

## Universal Relay / RTD-Box TR800 Web

7XV5662-7AD10

### General 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 together 12 measuring inputs can be connected.

Connection is established via a serial RS485 interface (see Figure 3). The TR800 is protocol compatible with the TR600 (7XV5662-3AD10, 7XV5662-5AD10) on the serial RS 485 interface, and transmits the 6 temperatures in the same format. In this mode, the TR800 can replace the TR600.

In the case of machine protection 7SK80 the connection may alternatively be made via the Ethernet interface, if the system interface is otherwise occupied (see Figures 1 and 2). The Universal Relay is operated and configured via the Ethernet interface with a Web –Browser. This mode of configuration is clearly more convenient than with the TR600, which only has a simple local operation. 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 0/4 – 20 mA DC and 0 – 10 V DC 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 substation control unit (e.g. SICAM PAS). In the bay control unit 6MD66 V4.8 (from 05/2009) all 8 measuring inputs are available.

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

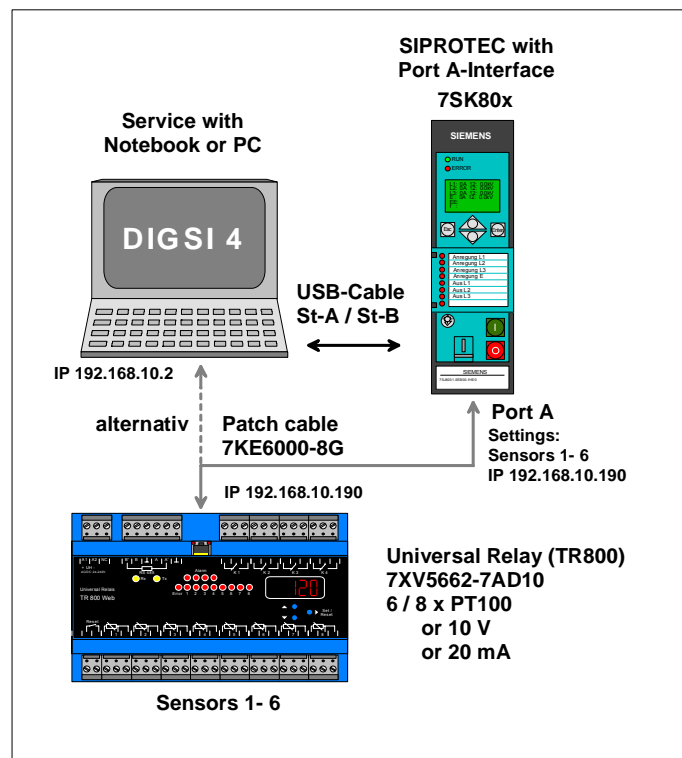
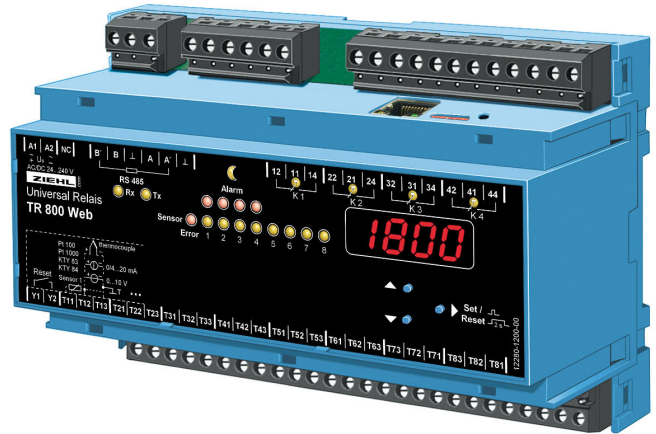


Figure 1: Connection of a device via Ethernet

## Communication with a TR800 Web via the 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 read in all 6 temperature values.

**Hint:** If during commissioning a commercially available switch with 3 patch cables (1:1) is used temporarily, the protection device may be configured and tested in parallel with a PC and DIGSI 4 as well as the TR800. Data transmission between the SIPROTEC – device and the TR800, as well as the setting dialog between the PC, the SIPROTEC – device and the TR800 take place in parallel via the same Ethernet network.

## Communication with two TR800 Web via the 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, both the TR800 Web, 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.

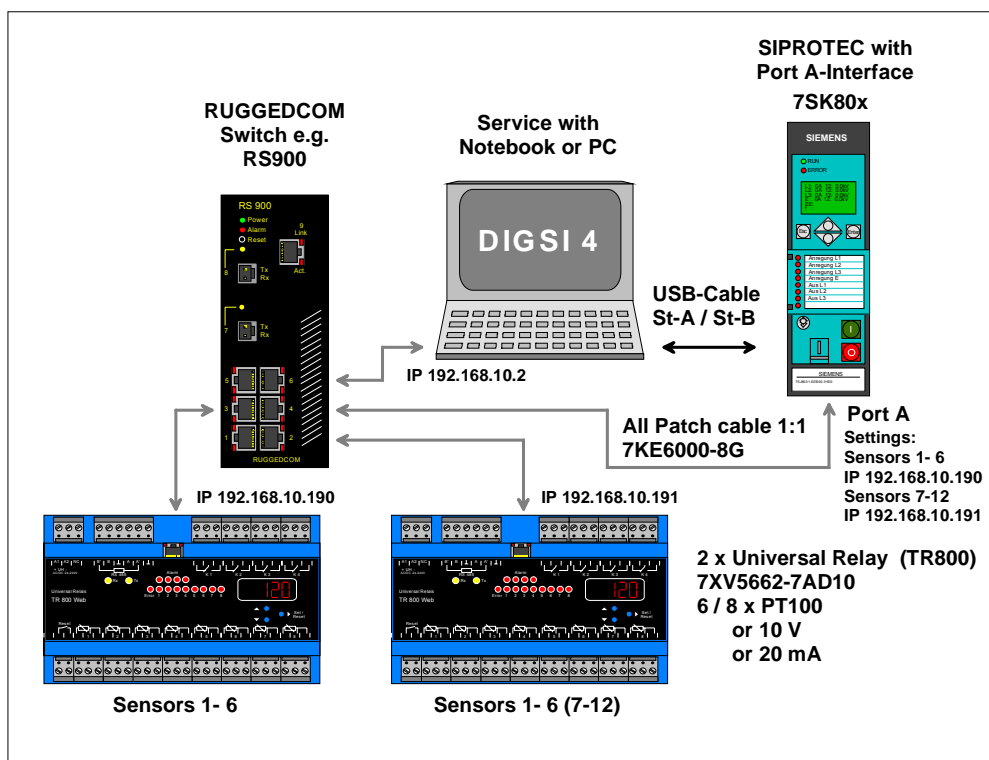


Figure 2: Connection of two devices via Ethernet

DIGSI 4 and the Web Browser can run in parallel on the operating PC. Accordingly, one of the two TR 800 Web and the protection device can be applied and read out during normal operation.

**NOTE:** The network must be limited to those devices which directly communicate with the TR 800. A number of TR 800 and SIPROTEC devices may be located in this network segment. The simultaneous operation of the protection device (e.g. 7SK80x) with DIGSI 4 is possible. A configuration as shown in Figure 2 is recommended, whereby a number of TR 800 and SIPROTEC devices may be located in this network segment.

## Communication via RS485-Bus

One or two TR800 may be connected via a RS485 interface to a SIPROTEC 4 bay 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 multimode FO cable and the converter 7XV5650.

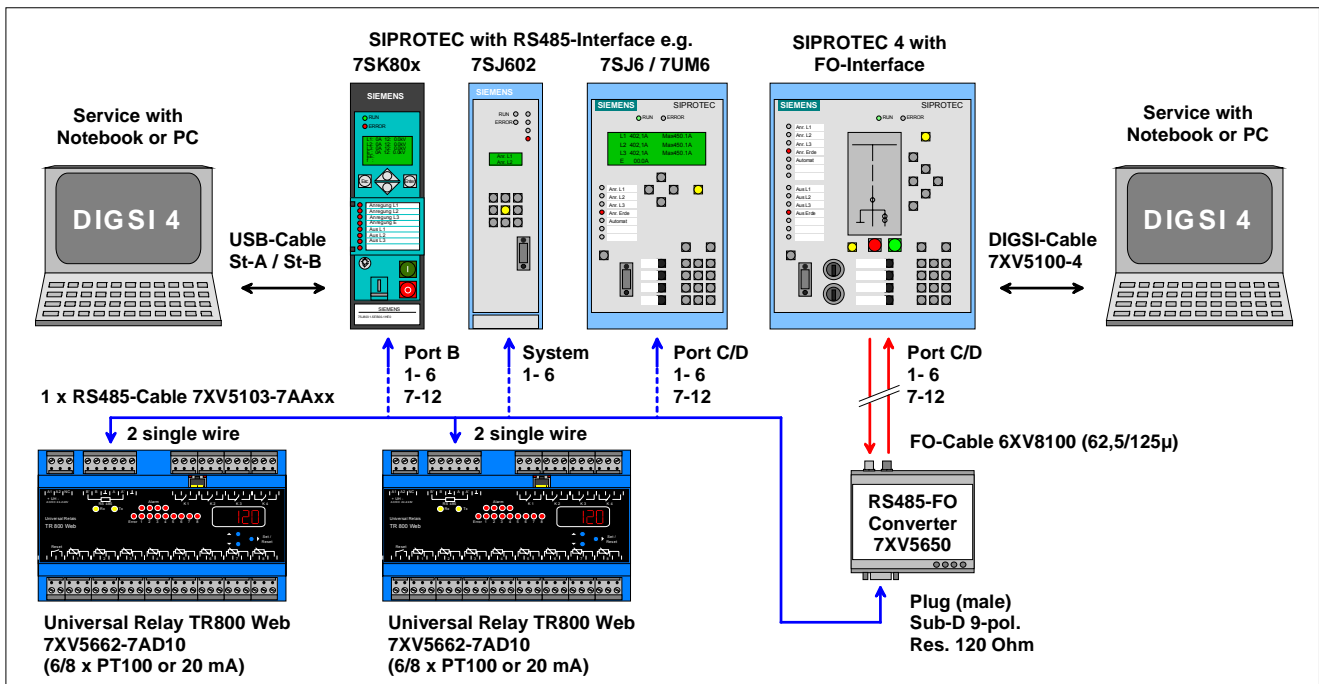


Figure 3: Connection via serial RS485 Bus or FO cable

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 RS 485 address of the TR 800 Web.

Address 0: 6 measured values are sent by the TR800 Web in 3 second intervals. A device is connected via RS485 and the SIPROTEC – device operates in the “6 RTD Simplex” – Mode. Only one TR 800 Web may be connected.

Address 1: The first TR800 Web responds to a request from protection device (measured values 1 - 6). 6 measurement locations are set in the SIPROTEC – device. A “6 RDT half-duplex” operation must be set.

Address 2: The second TR800 Web responds to the request from the protection device (measured value 7 – 12). In the first TR800 address 1 must be set. 12 measuring points are configured in the SIPROTEC device and it must be set to “12 RDT half-duplex” operation.

Detailed information (e.g. settings of thermo functions in the devices, protocols etc.) may be obtained from the applicable device manuals and the extensive application description of the TR 800 Web operation together with SIPROTEC devices in the Internet.

[www.siprotec.com](http://www.siprotec.com) -> Accessories -> 7XV5662-xAD.

## Technical data

<b>Auxiliary voltage Us:</b>	AC/DC 24 – 240 V, 0 / 45 - 120 Hz < 4 W < 8 VA
Tolerance	DC 20,4 - 297 V, AC 20 - 264 V
Insulation	2000 V AC
<b>Relay out-put:</b>	4 x 1 change-over 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
UL electrical ratings:	250 V ac, 3 A, general use 240 V ac, 1/4 hp, 2.9 FLA 120 V ac, 1/10 hp, 3.0 FLA C 300 D 300 1 A 240 VAC
Rated operating current $I_e$ :	
AC15	$I_e = 3 A$ $U_e = 250 V$
DC13	$I_e = 2 A$ $U_e = 24 V$ $I_e = 0,2 A$ $U_e = 125 V$ $I_e = 0,1 A$ $U_e = 250 V$
Recommended fuse	T 3,15 A (gL)
Contact life span mech.	$3 \times 10^7$ switching operations
Contact life span electr.	$1 \times 10^5$ switching operations at AC 250 V / 6 A
<b>Real-time clock</b>	Power reserve 7 days. Continuous synchronisation via SNTP on the Ethernet interface is possible
<b>Testing conditions</b>	EN 61010-1
Rated impulse voltage insulation	4000 V
Pollution rate	2
Rated insulation level $U_i$	300 V
Duty cycle	100 %
Perm. Ambient temperature	-20 °C ... +65 °C EN 60068-2-1 dry heat
Seismic safety EN 60068-2-6	2...25 Hz $\pm 1,6$ mm 25 ... 150 Hz 5 g
Electrical isolation	Ethernet – measuring input min. 500 VDC
No electrical isolation	RS 485 – measuring input
<b>EMC-tests</b>	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 +/-1Impulse 1,2/50 $\mu$ s (8/20 $\mu$ s)
Electrostatic discharge	IEC 61000-4-2 +/-4 kV contact discharge, +/- 8kV 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

Pt 100, Pt 1000 according to EN 60751:

Sensor	Measuring range °C		Short circuit Ohm	Interruption Ohm	Sensor resistance + circuit resistance Ohm
	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.

Accuracy  $\pm 0,5$  % of measured value  $\pm 0,5$  K  
Sensor current  $\leq 0,6$  mA  
Temperature drift  $< 0,04$  °C/K

## Voltage- current in-put

	Input- resistance	Maximum Input signal	Accuracy of final value
0 – 10 V	12 k $\Omega$	27 V	0,1 %
0/4-20 mA	18 $\Omega$	100 mA	0,5 %

Temperature drift < 0,02 %/K

## Resistance measurement:

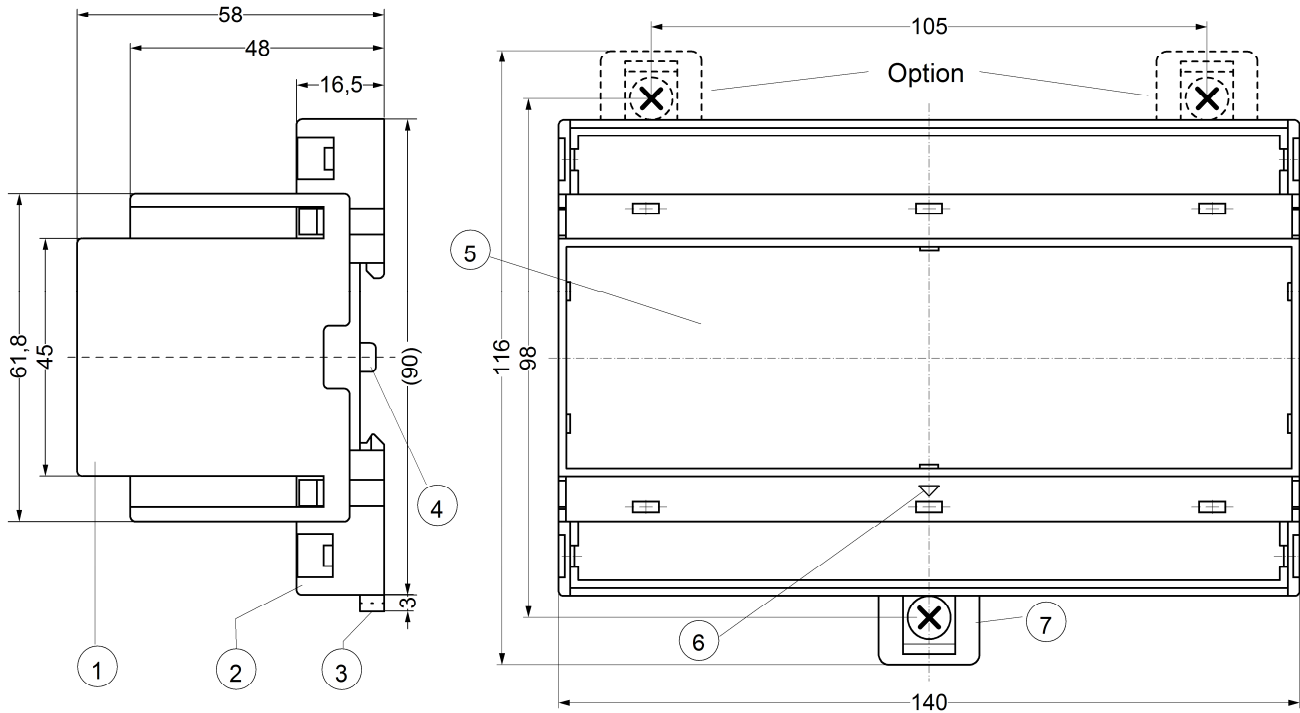
Accuracy 0,0 ... 500,0  $\Omega$  0,2 % of measured value  $\pm 0,5$   $\Omega$   
Accuracy 0...30,00 k $\Omega$  0,5 % of measured value  $\pm 2$   $\Omega$   
Sensor current  $\leq 0,6$  mA

## Housing

Housing type	V8, Distribution panel mounting
Size (W x H x D)	140 x 90 x 58 mm
Depth / Width	55 mm / 8 TE
Circuit termination single strand	per 1 x 1,5 mm <sup>2</sup>
Braided conductor with crimp lug	per 1 x 1,0 mm <sup>2</sup>
Tightening torque of terminal screw	0,5 Nm (3,6 lb.in)
Degree of protection of housing/terminals	IP 30 / IP 20
Mounting vertical/horizontal	optional
Affixing	Snap on to standard rail mounting 35 mm acc. to EN 60715 or Screw mounting (with 2 additional brackets)
Weight	approx. 370 g

Technical changes may take place

## Construction V8



- 1 Oberteil / cover
- 2 Unterteil / base
- 3 Riegel / bar for snap mounting
- 4 Plombenlasche / latch for sealing
- 5 Frontplatteneinsatz / front panel
- 6 Kennzeichen für unten / position downward
- 7 Riegel bei Wandbefestigung mit Schrauben. Riegelbohrung  $\varnothing$  4,2 mm / for fixing to wall with screws,  $\varnothing$  4,2 mm.

## Ordering Data

Product Name

**RTD-Box TR800 Web**

Distributed Input-box for 6/8 RTD-connection (RTD-Box)  
or 6/8 x 20mA, or 0-10 V

Rail mounting plastic, Protection class IP21

1 serial Interface RS485 for communication of measurements

1 RJ45-Interface for Parameter setting over Web-Browser  
and communication of measurements

Wide range power supply AC / DC 24-240V

Note: The device can be operated in a 7 XV5662-2AD10 or  
7 XV5662-5AD10 compatible mode.

Order No.:

**7 XV 56 6 2 - 7 A D 1 0**

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