process up to 12 measured values.

Up to now, 2 RTD-Boxes TR600 were required. The RTD-Box TR1200 can now replace up to 2 RTD-Boxes TR600 for temperature measurement.

Note: The TR1200 does not supply its own alarm messages or contacts.

The alarm levels must be set and displayed for each input in the protection device, and output via contacts or transferred to a central control system.

Note: This application guide is only meant as an additional user information, and assumes knowledge of the general information for operation of the products as well as their basic functions as described in the applicable manuals.

Measurement of up to 12 temperature measured values

From a RTD-Box TR1200 up to 12 temperature measured values can be input into and processed by a protection device via an "RS485-Bus". Larger distances should be covered with an FO converter and optical interface.



Figure 1: TR1200 with various protection devices and operation PC with DIGSI 4

Application for RTD-Box TR1200 (RS485)

This document describes the measurement of 12 temperatures in a 7SJ62x via the RTD-Box TR1200 at an RS485-Bus.

The RTD-Box TR1200 has 12 sensor inputs and can in this way measure 12 temperatures via Pt 100-elements.

2 and 3 conductor Pt 100 are supported. In the case of 2 conductor operation, the measured line resistance can be compensated with an applicable setting.

All settings are done with 3 keys on the front cover. Input can be blocked with a code.

The measured value output to the protection device is done with the bus cable 7XV5103-7AAxx via a RS485-Bus.

Note: SIPROTEC 4 protection devices can







Connection of the RTD-box 7XV5662-6AD10 with connection cable 7XV5103-7AAxx to Protection devices SIPROTEC 4 (RS485)



The two short cable ends (rd + bl) are connected to A (rd) and B (bl) of the RTD-box. By bridging of the terminals A - A' and B - B' the termination resistances are activated.

The two long cable ends (rd + bl) are connected to A' (rd) and B' (bl) to activated the bus termination.



Setting the devices

The protection device 7SK80 is set with DIGSI 4 on a Notebook via the USB front interface. A USB cable with plug type A to plug type B is used.

The SIPROTEC 4 protection devices (here e.g. 7SJ62) are set with the "DIGSI-cable" 7XV5100-4/BB via the serial front interface.

The RTD-Box TR1200 is set with 3 keys. The navigation is done via the setting tree and the relevant settings are displayed in the display.

Setting the protection device 7SJ62 with DIGSI 4

A notebook is connected with the "DIGSI-cable" 7XV5100-4/BB via the RS232-interface with the front interface of the protection device. The protection device is configured in DIGSI 4 with a corresponding MLFB and (if not yet done) initialised.

The RTD-Box is connected to the RS485 Service-interface "Port C".



If the "Service Port" (Port C) has already been configured in the factory with "MLFB", this can be checked under "Properties", "MLFB"

Save with "OK"

Properties - SIPROTEC 4 variant		X					
General MLFB Communication modules DIGS	I Manager Communication parameters						
Order number (MLFB): 75J62414EB021FG0 +J +K	+L]						
Z. Nominal Current	1 : Iph=1A , IE=1A/Sensitive						
8. Power Supply	4 : DC 60V Binary Input Preset 17V						
<u>9</u> . Housing	E : Flush Mounting Case Ring Lugs 📃 🚽 🚽 📖						
1 <u>0</u> . Language/Regional Functions	B : Region World, 50/60Hz, English 📃 🔣						
1 <u>1</u> . Systemport	0:NO						
1 <u>2</u> . Service Port	2 : DIGSI 4/Modem/RTD-Box, RS485 📃 💽 🧕						
1 <u>3</u> . Osc. Fault Recording / Metering	1 : Oscillographic Fault Recording						
14. Overcurrent / Motorprotection /	F : PH/E; Unbalance Load; Set Groups; etc. 💌 ⊵						
1 <u>5</u> . Directional Overcurrent / Voltage	G : Dir. Ph/E; 0/U Volt; 0/U Freq; 📃 📃						
1 <u>6</u> . Auto Reclose / Fault locator	0 : none 📃 📕 🔜						
OK	Cancel Help						



Energy Sector Energy Automation

	Properties - SIPROTEC 4 variant		
	General MLFB Communication mod	Jules DIGSIManager Communica	tion parameters
If the interface module was retro-fitted it must first be configured under "Properties", "Communication modules".	11. Systemport 12. Service Port Declare here exchanged or The originally ordered order	ND DIGSI 4/Modem/RTD-6 N0 DIGSI 4/Modem, RS23 retro-fitted d DIGSI 4/Modem/RTD-6 number (ML DIGSI4/Modem,Fibre 8;	Image: Sox, RS485 Image: Sox, RS485 2000, RS485 Image: Sox, RS485 2000, RS485 2000, RTD-Box
Thereafter again "Initialize device".	<u>C</u> onfiguration:	[<u>▼</u> <u>S</u> et
Save with " OK "	Open device		Cancel Help
Open dialog with the protection device in DIGSI 4 using the connection type "Direct" via the "PC-interface" "COM1" and the "Device interface" "Front".	Connection type	Connection properties PC interface: Device interface:	COM1
Continue with " OK"	ОК		Cancel Help

Image: Select function Image: Select funct	🎸 DIGSI - [Region London / Subs	station East / Feeder 2 / 7SJ624 V4.7/7SJ624 V04.73.06]	
Image: Second	🔁 File Edit Insert Device View	Options Window Help	_ @ ×
Annuclation Measurement CFC Oscillographic Records CFC Power System Data 1 Setting Group A Setting Group A Settings General Device Settings Time Synchronization Interfaces Power System Data 1 Setting Group A Settings Time Synchronization Interfaces Power System Data 1 Setting Group A Settings Additional Functions	File Egit Insert Device View □ ③ ○ <td>Options Window Help Image: Select Function Image: Select Function Image: Device Configuration Image: Select Function Image: Device Configuration Matrix) Image: Select Function Image: Select Function Image: Select Function Image: Select</td> <td></td>	Options Window Help Image: Select Function Image: Select Function Image: Device Configuration Image: Select Function Image: Device Configuration Matrix) Image: Select Function Image: Select Function Image: Select Function Image: Select	
Press F1 for Help. 75J624 V04.73.05 Online COM1 115200 8E1 00001	Press F1 for Help.	753624 V04.73.05 Online COM1 115200 8E1 00001	

Under "Settings" select the function "Interfaces".

Under "Interface Settings" the setting of the "Service interface" is done.

1

Address:

Frame: Baudrate: 8 E(ven) 1 9600

All other settings are not relevant and can remain in their pre-set state.

Data transfer at the service interface is always done automatically if a RTD-Box is used, at 9600 Baud and 8E1.

These settings must also be selected in the RTD-Box.

Interface Settings					X
Serial port on PC VD Addresses	Operator Interface	Service in	nterface	IEC 103 on devi	ce
<u>A</u> ddress:	1				
<u>F</u> rame:	81	E(ven) 1 💌			
<u>B</u> aud rate:	96	00 💌			
Max. telegram gap (050):	0		x 100 m	s	
IP address:	1	92.168.	2.1		
Subnet <u>m</u> ask:	2	55 . 255 .	255 . 0)	
Lin <u>k</u> layer:	PF	P (point-to-p	ioint, seria	l)	•
- Access authorization at interfac	ce for				
Customize	✓ Iest and diagn	ostics			
Web monitor access:	Re	ading			•
Idle state of fiber optic connect	ion				
C Light ON	C Light OFF				
	1			Connect	
				Lancei	нер
J624 V4.7/7SJ624 V04.73	8.06]				



In "Functional Scope",,12 RTD half duplex operation"is selected under the function

"Ext. Temperature Input Connection Type".

unctio	onal Scope		×
<u>∖v</u> ailab	le functions:		
No.	Function	Scope	^
0116	DMT / IDMT Directional Earth	Definite Time only	
0127	DMT 1Phase	Disabled	
0117	Cold Load Pickup	Disabled	
0122	2nd Harmonic Inrush Restraint	Disabled	
0131	(sensitive) Earth fault	Disabled	
0130	(sens.) Earth fault dir. characteristic	cos phi / sin phi measurement (standard)	
0140	Unbalance Load (Negative Sequence)	Disabled	
0142	Thermal Overload Protection	Disabled	
0150	Under / Overvoltage Protection	Disabled	
D154	Over / Underfrequency Protection	Disabled	
0170	Breaker Failure Protection	Disabled	
0172	Circuit Breaker Wear Monitoring	Disabled	
0182	Trip Circuit Supervision	Disabled	
0190	External Temperature Input	Port C	
0191	Ext. Temperature Input Connection Type	12 RTD half duplex operation 📃 💌	
	Flexible Function 1 20	Please select	
			~
		About	
C	DIGSI -> device	Cancel Help	

Ø DIGSI - [Region London / Subs	tation East / Feeder 2 / 7SJ624 V4.7/	/SJ624 V04.73.06]	
File Edit Insert Device View	Options <u>W</u> indow <u>H</u> elp		_ 8 ×
🔒 🏉 🕹 🖻 💼 😭 📩 🎘	王 🎖 🐁 🗄 🏥 🏢 💵 🕺		
Online Settings Control Annunciation Measurement Oscillographic Records Test	Select function Select function Masking I/O (Configuration Matrix) CFC Power System Data 1 Selecting Group A Collographic Fault Records General Device Settings Time Synchronization Interfaces Additional Functions	Setting Group A Functions:	×
Press F1 for Help.	753624 V04.73	No. Function No. Function 0004 Power System Data 2 0005 DMT / IDMT Phase/Earth Overcurrent 0006 DMT / IDMT Directional Ph/E Overcurrent 0013 Measurement Supervision 0026 Energy 0090 RTD-Box	
Under "Setting Group " RTD-Box " is done with	A"customisation of the n "Customize…".		
		Customize <u>R</u> eset <u>A</u> bout <u>C</u> lose Help	

The next step is to configure all required measurement inputs. 4 setting pages with 3 measurement inputs each are offered for configuration.

In the following example only the first measuring input is configured. The same procedure must be used for the others.

In the initial menu only the pick-up values of the temperature stages are displayed.

Put a check in "**Display additional settings**" to make all settings visible.

In the window **"RTD 1-3**" the settings for the first three measuring inputs can now be done.

Initially for **"RTD 1**"the **"Type**"of the Thermo element is selected to **"Pt 100 Ohm**"

	- Settings Group A	
D 1-3	RTD 4-6 RTD 7-9 RTD 10-12	
ttings		
No.	Settings	Value
9013	RTD 1: Temperature Stage 1 Pickup	100
9015	RTD 1: Temperature Stage 2 Pickup	120
9023	RTD 2: Temperature Stage 1 Pickup	100
9025	RTD 2: Temperature Stage 2 Pickup	120
9033	RTD 3: Temperature Stage 1 Pickup	100
9035	RTD 3: Temperature Stage 2 Pickup	120
Disp	lay additional settings	
Disp	lay additional settings	Export <u>G</u> raph About

D-Box	- Settings Group A			
TD 1-3	RTD 4-6 RTD 7-9 RTD 10-12			
<u>S</u> ettings:				
No.	Settings		Value	
9011A	RTD 1: Type			not connecte
9012A	RTD 1: Location			Othe
9013	RTD 1: Temperature Stage 1 Pickup			100 °C
9015	RTD 1: Temperature Stage 2 Pickup			120 °C
9021A	RTD 2: Type			not connecte
9022A	RTD 2: Location			Othe
9023	RTD 2: Temperature Stage 1 Pickup			100 °C
9025	RTD 2: Temperature Stage 2 Pickup			120 °C
9031 A	RTD 3: Type			not connecte
9032A	RTD 3: Location			Other
9033	RTD 3: Temperature Stage 1 Pickup			100 °C
9035	RTD 3: Temperature Stage 2 Pickup			120 °C
✓ Disp	lay additional settings			
		Export	<u>G</u> raph	About
OK	Apply DIGSI -> Device		Cancel	Help

No.	Settings	Value
9011A	RTD 1: Type	not connected
9012A	RTD 1: Location	not connected
9013	RTD 1: Temperature Stage 1 Pickup	Pt 100 Ohm
9015	RTD 1: Temperature Stage 2 Pickup	Ni 120 Ohm
9021 A	RTD 2: Type	Ni 100 Ohm
9022A	RTD 2: Location	Othe
9023	RTD 2: Temperature Stage 1 Pickup	100 °C
9025	RTD 2: Temperature Stage 2 Pickup	120 °C
9031 A	RTD 3: Type	not connecte
9032A	RTD 3: Location	Othe
9033	RTD 3: Temperature Stage 1 Pickup	100 °C
9035	RTD 3: Temperature Stage 2 Pickup	120 °C
Displ	lay additional settings	

In this menu a "Location"can be selected for the measured value "RTD 1"

Under "**Temperature Stage 1 / 2 Pickup**" two pick up thresholds for alarm or trip can be set for the measured value "**RTD 1**"

RTD-Box - Settings Group A		
RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12		
Setting:		
No Settings		Value
9011A PTD 1: Tune	terdiscriptie	Pt 100 Obm
90124 RTD 1: Location	Other	FT 100 Offin
9013 RTD 1: Temperature Stage 1 Pickup		
9015 RTD 1: Temperature Stage 2 Pickup	Ambie	ent
9021A RTD 2: Type	Windir	ng
9022A RTD 2: Location	Bearin	ng
9023 RTD 2: Temperature Stage 1 Pickup	Other	
9025 RTD 2: Temperature Stage 2 Pickup		120 °C
9031A RTD 3: Type		not connected
9032A RTD 3: Location		Other
9033 RTD 3: Temperature Stage 1 Pickup		100 °C
9035 RTD 3: Temperature Stage 2 Pickup		120 °C
	Export	<u>G</u> raph <u>About</u>
OK <u>Apply</u> <u>D</u> IGSI -> Device		Cancel Help
OK Apply DIGSI -> Device RTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12		Cancel Help
OK Apply DIGSI -> Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No Settings		CancelHelp
OK Apply DIGSI -> Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings NO. Settings		Cancel Help Value
OK Apply DIGSI -> Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: location		Cancel Help Value Pt 100 Ohm Ambient
OK Apply DIGSL-> Device RTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: Type 9012A RTD 1: Topersture Stage 1 Pickup		Cancel Help Value Pt 100 Ohm Ambient 30 °C
OK Apply DIGSL-> Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: Temperature Stage 1 Pickup 9013 RTD 1: Temperature Stage 2 Pickup 9015 RTD 1: Temperature Stage 2 Pickup		Cancel Help Value Pt 100 Ohm Ambient 30 °C 90 °C
OK Apply DIGSL >> Device RTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings:		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<<250:00
OK Apply DIGSI → Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: Cocation 9015 RTD 1: Temperature Stage 1 Pickup 9015 RTD 2: Type 9022A RTD 2: Type 9022A RTD 2: Cocation		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<=250; colnected
OK Apply DIGSI → Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings No. Settings 9012A RTD 1: Type 9012A RTD 1: Temperature Stage 1 Pickup 9013 RTD 1: Temperature Stage 2 Pickup 9012A RTD 2: Location 9022A RTD 2: Location 902A RTD 2: Location		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<=250; colorected
OK Apply DIGSL-> Device RTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: Temperature Stage 1 Pickup 9013 RTD 1: Temperature Stage 2 Pickup 9021A RTD 2: Type 9022A RTD 2: Temperature Stage 1 Pickup 9023 RTD 2: Temperature Stage 1 Pickup 9023 RTD 2: Temperature Stage 2 Pickup 9025 RTD 2: Temperature Stage 2 Pickup		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<=250; col
OK Apply DIGSI → Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: Temperature Stage 1 Pickup 9013 RTD 1: Temperature Stage 2 Pickup 9022A RTD 2: Location 9023 RTD 2: Location 9023 RTD 2: Location 9025 RTD 2: Temperature Stage 1 Pickup 9024 9025 RTD 2: Location 9025 RTD 2: Temperature Stage 2 Pickup 9023 RTD 2: Temperature Stage 2 Pickup 9024 RTD 3: Type		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<=250; oo
OK Apply DIGSI → Device CTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9012A RTD 1: Location Stage 1 9013 RTD 1: Temperature Stage 1 Pickup 9015 RTD 1: Temperature Stage 2 Pickup 9024 RTD 2: Tomperature Stage 1 Pickup 9023 RTD 2: Temperature Stage 1 Pickup 9023 RTD 2: Temperature Stage 1 Pickup 9023 RTD 2: Temperature Stage 2 Pickup 9031 RTD 3: Tope Pickup 9031 RTD 1: Cocation Pickup 9032 RTD 2: Temperature Stage 1 Pickup 9031 RTD 3: Tope Pickup		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50 <= <= 250; ool
OK Apply DIGSI → Device CID-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings No. Settings 9011A RTD 1: Type 9012A RTD 1: Location 9013 RTD 1: Temperature Stage 1 Pickup 9014 RTD 2: Type 9022A RTD 2: Type 9022A RTD 2: Temperature Stage 1 Pickup 9023 RTD 2: Temperature Stage 1 Pickup 9031A RTD 3: Tope 9032A RTD 3: Location 9032A RTD 3: Location 9032A RTD 3: Location		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<=250; col
OK Apply DIGSI → Device CID-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings No. Settings 9011A RTD 1: Type 9011A RTD 1: Temperature Stage 1 Pickup 9012A RTD 1: Temperature Stage 2 Pickup 9012A RTD 2: Location 9023A RTD 2: Location 9025 RTD 2: Temperature Stage 1 Pickup 9021A RTD 3: Type 9023A RTD 2: Temperature Stage 2 Pickup 9031A RTD 3: Type 9032A RTD 3: Temperature Stage 1 Pickup 9033 RTD 3: Temperature Stage 1 Pickup 9033 RTD 3: Temperature Stage 1 Pickup 9033 RTD 3: Temperature Stage 1 Pickup 9035 RTD 3: Temperature Stage 1 Pickup 9035 RTD 3: Temperature Stage 1 Pickup		Cancel Help Value Pt 100 Ohm Pt 100 Ohm Ambient 30 °C 40 °C -50<=<=250; col 40 °C -col -00 °C 100 °C 100 °C 100 °C -00 °C -120 °C -00 °C -120 °C -00 °C -100 °C -00 °C -100 °C -120 °C
OK Apply DIGSI → Device CID-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings No. Settings 9011A RTD 1: Troperature Stage 1 Pickup 9015 RTD 1: Temperature Stage 2 Pickup 9021A RTD 2: Type 9022A RTD 2: Location 9023 RTD 2: Temperature Stage 1 Pickup 9031A RTD 3: Location 9032A RTD 3: Location 9032A RTD 3: Temperature Stage 1 Pickup 9032A RTD 3: Location 9033A RTD 3: Temperature Stage 1 Pickup 9035 RTD 3: Temperature Stage 2 Pickup 9035 RTD 3: Temperature Stage 2 Pickup 9035 RTD 3: Temperature Stage 2 Pickup		Cancel Help Value Pt 100 Ohm Ambient 30 °C -50<=<=250; col
OK Apply DIGSI -> Device RTD-Box - Settings Group A RTD 1-3 RTD 4-6 RTD 7-9 RTD 10-12 Settings: No. Settings 9011A RTD 1: Type 9012A RTD 1: Temperature Stage 1 Pickup 9013 RTD 1: Temperature Stage 2 Pickup 9022A RTD 2: Location 9023 RTD 2: Temperature Stage 1 Pickup 9032A RTD 2: Temperature Stage 2 Pickup 9031A RTD 3: Temperature Stage 1 Pickup 9033A RTD 3: Temperature Stage 1 Pickup 9033 RTD 3: Temperature Stage 1 Pickup 9035A RTD 3: Temperature Stage 2 Pickup 9035 RTD 3: Temperature Stage 1 Pickup 9035A RTD 3: Temperature Stage 2 Pickup 9034 RTD 3: Temperature Stage 1 Pickup 9035A RTD 3: Temperature Stage 2 Pickup 9035 RTD 3: Temperature Stage 2 Pickup 9035A RTD 3: Temperature Stage 2 Pickup 9035 RTD 3: Temperature Stage 2 Pickup 9035A RTD 3: Temperature Stage 2 Pickup	Egport	Cancel Help Value PI 100 Ohm Ambient 30 °C -50 <= <= 250; oo

When all measuring inputs have

been configured, the settings are sent to the protection device with the key **"DIGSI -> Device"**.

The procedure is concluded by entry of the password and "**OK**".

 Enter Password

 Password for parameter set:

 OK

 Cancel

Note: Also save the settings to "File".

👌 DIGSI - [Region London / Substation East / Fe	eder 2 / 7SJ624 V4.7/7SJ624 V04.73.06]	
File Edit Insert Device View Options Window	Help	_ 8 ×
📕 🎒 👗 🖻 🛍 🖗 📩 🎘 ∓ 🏌 🕒 🕻	₩ ₩ ₩ №	
Online Settings Control Annunciation Measurement Secondary Values Secondary Values	and time .06.2009 11:16:00.146 RTD-Box Measuring Values - 28.05.2009 - Region Ansbach / Verteil	
Empty	01068 Temperature of RTD 1 24 °C 212 °C 212 °C	
The measured values can be output in DIGSI under "Measurement" – "Others" – "RTD-Box Measurement Values".	01009 Temperature of RTD 2 212 °C 01070 Temperature of RTD 3 47 °C 01071 Temperature of RTD 4 72 °C 01072 Temperature of RTD 5 63 °C 01073 Temperature of RTD 6 69 °C 01074 Temperature of RTD 7 24 °C 01075 Temperature of RTD 8 80 °C 01076 Temperature of RTD 9 01077 Temperature of RTD10 01078 Temperature of RTD11 01079 Temperature of RTD12	-
	500)0 ms

In the display of the protection device, the measured values are output under "**Measurement**"- "**RTD-Box**".

Processing of the measured values by protection functions

Alarms and measured values of the Thermo function can be transferred to a superordinate control system or may also be transferred between devices via "IEC 61850 GOOSE"

Configuration of the RTD-Box TR1200

In the following, the connection of the sensors and the configuration of the TR 1200 for processing in SIPROTEC devices is described. The difference here is the mode of connection of the RTD-Box.

6 RTD Simplex (1x TR 1200 works like 1x TR 600) = Factory setting

The TR 1200 transmits the data from Sensors 1...6 cyclically every 3 s under device address 0.

- 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" (Factory setting).
- Set device address in menu item **bUS** \rightarrow **Adr** to "0" (Factory setting).
- Set Baudrate in menu item $|\mathbf{bUS}| \rightarrow |\mathbf{bdr}|$ to "96" (Factory setting).
- Set Data in menu item **bUS** \rightarrow **PAr** to "Entropy to "Entropy setting".

6 RTD half duplex (1x TR 1200 works like 1x TR 600)

The TR 1200 transmits the data from Sensors 1...6 on request with device address 1 or 2.

- 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" (Factory setting).
- Set device address in menu item **bUS** \rightarrow **Adr** to "1".
- Set Baudrate in menu item **bUS** \rightarrow **bdr** to "96" (Factory setting).
- Set Data in menu item **bUS** \rightarrow **PAr** to "EuE" (Factory setting).

12 RTD halb duplex (1x TR 1200 works like 2x TR 600)

The TR 1200 transmits the data from Sensors 1...6 on request with device address 1 and the data from Sensors 7...12 on request with device address 2.

- Connect Sensors 1...12.
- Configure Sensors 1...12 in menu item **SEn** depending on the connection. (configure Sensors that are not connected as "nc").
- Set device address in menu item **bUS** \rightarrow **Adr** to "1".
- Set Baudrate in menu item **bUS** \rightarrow **bdr** to "96" (Factory setting).
- Set Data in menu item **bUS** \rightarrow **PAr** to "EuE" (Factory setting).

Note for SIPROTEC-protection devices:

The data transfer at the service interface always takes place automatically at 9600 Baud with the data format 8E1 when a RTD-Box is used.

Installation as well as safety instructions and detailed setting notes for the devices may be found in the corresponding manuals for each device.

Good luck!