

AXL F BK S3

Axioline F bus coupler for Sercos



Data sheet
105610_en_02

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1 Description

Valid from firmware version 1.10.

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

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

Features of Sercos

- 2 Ethernet-Ports
- Rotary coding switches for setting the Sercos address
- Transmission speed of 100 Mbps with a minimum Sercos cycle time of 31.25 μ s
- Sercos diagnostic LED
- Certified according to Sercos V1.12
- Supports Sercos V1.31
- FSP-IO (Function Specific Profile-IO) for modular I/O devices
- A maximum of 8 connections are supported (max. 4 consumer and max. 4 producer connections)
- Cross communication is possible up to reaching the maximum number of connections

- Synchronization

Features of Axioline F

- Up to 63 additional Axioline F devices can be connected
- Typical cycle time of the Axioline F local bus is around 10 μ s
- Runtime in the bus coupler is negligible (goes to 0 μ s)
- Firmware can be updated
- Diagnostic and status indicators



This data sheet is only valid in association with the UM EN AXL F 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 phoenixcontact.net/products.
You will always find the current SDDML-files here.

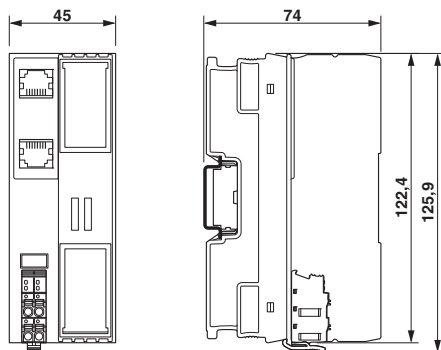
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3 Ordering data

| Description | Type | Order No. | Pcs./Pkt. |
|---|-------------------------------------|-----------|-----------|
| Axioline F bus coupler for Sercos (including bus base module and connector) | AXL F BK S3 | 2701686 | 1 |
| Accessories | | | |
| Axioline F bus base module for housing type BK (Replacement item) | AXL BS BK | 2701422 | 5 |
| Axioline F short power connector (for e.g., AXL F BK ...) (Replacement item) | AXL CN S/UL | 2701421 | 5 |
| 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. (Connector/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. (Connector/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 plugs FL PLUG RJ45..., for assembly on site (Tools) | FL CRIMPTOOL | 2744869 | 1 |
| Zack marker strip for Axioline F (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, in 10 mm pitch, unprinted, 10-section, for individual labeling with M-PEN 0.8, X-PEN, or CMS-P1-PLOTTER (Marking) | ZBF 10/5,8 AXL UNPRINTED | 0829580 | 50 |
| Insert label, Roll, white, unlabeled, can be labeled with: THERMOMARK ROLL, THERMOMARK ROLL X1, THERMOMARK X, THERMOMARK S1.1. Mounting type: snapped into marker carrier, Lettering field: 35 x 18.7 mm (Marking) | EMT (35X18,7)R | 0801831 | 1 |
| Connecting cable, for connecting the controller to a PC for PC Worx and LOGIC+, USB A to micro USB B, 2 m in length. (Cable/conductor) | CAB-USB A/MICRO USB B/2,0M | 2701626 | 1 |
| Documentation | | | |
| User manual, English, Axioline F: System and installation | UM EN AXL F SYS INST | - | - |
| User manual, English, Axioline F: Diagnostic registers, and error messages | UM EN AXL F SYS DIAG | - | - |
| User manual, English, Sercos system manual for I/O devices | UM EN SERCOS SYS | - | - |
| Application note, English, Updating the firmware of an Axioline F bus coupler | AH EN TFTP FIRMWARE UPDATE AXL F BK | - | - |

4 Technical data

Dimensions (nominal sizes in mm)



| | |
|--------------------|---|
| Width | 45 mm |
| Height | 125.9 mm |
| Depth | 74 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 | traffic grey A RAL 7042 |
| Weight | 177 g (with connector and bus base module) |
| Ambient temperature (operation) | -25 °C ... 60 °C (Mounting position: wall mounting on horizontal DIN rail) -25 °C ... 55 °C (Mounting position: any) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Permissible humidity (operation) | 5 % ... 95 % (non-condensing) |
| Permissible humidity (storage/transport) | 5 % ... 95 % (non-condensing) |
| 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 |
| Mounting position | Any (observe temperature derating) |

Connection data

| | |
|--|---|
| Designation | Axioline F connector |
| Connection method | Push-in connection |
| Conductor cross section solid / stranded | 0.2 mm ² ... 1.5 mm ² / 0.2 mm ² ... 1.5 mm ² |
| Conductor cross section [AWG] | 24 ... 16 |
| Stripping length | 8 mm |



Please observe the information provided on conductor cross sections in the "Axioline F: system and installation" user manual.

Interface Sercos

| | |
|----------------------|---|
| Number | 2 |
| Connection method | RJ45 socket, auto negotiation and auto crossing |
| Transmission speed | 100 MBit/s (Full duplex) |
| Cycle Time | 31.25 μ s |
| Transmission physics | Ethernet in RJ45 twisted pair |
| Transmission length | max. 100 m |

Interface Axioline F local bus

| | |
|--------------------|-----------------|
| Connection method | Bus base module |
| Transmission speed | 100 MBit/s |

Interface Service

| | |
|-------------------|------------------|
| Number | 1 |
| Connection method | Micro USB type B |

System limits

| | |
|-----------------------------|-----------------------|
| Number of supported devices | max. 63 (per station) |
|-----------------------------|-----------------------|



NOTE: Electronics may be damaged when overloaded

Observe the logic current consumption of each device when configuring an Axioline F station. It is specified in every module-specific data sheet. The current consumption can differ depending on the individual module. The permissible number of devices that can be connected therefore depends on the specific station structure.

Sercos

| | |
|------------------|---------------------------|
| Equipment type | Sercos slave |
| Device profile | FSP_IO |
| Update rate | 31.25 μ s |
| Sercos protocols | Sercos |
| Specification | Sercos specification 1.31 |

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 |
| Current consumption from U_L | typ. 105 mA (without I/Os and $U_L = 24$ V) max. 570 mA (with 2 A at U_{Bus} for the I/Os and $U_L = 24$ V) |
| Power consumption at U_L | typ. 2.5 W (without I/Os) max. 13.7 W (with 2 A load at U_{Bus} for the I/Os) |



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

Mechanical tests

| | |
|--|-----|
| Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6 | 5g |
| Shock in acc. with EN 60068-2-27/IEC 60068-2-27 | 30g |
| Continuous shock according to EN 60068-2-27/IEC 60068-2-27 | 10g |

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: $\pm 0.5 \text{ kV} / \pm 0.5 \text{ kV}$ (symmetrical/asymmetrical); field-bus cable shield: $\pm 1 \text{ kV}$

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 phoenixcontact.net/products.

5 Internal circuit diagram

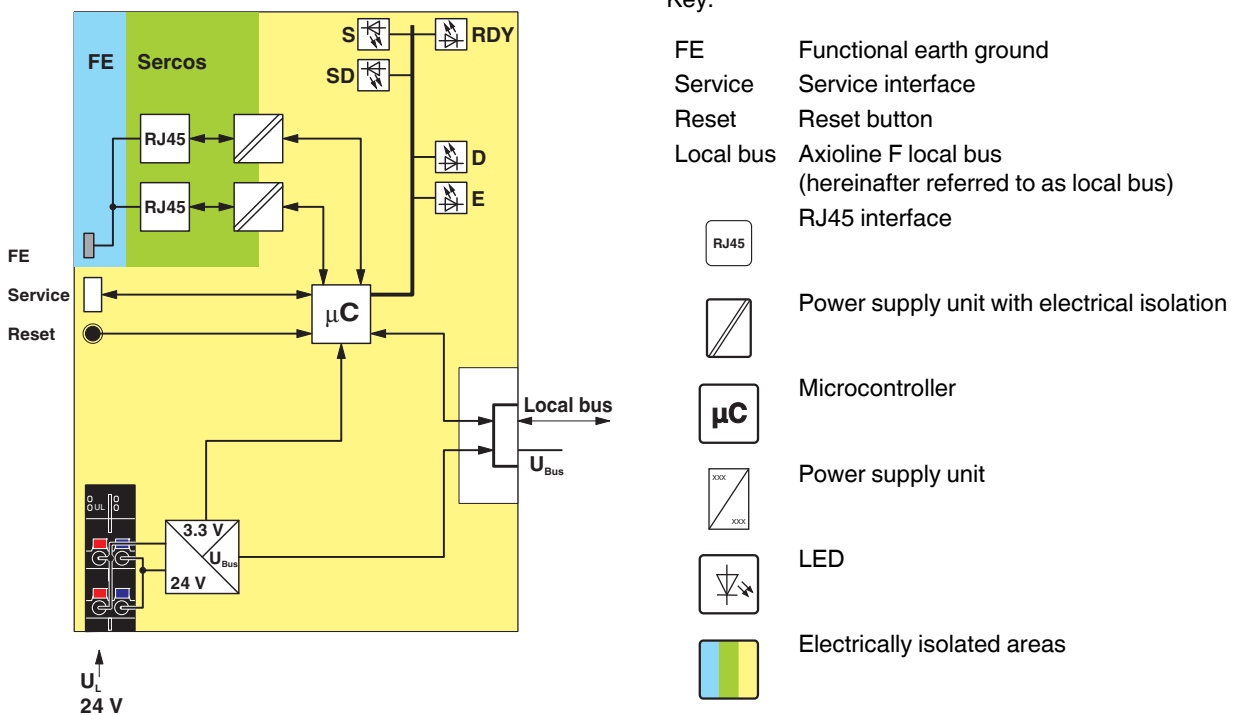


Figure 1 Internal wiring of the terminal points

6 Connection of Sercos and supply

6.1 Connecting Sercos

Connecting Sercos to the bus coupler via an 8-pos. RJ45 connector.

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.



Shielding
The shielding ground of the connected twisted pair cables is electrically connected with the socket. When connecting network segments, avoid ground loops, potential transfers, and voltage equalization currents via the braided shield.



Observe bending radii
The housing dimensions specified under "Dimensions" refer to the bus coupler with I/O connectors without Ethernet connection. When installing the bus coupler in a control box, observe the bending radii of the cables and the connectors used. If required, use angled RJ45 connectors to maintain these bending radii.

6.2 Connecting the supply voltage - terminal point assignment

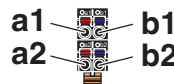


Figure 2 Terminal point assignment

| Terminal point | Color | Assignment |
|-----------------------------|-------|--|
| Supply voltage input | | |
| a1, a2 | Red | 24 V DC (U _L) Supply of the logic voltage (internally jumpered) |
| b1, b2 | Blue | GND Reference potential of the supply voltage (internally jumpered) |

7 Connection example

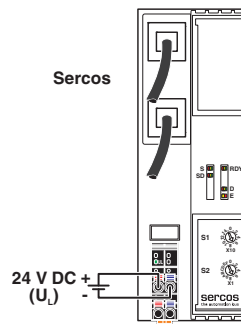


Figure 3 Connection of the cables

8 Configuration via rotary encoding switch

You can configure the address assignment and other functions using rotary encoding switches.

After modifying the switch position, restart the bus coupler, as the modification to the switch position does not take effect during operation.

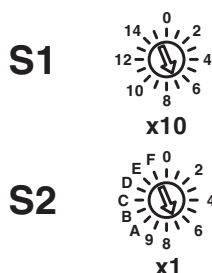


Figure 4 Rotary encoding switch

The code results from the sum of S1 x 10 plus S2 x 1. The image shows code 77 (7 x 10 + 7).

| S1 | S2 | Code | Function |
|----------|---------|------------|-----------------------------------|
| 0 | 0 | 00 | Remote address assignment |
| 0 ... 15 | 0 ... 9 | 01 ... 159 | Manual address assignment |
| 12 | C | 12C | Resetting to the default settings |
| Other | | | Reserved |

8.1 Remote address assignment

Switch position 00

The standard Sercos remote access is activated with this switch position, so that the bus coupler accepts an address assignment e.g., via the engineering system.

8.2 Manual address assignment

Switch position 01 ... 159

The devices are automatically assigned addresses as standard.

Set the Sercos address manually with this switch position. Remote address assignment, e.g., via an engineering tool, is deactivated.

8.3 Resetting to the default settings

Switch position 12C

All settings are reset to the delivery state.



The device is ready for operation after powering up, as soon as the RDY LED lights up green.
A connection to the device however cannot be established in this switch position.
As soon as the RDY LED lights up green, a new switch position can be selected on the rotary encoding switch and the device can be restarted.



Alternatively, the default setting can also be restored via the reset button (see "Reset button").

8.4 Reserved/invalid switch position

The device starts with the previous settings, e.g., with the settings that were valid before the device was restarted.

9 Local status and diagnostic indicators

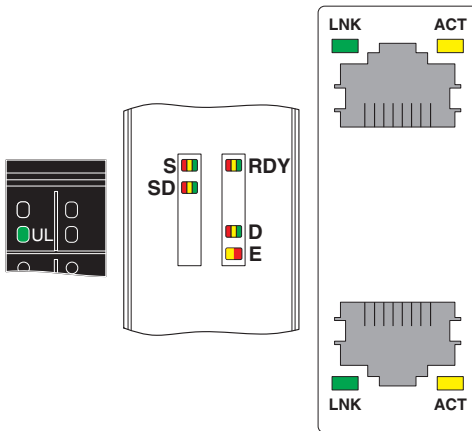


Figure 5 Local status and diagnostic indicators

| Designation | Color | Meaning | State | Description |
|-------------|------------------|--------------------|------------------------|--|
| UL | Green | U _{Logic} | ON | Communications power supply present. |
| | | | OFF | Communications power supply not present. |
| S | Red/orange/green | Sercos | 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 |

| Designation | Color | Meaning | State | Description |
|--|------------------|--|--|---|
| SD | Red/orange/green | Sub Device | Green ON | Sub device is on the operation level (OL) |
| | | | Orange ON | Sub device is on the parameterization level (PL) |
| | | | Red ON | Error in the sub device (C1D) |
| | | | OFF | Sub device is not active. |
| RDY | Green/yellow/red | Ready | Green ON | Device is ready for operation. |
| | | | Flashing green/yellow | Communications power undervoltage or surge voltage Overtemperature |
| | | | Yellow ON | Firmware/bus coupler is booting |
| | | | Yellow flashing | Firmware update is being performed. |
| | | | Flashing yellow/red | Firmware update has failed. |
| | | | Flashing red | Faulty firmware |
| | | | Red ON | Rotary encoding switches are set to an invalid/reserved position. |
| | | | OFF | Device is not ready for operation. |
| D | Red/yellow/green | Diagnostics of local bus communication | | |
| | | Run | Green ON | The station is ready for operation, communication within the station is OK. All data is valid. There are no faults. |
| | | Active | Green flashing | The station is ready for operation, communication within the station is OK. The data is not valid. Valid data from the controller/higher-level network not available. There is no fault in the module. |
| | | Ready | Yellow ON | The station is ready for operation, no data exchange taking place. |
| | | | Yellow flashing | Access from Startup+ in I/O check mode |
| | | | Flashing yellow/red | Local bus error during active I/O check |
| | | | Flashing red | Local bus error on startup |
| | | | | Possible causes: |
| | | | | Configuration cannot be generated, information is missing from a device |
| | | | | Chip version of a device is <V1.1 |
| | | The desired and actual configuration are different | | |
| | | No local bus device connected | | |
| | | The maximum number of local bus devices is exceeded. | | |
| | | Red ON | The station is ready for operation but has lost connection to at least one device. | |
| | | | Possible causes: | |
| | | | Communication error | |
| | | | Local bus device has been removed or configured device is missing. | |
| Reset at a local bus device | | | | |
| Serious device error at a local bus device (local bus device can no longer be reached) | | | | |
| Power down | OFF | Device in (power) reset. | | |

| Designation | Color | Meaning | State | Description |
|-------------|----------------|-----------------------|-----------|--|
| E | Yellow/ red | Error | Yellow ON | I/O warning at a local bus device |
| | | | Red ON | I/O error at a local bus device |
| | | | OFF | No I/O messages present. |
| 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 | Flashing | Transmission or reception of Ethernet telegrams at port 1/2 |
| | | | OFF | No transmission or reception of Ethernet telegrams at port 1/2 |

10 Sercos

10.1 Realtime connections

The module supports a maximum of eight realtime data connections (S-0-1050.0.x to S-1050.7.x), with a maximum of four consumer and four producer connections.

10.2 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)
- State machine (GDP_StM)
 - State machine (FG_StateMachine)
- Diagnosis trace (GDP_DiagT)
- Diagnosis trace advanced (GDP_DiagTAdv)
- Energy status (GDP_EnS)
 - Energy (FG_Energy)
- Energy control basic (GDP_EnCBasic)
 - Energy (FG_Energy)

Sercos communication model (SCP: Sercos Communication Profiles)

- Variable configuration (SCP_VarCfg, SCP_VarCfg_0x02, SCP_VarCfg_0x03)
 - 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, SCP_Sync_0x02)
- Diagnostics (SCP_Diag)
 - Control of communication phases (FG Control)
 - Bus diagnostics (FG Bus-Diagnostics)
- Non-realtime channel (SCP_NRTPC)
 - Parameters for the non-realtime channel (FG NRT)
- Consumer connection monitoring; Watchdog (SCP_WDCon)
 - 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)

10.3 Electronic rating plate

The electronic rating plate comprises the IDNs S-0-1300.x.y. See the table in the “Sercos parameter” section.

10.4 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 of an I/O function group or several I/O function groups (for example devices with inputs and outputs).

The first local bus 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 number of bytes of the containers is always even.

The following function groups are defined:

| Function group (FG_IO) | Name |
|------------------------|---|
| 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 |

The bus coupler supports the following IDNs as configurable data:

| In a producer connection | In a consumer connection |
|--|--------------------------|
| S-0-1500.0.2 | S-0-1500.0.1 |
| S-0-1500.0.9 | S-0-1500.0.5 |
| FG_IO.x.9 | FG_IO.x.5 |
| FG_IO.x.13 | FG_IO.x.11 |
| S-0-0390 | |
| This information is stored in the IDN. | |
| S-0-0187 | S-0-0188 |

10.5 Synchronization mechanisms of the bus coupler

The bus coupler offers three synchronization mechanisms. These are standardized according to the Sercos specification and are configured by the Sercos master.

The modules, which support a synchronization method, are stored in IDN S-0-1050.x.13.

Asynchronous mode

The local bus, which is at a lower level to the bus coupler, runs asynchronously to the higher-level Sercos bus.

Clock-synchronous mode

The local bus, which is at a lower level to the bus coupler, runs synchronously to the higher-level Sercos bus.

The input and output data is read in or output at a time determined by the master.

In doing so, the runtimes of the Axioline F modules are taken into consideration.

Cyclic mode

The local bus, which is at a lower level to the bus coupler, runs synchronously to the higher-level Sercos bus.

The output data is output as quickly as possible and the input data is read in as late as possible.

In doing so, the runtimes of the Axioline F modules are taken into consideration.

10.6 Diagnostics: bus and user errors

| Sercos diagnostic code (IDN S-0-0390.0.0) [hex] | Message | Meaning | Corrective |
|---|--|--|--|
| Local bus error | | | |
| C10F.B001 | Local bus device is missing | Device not present | Install the device or check the contacts and replace a defective device, if necessary. |
| C10F.B002 | Incorrect local bus device present | Wrong device | An incorrect device was detected at the specified location. Check the contacts, replace a defective device, 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, connectors, 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. |

| Sercos diagnostic code (IDN S-0-0390.0.0) [hex] | Message | Meaning | Corrective |
|---|---|--|---|
| General errors | | | |
| C10F.B041 | Hardware error | Hardware fault | Replace the device. |
| C10F.B042 | Firmware error | Firmware error | Replace the device. |
| C10F.B043 | Local bus is running asynchronously (in relation to the Sercos bus cycle) | Local bus is running asynchronously (in relation to the Sercos bus cycle) | Check the time parameters and adapt them, if necessary. |
| Manufacturer-specific errors | | | |
| 400F.OA73 | Not supported local bus slave at slot: x | Axioline F module at slot x is not supported; x = slot of the first non-supported module | At least one old, non-supported module is located in the Axioline F station. Replace the module for a module with a current hardware/firmware version. |

10.7 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.

Access PDI object 0018_{hex} (DiagState) with IDN P-1-0024.x.0 via the mapping method. See “Mapping method” section and module-specific data sheet.

10.8 Sercos address

You can configure the Sercos address assignment manually or remotely, see section “Configuration via rotary coding switch”.

The Sercos address is saved retentively.



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

10.9 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 |
|--------------|--------------------------|
| P-0-2000.0.1 | Update procedure command |

11 Sercos parameter

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-0-0188 | IDN list of configurable data as consumer | - | - |
| S-0-0267 | Password | PW170875 | - |
| S-0-0279 | IDN-list of password protected data | - | - |
| S-0-0390 | Diagnostic number | - | - |
| S-0-0420 | Activate parameterization level procedure command (PL) | - | - |
| S-0-0422 | Exit parameterization level procedure command | - | - |
| S-0-0423 | IDN-list of invalid data for parametrization level | - | - |
| S-0-0425 | Sub-device state machine control | - | - |
| S-0-1000 | SCP type & version | - | 0201 _{hex} , 0202 _{hex} , 0203 _{hex} , 0301 _{hex} , 0302 _{hex} , 0501 _{hex} , 0801 _{hex} , 1801 _{hex} , 0E01 _{hex} , 1601 _{hex} , 1A01 _{hex} , 1901 _{hex} |
| 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 (t_5) | 250 000 | μs |
| S-0-1006 | AT0 transmission starting time (t_1) | - | μs |
| S-0-1007 | Feedback acquisition capture point (t_4) | - | μs |
| S-0-1008 | Command value valid time (t_3) | - | 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-0-1020.0.1 | Current IP address | 192.168.0.10 | - |
| S-0-1021 | Subnet mask | 255.255.255.0 | - |
| S-0-1021.0.1 | Current subnet mask | 255.255.255.0 | - |
| S-0-1022 | Gateway address | 192.168.0.1 | - |
| S-0-1022.0.1 | Current gateway address | 192.168.0.1 | - |

| IDN | Name | Default values | Unit |
|----------------|--|--------------------|------|
| S-0-1023 | SYNC jitter | 1000 | µs |
| S-0-1024 | SYNC delay measuring procedure command (process command) | - | - |
| 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 | - | - |
| S-0-1035 | Error counter port1 and port2 | - | - |
| S-0-1036 | Inter frame gap | - | - |
| S-0-1037 | Slave jitter | - | - |
| 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-0-1048 | Activate network settings | - | - |
| 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.9 | Connection state | - | - |
| 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.13 | Configuration list for sync | - | - |
| S-0-1051 | Image of connection setups | - | - |
| S-0-1300.0.1 | Component name | sercos bus coupler | - |
| S-0-1300.0.2 | Vendor name | Phoenix Contact | - |
| S-0-1300.0.3 | Vendor code | 200 | - |
| S-0-1300.0.4 | Device name | AXL F BK S3 | - |
| S-0-1300.0.5 | Device ID | 2701686 | - |
| 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 | 2701686 | - |
| S-0-1300.0.12 | Serial number | xxxx... | - |
| S-0-1300.0.20 | Operational hours | - | h |
| S-0-1300.0.134 | FIBO version info | - | - |
| S-0-1300.x.1 | Component name | xxxx... | - |
| S-0-1300.x.2 | Vendor name | xxxx... | - |
| S-0-1300.x.3 | Vendor code | xxx | - |
| S-0-1300.x.4 | Device name | xxxx... | - |
| S-0-1300.x.5 | Device ID | xxxx... | - |
| S-0-1300.x.7 | Function revision | - | - |
| S-0-1300.x.8 | Hardware revision | - | - |

| IDN | Name | Default values | Unit |
|----------------|---|-------------------------|------|
| S-0-1300.x.9 | Software revision | - | - |
| S-0-1300.x.11 | Order number | xxxx... | - |
| S-0-1300.x.12 | Serial number | xxxx... | - |
| 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-0-1305.0.2 | Sercos current fine time | - | - |
| S-0-1320 | List of available energy modes | - | - |
| S-0-1321.0.6 | Power consumption | - | - |
| S-0-1322 | Procedure command change energy mode | - | - |
| S-0-1322.0.1 | List of supported command types | - | - |
| S-0-1322.0.2 | Command type selection for procedure command change energy mode | - | - |
| S-0-1322.0.3 | Target energy mode for procedure command change energy mode | - | - |
| S-0-1323.0.1 | Current energy mode | - | - |
| S-0-1500.0.1 | IO control | - | - |
| S-0-1500.0.2 | IO status | - | - |
| S-0-1500.0.3 | List of module type codes | - | - |
| S-0-1500.0.5 | Container output data | - | - |
| S-0-1500.0.9 | Container input data | - | - |
| S-0-1500.0.19 | Parameter channel receive | - | - |
| S-0-1500.0.20 | Parameter channel transmit | - | - |
| S-0-1500.0.23 | Local bus cycle time | - | µs |
| S-0-1500.0.32 | IO diagnostic message | - | - |
| S-0-1500.0.33 | Current IO diagnostic message | - | - |
| S-0-1500.0.128 | Local bus error continue mode | - | - |
| 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 in the UM DE SERCOS SYS user manual.

S-0-1050.x.1 (Connection setup)

The following connection types (bit 0 and 1 of IDN S-0-1050.x.1) are supported:

- Producer cycle, synchronous operation (clock synchronous, 00_{bin})
- Asynchronous operation without watchdog (non-cyclic type 2, 10_{bin})

S-0-1500.0.128 (Local bus error continue mode)

This IDN defines the behavior after a bus error.

- = 0: The data transfer is only started once the error has been removed and the S-0-0099 command has been executed.
- = 1: The data transfer is started automatically once the error has been removed.

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



For an overview of the PDI objects of a module, please refer to the module-specific data sheet.
 You can find further information on Sercos in the UM DE SERCOS SYS user manual.

13 Mapping method

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

In the bus coupler, these PDI objects are mapped to the manufacturer-specific parameters P-1-x.y.z.

This means that you have read and/or write access to the PDI objects via the manufacturer-specific parameters P-1-x.y.z.

P-1-x.y.z Sercos SVC/PDI 1:1 mapping

- x PDI index (decimal)
P-1-0001.y.z ... P-1-4096.y.z
 - y Module slot
Bus coupler: y = 0
1st module after the bus coupler: y = 1
:
63rd module after the bus coupler: y = 63
 - z Subindex
- Example: P-1-0010.15.0

13.1 Description of parameter P-1-x.y.z

Function

You can use this parameter to access PDI objects with index 0001_{hex} ... 1000_{hex}.

Attributes

| | |
|---------------|--|
| Length | Maximum number of elements is device-specific Current length variable |
| Format | Object-specific |
| Function | Parameter |
| Changeability | Yes |
| Executability | Communication phases CP2, CP3, CP4 |

After the IDN has been sent, the result is shown in the IDN.

13.2 Example: read PDI object

Read the order number of the first module after the bus coupler.

| | | |
|---|-------------------------|---|
| x | PDI index | 000A _{hex} = 0010 _{dec} |
| y | Module slot; 1st module | 1 |
| z | PDI subindex | 0 |

The parameter to be sent is P-1-0010.1.0.

The contents of the object are reported as the result in the IDN.

| Byte | Contents (hex) | Meaning |
|------|----------------|-------------------|
| 0 | 32 | Order No. 2688161 |
| 1 | 36 | |
| 2 | 38 | |
| 3 | 38 | |
| 4 | 31 | |
| 5 | 36 | |
| 6 | 31 | |
| 7 | 00 | Zero-terminated |

14 Tunnel method

14.1 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.20 Parameter channel transmit
Transferring data to the parameter channel via the service channel. The response is in S-0-15xx.y.19.

S-0-15xx.y.19 Parameter channel receive
Read the response via the service channel after transmitting IDN S-0-15xx.y.20.

y Module slot
1st module after the bus coupler: y = 1
:
63rd module after the bus coupler: y = 63



The parameters are described in the “Sercos system manual for I/O devices” user manual.

If a module is assigned to several function groups, the PDI objects can be read via each assigned function group.

14.2 Structure of IDN S-0-15xx.y.20

| Byte | Meaning |
|-------------|---------------------------------------|
| 0 | Service command code (high byte) |
| 1 | Service command code (low byte) |
| 2 | Parameter count (high byte) |
| 3 | Parameter count (low byte) |
| 4 | Reserved |
| 5 | Reserved (slot) |
| 6 | Subslot |
| 7 | Reserved |
| 8 | PDI object index (high byte) |
| 9 | PDI object index (low byte) |
| 10 | PDI object subindex |
| 11 | Amount of data to be written in bytes |
| 14 ... xxxx | Data to be written |

Command code

0041_{hex} Read PDI object
0042_{hex} Write PDI object

Parameter count

Number of following parameters in words

Reserved (slot)

It is not necessary to specify the slot number because it is taken from the IDN (y). If you enter a value that does not equal 00_{hex} in byte 5, this value is overwritten internally by the slot number specified by y.

Subslot

Specify a subslot if you wish to access a submodule (e.g., IO-Link). Not used at present (= 0).

PDI object index

See module-specific data sheet.

PDI object subindex

See module-specific data sheet.

See user manual, Sercos system manual for I/O devices.

Amount of data to be written in bytes

For command 0041_{hex}: 00_{hex}
For command 0042_{hex}: Amount of data to be written in bytes

Data to be written

For command 0041_{hex}: Not available
For command 0042_{hex}: Data to be written

14.3 Structure of IDN S-0-15xx.y.19

| Byte | Meaning |
|-------------|-------------------------------------|
| 0 | Service command code (high byte) |
| 1 | Service command code (low byte) |
| 2 | Parameter count (high byte) |
| 3 | Parameter count (low byte) |
| 4 | Reserved (copy) |
| 5 | Slot |
| 6 | Subslot (copy) |
| 7 | Reserved |
| 8 | PDI object index (high byte) (copy) |
| 9 | PDI object index (low byte) (copy) |
| 10 | PDI object subindex (copy) |
| 11 | Amount of data read in bytes |
| 12 | Error class |
| 13 | Error code |
| 14 ... xxxx | Read data or additional code |

Read data or additional code

Positive response

For command 0041_{hex}: Read data
 For command 0042_{hex}: Not available

Negative response

Byte 14, 15 Additional error code

Should an error occur, the error message details the error class, error code, and additional code. Potential errors are listed in the following table.

Command code

8041_{hex} Response to "Read PDI object"
 8042_{hex} Response to "Write PDI object"

Parameter count

Number of following parameters in words

... (copy)

Copy of request from IDN S-0-15xx.y.20

Amount of data read in bytes

For command 0041_{hex}: Amount of data read in bytes
 For command 0042_{hex}: 00_{hex}
 For an error: 00_{hex}

Error class, error code

= 0000_{hex}: No error; positive response
 ≠ 0000_{hex}: An error has occurred; negative response

Error messages

| Error class (hex) | Error code (hex) | Additional code (hex) | Meaning |
|-------------------|------------------|--|---|
| 00 | 00 | 0000 | No error |
| 05 | 02 | 0031 | Permissible length exceeded. Object cannot be read completely. |
| 06 | 02 | 00A2 | Hardware fault |
| | 03 | 0000 | Write and fetch not supported |
| 06 | 05 | 0000 | Inconsistent object attributes |
| | | 0011 | Subindex is not supported |
| | | 0012 | Code is not a request |
| | | 0013 | A reserved bit has been used |
| | | 0014 | Subslot not supported |
| | | 0015 | Read/write service type is not supported |
| | | 0016 | Index of request fetch service does not equal 0000 _{hex} |
| | | 0017 | Length for read or fetch service does not equal zero |
| | | 0018 | Length does not correspond to the object length which has been read from the EEPROM |
| | 0019 | Read only object cannot be overwritten | |
| | 07 | 0000 | Object does not exist |
| 08 | 01 | 0000 | Error writing the object |
| | | 00A2 | Error reading the object |
| 0F | 00 | 0000 | Error cannot be assigned |
| | 04 | 0000 | Inconsistent parameters |
| | 05 | 0000 | Invalid parameters |
| | 06 | 0000 | Access not supported |
| | 11 | 0000 | Invalid device |
| | 12 | 0000 | Timeout |
| | 21 | 0000 | Invalid slot number |
| | 22 | 0000 | Slot is not active |
| | 23 | 0000 | Invalid data length |
| | 24 | 0000 | Invalid parameter counter |

14.4 Example: read PDI object

Read the order number of the first module after the bus coupler.

Read request

In this example, the first module is a digital output module. Therefore, IDN S-0-1502.1.20 is used.

| Byte | Contents (hex) | Meaning | |
|------|----------------|---------------------------------------|----------------------|
| 0 | 00 | Code | Read PDI object |
| 1 | 41 | | |
| 2 | 00 | Parameter count | 4 words follow |
| 3 | 04 | | |
| 4 | 00 | Reserved | |
| 5 | 00 | | |
| 6 | 00 | Subslot | No subslot |
| 7 | 00 | Reserved | |
| 8 | 00 | PDI object index | 000A: order number |
| 9 | 0A | | |
| 10 | 00 | Subindex | No subindex |
| 11 | 00 | Amount of data to be written in bytes | Read, therefore = 00 |



Ensure that a write request always contains an even number of bytes. Top up with an additional byte if necessary. If you transmit an uneven number of bytes, you will receive a negative response with a corresponding error message.

Response

The result is stored in IDN S-0-1502.1.19.



The response always contains an even byte count. A byte with 00_{hex} is added if necessary in order to top up to an even byte number.

- Positive response

| Byte | Contents (hex) | Meaning | |
|------|----------------|------------------------------|---|
| 0 | 80 | Code | Response to "Read PDI object" |
| 1 | 41 | | |
| 2 | 00 | Parameter count | 9 words follow |
| 3 | 09 | | |
| 4 | 00 | Reserved | Copy |
| 5 | 01 | Slot | Slot (y from IDN) |
| 6 | 00 | Subslot | Copy |
| 7 | 00 | Reserved | Copy |
| 8 | 00 | PDI object index | Copy |
| 9 | 0A | | |
| 10 | 00 | PDI object subindex | Copy |
| 11 | 08 | Amount of data read in bytes | 8 bytes of read data |
| 12 | 00 | Result | No error |
| 13 | 00 | | |
| 14 | 32 36 | Read data | Order number (8 bytes, including zero termination) E.g., 2688161 |
| ... | 38 38 | | |
| 21 | 31 36 | | |
| | 31 00 | | |

- Negative response

| Byte | Contents (hex) | Meaning | |
|------|----------------|------------------------------|-------------------------------|
| 0 | 80 | Code | Response to "Read PDI object" |
| 1 | 41 | | |
| 2 | 00 | Parameter count | 6 words follow |
| 3 | 06 | | |
| 4 | 00 | Reserved | Copy |
| 5 | 01 | Slot | Slot (y from IDN) |
| 6 | 00 | Subslot | Copy |
| 7 | 00 | Reserved | Copy |
| 8 | 00 | PDI object index | Copy |
| 9 | 0A | | |
| 10 | 00 | PDI object subindex | Copy |
| 11 | 00 | Amount of data read in bytes | No data read |
| 12 | xx | Error class | Error message |
| 13 | xx | Error code | |
| 14 | xx | Additional error code | |
| 15 | xx | | |

15 Reset button

The reset button is located beneath the top marking label on the bus coupler.

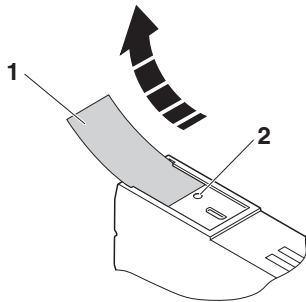


Figure 6 Reset button

- 1 Labeling field
- 2 Reset button

The reset button has two functions:

- Restarting the bus coupler
- Resetting of the default settings

15.1 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.

15.2 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 the reset 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.

16 Service interface

The service interface is located beneath the top marking field on the bus coupler.

The service interface is used for later applications.

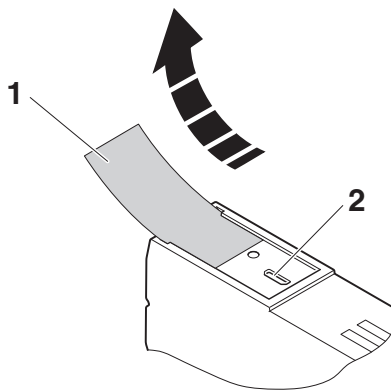


Figure 7 Service interface

- 1 Labeling field
- 2 Service interface

17 Startup

17.1 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.

17.2 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 and lengths of the input/output process data on the local bus are mapped to Sercos according to the Sercos profile.
- Local bus devices are not parameterized. The devices can be parameterized in CP2 or CP3.

By switching over the communication phases to CP3 and subsequently CP4, the Sercos master now has the possibility to accept this configuration for realtime operation unchanged or to make changes and to activate them before switching to CP3 via process command S-0-1500.0.12 (Rearrangement of IO resource).

17.3 Sending BootP requests

On startup, the bus coupler sends three BootP requests.

If it receives a BootP response, the new IP parameters (IP address, subnetwork mask) are saved.

If the bus coupler does not receive a response, it starts with the previous configuration.

A BootP server must be available to respond to a BootP request.

17.4 Modifying IP parameters

The following IDNs for IP parameters are implemented on the bus coupler:

| IP parameters | | Current IP parameters | | Default setting |
|---------------|-----------------|-----------------------|-------------------------|-----------------|
| S-0-1020 | IP address | S-0-1020.0.1 | Current IP address | 192.168.0.10 |
| S-0-1021 | Subnet mask | S-0-1021.0.1 | Current subnet mask | 255.255.255.0 |
| S-0-1022 | Gateway address | S-0-1022.0.1 | Current gateway address | 192.168.0.1 |

The default settings of the relevant IDNs are identical.

The bus coupler functions with the IP parameters stored in IDNs S-0-1020.0.1, S-0-1021.0.1, and S-0-1022.0.1

If you wish to modify one or more IP parameters, proceed as follows:

- Adjust the IP parameters in IDNs S-0-1020, S-0-1021, and S-0-1022.
- Execute procedure command S-0-1048 (Activate network settings).

In doing so, at the same time, all modified IP parameters are applied as current IP parameters and the bus coupler now functions with the modified settings.

18 Firmware update



NOTE: Potential damage to the device
 If the bus coupler is disconnected from the supply voltage during the firmware update, the bus coupler may be destroyed.

- Never disconnect the bus coupler from the supply voltage during the firmware update.



If you are using Windows 7 or Windows 8: Make sure that the "TFTP Client" check box is activated in the control panel under "Activate or deactivate Windows functions".

18.1 Firmware update according to Sercos specification

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 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 phoenixcontact.net/products.

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

- Save the current firmware update file to your PC.
- Rename the file c2701686.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> 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 c2701686.fw
```



The update file is transmitted as quickly as possible to the NRT to CP2 modes.
 The transmission is complete as soon as the next command line appears in the command console of your PC.

- 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 is automatically completed with a bus coupler restart.

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

LED states during firmware update

| RDY LED | Meaning |
|---------------------|--|
| Flashing yellow/red | Incorrect update file downloaded to bus coupler. |
| Yellow flashing | Firmware update is being performed. |
| Green ON | Device is ready for operation. |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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