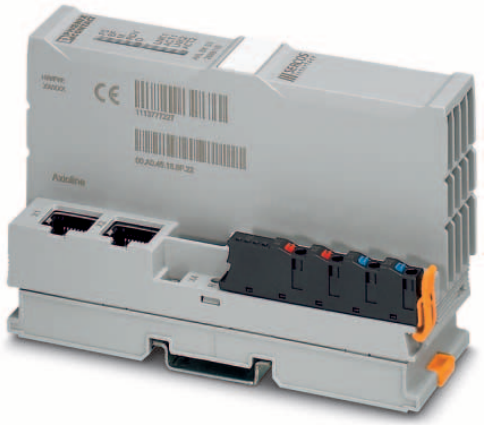
AXL BK S3 (-ME)

Axioline bus coupler for sercos



Data sheet
8200_en_01

1 Description

The bus coupler is intended for use within a third-generation sercos network and represents the link to the Axioline system.

Up to 63 Axioline devices can be connected to an existing sercos network with the help of the bus coupler.

Features

Features of sercos

- 2 Ethernet-Ports
- Transmission speed of 100 Mbps with a minimum sercos cycle time of 31.25 µs
- sercos diagnostic LED
- Supports sercos V1.3
- FSP-IO (Function Specific Profile-IO) for modular I/O devices
- 2 connections
- Synchronization

Features of Axioline

- Connection of up to 63 other Axioline devices
- Typical cycle time of the Axioline system bus: 10 µs, approximately
- Runtime in the bus coupler is negligible (goes to 0 µs)
- Firmware can be updated
- Diagnostic and status indicators

This data sheet is only valid in association with the UM EN AXL SYS INST user manual.
You can find further information on sercos in the UM DE SERCOS SYS user manual.

Make sure you always use the latest documentation.
It can be downloaded from the product at www.phoenixcontact.net/catalog.
You will always find the current SDDML-files here.

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3 Ordering data

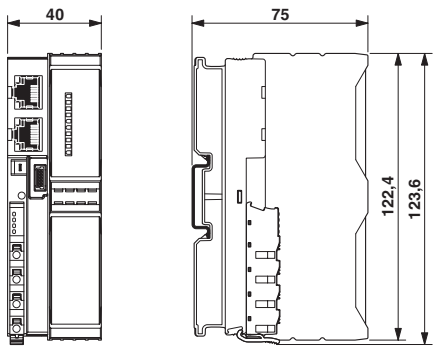
Description	Type	Order No.	Pcs. / Pkt.
Axioline bus coupler for sercos (including bus base module and connector)	AXL BK S3	2688116	1
Axioline bus coupler for sercos (electronics module as a replacement for item 2688116 AXL BK S3)	AXL BK S3-ME	2688226	1

Accessories	Type	Order No.	Pcs. / Pkt.
Power plug for Axioline bus couplers (AXL BK ...)	AXL CN L/UL	2700979	1
Zack marker strip for Axioline (device labeling), in 2 x 20.3 mm pitch, unprinted, 25-section, for individual labeling with B-STIFT 0.8, X-PEN, or CMS-P1-PLOTTER (Marking)	ZB 20,3 AXL UNPRINTED	0829579	25
Zack Marker strip, flat, Strip, white, Unlabeled, Can be labeled with: Plotter, Mounting type: Snap into flat marker groove, For terminal block width: 10.15 mm, Lettering field: 4 of 10.15 x 5 mm and 1 of 5.8 x 5 mm (Marking)	ZBF 10/5,8 AXL UNPRINTED	0829580	50
RJ45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve. (Plug/Adapter)	FL PLUG RJ45 GR/2	2744856	1
RJ45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used. (Plug/Adapter)	FL PLUG RJ45 GN/2	2744571	1
CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm^2, solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter (Cable/conductor)	FL CAT5 HEAVY	2744814	1
CAT5-SF/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm^2, stranded, shielded, outer sheath: 5.75 mm ± 0.15 mm diameter (Cable/conductor)	FL CAT5 FLEX	2744830	1
Crimping pliers, for assembling the RJ45 connectors FL PLUG RJ45..., for assembly on site (Tools)	FL CRIMPTOOL	2744869	1
Programming adapter with USB interface, for programming with the IFS-CONF, MACX-MCR-CONF and UPS-CONF software (Cable/conductor)	IFS-USB-PROG-ADAPTER	2811271	1
Software for starting up and parameterizing Axioline stations	STARTUP+	2700636	1

Documentation	Type	Order No.	Pcs. / Pkt.
User manual, English, Axioline: System and installation	UM EN AXL SYS INST	-	-
User manual, English, sercos system manual for I/O devices	UM EN SERCOS SYS	-	-
Application note, English, access to PDI objects from the modules of an Axioline station via sercos	AH EN SERCOS - PDI	-	-

4 Technical data

Dimensions (nominal sizes in mm)



Width	40 mm
Height	124 mm
Depth	75 mm
Note on dimensions	The depth is valid when a TH 35-7.5 DIN rail is used (according to EN 60715).

General data

Color	gray
Weight	174 g
Ambient temperature (operation)	-25 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (according to DIN EN 61131-2)
Permissible humidity (storage/transport)	5 % ... 95 % (according to DIN EN 61131-2)
Air pressure (operation)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Air pressure (storage/transport)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20
Protection class	III, IEC 61140, EN 61140, VDE 0140-1

Connection data

Connection method	Spring-cage connection with direct plug-in method
Conductor cross section solid / stranded	0.2 mm² ... 1.5 mm²
Conductor cross section [AWG]	24 ... 16

Interface sercos

Connection method	RJ45 female connector, auto negotiation
Number	2
Transmission speed	100 MBit/s (Full duplex)
Transmission physics	Ethernet in RJ45 twisted pair
Transmission length	max. 100 m

Interface Axio bus

Connection method	Connection for bus base module
Transmission speed	100 MBit/s

Interface Service (USB adapter)

Connection method	IFS-USB-PROG-ADAPTER
Number	1

System limits of the bus coupler

Amount of process data	1485 Byte (for each data direction)
Number of supported devices	max. 63 (per station)

sercos

Device profile	FSP_IO
Equipment type	sercos slave
Update rate	31.25 µs

Supply of the bus coupler

Supply of communications power U_L	24 V DC
Maximum permissible voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current supply at U_{bus}	2 A

NOTE: Electronics may be damaged when overloaded

Provide external fuses for the 24 V U_L area. The power supply unit must be able to supply four times the nominal current of the external fuse to ensure that it blows in the event of an error.

Error messages to the higher level control or computer system

None

Protective circuit

Surge protection, protection against polarity reversal of the supply voltage	Yes

Mechanical tests

Vibration resistance in acc. with IEC 60068-2-6	5 g
Shock test in acc. with IEC 60068-2-27	25 g, 11 ms period, half-sine shock pulse
Bump endurance test according to EN 60068-2-29	10 g

Conformance with EMC Directive 2004/108/EC

Noise immunity test in accordance with EN 61000-6-2	
Electrostatic discharge (ESD) EN 61000–4–2/IEC 61000–4–2	Criterion B; 6 kV contact discharge, 8 kV air discharge
Electromagnetic fields EN 61000–4–3/IEC 61000–4–3	Criterion A; Field intensity: 10 V/m
Fast transients (burst) EN 61000–4–4/IEC 61000–4–4	Criterion B, 2 kV
Transient surge voltage (surge) EN 61000–4–5/IEC 61000–4–5	Criterion B; DC supply lines: ±0.5 kV/±0.5 kV (symmetrical/asymmetrical); field-bus cable shield: ±1 kV
Conducted interference EN 61000–4–6/IEC 61000–4–6	Criterion A; Test voltage 10 V
Noise emission test according to EN 61000-6-3	
Radio interference properties EN 55022	Class B

Approvals

For the latest approvals, please visit www.phoenixcontact.net/catalog.

5 Internal circuit diagram

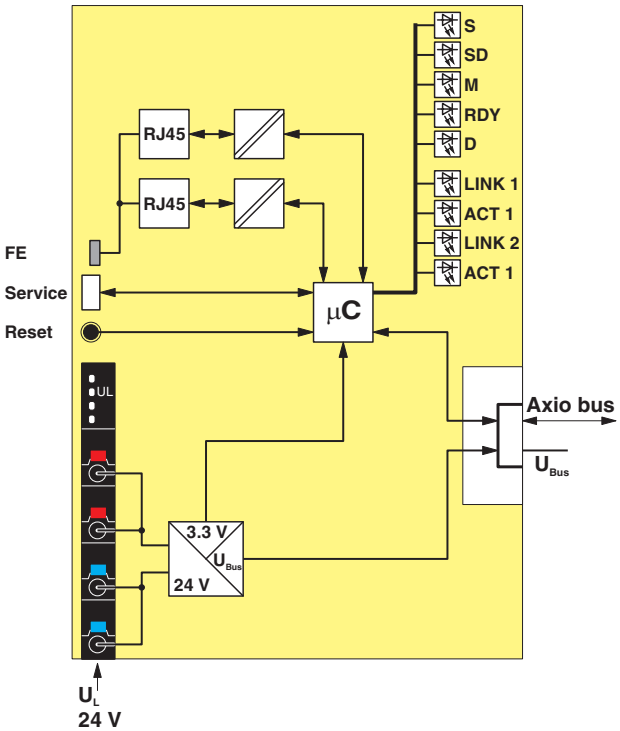


Figure 1 Internal wiring of the terminal points

Key:

FE	Optional functional earth ground connection
Service	Service interface
Reset	Reset button
RJ45	RJ45 interface
µC	Microprocessor
xxx / xxx	Power supply unit
	LED

6 Connection of sercos and supply

6.1 Connect sercos

Connect sercos to the bus coupler via an 8-pos. RJ45 plug.

The sercos connections are set to autocrossing (auto crossover).

Install sercos in accordance with the specifications in the current "Planning and Installation Guide" (see www.sercos.com).

Also observe the information in the "sercos system manual for I/O devices" user manual.

Ring recovery

The bus coupler does not support ring recovery of the sercos following error rectification.

If the sercos ring was interrupted by an error, proceed as follows to reconnect the ring:

- Rectify the error.
- Ensure that the bus coupler runs through communication phases CP0 to CP4.

6.2 Connecting the supply voltage - terminal point assignment

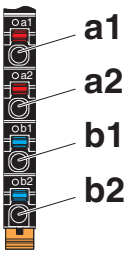


Figure 2 Terminal point assignment

Terminal point	Color	Assignment	
Supply voltage input			
a1, a2	Red	24 V DC (U_L)	Communications power supply (internally bridged)
b1, b2	Blue	GND	Reference potential of the supply voltage (internally bridged)

7 Connection example

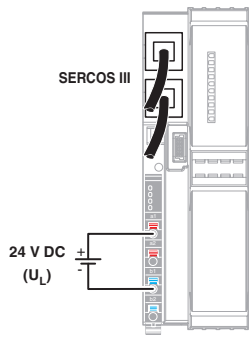


Figure 3 Connection of the cables

8 Local status and diagnostic indicators

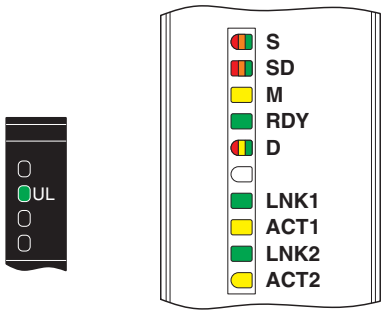


Figure 4 Local status and diagnostic indicators

Designation	Color	Meaning	State	Description
S	Red/Orange/ Green	sercos diagnostics	OFF	NRT mode; no sercos communication
			Orange ON	CP0
			Flashing orange/green	CP1: 250 ms green, 2750 ms orange
			Flashing orange/green	CP2: 250 ms green, 250 ms orange, 250 ms green, 2250 ms orange
			Flashing orange/green	CP3: 250 ms green, 250 ms orange, 250 ms green, 250 ms orange, 250 ms green, 1750 ms orange
			Green ON	CP4
			Green flashing	Loop back activated
			Flashing red/orange	User error; see chapter on "Diagnostics: bus and user errors"
			Flashing red/ green	MST loss
			Red ON	Communication error
			Flashing orange (2 Hz)	Identification (bit 15 in device control); is used for address assignment and configuration errors.
			Flashing red (2 Hz)	Watchdog error
SD	Red/Orange/ Green	Sub device	Green ON	Sub device is on the parameterization level (PL)
			Orange ON	Sub device is on the operation level (OL)
			Red ON	Error in the sub device (C1D)
			OFF	Sub device is not active.
M	Yellow	Maintenance	OFF	There is no maintenance request of an Axioline device.
			ON	There is at least one maintenance request of an Axioline device (e.g., device temperature at permissible limit)
RDY	Green	Ready	ON	Device ready to operate
			OFF	Device not ready to operate
			Flashing	Device booting (for firmware update with boot requests)

Designation	Color	Meaning	State	Description
D	Red/yellow/ green	Diagnostics	Red ON	Bus error
			Yellow ON	READY: Device is ready to operate, no data is exchanged
			Yellow flashing	I/O error in ACTIVE
			Green ON	RUN: Data exchange; status and data from the higher-level system is transmitted
			Green flashing	ACTIVE: Configuration is active, data exchange with invalid process data
			Green/yellow alternating	I/O error in RUN
LNK 1/2	Green	Link port 1/2	ON	Connection via Ethernet to a module via port 1/2 established
			OFF	No connection established via port 1/2
ACT 1/2	Yellow	Activity port 1/2	ON	Transmission or reception of Ethernet telegrams at port 1/2
			OFF	No transmission or reception of Ethernet telegrams at port 1/2

9 Mapping of I/O modules in sercos

The local bus devices are assigned to the I/O function groups and structure instances according to the sercos I/O profile.

A structure instance (slot) can consist if an I/O function group or several I/O function groups (devices with inputs or outputs).

The first Axioline device occupies slot 1 (structure instance 1), the second occupies slot 2 (structure instance 2) etc.

When assigning the inputs and outputs to the container input data (S-0-1500.0.9) or to the container output data (S-0-1500.0.5), the input and output process data is always mapped in byte limits in the container according to the sercos I/O profile.

The following function groups are defined:

Function group	Name
S-0-1501	I/O function group unknown
S-0-1502	I/O function group digital output
S-0-1503	Digital input
S-0-1504	I/O function group analog output
S-0-1505	I/O function group analog input
S-0-1506	I/O function group counter
S-0-1507	I/O function group complex protocol
S-0-1508	I/O function group sub bus master
S-0-1509	I/O function group sub bus slave
S-0-1512	I/O function group PLC module
S-0-1513	I/O function group motor starter
S-0-1514	I/O function group PWM (pulse width modulation)
S-0-1515	I/O function group positioning
S-0-1516	I/O function group passive

The bus coupler supports IDNs S–0–1500.0.2 and S–0–1500.0.9 in a producer connection and IDNs S–0–1500.0.1 and S–0–1500.0.5 for a consumer connection as configurable data. This information is stored in IDNs S-0-0187 and S–0–0188.

10 sercos

10.1 sercos profile, classes and function groups

The following sercos profile, classes and function groups are implemented in the module:

sercos device model
(GDP: Generic Device Profile)

- Basis device model (GDP_Basic)
  - Diagnostics (FG_Diagnosis)
  - Administration (FG_Administration
  - Device identification (FG_Identification)
- Identification (GDP_Id)
- Function/Hardware/Firmware/Firmware loader version (GDP_Rev)
- Password (GDP_PWD)

sercos communication model
(SCP: sercos Communication Profiles)

- Variable configuration (SCP_VarCfg)
  - Identification of SCP classes (FG SCP Identification)
  - Control of communication phases (FG Control)
  - Telegram structure (FG Telegram Setup)
  - Parameters for producer-consumer connection (FG Connection)
  - Bus diagnostics (FG Bus-Diagnostics)
  - Parameters for the non-realtime channel (FG NRT)
  - Timing behavior of the communication (FG Timing)
- Synchronous and isochronous producer and consumer data (SCP_Sync)
- Diagnostics (SCP_Diag)
  - Control of communication phases (FG Control)
  - Bus diagnostics (FG Bus-Diagnostics)
- Non-realtime channel (SCP_NRT)
  - Parameters for the non-realtime channel (FG NRT)
- Consumer connection monitoring; Watchdog (SCP_WD)
  - Parameters for the producer-consumer connection (FG Connection)
- Support for SCP_SIP and SCP_TFTP
- Cyclic communication (SCP_Cyc)

sercos function model
(FSP: Function Specific Profile I/O)

- I/O function profile (FSP_IO)

10.2 Diagnostics: bus and user errors

sercos diagnostic code (IDN S-0-0390.0.0) [hex]	Message	Meaning	Remedy
Local bus error			
C10F.B001	Local bus device is missing	Device not present	Install the device or check the contacts and replace a defective module, if necessary.
C10F.B002	Incorrect local bus device present	Wrong device	A wrong device was detected at the specified position. Check the contacts, replace a defective module, if necessary or adapt the configuration.
C10E.B012	Local bus device peripheral or application error	Error in a local bus device	See corresponding data sheet.
Device error			**Read out via IDN 1500.0.32 to ascertain which device and possibly which channel is affected and check the contact, parameterization and function.**
C10F.B012	Application not ready	Application on device not ready	Check the specified channel of the device, the devices connected to the module, the parameters of the specified device as well as the connected sensors and actuators. Delay the start after power on or replace the device. See corresponding data sheet.
C10F.B013	Local bus device power on reset	Local bus devices causes a restart	The specified device executed a reset due to a fault or insufficient voltage supply. Check the power supply. Find the cause by checking the power supply to the devices and check whether they conform to the nominal value of the permissible AC component. Check the power supply unit of the bus coupler for overload (see corresponding data sheet).
Transmission error			**Check the system and replace devices, if necessary.**
C109.B022	Communication error	Multiple transmission error	Bus errors occurred. The system has transmission errors. Check the segment, shielding of the bus cables, grounding/equipotential bonding, plugs, communications power (for power drops), FO assembly, as well as the remote bus devices and whether the devices are aligned correctly.
C10F.B023	Data communication error	I/O communication error	Check the system, shielding of the bus cables, connectors, grounding/equipotential bonding, voltage supply of the periphery and the voltage supply of the inputs/outputs. Replace devices if necessary.
C10F.B024	Management communication error	Strong interference in local bus communication	Check the system, shielding of the bus cables, connectors, grounding/equipotential bonding, voltage supply of the periphery and the voltage supply of the inputs/outputs. Replace devices if necessary.
Configuration errors			
C10F.B030	Configuration error	configuration errors	The configuration is invalid. Replace device or modify configuration.
General errors			
C10F.B042	Firmware error	Firmware error	Replace the device.
C10F.B041	Hardware error	Hardware fault	Replace the device.

10.3 Diagnose: periphery and channel error

Periphery and channel error can only occur once for each I/O module or channel.

In accordance with the sercos specification, errors and messages are mapped in diagnostic IDNs S-0-0390, S-0-0095, S-1500.0.32, and S-1500.0.33.

The messages are also entered in IDNs S-0-1303.0.10, S-0-1303.0.11, and S-0-1303.0.12.

You can also read out module-specific diagnostics via IDN P-1-0024.x.0.

10.4 sercos address

There is no switch for setting the sercos address.

Default address 1 is used for manual address assignment.

The bus coupler supports remote address assignment of the sercos address according to the sercos specification.

The sercos address is saved retentively.

For an automatic address assignment description, please refer to the documentation of your sercos master.

10.5 Password (IDN/S-0-0267)

In the default setting some module parameters are write-protected with a password.

The default password is PW170875.

The following IDNs are password protected:

IDN	Description
S-0-1020	IP address
S-0-1021	Subnet mask
S-0-1022	Gateway address
P-0-2000.0.1	Update procedure command

11 sercos parameter

11.1 Overview of sercos parameters

The following table lists all sercos parameters (S parameters) with important features that have been implemented into the bus coupler.

IDN	Name	Default values	Unit
S-0-0014	Interface status	-	-
S-0-0017	IDN list of all operation data	-	-
S-0-0021	IDN list of invalid operation data for CP2	-	-
S-0-0022	IDN list of invalid operation data for CP3	-	-
S-0-0025	IDN list of all procedure commands	-	-
S-0-0095	Diagnostic message	-	-
S-0-0099	Reset class 1 diagnostic (process command)	-	-
S-0-0127	CP3 transition check (process command)	-	-
S-0-0128	CP4 transition check (process command)	-	-
S-0-0187	IDN list of configurable data as producer	S-0-1500.0.2, S-0-1500.0.9	ID
S-0-0188	IDN list of configurable data as consumer	S-0-1500.0.1, S-0-1500.0.5	ID
S-0-0267	Password	PW170875	-
S-0-0279	IDN-list of password protected data	-	-
S-0-0390	Diagnostic number	-	-
S-0-1000	SCP type & version	-	
S-0-1002	Communication cycle time (t_{Scyc})	-	µs
S-0-1003	Allowed MST losses in CP3/CP4	10	-
S-0-1005	Minimum feedback processing time (t5)	250 000	µs
S-0-1006	AT0 transmission starting time (t1)	-	µs
S-0-1007	Feedback acquisition capture point (t4)	-	µs
S-0-1008	Command value valid time (t3)	-	µs
S-0-1009	Device control (C-Dev) offset in MDT	-	-
S-0-1010	Length of MDTs	-	-
S-0-1011	Device status (S-Dev) offset in AT	-	-
S-0-1012	Length of ATs	-	-
S-0-1013	SVC offset in MDT	-	-
S-0-1014	SVC offset in AT	-	-
S-0-1015	Ring delay	-	µs
S-0-1016	Slave delay	-	µs
S-0-1017	NRT transmission time	650 000 950 000	µs
S-0-1019	MAC address	00.A0.45.xx.xx.xx	-
S-0-1020	IP address	192.168.0.10	-
S-0-1021	Subnet mask	255.255.255.0	-
S-0-1022	Gateway address	192.168.0.1	-
S-0-1023	SYNC jitter	1000	µs
S-0-1024	SYNC delay measuring procedure command (Prozesskommando)	-	-
S-0-1026	Version of communication hardware	-	-
S-0-1027.0.1	Requested MTU	-	-
S-0-1027.0.2	Effective MTU	-	-
S-0-1028	Error counter MST-P/S	-	-
S-0-1031	Test pin assignment Port 1 and Port 2	-	-

IDN	Name	Default values	Unit
S-0-1035	Error counter Port1 and Port2	-	-
S-0-1040	SERCOS address	1	-
S-0-1041	AT Command value valid time (t9)	-	µs
S-0-1044	Device control	-	-
S-0-1045	Device status	-	-
S-0-1047	Maximum consumer activation time (t11)	-	µs
S-0-1050.x.1	Connection setup	-	-
S-0-1050.x.2	Connection number	-	-
S-0-1050.x.3	Telegram assignment	-	-
S-0-1050.x.4	Max. length of connection	-	-
S-0-1050.x.5	Current length of connection	-	-
S-0-1050.x.6	Configuration list	-	-
S-0-1050.x.8	Connection control	-	-
S-0-1050.x.10	Producer cycle time	-	µs
S-0-1050.x.11	Allowed data losses	-	-
S-0-1050.x.12	Error counter data losses	-	-
S-0-1050.x.20	IDN allocation of real-time bit	-	-
S-0-1050.x.21	Bit allocation of real-time bit	-	-
S-0-1051	Image of connection setups	-	-
S-0-1300.x.1	Component name	xxxx...	-
S-0-1300.0.2	Vendor name	Phoenix Contact	-
S-0-1300.0.3	Vendor code	200	-
S-0-1300.0.4	Device name	xxxx...	-
S-0-1300.0.5	Device ID	xxxxxxx	-
S-0-1300.0.6	Connected to subdevice	-	-
S-0-1300.0.7	Function revision	-	-
S-0-1300.0.8	Hardware revision	-	-
S-0-1300.0.9	Software revision	-	-
S-0-1300.0.10	Firmware loader revision	-	-
S-0-1300.0.11	Order number	xxxxxxx	-
S-0-1300.0.12	Serial number	xxx	-
S-0-1300.0.13	Manufactoring date parameter	-	-
S-0-1300.0.20	Operational hours	-	h
S-0-1301	List of GDP classes & version	0101_{hex}	-
S-0-1302.0.1	FSP type & version	00010001_{hex}	-
S-0-1302.0.2	Function groups	S-0-1500.0.0	-
S-0-1302.0.3	Application type	Modular IO station	-
S-0-1303.0.01	Diagnosis trace configuration	-	-
S-0-1303.0.02	Diagnosis trace control	-	-
S-0-1303.0.03	Diagnosis trace state	-	-
S-0-1303.0.10	Diagnosis trace buffer no1	-	-
S-0-1303.0.11	Diagnosis trace buffer no2	-	-
S-0-1303.0.12	Diagnosis trace buffer no3	-	-
S-0-1305.0.1	sercos current time	-	-
S-0-1500	I/O bus coupler	-	-
S-0-1500.x.1	IO control	-	-
S-0-1500.x.2	IO status	-	-
S-0-1500.x.3	List of module type codes	-	-
S-0-1500.x.5	Container output data	-	-
S-0-1500.x.9	Container input data	-	-

IDN	Name	Default values	Unit
S-0-1500.x.19	Parameter channel receive	-	-
S-0-1500.x.20	Parameter channel transmit	-	-
S-0-1500.x.23	Local bus cycle time	-	µs
S-0-1500.x.32	IO diagnostic message	-	-
S-0-1500.x.33	Current IO diagnostic message	-	-
S-0-1501	I/O function group unknown	-	-
S-0-1502	I/O function group digital output	-	-
S-0-1503	I/O function group digital input	-	-
S-0-1504	I/O function group analog output	-	-
S-0-1505	I/O function group analog input	-	-
S-0-1506	I/O function group counter	-	-
S-0-1507	I/O function group complex protocol	-	-
S-0-1508	I/O function group sub bus master	-	-
S-0-1509	I/O function group sub bus slave	-	-
S-0-1512	I/O function group PLC module	-	-
S-0-1513	I/O function group motor starter	-	-
S-0-1514	I/O function group PWM (pulse width modulation)	-	-
S-0-1515	I/O function group positioning	-	-
S-0-1516	I/O function group passive	-	-
P-1-x.y.z	sercos SVC/PDI 1:1 mapping (x = PDI-Index, y = module slot, z = Subindex)	-	-
P-0-2000.0.1	Update command (process command)	-	-

You can find further information on sercos parameters in the UM DE SERCOS SYS user manual.

12 Access to PDI objects

You can access PDI objects from the modules of a station via sercos. You have two options here:

- Mapping method
  - Simple method
  - For PDI objects with the index 0001_{hex} ... 1000_{hex}
- Tunnel method
  - More complex method
  - For all PDI objects

Detailed information on accessing PDI objects from the modules of an Axioline station via sercos can be found in the AH DE SERCOS - PDI application note.

12.1 Mapping method

You can use the mapping method for PDI objects with the index 0001hex ... 1000hex (1_{dec} ... 4096_{dec}).

To do so, map the PDI object in the manufacturer-specific parameter P-1-x.y.z

P-1-x.y.z	**sercos SVC/PDI 1:1 mapping**
x	PDI index (decimal)
	maximum: P-1-4096.y.z
y	Module slot
	Bus coupler = 0
	1st module after the bus coupler = 1
	:
	63rd module after the bus coupler = 63
z	Subindex
Example:	P-1-0010.15.0

12.2 Tunnel method

You can use the tunnel method for all PDI objects.

You tunnel the PDI object through the function groups of the FSP_I/O, i.e. through IDNs S–0–1501 to S–0–1516.

S-0-15xx.y.19	**Parameter channel receive**
	Receiving the response via the service channel
S-0-15xx.y.20	**Parameter channel transmit**
	Transferring data to the parameter channel via the service channel
y	Module slot
	1st module after the bus coupler = 1
	:
	63rd module after the bus coupler = 63

13 Reset button

The reset button is on the front of the bus coupler.

The reset button has two functions:

– Restarting the bus coupler
– Restoring the default settings

13.1 Restarting the bus coupler

The bus coupler is restarted when the button is pressed during operation.

The outputs of the station are set to the parameterized substitute values.

The process image of the inputs is not re-read.

13.2 Restoring the default settings

The bus coupler is supplied with the following default settings:

Default values (default settings)		
S-0-1019	00-A0-45-xx-xx-xx	MAC address
S-0-1020	192.168.0.10	IP address
S-0-1021	255.255.255.0	Subnet mask
S-0-1022	192.168.0.1	Gateway address
S-0-1040	1	sercos address
S-0-0267	PW170875	Password
S-0-1302.0.3	Modular IO station	Application type

Holding down the button during the initialization phase restores the default settings.

If you wish to restore the default settings, proceed as follows:

- Disconnect the power to the module.
- Press and hold down the button.
- Switch on the power.

The LEDs indicate the initialization phase:

LED	State	Meaning
RDY	OFF	Starting firmware
RDY	Flashing	Initializing firmware
RDY	Green	Initialization complete

- When the RDY LED lights up green, release the button.

The default settings are restored.

14 Startup

14.1 Starting the firmware

The firmware is started after you have supplied power to the bus coupler.

The bus coupler is ready for operation when the RDY LED lights up permanently green.

14.2 Basic configuration

The bus coupler executes the basic communication after switching on the bus coupler or after resetting with the reset button and the first entry into the CP2 communication phase.

These means:

– The corresponding I/O function groups and the structure elements are generated for all devices detected on the local bus.
– Channel number and width correspond to the detected data widths of the devices.
– The input/ output process data of all I/O function groups are configured via IO_FG.x.2 for mapping in S-0-1500.0.5 (container output data) or S-0-1500.0.9 (container input data).
– The content an lengths of the input/output process data is mapped 1:1 to sercos.

By switching over the communication phases to CP3 and subsequently in CP4, the sercos master now has the possibility, to accept this configuration for real-time operation without change or to make changes and to activate them before switching to CP3.

15 Firmware update

The firmware update is carried out in accordance with the procedure described in the sercos specification. This means that a TFTP server is implemented on the bus coupler, which can receive files from any TFTP client. The file for the update is saved by the bus coupler in the file system, verified, and, if found to be valid, transferred to the program code area of the memory during the boot phase following a reset (power down). This process can take a few minutes.

Update requirements

– In the following, the term "PC" will be used as a general term for a PC and notebook, or similar.
– To make sure that no settings are lost during updating, take suitable measures to back up the device settings.
– In order to establish a connection to the Axioline bus coupler, it may be necessary to deactivate the firewall of your PC.
– Current firmware update file is available from the download area of the bus coupler at www.phoenixcontact.net/catalog.

Transfer file for firmware update to the bus coupler (using Windows XP)

- Save the current firmware update file to your PC.
- Rename the file c2688226.fw.
- Connect the bus coupler to the the LAN card of your PC via an Ethernet cable.
- Switch on the power supply to the bus coupler.
- Make sure that the IP address of your PC is in the same ip address space as the bus coupler, which you wish to update.
- Run the command console of your PC.
- Enter the following command line: tftp -i <ip-address of the bus coupler> PUT <name of the update file>

  tftp -i <ip address> PUT <file name>
  ip address IP address of the bus coupler
  file name Name of the update file
  Example: tftp -i 192.168.0.2 PUT c2688226.fw
  tftp -i 192.168.0.2 PUT c2688226.fw

- Once the firmware file has been successfully transferred, restart the bus coupler by resetting the voltage or execute IDN/P-0-2000.0.1.

Firmware update

After the bus coupler restart, the firmware update is performed automatically.

The firmware update can take several minutes.
Never disconnect the supply voltage during the firmware update process.

The firmware update is automatically completed with a bus coupler restart.

The status LEDs signal the current status of the firmware update.

LED states: firmware update is being performed

LED	Meaning
RDY flashing	BootP requests are sent and the firmware container is loaded via tftp.
RDY ON / M ON	Firmware is saved.

LED states: update complete

LED	Bus coupler without connected modules	Bus coupler with connected modules
S3	OFF	OFF
SD	Orange	Orange
M	OFF	OFF
RDY	Green	Green
D	Orange	Green flashing