

Operating Manual TR1200IP

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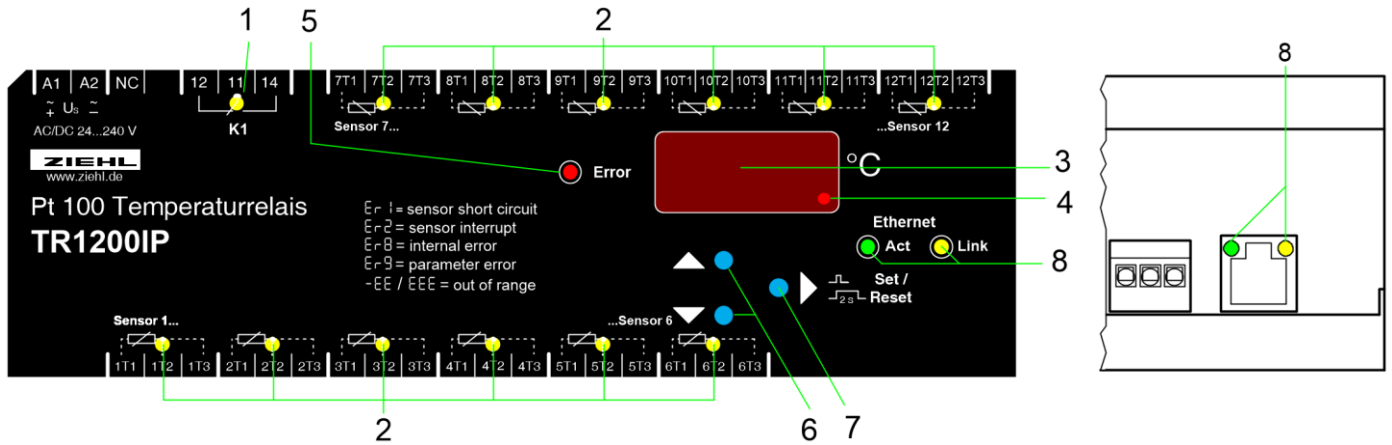
- Pt 100 temperature relay for up to 12 sensors with electric 10 MBit/s Ethernet interface
- Configuration through Web server
- IEC 61850 GOOSE protocol.



Table of contents

1	Display and controls	3
2	Factory settings and software version	3
3	Application and brief description	5
4	Summary of the functions	5
5	Connection diagram	6
6	Important notice	6
7	Mounting	7
8	Detailed description	7
8.1	Description of the connections	7
9	Commissioning	8
9.1	Control chart	8
9.2	Web-Server	9
9.3	Description of the parameters	9
9.4	Display mode (last decimal point off)	10
9.5	Menu mode (last decimal point on)	10
9.6	Configuration mode (last decimal point flashes).....	10
9.7	2-wire cable compensation	11
9.8	Configuring sensors.....	11
9.9	Configuring the relay.....	11
9.10	Configuring the Ethernet interface	11
9.11	Simulation.....	14
9.12	Code lock	14
9.13	Possible indications in display.....	15
10	Maintenance and repair	16
11	Troubleshooting and measures	16
12	Technical data	17
13	Mounting type V8:	19
14	TR1200IP Ethernet interface	20
14.1	ZIEHL RTD UDP protocol	20
14.2	Modbus TCP protocol	20
14.3	http protocol.....	20
14.4	IEC 61850 GOOSE protocol	21
15	Appendix SIPROTEC configuration	22
15.1	Configuration SIPROTEC Compact-Devices (only 7SJ80 and 7SK80)	22
15.2	Configuration SIPROTEC 5-Devices.....	22
16	Firmware update	23

1 Display and controls



- 1 LED relay status (yellow)**
 OFF Relay is released
 ON Relay operating
- 2 LEDs sensors (yellow)**
 ON Sensor value of the related LED in the digital display
 FLASHES, **Er 1** or **Er 2** Sensor error in the corresponding sensor circuit
 MORE THAN ONE ON Temperature value of the warmest sensor is displayed in the digital display
- 3 3-digit digital display (red)**
 Displays the sensor value
 Displays the errors with error code e.g. **Er 9**
- 4 Last decimal point (red)**
 Off Display mode
 Illuminated Menu mode
 Flashes Configuration mode
- 5 LED Error (red)**
 OFF No error present
 ON, **Er 1** , **Er 2** , **Er 8** or **Er 9** Sensor error, device error or configuration error
- 6 Up / Down key (in display mode, normal state)**
 Press briefly Change into the menu mode
 Press for > 2s: Displays the MAX (Up) and MIN (Down) measurement, pressing the Set key for ≥ 2s in addition deletes the saved value
- 7 Set/Reset key (in display mode, normal state)**
 Press briefly Displays the next measurement
 Press for > 2s: Reset, return to display mode
 Press for > 10s: Displays the software version e.g. **000**
- 8 Ethernet interface LEDs (yellow)**
 Act FLASHES Unit is receiving or transmitting via the Ethernet interface
 BRIEFLY
 Link FLASHES Valid connection via the Ethernet interface
 BRIEFLY

2 Factory settings and software version

When changing programs, all parameters are reset to the factory settings.

Menu item	Parameter	factory settings	User data
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SEn.	S 1 (Sensor 1)	3-L	
	S 2 (Sensor 2)	3-L	
	S 3 (Sensor 3)	3-L	
	S 4 (Sensor 4)	3-L	
	S 5 (Sensor 5)	3-L	
	S 6 (Sensor 6)	3-L	
	S 7 (Sensor 7)	nc	
	S (Sensor)	nc	
	S 9 (Sensor 9)	nc	
	S 10 (Sensor 10)	nc	
	S 11 (Sensor 11)	nc	
	S 12 (Sensor 12)	nc	
rEL.	rEL (Relay function)	r	
IP.	IP 1 (1st block IP address)	192	
	IP 2 (2nd block IP address)	168	
	IP 3 (3rd block IP address)	1	
	IP 4 (4th block IP address)	100	
Sub.	SU 1 (1st block subnetwork)	255	
	SU 2 (2nd block subnetwork)	255	
	SU 3 (3rd block subnetwork)	0	
	SU 4 (4th block subnetwork)	0	
GAt.	GA 1 (1st block gateway)	192	
	GA 2 (2nd block gateway)	168	
	GA 3 (3rd block gateway)	1	
	GA 4 (4th block gateway)	1	
UdP.	rtd (RTD Protocol)	on	
	Ud 1 (1st block UDP port)	50	
	Ud 2 (2nd block UDP port)	00	
CFG.	htt (http)	FUL	
	Mod (Modbus Protocol)	on	
Si.	S 1 ... S 12 (Sensor 1...12)	0	
CodE.	on / off	off	
	Pin (Pin code)	504	

Display the software version: Press the "Set" key for 10 s in the display mode.

3 Application and brief description

The TR1200IP can be used wherever multiple Pt 100 sensors (up to 12) need to be evaluated simultaneously:

- Motors or generators,
- also with simultaneous monitoring of bearings or, e.g., exhaust temperatures
- Transformers, also with additional core-temperature monitoring
- Machines and plants

Type TR1200IP temperature relays register the temperature of up to 12 sensors simultaneously and provide the values to the electric 10 MBit/s Ethernet interface.

2 IP protocols are supported, so the registered temperatures can be subsequently evaluated by connected devices that are linked with the TR1200IP via an Ethernet network. In motors, that could be a motor contactor, in transformers a transformer contactor with integrated overload function and thermal monitoring.

An alarm relay reports devices and sensor errors. Sensor breaks or sensor short-circuits are also transmitted via the protocol to the connected evaluation unit.

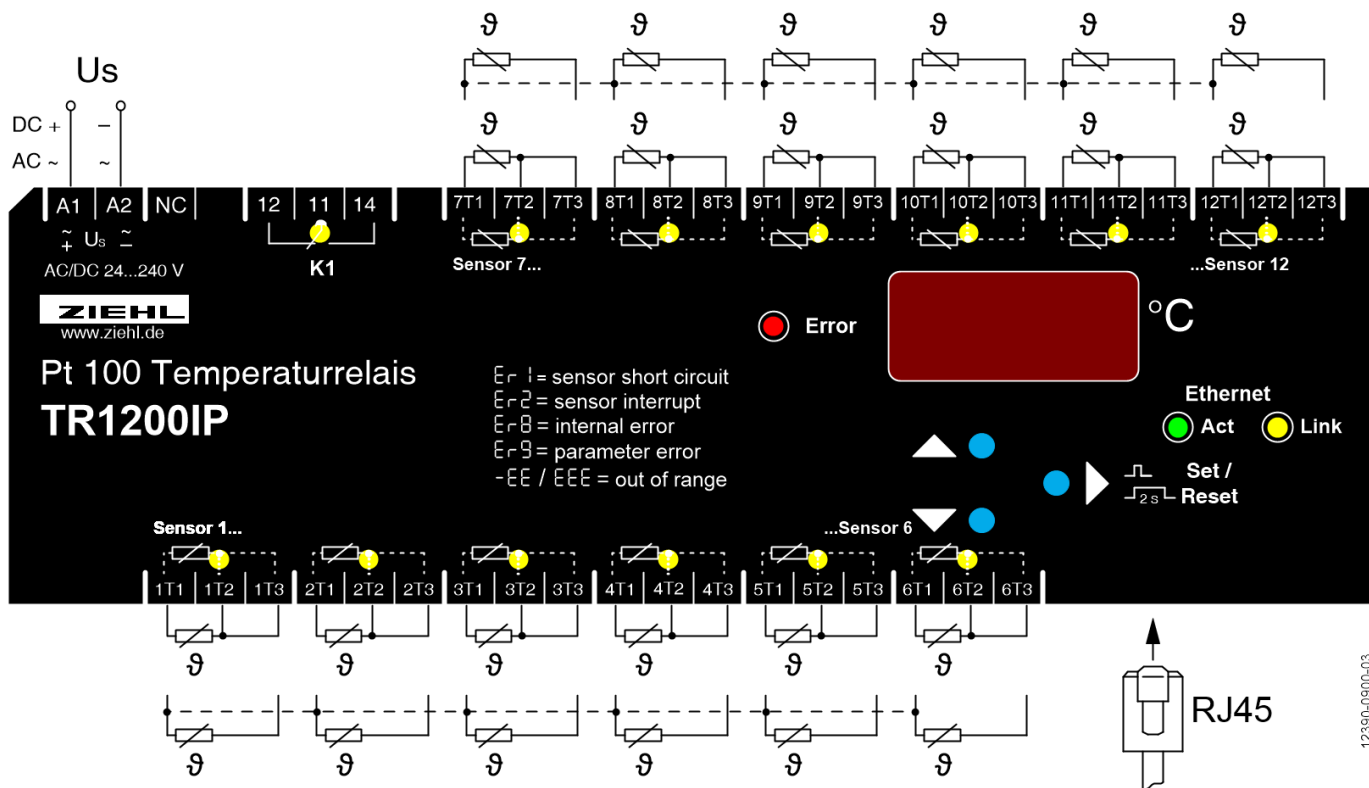
4 Summary of the functions

- 3-digit digital display for the temperature of up to max. 12 measuring points
- 12 sensor inputs; 1...12 sensors can be connected
- Pt 100 in 2- or 3-wire technology, when connecting Ni100 or Ni120, conversion to the correct temperature in the evaluation unit is required, SIPROTEC devices from Siemens (e.g. 7SK80) support this function.

The EN100 module in the SIPROTEC 4 units does not support the TR1200 IP.

- 1 alarm relay (1 change-over contact)
- Electric 10 MBit/s Ethernet interface (RTD IP protocol from ZIEHL, or Modbus IP protocol)
- Read-out display, configuration, simulation and firmware update via Web browser
- Tested with Mozilla Firefox 3.5 and Microsoft Internet Explorer 8.0
- LEDs for measurement allocation, error, relay status and Ethernet interface
- Code protection against manipulation of the setpoint values
- Wide area power supply AC/DC 24...240 V
- Distributor housing for panel mounting 8 TE, front-to-back size 55 mm
- Mounting on 35mm DIN EN 60715 standard rail

5 Connection diagram



6 Important notice



DANGER!

Hazardous voltage!

Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.

The flawless and safe operation of a device requires that it is shipped and stored appropriately, professionally installed and put into operation and operated according to its intended use.

Only people who are familiar with the installation, commissioning and operation and who have qualifications corresponding to their job are permitted to work on the device. They must comply with the contents of the operating instructions, the notices attached to the device and the relevant safety regulations for constructing and operating electrical plants.

The devices are built and certified in accordance with DIN/EN/IEC and leave the factory in a safe and technically flawless condition. To maintain this state you must comply with the safety regulations indicated with "Caution" in the operating instructions.

If the information in the operating instructions is insufficient at any time, please contact us directly or contact the representation responsible for you.

Instead of the industrial norms and stipulations stated in the operating instructions and applicable in Europe, you must comply with the valid and applicable regulations in the country of utilisation if the device is used outside of the area of application.



Caution! If the operating current execution is programmed for all relays, a failure of the control voltage or the device will not be detected.

When using as a monitoring device, the operator must ensure that this error is detected through periodic performance tests. We recommend programming and correspondingly evaluating at least one relay in closed-circuit current execution.

Caution! Sensor connections

It is only permitted to connect to or disconnect from sensor connections terminals or to plug them in or unplug them with the power supply switched off.

The pin connections of Sensors 1...6 (below) are not compatible with Sensors 7...12 (above). If a 3-conductor sensor connected below is to be connected above, both external connections must be swapped. The sensors are connected to terminals 1T1 – 1T2 – 1T3, 2T1 - ... - 12T3. The plug-in contacts have special contact material and must only be used for connecting the sensors.

Ethernet connection:

Use the Ethernet connection solely with a shielded patch cable, category 5. The maximum cable length is 20m.

When using longer cable lengths, the earth potential can shift, causing transmission interference. Corrective measures by using media converters can be taken which can optically transmit the electrical signal across further distances and, e.g., create the connection to an optical switch.

Comply with the maximum permissible temperature when installing in a switch cabinet. Ensure sufficient clearance to other devices or heat sources. If cooling is inhibited, e.g., through close proximity to devices with increased surface temperature or interference with the cooling-air current, the permissible ambient temperature is decreased.



Caution!
Before applying mains voltage to the device, make sure that the control voltage U_s complies with the mains voltage connected to the device!



A circuit-breaker or switch must be situated within easy reach of the unit and fused. Installation excess current protection should be ≤ 10 A.

7 Mounting

The device can be mounted:

- Distribution board or switch cabinet on 35 mm rails according to EN 60715

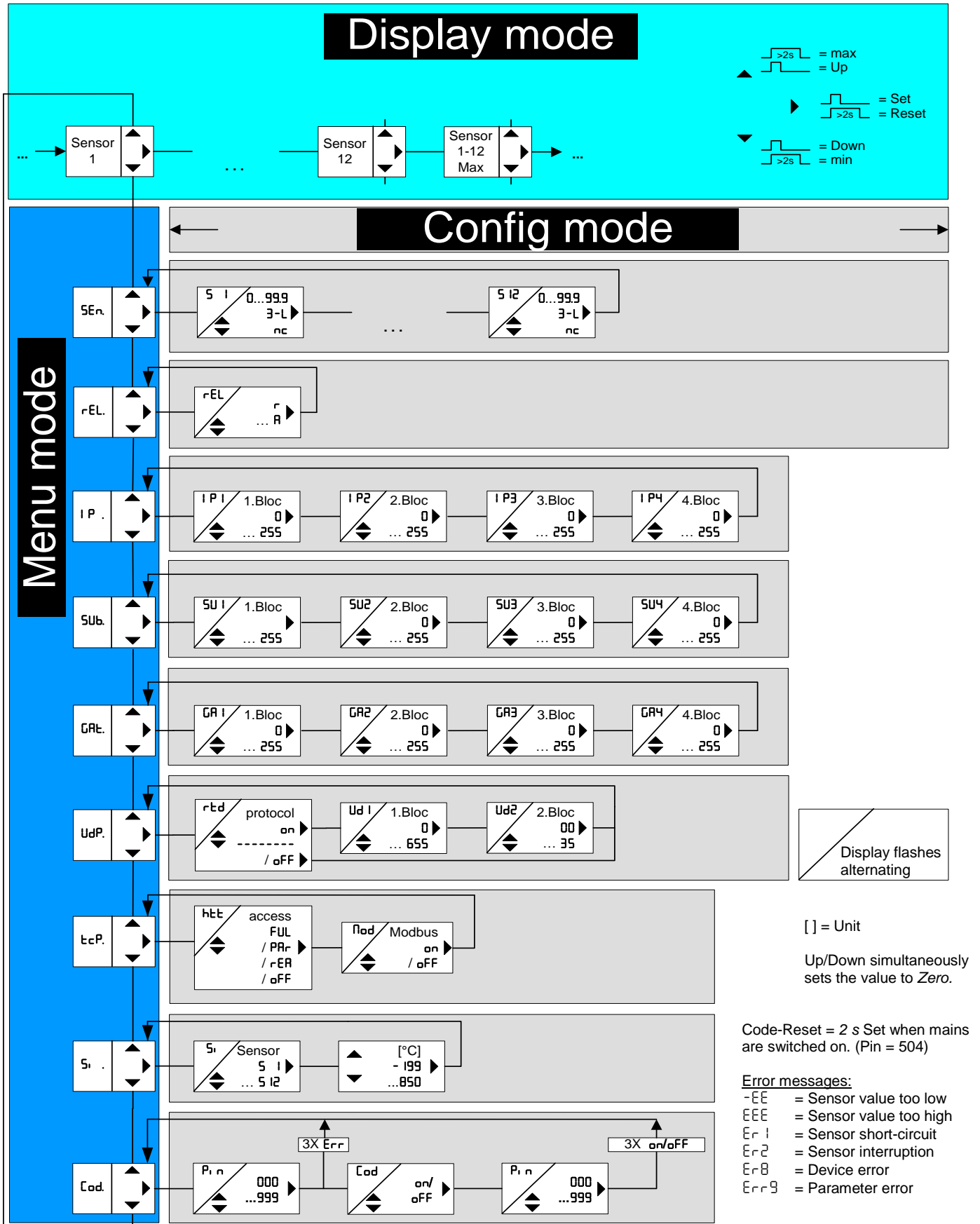
8 Detailed description

8.1 Description of the connections

Connection	Function
A1 and A2	Supply voltage U_s , see 12. Technical data
11, 12, 14	Alarm relay
1T1...12T3	Sensor connections (xT2 = connection for sensing cable with 3-wires)
Ethernet	RJ45 jack for 10 Mbit/s Ethernet connection

9 Commissioning

9.1 Control chart



9.2 Web-Server

All parameters that can be changed directly on the TR1200IP can also be intuitively set via the integrated Web server. To accomplish that, it suffices to connect your TR1200IP with your network and execute steps described in [8.9 Configuring the Ethernet interface](#). You can address the TR1200IP by entering the previously set IP address in your Web browser's address bar.

9.3 Description of the parameters

Parameter	Display	Explanation	Adjustment range
Sensors	SEn.	Menu item for sensor configuration	S 1 ... S 12
Sensor	S 1 S 2 ...	Sensor configuration (cable compensation) S1...S12	0.00 , 3-L , nc
Relay function	rEL	Zero signal current / operating current	r , R
IP address	IP .	Menu item for setting the IP address, subdivided into 4 blocks	IP 1 ... IP 4
IP address blocks	IP 1 IP 2 ...	IP address blocks (set to next) Block1.Block2.Block3.Block4	0 ... 255
Subnetwork mask	SUb.	Menu item for setting the subnetwork mask, subdivided into 4 blocks	SU 1 ... SU 4
Subnetwork mask Address blocks	SU 1 SU 2 ...	Subnetwork mask address blocks (set to next) Block1.Block2.Block3.Block4	0 ... 255
Gateway	GAe.	Menu item for setting the gateway, subdivided into 4 blocks	GA 1 ... GA 4
Gateway address blocks	GA 1 GA 2 ...	Gateway address blocks (set to next) Block1.Block2.Block3.Block4	0 ... 255
UDP	UdP.	Menu item to configure the protocol and the UDP port (2 blocks)	UdP , Ud 1 , Ud 2
RTD protocol	rtd	Switch RTD protocol on or off	on , off
UDP Port Block 1	Ud 1	1 Block UDP Port (0...65535) xxx35	0 ... 655
UDP Port Block 2	Ud 2	2 Block UDP Port (0...65535) xxx35	00 ... 35
TCP	tCP.	Menu item for http and modbus configuration	htt , Mod
http	htt	http Port Access Full access / Read only / Off	FUL , PAR , rER , off
Modbus	Mod	Switch modbus on or off	on , off

9.4 Display mode (last decimal point off)

In the display mode, the TR1200IP is in its normal state; here the temperature of the selected sensor is displayed. In addition, the error codes (e.g. **Er 1**) are displayed.

Function key Set / Reset	<u>Press briefly:</u> Switches the sensor over
	<u>Press for > 10 s:</u> Displays the software version, e.g. 000
Function key Up / Down	<u>Press briefly:</u> Changes into the menu mode
	<u>Press for ≥ 2 s:</u> Displays MAX and MIN measurements, additionally pressing the Set key for ≥ 2 s deletes the saved values

9.5 Menu mode (last decimal point on)

The menu mode is used to select the menu items. If no key is pressed for 30s, one automatically returns to the display mode.

Function key Set / Reset	<u>Press briefly:</u> Changes into the configuration mode
	<u>Press for ≥ 2 s:</u> Returns to the display mode (the most recently set values are then applied)
Function key Up / Down	<u>Press briefly:</u> Select menu item; changes into the display mode

9.6 Configuration mode (last decimal point flashes)

The value of a parameter can be set in the configuration mode. The display continually alternates between the parameter name and the currently set value until the Up/Down key is pressed, which changes the value of the parameter.

If no key is pressed for 2s, the display starts alternating again.

If no key is pressed for 30s (simulation mode 15 min), one automatically returns to the display mode (the most recently set value is applied during this)

Function key Set / Reset	<u>Press briefly:</u> The settings are taken over; continue to next parameter. After the last parameter, changes into menu mode
	<u>Press for ≥ 2 s:</u> Returns to display mode (except simulation mode), the most recently set values are applied during this
Function key Up / Down	<u>Press short/long:</u> Value change of the parameter (slow/fast)

Hint: Pressing the Up and Down keys simultaneously sets the adjustable value to zero. If you keep the Up or Down key pressed while setting a value, the speed of the change in the display is accelerated.

9.7 2-wire cable compensation

The sensor has to be connected to the terminals xT1 and xT3; xT2 remains open.
In a 2-wire connection, the line resistance has to be determined as in the following.
Short-circuit the cable on the sensor and measure the resistance.

We always recommend conducting 2 or 3 cables to each sensor. If in a 2-wire connection a mutual (ground) return circuit with the same conductor cross-section is used, the currents are cumulative and so is the voltage drop on the mutual cable.

Calculate the compensation value to be entered as follows:

$$RK = (n+1) \times RL/2 \quad (RL = \text{Total cable resistance, } n = \text{Number of sensors})$$

9.8 Configuring sensors

Adjustment process:

<ul style="list-style-type: none">Select the menu item with the Up/Down key until ...
⇒ Display 5E_n
<ul style="list-style-type: none">Press the Set key
⇒ Display 5 1 / 3-L (Sensor 1 / Connection type) flash alternately
<ul style="list-style-type: none">Use the Up and Down buttons to set the connection type or line resistance. <u>Sensor not connected:</u> Select nc <u>3-wire connection:</u> Select 3-L <u>2-wire connection:</u> 0.00 Perform a line compensation and adjust the line resistance
<ul style="list-style-type: none">Press the Set key
⇒ Display 5 2 / 3-L (Sensor 2 / Connection type) flash alternately
<ul style="list-style-type: none">Configure all 12 sensors in this manner.

9.9 Configuring the relay

Adjustment process:

<ul style="list-style-type: none">Select the menu item with the Up/Down key until...
⇒ Display rEL. (Relay function)
<ul style="list-style-type: none">Press the Set key
⇒ Display rEL / r (Relay function / Zero signal current) flash alternately
<ul style="list-style-type: none">Use the Up and Down keys to select the relay function
<ul style="list-style-type: none">Press the Set key (exits the configuration mode)
⇒ Display rEL. (Relay function)

9.10 Configuring the Ethernet interface

Adjustment process:

<ul style="list-style-type: none">Select the menu item with the Up/Down key until ...
⇒ Display IP . (Bus)
<ul style="list-style-type: none">Press the Set key
⇒ Display IP 1 / 192 (IP address 1st block / 192) flash alternately
<ul style="list-style-type: none">Set the desired address for 1st block of the IP using the Up and Down keys

<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display IP1 / 168 (IP address 2nd block / 168) flash alternately
<ul style="list-style-type: none"> • Set the desired address for 2nd block of the IP using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display IP3 / 1 (IP address 3rd block / 1) flash alternately
<ul style="list-style-type: none"> • Set the desired address for 3rd block of the IP using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display IP4 / 100 (IP address 4th block / 50) flash alternately
<ul style="list-style-type: none"> • Set the desired address for 4th block of the IP using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display IP. (IP address)
<ul style="list-style-type: none"> • Press Down key
<ul style="list-style-type: none"> ⇒ Display Sub. (subnetwork mask)
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Sub1 / 255 (subnetwork mask 1st block / 255) flash alternately
<ul style="list-style-type: none"> • Set the 1st block of the subnetwork mask using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Sub2 / 255 (subnetwork mask 2nd block / 255) flash alternately
<ul style="list-style-type: none"> • Set the 2nd block of the subnetwork mask using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Sub3 / 255 (subnetwork mask 3rd block / 255) flash alternately
<ul style="list-style-type: none"> • Set the 3rd block of the subnetwork mask using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Sub4 / 0 (subnetwork mask 4th block / 0) flash alternately
<ul style="list-style-type: none"> • Set the 4th block of the subnetwork mask using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Sub. (subnetwork mask)
<ul style="list-style-type: none"> • Press Down key
<ul style="list-style-type: none"> ⇒ Display Gate. (Gateway)
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Gate1 / 0 (gateway 1st block / 0) flash alternately
<ul style="list-style-type: none"> • Set the 1st block of the gateway using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Gate2 / 0 (gateway 2nd block / 0) flash alternately
<ul style="list-style-type: none"> • Set the 2nd block of the gateway using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Gate3 / 0 (gateway 3rd block / 0) flash alternately
<ul style="list-style-type: none"> • Set the 3rd block of the gateway using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Gate4 / 0 (gateway 4th block / 0) flash alternately
<ul style="list-style-type: none"> • Set the 4th block of the gateway using the Up and Down keys
<ul style="list-style-type: none"> • Press the Set key
<ul style="list-style-type: none"> ⇒ Display Gate. (Gateway)

• Press Down key
⇒ Display UdP. (UDP configuration)
• Press the Set key
⇒ Display rtd / on (RTD protocol / on) flash alternately
• Turn the RDT protocol on /off using the Up and Down keys
• Press the Set key
⇒ Display Ud1 / 5 (UDP Port 1st block/ 5) flash alternately
• Set the 1st block of the UDP port using the Up and Down keys
• Press the Set key
⇒ Display Ud2 / 000 (UDP port 2nd block/ 000) flash alternately
• Set the 2nd block of the UDP port using the Up and Down keys
• Press the Set key
⇒ Display UdP. (UDP)
• Press Down key
⇒ Display tCP. (TCP configuration)
• Press the Set key
⇒ Display htt / FUL (http port / full access) flash alternately
• Configure the http port with the Up and Down keys
• Press the Set key
⇒ Display Mod / on (Modbus / on) flash alternately
• Turn the modbus protocol on /off using the Up and Down keys
• Press the Set key
⇒ Display tCP. (TCP configuration)

Note:Note: The UDP port always applies for the transmission of Sensors 1...6.
Sensors 7...12 are transmitted via the set UDP port +1.

9.11 Simulation

A sensor can be selected and a temperature simulated here. All device functions operate as if this value is actually being measured. Error messages are only indicated with the LEDs and not in the display. The set values are simulated until the menu item **S.** is left with the Up or Down button. If no key is pressed for 15 minutes, the device automatically switches back to the display mode.

Adjustment process:

• Select the menu item with the Up/Down key until...
⇒ Display S. (Simulation)
• Press the Set key
⇒ Display S. / S I (Simulation / Sensor) flash alternately
• Use the Up and Down keys to select the sensor function
• Press the Set key
⇒ Display 0 (Temperature)
• Simulate the desired temperature using the Up and Down keys
• Press the Set key
⇒ Display S. (Simulation)

By pressing the Set button repeatedly all sensors can be selected in succession. The simulated values are retained until the menu item **S.** is left by pressing Up or Down.

9.12 Code lock

Here, the set parameters can be protected by activating a code lock. The device acknowledges an incorrect entry with **Err** (flashes three times).

Adjustment process:

• Select the menu item with the Up/Down key until...
⇒ Display Code (Code lock)
• Press the Set key
⇒ Display Pin / 0 (Pin / Pin code) flash alternately
• Use the Up and Down keys to set the saved pin code (factory setting is 504)
• Press the Set key
• Set the desired code lock using the Up and Down keys: <ul style="list-style-type: none">○ off off, all parameters can be changed○ on on, no parameters can be changed
• Press the Set key
⇒ Display Pin / 504 (Pin / Pin code) flash alternately
• Set the desired new pin code with the Up and Down keys (caution: write down the pin code)
• Press the Set key (exits code locking)
⇒ Code lock on, display on flashes three times
⇒ Code lock off, display off flashes three times
⇒ Display Code (Code lock)

9.13 Possible indications in display

Display mode

Er 1 ... Er 9	Error messages (see 11. Troubleshooting and measures)
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Menu mode / Configuration mode

SEn.	Menu item sensor configuration
S 1 ... S 12	Sensors 1...12
3-L	3-conductor connection
nc	No sensor connected
rEL	Relay function
IP.	Menu item for configuring the IP address
IP 1 ... IP 4	Blocks 1 to 4 to set the IP address
SUB.	Menu item for configuring the subnetwork mask
SU 1 ... SU 4	Blocks 1 to 4 to set the subnetwork mask
8GATE.8	Menu item for configuring the gateway
GA 1 ... GA 4	Blocks 1 to 4 to set the gateway
UDP.	Menu item to configure the RTD protocol and the setting of the UDP port
rtd	ZIEHL RTD protocol
Ud 1 ... Ud 2	Blocks 1 to 2 to set the UDP port (if possible > 1024)
tcp.	Menu item for configuring the http port and the modbus protocol
htt	Configure the http port
FUL	Full access, http port and firmware update On
PAR	Measurements and device data along with configuration in the browser (no firmware update, no network settings modification)
rER	Read access, only measurements and device data in the browser
oFF	No user interface and no firmware update
Mod	Modbus TCP protocol
Si	Simulation
cod	Code lock
Pin	Pin code (factory setting 504)
UPd	Firmware update is running

10 Maintenance and repair

The TR 1200 is maintenance-free. Periodically test for proper functioning.

11 Troubleshooting and measures

Error	Cause	Remedy
-EE appears in the display	Sensor short-circuit	Measurement range of -199°C (sensor resistance <18.39 Ohm) undercut
EEE appears in the display	Sensor interruption	Measurement range of 850°C (sensor resistance >390.26 Ohm) exceeded
Er1 appears in the display	Sensor short-circuit	The LED in the defective sensor circuit flashes, check sensor circuit for short-circuit
Er2 appears in the display	Sensor interruption	The LED in the defective sensor circuit flashes, check sensor circuit for interruption
Er8 appears in the display	Internal device error	The unit needs to be returned
Er9 appears in the display	Parameter error	Do a factory reset
False values or sensor error for Sensors 7...12	Sensors 7...12 are not connection compatible to Sensors 1...6	Connect Sensors 7...12 correctly
The device cannot be configured	Code lock	<p>The code lock provides protection against unauthorised manipulation on the device. If the code lock is active, the parameters cannot be changed. The pin can be set by the user.</p> <p><u>Pin code unknown? -> Perform a code reset:</u></p> <p>While switching on the supply voltage, press the "Set" key for 2 s</p> <ul style="list-style-type: none"> ▷ The display alternates 888 – [od – oFF – 888 ▷ Release the Set key <p>Code lock is switched off, Pin code = 504</p>
Unable to receive GOOSE messages	The settings in the IEC61580 System Configuration Utility must match the settings of TR1200IP. The Ethernet switch must support 10-Mbit/s.	<p>Check settings.</p> <p>Check Switch.</p>

12 Technical data

Rated supply voltage Us: AC/DC 24 – 240 V
 Tolerance DC 20, 4 - 297 V AC 20 - 264 V 50/60 Hz
 Power consumption < 3 W < 10 VA

Relay output: 1 Wechsler (CO)
 Switching voltage max. AC 415 V
 Switching current max. 5 A
 Switching capacity max. 1250 VA (ohmic load)
 max. 120 W at DC 24

UL electrical ratings: 250 V ac, 5 A, resistive
 E214025 240 V ac, 1/2 hp
 120 V ac, ¼ hp
 B 300 – pilot duty, UL 508

Nominal operating current Ie:
 AC15 Ie = 3 A Ue = 250 V
 DC13 Ie = 2 A Ue = 24 V
 Ie = 0.2 A Ue = 125 V
 Ie = 0.1 A Ue = 250 V

Recommended series fuse T 3.15 A (gL)
 Contact service life, mech. 1 x 10⁷ operating cycles
 Contact service life, electr. 1 x 10⁵ operating cycles at AC 250 V / 6 A

Temperature measurement:
 Measurement time sensor 0.25...3s (dependent on the number of sensors)
 Measurement time sensor 0.25...30s (for measurement cycle of one sensor)
 Measurement range -199°...850°C
 Resolution 1°C

Sensor connection

12x Pt 100 acc EN 60751, connection of Ni100 and Ni120 sensors possible. Conversion of the measured values must be performed in the evaluation unit.

Sensor	Measurement range °C		Short-circuit Ohm	Interruption Ohm	Sensor resistance + line resistance Ohm
	min	max	<	>	max
Pt 100	-199	860	15	400	500

Tolerance ±0.5 % of measurement ±1 K
 Sensor current ≤ 0.8 mA
 Temperature drift <0.04°C/K

Ethernet interface

Transmission speed 10 MBit/s
 IP address Standard: 192.168.1.100, adjustable
 Subnetwork mask Standard: 255.255.255.0, adjustable
 UDP port Standard: 5000 (5001), adjustable
 Max cable length 20m when using CAT 5 patch cable
 Max response time RTD / Modbus < 700 µs

<u>Test conditions</u>	EN 61010-1
Rated impulse withstand voltage	4000 V
Surge category	III
Pollution level	2
Rated insulation voltage Ui	300 V
Operating time	100 %
Galvanic insulation	Supply voltage– Measurement input DC 3820 V
Ethernet Control voltage–Measurement input	DC 500V

<u>EMC-tests</u>	EN 61326-1
emitted interference	EN 61000-6-3
Burst	EN 61000-4-4 +/-4 kV
Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms	
SURGE	IEC 61000-4-5 +/-4 kV
	Impulse 1,2/50 µs (8/20 µs)
discharge of static electricity	IEC 61000-4-2 +/-4 kV contact, +/- 8kV air

Environmental conditions

Ambient temperature range	-20 °C ... +65 °C
Storage temperature range	-20 °C ... +70 °C
Altitude	Up to 2000 m
Climatic conditions	5 – 85 % rel. humidity, no condensation
External wiring temperature range	-5 °C ... +70 °C
Vibration resistance EN 60068-2-6	2...25 Hz ±1,6 mm 25 ... 150 Hz 5 g

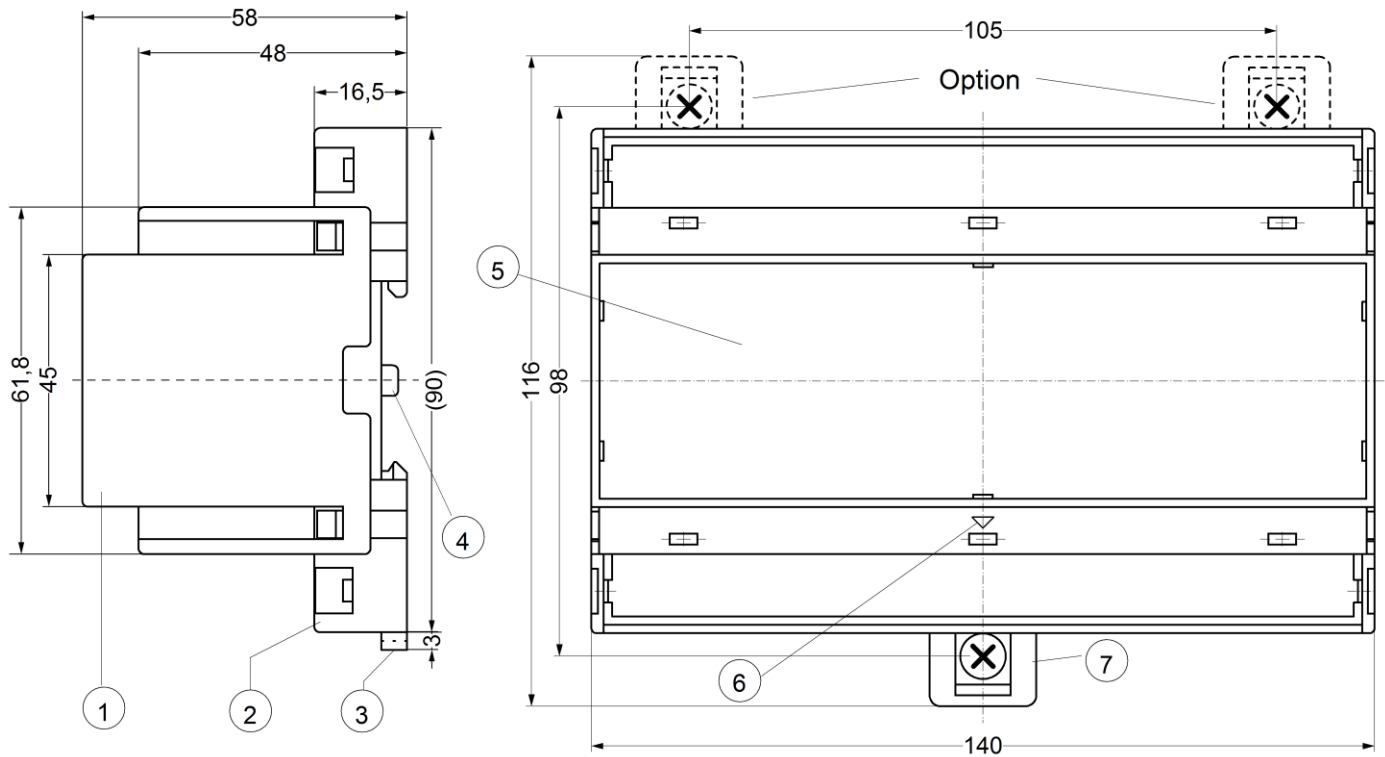
Housing

Dimensions (W x H x D)	Type V8, distribution board 140 x 90 x 58 mm
Front-to-back size / Width	55 mm / 8 TE
Wiring connection single strand	each 1 x 1.5 mm ²
Finely stranded with wire end ferrule	each 1 x 1.0 mm ²
Starting torque of the terminal screw	0.5 Nm (3.6 lb.in)
Protection class housing / terminals	IP 30 / IP20
Mounting position	Arbitrary
Mounting	Snap-on fastening standard rail 35 mm acc EN 60715 or Fasten with screws (with 2 additional bars)
Weight:	Approx. 350 g

We reserve the right to make technical changes.

13 Mounting type V8:

Dimensions in mm



- 1 Cover
- 2 Base
- 3 Bar for snap mounting
- 4 Latch for sealing
- 5 Front panel
- 6 Identification for down / position downward
- 7 Bar for wall mounting with screws. Bar drill hole \varnothing 4.2 mm / for fixing to wall with screws, \varnothing 4.2 mm.

14 TR1200IP Ethernet interface

Ethernet	UDP (Port 0...65535)	ZIEHL RTD (can be switched off)	Read measurements and device data	
	TCP	MODBUS TCP (Port 502, disconnectable, 1 connection)	Read measurements and device data	
		http (interface) (Port 80 disconnectable)	Read access	Read measurements and device data
			Configuration access	+ configure sensors and relays
Full access	+ network settings and firmware update			

All protocols can be activated or deactivated independent of each other.

14.1 ZIEHL RTD UDP protocol

The ZIEHL RTD protocol can be switched off in the menu item **UDP** - **RTD**.

The UDP Port can be set in the menu item **UDP** - **UD1** and **UD2** in the range of 0...65535 in 2 blocks.

You can find documentation on the ZIEHL RTD protocol in the Internet at www.ziehl.com TR1200IP – ZIEHL RTD protocol

14.2 Modbus TCP protocol

The modbus protocol can be switched off in the menu item **TCP** - **Mod**.

The modbus TCP Port is permanently set to 502 and cannot be changed.

You can find documentation on the Modbus TCP protocol in the Internet at www.ziehl.com TR1200IP – Modbus TCP protocol.

14.3 http protocol

The browser and firmware update function depend on the access set in the menu item **TCP** - **HTTP**.

The following functions are available in the browser:

Full access FUL	Measurements and device data can be viewed
	The TR1200IP can be configured
	Network settings can be modified
	Firmware update is possible
Configuration access PR	Measurements and device data can be viewed, configuration possible, network settings cannot be modified
Read access RE	Measurements and device data can be viewed
No access OFF	The http port is completely switched off

The http port is permanently set to 80 and cannot be changed.

14.4 IEC 61850 GOOSE protocol

GOOSE application descriptions see: <http://www.ziehl.com/en/AllProducts/detail/TR1200IP-40>

TR1200IP

Status Simulation Sensor Config IP Config TCP/UDP Config **GOOSE** Firmware Update Help

Achtung: VLAN ID / Priorität wird nicht unterstützt!
Warning: VLAN ID / Priority is not supported!

IEC 61850:	<input checked="" type="radio"/> On <input type="radio"/> Off
Goose MAC:	<input type="text" value="01:0C:CD:01:10:00"/>
IEC 61850 Name:	<input type="text" value="TR1200IP_504"/>
Go ID:	<input type="text" value="ZIEHL_TR1200IP"/>
App ID:	<input type="text" value="0x_0504"/>
Monitoring time min:	<input type="text" value="10"/> ms
Monitoring time max:	<input type="text" value="2000"/> ms
Deadband:	<input type="text" value="99"/> .0 °C
Config revision:	<input type="text" value="1"/>
<input type="button" value="Save Config"/>	

[Download IEC 61850 IED Capability Description \(ICD\) file](#)

Sensor state of single sensor	Internal error / device error 0 = no error	temperature value	Quality of the temperature value
Valid temperature	0	-199..859 °C	0
Sensor = not connected	0	980 °C	0x0042
Sensor interruption	0	999 °C	0x0042
Sensor short-circuit	0	-999 °C	0x0042
any	> 0	-199..859, -999, 980,999 °C	0x0042

QUALITY 0x0042 = INVALID + FAILURE

15 Appendix SIPROTEC configuration

15.1 Configuration SIPROTEC Compact-Devices (only 7SJ80 and 7SK80)

Connection of sensors and configuration of RTD box TR 1200 IP for evaluation of Siemens SIPROTEC Compact-devices 7SJ80 and 7SK80 at Port A.

Settings for the Ethernet connection between SIPROTEC Compact-device and RTD box TR1200 IP:

-Setting in SIPROTEC Compact-device is „**Ziehl RTD UDP Protocol**“

-Setting in RTD TR1200 IP is „**Modbus UDP Protocol**“ with „**On**“ (Presetting = „On“) activated.

CAUTION! The EN100 module in the SIPROTEC 4 devices does not support this function.

The connection type „**6 RTD Ethernet**“ or „**12 RTD Ethernet**“ from the RTDs set within „Function scope“ of the Compact-device.

Following settings have to be done in RTD box TR1200 IP:

For „6 RTD Ethernet“ Connect Sensors 1...6

- ⇒ Configure Sensors 1...6 in menu item **SEn** depending on the connection (configure sensors that are not connected as "nc")
- ⇒ Configure Sensors 7...12 in menu item **SEn** as "nc"
- ⇒ Set IP address in menu item **IP .** and UDP port in menu item **UdP**

The TR 1200 IP transmits the data of Sensors 1...6 on enquiry (see protocol description) with the IP address under the set UDP port.

For „12 RTD Ethernet“ Connect Sensors 1...12

- ⇒ Configure Sensors 1...12 in menu item **SEn** depending on the connection
- ⇒ Set IP address in menu item **IP .** and UDP port in menu item **UdP**

The TR 1200 IP transmits the data of Sensors 1...6 on enquiry (see protocol description) with the IP address under the set UDP port. On enquiry with the same IP address under the set UDP port +1, the TR 1200 IP transmits the data of Sensors 7...12.

Find detailed application description in Internet, at following Link :

www.siprotec.com > Accessories > Temperature Detection > 7XV5662-8AD10 > Downloads

15.2 Configuration SIPROTEC 5-Devices

Settings for the Ethernet connection between SIPROTEC 5 and RTD box TR1200 IP:

-Setting in SIPROTEC 5-device is „**SUP-Protocol**“ (Slave Unit Protocol)

-Setting in RTD TR1200 IP is „**Modbus TCP Protocol**“ with „**On**“ (Presetting = „On“) activated.

The „**Modbus**“ TCP-Protocol can be activated with the function buttons under the menu **tcp** – **Mod** or using the Web-Browser in the tab „**TCP/UDP Config**“ with „**On**“ activated.

The setting „RTD“ (RTD-Protocol) and „UDP Port“ have no influence here.

The Modbus TCP Port is fix set to 502 and cannot be changed.

The setting of the SIPROTEC 5-device can be found in manual (e.g. 7UT82) in chapter 5.9 „function group type analog converter“.

In Internet under: www.siprotec.com > SIPROTEC 5 > 7UT82 > Downloads

Attention! The RTD box TR1200 IP supports only **10 MBit/s Ethernet** connections, so no direct connection to **100 MBit-communication modul** is possible. In such a case you have to use e.g. an autom. 10/100 MBit/s- Autosensing-Switch between TR1200 IP and SIPROTEC 5.

16 Firmware update

- ⇒ Set the access to **FUL** in the menu item **ⓧⓧⓧ** - **ⓧⓧⓧ**
- ⇒ Start the "Firmware update" page in the browser
- ⇒ Select the file with the new firmware
- ⇒ Start the firmware update by clicking on the "Update" button; the file will be downloaded from TR1200IP
- ⇒ During transmission, the **UPd.** is displayed and the sensor LEDs S1...6 illuminate in succession.
- ⇒ As soon as the firmware has been transmitted, the TR1200IP reprograms itself. During this process the sensor LEDs S1...6 flicker rapidly. Do not switch off the unit under any circumstances. As soon as the firmware update has completed, the TR1200IP restarts and is ready for operation again

Please go to www.ziehl.com in the Internet for the latest TR1200IP firmware