AXL SE IOL4



Axioline Smart Elements, IO-Link master, IO-Link ports: 4

Data sheet
108986_en_14

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1 Description

You can integrate Axioline Smart Elements into systems with the Smart Element interface.
The IO-Link master enables the operation of up to four IO-Link devices. Alternatively, you can connect a standard digital sensor or actuator to each port.

Features

- Connection of 4 IO-Link devices
- Alternatively: connection of one digital sensor or actuator per port
- Connection of IO-Link devices in 3-conductor technology
- Connection of sensors in 3-conductor technology
- Connection of actuators in 2- and 3-conductor technology
- Parameter data storage on the master
- IO-Link specification V1.1.2
- Substitute value behavior of inputs and outputs can be parameterized for each port
- IOL-CONF supported
- Device rating plate stored

Use the following firmware versions to operate the IO-Link master on a bus coupler:

Type	Firmware version
AXL F BK PN TPS (XC)	≥ 1.31
AXL F BK EC	≥ 1.30
AXL F BK EIP (XC)	≥ 1.30
AXL F BK EIP EF	≥ 1.30
AXL F BK ETH (XC)	≥ 1.30
AXL F BK S3	≥ 1.35

The following bus couplers do not support operation of the IO-Link master:

- AXL F BK PN (XC)
- AXL F BK PB (XC)
- AXL F BK SAS

Use a PLCnext Control device to operate the IO-Link master in the Phoenix Contact automation system.

Observe these notes

This data sheet is only valid in association with the UM EN AXL SE SYS INST user manual.

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.com/product/1088132

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3 Ordering data

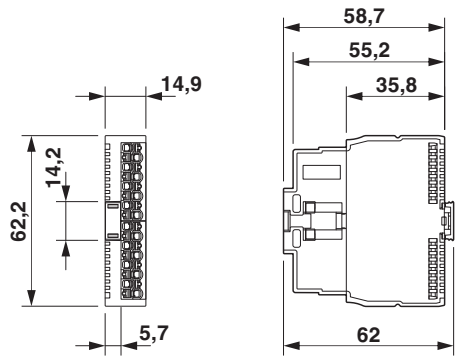
Description	Type	Item no.	Pcs./Pkt.
Axioline Smart Elements, IO-Link master, IO-Link ports Class A: 4, connection method: Push-in connection, connection technology: 3-conductor, degree of protection: IP20	AXL SE IOL4	1088132	1

Documentation	Type	Item no.	Pcs./Pkt.
User manual, English, Axioline Smart Elements	UM EN AXL SE SYS INST	-	-
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	-	-
Quick start guide, English, Startup of IO-Link masters and IO-Link devices with the IOL-CONF software	UM QS EN AXL F IOL CONF	-	-

Additional ordering data	
For additional ordering data (accessories), go to:	www.phoenixcontact.com/product/1088132

4 Technical data

Dimensions (nominal sizes in mm)



Width	14.9 mm
Height	62.2 mm
Depth	62 mm

General data	
Color	Housing: traffic grey A (RAL 7042)
Weight	37 g
Ambient temperature (operation)	-25 °C … 60 °C
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)
Overvoltage category	II (IEC 60664-1, EN 60664-1)
Degree of pollution	2 (IEC 60664-1, EN 60664-1)
Mounting type	Plug-in mounting (Smart Element slot)
Mounting position	See the system in which the Smart Element is used.

Do not use the Smart Element in an atmosphere that contains corrosive gas.

Connection data: I/O	
Connection method	Push-in connection
Conductor cross section, rigid	0.25 mm² … 1.5 mm²
Conductor cross section, flexible	0.25 mm² … 1.5 mm²
Conductor cross section [AWG]	24 … 16
Conductor cross section flexible, with ferrule with plastic sleeve	0.25 mm² … 1.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm² … 1.5 mm²
Stripping length	8 mm

Please observe the information provided on conductor cross sections in the “Axioline Smart Elements” user manual.

Interface: Smart Element interface	
Number of interfaces	1
Connection method	Card edge connector
Start time until ready to operate	< 500 ms

Communications power supply of the Smart Elements (U_{SE})	
Supply voltage	using card edge connectors
Current draw	See documentation for the system in which the Smart Element is used.

I/O supply (U_P) incl. IO-Link port supply	
Nominal supply voltage	24 V DC (using card edge connectors)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption	min. 18 mA (without connected peripherals) typ. 2020 mA max. 2030 mA (Internal current consumption + full load of the 4 IO-Link ports (4 x 500 mA))
Surge protection	See the system in which the Smart Element is used.
Reverse polarity protection	Polarity protection diode
Protection	See the system in which the Smart Element is used.
IO-Link ports: Class A	
Number of ports	4
Connection method	Push-in connection
Connection technology	3-conductor
IO-Link port supply L+	
Nominal voltage for I/O supply	24 V DC
Supply voltage range	18 V DC ... 30 V DC (including all tolerances, including ripple)
Nominal current for every IO-Link port	500 mA (at L+/L-) 200 mA (at C/Q)
Overload protection for L+	electronically limited to 0.6 A
Short-circuit protection for L+	by switching off after 55 ms
Power dissipation	
Maximum power dissipation for nominal condition	1.85 W
IO-Link ports in digital input (DI) mode	
Number of inputs	max. 4 (EN 61131-2 type 1)
Connection method	Push-in connection
Connection technology	3-conductor
Nominal input voltage	24 V DC
Nominal input current	typ. 2.5 mA
Sensor current per channel	max. 500 mA (from L+/L-)
Input voltage range "0" signal	-0.3 V DC ... 5 V DC
Input voltage range "1" signal	11 V DC ... 30 V DC
Input filter time	1 µs
Cable length	< 20 m (in accordance with IO-Link specification)

IO-Link ports in digital output (DO) mode	
Number of outputs	max. 4
Connection method	Push-in connection
Connection technology	2-, 3-conductor
Nominal output voltage	24 V DC
Nominal current per channel	200 mA
Cable length	< 20 m (in accordance with IO-Link specification)

Input and output address area	
Input address area	64 Byte
Output address area	64 Byte

The number of IO-Link devices you operate must be such that neither the sum of all input process data nor the sum of all output process data for the connected IO-Link devices exceeds 58 bytes.

Operate a maximum of eight IO-Link masters in an Axioline F station with the AXL F BK PN TPS (XC) PROFINET bus coupler.

Electrical isolation/isolation of the voltage areas	
Test section	**Test voltage**
Communications supply / 24 V supply (I/O)	500 V AC, 50 Hz, 1 min
Communications supply / functional ground	500 V AC, 50 Hz, 1 min
24 V supply (I/O) / functional ground	500 V AC, 50 Hz, 1 min

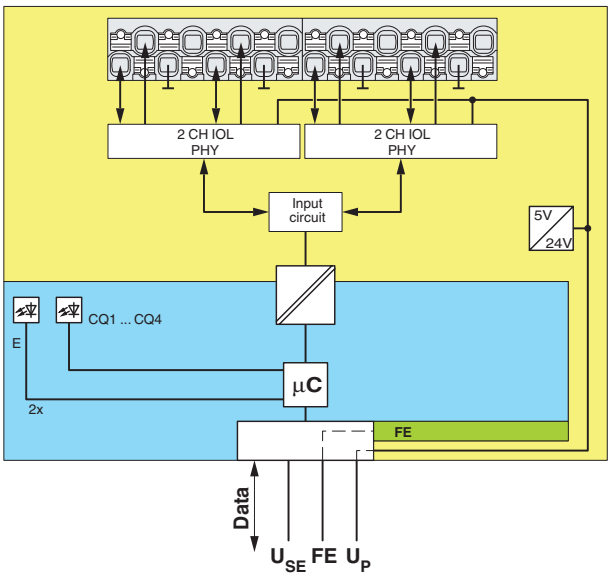
Mechanical tests	
Vibration resistance in accordance with EN 60068-2-6/IEC 60068-2-6	5g
Shock in accordance with EN 60068-2-27/IEC 60068-2-27	30g
Continuous shock in accordance with EN 60068-2-27/IEC 60068-2-27	10g

Conformance with EMC Directive 2014/30/EU	
Immunity test in accordance with EN IEC 61000-6-2	
Electrostatic discharge (ESD) IEC 61000-4-2	Criterion B, ±6 kV contact discharge, ±8 kV air discharge
Electromagnetic fields IEC 61000-4-3	Criterion A, Field intensity: 10 V/m
Fast transients (burst) IEC 61000-4-4	Criterion B, ±2 kV
Conducted interference IEC 61000-4-6	Criterion A, Test voltage 10 V
Noise emission test in accordance with EN IEC 61000-6-4	Class A

Approvals and manufacturer's declarations	
The latest documents can be found at:	www.phoenixcontact.com/product/1088132

5 Internal circuit diagram

Figure 1 Internal wiring of the terminal points



Key:

Data	Data transmission
U_{SE}	Communications power supply of the Smart Element
FE	Functional ground
U_P	I/O supply of the Smart Element
µC	Microcontroller
	Galvanic isolation for data
	LED
	Power supply unit
Input circuit	Input circuit
	Electrically isolated areas

6 For your safety

6.1 Intended use

Use Smart Elements exclusively in accordance with the specifications in the data sheet and the “Axioline Smart Elements” user manual.
Please also refer to the documentation for the system in which the Smart Elements are used.

If the equipment is used in a manner not specified, the protection provided by the equipment may be impaired.

6.2 Qualification of users

The use of products described in this data sheet is oriented exclusively to electrically skilled persons or persons instructed by them. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.

6.3 Installation

NOTE: Fire hazard

– The device must be installed in the final protective housing, which provides sufficient resistance to mechanical strain and protection against the spreading of fire in accordance with the standards UL/IEC/EN 61010-1 and UL/IEC/EN 61010-2-201.
– The external circuits intended to be connected to this device must be galvanically separated from mains supply or hazardous live voltage by reinforced or double insulation and meet the requirements of SELV/PELV (Class III) circuits in accordance with UL/CSA/IEC/EN 61010-1, UL/CSA/IEC/EN 61010-2-201.

6.4 Disconnecting or plugging in a Smart Element

NOTE: Damage to contacts or malfunction

Before performing work on a Smart Element, disconnect the power to the Smart Element.

This means:

- Disconnect the connected I/O devices from the power.
- Switch off the I/O supply voltage U_P!
- Switch off the communications power U_{SE}. For the system in which the Smart Element is used, this means the following: Switch off the voltage that generates the U_{SE}.

6.5 Strain relief

NOTE: Damage to the contacts

Physical overloads can result in damage to the terminal points.

- Relieve strain in the connected cables.

6.6 Locking a Smart Element

Make sure that each Smart Element is locked in its slot. This is only ensured if the unlocking mechanism has been pushed into the guide as far as it will go.

See “Axioline Smart Elements” user manual.

6.7 Applications with UL approval

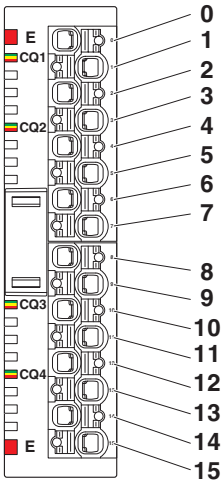
Information:

To install the device in accordance with UL/CSA/IEC standard, the following notes must be observed.

– Minimum temperature rating of the cables to be connected to the field wiring terminals:
  95 °C, AWG 24 ... 16
– Use copper conductors only.

7 Terminal point assignment as well as diagnostics and status indicators

Figure 2 Terminal point assignment as well as diagnostics and status indicators



7.1 Terminal point assignment

Terminal point	Assign-ment	Meaning	
0	C/Q1	IO-Link data transmis-sion channel	Port 1
1	L1+	IO-Link port supply	
2	L1-	Reference potential of the IO-Link port supply	
3	-	Not used	
4	C/Q2	IO-Link data transmis-sion channel	Port 2
5	L2+	IO-Link port supply	
6	L2-	Reference potential of the IO-Link port supply	
7	-	Not used	
8	C/Q3	IO-Link data transmis-sion channel	Port 3
9	L3+	IO-Link port supply	
10	L3-	Reference potential of the IO-Link port supply	
11	-	Not used	
12	C/Q4	IO-Link data transmis-sion channel	Port 4
13	L4+	IO-Link port supply	
14	L4-	Reference potential of the IO-Link port supply	
15	-	Not used	

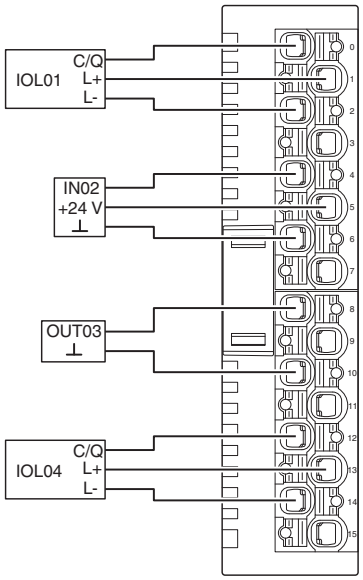
7.2 Local diagnostics and status indicators

Designation	Color	Description	
E	Red	Error	
		Off	No error
		Flashing (0.5 Hz)	Error in Smart Element Replace the Smart Element.
		Flashing (4 Hz)	Communication error Check whether the Smart Element has been plugged in correctly.
		On	I/O error Check the connected components and wiring. Remove the error.
CQ1 ... CQ4	Red/yellow/ green	Diagnostics/status of the IO-Link ports	
		Green on	In IO-Link operating mode: IO-Link communication present.
		Flashing green	In IO-Link operating mode: no IO-Link communication.
		Yellow on	In DI or DO operating mode: the digital input or output is set.
		Red on	Overload or short circuit on the L+/L- cable
			Overload or short circuit on the C/Q cable
		Off	In DI or DO mode: the digital input or output is not set.

See also “Diagnostic state (0018_{hex}: DiagState)” section, “Possible error codes” table.

8 Connection example

Figure 3 Connection example



In the connection example, two IO-Link devices are used which are operating in IO-Link mode.

Additionally, a digital sensor and a digital actuator are used in the example. They are being operated in DI and DO mode.

9 Process data

The process data is mapped in Motorola format (Big Endian).

If you use the Smart Element in an Axioline F station, note the following:

You can transmit a maximum of 64 bytes of process data per cycle in every direction via the Axioline F local bus. These 64 bytes consists of six bytes of master status data and a maximum of 58 bytes of device process data. Make sure that the sum of all input process data and the sum of all output process data for the connected IO-Link devices is a maximum total of 58 bytes. If the total process data exceeds 58 bytes, you will not be able to operate the master in this constellation. See “Arrangement of the input and output process data”.

9.1 IN process data

If the IO-Link master determines that the process data sent by the device is invalid, the last valid data received is retained in the process input data of the IO-Link master. The corresponding bit for the port is set to 0 in byte 1 (PD_VALID state).

9.1.1 Byte 0: status of the IO-Link connection for each IO-Link port

Per port, one bit displays whether a port that is to work in the IO-Link operating mode was able to establish contact with an IO-Link device.

For each bit in the byte: the bit is only active if the corresponding port is configured to the IO-Link operating mode. Otherwise the bit has no function (= 0).

Port state (COM status)								
Byte	**0**							
Bit	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Port	-	-	-	-	4	3	2	1

Value range

0 No IO-Link communication at this port.

1 IO-Link communication at this port (an IO-Link device has been detected/found).

9.1.2 Byte 1: status of the IO-Link input process data for each port

If a port was able to establish communication with an IO-Link device, one bit of each respective port displays whether valid process data was able to be read in via the IO-Link communication.

For each bit in the byte: the bit is only active if the corresponding port is configured to the IO-Link operating mode. Otherwise the bit has no function (= 0).

PD_VALID state								
Byte	**1**							
Bit	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Port	-	-	-	-	4	3	2	1

Value range

0 The IO-Link input process data at this port is not valid.

1 The IO-Link input process data at this port is valid (if COM status = 1).

9.1.3 Byte 2: status (level) of the C/Q cable for each IO-Link port

The bit is set under the following conditions:

Operating mode	Condition for setting the bit
DI	The input for the corresponding port is set.
IOL	The input of the corresponding port has been set **and** an IO-Link connection has not yet been established to the IO-Link device.

DI state at C/Q								
Byte	**2**							
Bit	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Port	-	-	-	-	4	3	2	1

Value range

0 Low Level < 8 V

1 High Level > 13 V

9.1.4 Byte 3 ... 5: reserved

Reserved	
Byte	**3 ... 5**
Contents	00_{hex} respectively

9.1.5 Byte 6 ... 63: input process data

Input process data (IN_58Bytes)	
Byte	**6 ... 63**
Contents	xx_{hex} respectively

These 58 bytes contain the input process data (user data) of the four IO-Link ports.

The process data length of the individual ports depends on the port parameterization (object 0041_{hex}: RefSubBus-Structure, desired sub-bus configuration). If the used data width is less than 58 bytes, the excess bytes will be set to 00_{hex}.

Input and output process data has a symmetrical structure (see “Arrangement of the input and output process data”).

9.2 OUT process data

9.2.1 Byte 0 ... 1: reserved

Reserved	
Byte	**0 ... 1**
	00_{hex} respectively

9.2.2 Byte 2: set point (level) of the C/Q cable for each IO-Link port

A port will only issue the status of the corresponding bits at pin C/Q as a digital switching signal if it is configured to the DO mode.

DO state at C/Q								
Byte	**2**							
Bit	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Port	-	-	-	-	4	3	2	1

Value range

0	Low	Level < 8 V
1	High	Level > 13 V

9.2.3 Byte 3 ... 5: reserved

Reserved	
Byte	**3 ... 5**
	00_{hex} respectively

9.2.4 Byte 6 ... 63: output process data (user data) of the IO-Link ports

Output process data (OUT_58Bytes)	
Byte	**6 ... 63**
Contents	xx_{hex} respectively

These 58 bytes contain the output process data (user data) of the four IO-Link ports.

The process data length of the individual ports depends on the port parameterization (object 0041_{hex}: RefSubBus-Structure, desired sub-bus configuration). If the used data width is less than 58 bytes, the excess bytes will be set to 00_{hex}.

Input and output process data has a symmetrical structure (see “Arrangement of the input and output process data”).

9.3 Arrangement of the input and output process data

From the point of view of Axioline F bus couplers: if the used data width for the input and output process data of the IO-Link ports is less than 58 bytes, the excess bytes will be set to 00_{hex}.

Inside the process data frame, the input and output process data of the IO-Link ports has a symmetrical start point. The input and output process data of a port is therefore identical in length.

From the Axioline F bus coupler perspective: if the connected IO-Link devices do not occupy the same quantity of input and output bytes in the process data, the missing byte will be set to the value 00_{hex}.

The data length of the individual ports depends on the parameterization of the relevant port. Parameterize the port via object 0041_{hex}, RefSubBusStructure (desired sub-bus configuration).

Example:

Port	Designation	Mode	Input process data in bytes	Output process data in bytes
1	P1	IO-Link	2	5
2	P2	DI		
3	P3	DO		
4	P4	IO-Link	7	0

Byte														
6	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**...**	**63**
IN process data (byte 6 ... 63)														
P1		00			P4							00	...	00
OUT process data (byte 6 ... 63)														
P1					00							00	...	00

P1 ... P4 Process data of ports 1 ... 4
00 Invalid data range, filled with 00_{hex}

In the case of error-free IO-Link mode for this example, the bytes for port status (COM status) and PD_Valid status contain the following:

	Bit	7	6	5	4	3	2	1	0
	Port	-	-	-	-	P4	P3	P2	P1
Input process data									
Byte 0	COM status	0	0	0	0	1	0	0	1
Byte 1	PD_Valid status	0	0	0	0	1	0	0	1
Byte 2	DI state at C/Q	0	0	0	0	0	0	X	0
Byte 3 ... 5	Reserved	0	0	0	0	0	0	0	0
Output process data									
Byte 0	Reserved	0	0	0	0	0	0	0	0
Byte 1	Reserved	0	0	0	0	0	0	0	0
Byte 2	DO state at C/Q	0	0	0	0	0	X	0	0
Byte 3 ... 5	Reserved	0	0	0	0	0	0	0	0

X State of the port (0 or 1)

10 Parameter, diagnostics and information (PDI)

10.1 PDI objects

The module has PDI objects. They are used to map parameters, diagnostic data, and information about the module. The PDI objects can be read and/or written acyclically.

You can find out how to access the PDI objects in the documentation for the bus coupler or the controller used.

The PDI objects necessary for operation are described in the following section.

You will find an explanation of the data types in the user manual UM EN AXL F SYS INST.

The following applies to all tables below:

Abbreviation	Meaning
Length in bytes	Maximum length of the elements in bytes
R	Read
W	Write
[x]	Number of elements in an array or record

Each visible string is terminated with a null terminator (00_{hex}). The length of a visible-string-type element is therefore at least one byte larger than the number of user data items.
If the number of user data items plus null terminator is smaller than the specified length of the element, the visible string will be populated with a null character (00_{hex}).

You will find detailed information on the PDI objects in the user manual UM EN AXL F SYS INST.

10.2 Retentive storage

The module has retentively (non-volatilely) and volatilely stored parameters.

Retentively stored parameters retain their values even after the module voltage is reset.

When the parameterization is reset (via object $002D_{hex}$), certain retentively stored parameters are reset to their default settings. You can find out which parameters are reset in the description for object $002D_{hex}$.

For writeable parameters, the following tables indicate whether they are stored retentively or volatilely.

A write operation to the module memory is only triggered if the value of at least one retentive parameter has been changed.

Due to the storage technology used, parameters that are stored retentively only allow a certain number of write access operations (typ. 100,000 to 1,000,000 times). **They are not suitable for being changed cyclically.**

NOTE: Damage to the Flash memory during cyclic write access

The flash memory is only designed for a limited number of write access operations.

- Make sure that write access operations are not performed too often and, in particular, are not performed cyclically.
- Note this behavior when programming function blocks.
- For systems with initial parameterization (e.g., PROFINET), avoid parameterization from the application program.

11 Standard objects

Index (hex)	Object name	Data type	Length in bytes	Rights	Meaning/contents		Retentive storage	
Device type								
0037	DeviceType	Octet string	8	R	Device type	0002 0040 0000 $1B06_{hex}$		
Diagnostics objects								
0018	DiagState	Record [11]	73	R	Diagnostic state			*
0019	ResetDiag	UINT8	1	R/W	Handling diagnostic messages			*
Objects for process data management								
0024	ResetCode	Array [4] of UINT16	8	R/W	Output substitute value behavior (PDOUT) in DO mode		Yes	*
0025	PDIN	Octet string	64	R	Input process data The structure corresponds to the representation in the "Process data" section.			
0026	PDOUT	Octet string	64	R	OUT process data The structure corresponds to the representation in the “Process data” section.			
Objects for device management								
002D	ResetParam	UINT8	1	R/W	Reset parameterization		No	*
Objects for modular devices								
0035	SubBusInfo	Record [5]	14	R	Sub-bus information			*
0036	ActSubBus-Structure	Array [4] of Records	40	R	Actual sub-bus configuration			*
0041	RefSubBus-Structure	Array [4] of Records	40	R/W	Desired sub-bus configuration		Yes	*
0042	ModuleStatus	Array [4] of Byte	4	R	Module status			*
0043	SubBusBe-haviour	Array [3] of UINT8	3	R	Behavior of the IO-Link master			*

The objects identified with * in the last column are described in more detail in the following sections.

The description of the other objects is to be found in the user manual UM EN AXL F SYS INST.

11.1 Diagnostics state (0018_{hex}: DiagState)

This object is used for a structured message of an error.

Read off all information via subindex 00 to receive all information on an error number. Access to individual elements of the object is not permitted.

A detailed description of the object is provided in user manual UM EN AXL F SYS INST.

Possible error codes

Element	02	03	04	08	0B			
Error	**Priority**	**Channel**	**Error code**	**Function group**	**Text**	**LED**		**Corrective**
	hex	**hex**	**hex**			**E**	**CQx**	
No error	00	00	0000	General	Status OK	○	○	
Overload or short circuit on the L+/L- cable	01	01 ... 04	2340	SubMa	Overload or short circuit (L+)	●	◑	Check the L+ cable of the port.
Overload or short circuit on the C/Q cable	01	01 ... 04	2344	SubMa	Overload or short circuit (C/Q)	●	◑	Check the C/Q cable of the port.
I/O supply voltage (U_P) is not present.	01	FF	3130	General	Supply missing (U_P)	●	○	Check the supply voltage.
Error in the Smart Element firmware	01	FF	6100	General	Firmware error, update required	●	◔	Replace the Smart Element.
Problem communicating with the Smart Element	01	FF	6130	General	Smart Element missing	✹	○	Check whether the Smart Element has been plugged in correctly. If the error is still present, replace the Smart Element.
Error in the parameter memory	01	FF	6320	General	Parameter error, repeat parameterization	●	◔	Error in the parameter memory. Parameterize the Smart Element.
No module found at a port configured as IO-Link (after 5 seconds following port configuration)	01	01 ... 04	A001	SubMa	IOL device missing	●	☼	Check if the IO-Link device is correctly connected. Check the cabling. Replace the IO-Link device.

Element	02	03	04	08	0B			
Error	**Priority**	**Channel**	**Error code**	**Function group**	**Text**	**LED**		**Corrective**
	hex	**hex**	**hex**			**E**	**CQx**	
Connected IO-Link device does not match IO-Link port configuration. For possible causes, refer to the table “Possible causes for specific error codes”.	01	01 ... 04	A002	SubMa	IOL device validation fault	●	◐	Check the desired and actual configuration. You can query the exact cause of the error via object 0714_{hex}.
IO-Link device at the port reports an event	01	01 ... 04	A010 AddValue: IO-Link device event error code	SubMa	IOL port [port number], qualifier 0x[qualifier code], code 0x[error code]	●	◐	
	02					○	○	
	83					○	○	
Configuration error on the device at the respective port. Data storage problem. For more detailed information, see object 0713_{hex} IOL_DS_-FaultState.	01	01 ... 04	A014	SubMa	IOL device datastorage fault	●	◐	You can query the exact cause of the error via object 0713_{hex}.
Communication error at the relevant port with the connected device. For possible causes, refer to the table “Possible causes for specific error codes”.	01	01 ... 04	A020	SubMa	IOL device communication fault	●	☼	

Key

Priority	00_{hex}	No error
	01_{hex}	Error
	02_{hex}	Warning
	83_{hex}	Information

Channel	00_{hex}	No error
	01_{hex}	Port 1
	...	...
	04_{hex}	Port 4
	FF_{hex}	Entire device

LED	○	Off
	●	On
	◑	Red on
	◐	Green on
	☼	Flashing green
		900 ms on, 100 ms off
	✹	Flashing (4 Hz)
	◔	Depends on the operating mode

Possible causes for specific error codes

Error code (hex)	Error	Possible cause
A002	Connected IO-Link device does not match IO-Link port configuration.	Parameterized IN or OUT process data length in object 0041_{hex}, RefSubBusStructure, is too small.
		Wrong device ID or vendor ID. For more detailed information, see object 0714_{hex}, IO_Port_FaultState.
A020	Communication error at the relevant port with the connected device.	Device is disconnected.
		Wire break on C/Q cable.
		No power at device.

Error code $A010_{hex}$

Error code (hex)	Error	Note
A010	IO-Link device at the port reports an event	In addition to error code $A010_{hex}$ in subindex 04, the error code of the IO-Link event is reported in subindex 09 (AddValue). For the meaning of this code, please refer to the IO-Link device documentation. The priority of error code $A010_{hex}$ is equivalent to the priority of the event reported by the IO-Link device.

11.2 Handling diagnostic messages (0019_{hex}: ResetDiag)

You can use this object to specify how the Smart Element should handle diagnostic messages.

Handling diagnostic messages	
Value (hex)	**Meaning**
00	**Permit all diagnostic messages (default)**
02	Delete all diagnostic messages that are still pending
06	Delete all diagnostic messages and do not permit new ones
Other	Reserved

11.3 Output substitute value behavior (PDOUT) in DO mode (0024_{hex}: ResetCode)

Use this object to parameterize the behavior of the Smart Element outputs in the event that process data is missing.

This substitute value behavior applies for the ports in DO mode.
Parameterize the substitute value behavior for the ports in IO-Link mode via object 0716_{hex}, IOL-ResetCode.

0024_{hex}: output substitute value behavior (PDOUT) in DO mode (read, write)			
Subindex (hex)	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT16	8	Read or write entire object.
01	UINT16	2	Substitute value behavior port 1
:	:	:	:
04	UINT16	2	Substitute value behavior port 4

Value range	
Value (hex)	**Meaning**
0000	**Output of 0 (default)**
0001	Output of 1
0002	Hold last value
Other	Reserved

11.4 Reset parameterization ($002D_{hex}$: ResetParam)

Use this object to reset certain parameters to the factory default settings (default values).

To reset the parameters, value 01_{hex} must be transferred during write access.

Reset the following parameters using this object:

Index (hex)	**Object name**	**Meaning**
Standard objects		
0024	ResetCode	Output substitute value behavior (PDOUT) in DO mode
0041	RefSubBusStructure	Desired sub-bus configuration
Application objects		
0700	IOL_PortDiag	IO-Link port diagnostics
0702	IOL_Vali_&_BackUp	Compatibility check and data storage behavior
0705	IOL_DevRespTimeout	ISDU device response timeout
0710	IOL_Datastorage_Dataset	Data for data storage
0716	IOL_ResetCode	IO-Link device substitute value behavior (PDOUT)
0717	IOL_ReplacementValue_PDIN	IO-Link substitute value behavior (PDIN)

11.5 Sub-bus information (0035_{hex}: SubBusInfo)

This object contains basic information on the connected sub-bus.

0035_{hex}: sub-bus information (read)					
Subindex	**Data type**	**Length in bytes**	**Meaning**		**Contents**
00	Record [5]	14	Sub-bus information		
01	Octet string	8	Sub-bus designation		IOL_01
02	Array [3] of UINT8	3	Field lengths in bytes in the objects for the actual configuration and the desired configuration of the sub-bus (objects 0036_{hex} and 0041_{hex})		
			Byte 0	Field length in bytes of “Device type”	6
			Byte 1	Field length in bytes of “PD IN length”	2
			Byte 2	Field length in bytes of “PD OUT length”	2
03	UINT8	1	Number of sub-bus modules currently connected = Number of entries in ActSubBusStructure For IO-Link masters: number of available IO-Link ports		4
04	UINT8	1	Last sub-bus device accessible via the cyclic process data channel, based on the desired configuration of the sub-bus (object 0041_{hex}) For IO-Link masters: number of available IO-Link ports		4
05	UINT8	1	Residual system		
			0	No residual system will be operated.	
			1	A residual system will be operated.	

No residual system will be operated

The actual configuration does not match the desired configuration (objects 0036_{hex} and 0041_{hex}).

All IO-Link ports can be operated as parameterized.

- All IO-Link devices have been detected and the parameterization matches the IO-Link device.
- Inactive ports, DI and DO (with L+, L-) are operating without errors.

A residual system will be operated

The option SubBusBehaviour.Remaining = ON is selected and one or more devices of the desired configuration (object 0041_{hex}) are not present in the actual configuration (object 0036_{hex}).

For ports in IO-Link mode:

- At the ports where the parameterization matches the IO-Link device:
  - The IO-Link output data is declared valid.
  - The IO-Link input data is marked as valid.
- At the ports where the parameterization does not match the IO-Link device:
  - The IO-Link output data is declared invalid.
  - The IO-Link input data is marked as invalid.

For ports in DI, DO or inactive mode:

- The ports can be operated.

11.6 Actual sub-bus configuration (0036_{hex}: ActSubBusStructure)

This object describes the active configuration (actual configuration) of the IO-Link master.

The IO-Link master reads the configuration directly from each connected IO-Link device. This active configuration (actual configuration) may differ from the configured desired configuration (0041_{hex}: RefSubBusStructure).

The object indicates how each IO-Link port is currently operating.

0036_{hex}: actual sub-bus configuration (read)				
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**	
00	Array [4] of Records	40	Read entire object.	
01	Record [3]	10	Actual sub-bus configuration device 1	
	Array [6] of UINT8	6	Device type	
			Byte 0	Operating mode of the port (port mode) 00_{hex}: IO-Link 01_{hex}: DI (behaves as a digital input, default) 02_{hex}: DO (behaves as a digital output) $0D_{hex}$: disabled Other: reserved
			Byte 1	Vendor ID (MSB) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 2	Vendor ID (LSB) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 3	Device ID (MSB) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 4	Device ID (...) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 5	Device ID (LSB) (IO-Link mode) 00_{hex} (other operating modes)
	UINT16	2	PD IN length Length in bits in the input process data channel	
			0 bit ... 256 bits 0 for DI, DO otherwise depends on the IO-Link device	
	UINT16	2	PD OUT length Length in bits in the output process data channel	
			0 bit ... 256 bits 0 for DI, DO otherwise depends on the IO-Link device	
...	...	...	...	
04	Record [3]	10	Actual sub-bus configuration device 4	

In the process image, the process data lengths (PD IN length, PD OUT length) are rounded up to byte lengths.

Example:
PD IN length = 5 bits
Process image = 1 byte

11.7 Desired sub-bus configuration (0041_{hex}: RefSubBusStructure)

This object can be used to read and write the desired configuration.

The desired configuration includes the specified port configuration and the IO-Link behavior of the IO-Link master in relation to the connected IO-Link devices.

When IO-Link mode is selected, you can parameterize the behavior of the IO-Link master in relation to the connected IO-Link devices.

0041_{hex}: desired sub-bus configuration (read/write)				
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**	
00	Array [4] of Records	40	Read or write entire object.	
01	Record [3]	10	Desired sub-bus configuration device 1	
	Array [6] of UINT8	6	Device type	
			Byte 0	Operating mode of the port (port mode) 00_{hex}: IO-Link 01_{hex}: DI (behaves as a digital input, default) 02_{hex}: DO (behaves as a digital output) $0D_{hex}$: disabled Other: reserved
			Byte 1	Vendor ID (MSB) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 2	Vendor ID (LSB) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 3	Device ID (MSB) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 4	Device ID (...) (IO-Link mode) 00_{hex} (other operating modes)
			Byte 5	Device ID (LSB) (IO-Link mode) 00_{hex} (other operating modes)
	UINT16	2	PD IN length Length in bits in the input process data channel	
			0 bit ... 256 bits 0 for DI, DO otherwise depends on the IO-Link device	
	UINT16	2	PD OUT length Length in bits in the output process data channel	
			0 bit ... 256 bits 0 for DI, DO otherwise depends on the IO-Link device	
...	...	...	...	
04	Record [3]	10	Desired sub-bus configuration device 4	

In the process image, the process data lengths (PD IN length, PD OUT length) are rounded up to byte lengths.

Example:
PD IN length = 5 bits
Process image = 1 byte

Type testing of the VendorID and DeviceID is only performed if 0702_{hex} is activated.

11.8 Module status (0042_{hex}: ModuleStatus)

The object indicates the current status of the individual IO-Link ports.

The object relates to the desired configuration (object 0041_{hex}).

0042_{hex}: module status (read)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read entire object.
01	UINT8	1	Status IO-Link port 1
:	:	:	:
04	UINT8	1	Status IO-Link port 4

Value range		
Bit	**Value**	**Meaning**
0	1	Port/IO-Link device reports an error.
1	1	Port/IO-Link device reports a warning.
2	1	Port/IO-Link device reports information.
3	0	Reserved
4	0	Reserved
5	0	Reserved
6	0	Device does not correspond to the desired configuration.
	1	Device corresponds to the desired configuration.
		(DI or DO always 1)
7	0	Device is not accessible.
	1	Device is accessible.
		(DI or DO always 1)

11.9 Behavior of the IO-Link master (0043_{hex}: SubBusBehaviour)

This object can be used to read the behavior of the IO-Link master. The behavior applies uniformly for all ports.

Example for an IO-Link system property:
In IO-Link mode, an IO-Link port continuously tries to establish the connection to an IO-Link device.
This is why the “Automatic restart” and “Enable residual system” parameters are permanently set to ON and cannot be changed. However, the residual system is only operated as long as the AXL SE IOL4 Smart Element is not destroyed (e.g., in the event of short circuit or overload).

0043_{hex}: behavior of the IO-Link master (read)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [3] of UINT8	3	Read entire object.
01	UINT8	1	Automatic startup
02	UINT8	1	Automatic restart
03	UINT8	1	Enable residual system

Value range			
Automatic startup	During automatic startup, the IO-Link master automatically starts up the IO-Link devices, without the desired configuration having been specified via object 0041_{hex}. Following startup of the IO-Link master, it can operate the ports in a number of different ways.		
	00_{hex}	**OFF (default)**	With configuration comparison. The desired configuration is interpreted as the target setting. IO-Link ports for which DI/DO mode has been specified via object 0041_{hex} start operating immediately. IO-Link ports for which IO-Link mode has been specified via object 0041_{hex} continuously try to establish an IO-Link connection. If the desired configuration and actual configuration match (objects 0036_{hex} and 0041_{hex}), the IO-Link devices are parameterized automatically, as necessary. Next, IOL PD IN is read and IOL PD OUT is written as “valid” (Operate and PD OUT Valid).
Automatic restart	If a port is parameterized accordingly, due to the IO-Link system properties (point-to-point connection) the IO-Link master always tries to re-establish an interrupted IO-Link connection. IO-Link ports parameterized as DI or DO behave like “normal” DI or DO.		
	01_{hex}	**ON (default)**	The IO-Link master attempts to start up the connected devices wherever possible.
Enable residual system	**01_{hex}**	**ON (default)**	The IO-Link master attempts to start up the connected devices wherever possible.

12 Application objects: objects specifically for the IO-Link master

Index (hex)	Object name	Data type	Length in bytes	Rights	Meaning/contents	Retentive storage
0700	IOL_PortDiag	Array [4] of UINT8	4	R/W	IO-Link port diagnostics	Yes
0702	IOL_Vali_&_BackUp	Array [4] of UINT8	4	R/W	Compatibility check and data storage behavior	Yes
0703	IOL_MasterCycletime	Array [4] of UINT8	4	R	IO-Link master cycle time	
0705	IOL_DevRespTimeout	Array [4] of UINT8	4	R/W	ISDU device response timeout	Yes
0710	IOL_Datastorage_ Dataset	Array [4] of Byte	8104	R/W	Data for data storage	Yes
0713	IOL_DS_FaultState	Array [4] of UINT16	8	R	Status of data storage	
0714	IOL_Port_FaultState	Array [4] of UINT8	4	R	Status of the IO-Link port	
0715	IOL_Port_Speed	Array [4] of UINT8	4	R	Communication rate of the IO-Link ports (COMRATE)	
0716	IOL_ResetCode	Array [4] of UINT16	8	R/W	IO-Link device substitute value behavior (PDOUT)	Yes
0717	IOL_Replacement Value_PDIN	Array [4] of UINT16	8	R/W	Input substitute value behavior (PDIN) in case of invalid IO-Link data	Yes

12.1 IO-Link port diagnostics (0700_{hex}: IOL_PortDiag)

This object can be used to enable or disable diagnostics of the ports.

0700_{hex}: IO-Link port diagnostics (read, write)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read or write entire object.
01	UINT8	1	IO-Link port diagnostics port 1
:	:	:	:
04	UINT8	1	IO-Link port diagnostics port 4

Value range		
Bit	**Value (hex)**	**Meaning**
Bit 0		IO-Link port diagnostics (only relevant in IO-Link mode)
	0	Disabled: ignore IO-Link device diagnostics (event).
	1 (default)	**Enabled: report IO-Link device diagnostics (event).**
Bit 1		Port alarm
	0	Disabled: ignore unexpected port state (overload or loss of IO-Link communication).
	1 (default)	**Enabled: report unexpected port state (overload or loss of IO-Link communication).**

12.2 Compatibility check and data storage behavior (0702_{hex}: IOL_Vali_&_BackUp)

This object can be used to set the degree of severity of the compatibility check and the data storage behavior for each IO-Link port.

The object is only relevant for ports in IO-Link mode.

0702_{hex}: compatibility check and data storage behavior (read, write)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read or write entire object.
01	UINT8	1	Compatibility check and data storage behavior port 1
:	:	:	:
04	UINT8	1	Compatibility check and data storage behavior port 4

Value range	
Value (hex)	**Meaning**
00	**No device test (default)**
01	Type compatible (V1.0)
02	Type compatible (V1.1)
03	Type compatible (V1.1) with backup and restore
04	Type compatible (V1.1) with restore
05 ... FF	Reserved

Note that when changing the parameter from value 03 or 04 to the value 00, 01, or 02, the data storage date stored in the IO-Link master will be deleted.

12.3 IO-Link master cycle time (0703_{hex}: IOL_MasterCycletime)

This object can be used to read the current cycle time (MasterCycleTime) for each IO-Link port.

If the port is parameterized for IO-Link mode, the value specifies the coded cycle time. See “IO-Link Interface and System Specification V1.1.2”, www.io-link.com.

If the port is parameterized for DI or DO mode, the value = 0.

0703_{hex}:IO-Link master cycle time (read)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read entire object.
01	UINT8	1	IO-Link master cycle time port 1
:	:	:	:
04	UINT8	1	IO-Link master cycle time port 4

Value range	
Value	**Meaning**
0	DI or DO mode
	No device connected or no IO-Link communication
xx	Coded cycle time of IO-Link communication. See “IO-Link Interface and System Specification V1.1.2,” www.io-link.com.

12.4 ISDU device response timeout (0705_{hex}: IOL_DevRespTimeout)

This object can be used to define the time limit for the every IO-Link port to respond to a service request, i.e., to start the response (ISDU device response timeout).
Unit: x 100 ms

The object is only relevant for ports in IO-Link mode.

0705_{hex}: ISDU device response timeout (read, write)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read or write entire object.
01	UINT8	1	ISDU device response timeout port 1
:	:	:	:
04	UINT8	1	ISDU device response timeout port 4

Value range	
Value	**Meaning**
Unit: x 100 ms	
50 … 255	Corresponds to 5 s … 25.5 s
50	**Corresponds to 5 s (default)**
Other	Reserved

Make sure that the time limit for the device is less than the time limit for the higher-level bus system.

12.5 Data for data storage (0710_{hex}: IOL_Datastorage_Dataset)

This object can be used to access the data for data storage.

The object is only relevant for ports in IO-Link mode.

A maximum of 2048 bytes of parameter data memory are available for an IO-Link device.
The master adds a 14-byte header, which contains the device ID.
In total, 2062 bytes can be stored in the master per IO-Link port.

You can access this data via a “domain variable”.

0710_{hex}: data for data storage (read, write)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
01	Array [2062] of UINT8	2062	Data storage port 1
:	:	:	:
04	Array [2062] of UINT8	2062	Data storage port 4

Structure of the data for data storage

Length of the data record	CRC32	Vendor ID	Device ID	Reserved	Function ID	Data storage contents
2 bytes	4 bytes	2 bytes	3 bytes	1 byte	2 bytes	2048 bytes

12.6 Status of data storage (0713_{hex}: IOL_DS_FaultState)

This object contains the status of data storage. The object is required for integration in Sercos.

The object is only relevant for ports in IO-Link mode.

0713_{hex}: status of data storage (read)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT16	8	Read entire object.
01	UINT16	2	Status of data storage port 1
:	:	:	:
04	UINT16	2	Status of data storage port 4

Value range		
Bit	**Value (hex)**	**Meaning**
Bit 0 ... 7		Status code
	00	No data storage error
	01	Identification error
	02	Error checking size
	03	Error checking upload
	04	Checksum error
	05	Upload error
	06	Download error
	07	Device data storage disabled
	08 ... FF	Reserved
Bit 8 ... 14		Reserved
Bit 15		Interpretation of bit 0 ... 7
	0	Standard
	1	Manufacturer-specific (bit 0 ... 7 defined by manufacturer)

12.7 Status of the IO-Link port (0714_{hex}: IOL_Port_FaultState)

The object indicates the status of the individual IO-Link ports.

The object is only relevant for ports in IO-Link mode.

0714_{hex}: status of the IO-Link port (read)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read entire object.
01	UINT8	1	Status port 1
:	:	:	:
04	UINT8	1	Status port 4

Value range		
Bit	**Value (hex)**	**Meaning**
Bit 0 ... 7		Status code
	00	No error
	01	IO-Link device missing
	02	Incorrect input process data length
	03	Incorrect output process data length
	04	Incorrect revision (actual: 1.0, target: 1.1)
	05	Incorrect revision (actual: 1.1, target: 1.0)
	06	Wrong vendor ID
	07	Wrong device ID
	08	Wrong serial number
	09 ... FE	Reserved
	FF	Unknown internal error

12.8 Communication speed of the IO-Link ports (0715_{hex}: IOL_Port_Speed)

The object indicates the communication speed (baud rate) of the IO-Link ports.

The object is only relevant for ports in IO-Link mode.

0715_{hex}: communication speed of the IO-Link ports (read)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT8	4	Read entire object.
01	UINT8	1	Speed port 1
:	:	:	:
04	UINT8	1	Speed port 4

Value range	
Value (hex)	**Meaning**
01	COM1 (4.8 kbps)
02	COM2 (38.4 kbps)
03	COM3 (230.4 kbps)
04 ... FF	Reserved

12.9 IO-Link device substitute value behavior (PDOUT) (0716_{hex}: IOL_ResetCode)

This object is used to parameterize the substitute value for the output process data for each channel in the absence of valid output process data.

This substitute value behavior applies for the ports in IO-Link mode.
Parameterize the substitute value behavior for the ports in DO mode via object 0024_{hex}, ResetCode.

0716_{hex}: IO-Link device substitute value behavior (read, write)			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of UINT16	8	Read or write entire object.
01	UINT16	2	IO-Link device substitute value behavior (PDOUT) port 1
:	:	:	:
04	UINT16	2	IO-Link device substitute value behavior (PDOUT) port 4

Value range	
Value (hex)	**Meaning**
0000	Output of 0 on all outputs of the IO-Link device
0001	Output of 1 on all outputs of the IO-Link device
0002	Hold last value
0010	**Apply substitute value of the connected IO-Link device (default)**
Other	Reserved

12.10 Input substitute value behavior (PDIN) in case of invalid IO-Link data (0717_{hex}: IOL_ReplacementValue_PDIN)

This object is used to parameterize the substitute value that is to be transmitted via the input process data in the event of an I/O error for each channel.

This substitute value behavior applies for the ports in IO-Link mode.

0717_{hex}: input substitute value behavior (PDIN) in case of invalid IO-Link data			
Subindex	**Data type**	**Length in bytes**	**Meaning/contents**
00	Array [4] of INT16	8	Read or write entire object.
01	UINT16	2	Input substitute value behavior (PDIN) in case of invalid IO-Link data port 1
:	:	:	:
04	UINT16	2	Input substitute value behavior (PDIN) in case of invalid IO-Link data port 4

Value range	
Value (hex)	**Meaning**
0000	**Set input value to zero value (default)**
0001	Set input value to upper final value
0002	Hold last value
Other	Reserved

13 Access to parameters of connected IO-Link devices

For parameterization of IO-Link devices, the IO-Link protocol uses ISDU (Index Service Data Unit) objects. These have an index and a subindex. A description of the supported ISDU objects can be found in the device-specific data sheet or the IODD (IO Device Description) for the IO-Link device.

The IO-Link master provides read and write access to ISDU objects of IO-Link devices. How access takes place depends on the higher-level system.

13.1 PROFINET

PLCnext Engineer

For operation on a controller from Phoenix Contact (PLCnext Control family), you can parameterize the IO-Link devices by integrating the associated device description file (IODD) in PLCnext Engineer (PROFINET startup).

Information on PLCnext Engineer can be found on the Internet at:

phoenixcontact.com/product/1046008

Parameterization via function blocks in PROFINET engineering tools (acyclic access)

Information on the engineering tool can be found in the corresponding manufacturer-specific documentation.

13.2 EtherCAT®, EtherNet/IP™, Modbus/TCP (UDP)

Acyclic access to ISDU objects of an IO-Link device via PDI channel from the IO-Link master

To address the connected IO-Link device, use the “Subslot” field for the channel number of the IO-Link master to which the IO-Link device is connected. You can enter the parameter information of the ISDU object (index, subindex, length, data) via the additional information for PDI access.

Information on PDI access can be found in the documentation for the bus coupler.

The documents can be found on the Internet at:

AXL F BK EC

www.phoenixcontact.com/product/2688899

AXL F BK EIP / ... XC / ... EF

www.phoenixcontact.com/product/2688394

www.phoenixcontact.com/product/1167192

www.phoenixcontact.com/product/2702782

AXL F BK ETH / ... XC

www.phoenixcontact.com/product/2688459

www.phoenixcontact.com/product/2701949

13.3 Sercos®

Acyclic access to ISDU objects of an IO-Link device via PDI channel from the IO-Link master

To address the connected IO-Link device, use the “Subslot” field for the channel number of the IO-Link master to which the IO-Link device is connected. You can enter the parameter information of the ISDU object (index, subindex, length, data) via the additional information for PDI access.

Acyclic access is referred to here as the tunnel method.

Information on PDI access can be found in the documentation for the bus coupler.

The documents can be found on the Internet at:

AXL F BK S3

www.phoenixcontact.com/product/2701686

Parameterization via function blocks in Sercos engineering tools (acyclic access)

Information on the engineering tool can be found in the corresponding manufacturer-specific documentation.

14 Device descriptions

The device is described in the device description files.
The device descriptions for controllers from Phoenix Contact are included in PC Worx and PLCnext Engineer, as well as in the corresponding service packs.
The device description files for other systems are available for download at www.phoenixcontact.com/products in the download area of the bus coupler installed.