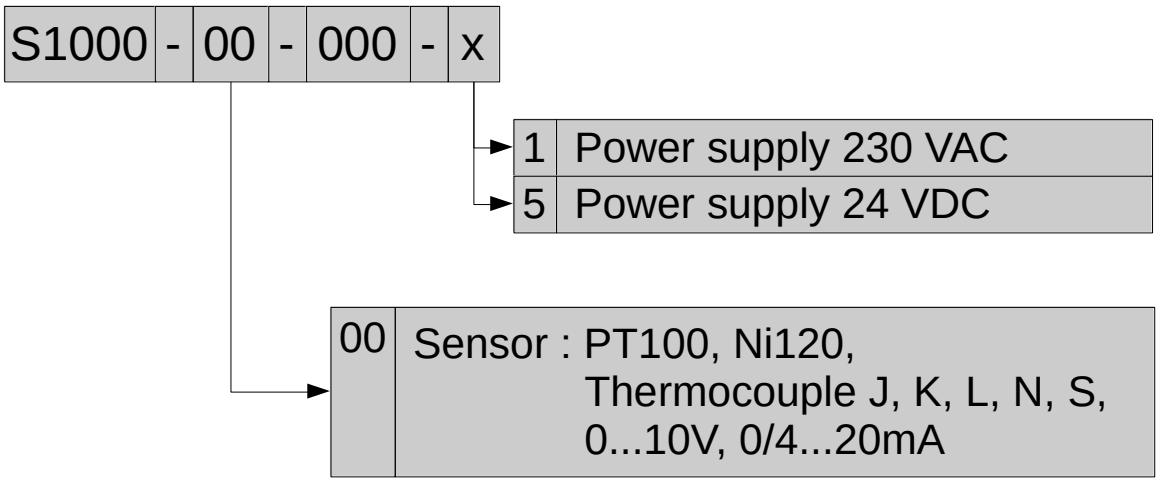
Format: 22,5mm x 75mm

Description and operating manual

ELOTECH Industrieelektronik GmbH
Verbindungsstraße 27
D - 40723 HILDEN
FON +49 2103 / 255 97 0 FAX +49 2103 / 255 97 29
www.elotech.de Email: info@elotech.de

1 Contents

2 Type Code



3 Using the S1000 as a controller:

To use the S1000 as a switching controller for heating mode, the following parameters must be set:

Alarm behaviour A_ = A_Lo
Alarm-Delay d_ = d_ -
Self-locking H_ = H_oF
Sensor Error E_ = E_oF

The limit value in the operating level assumes the function of the setpoint.

The hysteresis parameter Y_ can be used to adjust the control action:
The smaller the hysteresis is set, the less the actual value fluctuates. However, the frequency of the switching cycles increases, which can lead to an increased relay wear.

4 General Information

Symbols used:

A_H1	Messages shown by the controller display
<§>	Symbolizes the value of the factory adjustment of the respective parameter.

5 Installation Instructions

Make sure that the S1000 is used for the intended purpose only.

This device is designed for cap rail mounting.
Protect the device against impermissible humidity and contamination.

Ambient temperature must not exceed 50 °C (122 °F).
Electrical connections must be made according to valid regulations and by properly qualified personnel.

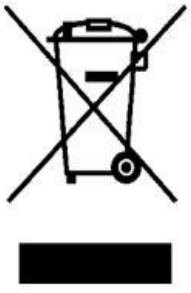
If using thermocouple sensors, compensation lines have to be connected directly to the controller terminals. Sensors may be connected only in compliance with the programmed range.

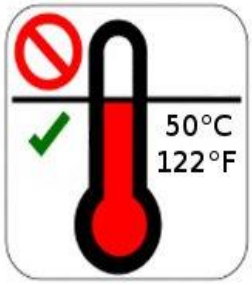
Separate installation of S1000 and inductive loads is recommended.
Interference from contactor coils must be suppressed by connecting adapted RC-combinations parallel to the coils.
Control circuits (e.g. for contactors) should not be connected to the mains power supply terminals of the S1000

The configuration parameters are generally to be selected first.

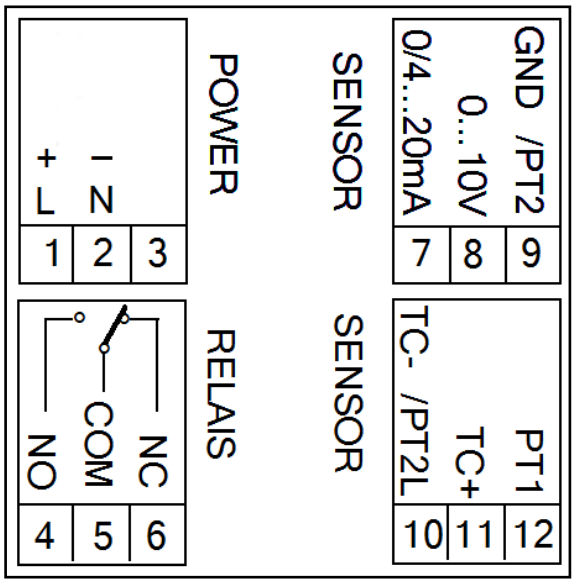
Disclaimer of Liability
We have checked the contents of this document for conformity with the hardware and software described. Nevertheless, we are unable to preclude the possibility of deviations so that we are unable to assume warranty for full compliance. However, the information given in the publication is reviewed regularly. Necessary amendments are incorporated in the following editions.
We would be pleased to receive any improvement suggestions which you may have.
The information contained herein is subject to change without notice.

Electronic scrap and components are subject to special treatment and must be disposed of by authorized companies.

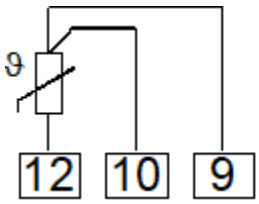


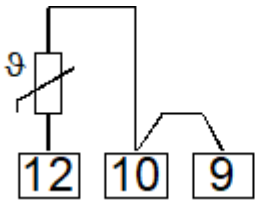
6 Connection Diagram



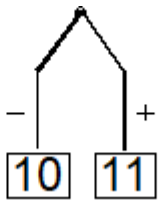
PT100 (RTD) 3-Wire



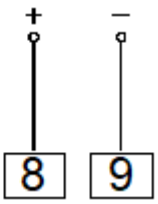
PT100 (RTD) 2-Wire



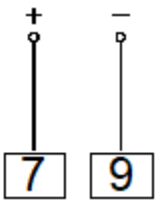
Thermo-couple



0...10V



0/4...20mA



7 Display and Keyboard

Display of actual process value

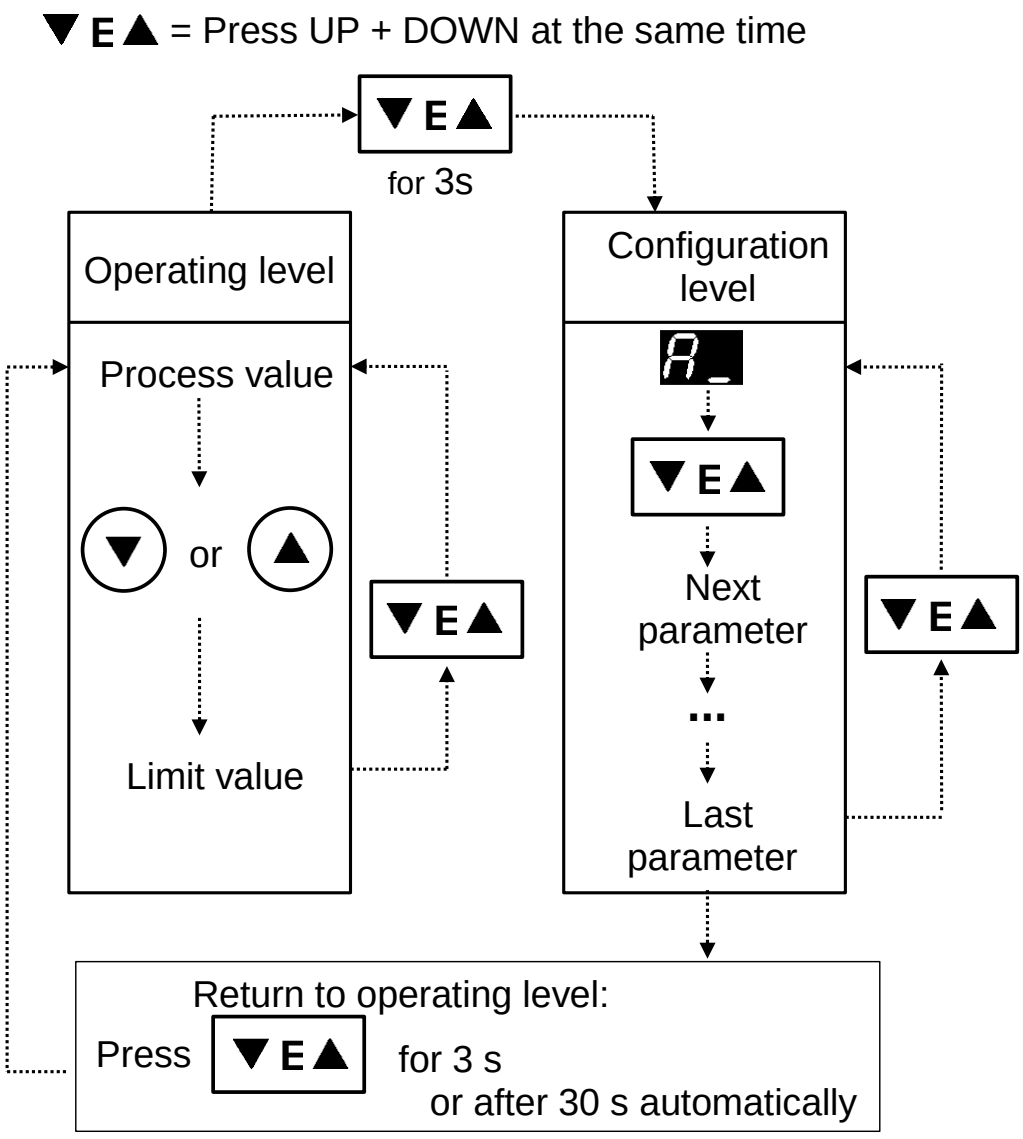
Display of limit value (or setpoint): flashing dot on top right

Display of alarm relay state:
- Alarm symbol illuminated: relay activated
- Alarm symbol flashing: relay activated and locked (self-hold). To be acknowledged by actuation of any key

Keys

8 Operating Levels

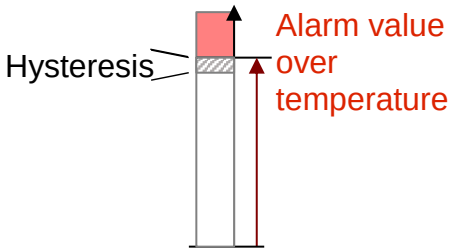
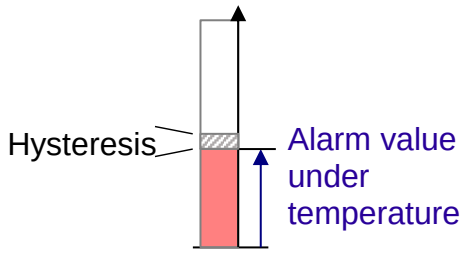
After power on the device is in the operating level and displays the actual process value.



Operating level:
Display of actual process value or adjustment of the limit value / setpoint
Limit value / setpoint display and adjustment: press any key.
Limit value / setpoint is indicated by a flashing dot behind respectively above the value.
Adjustment of limit value / setpoint by means of keys „▼" / „▲".
The value is flashing when being changed.
Press both keys „▼ E ▲" to save the altered value.
Press both keys again to return to the display of actual process value.

Configuration level: Set up of device
Press both keys „▼ E ▲" at least 3 s in order to enter the configuration level.
Press both keys „▼ E ▲" to switch to the next parameter.
Adjust the value by means of the keys „▼" / „▲".
The value is flashing when being changed.
Press both keys „▼ E ▲" to save the altered parameter.
Press both keys „▼ E ▲" again at least 3 s to get back to the operating level. The device returns automatically to operating mode after 30 s without key actuation.

9 Parameter in the Configuration Level

A_ **A**larm configuration	A_Hi Over temperature alarm **<§>** - The temperature has to be higher than the limit value to activate the relays. Switch off with hysteresis.	
	A_Lo Under temperature alarm The temperature has to be lower than the limit value / setpoint to activate the relays. Switch off with hysteresis.	
y_ Alarm-H**y**steresis / Controlh**y**steresis	y_ 1 **...** y_50 Hysteresis 1°**<§>** Hysteresis 50° Hysteresis for switching off the relay.	
d_ Alarm**d**elay	d_ - **,** d_ 1 **...** d_ 9 Delay off **<§>,** Delay: 1s ... Delay: 9s This delay can prevent false alarms caused by transient variations of the actual process readings and is only effective on activation of the relay.	
H_ Self-**h**old mode	H_oF Self-hold OFF **<§>** H_on Self-hold active By means of the self-hold mode (lock mode) it is possible to memorise transient disturbances. When the relay is being locked the alarm LED is flashing and the relay remains activated. Alarm acknowledge: press any key for release of the relay.	
S_ **S**ensor selection	S_Pt	RTD (Pt100) -100...800°C **<§>** or -148... 1472°F
	S_ni	Ni120 0...250°C or 32....482°F
	S_tL	Thermocouple Fe-CuNi(L) 0...800°C , 32..1472°F
	S_tJ	Thermocouple Fe-CuNi(J) 0...800°C ; 32..1472°F
	S_tA	Thermocouple NiCr-Ni(K) 0..1200°C ; 32..2192°F
	S_tS	Thermocouple PtRh-Pt(S) 0..1600°C ; 32..2912°F
	S_tN	Thermocouple NiCrSi-NiSi(N) 0..1200°C; 32..2192°F
	S_0A	Linear input 0..20 mA
	S_4A	Linear input 4..20 mA
	S_1u	Linear input 0..10 V

U_ Display **u**nit	This parameter is only visible a temperature sensor input is selected. U_°C ° Celsius **<§>** or U_°F ° Fahrenheit.
r_L Linear input range bottom end (**r**ange **L**ow)	This parameter is only visible if a linear input is selected. The display switches back and forth between the parameter text and the value to be adjusted. Adjustment range: -1999 … r_H **<§ = 0>** The difference between range low and range high must amount to a minimum of 100 units.
r_H Linear input range top end (**r**ange **H**igh)	This parameter is only visible if a linear input is selected. The display switches back and forth between the parameter text and the value to be adjusted. Adjustment range: r_L … 2000… **<§ = 1000>** The difference between range low and range high must amount to a minimum of 100 units.
F_ Process **F**ilter	F_- **,** F_0.1 **...** F_9.9 Filter off **<§>,** Filter time= 0,1s Filter time= 9,9s Damping of the actual reading. This is effective on display and on release of alarms as well.
E_ Behavior with sensor **E**rror	E_oF In case of sensor errors, relay is always switched off. E_on In case of sensor errors, relay is always switched on. **<§>**
o_ Relay inverter (**o**utput)	o_di Direct: Relay switched on in case of alarms. o_in Inverted: relay switched off in case of alarms.

10 Parameter in the Operating Level

Process value	Initial state: display of actual process value. Press any key „▲" or „▼" to display the limit value.
Limit value or Setpoint	For the distinction against the actual process value there is a flashing dot above respectively behind the value. Adjustment range: OFF **<§>**, lower range value … upper range value If the value is set to „OFF" the relay is always deactivated.

11 Error Messages

Message	**Cause**	**Possible remedy**
Er.Hi	Top range end has been exceeded, sensor defect	Check sensor and cable
Er.Lo	Bottom range end has been exceeded, sensor defect	Check sensor and cable
Err.0 Er.59	System errors	Quit error message by pressing both keys „▼ ▲" Check all parameters. If the error message continues, please send the device back to the manufacturer.

12 Technical Data

Input: Pt100 (RTD)	2- or 3-wire connection possible Built-in protection against sensor break and short circuit Sensor current: < 0,5 mA Calibration accuracy: … ≤ 0,2 % Linear error: … ≤ 0,2 % Influence of the ambient temperature: … ≤ 0,01 % / K
Input: Thermocouple	Built-in internal compensation point and protection against sensor break and incorrect polarity. Re-calibration not required for a line resistance of up to 50 Ohm. Calibration accuracy: … ≤ 0,25 % Linear error: … ≤ 0,2 % Influence of the ambient temperature: … ≤ 0,01 % / K
Input: Linear	0/4...20mA or 0...10V, the display range is adjustable. Calibration accuracy: < 0,2 % Linear error: < 0,2 % Influence of the ambient temperature: … ≤ 0,01 % / K
Output	Relay, change over contact, max. 250 VAC, max. 3 A (resistive load)
Display:	7-Segment, 4 digits; 7 mm red
Data protection	EAROM
CE-mark	Tested according to 2004/108/EG; EN 61326-1 Electrical safety: EN 61010-1
Power Supply	Depends on the version of the device: - 230 V AC, +/-10 %, 48...62 Hz; approx. 1 VA - 24 V DC, +/-25 %, approx. 1 W
Connections	Screw terminals, Protection mode IP 20 (DIN 40050), Insulation material: PA Conductor cross section: max 2,5 mm²
Permissible operating conditions	Operating temperature: 0 … 50°C / 32 … 122°F Storage temperature: -30 … 70°C / -22 … 158°F Climate class: KWF DIN 40040; equivalent to annual average max. 75 % rel. humidity, no condensation
Casing	Material: PA6.6-FR, UL 94-V1 Protection mode: IP 20 (DIN 40050) Mounting: Cap rail, DIN EN 60715 TH 35 Format: Width: 22,5mm Height: 75mm Depth: 112mm
Weight	Approx. 100 g (24V DC); Approx. 150g (230V AC)

Subject to technical improvements.