RTD Unit – 7XV5662-7AD10

Description

The universal relay TR800 Web has 8 measuring or sensor inputs and can measure 8 temperatures using Pt 100 elements (Ni100 and Ni120). The measured values 1 to 6 can be transmitted by protocol to SIPROTEC 4 devices with temperature function. 2 universal relays with a total of 12 measuring inputs can be connected.

The connection uses a serial RS485 interface (see *Figure 8.1/9*). The TR800 is protocol-compatible with the TR600 (7XV5662-3AD10, 7XV5662-5AD10) to the serial RS485 interface and transfers the 6 temperatures in the same format. In this mode, the TR800 can replace the TR600.

The serial RS485 interface can be connected to a Reyrolle 5 (7SR5) device and used with the **`49TS Temperature Sensor Supervision`** function. For further details see the 7SR5 Device Manual.

For the motor protection SIPROTEC 7SK80, the connection can also use the Ethernet interface if the system interface is (already) used (see *Figure 8.1/7* and *Figure 8.1/8*). The universal relay is operated and configured via the Ethernet interface using a web browser. Support is provided for 3-wire thermocouples. For the 2-wire connection, the measured line resistance can be compensated by a software setting. In addition, temperatures can be simulated to test the temperature function in SIPROTEC devices.

As an alternative to temperature sensors, 8 analog values (DC 0/4 mA to 20 mA and DC 0 V to 10 V) can be measured The output can be scaled and the units (°C, V, A, %) can be adapted in the TR800. The RTD protocol in temperature format is used for transmission to the SIPROTEC device and six of the 8 analog sensor values are available there. With two TR800s, 12 values are available. Accordingly, for example, 5.5 mA is transmitted using the temperature value 55 and can be displayed either as a temperature in the SIPROTEC device or queried as a threshold value with respect to limits. This allows further processing of analog values in SIPROTEC devices with temperature function or the transmission of these values to systems control (for example, SICAM PAS). In the SIPROTEC 6MD66 bay controller (starting with V4.8), all 8 measuring inputs are available.

The TR800 has a wide-range power supply unit, DC 24 V to 250 V and AC 115/230 V, and an alarm relay. A sensor interruption or a sensor short is reported and transmitted to the SIPROTEC device via protocol.

Benefits

- 8 measuring inputs:
  - Pt 100, Pt 1000 in 2-wire or 3-wire technology
  - KTY 83 or KTY 84
  - Thermocouple types B, E, J, K, L, N, R, S, T
  - DC 0 V to 10 V, DC 0/4 mA to 20 mA
  - Resistance: 500 ohms, resistance: 30 kOhms
- 4 relay outputs (all as isolated change-over contacts)
- Ethernet interface (http, https, UDP, Modbus, Bonjour, UpNP, SNMP)
- RS485 interface (ZIEHL standard protocol and Modbus RTU protocol)

[ph_7XV5662-7AD10_, 1, --]

Figure 8.1/6 Universal Relay/RTD Box TR800

- Universal power supply unit, AC/DC 24 V to 240 V
- Integrated Web server for configuration, reading measured data, e-mail alarms to user management, data and alarm logging
- Time-dependent control (day/night)
- Real-time clock with synchronization via the time server.

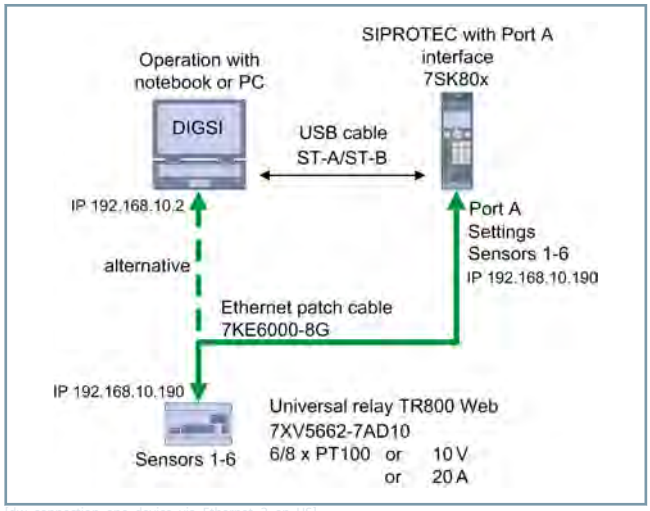
Application Examples

NOTE

The TR800 Web can only be used with SIPROTEC 4 or SIPROTEC 4 Compact devices.

Communication with a TR800 Web over the Ethernet interface

If a universal relay TR800 is sufficient for measured-value acquisition, this relay can be connected directly to the protection device (for example, 7SK80x/port A) by means of a CAT 5 patch cable. The TR800 Web is set in advance in the Web browser on a PC using the same cable. A TR800 can be queried by two or more SIPROTEC devices. The IP address and the UDP port of the TR800 can be set in the SIPROTEC device. In this way, a SIPROTEC device can use the temperatures 1 to 3 and another device can use the temperatures 3 to 6 for further processing, however, each device reads all 6 temperature values (*Figure 8.1/7*).



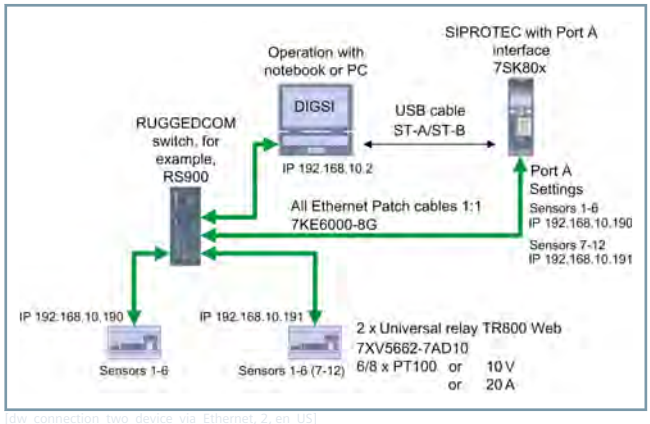
[dw_connection_one_device_via_Ethernet, 2, en_US]

Figure 8.1/7 Connecting a Device via the Ethernet

Communication with 2 TR800 Webs over the Ethernet interface

If 2 TR800s are used for measured-value acquisition on large engines, a switchgear-compatible switch (for example, RUGGEDCOM RS900 or Hirschmann RSR20) must be used. The switch, the 2 TR800 Web relays, the protection device and the control PC, connected via the patch cable (1:1), form their own subnetwork or are part of a larger Ethernet network.

DIGSI 4 and the Web browser may run in parallel on the control PC. Accordingly, one of the 2 TR800 Webs and the protection device can be used in parallel during normal operation and data can be read from them (*Figure 8.1/8*).



[dw_connection_two_device_via_Ethernet, 2, en_US]

Figure 8.1/8 Connecting 2 Devices via the Ethernet

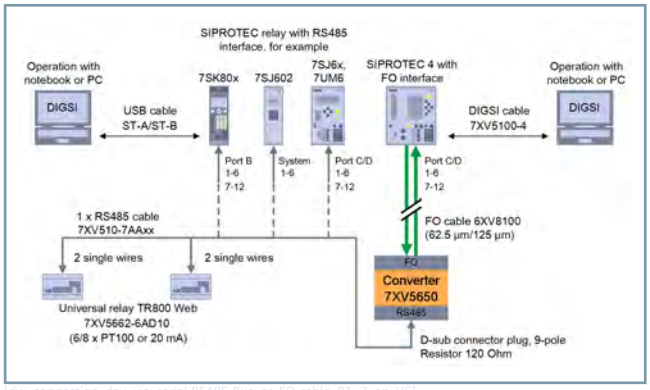
Communication over the RS485 bus

One or two TR800s can be connected to a SIPROTEC 4 device with temperature function (7SJ6, 7UT6, 7UM6) or the Compact device SIPROTEC 7SK80 via the RS485 interface.

The special cables 7XV5103-7AAxx are used for connection. In the case of remote measuring points, a connection can also be established via a multimode optical fiber and the converter 7XV5650.

3 operating modes are available for various applications. All 3 types are compatible with the RTD unit TR600 with 6 measuring inputs. The operating mode is set using the RS485 address of the TR800 Web.

You can find detailed information at *www.siemens.com/siprotec*

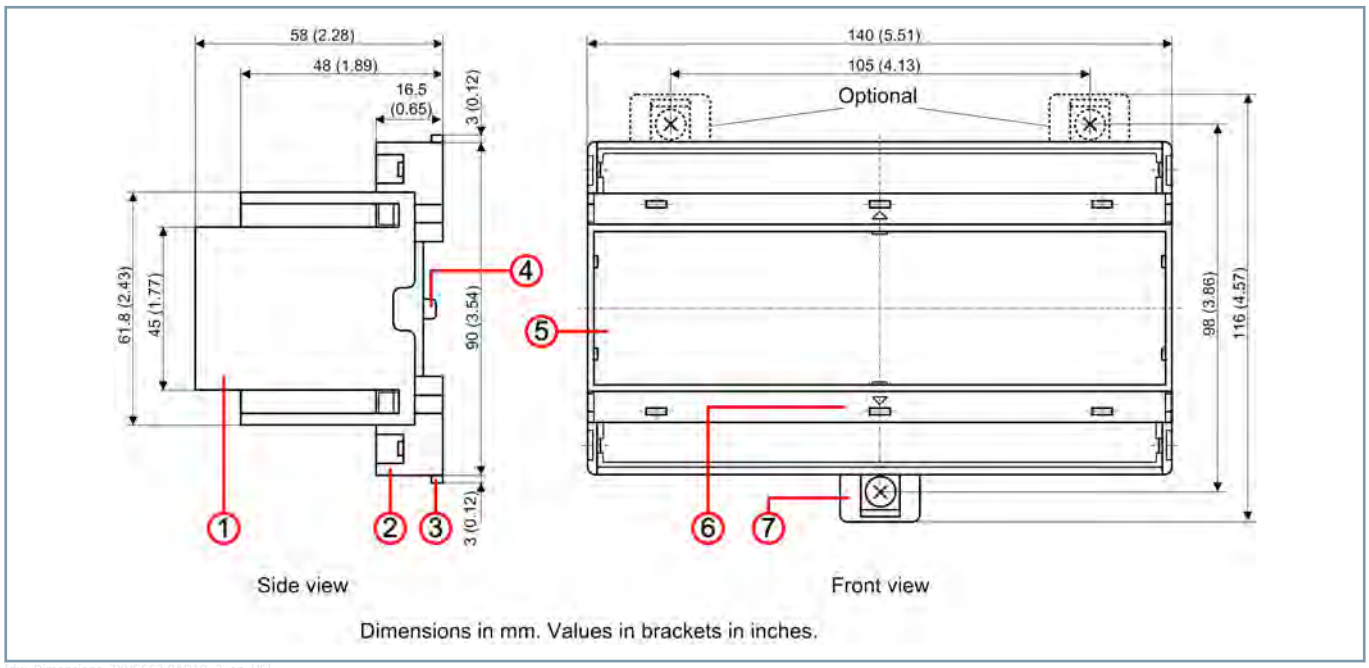


[dw_connection_dev_via_serial-RS485-Bus_or_FO-cable_01, 3, en_US]

Figure 8.1/9 Connection via the Serial RS485 Bus or Fiber-Optic Cable

8.1

Dimensioned Drawing



[dw_Dimensions_7XV5662-8AD10, 2, en_US]

Figure 8.1/10 Dimensions, RTD Unit 7XV5662-7AD10

Technical Data

Rated auxiliary voltage	
Auxiliary voltage V_H	24 to 240 VAC/VDC, 0/45 to 120 Hz, < 4 W, < 8 VA
Tolerance	20.4 to 297 VDC, 20 to 264 VAC
Isolation voltage	2000 VAC

Relay/output			
Quantity		4 x 1 change-over contact	
Contact voltage		max. 415 VAC	
Switched current		max. 5 A	
Switching power		max. 2000 VA (resistive load) max. 120 W at 24 VDC	
Reduction factor at cos φ = 0.7		0.5	
Electrical rated data V_L:		250 VAC, 3 A, general purpose AC 240 V, ¼ hp. 2.9 FLA 120 VAC, ¹⁄₁₀ hp. 3.0 FLA A C 300 D 300 1 A, 240 VAC	
Rated operating current I_E	AC 15 DC 13	I_E = 3 A I_E = 2 A I_E = 0.2 A I_E = 0.1 A	V_E = 250 V V_E = 24 V V_E = 125 V V_E = 250 V

Relay/output	
Recommended fuse	3.5 A (gL)
Contact service life, mechanical	1 × 10^7 switching cycles
Contact service life, electrical	1 x 10^5 switching cycles at 250 VAC/6 A

Real-time clock	
	Buffer for 7 days Continuous synchronization is possible via the SNTP protocol to the Ethernet interface

Test conditions	
According to	EN 61010-1
Rated surge immunity	4000 V
Degree of pollution	2
Rated insulation voltage V_i	300 V
Operational time	100%
Permissible ambient temperature	-20 °C bis +65 °C EN 60068-2-1, dry heat
Earthquake safety EN 60068-2-6	2 to 25 Hz, ± 1.6 mm 25 to 150 Hz, 5 g
Galvanic separation	Ethernet-measuring input: min. 500 VDC
No galvanic separation	RS 485-interface – measuring inputs
EMC Tests	EN 61326-1
EMC test for emitted interference	EN 61000-4-3

Test conditions	
Fast transient bursts	EN 61000-4-4 ± 4 kV Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms
Energy surge voltages (SURGE)	IEC 61000-4-5 ± 1 pulse: 1.2/50 µs (8/20 µs)
Electrostatic discharge test	IEC 61000-4-2 ± 4 contact discharge, ± 8 kV air discharge
Ethernet connection	10/100 megabit Auto-MDIX (no crossover cable required)

Sensor connection					
Measuring cycle/measurement time (for 8 measurands)	< 3 s				
Pt100, Pt1000 according to EN 60751:					
	Measuring range °C		Short circuit, ohms	Open circuit, ohms	Sensor resistance + line resistance, ohms
Sensor	min.	max.	<	>	> max.
Pt 100	-199	860	15	400	500
Pt 1000	-199	860	150	4000	4100
If Ni100 or Ni120 sensors are connected, the SIPROTEC device handles conversion. The TR800 is configured for Pt100 sensors.					
Accuracy	± 0.5 % of the measured value ± 0.5 K				
Sensor current	≤ 0.6 mA				
Temperature drift	< 0.04 °C				

Voltage/current input			
	Input impedance	Max. input signal	Accuracy of the end value
0 – 10 V	12 kΩ	27 V	0.1%

Voltage/current input			
0/4–20 mA	8 kΩ	100 mA	0.5%
Temperature drift		< 0.02% / K	

Resistance measurement	
Accuracy 0.0 to 500.0 Ω	0.2% of the measured value ± 0.5 Ω
Accuracy 0 to 30.00 kΩ	0.5 % of the measured value ± 2 Ω
Sensor current	≤ 0.6 mA

Housing	
Housing type	V8, distribution panel mounting
Dimensions (W x H x D)	140 × 90 × 58 mm
Depth/width	55 mm / 8 HPs
Line termination, single conductor	1 × 1.5 mm² each
Braided conductor with end sleeve	1 × 1.0 mm² each
Tightening torque for terminal screw	0.5 Nm
Degree of protection of the housing/ terminal	IP30/IP20
Vertical/horizontal mounting	optional
Fastening	Snap-on mounting to 35-mm DIN rail according to EN 60715 or screw fixing(with 2 additional angle brackets)
Weight	about 370 g

Selection and Ordering Data

Description	Order no.												
	1	2	3	4	5	6	7		8	9	10	11	12
Temperature measuring device (RTD unit)	7	X	V	5	6	6	2	-	7	A	D	1	0
The TR800 Web can only be used with SIPROTEC 4 or SIPROTEC 4 Compact devices. With 6/8 Pt100 temperature sensors [1] or 6/8 20 mA analog inputs; RS485 interface or electrical Ethernet interface; for DIN rail mounting For each protection device, 2 units can be used. 24 to 250 VAC/VDC													
Note: also see the cost-effective next generation 7XV5674 for 20 mA applications													