



## Operating Manual

**CH50I.M12**  
IO-Link Hub

**EN-US**

# 1 About this document

## 1.1 Purpose and scope of application

This document instructs the technical staff of the machine manufacturer or machine operator on the safe use of the described devices.

It does not include instructions on the safe use of the machine in which the devices are integrated. Information on this is found in the operating manual of the machine.

- Read this chapter carefully before you start working with the device.
- Study the documentation carefully before device commissioning.
- Store the manual in a place that is accessible to all users at all times for the entire service life of the device.



Understanding the present manual requires general knowledge about automation technology. In addition, planning and using automation systems requires technical knowledge which is not included in this manual.

## 1.2 Labels in this manual

| Identifier            | Usage  | Example   |
|-----------------------|--|---|
| <i>Dialog element</i> | Indicates dialog elements.                   | Click the <b>OK</b> button.                               |
| <i>Unique name</i>    | Indicates the names of products, files, etc. | <i>Internet Explorer</i> is not supported in any version. |
| Code                  | Indicates entries.                           | Enter the following IP address:<br>192.168.0.250          |

## 1.3 Warnings in this manual

Warnings draw attention to potential personal injury or material damage. The warnings in this manual indicate different hazard levels:

| Symbol  | Warning term   | Explanation   |
|---|----------------|---|
|  | <b>DANGER</b>  | Indicates an imminent potential danger with high risk of death or serious personal injury if not being avoided. |
|   | <b>WARNING</b> | Indicates potential danger with medium risk of death or (serious) personal injury if not being avoided.         |
|   | <b>CAUTION</b> | Indicates a danger with low risk, which could lead to light or medium injury if not avoided.                    |
|  | <b>NOTE</b>    | Indicates a warning of material damage.   |
|   | <b>INFO</b>    | Indicates practical information and tips that enable optimal use of the devices.                                |

## 1.4 Scope of delivery

Delivery includes:

- 1 x CH50I device
- 10 x product label
- General information sheet (11042373)

## 1.5 Trademarks

The present documentation uses the trademarks of the following companies and institutions:

*IO-Link*

c/o PROFIBUS User Organisation e.V. (PNO)

## 1.6 Specifications

| Specification                              | Link   |
|--|--|
| <i>IO-Link</i><br>Version 1.1.2 of 07.2013 | <a href="http://www.io-link.com">www.io-link.com</a> |



### INFO

The features of IO-Link specification V 1.1.3 are supported.

## 2 General information

### Intended use

This product is a precision device and serves the detection of items, objects, or physical measurement variables and the preparation or provision of measured values as electric variables for the higher-level system.

Unless specifically labeled, this product may not be used in explosive environments.

### Commissioning

Assembly, installation, and calibration of this product may only be performed by a specialist.

### Installation

Only use the fasteners and fastener accessories intended for this product for installation. Outputs not in use must not be wired. Unused wires of cable outputs must be insulated. Do not go below the permissible cable bending radii. Disconnect the system from power before the product is electrically connected. Use shielded cables to prevent electro-magnetic interference. If the customer assembles plug connections on shielded cables, then EMC-version plug connections should be used and the cable shield must be connected to the plug housing across a large surface area.

### Disposal (environmental protection)



Used electrical and electronic devices may not be disposed of in household waste. The product contains valuable raw materials that can be recycled. Therefore dispose of this product at the appropriate collection point. For additional information visit [www.baumer.com](http://www.baumer.com).

## 3 Safety

### 3.1 General safety instructions



#### **⚠ DANGER**

##### **High electrical voltage in the machine/system.**

Death or severe injuries resulting from electric shock.

- a) While working on the machine/devices, comply with the five safety rules of electrical engineering.

##### **Protection of persons and material assets**

- According to DIN VDE 0105-100 - Operation of electrical systems - Part 100: General definitions

##### **The 5 Safety Rules**

Protect against *high electrical voltage*

1. Switch off the device.
2. Secure against unwanted switchon.
3. Ensure that each pole is not live respectively under voltage.
4. Grounding and short-circuiting.
5. Cover or block neighboring parts under voltage.

##### **Qualified personnel**

The appliance may only be installed, commissioned and operated by qualified personnel who have received safety training.



#### **INFO**

At all times, the instruction manual must be made available to the operator at the machine the device is operated at.



#### **INFO**

Any manipulation/modification of hardware and software only qualified *Baumer* personnel, except for firmware updates.

##### **Intended use**

The device has been designed and manufactured for:

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



#### **INFO**

Radio interference may occur if the device is used in domestic or mixed-use areas.

- a) Observe the applicable standards for residential or mixed-use areas!

**Predictive misuse**

The device:

- must not be modified in design, technology or electrics.
- must only be deployed in the applications described in the present instruction manual and the related data sheets.
- must not be deployed as a safety-related device. It does not comply with the relevant standards. Any safety functions in the system are not ensured.
- only use the device in environments with corresponding IP-rating.
- only clean the device with oil-free compressed air and a leather cloth.
- do not use the device as a climbing aid.

## 4 Description

### 4.1 Device

#### IO-Link hub (CH50I.M12)

- IO-Link hub in 50 mm plastic housing
- 1 x M12 IO-Link Class A
- 8 x M12 I/O
- 16 configurable digital inputs/outputs

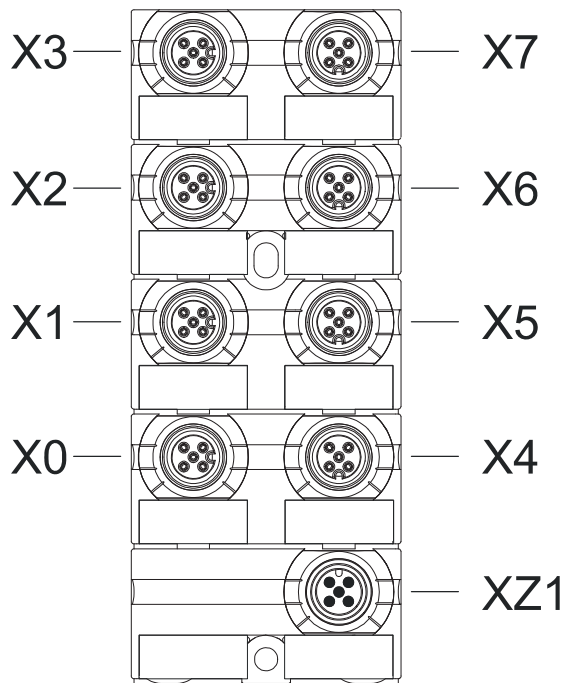


### 4.2 Product name nomenclature

The nomenclature is based on a scheme indicating the product functionality.

|              |                |
|--------------|----------------|
| <b>CH50I</b> | Product family |
| <b>M12</b>   | Slot size      |

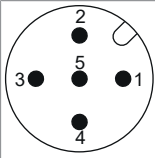
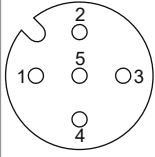
### 4.3 Device structure



**X0 ... X7** Digital inputs and outputs US  
**XZ1** Module supply, IO-Link Class A

## 4.4 Pin assignment

### IO-Link Class A

| IO-Link   | XZ1 (M12 connector)    |              |
|---|------------------------|--------------|
|  | 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 (mating M12) |              |
|  | Pin 1                  | 24 V US (L+) |
|   | Pin 2                  | DIO US       |
|   | Pin 3                  | 0 V US       |
|   | Pin 4                  | DIO US       |
|   | Pin 5                  | FE           |

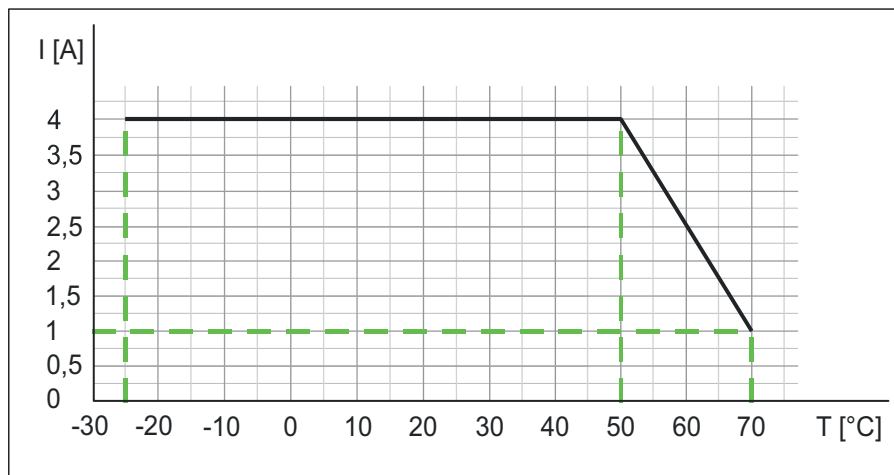


## 5 Technical data

### 5.1 Electrical Data

| Supply               |                       |                |
|----------------------|-----------------------|----------------|
| Operating voltage US |                       | 24 V DC        |
| Voltage range US     |                       | 18 ... 30 V DC |
| Total current US     | ≤50 °C (see Derating) | ≤4 A           |
| Current consumption  | At idle               | ≤40 mA         |
| Galvanic isolation   |                       | No             |

#### Total current US



/// 1: Total current US

| IO-Link            |  |  |
|--------------------|--|--|
| Communication rate |  | COM3   |
| Transmission rate  |  | 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           |  | 0x015E   |
| DeviceID           |  | 0x018A9D                                       |
| Process data       |  | 4 bytes (inputs), 2 bytes (outputs)            |

#### Sensor supply +

|                   |          |         |
|-------------------|----------|---------|
| Terminal/mating   |          | M12     |
| Operating voltage |          | 24 V DC |
| Power supply      | Per port | ≤0.5 A  |

#### Input (DI)

|                         |            |                       |
|-------------------------|------------|-----------------------|
| Terminal/mating         |            | M12                   |
| Conductor cross-section |            | ≤0.75 mm <sup>2</sup> |
| Cable length            |            | ≤30 m                 |
| Input characteristic    | EN 61131-2 | Type 1 + Type 3       |

| <b>Input (DI)</b>       |            |                         |
|-------------------------|------------|-------------------------|
| Input filter            |            | 1 ... 10 ms, adjustable |
| <b>Output (DO)</b>      |            |                         |
| Terminal/mating         |            | M12                     |
| Conductor cross-section |            | ≤0.75 mm <sup>2</sup>   |
| Cable length            |            | ≤30 m                   |
| Output current          | Per pin    | ≤0.5 A                  |
| Switching frequency     | Ohmic load | ≤25 Hz                  |

## 5.2 Ambient conditions

| <b>Climate</b>                |   |  |
|-------------------------------|---|--|
| Operating temperature         |   | -25 °C ... +70 °C  |
| Storage temperature           |   | -40 °C ... +85 °C  |
| Installation height           | Above sea level                                       | ≤3000 m  |
| Relative humidity             |   | ≤95 %  |
| <b>Mechanical</b>             |   |  |
| Oscillation test              | EN 60068 Part 2-6                                     | 5 ... 500 Hz; constant amplitude 1 mm; acceleration 15 g                       |
| Shock test                    | EN 60068 Part 2-27                                    | 50 g, duration 11 ms   |
| <b>Electrical safety</b>      |   |  |
| Protection                    | IP protection rating is not considered in UL approval | IP68   |
| Protection rating             |   | III  |
| Level of contamination        |   | 2  |
| <b>EMC emission</b>           |   |  |
| Radiated interference E-field | EN 61000-6-4 Emission                                 | QP: 40 dB $\mu$ V/m @ 30 ... 230 MHz<br>QP: 47 dB $\mu$ V/m @ 230 ... 1000 MHz |

| <b>EMC-immunity</b>  |                         |  |
|--|-------------------------|--|
| Discharge of static electricity (housing)                                    | EN 61000-4-2            | ±4 kV @ contact<br>±8 kV @ air                         |
| Electromagnetic HF fields (housing)  | EN 61000-4-3 RF-Field   | 10 V/m   |
| Fast transient electrical disturbance variables (burst)<br>DC inputs/outputs | EN 61000-4-4            | ±2 kV I/O supply<br>±1 kV data line/<br>±1 kV I/O line |
| Magnetic field   | EN 61000-4-8            | 30 A/m @ 50 Hz   |
| Variables of conducted disturbance, HF fields                                | EN 61000-4-6, irregular | 10 V   |

### 5.3 Protection

| <b>Device protection</b>                  |  |                  |
|---|--|------------------|
| Overvoltage protection                    |  | Yes              |
| Overload protection device supply         | To be ensured by load circuit monitoring | Yes              |
| Inverse-polarity protection device supply |  | Yes              |
| Short-circuit protection sensor supply    |  | Electronically   |
| Short-circuit protection output           |  | Electronically   |
| Protective circuit input                  | Internal                                 | Suppressor diode |

### 5.4 Product reliability


| <b>Product reliability</b> |                                    |          |
|----------------------------|------------------------------------|----------|
| MTTF                       | SN 29500 (at 40 °C and rated data) | 57 years |

### 5.5 Mechanical data

| <b>Mounting data</b> |           |                    |
|----------------------|-----------|--------------------|
| Weight               | Net       | 200 g              |
| Dimensions           | L x W x H | 126 x 50 x 34,5 mm |

## 5.6 Conformity, Approvals

| Conformity, Approvals |   |                 |
|-----------------------|---|-----------------|
| Product standard      | EN 61131-2<br>Programmable Logic Controllers Part 2 | Compliant       |
| CE                    | 2014/30/EU<br>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         |

| Hazardous substance (有害物質)   |   |        |         |         |                           |                         |                                 |
|--|---|--------|---------|---------|---------------------------|-------------------------|---------------------------------|
|   | Part Name                               | Lead   | Mercury | Cadmium | Hexavalent                | Polybrominated          | Polybrominated                  |
|  | 零件名稱                                    | (Pb) 鉛 | (Hg) 汞  | (Cd) 鎘  | Chromium<br>(Cr (VI)) 六价铬 | biphenyls (PBB)<br>多溴联苯 | diphenyl ethers<br>(PBDE) 多溴联苯醚 |
|  | Component part PCB<br>组件部分 印刷电路板        | X      | O       | O       | O                         | O                       | O                               |
|  | Connection Terminal/ Screws<br>接线端子 / 拧 | X      | O       | O       | O                         | O                       | O                               |
| <p>O: Indicates that the content of the harmful substance in all homogeneous materials of the component part is below the limit defined in GB/T 26572.<br/>O: 表明該有害物質在組成部分的所有均質材料的含量低於按GB/ T26572定義的限制。</p> <p>X: Indicates that the content of the harmful substance in at least one homogeneous material of the component part exceeds the limit defined in GB/T 26572.<br/>X: 表示該有害物質在組成部分中的至少一個均質材料的含量超過按GB / T26572定義的限制。</p> |   |        |         |         |                           |                         |                                 |

## 6 Installation

### 6.1 Requirements

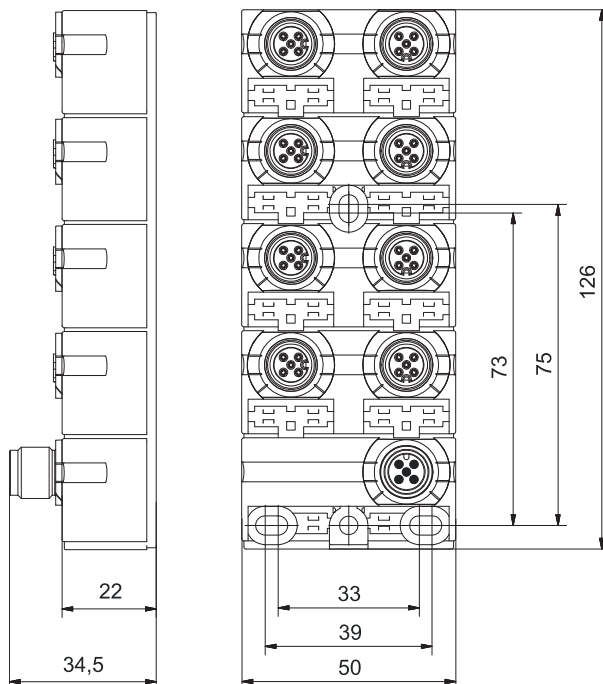
Installation requirements:

- Even mounting surface to avoid mechanical tension.
- Provide proper grounding.
- Suitable installation site in terms of vibration and shock load, temperature and humidity (see [Technical data ▸ 9j](#)).
- Protected to prevent connection cables from being torn off accidentally.

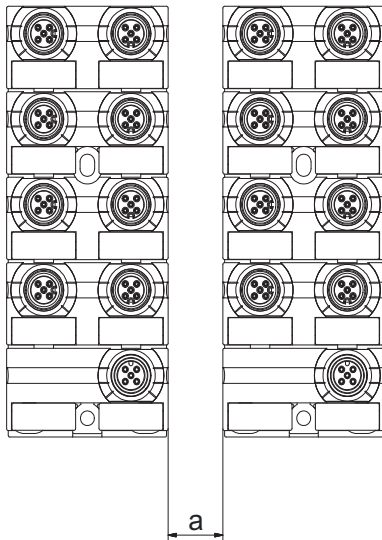
Observe the following installation requirements:

- Installation in the immediate vicinity of sensor/actuator
- Even mounting surface to avoid mechanical tension
- Earthed mounting surface for ring terminal earthing
- Short cable distance to all components
- Sufficient space to ease replacement and plug-in connections
- Appropriate installation site in terms of vibration and shock, temperature and humidity (see chapter Technical Specifications)
- Protected site to prevent connection cables from being torn off accidentally
- Diagnostic LEDs visible during operation

### 6.2 Dimensions



### 6.3 Mounting distance



III. 2: Distance in mm

a |      Straight connector: 5 mm  
             Angled connector: 50 mm



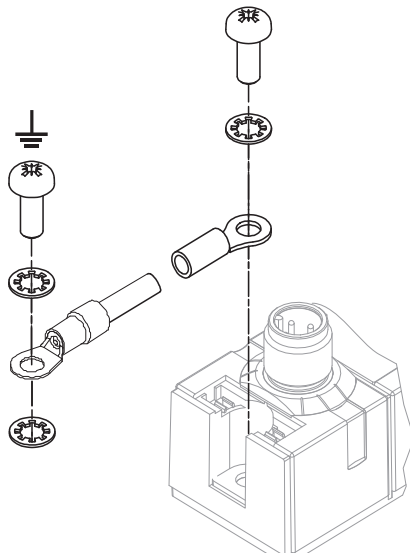
#### INFO

Minimum distance of 50 mm required where using angled connectors.

### 6.4 Functional ground

For EMC compliance, a ring cable lug is required.

Input and output shield connection of is via the ring cable lug.



III. 3: Fastening the ring cable lug

#### Also see about this

[Accessories](#) [▶ 33]

## 6.5 Mounting the device



### ⚠ WARNING

#### Material damage due to incorrect installation.

Use fastening screws that are appropriate for the mounting surface.

- a) Make sure the fastening screws are appropriate for use with the intended mounting surface.
- b) Tighten the screws carefully. Observe the specified tightening torques.

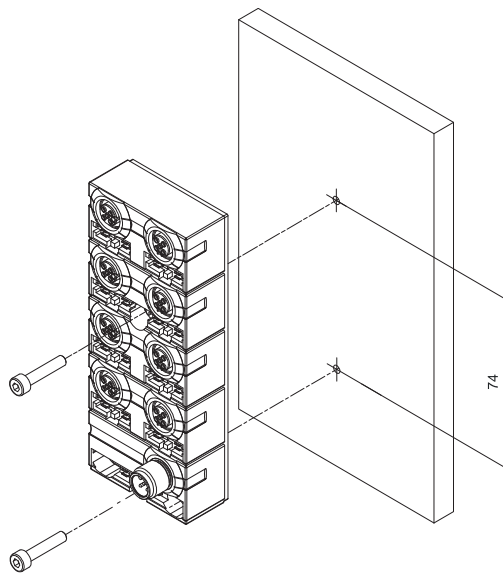


### ⚠ WARNING

#### Material damage through improper use.

Do not use the devices as climbing aids. Devices may come off by improper use or might be damaged.

- a) Install the device in a way that it cannot be abused as climbing aid.



Ill. 4: Mounting. Dimensions in mm

a = 75 mm

When mounting the device, observe the order indicated below:

#### **Instruction:**

- a) Align the housing.
- b) Use a conductive screw to fasten the ring cable lug.
- c) Slightly tighten the first M4 screw.
- d) Slightly tighten the second M4 screw.
- e) Tighten both M4 screws to the specified torque.

#### **Also see about this**

[Functional ground \[▶ 14\]](#)

## 7 Installation

### 7.1 Electrical installation of the device

#### **DANGER**

##### **High electrical voltage in the machine/system.**

Death or severe injuries resulting from electric shock.

- a) Device connection must be performed by qualified personnel only.
- b) While working on the machine/devices, comply with the five safety rules of electrical engineering.

##### **Protective measures for connection**

- Compliant to *IEC 60364 - Protection against electric shock..*



#### **CAUTION**

##### **Hot surface.**

Minor personal injuries and damage to the device when contacting hot surfaces.

- a) Wear suitable isolating gloves.
- b) Only use connection cables that meet thermal requirements.

#### 7.1.1 Connection lines

#### **WARNING**

##### **Risk of fire due to short circuit.**

Supply lines and/or devices may short circuit when damaged causing overheating and fire.

- a) Provide intelligent current monitoring or fuse.



#### **INFO**

Maximum length of sensor and actuator cables is limited to 30 m.



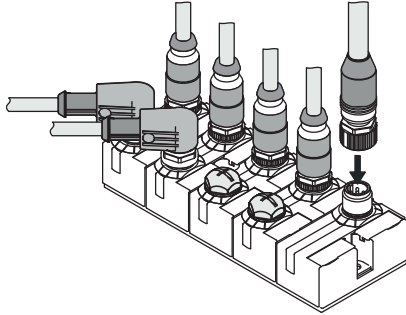
## 7.2 Ensuring Tightness (IP67)

### CAUTION


#### Leaky housing.

Risk of personal injury and material damage due to failure caused by ingress of conductive liquids.

- a) Seal any male and female connectors not in use.



///. 5: Connection lines

|     |        |   |                        |
|-----|--------|---|------------------------|
| M12 | 0.6 Nm |  | CAM12-<br>W13-11238690 |
|-----|--------|---|------------------------|



### INFO

A large selection of connection cables can be found on the Baumer website <https://www.baumer.com>.

## 8 Operation

### NOTICE

After writing the *Application Specific Tag* to the IO-Link hub, the hub would briefly interrupt IO-Link connection if the text is not identical to that stored in the hub.

### 8.1 LED indicator

The devices feature the following separate LED indicators:

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






Either indicated by continuous or flashing LEDs.

#### 8.1.1 LED indicator US and IO-Link

The device features a two-color LED for indicating IO-Link status and sensor supply status US. IO-Link status is indicated by the LED on green, the US status by the LED on red.






A mixture of flashing green and red may result in flashing amber in the event of overlapping.

#### Two-color LED indicator IO-Link and US

| Indicator   | Status           | Description   |
|---|------------------|---|
|  Green | On continuous    | IO-Link not in status <i>OPERATE</i> , no cyclical data communication present; sensor supply OK |
|  Green | Flashing at 1 Hz | IO-Link in status <i>OPERATE</i> , cyclical data communication; sensor supply OK                |
|  Red   | On continuous    | Short circuit DO, temperature warning etc.  |
|  Red   | Flashing at 1 Hz | IO-Link communication error   |
|  Off   | Off              | Device off, no IO-Link connection present   |

Tab. 1: Indicator IO-Link and US

### Firmware update

| Indicator   | Status           | Description   |
|---|------------------|---|
|  Green     | On continuous    | IO-Link in status <i>IDLE</i><br>Firmware update successfully executed            |
|  Green     | Flashing at 1 Hz | IO-Link in status <i>PREOPERATE / OPERATE</i><br>Update is not yet being executed |
|  Red       | On continuous    | Update failed   |
|  Green/red | Flashing at 2 Hz | IO-Link in status <i>PREOPERATE / OPERATE</i><br>Update is being executed         |
|  Grey      | Off              | Device off, no IO-Link connection present   |




Tab. 2: Firmware update

### NOTICE

Error-free operation no longer guaranteed at US <18 V.

### 8.1.2

#### LED indicator for inputs and outputs

| Indicator  | Status        | Input voltage | Description  | Logo value |
|--|---------------|---------------|--|------------|
|  Yellow | On continuous | 24 V          | channel at   | 1          |
|  Red  | On continuous | 0 V           | Short circuit or<br>overload DO                    | 0          |
|  Grey | Off           | 0 V           | Device off or<br>firmware update<br>being executed | 0          |

Tab. 3: LED indicator digital inputs/outputs

#### Error at input or output

In the event of error (short circuit, overload or power recovery) present at minimum one input or output, the LEDs of all input and output slots light up red.

## 8.2 IO-Link object directory

### 8.2.1 DPP (Direct Parameter Page)

| ISDU index            | DPP index | Object name               | Access | Length in bytes | Meaning / Default value                      |
|-----------------------|-----------|---------------------------|--------|-----------------|--|
| <b>Identification</b> |           |                           |        |                 |  |
| 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               | 0x015E                                       |
|                       | 0x08      | VendorID 2 (MSB)          | R      | 1               |  |
|                       | 0x09      | DeviceID 1 (Octet 2, MSB) | R/W    | 1               | 0x01   |
|                       | 0x0A      | DeviceID 1 (Octet 1, MSB) |        | 1               | 0x8A   |
|                       | 0x0B      | DeviceID 1 (Octet 0, LSB) |        | 1               | 0x018A9D                                     |
|                       | 0x0C      | FunctionID 1 (MSB)        | R      | 1               |  |
|                       | 0x0D      | FunctionID 2 (MSB)        |        | 1               |  |
|                       | 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                |           | PDOOutputDescriptor       | R      | variable        |  |
| 0x0010                |           | VendorName                | R      | 64              | Baumer                                       |
| 0x0011                |           | VendorText                | R      | 64              | www.baumer.com                               |
| 0x0012                |           | ProductName               | R      | 64              | CH50I.M12                                    |
| 0x0013                |           | ProductID                 | R      | 64              | 11261574                                     |
| 0x0014                |           | ProductText               | R      | 64              | Digital Hub DIO16 M12                        |
| 0x0015                |           | SerialNumber              | R      | 16              | Consecutive serial number, set by default    |
| 0x0016                |           | HardwareRevision          | R      | 64              | e.g. B. "01.00"                              |
| 0x0017                |           | FirmwareRevision          | R      | 64              | e.g. "V.1.00.00"                             |
| 0x0018                |           | ApplicationSpecific-Tag   | R      | 16 ... 32       | User-specific name, e.g. "System 3 / Port 4" |
| 0x0019                |           | FunctionTag               | R      | 32              |  |
| 0x001A                |           | LocationTag               | R      | 32              |  |

| ISDU index            | DPP index | Object name           | Access | Length in bytes | Meaning / Default value   |
|-----------------------|-----------|-----------------------|--------|-----------------|---|
| <b>Identification</b> |           |                       |        |                 |   |
| 0x0020                |           | Error Count           | R      | 2               |   |
| 0x0024                |           | DeviceStatus          | R      | 1               | <ul style="list-style-type: none"> <li>■ 0: Device is operating properly</li> <li>■ 1: Maintenance Required</li> <li>■ 2: Out of Specification</li> <li>■ 3: Functional Check</li> <li>■ 4: Failure</li> <li>■ 5 ... 255: Reserved</li> </ul> |
| 0x0025                |           | DetailedDeviceStatus  | R      | variable        | 6 x (Octet 1: EventQualifier, Octet 2, 3: Event-Code)   |
| 0x0028                |           | ProcessDataInput      | R      | PD length       |   |
| 0x0029                |           | ProcessDataOutput     | R      | PD length       |   |
| 0x0031 ...<br>0x003F  |           | Reserved for profiles |        |                 |   |

### 8.2.2 ISDU (Indexed Service Data Unit)

| ISDU index | Object name                           | Access | Length in bytes | Significance  | Default value |
|------------|---------------------------------------|--------|-----------------|---|---------------|
| 0x0040     | Status: Power Supply Status US        | R      | 1               | Output of US status: <ul style="list-style-type: none"> <li>■ 0x00 = OK</li> <li>■ 0x01 = undervoltage</li> <li>■ 0x02 = overvoltage</li> </ul>   | –             |
| 0x0041     | Status: Power Supply Value US         | R      | 1               | Output of measured US voltage in increments of 0.1 V. Updated every 10 ms.  | –             |
| 0x0044     | Status: Internal Temperature Value °C | R      | 1               | Output of internal device temperature from -25 °C to +70 °C in increments of 0.1 °C. Updated every 10 ms.   | –             |
| 0x0045     | Status: Internal Temperature Value °F | R      | 1               | Output of internal device temperature from -13 °F to +158 °F in increments of 0.1 °F. Updated every 10 ms.  | –             |
| 0x0050     | Diagnosis: Short Circuit Detection DO | R      | 16              | Allows you to read a short circuit being present at a specific channel. <ul style="list-style-type: none"> <li>■ Subindex 1: X0 Pin 4</li> <li>■ Subindex 2: X0 Pin 2</li> <li>■ ...</li> <li>■ Subindex 15: X7 Pin 4</li> <li>■ Subindex 16: X7 Pin 2</li> </ul> | –             |

| ISDU index | Object name                                | Access | Length in bytes | Significance  | Default value |
|------------|--|--------|-----------------|---|---------------|
| 0x0060     | Identification: Identification ID          | R/W    | 2               | Number for module identification. Value is provided in the input process data.  | 0x0000        |
| 0x0061     | Identification: User Defined Serial Number | R/W    | 2               | User-defined serial number. It may be used to ensure that the device will only be connected to an appropriate master.   | 0x0000        |
| 0x0062     | Diagnosis: Disable General Diagnosis       | R/W    | 16              | Adjustable diagnostics: <ul style="list-style-type: none"> <li>■ 0 = enabled</li> <li>■ 1 = disabled</li> <li>■ Subindex 1: IO-Link event code transmitted to master</li> <li>■ Subindex 2: US - diagnosed under-voltage</li> <li>■ Subindex 3: US - diagnosed over-voltage</li> <li>■ Subindex 4: US - LED status</li> <li>■ Subindex 5: UA - Diagnosis "Not connected"</li> <li>■ Subindex 6: UA - diagnosed under-voltage</li> <li>■ Subindex 7: UA - diagnosed over-voltage</li> <li>■ Subindex 8: UA - LED-Status</li> <li>■ Subindex 9: TEMP - diagnosed low temperature</li> <li>■ Subindex 10: TEMP - diagnosed high temperature</li> <li>■ Subindex 11: TEMP - LED-Status</li> <li>■ Subindex 12 ... 16: Reserved</li> </ul> | 0             |
| 0x0070     | In-/Outputs: Bitmapping Layout             | R/W    | 1               | Bit mapping layout of process data. <ul style="list-style-type: none"> <li>■ 0 = port-based bit mapping</li> <li>■ 1 = pin-based bit mapping</li> </ul>   | 0             |
| 0x0072     | In-/Outputs: Channel Configuration         | R/W    | 16              | Setting the I/O function per channel. <ul style="list-style-type: none"> <li>■ Subindex 1: X0 Pin 4</li> <li>■ Subindex 2: X0 Pin 2</li> <li>■ ...</li> <li>■ Subindex 15: X7 Pin 4</li> <li>■ Subindex 16: X7 Pin 2</li> </ul> Setting per channel (subindex): <ul style="list-style-type: none"> <li>■ 0 = Auto configuration / universal (DIO)</li> <li>■ 1 = Input</li> </ul>   | 0             |

| ISDU index | Object name                                   | Access | Length in bytes | Significance   | Default value |
|------------|---|--------|-----------------|--|---------------|
|            |   |        |                 | <ul style="list-style-type: none"> <li>▪ 2 = Output</li> </ul>   |               |
| 0x0080     | Inputs: Inverting Input Logic                 | R/W    | 1               | Input logic inversion per channel. <ul style="list-style-type: none"> <li>▪ Bit 0: X0 Pin 4</li> <li>▪ Bit 1: X0 Pin 2</li> <li>▪ ...</li> <li>▪ Bit 15: X7 Pin 4</li> <li>▪ Bit 16: X7 Pin 2</li> </ul> Setting per channel (subindex): <ul style="list-style-type: none"> <li>▪ 0 = standard, not inverted</li> <li>▪ 1 = Inverted</li> </ul>  | 0             |
| 0x0081     | Inputs: Signal Extension / Impulse Stretching | R/W    | 16              | Input pulses prolonged in steps of 10 ms. <ul style="list-style-type: none"> <li>▪ Subindex 1: X0 Pin 4</li> <li>▪ Subindex 2: X0 Pin 2</li> <li>▪ ...</li> <li>▪ Subindex 15: X7 Pin 4</li> <li>▪ Subindex 16: X7 Pin 2</li> </ul> Setting per channel (subindex): <ul style="list-style-type: none"> <li>▪ 0 = 0 ms / OFF</li> <li>▪ 1 = 10 ms</li> <li>▪ 2 = 20 ms</li> <li>▪ 3 = 30 ms</li> <li>▪ ...</li> <li>▪ 255 = Reserved</li> </ul>   | 0             |
| 0x0082     | Inputs: Input Debounce / Filter Time          | R/W    | 1               | Setting the input filter time per channel. <ul style="list-style-type: none"> <li>▪ Subindex 1: X0 Pin 4</li> <li>▪ Subindex 2: X0 Pin 2</li> <li>▪ ...</li> <li>▪ Subindex 15: X7 Pin 4</li> <li>▪ Subindex 16: X7 Pin 2</li> </ul> Setting per channel (subindex): <ul style="list-style-type: none"> <li>▪ 0 = OFF (no filtering)</li> <li>▪ 1 = 1 <math>\mu</math>s</li> <li>▪ 2 = 10 <math>\mu</math>s</li> <li>▪ 3 = 100 <math>\mu</math>s</li> <li>▪ 4 = 1 ms</li> <li>▪ 5 = 2 ms</li> <li>▪ 6 = 3 ms</li> <li>▪ 7 = 5 ms</li> <li>▪ 8 = 10 ms</li> </ul> | 4             |

| ISDU index | Object name                              | Access | Length in bytes | Significance  | Default value |
|------------|--|--------|-----------------|---|---------------|
| 0x0090     | Outputs: Short Circuit Recovery Behavior | R/W    | 16              | <p>Defines the behavior of each output (channel) after short circuit / overload:</p> <ul style="list-style-type: none"> <li>▪ Bit 0: X0 Pin 4</li> <li>▪ Bit 1: X0 Pin 2</li> <li>▪ ...</li> <li>▪ Bit 15: X7 Pin 4</li> <li>▪ Bit 16: X7 Pin 2</li> </ul> <p>Setting per channel (subindex):</p> <ul style="list-style-type: none"> <li>▪ 0 = Automatic reset after 60 sec.</li> <li>▪ 1 = Manual reset via output process data</li> </ul> <p>For manual reset, change the related process data bit from 0 to 1.</p> | 0             |
| 0x0091     | Outputs: Fail-Safe Behavior              | R/W    | 16              | <p>Defines the behavior of each output (channel) in the event of communication loss with master.</p> <ul style="list-style-type: none"> <li>▪ Subindex 1: X0 Pin 4</li> <li>▪ Subindex 2: X0 Pin 2</li> <li>▪ ...</li> <li>▪ Subindex 15: X7 Pin 4</li> <li>▪ Subindex 16: X7 Pin 2</li> </ul> <p>Setting per channel (subindex):</p> <ul style="list-style-type: none"> <li>▪ 0 = logical 0 / OFF</li> <li>▪ 1 = logical 1 / ON</li> <li>▪ 2 = Hold last state</li> </ul>  | 0             |



**8.2.3 Configuration assignment in pin-based mapping mode**

| <b>Channel A</b> | <b>Channel B</b> |
|------------------|------------------|
| Pin4_X0          | Pin4_X0          |
| Pin4_X1          | Pin2_X0          |
| Pin4_X2          | Pin4_X1          |
| Pin4_X3          | Pin2_X1          |
| Pin4_X4          | Pin4_X2          |
| Pin4_X5          | Pin2_X2          |
| Pin4_X6          | Pin4_X3          |
| Pin4_X7          | Pin2_X3          |
| Pin2_X0          | Pin4_X4          |
| Pin2_X1          | Pin2_X4          |
| Pin2_X2          | Pin4_X5          |
| Pin2_X3          | Pin2_X5          |
| Pin2_X4          | Pin4_X6          |
| Pin2_X5          | Pin2_X6          |
| Pin2_X6          | Pin4_X7          |
| Pin2_X7          | Pin2_X7          |

## 8.3 Diagnostic tools

### 8.3.1 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 are applicable as well.

| Event code | Event type   | Description                                      | Action   |
|------------|--------------|--|--|
| 0x4000     | Error        | Temperature error                                | Overload   |
| 0x4210     | Warning      | Permitted device temperature exceeded            | Localize heat source                                 |
| 0x4220     | Warning      | Temperature below permitted device temperature   | Insulate device                                      |
| 0xFF91     | Notification | Data Storage (DS) upload by master required      | Execute DS upload                                    |
| 0x5100     | Error        | General supply voltage error (UL1)               | Check availability                                   |
| 0x5110     | Warning      | Main supply overvoltage (UL1)                    | Check permitted voltage range                        |
| 0x5111     | Warning      | Main supply undervoltage (UL1)                   | Check permitted voltage range                        |
| 0x1830     | Warning      | Main supply overvoltage (UL2)                    | Check permitted voltage range                        |
| 0x1831     | Warning      | Main supply undervoltage (UL2)                   | Check current consumption of the connected consumers |
| 0x1832     | Error        | Secondary voltage error (UL2)                    | Check current consumption of the connected consumers |
| 0x7710     | Error        | Short circuit                                    | Check installation                                   |
| 0x8CA0     | Error        | Overload/short circuit at DIO pin - port 0 pin 4 | Check installation                                   |
| 0x8CA1     | Error        | Overload/short circuit at DIO pin - port 0 pin 2 | Check installation                                   |
| 0x8CA2     | Error        | Overload/short circuit at DIO pin - port 1 pin 4 | Check installation                                   |
| 0x8CA3     | Error        | Overload/short circuit at DIO pin - port 1 pin 2 | Check installation                                   |
| 0x8CA4     | Error        | Overload/short circuit at DIO pin - port 2 pin 4 | Check installation                                   |
| 0x8CA5     | Error        | Overload/short circuit at DIO pin - port 2 pin 2 | Check installation                                   |
| 0x8CA6     | Error        | Overload/short circuit at DIO pin - port 3 pin 4 | Check installation                                   |
| 0x8CA7     | Error        | Overload/short circuit at DIO pin - port 3 pin 2 | Check installation                                   |
| 0x8CA8     | Error        | Overload/short circuit at DIO pin - port 4 pin 4 | Check installation                                   |

| Event code | Event type | Description  | Action             |
|------------|------------|--|--------------------|
| 0x8CA9     | Error      | Overload/short circuit at DIO pin - port 4<br>pin 2        | Check installation |
| 0x8CAA     | Error      | Overload/short circuit at DIO pin - port 5<br>pin 4        | Check installation |
| 0x8CAB     | Error      | Overload/short circuit at DIO pin - port 5<br>pin 2        | Check installation |
| 0x8CAC     | Error      | Overload/short circuit at DIO pin - port 6<br>pin 4        | Check installation |
| 0x8CAD     | Error      | Overload/short circuit at DIO pin - port 6<br>pin 2        | Check installation |
| 0x8CAE     | Error      | Overload/short circuit at DIO pin - port 7<br>Pin 4        | Check installation |
| 0x8CAF     | Error      | Overload/short circuit at DIO pin - port 7<br>pin 2        | Check installation |
| 0x8CD0     | Error      | Overload/short circuit in sensor supply at<br>Port 0 Pin 1 | Check installation |
| 0x8CD1     | Error      | Overload/short circuit in sensor supply at<br>Port 1 Pin 1 | Check installation |
| 0x8CD2     | Error      | Overload/short circuit in sensor supply at<br>Port 2 Pin 1 | Check installation |
| 0x8CD3     | Error      | Overload/short circuit in sensor supply at<br>Port 3 Pin 1 | Check installation |
| 0x8CD4     | Error      | Overload/short circuit in sensor supply at<br>Port 4 Pin 1 | Check installation |
| 0x8CD5     | Error      | Overload/short circuit in sensor supply at<br>Port 5 Pin 1 | Check installation |
| 0x8CD6     | Error      | Overload/short circuit in sensor supply at<br>Port 6 Pin 1 | Check installation |
| 0x8CD7     | Error      | Overload/short circuit in sensor supply at<br>Port 7 Pin 1 | Check installation |

Tab. 4: IO-Link events

## 8.4 Process data

### 8.4.1 Port-based mapping

#### Process data digital inputs

| Byte 0 Inputs X0 ... X3 |         |
|-------------------------|---------|
| Bit                     | Contact |
| 0                       | Pin4_X0 |
| 1                       | Pin2_X0 |
| 2                       | Pin4_X1 |
| 3                       | Pin2_X1 |
| 4                       | Pin4_X2 |
| 5                       | Pin2_X2 |
| 6                       | Pin4_X3 |
| 7                       | Pin2_X3 |

| Byte 1 Inputs X4 ... X7 |         |
|-------------------------|---------|
| Bit                     | Contact |
| 0                       | Pin4_X4 |
| 1                       | Pin2_X4 |
| 2                       | Pin4_X5 |
| 3                       | Pin2_X5 |
| 4                       | Pin4_X6 |
| 5                       | Pin2_X6 |
| 6                       | Pin4_X7 |
| 7                       | Pin2_X7 |

#### NOTICE

Bytes 2 and 3 only supported by E0 devices.

| Byte 2 Diagnostics |   |
|--------------------|---|
| Bit                | Description   |
| 0                  | Supply error or warning (overvoltage or undervoltage)       |
| 1                  | Device temperature too high or too low                      |
| 2                  | Input/output error or warning (short circuit or overload)   |
| 3                  | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |
| 4                  | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |

| <b>Byte 2 Diagnostics</b> |   |
|---------------------------|---|
| <b>Bit</b>                | <b>Description</b>  |
| 5                         | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |
| 6                         | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |
| 7                         | Global status<br>0 = no diagnostic<br>1 = fault detected    |

| <b>Byte 3 Module identification</b> |  |
|-------------------------------------|--|
| <b>Bit</b>                          | <b>Description</b>   |
| 0 ... 7                             | User-defined bits, e.g. for tool change<br>0 = not used<br>1 ... 255 = ID value read from object |

### Process data Digital outputs

| <b>Byte 0 Inputs X0 ... X3</b> |                |
|--------------------------------|----------------|
| <b>Bit</b>                     | <b>Contact</b> |
| 0                              | Pin4_X0        |
| 1                              | Pin2_X0        |
| 2                              | Pin4_X1        |
| 3                              | Pin2_X1        |
| 4                              | Pin4_X2        |
| 5                              | Pin2_X2        |
| 6                              | Pin4_X3        |
| 7                              | Pin2_X3        |

| <b>Byte 1 Inputs X4 ... X7</b> |                |
|--------------------------------|----------------|
| <b>Bit</b>                     | <b>Contact</b> |
| 0                              | Pin4_X4        |
| 1                              | Pin2_X4        |
| 2                              | Pin4_X5        |
| 3                              | Pin2_X5        |
| 4                              | Pin4_X6        |
| 5                              | Pin2_X6        |
| 6                              | Pin4_X7        |
| 7                              | Pin2_X7        |

## 8.4.2 Pin-based mapping

### Process data digital inputs

| Byte 0 Inputs X0 ... X7 |         |
|-------------------------|---------|
| Bit                     | Contact |
| 0                       | Pin4_X0 |
| 1                       | Pin4_X1 |
| 2                       | Pin4_X2 |
| 3                       | Pin4_X3 |
| 4                       | Pin4_X4 |
| 5                       | Pin4_X5 |
| 6                       | Pin4_X6 |
| 7                       | Pin4_X7 |

| Byte 1 Inputs X0 ... X7 |         |
|-------------------------|---------|
| Bit                     | Contact |
| 0                       | Pin2_X0 |
| 1                       | Pin2_X1 |
| 2                       | Pin2_X2 |
| 3                       | Pin2_X3 |
| 4                       | Pin2_X4 |
| 5                       | Pin2_X5 |
| 6                       | Pin2_X6 |
| 7                       | Pin2_X7 |

### NOTICE

Bytes 2 and 3 only supported by E0 devices.

| Byte 2 Diagnostics |   |
|--------------------|---|
| Bit                | Description   |
| 0                  | Supply error or warning (overvoltage or undervoltage)       |
| 1                  | Device temperature too high or too low                      |
| 2                  | Input/output error or warning (short circuit or overload)   |
| 3                  | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |
| 4                  | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |
| 5                  | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |

| <b>Byte 2 Diagnostics</b> |   |
|---------------------------|---|
| <b>Bit</b>                | <b>Description</b>  |
| 6                         | DIA at channel X<br>0 = channel 1<br>...<br>15 = channel 16 |
| 7                         | Global status<br>0 = no diagnostic<br>1 = fault detected    |

| <b>Byte 3 Module identification</b> |  |
|-------------------------------------|--|
| <b>Bit</b>                          | <b>Description</b>   |
| 0 ... 7                             | User-defined bits, e.g. for tool change<br>0 = not used<br>1 ... 255 = ID value read from object |

### Process data Digital outputs

| <b>Byte 0 Inputs X0 ... X7</b> |                |
|--------------------------------|----------------|
| <b>Bit</b>                     | <b>Contact</b> |
| 0                              | Pin4_X0        |
| 1                              | Pin4_X1        |
| 2                              | Pin4_X2        |
| 3                              | Pin4_X3        |
| 4                              | Pin4_X4        |
| 5                              | Pin4_X5        |
| 6                              | Pin4_X6        |
| 7                              | Pin4_X7        |

| <b>Byte 1 Inputs X0 ... X7</b> |                |
|--------------------------------|----------------|
| <b>Bit</b>                     | <b>Contact</b> |
| 0                              | Pin2_X0        |
| 1                              | Pin2_X1        |
| 2                              | Pin2_X2        |
| 3                              | Pin2_X3        |
| 4                              | Pin2_X4        |
| 5                              | Pin2_X5        |
| 6                              | Pin2_X6        |
| 7                              | Pin2_X7        |

## 9 Maintenance and cleaning

---

**⚠ WARNING****Material damage due to defective or damaged appliances.**

The function of the devices is not guaranteed.

- a) Replace defective or damaged devices.
- 

**Cleaning the appliance:**

- Only use oil-free compressed air or ethanol
- Only use non-fibrous materials (e.g. leather cloth)
- Do not use contact spray



**10****Annex****10.1****Accessories****10.1.1****Tools**

| Designation                       | Art. no.           |
|-----------------------------------|--------------------|
| M8 installation wrench set SW 9   | CAM8.WS9-11238649  |
| M12 installation wrench set SW 13 | CAM12-W13-11238690 |



III. 6: Assembly wrench

**INFO****PRODUCTS AND ACCESSORIES**

You will encounter a large product selection at: <https://www.baumer.com>





