6.8 Communications module SS4

Order No. 6DD1688-0AD0

Description The following **serial interfaces** (data transfer protocols) can be implemented using the SS4 communications module:

Protocol	Application
DUST1	Connecting configuring- and operator control PCs, e. g. to load the program mode and for start-up (commissioning)
DUST2	Connecting a message printer
DUST3	Connecting SIMATIC S5 (AS 512 or CP 525)
USS	Connecting • OP2 operator control panels • VD1 text displays • drive converters to the process coupling; The SS4 is **USS master** and can be operated on the USS bus. Max. baud rate: 187.5 kbaud

CS7 plug-in module The communications module is a plug-in module for the CS7 support module. The CS7 support module, the communications module and its selected receptacle are configured using HWConfig. A maximum of 3 communication modules can be inserted on the CS7.

Data is transferred with the CPU modules via a 16 kbyte dual port RAM which is located on the CS7 support module.

Physical interface The configurable SS4 interface has, as standard an **RS 232** physical interface to connect to the COM interfaces of a PC.
Other physical interfaces can be selected using an optional interface module which can be inserted on the SS4:

Interface module	Physical interface (signal level along the cable)	Application
SS1	20 mA line current (TTY)	Long data transfer lines; interrupted lines can be reliably identified
SS2	RS 232 („V.24“)	For printers with control signals (RTS, CTS)
SS31	RS 485	USS protocol

The maximum baud rate is **187.5 kbaud** and is dependent on the associated protocol software and if relevant, the interface modules used (refer under interface modules).

6.8.1 Connecting programmers or PC

Connecting cables for PG740, PG750 or PG770 programmers can be assembled using the SM8 parts set (for SS4) or an appropriate parts set for

the programmer side, according to the following drawing.
A 4-core screened round cable is required (e. g. LICYC 4*0,5, Metrofunk).

RS 232 interface

Operating a PC or PG750/770 via the standard RS 232 (V.24) interface:

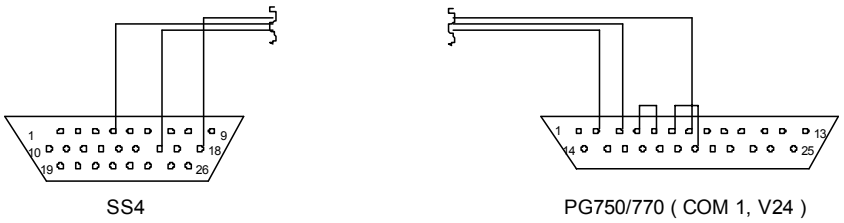


Fig. 6-7 SS4 at a PG750/770 (COM1) via the RS 232 interface (the two jumpers for the PC are not required!)

20mA interface

Operating the PG750/770 at the **active** SS4 communications module (active: Line current source and -sink on the SS4 side; thus, higher data integrity can be achieved with long cables and high baud rates):

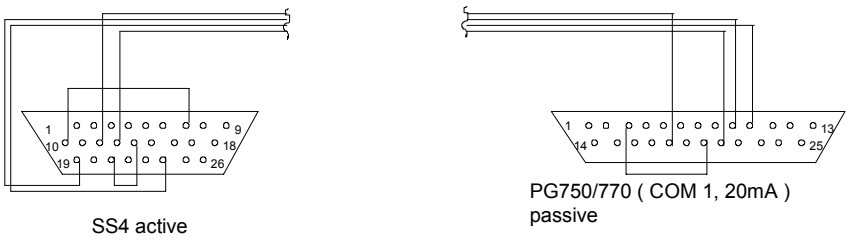


Fig. 6-8 SS4 at PG750/770 (COM1) via the 20mA interface (active)

Operating the PG750/770 at the **passive** SS4 communications module (passive: Line current source and -sink are not at the SS4 side):

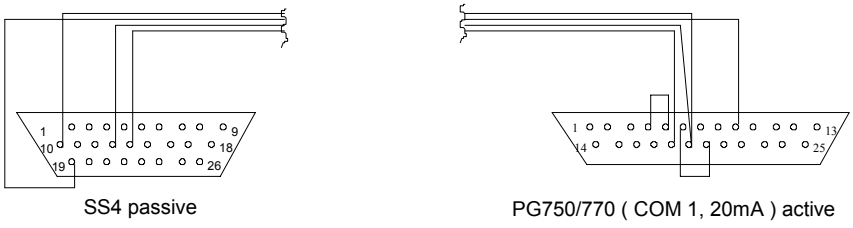


Fig. 6-9 SS4 at PG750/770 (COM1) via the 20mA interface (passive)

NOTE

If the **PG750/770** is operated as passive 20 mA current interface, then switches S3/2 and S3/3 in the PG must be opened (refer to the PG750/770 Manual).

6.8.2 USS connection for OP2, VD1

Connecting cables for the OP2 operator control device or the VD1 numerical display can be assembled using the SM8 parts set (for SS4) or an appropriate parts set for OP2/VD1 (OP2: Parts set SM5) according to the following diagrams.
A 4-core screened round cable is required (e. g. LICYC 4*0,5, Metrofunk).

Bus termination

In order to increase the data integrity, the bus cable at both ends (at the first and last nodes) must be terminated using a resistor network:

- an 150Ω resistor between the RS485+, RS485- data signal lines
- one 390Ω resistor each from the data signal cables RS485+ to +5 V and from RS485- to ground to define a quiescent signal level when a node is not transmitting („basis network“)

For the **VD1 numerical display,** the bus termination (including basis network) is already integrated in the unit. These can be activated using the two DIL switches S1/S2.

USS bus with connection

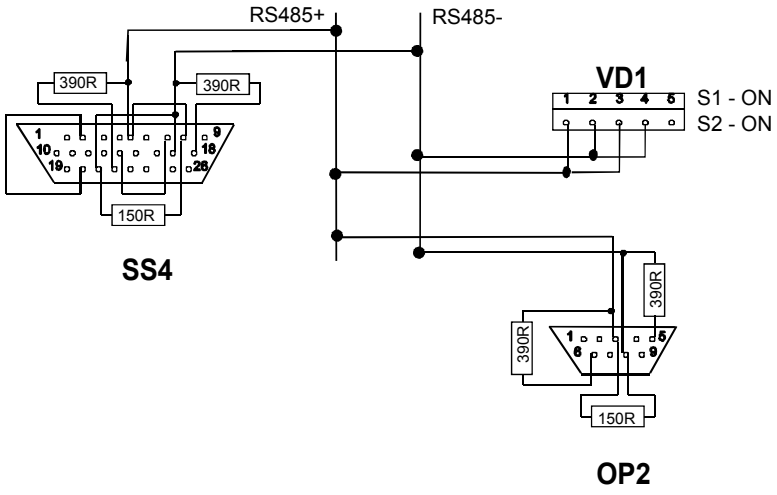


Fig. 6-10 SS4 at OP2 and VD1; with bus terminating circuitry

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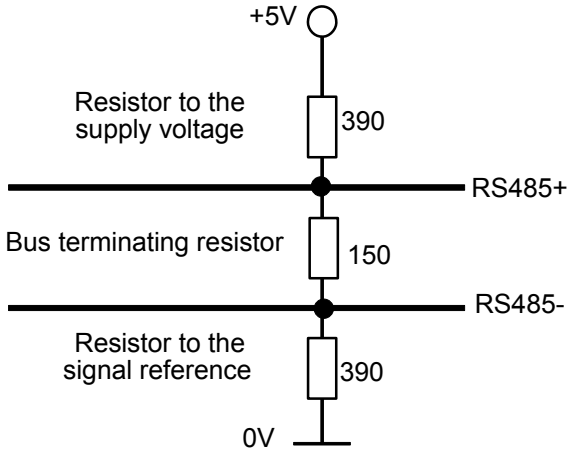


Fig. 6-11 RS 485 bus termination

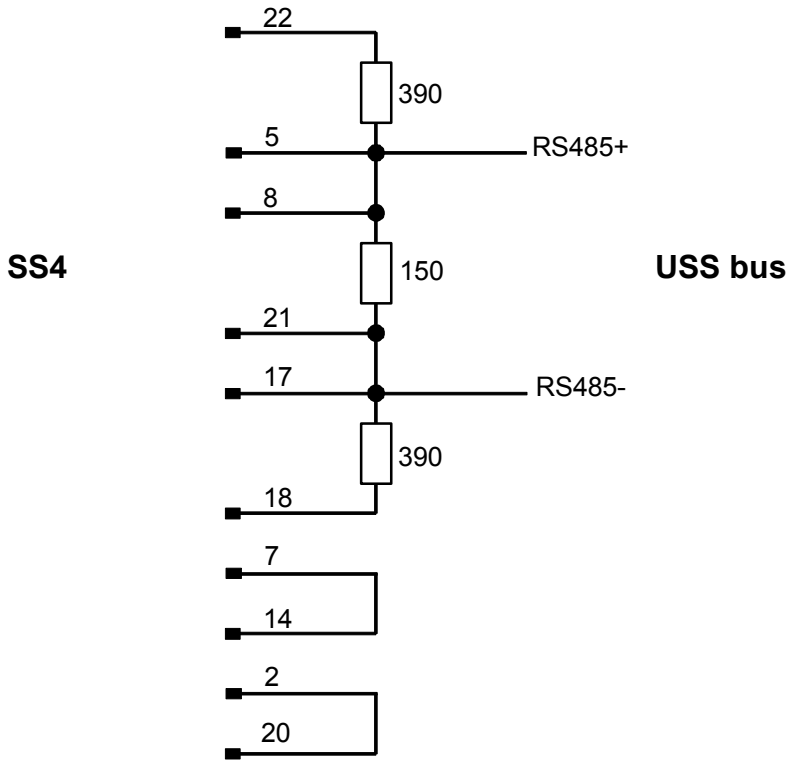


Fig. 6-12 Connector assignment SS4 with bus termination

USS bus cable without circuitry

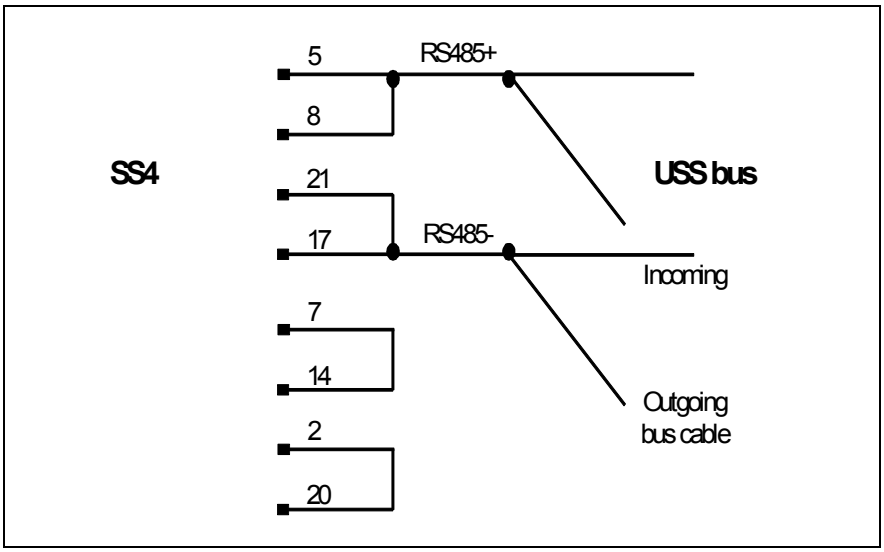


Fig. 6-13 SS4 Connector assignment without bus termination (SS4 at the center of the bus cable)

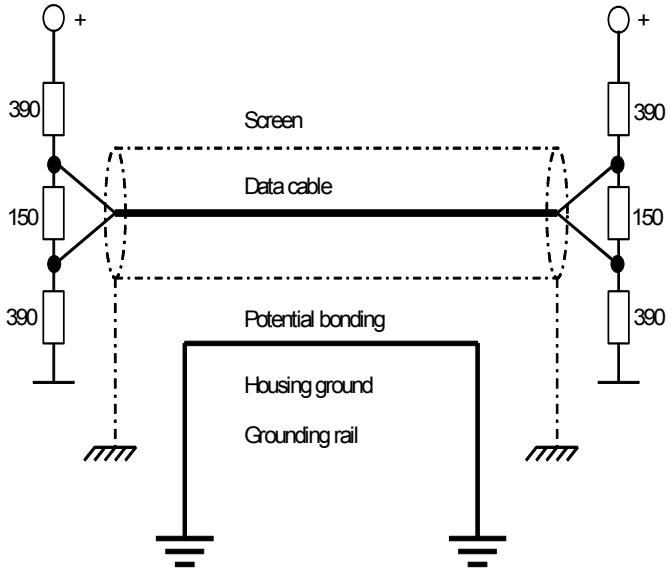


Fig. 6-14 Screening and potential bonding of the data cable

6.8.3 Supplementary components

- SM8 **connector parts set** (26 pin, high-density plug connector)
- **interface module:**
  A 40-pin dual inline socket X51 is provided in the communications module. An **interface module** can be inserted in this socket in order to implement an RS 485 (for USS) or 20mA interface instead of the existing RS 232.
  - interface module SS1 (20 mA)
  - interface module SS2 (RS 232)
  - interface module SS31 (RS 485)

When inserting the interface module, the **mounting position** must be observed:
The recesses of the socket of the interface module (and pin 1, marked by the point) and that of the socket on the SS4 (X51) must coincide.

6.8.4 Mounting guidelines and noise immunity

Front panel grounding with CS7

The front panel of the communications module must be connected to the front panel of the CS7 using the cables provided with the CS7.

Cable screen

The data transfer cable screen (bus cable) must be grounded to a grounding rail through the largest possible surface area where the cable enters the equipment. In addition, the screen must be connected to the housing in the connector housing. The connector must be screwed to the communications module.

Other information

Further information on EMC and ambient conditions, refer to Section „General technical data“

6.8.5 SS4 diagnostic functions

LED on CS7

Each receptacle of the CS7 support module has 2 LEDs, which allow diagnostic of the associated communication module (operating and fault/error conditions).

LEDs on CS7		Significance for SS4
Green H10 / H20 / H30	Yellow H11 / H21 / H31	
Dark	Dark	Communications module not initialized
Flashing	Flashing	RAM test error
Flashing	Dark	Hardware of the communications module is initialized; wait for a connection to be established to the initializing CPU module
Lit	Dark	DUST / USS initialized
Lit	Lit	Data transfer running
Dark	Lit	Software error

Table 6-4 Functions of the LEDs on CS7

LED on SS4

An additional four LEDs for interface diagnostics is provided on the communications module. However, when installed these LEDs are not visible.

LED on SS4		Significance for SS4
H1	Dark / lit: Flickers / glows:	Hex monitor not receiving Hex monitor receiving data
H2	Dark / lit: Flickers / glows:	Hex monitor not transmitting data Hex monitor transmitting data
H3	Dark / lit: Flickers / glows:	DUST/USS interface not transmitting DUST/USS interface transmitting data
H4	Dark / lit: Flickers / glows:	DUST/USS interface not receiving data DUST/USS interface receiving data

Table 6-5 Functions of the LEDs on SS4

Diagnostics interface X5

The 26-pin interface connector X5 includes, in addition to the signals of the configurable interface, also the signals of an RS 232 diagnostics interface („hexadecimal monitor“).
The required connecting cable, together with the cable of the configurable interface must be connected at the interface connector to use this diagnostics interface:

Pin	Diagnostics interface X5 (RS-232)
1	TxD
9	GND
26	RxD

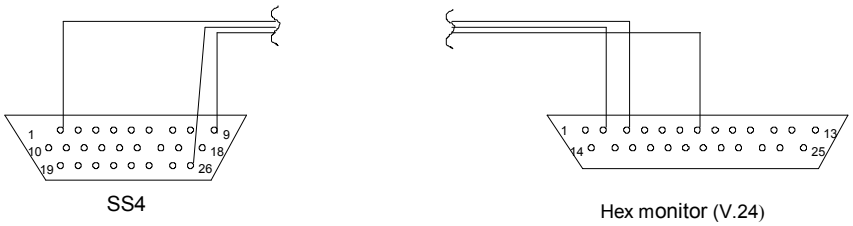


Fig. 6-15 Pin assignment of the diagnostics interface

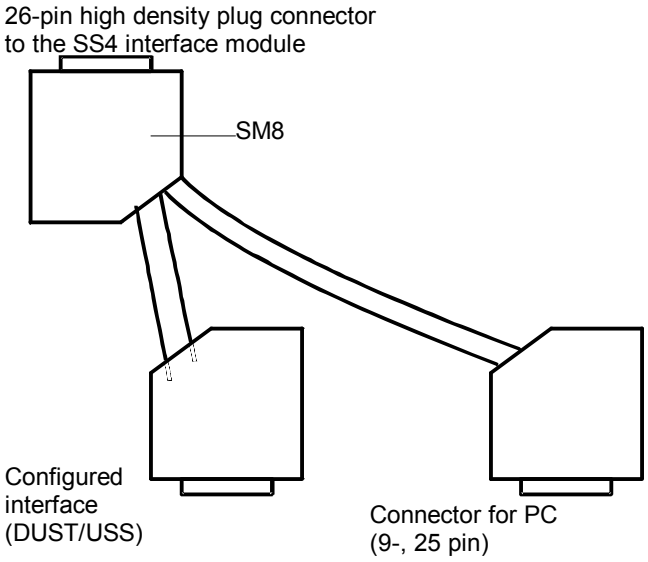


Fig. 6-16 Connecting the configuring- and diagnostics interface at connector X5.

6.8.6 Connector assignment X5

Pin	RS 232 standard interface	RS 232 with SS2	20 mA with SS1	RS 485 with SS31
1				
2		**TxD**		+RTS
3		**RxD**		+TRxD
4	**TxD**			
5		CTS		**RS485+**
6		DCD		+RTxC
7		**GND**	+Iq2	+DCD
8		DCD		+RxD
9	**GND**	GND	GND	GND
10			**+TxD**	
11	P15	P15	P15	P15
12			+Iq1	
13		RTS	**+RxD**	
14			**-RxD**	-RTS
15		RTxC		-TRx
16	**RxD**			
17		RTxC		**RS485-**
18	GND	GND	GND	GND
19			**-TxD**	-RTxC
20		DTR		-DCD
21			-Iq1	-RxD
22	P5	P5	P5	P5
23	P5	P5	P5	P5
24		TRxC	-Iq2	
25	N15	N15	N15	N15
26				

Table 6-6 Pin assignment of connector X5