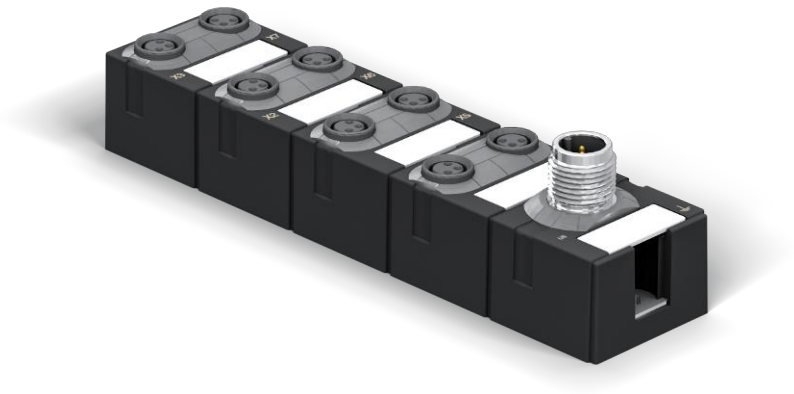
wenglor
the innovative family

Operating Instructions

EP8H002
IO-Link Hub for M8 × 1



EN

Translation of the original operating instructions
Subject to change without notice
Available as PDF file only
Version 1.0

Table of Contents

1 General

1.1 Information Concerning these Instructions

- These instructions make it possible to use the product safely and efficiently.
- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- Local accident prevention regulations and national work safety regulations must be complied with as well.
- The product is subject to further technical development, and thus the information contained in these operating instructions may also be subject to change. The current version can be found at www.wenglor.com in the product's separate download area.

INFORMATION

The operating instructions must be read carefully before using the product and must be kept on hand for later reference.

1.2 Explanation of Symbols

- Safety precautions and warnings are emphasized by means of symbols and signal words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:

SIGNAL WORD

Type and source of danger!

Possible consequences in the event that the hazard is disregarded.

→ Measures for averting the hazard.

The meanings of the signal words, as well as the scope of the associated hazards, are listed below:

⚠ DANGER

This signal word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.

⚠ WARNING

This signal word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.

⚠ CAUTION

This signal word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.

NOTICE

This signal word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.

INFORMATION

Information draws attention to useful tips and suggestions, as well as information on efficient, error-free use.

1.3 Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art technology, as well as applicable standards and guidelines. Subject to change without notice.
- A valid declaration of conformity can be accessed at www.wenglor.com in the product's separate download area.
- wenglor sensoric elektronische Geräte GmbH (hereinafter referred to as "wenglor") excludes all liability in the event of:
  - Non-compliance with the instructions
  - Use of the product for purposes other than those intended.
  - Use by untrained personnel.
  - Use of unapproved spare parts.
  - Unapproved modification of products.
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wenglor assumes no liability for printing errors or other inaccuracies contained in these operating instructions unless wenglor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.

1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

2 For Your Safety

2.1 General Safety Precautions

Specialist Personnel

Only qualified and safety-technically instructed personnel may install, commission and operate the device.

Target Group

This document is intended for specialists in automation technology.

NOTICE

Insofar as they are not described in this document, interventions in the hardware and software of the device may only be carried out by specialist personnel of wenglor sensoric GmbH.

NOTICE

The operating instructions must be available at all times to the operator of the machine on which the device is used.

2.2 Use for Intended Purpose

The product is designed and manufactured for:

- Industrial use.
- Operation within the specified ambient conditions.
- Use in the field.

NOTICE

When the device is used in a residential or mixed-use area, radio interference may occur.

→ Observe applicable standards for the residential or mixed-use area!

Foreseeable Misuse

- Do not make any structural, technical or electrical modifications to the device.
- Only use the device within the ranges described in this manual, the technical data and the operating instructions.
- Do not use the device as a safety-related device. It does not comply with the relevant standards. Safety functions of the system are not guaranteed.
- Only use the device in the appropriate IP-protected environment.
- Clean only with oil-free compressed air and a leather cloth.
- Do not use the device as a climbing aid.

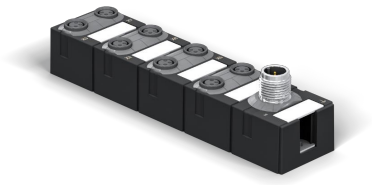
Warranty and Liability

Warranty and liability claims are forfeited if:

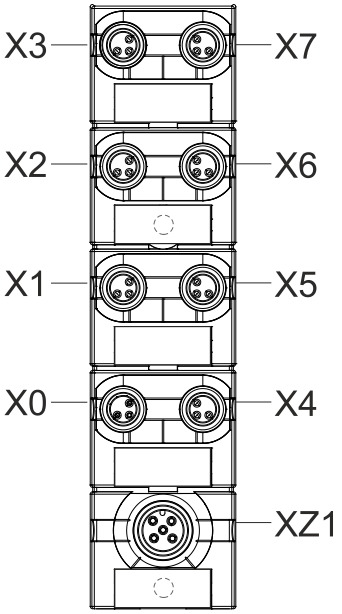
- the product is not used as intended,
- damage is due to failure to observe the operating instructions,
- the personnel was/is not competent.

3 Description

- IO-Link hub in 30 mm plastic housing
- 1 × M12 IO-Link Class A
- 8 × M8 I/O
- 8 configurable digital inputs/outputs



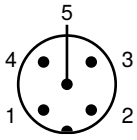
3.1 Device Configuration

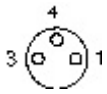


Port designation	Explanation
X0 ... X7	Digital inputs and outputs US
XZ1	Device supply, IO-Link Class A

3.2 Pin Assignments

3.2.1 IO-Link Class A

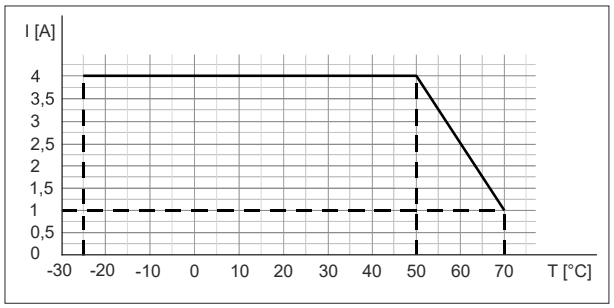
IO-Link	XZ1 (M12 plug)	
	Pin 1	24 V ⎓ US (L+)
	Pin 2	n. c.
	Pin 3	0 V US (L-)
	Pin 4	C/Q IO-Link
	Pin 5	n. c.

DIO	X0 ... X7 (M8 sockets)	
	Pin 1	24 V ⎓ US
	Pin 3	0 V US
	Pin 4	DIO US

4 Technical Data

Electrical Data		
Device Power Supply		
Operating voltage US		24 V ⎓
Operating voltage range US		18...30 V ⎓
Total current US	≤ 50 °C (see derating)	≤ 4 A
Idle current consumption		≤ 40 mA
Electrical isolation		No

Total Current US



IO-Link		
Communication speed		COM3
Transmission speed		230,400 bit/s
Bus protocol		IO-Link V1.1.2, compatible with IO-Link V1.1.3
IO-Link cycle time		≥ 1 ms
VendorID		0x0057
DeviceID		0x0C0005
Process data		2 bytes (inputs), 2-byte (outputs)
Sensor Power Supply		
Plug/socket		M8
Operating voltage		24 V ⎓
Power Supply	Pro 2 Ports (X0+X1, X2+X3, X4+X5, X6+X7)	≤1 A
Input (DI)		
Plug/socket		M8
Cable cross section		≤ 0.75 mm²
Cable length		≤ 30 m
Input characteristics	EN 61131-2	Type 1 + Type 3
Input filter		1 ms
Output (DO)		
Plug/socket		M8
Cable cross section		≤ 0.75 mm²
Cable length		≤ 30 m
Output current	Per pin	≤ 0.5 A
Switching frequency	Resistive load	≤ 25 Hz

Ambient Conditions		
Climatic Conditions		
Operating temperature		–25 °C...+70 °C
Storage temperature		–40 °C...+85°C
Installation altitude	Above normal height	≤ 3,000 m
Relative humidity		≤ 95%
Mechanical Characteristics		
Vibration testing	EN 60068 Part 2-6	5...500 Hz; const. Amplitude 1 mm; Acceleration 15 g
Shock test	EN 60068 Part 2-27	50 g @ 11 ms
Electric Safety		
Degree of protection	The IP rating is not included in the UL approval	IP 68
Protection class		III
Pollution degree		2
EMC Interference Emission		
Radio interference field strength	EN 61000-6-4 Emission	QP: 40 dBµ V/m @ 30...230 MHzQP: 47 dBµ V/m @ 230...1000 MHz
EMC Interference Immunity		
Discharge of static electricity (housing)	EN 61000-4-2	± 4 kV @ contact ± 8 kV @ air
High-frequency electromagnetic fields (housing)	EN 61000-4-3 RF field	10 V/m
Fast transient electrical disturbances (burst) DC inputs/outputs	EN 61000-4-4	± 2 kV I/O supply ± 1 kV data line/ ± 1 kV I/O line
Magnetic field	EN 61000-4-8	30 A/m @ 50 Hz
Conducted disturbances, high frequency fields	EN 61000-4-6, asymmetric	10 V

Protection		
Equipment Protection		
Overvoltage protection		Yes
Overload protection device supply	To be ensured by load circuit monitoring	Yes
Reverse polarity protection device supply		Yes
Short-circuit protection sensor supply		Electronic
Short-circuit protection output (DO)		Electronic
Protective circuit input	Internal	Suppressor diode

Mechanical Data		
Mounting Data		
Weight	Net	200 g
Dimensions	L x W x H	126 × 50 × 34.5 mm

Product Reliability		
Product Reliability		
MTTF	SN 29500 (at 40 °C and rated data)	57 years

Conformity, Approvals		
Conformity, approvals		
Product standard	EN 61131-2 Programmable logic controllers part 2	Compliant
CE	2014/30/EU 2011/65/EU	Compliant
UKCA		Compliant
EMC	2014/30/EU	Compliant
REACH	No. 1907/2006	SVHC List
WEEE	2012/19/EU	Compliant
ULus		E201820
RoHS	2011/65/EU & 2015/863	Exception 6c&7a
China RoHS	SJ/T 11364-2014	25 EPUP

5 Installation

5.1 Prerequisites

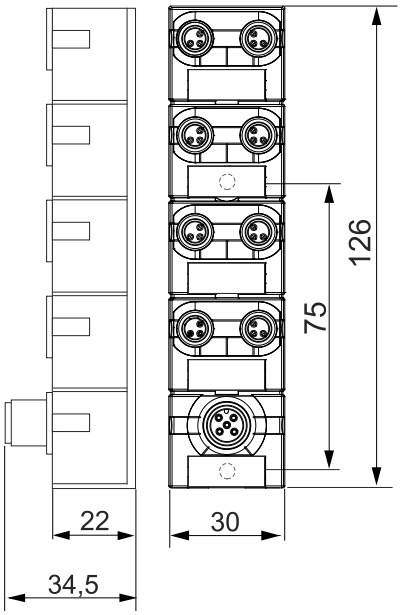
Prerequisites for installation:

- Flat mounting surface for mechanically stress-free mounting.
- Provide suitable grounding.
- Suitable installation location with regard to vibration and shock load, temperature and humidity (see section 4 “Technical Data”).
- Protected to prevent the connection cables from being torn off by personnel or equipment.

Establish the following prerequisites for mounting the device:

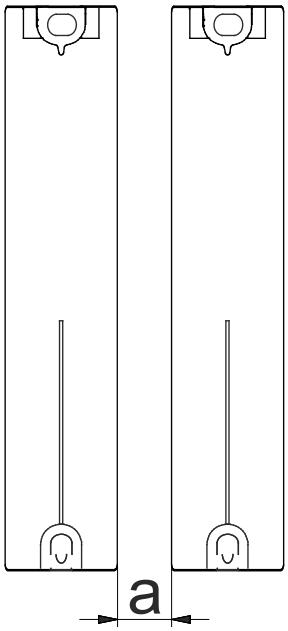
- Installation location in the immediate vicinity of the sensor/actuator
- Flat mounting surface for mechanically stress-free mounting
- Grounded mounting surface for grounding the ring cable lug
- Short cable paths to all components
- Sufficient space for easy device replacement and for connecting the plug connections
- Suitable installation location with regard to vibration and shock load, temperature and humidity (see section Technical Data)
- Protected to prevent tearing of the connection lines by personnel or equipment
- Diagnostic LEDs of the device visible during operation

5.2 Dimensions



Dimensions specified in mm (1 mm = 0.03937")

5.3 Mounting Clearance



a = straight plug: 5 mm

Angled plug: 50 mm

NOTICE

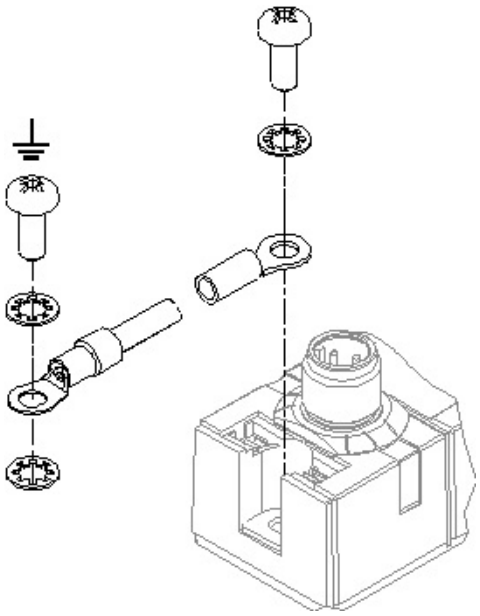
A minimum distance of 50 mm must be maintained when using angled plugs.

5.4 Functional Earth

The use of the ring cable lug is necessary for EMC compliance.

The screen connection of the input and output sockets takes place via the ring cable lug.

FE Connection



M4 tightening torque 2 Nm

5.5 Mounting the Unit

NOTICE

Material damage due to incorrect installation.

The mounting screws and tightening torques depend on the subsurface of the installation site.

1. Use mounting screws according to the condition of the mounting surface.
2. Tighten the screws carefully. The specified tightening torques must be observed.

NOTICE

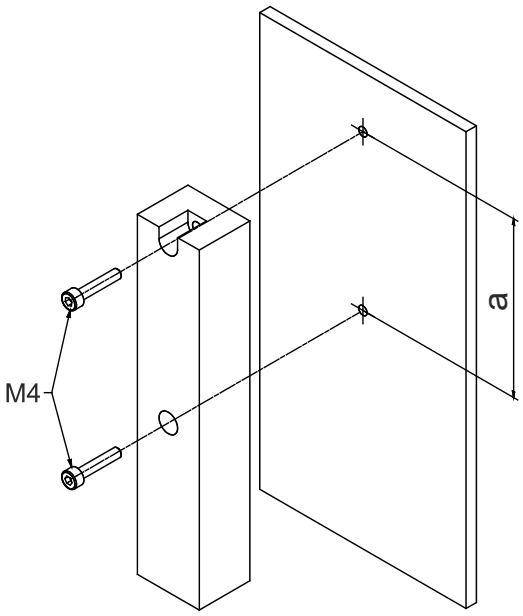
Material damage due to misuse.

Do not use the equipment as a climbing aid. Misuse may cause the devices to tear off or otherwise be damaged.

→ Mount the devices in such a way that they cannot be used as climbing aids.

Mounting

Installation with two M4 mounting screws



Distance between mounting screws:

a = 75 mm

M4 tightening torque 2 Nm

Mounting

Mount the device in the specified order:

1. Align the housing.
2. Fasten the ring cable lug with a conductive screw (see section Functional ground [▶ 14]).
3. Slightly tighten one M4 screw.
4. Slightly tighten the second M4 screw.
5. Tighten the two M4 screws according to the torque.

6 Installation

⚠ WARNING

High electrical voltages

Danger to life due to electric shock.

1. Only qualified personnel are allowed to connect the device.
2. Observe the five safety rules for electrical engineering.

Protective Measures During Connection

→ According to IEC 60364 – Protection against electric shock.

⚠ CAUTION

Hot interface

Burns and cable damage when touching the devices.

1. Wear heat-resistant gloves.
2. Only use lines with a temperature resistance of at least 80 °C.

6.1 Connection Lines

⚠ WARNING

Risk of fire due to short circuit!

Supply lines and/or devices damaged by a short circuit can overheat and cause fires!

→ Provide intelligent current monitoring or fuse.

NOTICE

The cable length of the sensor and actuator cables is limited to 30 m.

6.2 Ensure Tightness

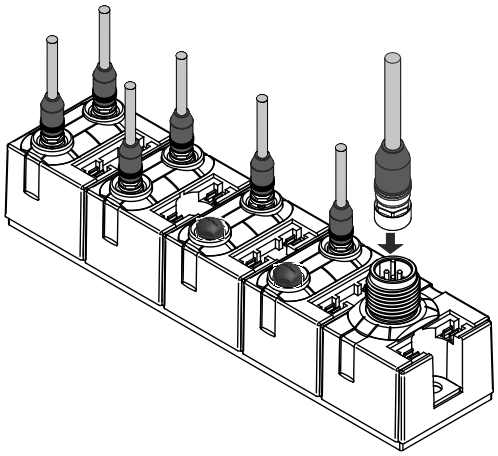
NOTICE

Damage to the device and device failure due to ingress of liquids.

The degree of protection is only guaranteed if all connections are closed with plug connectors, locking screws or caps.

→ Seal unused plugs and sockets.

Connection Lines



M12 connection cables tightening torque 0.6 Nm
M8 connection cables tightening torque 0.4 Nm

7 Operation

NOTICE

After writing an application specific tag to the IO-Link hub, the hub briefly interrupts the IO-Link connection if the text is different from the text stored in the hub.

7.1 LED Display

The products are equipped with the following separate LED indicators:

- LED display IO-Link and sensor supply US
- LED display for inputs/outputs

Displays include static illumination and blinking LEDs.

7.1.1 LED Display US and IO-Link

The device has a combined LED for the IO-Link status and the US sensor supply status. This can result in a mixture of green and red flashing codes (orange flashing code in the case of overlay).

Combined LED Display IO-Link and US

LED display	LED status	Description
Green	Continuous light	IO-Link not in OPERATE status, no cyclic data communication; Sensor power supply OK
Green	Flashing **1 Hz**	IO-Link in OPERATE status, cyclic data communication; Sensor power supply OK
Red	Continuous light	Short circuit DO, temperature warning, etc.
Red	Flashing **1 Hz**	IO-Link communication error
Off		Device off, no IO-Link connection

Firmware Update

LED display	LED status	Description
Green	Continuous light	IO-Link in IDLE status, Firmware update successfully completed
Green	Flashing **1 Hz**	IO-Link in PREOPERATE/OPERATE status, Update not yet being carried out
Red	Continuous light	Update not successful
Green/Red	Flashing **2 Hz**	IO-Link in PREOPERATE/OPERATE status, Update is carried out

Off		Device off, no IO-Link connection

NOTICE

At US <18 V, fault-free operation is no longer guaranteed.

7.1.2 LED Display for Inputs and Outputs

LED Display for Digital Inputs/Outputs

LED display	LED status	Voltage at input	Description	Logic value
Yellow	Continuous light	24 V	Channel on	1
Red	Continuous light	0 V	Short circuit or overload DO	0
Off		0 V	Device off or firmware update in progress	0

Input or Output Error

If an error occurs at at least one input or output, the LEDs light up red at all input and output slots.

7.2 IO-Link Object Directory

7.2.1 DPP (Direct Parameter Page)

ISDU index	DPP index	Object name	Access	Length in bytes	Meaning/default value
Identification					
0x0000	0x00	MasterCommand	W	1	
	0x01	MasterCycleTime	R/W	1	
	0x02	MinCycleTime	R	1	
	0x03	M-sequenceCapability	R	1	
	0x04	RevisionID	R/W	1	
	0x05	ProcessDataIn	R	1	
	0x06	ProcessDataOut	R	1	
	0x07	VendorID 1 (MSB)	R	1	0x0057
	0x08	VendorID 2 (MSB)	R	1	
	0x09	DeviceID 1 (Octet 2, MSB)	R/W	1	0x00
	0x0A	DeviceID 1 (Octet 1, MSB)		1	0x00
	0x0B	DeviceID 1 (Octet 0, LSB)		1	0x34
	0x0C	FunctionID 1 (MSB)	R	1	
	0x0D	FunctionID 2 (LSB)		1	

ISDU index	DPP index	Object name	Access	Length in bytes	Meaning/default value
	0x0E	Reserved	R	1	
	0x0F	SystemCommand	W	1	
0x0002		SystemCommand	R	1	
0x0003		DataStorageIndex	R	variable	
0x000D		ProfileCharacteristic	R	variable	
0x000E		PDInputDescriptor	R	variable	
0x000F		PDOutputDescriptor	R	variable	
0x0010		VendorName	R	64	wenglor
0x0011		VendorText	R	64	the innovative family
0x0012		ProductName	R	64	EP8H002
0x0013		ProductID	R	64	EP8H002
0x0014		ProductText	R	64	IO-Link Hub M8 Basic Firmware Edition: 2 Byte IN / 2 Byte Out
0x0015		SerialNumber	R	16	Consecutive serial number set in production
0x0016		HardwareRevision	R	64	e.g. “01.00”
0x0017		FirmwareRevision	R	64	e.g. "V.1.00.00"
0x0018		ApplicationSpecific-Tag	R	16...32	User-specific designation e.g. “System 3 / Port 4”
0x0019		FunctionTag	R	32	
0x001A		LocationTag	R	32	
Diagnosis					
0x0020		Error Count	R	2	
0x0024		DeviceStatus	R	1	0: Device is operating properly 1: Maintenance Required 2: Out of Specification 3: Functional Check 4: Failure 5 ... 255: Reserved
0x0025		DetailedDeviceStatus	R	variable	6 x (Octet 1: EventQualifier, Octet 2, 3: EventCode)
0x0028		ProcessDataInput	R	PD length	
0x0029		ProcessDataOutput	R	PD length	
0x0031 ... 0x003F		Reserved for profiles	R		

7.3 Diagnosis

7.3.1 Vendor-Specific IO-Link Events

NOTICE

In addition to the vendor-specific IO-Link events listed here, the standard events of the IO-Link specification also apply.

Event code	Type	Description	Corrective measure
0x4000	Error	Temperature error	Overload
0x4210	Warning	Permissible device temperature exceeded	Localize heat source
0x4220	Warning	Permissible device temperature not reached	Device insulation
0xFF91	Notification	Data storage (DS) upload from master required	Perform DS upload
0x5100	Error	General supply voltage fault (UL1)	Check availability
0x5110	Warning	Overvoltage in main supply (UL1)	Check permissible voltage range
0x5111	Warning	Undervoltage in the main supply (UL1)	Check permissible voltage range
0x1830	Warning	Overvoltage in the secondary supply (UL2)	Check permissible voltage range
0x1831	Warning	Undervoltage in the secondary supply (UL2)	Check current consumption of connected consumers
0x1832	Error	Fault in secondary voltage (UL2)	Check current consumption of connected consumers
0x7710	Error	Short circuit	Check installation
0x8CA0	Error	Overload/short circuit of the DIO pin – Port 0 Pin 4	Check installation
0x8CA1	Error	Reserviert	-
0x8CA2	Error	Overload/short circuit of the DIO pin – Port 1 Pin 4	Check installation
0x8CA3	Error	Reserviert	-
0x8CA4	Error	Overload/short circuit of the DIO pin – Port 2 Pin 4	Check installation
0x8CA5	Error	Reserviert	-
0x8CA6	Error	Overload/short circuit of the DIO pin – Port 3 Pin 4	Check installation
0x8CA7	Error	Reserviert	-
0x8CA8	Error	Overload/short circuit of the DIO pin – Port 4 Pin 4	Check installation
0x8CA9	Error	Reserviert	-
0x8CAA	Error	Overload/short circuit of the DIO pin – Port 5 Pin 4	Check installation
0x8CAB	Error	Reserviert	-
0x8CAC	Error	Overload/short circuit of the DIO pin – Port 6 Pin 4	Check installation
0x8CAD	Error	Reserviert	-
0x8CAE	Error	Overload/short circuit of the DIO pin – Port 7 Pin 4	Check installation
0x8CAF	Error	Reserviert	-

Event code	Type	Description	Corrective measure
0x8CD0	Error	Overload/short circuit of sensor supply Port 0 Pin 1	Check installation
0x8CD1	Error	Overload/short circuit of sensor supply Port 1 Pin 1	Check installation
0x8CD2	Error	Overload/short circuit of sensor supply Port 2 Pin 1	Check installation
0x8CD3	Error	Overload/short circuit of sensor supply Port 3 Pin 1	Check installation
0x8CD4	Error	Overload/short circuit of sensor supply Port 4 Pin 1	Check installation
0x8CD5	Error	Overload/short circuit of sensor supply Port 5 Pin 1	Check installation
0x8CD6	Error	Overload/short circuit of sensor supply Port 6 Pin 1	Check installation
0x8CD7	Error	Overload/short circuit of sensor supply Port 7 Pin 1	Check installation

7.4 Process Data

7.4.1 Port-Based Mapping

Process Data Digital Inputs

Byte 0 inputs X0...X3

Bits	Contact
7	Reserved
6	Pin4_X3
5	Reserved
4	Pin4_X2
3	Reserved
2	Pin4_X1
1	Reserved
0	Pin4_X0

Byte 1 inputs X4...X7

Bits	Contact
7	Reserved
6	Pin4_X7
5	Reserved
4	Pin4_X6
3	Reserved
2	Pin4_X5
1	Reserved
0	Pin4_X4

Process Data Digital Outputs

Byte 0 outputs X0...X3

Bits	Contact
7	Reserved
6	Pin4_X3
5	Reserved
4	Pin4_X2
3	Reserved
2	Pin4_X1
1	Reserved
0	Pin4_X0

Byte 1 outputs X4...X7

Bits	Contact
7	Reserved
6	Pin4_X7
5	Reserved
4	Pin4_X6
3	Reserved
2	Pin4_X5
1	Reserved
0	Pin4_X4

8 Maintenance Instructions

NOTICE

This wenglor product is maintenance-free.

Cleaning and inspection of the plug connections at regular intervals are advisable.

Do not clean the product with solvents or cleaning agents that could damage the product.

The product must be protected against contamination during initial start-up.

9 Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

10 Declarations of Conformity

Declarations of conformity can be found on our website at www.wenglor.com in the product's separate download area.