STÖBER

I/O Terminal Module

Commissioning Instructions

Installation

Connecting

V 5.6-H or later

09/2013 en

Table of contents

1 Overview

Inverter	HW status of the inverter	SEA 5001	REA 5001	XEA 5001
MDS 5000A	200 or higher	Yes	Yes	HW status 11 or higher for the accessories
MDS 5000	up to 199	Yes	Yes	Yes

Inverter	HW status of the inverter	SEA 5001	REA 5001	XEA 5001
SDS 5000A	200 or higher	Yes	Yes	HW status 11 or higher for the accessories
SDS 5000	up to 199	Yes	Yes	HW status 11 or higher for the accessories

I/O terminal module for standard SEA 5001
ID No. 49576
Description
- 2 analog inputs
- 2 analog outputs
- 5 binary inputs
- 2 binary outputs

I/O terminal module for resolver REA 5001
ID No. 49854
Terminals:
- 2 analog inputs
- 2 analog outputs
- 5 binary inputs
- 2 binary outputs

Encoder:
- Resolver
- EnDat® encoder 2.1 Sin-Cos
- TTL incremental encoder (simulation and evalutation)
- SSI encoder (simulation and evalutation)
- Stepper motor signals (simulation and evalutation)

The adapter is included with the REA 5001.

I/O terminal module for expanded XEA 5001
ID No. 49015
Terminals

- 3 analog inputs
- 2 analog outputs
- 13 binary inputs
- 10 binary outputs

Encoder:

- TTL incremental encoder (simulation and evaluation)
- Stepper motor signals (simulation and evaluation)
- SSI encoder (simulation and evaluation)

SSI connection cable X120
ID No. 49482
Description: For coupling the SSI interface X120 on the XEA 5001, 0.3 m

2 Notes on Safety

The devices may cause risks. For these reasons, comply with the following:

- The safety notes listed in the following sections and points
- The technical rules and regulations.

In addition, always read the appropriate documentation. STÖBER ANTRIEBSTECHNIK GmbH + Co. KG accepts no liability for damages caused by non-adherence to the instructions or applicable regulations. Subject to technical changes to improve the devices without prior notice. This documentation is purely a product description. It does not represent promised properties in the sense of warranty law.

2.1 Component part of the product

The technical documentation is a component part of a product.

- Since the technical documentation contains important information, always keep it handy in the vicinity of the device until the machine is disposed of.
- If the product is sold, disposed of, or rented out, always include the technical documentation with the product.

2.2 Operation in accordance with its intended use

The SEA 5001, REA 5001 and XEA 5001 accessories are only intended for use with POSIDRIVE® MDS 5000 and POSIDYN® SDS 5000.
Use with other devices is not permitted

2.3 Qualified personnel

Since the devices may harbor residual risks, all configuration, transportation, installation and commissioning tasks including operation and disposal may only be performed by trained personnel who are aware of the possible risks.
Personnel must have the qualifications required for the job. The following table lists examples of occupational qualifications for the jobs:

Activity	Possible occupational qualifications
Transportation and storage	Worker skilled in storage logistics or comparable training
Configuration	- Graduate engineer (electro-technology or electrical power technology) - Technician (m/f) (electro-technology)
Installation and connection	Electronics technician (m/f)
Commissioning (of a standard application)	- Technician (m/f) (electro-technology) - Master electro technician (m/f)
Programming	Graduate engineer (electro-technology or electrical power technology)
Operation	- Technician (m/f) (electro-technology) - Master electro technician (m/f)
Disposal	Electronics technician (m/f)

Tab. 2-1: examples of occupational qualifications

In addition, the valid regulations, the legal requirements, the reference books, this technical documentation and, in particular, the safety information contained therein must be carefully

- read
- understood and
- complied with

2.4 Installation and connection

Installation and connection work are only permitted after the device has been isolated from the power!
The accessory installation instructions allow the following actions during the installation of accessories:

- The housing in the upper slot can be opened
- The housing in the bottom slot can be opened.

Opening the housing in another place or for other purposes is not permitted.
The accessory installation instructions allow the following actions during the installation of accessories:

- The housing in the upper slot can be opened.

Opening the housing in another place or for other purposes is not permitted.

Use only copper lines. For the line cross sections to be used, refer to DIN VDE 0298-4 or DIN EN 60204-1 Appendix D and Appendix G.
Protect the device from falling parts (pieces of wire, leads, metal parts, and so on) during installation or other tasks in the switching cabinet. Parts with conductive properties inside the inverter can cause short circuits or device failure.
The motor must have an integrated temperature monitor with basic isolation in acc. with EN 61800-5-1 or external motor overload protection must be used.
The permissible protection class is protective ground. Operation is not permitted unless the protective conductor is connected in accordance with the regulations.
Comply with the applicable instructions for installation and commissioning of motor and brakes.

2.5 Commissioning, operation and service

Remove additional coverings before commissioning so that the device cannot overheat. During installation, provide the free spaces specified in the projecting manuals to prevent the inverter from overheating.
The housing of the drive controller must be closed before you turn on the supply voltage. When the supply voltage is on, dangerous voltages can be present on the connection terminals and the cables and motor terminals connected to them. Remember that the device is not necessarily de-energized after all indicators have gone off.
When network voltage is applied, the following are prohibited:

- Opening the housing
- Connecting or disconnecting the connection terminals
- Installing accessories

Before carrying out any work on the machine, observe all the following five safety regulations in the above-mentioned sequence:

1. Enable. Ensure that you also activate the auxiliary circuits.
2. Secure against switching on.
3. Ensure that the parts are de-energized.
4. Earth and short-circuit.
5. Cover or isolate any live neighboring parts.

Information
Please note that the discharge time for the intermediate circuit capacitors is 5 min. You can only ensure that the parts are de-energized after this time.

You can then start your work on the drive controller. Repairs may only be performed by STÖBER ANTRIEBSTECHNIK GmbH + Co. KG.
Send defective devices together with a fault description to:
STÖBER ANTRIEBSTECHNIK GmbH + Co. KG
Department VS-EL
Kieselbronner Str.12
75177 Pforzheim
GERMANY

2.6 Disposal

Please comply with the latest national and regional regulations! Dispose of the individual parts separately depending on their nature and currently valid regulations such as, for example:

- Electronic scrap (PCBs)
- Plastic
- Sheet metal
- Copper
- Aluminum

2.7 Presentation of notes on safety

NOTICE

Notice

means that property damage may occur

▶ if the stated precautionary measures are not taken.

⚠ CAUTION!

Caution

with warning triangle means that minor injury may occur

▶ if the stated precautionary measures are not taken.

⚠ WARNING!

Warning

means that there may be a serious danger of death

▶ if the stated precautionary measures are not taken.

⚠ DANGER!

Danger

means that serious danger of death exists

▶ if the stated precautionary measures are not taken.

Information
indicates important information about the product or a highlighted portion of the documentation which requires special attention.

3 Installation

⚠ WARNING!

Danger of injury/death and property damage due to electric shock!

▶ Before installing accessories, turn off all voltage supplies! Then wait 5 minutes for the DC link capacitors to discharge. Never begin with accessory installation until after this!

NOTICE

Danger of property damage from incorrect installation of the devices!

▶ It is essential to comply with the following installation instructions to avoid damage to the devices.

Information
Note that the installation of accessories is identical in POSIDRIVE® MDS 5000 and POSIDYN® SDS 5000. Only POSIDRIVE® MDS 5000 is shown in the installation instructions for clarity.

You will need one of the following accessory parts before you can connect binary and analog signals to the inverter. Installation is the same for all four accessory parts.

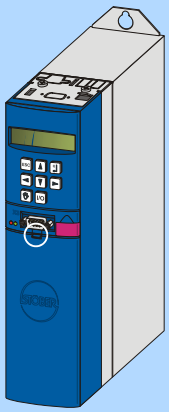
- SEA 5001, ID no. 49576
- REA 5001, ID no. 49854
- XEA 5001, ID no. 49015

You will need:

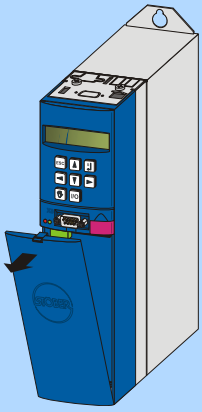
- A Phillips screwdriver
- The screws which are pre-mounted on the accessory.

Installation of an SEA 5001, REA 5001 or XEA 5001 in an MDS 5000

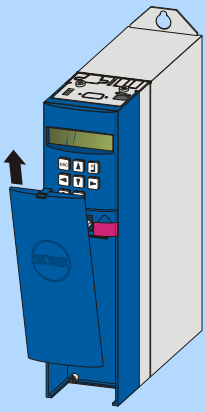
1. Unlock the snap catch on the inverter cover:



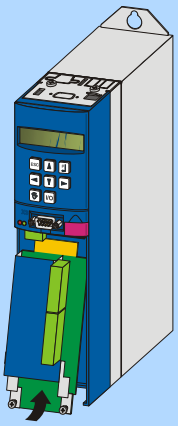
2. Lift up the upper end of the cover from the inverter:



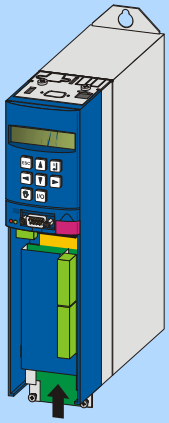
3. Lift the cover up and remove it from the inverter:



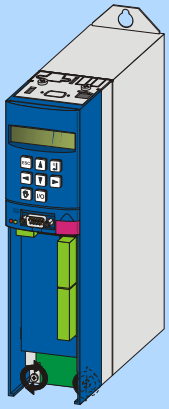
4. Insert the accessory part at a slant with the gold contacts in front. The gold contacts must be in front of the black terminal block.



5. Slide the gold contacts into the black connector.



6. Secure the accessory part to the inverter with the mounting screws:



⇨ You have now installed the accessory.

4 Connection

4.1 X100-X103: Analog and Binary Signals

⚠ WARNING!

Danger of machine malfunction due to EMC interference!

▶ Do not use cables longer than 30 m (leads to binary inputs, binary outputs, analog inputs and analog outputs)!

Information
Remember that the scanning time and update rate $T_{A\ min}$ depend on the complexity of the user program on the inverter. Both times can assume the values 1, 2, 4, 8, 16 or 32 ms depending on the scope of the user program. Also consider the setting of parameter *A150 cycle time*.

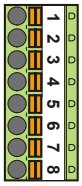
Terminal description – X100 – SEA 5001, REA 5000, REA 5001, XEA 5001

NOTICE

Machine movement due to unexpected target value

If the analog input is not switched, the inverter will detect a target value default of +5V.

▶ Always operate the inverter with a switched analog input.

Pin		Designation	Function	Data
	1	AE1+	+ Input of the analog input AE1 Resolution: • SEA 5001: 10 bits + sign • REA 5001 and XEA 5001: 15 bits + sign	Reference: Pin 3 U_E = ± 10 V R_i = 40 kΩ $T_{A\ min}$ = 1 ms $U_{E\ max}$ against Pin 3 = 30 V $U_{E\ max}$ against prot. cond. = 15 V $U_{E\ max}$ against AGND = 30 V
	2	AE1-Shunt	Current input; shunt connection Pin 2 must be jumpered with pin 1.	Reference: Pin 3 I_E = ± 20 mA R_i = 510 Ω Scan time: $T_{A\ min}$ = 1 ms
	3	AE1-	Inverted input of analog input AE1	$U_{E\ max}$ against Pin 1 = 30 V $U_{E\ max}$ against prot. cond. = 15 V $U_{E\ max}$ against AGND = 30 V
	4	AE2+	+ Input of analog input AE2; Resolution: • SEA 5001, XEA 5001: 10 bits + sign • REA 5001: 15 bits + sign	Reference: Pin 5 U_E = ± 10 V R_i = 40 kΩ $T_{A\ min}$ = 1 ms $U_{E\ max}$ against Pin 5 = 30 V $U_{E\ max}$ against prot. cond. = 15 V $U_{E\ max}$ against AGND = 30 V
	5	AE2-	Inverted input of analog input AE2	$U_{E\ max}$ against Pin 4 = 30 V $U_{E\ max}$ against prot. cond. = 15 V $U_{E\ max}$ against AGND = 30 V
	6	AA1	Analog output 1	Reference: Pin 8 $I_{A\ max}$ = 10 mA $T_{A\ min}$ = 1 ms R_i = 20 Ω Resolution: • MDS 5000: 10 bits + sign • MDS 5000A, SDS 5000, SDS 5000A: 11 bits + sign
	7	AA2	Analog output 2	
	8	AGND	Reference ground for analog signals	—

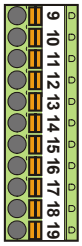
maximum conductor cross-section

Connection type	maximum conductor cross-section [mm²]
rigid	1,5
flexible	1,5

maximum conductor cross-section

Connection type	maximum conductor cross-section [mm²]
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,5
2 leads with the same cross-section with double cable end	—

Terminal description X101 - SEA 5001, REA 5001, XEA 5001

Pin		Designation	Function	Data
	9	GND 18 V	Reference ground for pin 19	—
	10	DGND	Reference ground for pins 11 to 18	—
	11	BE1	Binary input	High level: 12–30 V Low level: 0–8 V $U_{E\ max}$ = 30 V $T_{A\ min}$ = 1 ms (with timestamp) $I_{E\ max}$ = 16 mA at $U_{E\ max}$
	12	BE2		
	13	BE3[a)]		
	14	BE4[a)]		
	15	BE5[a)]		
	16	BA1	Binary output	$I_{A\ max}$ = 50 mA at 45 °C, 40 mA at 55 °C $T_{A\ min}$ = 1 ms
	17	BA2		
	18	24 V-In	24 V power: • For XEA 5001 and • For binary outputs with SEA 5001 and REA 5001	Input area: 18–28.8 V
	19	18 V-Out	Auxiliary voltage 18 V	U_A = 16–18 V $I_{A\ max}$ = 50 mA

a) BE3, BE4 and BE5 can be used as encoder inputs. See chapter 4.2.3 BE encoder and BA encoder simulation. On the REA 5001 these inputs can be converted to TTL level with sliding switches S0, S1 and S2.

maximum conductor cross-section

Connection type	maximum conductor cross-section [mm²]
rigid	1,5
flexible	1,5
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,5

maximum conductor cross-section

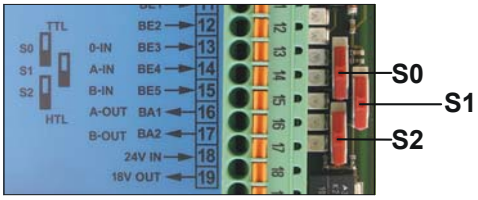
Connection type	maximum conductor cross-section [mm²]
2 leads with the same cross-section with double cable end	—

TTL/HTL switchover REA 5001

Switch	TTL/HTL Conversion
S0	BE3
S1	BE4
S2	BE5

The identification of the switches and the assignment of the switch positions to the function (HTL/TTL) are shown on the PCB cover of the REA 5001.

REA 5001



Terminal description X102 – XEA 5001

NOTICE

Machine movement due to unexpected target value

If the analog input is not switched, the inverter will detect a target value default of +5 V.

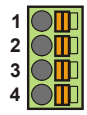
▶ Always operate the inverter with a switched analog input.

Pin		Designation	Function	Data
	1	AE3+	+ Input of analog input AE3 Difference input voltage Resolution: 10 bits + sign	Reference: pin 2 U_E = ± 10 V R_i = 40 kΩ $T_{A\ min}$=1 ms $U_{E\ max}$ against pin 2 = 30 V $U_{E\ max}$ against protective conductor = 15 V $U_{E\ max}$ against AGND = 30 V
	2	AE3-	Inverted input of analog input AE3	$U_{E\ max}$ against pin 1 = 30 V $U_{E\ max}$ against protective conductor = 15 V $U_{E\ max}$ against AGND = 30 V

maximum conductor cross-section

Connection type	maximum conductor cross-section [mm²]
rigid	1,5
flexible	1,5
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,5
2 leads with the same cross-section with double cable end	—

Terminal description X103 A – XEA 5001

Pin		Designation	Function	Data
	1	BA3	Binary output	$I_{A\ max}$ = 50 mA $T_{A\ min}$ = 1 ms
	2	BA4		
	3	BA5		
	4	BA6		

maximum conductor cross-section

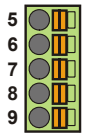
Connection type	maximum conductor cross-section [mm²]
rigid	1,5
flexible	1,5

maximum conductor cross-section

Connection type	maximum conductor cross-section [mm²]
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,75
2 leads with the same cross-section with double cable end	—

Information
When the 24 V power fails, binary inputs BE6 to BE13 have signal status 0 (regardless of the physical signal state).

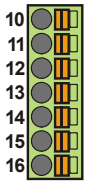
Terminal description X103 B - XEA 5001

Pin		Designation	Function	Data
	5	BA7	Binary output	$I_{A\ max}$ = 50 mA $T_{A\ min}$ = 1 ms
	6	BA8		
	7	BA9		
	8	BA10		
	9	BE6	Binary input	Bezug: Reference: pin 10 of terminal X101 High level: 12–30 V Low level: 0–8 V $U_{E\ max}$ = 30 V $T_{A\ min}$ = 1 ms $I_{E\ max}$ = 3 mA at $U_{E\ max}$

maximum conductor cross-section

Connection type	maximum conductor cross-section [mm²]
rigid	1,5
flexible	1,5
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,75
2 leads with the same cross-section with double cable end	—

Terminal description X103 C – XEA 5001

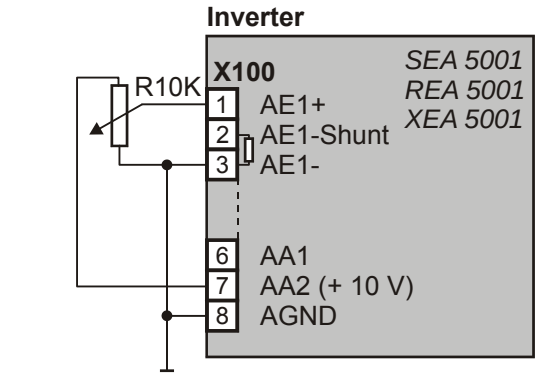
Pin		Designation	Function	Data
	10	BE7	Binary input	Reference: pin 10 of terminal X101 High level: 12–30 V Low level: 0–8 V $U_{E\ max}$ = 30 V $T_{A\ min}$ = 1 ms $I_{E\ max}$ = 3 mA at $U_{E\ max}$
	11	BE8		
	12	BE9		
	13	BE10		
	14	BE11		
	15	BE12		
	16	BE13		

maximum conductor cross-section

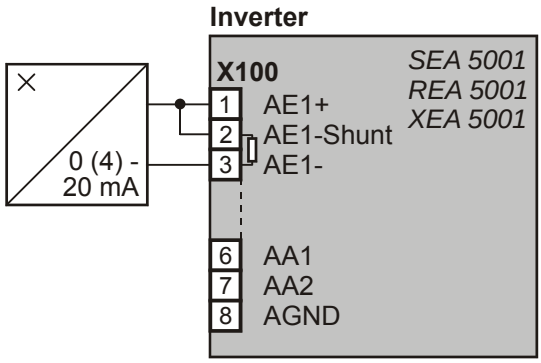
Connection type	maximum conductor cross-section [mm^2]
rigid	1,5
flexible	1,5
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,75
2 leads with the same cross-section with double cable end	—

Examples of connection

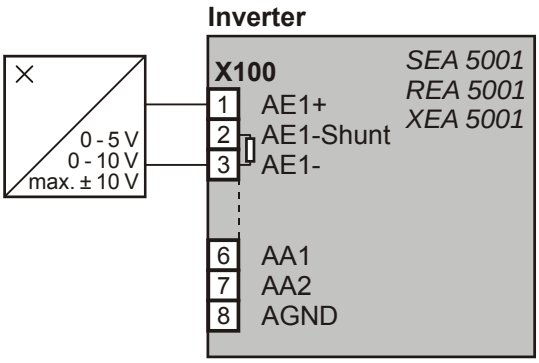
Potentiometer



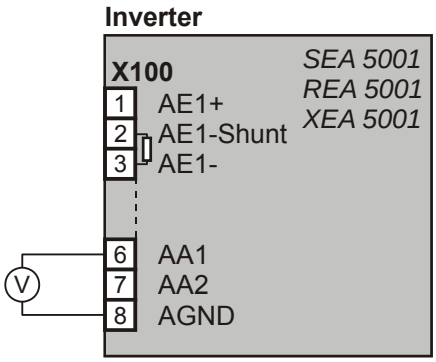
Current (0 - 20 mA, 4 - 20 mA)



Voltage (max. ± 10 V)



Analog output voltage



4.2 Encoder

Information
Remember that the encoder interfaces can usually evaluate or simulate several systems (e.g., EnDat® and incremental encoder). In the parameters enter the particular system that you are connecting to an interface. Please consult the inverter operating manual in this case.

4.2.1 X120

Prerequisite for using interface X120:
- REA 5001 or
- XEA 5001

Information
Interface X120 is a double interface on option board XEA 5001. The double interface makes it possible to distribute encoder signals to other inverters without a great amount of wiring work. This is why the two sub D connections have the same allocation.

General specifications	
U_A	18 V (See encoder power below.)
$I_{A\ max}$	250 mA, Sum of X4, X120 and X140: 500 mA
Maximum cable length	50 m
Max. number of stations	1 master and 31 stations
Terminating resistance	120 Ω

Specifications of SSI (evaluation and simulation)	
Switching frequency (SSI master)	592 kHz (motor encoder) or 250 kHz (position encoder)
Code	Binary or gray
Encoder type	Multi-turn: 24 or 25-bits Single-turn: 13 its (short) or 13 bits (tree)
Transmission	Double transmission can be switched off

Specifications of incremental and stepper motor signals (evaluation and simulation)	
Limit frequency	Evaluation: ≤ 1 MHz Simulation: 250 kHz

Specifications of incremental and stepper motor signals (evaluation and simulation)	
Signal level	TTL

Encoder power

Encoder power	Bridge
Pin 8 (U_A)	Pin 1 (GND-Enc) to Pin 9 (GND)
External	Pin 1 (GND-Enc) to GND to the external power supply

Terminal description X120 – SSI encoder

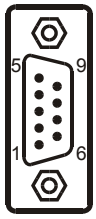
Pin		Designation	Function
 plug	1	GND-ENC	Reference for pins 4 to 7
	2	—	—
	3	—	—
	4	/CLK	Inverse, differential input/output for CLOCK
	5	CLK	Differential input/output for CLOCK
	6	DATA	Differential input/output for DATA
	7	/DATA	Inverse, differential input/output for DATA
	8	U_A	Encoder power
	9	GND	Reference for pin 8

Information
Remember that all SSI slaves must be switched on/off simultaneously (24 V on X11 and X101.18). Switching individual stations during operation will cause other stations to malfunction.

Terminal description X120 – incremental signals

Pin		Designation	Function
 plug	1	GND-ENC	Reference potential for pins 2 to 7
	2	N	Differential input/output for N-track
	3	/N	Inverse, differential input/output for N-track
	4	/A	Inverse, differential input/output for A-track
	5	A	Differential input/output for A-track
	6	B	Differential input/output for B-track
	7	/B	Inverse, differential input/output for B-track
	8	U_A	Encoder power
	9	GND	Reference for pin 8

Terminal description X120 for stepper motor signals

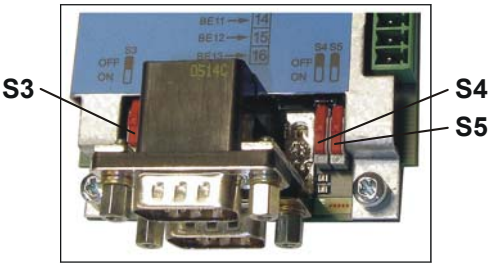
Pin		Designation	Function
 plug	1	GND-ENC	Reference potential for pins 4 to 7
	2	—	—
	3	—	—
	4	/Imp	Inverse, differential input/output for impulses
	5	Imp	Differential input/output for impulses
	6	Richtung	Differential input/output for direction ("Richtung")
	7	/Richtung	Inverse, differential input/output for direction
	8	U_A	Encoder power
	9	GND	Reference for pin 8

Connection – topology

Only linear topology is permitted when two or more stations are coupled via interface X120. The signal lines must be terminated with resistors for the stations at either end of the coupling. The terminating resistors can be switched through via switches S3, S4 and S5 on accessory parts XEA 5001 and REA 5001.

Switch	TTL Encoder	SSI Encoder
S3	Zero	—
S4	A	CLK
S5	B	DATA

XEA 5001



REA 5001

Please note that the switches are installed in different positions on the REA 5001 und XEA 5001 accessories. Identification of the switches and assignment of the switch positions to the function (switched on/switched off terminal resistance) are shown on the PCB cover.

4.2.2 X140

Prerequisite for using interface X140:

- REA 5001

Specifications for resolver	
U_E	-10 V ... +10 V
I_E	80 mA
f_E	7–9 kHz
P_{max}	0.8 W
Transfer ratio	0.5 ± 5 %
Number of poles	2, 4 and 6
Phase displacement	± 20 el.°
Maximum cable length	100 m

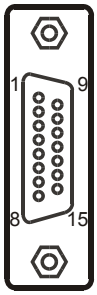
Specification EnDat® 2.1 with SIN/COS tracks	
U_A	5–15 V, See table below EnDat® encoder power supply
$I_{A\ max}$	250 mA, Sum of X4, X120 and X140 (EnDat®): 500 mA
$I_{A\ min}$	30 mA
Encoder type	Single and multi-turn, not suitable for linear instruments
Maximum cable length	100 m

EnDat® 2.1 encoder power supply

U_A	Via	Remarks
5 V (controlled at cable end)	Sense line of the encoder connected on pin 12 (Sense)	STÖBER servo motors EnDat® 2.1
5 V (controlled at X4)	Pin 12 (Sense) with pin 4 (UB+) jumpered	TTL (for customer-specific solutions)

Information
Note that the resolver interface at X140 is also used if a SDS 4000 is replaced where a motor with resolver at X40 was operated.
In this case, you can continue to use the previously used encoder cable. The connection of the motor temperature sensor is carried in this cable. For this reason, observe the Chapter 4.3 X141: Motor temperature sensor.

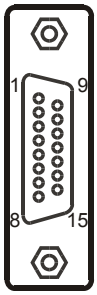
Terminal description X140 resolver (REA 5001)

Pin[a)]		Designation	Function
	1	Sin	Sine input
	2	GND	Reference to pin 6
	3	Cos	Cosine input
	4	—	—
	5	—	—
	6	ErregungResolv	Resolver excitation signal
	7	TempMotor	Connection MTF is output at X141, pin 1 if carried by the encoder cable.
	8	—	—
	9	/Sin	Sine input (inverse)
	10	—	—
	11	/Cos	Cosine input (inverse)
	12	—	—
	13	—	—
	14	TempMotor	Connection MTF is output at X141, pin 2 if carried by the encoder cable.
socket	15	—	—

a) View of sub D

Information
Note that the EnDat ®interface at X140 is used if a SDS 4000 is replaced where a motor with an absolute encoder at X41 was operated.
In this case, you can continue to use the previously used encoder cable. The connection of the motor temperature sensor is carried in this cable. For this reason, observe the chapter 4.3 X141: Motor temperature sensor.

Terminal description X140 EnDat® (REA 5001)

Pin[a]		Designation	Function
	1	Sin	Sine input
	2	GND	Supply for encoder power on pin 4
	3	Cos	Cosine input
	4	Versorgung+	Encoder power
	5	DATA	Differential input for DATA
	6	—	—
	7	TempMotor	Connection MTF is output at X141, pin 1 if carried by the encoder cable
	8	CLK	Differential input for CLOCK
	9	/Sin	Sine input (inverse)
	10	—	—
	11	/Cos	Cosine input (inverse)
	12	Sense	Sense signals for voltage regulation
	13	/DATA	Inverse, differential input for DATA
	14	TempMotor	Connection MTF is output at X141, pin 2 if carried by the encoder cable
socket	15	/CLK	Inverse, differential input for CLOCK

a) View of sub D

4.2.3 BE encoder and BA encoder simulation

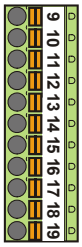
If you want to evaluate an incremental encoder or stepper signals on the binary interfaces, use the binary inputs BE3, BE4 and BE5. If you want to output the simulation of an incremental encoder or stepper motor signals, use BA1 and BA2. Remember that you cannot read or output any other binary signals on these binary interfaces if you have connected an encoder.

General specifications	
Maximum cable length	30 m
Signal level	HTL with SEA 5001 and XEA 5001 TTL/HTL-convertible with REA 5001

Evaluation – incremental and stepper motor signals	
High level	12–30 V
Low level	0–8 V
$U_{E\ max}$	30 V
$I_{E\ max}$	16 mA
f_{max}	100 kHz
$T_{A\ min}$	In the cycle time of the application with time stamp correction (resolution 1 µs)

Simulation – incremental and stepper motor signals	
$I_{A\ max}$	50 mA for 45 °C, 40 mA for 55 °C
Eff. update speed	1 kHz
Maximum output frequency for one track	250 kHz
Extrapolation frequency	1 MHz

Terminal description X101 Incremental encoder and Stepper motor signals

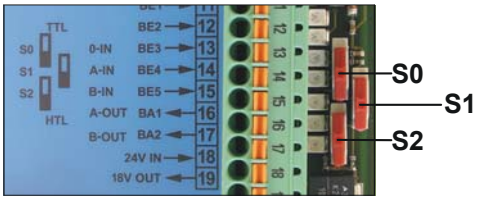
Pin		Designation	Function	Data
	9	GND 18 V	Reference ground for pin 19	—
	10	DGND	Reference gnd for pins 11 to 18	—
	11	BE1	—	—
	12	BE2	—	
	13	BE3	Evaluation: Incremental encoder: N Stepper motor signals: –	
	14	BE4	Evaluation: Incremental encoder: A Stepper motor signals: freq.	
	15	BE5	Evaluation: Incremental encoder: B Stepper motor signals: direction	
	16	BA1	Simulation Incremental encoder: A Stepper motor signals: freq.	—
	17	BA2	Simulation Incremental encoder: B Stepper motor signals: direction	
	18	24 V-In	24 V power - For XEA 5001 and - For Binärausgänge with SEA 5001 and REA 5001	Input range: 18–28.8 V
	19	18 V-Out	Auxiliary voltage 18 V	U_A = 16–18 V $I_{A\ max}$ = 50 mA

TTL/HTL switchover REA 5001

Switch	TTL/HTL Conversion
S0	BE3
S1	BE4
S2	BE5

The identification of the switches and the assignment of the switch positions to the function (HTL/TTL) are shown on the PCB cover of the REA 5001.

REA 5001



4.3 X141: Motor temperature sensor

Prerequisite for using interface X141:

- REA 5001

Terminal description – X141

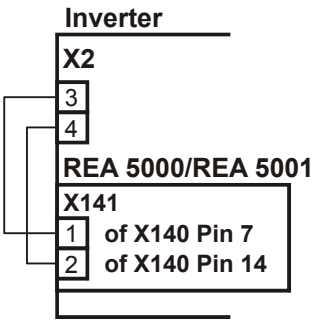
Pin		Function	Description
	1	1TP1/1K1 +	Thermal motor protection signal, comes from X140 pin 7
	2	1TP2/1K2 -	Thermal motor protection signal, comes from X140 pin 14

maximum conductor cross-section

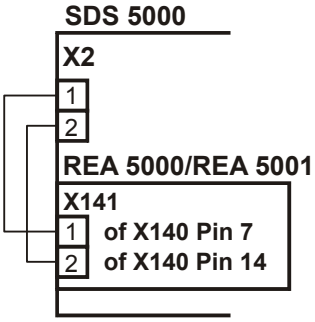
Connection type	maximum conductor cross-section [mm^2]
rigid	1,5
flexible	1,5
Flexible with cable end, without plastic sleeve	1,5
Flexible with cable end, with plastic sleeve	0,75
2 leads with the same cross-section with double cable end	—

MDS 5000

Example of connection of X141 and X2



Example of connection of X141 and X2



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