



Technical Manual

Setup MPI-Adapter



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1 Important Information

1.1 General instructions

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How to contact Pepperl+Fuchs - EXTEC GmbH:

Should you encounter any problems with the **MPI-Adapter** please consult the Technical Manual first of all. If you are still unable to solve the problems after studying the above information carefully, you can contact Pepperl+Fuchs - EXTEC GmbH directly as follows:

- 1) Internet: <http://www.extec.de>
- 2) E-mail: support@extec.de
- 3) Support hotline: Tel. +49 (0)7111/31 54 55 12
- 4) Write to the address below

If you need to contact the EXTEC support hotline, please make sure you have the Technical Manual handy!



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You can call up the latest information about EXTEC products on the Support page of our web site (Internet address: <http://www.extec.de>) or ask to be put on the mailing list for the **EXTEC NEWSLETTER**, our regular circular which will then be sent to you automatically. Please consult the EXTEC web site for details of how to subscribe.

Publisher:

Pepperl+Fuchs - EXTEC GmbH
Schorndorfer Straße 55
D-73730 Esslingen

1.2 Safety instructions

- ⇒ These devices are only allowed to be installed and operated by trained and qualified personnel who have received suitable instruction in their use.
- ⇒ These devices represent state-of-art technology. They are only allowed to be connected to systems that have been approved by Pepperl+Fuchs - EXTEC GmbH.
- ⇒ Never open the devices yourself. They are only allowed to be opened by authorized Pepperl+Fuchs - EXTEC GmbH personnel.
Pepperl+Fuchs - EXTEC GmbH is not liable for any resulting damages.
- ⇒ The devices are not allowed to be modified or otherwise altered in any way.
Pepperl+Fuchs - EXTEC GmbH is not liable for any resulting damages.
- ⇒ Please study the “*Technical Manual*” carefully prior to starting up the devices.
- ⇒ The most recent version of the “*Technical Manual*” is always valid. It is available on the Support page of our web site (Internet address: <http://www.extec.de>).
- ⇒ The operating voltage of the devices **must not exceed the limits** indicated in the “*Technical Manual*” under **Technical data**.
In the event of failure to comply, **Pepperl+Fuchs - EXTEC GmbH is not liable for any resulting damages.**
- ⇒ The relevant **specifications for hazardous areas** (e.g. EN50178, EN60079, EN 50014 - 50039) and **accident prevention regulations** (e.g. UVV) must be observed.

The technical data specified for the hazardous area corresponds to the certified values for the European EEx approval. The user is responsible for ensuring that the devices are suitable for their intended application and for the prevailing ambient conditions. No warranty can be given by Pepperl+Fuchs - EXTEC GmbH in this connection.

Data subject to change without notice

1.3 Symbols used in this manual



Warning:

The indicated specifications may not be modified. Non-compliance may result in dangerous situations and damages.

Caution:

Careful installation: do not replace electrical fuses with fuses from different manufacturers. Non-compliance may result in dangerous situations and damages.

Danger:

The product may possibly be negatively impacted or damaged by foreign influences.



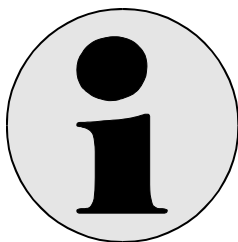
Non-hazardous area:

Assembly and installation only in **non-hazardous areas**. Power supply cables for the hazardous areas **zone 1** and **zone 2** only with cable type **DATL-A**.



Danger:
Hazardous area
(Zone 1+2)

All safety regulations as well as **compliance certificates for hazardous areas** must be observed. In addition, all regulations (VDE) published by the respective authorities for the application of the devices in **hazardous areas (zone 1 and 2)** must be complied with at all times.



Additional Info:

Information and notices that must be observed **additionally**.



Pressure load:

Significant mechanical **pressure** or **impact loads** may result in damages.

no mechanical Force

2 Voltage supply

The connection of an external voltage supply is not necessary usually, because the MPI adapter is supplied by the PLC.



If an external voltage supply is attached
please watch absolutely voltage polarization!

(an external voltage supply becomes only necessary if instead of the standard cable another longer cable is used.)

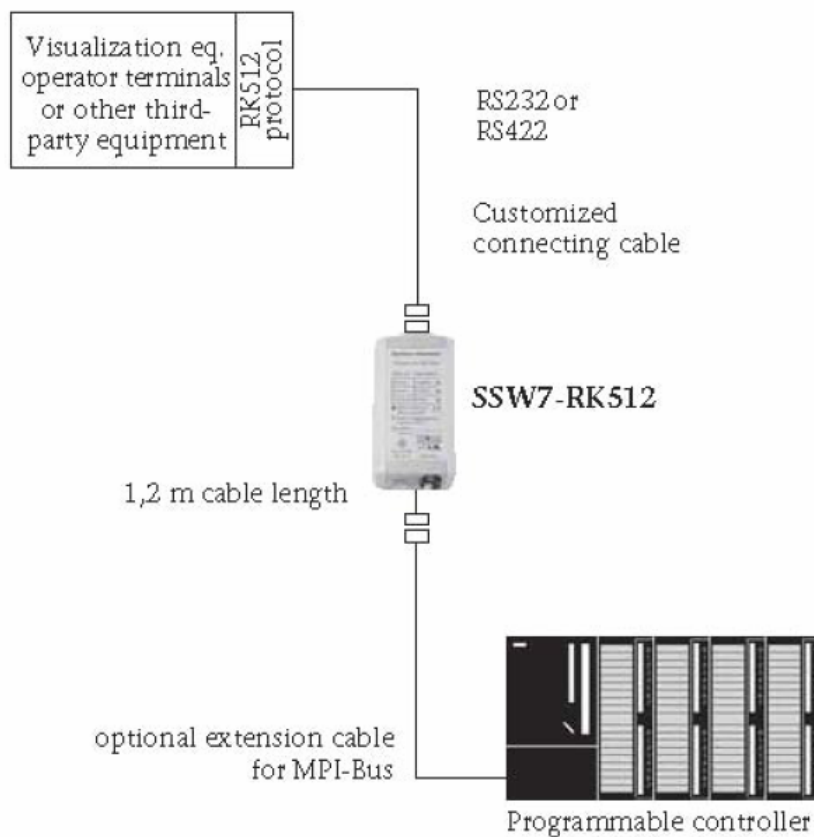
3 Function mode

The MPI adapter converts the RK512-protokoll of a serial interface (e.g. TERMEX over ENT DC) to the MPI bus.

A component is a 1,2 m long connecting cable which is directly connected to the CPU of the automation equipment. The 9-pole SubD plug of the MPI Adapter is connected by a standard null modem cable with the ENT-DC.

The Voltage supply is usually made from the CPU via the MPI-cable. It is however possible to supply the MPI adapter with 24V externally.(see chap. 2)

In this case please watch absolutely voltage polarization! .



3.1 Transmission

The SSW7-RK512 converts the RK512 protocol to the MPI bus. The RK 512 protocol transmits data with the 3964/R procedure. The BCC of the 3964/R procedure is always activated in the SSW7-RK512. The transmission format is predefined as 8 data bits, even parity, and 1 stop bit.

Data words, flags, input and output bytes can be transmitted. In general, only fetch and send requests from the serial partner are supported. The programmable controller cannot access the SSW7-RK512 or the communication partner behind it on its own initiative.

As the RK512 protocol only supports word-oriented addressing of data words the word address is converted to a corresponding byte address. If DW10 is specified as the source or destination address, the SSW7-RK512 requests DBW20 (DBB20 & DBB21) from the CPU. In case of inputs, outputs, and flags, however, both the RK512 and the MPI bus are byte oriented, i. e. there is no conversion.

The SSW7-RK512 supports continuation frames for which the standard block size is 128 bytes. The highest addressable byte address is 255 and the highest word address is 254.

The SSW-RK512 is set to MPI-address 5 in the factory and establishes a connection with MPI-address 2. The destination address and the local address can be set in DBO. The SSW7-RK512 first signs on to the bus and then establishes a connection with the destination CPU if a valid RK512 frame has been received from the serial partner.

4 Configuring the MPI adapter

You must configure the MPI adapter before you can use it with EXTEC terminals. You can also define the node MPI address with this configuration.

4.1 Installing the configuration software

The installation can be made either from Internet or by the EXTEC software CD.

4.1.1 Installation from the Internet

You can find under <http://www.extec.de>

TERMEX – Software – PLC-interfaces – the package: **SK-MPI** -

- from there, download the program
- mpi.exe: and start the installation
- e.g.: on the path: C:\Programs\EXTEC\MPI
- Now the file: **SSW7par.exe** is available
You need this for the configuration for the MPI adapter.

4.1.2 Installation from EXTEC-Software CD

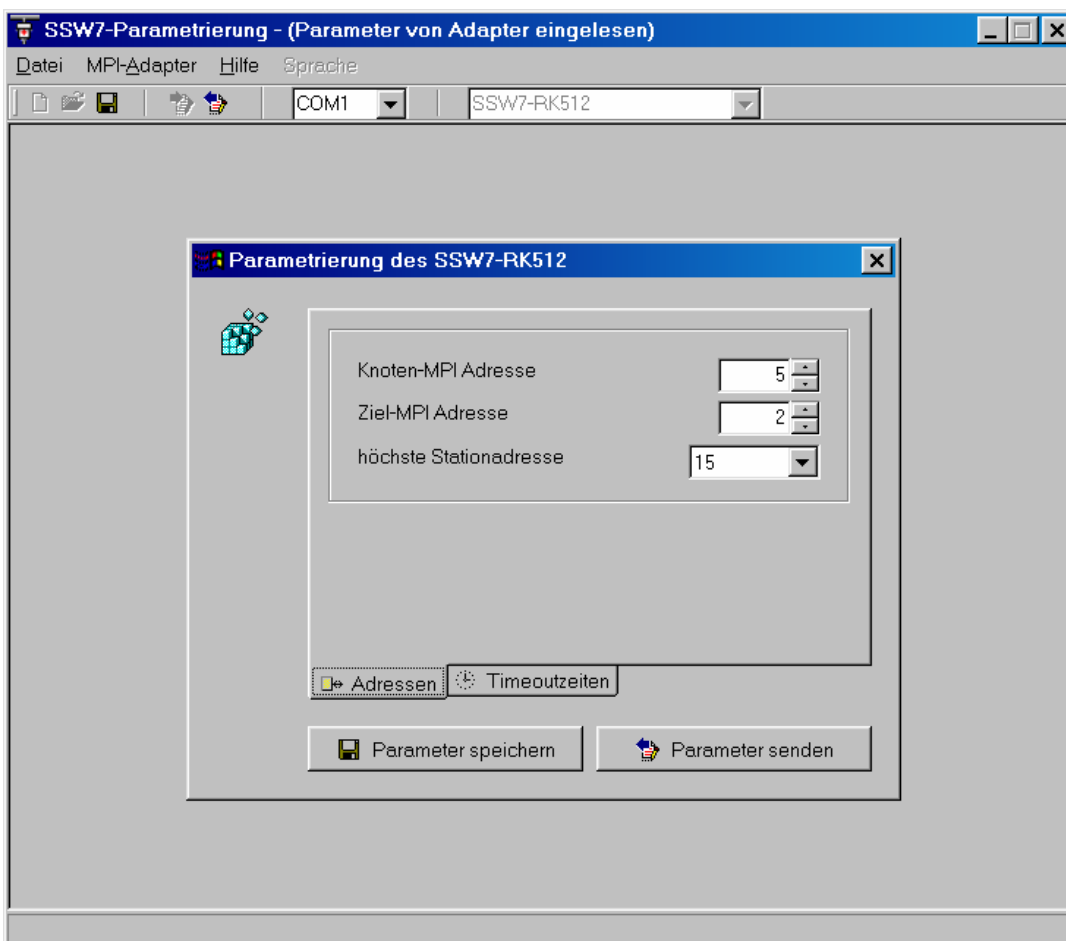
Insert the EXTEC software CD-ROM in your drive. A selection menu opens automatically. If not, you will have to start the <setup.exe> file manually on the CD-ROM.

- SK-MPI:
- mpi.exe: download and start
- e.g. on the path: C:\Programs\EXTEC\MPI
- Now the file: **SSW7par.exe** is available
You need this for the configuration for the MPI adapter.

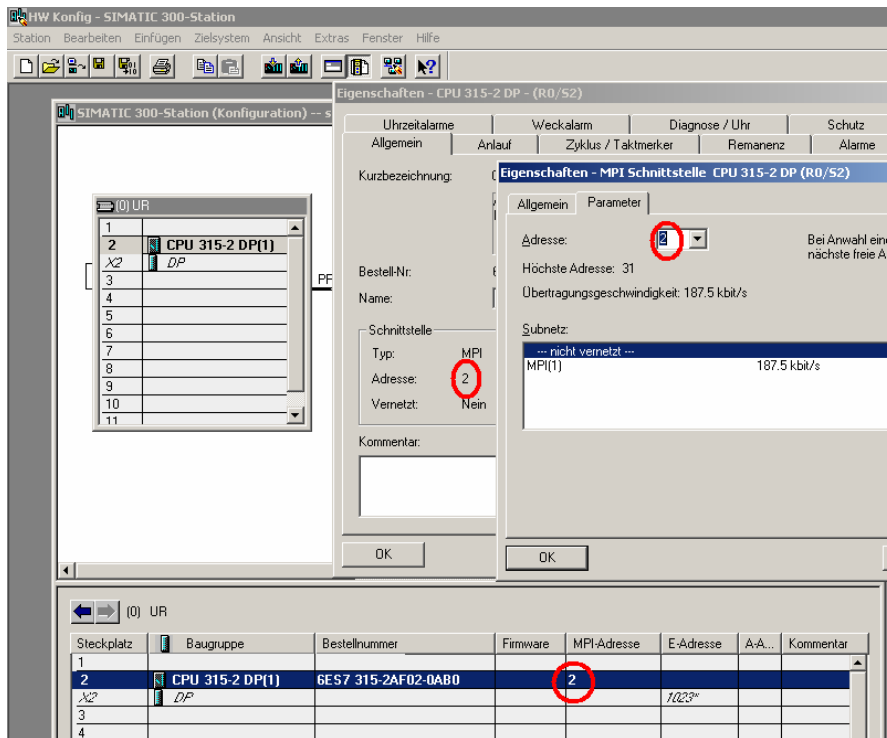
4.2 Configuring the MPI adapter

Please proceed as follows to configure your MPI adapter:

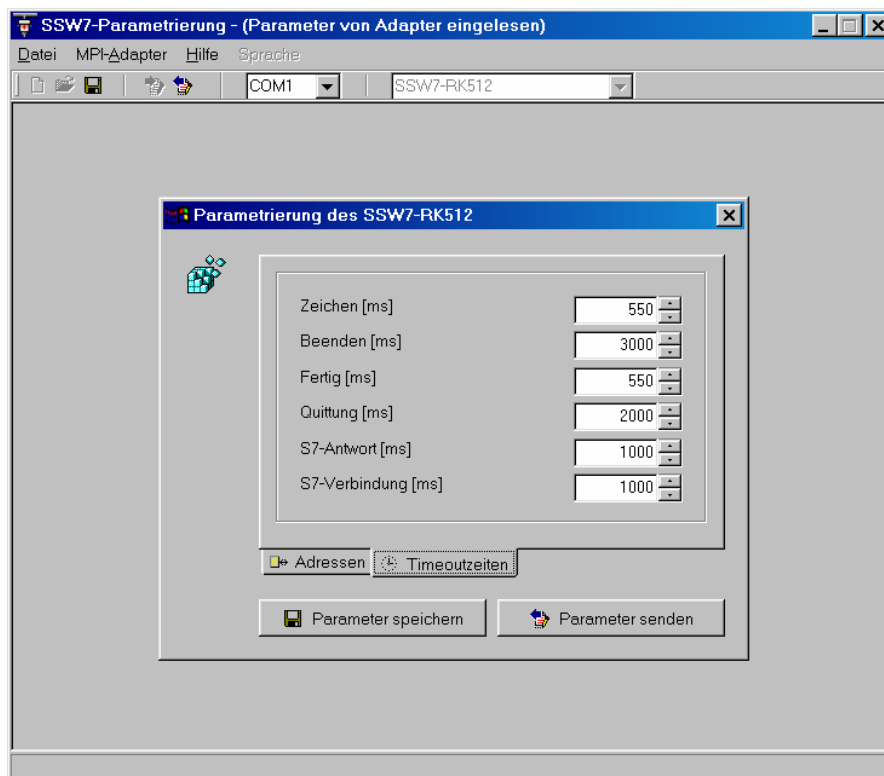
- 1) Start up your PLC.
- 2) Connect your MPI adapter to the MPI port on your PLC. This causes power to be supplied to the adapter. The green Power LED lights up.
- 3) Connect the MPI adapter to your PC using a null modem cable.
- 4) Start the MPI configuration program (**SSW7par.exe**).
- 5) Select the serial port to which your adapter is connected via the null modem cable.
- 6) Select the **<SSW7-RK512>** protocol.
- 7) Select **<MPI Adapter/Receive Parameters>**. The currently active adapter settings are read.
- 8) Select a suitable node MPI address under **<Addresses>** (default=5, several addresses on a line 5, 6, 7....) That is the address of the MPI adapter.



9) Set the target address (Default=2) This is the address of the CPU, that can be set at the SIMATIC manager as follows.



10) Change the <Acknowledgement=2000> setting under <Timeouts> (Characters=550, Exit=3000, Completed=550, **Acknowledgement=2000**, S7 Response=1000, S7 Connection=1000)



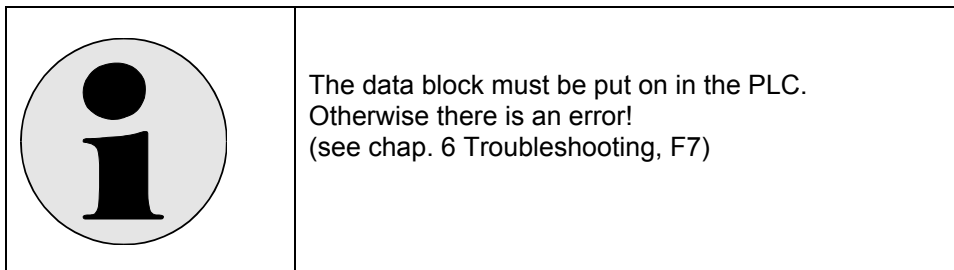
11) Click on <Send Parameters> to send the new settings to the adapter.

12) Recheck the settings by reading the parameters back from the adapter and verifying each one.

4.3 Starting the MPI adapter with an EXTEC terminal

- Connect the **MPI adapter** to the **MPI bus** of the Siemens S7 control using the cable provided. This cable is normally also used for the power supply. A separate power supply is only rarely necessary (refer to the short instructions provided by Helmholz). The Power LED on the MPI adapter should light up.
- Connect the **MPI adapter** to the EXTEC **ENT-DC** power supply unit using the standard ENT-DC PC cable (see TERMEX 2xx/3xx Technical Manual).
- Set the **protocol** in the terminal PROTOCOLS MENU to "Siemens S5 3964R".
- Set the **number** of the **data block** you want to use in the PROTOCOLS MENU.
- Set **9600 baud**, even parity and 8 data bits in the SERIAL PORTS MENU.
You must satisfy certain conditions in order to be able to transmit at the faster rate of 19200 baud:
 - You must use either the original EXTEC ENT-DC PC cable or a similar cable with a low inductance and capacitance.
 - You must use an ENT-DC 2.0 (not an ENT-DC 1.1).
 - The cables between the TERMEX and the ENT-DC must be short.
 - If the automatic baud rate detection function of the MPI adapter fails to recognize 19200 baud, you must change back to 9600 baud again.
- **Communication** is automatic without any additional drivers in the S7 control. The Connect LED should blink.

If an **error** occurs, the terminal outputs the messages for 3964R communication (see Firmware Manual). The MPI adapter indicates its status by means of three LEDs (refer to the short instructions provided by Helmholz).



5 LED states of the MPI adapter

The three LEDs on the top of the device provide you with information about the operating status of the adapter. You can use them to locate sources of errors quickly.

The LEDs have three different states: Off, on, blinking.

Power LED	Error	Voltage supply 24V*
ON	-	Voltage supply is all right. The processor is in operation.
OFF	X	The adapter has no power supply* or is defective.
BLINKING	X	Voltage supply* is not all right or the adapter ist defective.

Active LED	Error	Connection to MPI-bus
ON	-	The adapter is registered in the MPI network.
OFF	X	The adapter couldn't be registered in the MPI network.
BLINKING	X	The adapter has an invailed parameterization.

Connect LED	Error	Connection to the serial interface
ON	-	The adapter has established a 3964R-connection.
OFF	X	No 3964R-connection established.
BLINKING	-	The adapter is transmitting data.

* if instead of the standard cable another longer cable is used, an external voltage supply is necessary.

6 Troubleshooting


Error No.	Error:	Cause:												
F1 F2	<table border="1"> <tr> <td>Power LED</td> <td>OFF</td> </tr> <tr> <td>Active LED</td> <td>OFF</td> </tr> <tr> <td>Connect LED</td> <td>OFF</td> </tr> </table>	Power LED	OFF	Active LED	OFF	Connect LED	OFF	No power is being supplied to the MPI adapter. Causes: <ul style="list-style-type: none"> • MPI-adapter is not connected to PLC. • PLC is not switched on. 						
Power LED	OFF													
Active LED	OFF													
Connect LED	OFF													
F3	No connection to the MPI adapter	The null modem cable is connected to the wrong serial port on the PC. Either connect the cable to the correct port or select a different port in the configuration tool.												
F4	No connection to the MPI adapter	Normally the PLC use the MPI adress 2. If not, you have to adapt the <Source-MPI-adress> to the new value.												
F5	Faulty communication	Check if the acknowledgement time of the adapter is 2000 ms.												
F6	<table border="1"> <tr> <td>Power LED</td> <td>ON</td> </tr> <tr> <td>Active LED</td> <td>OFF</td> </tr> <tr> <td>Connect LED</td> <td>OFF</td> </tr> </table>	Power LED	ON	Active LED	OFF	Connect LED	OFF	No connection MPI to the terminal. Check the cable.						
Power LED	ON													
Active LED	OFF													
Connect LED	OFF													
F7	Changing conditions: <table border="1"> <tr> <td>Power LED</td> <td>ON</td> </tr> <tr> <td>Active LED</td> <td>ON</td> </tr> <tr> <td>Connect LED</td> <td>BLINK 2x</td> </tr> </table> Then for approx. 1 sec.: <table border="1"> <tr> <td>Power LED</td> <td>ON</td> </tr> <tr> <td>Active LED</td> <td>OFF</td> </tr> <tr> <td>Connect LED</td> <td>OFF</td> </tr> </table>	Power LED	ON	Active LED	ON	Connect LED	BLINK 2x	Power LED	ON	Active LED	OFF	Connect LED	OFF	Error with the access to the data block in the PLC. Causes: <ul style="list-style-type: none"> • Wrong data block is put on in the PLC. • Data block in the PLC is too short (256 data words) • Wrong number of the data block is adjusted on the terminal. • TERMEX770: second data block is missing in the PLC.
Power LED	ON													
Active LED	ON													
Connect LED	BLINK 2x													
Power LED	ON													
Active LED	OFF													
Connect LED	OFF													
F8	Changing conditions: <table border="1"> <tr> <td>Power LED</td> <td>ON</td> </tr> <tr> <td>Active LED</td> <td>BLINK</td> </tr> <tr> <td>Connect LED</td> <td>OFF</td> </tr> </table> Then for approx. 1 sec.: <table border="1"> <tr> <td>Power LED</td> <td>ON</td> </tr> <tr> <td>Active LED</td> <td>OFF</td> </tr> <tr> <td>Connect LED</td> <td>OFF</td> </tr> </table>	Power LED	ON	Active LED	BLINK	Connect LED	OFF	Power LED	ON	Active LED	OFF	Connect LED	OFF	The rate of the MPI-interface of the adapter was adjusted form 187.5 kBaud to 19200 Baud. The adapter is operated MPI laterally however with 187.5 kBaud. Please adjust aproprate the CPU with the help of the Simatic-manager. Remark: rate of the serial side of the adapter could not be adjusted. (auto-detect).
Power LED	ON													
Active LED	BLINK													
Connect LED	OFF													
Power LED	ON													
Active LED	OFF													
Connect LED	OFF													

7 Technical data

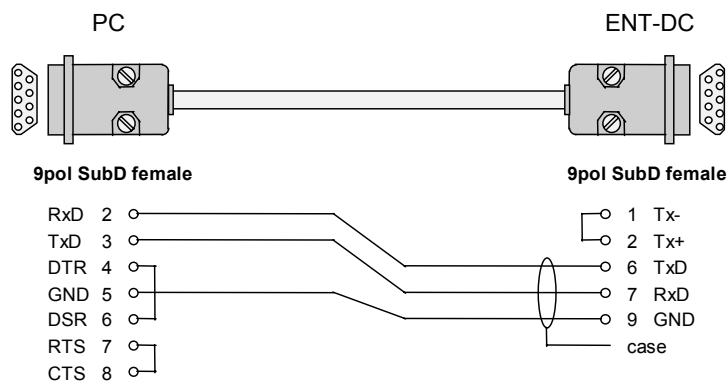
Dimensions:	105x53x29mm (LxBxH)
Weight:	approx. 180g (incl. MPI-cable & connector)
MPI-interface:	
Type:	RS485, electr. isolated
Transmission rate:	187,5 kbit/s
Cable:	1,2m, no terminating resistors
Connection:	Connector, SUB-D 9-way
Communication interface:	
Type:	RS232, serial asynchronous
Transmission rate:	19,2 kbit/s bis 115 kbit/s automatic detection!
Connection:	Connector, SUB-D 9-way
Power supply:	
Voltage:	+24V DC +/- 25% from the programmable controller or external supply (polarized)
Current consumption: (max.)	70 mA
Degree of protection:	
Degree of protection:	IP 30
Electromagnetic compatibility: (EMC)	
Interference emission:	Class B acc. to EN 55022
Interference immunity on signal lines:	± 2kV acc. to EN61000-4-4
Interference immunity ESD:	±6kV contact discharge EN61000-4-2
	±8kV air discharge EN61000-4-2
RF radiation fields:	10V/m acc. to EN61000-4-3
Conducted RF interference:	10V acc. to EN61000-4-6
Climatic conditions	
Temperature during operation:	-20°C to +60°C
Temp. storage / transport:	-20°C to +60°C
Relative humidity operation:	5% to 85% at 30°C (no condensation)
Relative humidity storage:	5% to 93% at 40°C (no condensation)
Special features:	
Quality assurance:	Acc. to ISO 9002
Maintenance:	Maintenance free (no battery)

8 Connecting cables

8.1 Zero-modem cable (PC - MPI-Adapter)

Pin		
2	RxD (Receive Data)	GND ————— GND
3	TxD (Transmit Data)	RxD ————— RxD
5	GND (Common)	TxD ————— TxD
7	RTS (Request to Send)	RTS ————— RTS
8	CTS (Clear to Data)	CTS ————— CTS

8.2 S-ENT/PC-9 Connecting cable ENT-DC-30 to MPI adapter (9pol SubD)



9 Order numbers

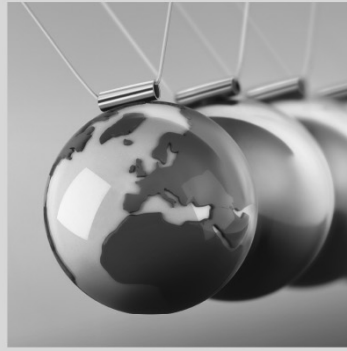
MPI-Adapter:

Type:		Part No:
SK-MPI-SSW7-RK512-AB	surface mounting case	520891
SK-MPI-SSW7-RK512-HS	top hat rail housing	520892

Connecting cable:

Type:		Part No:
S-ENT/PC-9	ENT-DC-30 to MPI-Adapter	520645

FACTORY AUTOMATION



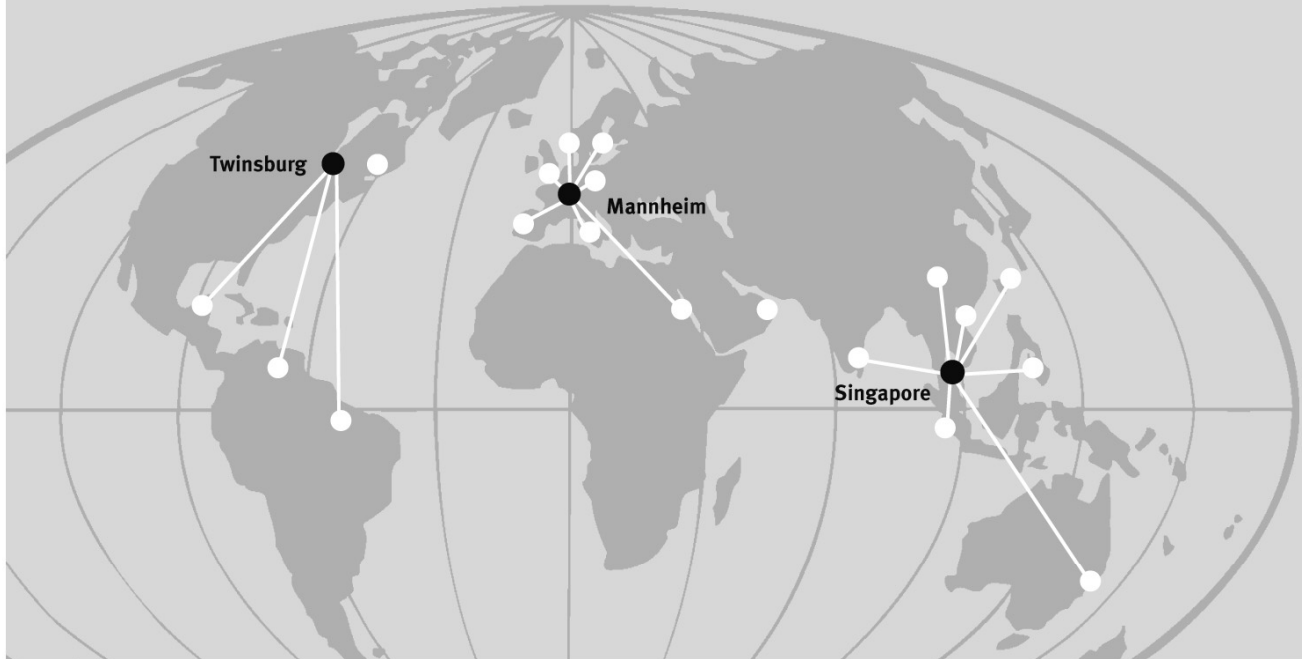
PROCESS AUTOMATION



SIGNALS FOR THE WORLD OF AUTOMATION

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