



Fig. 13/109 7XV5662-7AD10 universal relay/RTD-box TR800

Description

The universal relay TR800 Web has 8 measuring/sensor inputs and is able to capture 8 temperatures via PT100- (Ni100 and Ni120) elements. The measuring values 1 – 6 may be transmitted to SIPROTEC 4 devices with thermo function via protocol. Two universal relays with a total of 12 measuring inputs can be connected.

Connection is established via a serial RS485 interface (see Fig. 13/112). The TR800 is protocol compatible with the TR600 (7XV5662-3AD10, 7XV5662-5AD10) on the serial RS485 interface, and transmits the 6 temperatures in the same format. In this mode, the TR800 can replace the TR600.

In the case of 7SK80 motor protection, the connection may alternatively be made via the Ethernet interface, if the system interface is (pre-)assigned (see Fig. 13/110 + 13/111). The universal relay is operated and configured via the Ethernet interface with a Web browser. Three conductor thermo elements are supported. For the dual conductor connection the measured line resistance can be compensated for by a software setting. Furthermore, temperatures can be simulated to test the thermo-function in the SIPROTEC devices.

Alternatively to thermo sensors, 8 analog values DC 0/4 – 20 mA and DC 0 – 10 V may be measured. The output can be scaled and the designation (°C, V, A, %) can be adapted in the TR800. The transmission to the SIPROTEC – device however takes place via the RTD – protocol in temperature format. 6 of the 8 analog sensor values are available there. With 2 TR800 12 values are available. For example 5.5 mA is transferred with a temperature value of 55 in this way and may either be displayed as temperature in the SIPROTEC device or compared with a set limit via a threshold value. This allows for the processing of analog dimensions in SIPROTEC devices with thermo function or their transmission to a substation control unit (e.g. SICAM PAS). In the bay control unit 6MD66 V4.8 (available since 05/2009) all 8 measuring inputs are available.

The TR800 has a wide-range power supply from DC 24 V – 250 V and AC 115/230 V as well as an alarm relay. Sensor failure or sensor short-circuit are alarmed and transmitted via protocol to the SIPROTEC device.

Function overview

- 8 measuring inputs:
 - Pt 100, Pt 1000 in 2- or 3-conductor technology
 - KTY 83 or KTY 84
 - Thermocouples type B, E, J, K, L, N, R, S, T
 - DC 0 to 10 V, 0/4 to DC 20 mA
 - Resistance 500 Ohm, resistance 30 kOhm
- 4 relay-outputs (each potential-free changeover contact)
- Ethernet interface (http, https, UDP, MODBUS, Bonjour, UpNP, SNMP)
- RS485 interface (Standard ZIEHL- and MODBUS RTU protocol)
- Universal power-supply AC/DC 24 to 240 V
- Integrated Web server for configuration, read-out of measured data, user-management email-alarms, data- and alarm-logging
- Time-dependent control (day/night)
- Real-time clock with synchronization with time server.

Not applicable for SIPROTEC 5 !

Application

Application

Communication with one TR800 Web via Ethernet interface

If one universal relay TR800 is sufficient for the measured-value capturing, it may be connected directly to the protection device with a CAT5 patch cable (e.g. 7SK80x/ Port A). The setting of the TR800 Web is done prior to connection with the same cable via a PC using a Web browser. A TR800 can also be interrogated by two or more SIPROTEC devices. IP-address and the UDP-Port of the TR800 may be set in the SIPROTEC device. In this way, one SIPROTEC device may use temperatures 1 – 3 and another device can use the temperatures 3 – 6 for processing. Each device, however, reads in all 6 temperature values (Fig. 13/110).

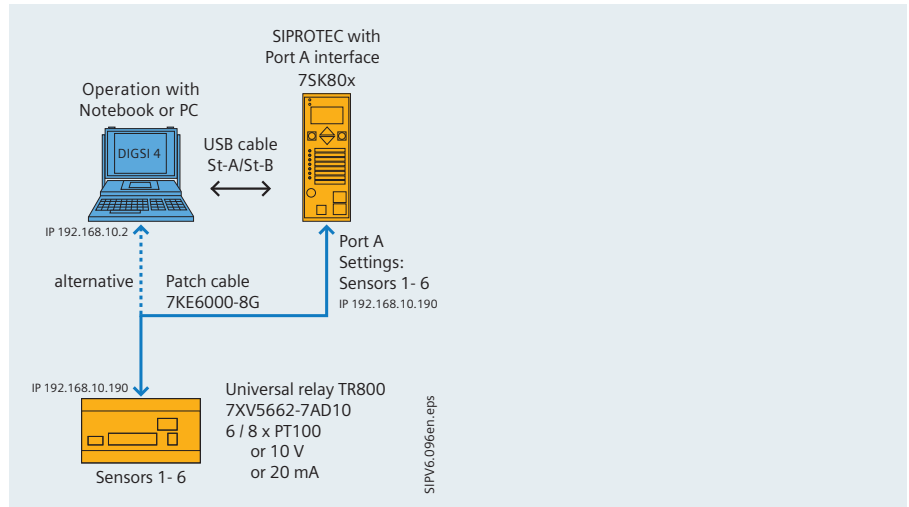


Fig. 13/110 Connection of one device via Ethernet

Communication with two TR800 Web via Ethernet interface

If two TR800 are applied on big motors for the purpose of measured-value capturing, a substation hardened switch (e.g. RUGGEDCOM RS900 or Hirschmann RSR20) must be used. The switch, the two TR800 Web relays, the protection device and the operating PC constitute an autonomous subnet when they are connected via patch cables (1:1). They may also be part of a larger Ethernet network.

DIGSI 4 and Web browser can run in parallel on the operating PC. Accordingly, one of the two TR800 Web and the protection device can be applied and read out during normal operation. (Fig. 13/111).

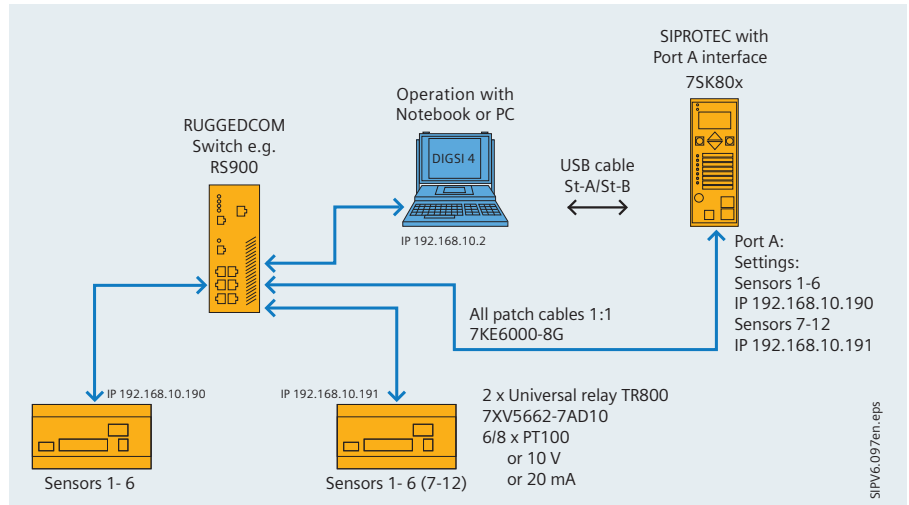


Fig. 13/111 Connection of two devices via Ethernet

Communication via RS485 bus

One or two TR800 may be connected via a RS485 interface to a SIPROTEC 4 device with thermo function (7SJ6, 7UT6, 7UM6), or the compact device 7SK80.

For connection purposes the special cables 7XV5103-7AAxx are used. In the case of remote measuring points a connection can also be established via a multi-mode FO cable and the converter 7XV5650.

For different applications, 3 modes of operation are available. All three modes are compatible with thermo box TR600 with 6 measuring inputs. The mode of operation is set via the RS485 address of the TR800 Web.

For detailed information please visit www.siemens.com/siprotec

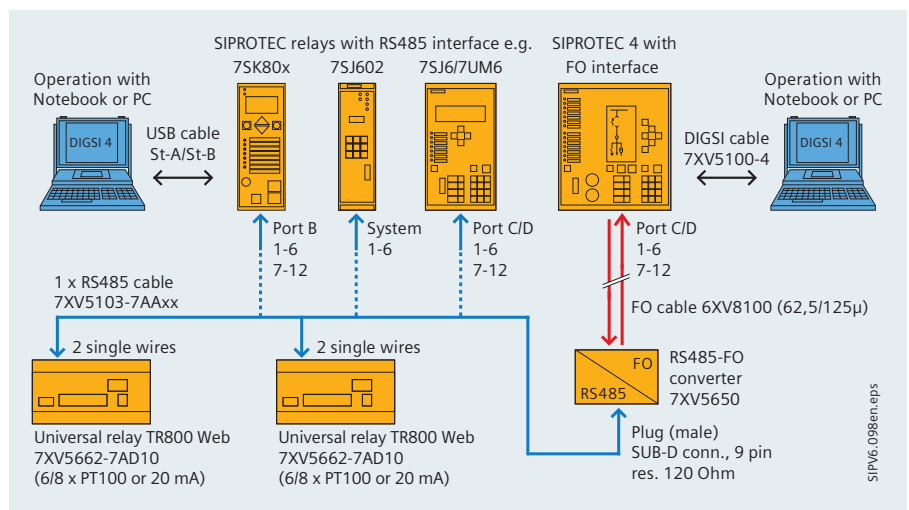


Fig. 13/112 Connection via serial RS485 bus or FO cable

Rated auxiliary voltage					
Auxiliary voltage V_S	AC/DC 24 to 240 V, 0/45 to 120 Hz < 4 W < 8 VA				
Tolerance	DC 20.4 to 297 V, AC 20 to 264 V				
Insulation	AC 2000 V				
Relay output					
Number	4 x 1 changeover contact (CO)				
Switching voltage	Max. AC 415 V				
Switching current	Max. 5 A				
Switching power	Max. 2000 VA (ohmic load) Max. 120 W at DC 24 V				
De-rating factor with $\cos \varphi = 0.7$	0.5				
U_L electrical ratings	AC 250 V, 3 A general use AC 240 V ¼ hp. 2.9 FLA AC 120 V ¼ hp. 3.0 FLA C 300 D 300 1 A AC 240 V				
Rated operating current I_E AC 15 DC 13	$I_E = 3$ A $V_E = 250$ V $I_E = 2$ A $V_E = 24$ V $I_E = 0.2$ A $V_E = 125$ V $I_E = 0.1$ A $V_E = 250$ V				
Recommended fuse	T 3.5 A (gL)				
Contact service life, mech.	1×10^7 switching operations				
Contact service life, electr.	1×10^5 switching operations at AC 250 V/6 A				
Real-time clock					
Buffered for 7 days. Continuous synchronization via SNTP on the Ethernet interface is possible					
Test conditions					
Acc. to	EN 61010-1				
Rated impulse voltage insulation	4000 V				
Pollution rate	2				
Rated insulation level V_i	300 V				
Duty cycle	100 %				
Perm. ambient temperature	- 20 °C to + 65 °C EN 60068-2-1 dry heat				
Seismic safety EN 60068-2-6	2 to 25 Hz ± 1.6 mm 25 to 150 Hz 5 g				
Electrical isolation	Ethernet – measuring input min. DC 500 V				
No electrical isolation	RS 485 interface – measuring inputs				
EMC tests	EN 61326-1				
EMC test for noise emission	EN 61000-4-3				
Fast transient disturbances/Burst	EN 61000-4-4 ± 4 kV Pulse 5/50 ns, $f = 5$ kHz, $t = 15$ ms, T = 300 ms				
High-energy surge voltages (SURGE)	IEC 61000-4-5 ± 1 impulse: 1.2/50 μ s (8/20 μ s)				
Electrostatic discharge	IEC 61000-4-2 ± 4 contact discharge, ± 8 kV air discharge				
Ethernet connection	10/100 MBit Auto-MDIX (no cross-over cable required)				
Sensor connection					
Measuring cycle/measuring time (for 8 measured values)	< 3 s				
Pt100, Pt1000 according to EN 60751:					
	Measured range °C		Short circuit Ohm	Interruption Ohm	Sensor resistance + circuit resistance Ohm
Sensor	min.	max.	<	>	> max.
Pt 100	-199	860	15	400	500
Pt 1000	-199	860	150	4000	4100
When connecting Ni100 or Ni120 sensors, the conversion is done in the SIPROTEC device. The TR800 is configured with Pt100 sensors.					

Accessories/7XV5662

Technical data, selection and ordering data

<i>Sensor connection (continued)</i>			
Accuracy	± 0.5 % of measured value ± 0.5 K		
Sensor current	≤ 0.6 mA		
Temperature drift	< 0.04 °C/K		
<i>Voltage/current input</i>			
	Input resistance	Maximum input signal	Accuracy of final value
0 – 10 V	12 kΩ	27 V	0,1 %
0/4 – 20 mA	18 Ω	100 mA	0.5 %
Temperature drift	< 0.02 %/K		
<i>Resistance measurement</i>			
Accuracy 0.0 ... 500.0 Ω	0.2 % of measured value ± 0.5 Ω		
Accuracy 0 ... 30.00 kΩ	0.5 % of measured value ± 2 Ω		
Sensor current	≤ 0.6 mA		
<i>Housing</i>			
Housing type	V8, distribution panel mounting		
Size (W × H × D)	140 × 90 × 58 mm		
Depth / Width	55 mm / 8 TE		
Circuit termination single strand	Per 1 × 1.5 mm ²		
Braided conductor with crimp lug	Per 1 × 1.0 mm ²		
Tightening torque of terminal screw	0.5 Nm (3.6 lb.in)		
Degree of protection of housing/terminals	IP30 / IP20		
Mounting vertical/horizontal	Optional		
Affixing	Snap-on mounting onto standard rail mounting 35 mm acc. to EN 60715 or screw mounting (with 2 additional brackets)		
Weight	Approx. 370 g		

Selection and ordering data

Description	Order No.
Universal relay/RTD-box TR800 Distributed input-box for 6/8 RTD-connections (RTD-box) or 6/8 × 20 mA, or 0 – 10 V Rail mounting plastic Protection class IP21 1 serial interface RS485 for communication of measurements 1 RJ45 interface for parameter setting via Web browser and communication of measurements Wide-range power supply AC/DC 24 to 240 V Note: The device can be operated in a 7XV5662-2AD10 or 7XV5662-5AD10 compatible mode.	7XV5662 - 7AD10