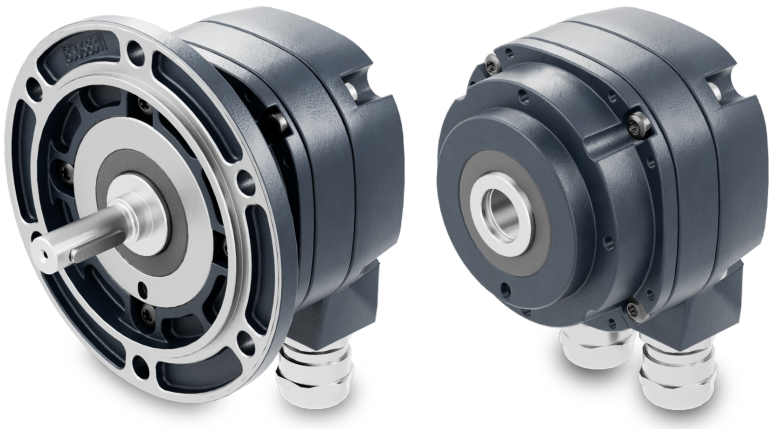
Baumer
Passion for Sensors

HÜBNER
BERLIN
A Baumer Brand



Operating Manual

HOG840, HOG860, HOG870, HOG890

Incremental encoder

EN-US

V2, T1 | 3/19/2025

Table of contents

1 About this document

1.1 Purpose

This operating manual (subsequently referred to as *manual*) allows the safe and efficient handling of the product .

The manual does not provide instructions on operating the machine in which the product is integrated. Information on this is found in the operating manual of the machine.

The manual is a constituent part of the product. It must be kept in the immediate vicinity of the product and must be accessible to personnel at all times.

Personnel must have carefully read and understood this manual before beginning any work. The basic prerequisite for safe working is compliance with all safety instructions and handling instructions given in this manual.

In addition, the local occupational health and safety regulations and general safety regulations apply.

The illustrations in this manual are examples only. Deviations are at the discretion of Baumer at all times.

1.2 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
	**DANGER**	Indicates an imminent potential danger with high risk of death or serious personal injury if not being avoided.
	WARNING	Indicates potential danger with medium risk of death or (serious) personal injury if not being avoided.
	CAUTION	Indicates a danger with low risk, which could lead to light or medium injury if not avoided.
	NOTE	Indicates a warning of material damage.
	**INFO**	Indicates practical information and tips that enable optimal use of the devices.

1.3 Labels in this manual

Identifier	Usage	Example
Dialog element	Indicates dialog elements.	Click ***OK***.
Unique name	Indicates the names of products, files, etc.	*Internet Explorer* is not supported in any version.
`Code`	Indicates entries.	Enter the following IP address: `192.168.0.250`

1.4 Disclaimer

The manufacturer is not liable for personal injury and/or property damage resulting from improper use of the device.

1.5 Scope of delivery

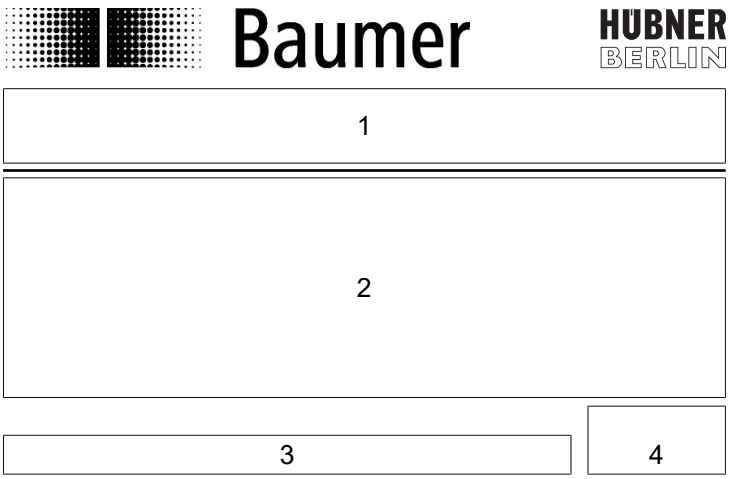
Delivery includes:

- Rotary encoder
- Torque plate with assembly kit (hollow shaft variants only)
- Protective shaft cap (solid shaft variants only)
- Quickstart
- General information sheet

1.6 Applicable documents

- Download at www.baumer.com:
  - Instruction manual
  - Manual BSS
  - Data sheet
  - EU Declaration of Conformity
  - Certificates and Approvals
- Attached to product:
  - General information sheet
  - Quickstart

1.7 Name plate



1	Product name, product code, material number	2	Serial number, technical data, MAC address
3	Baumer Website	4	Labels

1.8 Maintenance and service life

The device must not be opened unless for assembly and maintenance work as described in this instruction manual. Any repair or maintenance work requiring fully opening the device must be carried out by the manufacturer only.

Do not perform any modifications at the device.

The expected service life of the device depends on the ball bearings featuring permanent lubrication.

For any queries or subsequent deliveries refer to the product data specified on the device label, in particular type and serial number.

1.9 Approvals and warranty

Declaration of conformity according to the prevailing country-specific directives.

We grant a 2-year warranty in line with the conditions of the German Electrical and Electronic Manufacturers' Association (ZVEI).

INFO

warranty seal

Any breaking of the seal provided at the device will result in loss of warranty.

1.10 Temperature range for operation and storage

Device storage temperature: -15 ... +70 °C

Device operating temperature:

- HOG840: -30 °C ... +85 °C
- All other variants: -40 °C ... +100 °C

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.

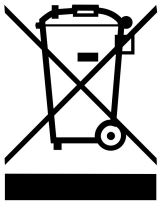
Commissioning

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.

3 Transport and storage

3.1 Transport

NOTICE

Material damage due to improper transport.

a) Ensure maximum diligence when unloading the delivered packages as well as when transporting them inside the company.

b) Note the information and symbols on the packaging.

c) Only remove packaging immediately before mounting.

3.2 Delivery inspection

Upon receipt immediately inspect the delivery for completeness and transport damage.

Claim any defect as soon as it is detected. Damages can only be claimed within the applicable claims deadlines.

In case of externally visible transport damage, proceed as follows:

Instruction:

a) Do not accept the delivery or only with reservations.

b) Note the scope of the damage on the transport documents or the delivery slip of the carrier.

c) Initiate the claim.

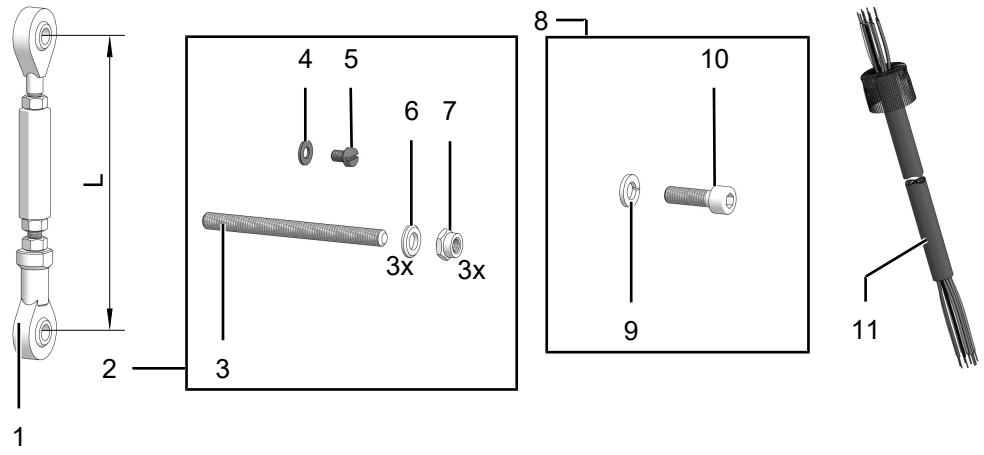
3.3 Storage

Store the product at the following conditions:

- Use the original packaging for storage.
- Do not store outdoors.
- Store dry and free from dust.
- Do not expose to aggressive media.
- Keep away from the sun.
- Avoid mechanical agitation.
- Storage temperature: -15 ... +70 °C..
- When storing for longer than 3 months, regularly check the general state of all parts and the packaging.

4 Description

4.1 Mounting accessories hollow shaft (not included)



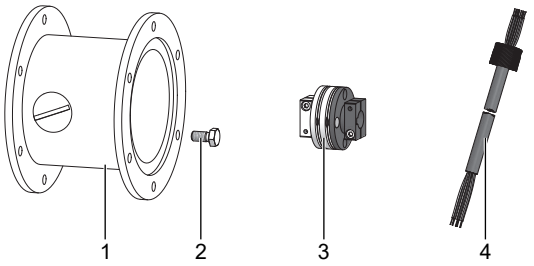
Ill. 1: Mounting accessories

1	Torque arm of length L (see table)	2	Mounting set, order number 11077197
3	Threaded rod M6 (1.4104), variable length (≤ 210 mm)	4	Washer B6.4 for grounding strap (ISO 7090)
5	Cylinder screw M6x8 mm, for grounding strap (ISO 1207)	6	Washer B6.4 (ISO 7090)
7	Self-locking nut M6 (ISO 10511)	8	Mount/dismount kit, order number 11077087
9	Spring washer 6 (DIN 7980)	10	Cylinder screw M6x30 mm (ISO 4762)
11	Sensor cable HEK 8		

The torque arm is available in different versions:

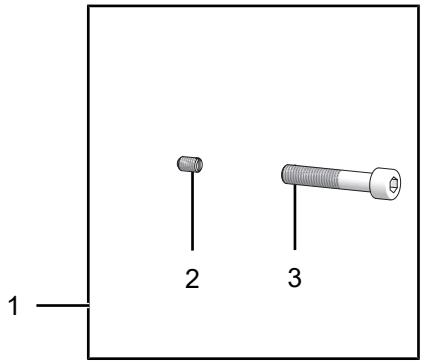
Torque arm	Order number
Standard	
67 - 70 mm	11043628
125 (±5) mm, may be shortened down to ≥ 71 mm	11004078
440 (+20/15) mm, may be shortened down to ≥ 131 mm	11002915
Insulated	
67 - 70 mm	11054917
125 (±5) mm, may be shortened down to ≥ 71 mm	11072795
440 (+20/15) mm, may be shortened down to ≥ 131 mm	11082677
Stainless	
67 - 70 mm	11054918
125 (±5) mm, may be shortened down to ≥ 71 mm	11072787
440 (+20/15) mm, may be shortened down to ≥ 131 mm	11072737

4.2 Mounting accessories solid shaft (not included)



1	Attachment device (customer-specific)
2	Fastening screws for attachment device (M6x16 mm, ISO 4017)
3	Flexible coupling
4	Sensor cable HEK 8

4.3 Accessories for dismount (not included in the delivery)



Ill. 2: Accessory for dismount

1	Mount/dismount kit, order number 11077087	2	Threaded pin M6x10 mm (ISO 7436)
3	Cylinder screw M8x45 mm (ISO 4762)		

5 Installation

NOTICE

Equipment damage due to mechanical impact

Strong vibration may lead to overload by constraining force.

a) Never apply force. If properly performed, all components can be mounted smoothly.

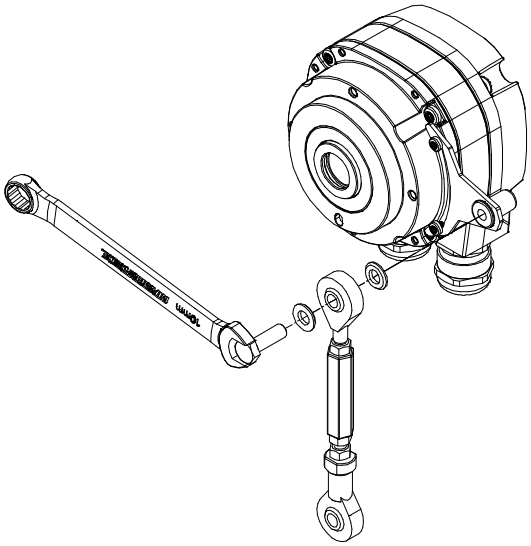
NOTICE

Equipment damage by adhering liquids

Sticky liquids may damage sensing unit and ball bearings. Disassembling a device which is stuck to the axis can lead to destruction.

a) Do not use adhesive liquids to fasten the device.

5.1 Mounting the torque arm



Ill. 3: Detaching the torque arm

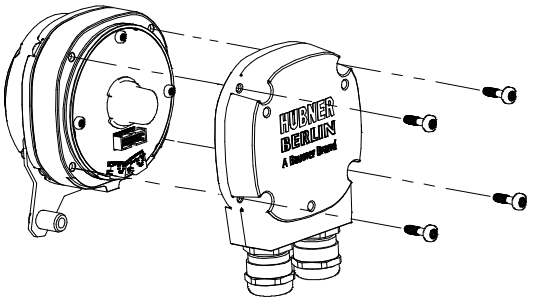
Tool

- ⎔ 10 mm

Instruction:

- Screw torque arm with washers to the torque plate using a hexagon screw (M6 x 24).

5.2 Unscrewing the terminal box



Ill. 4: Unscrewing the terminal box

Tool

- TX 20

Instruction:

- Loosen the housing screws and detach the terminal box.

5.3 Mounting the encoder

⚠ DANGER

Injuries caused by shaft rotation

Hair and clothing can get tangled in rotating shafts. This can lead to serious injuries.

a) Make sure that the device is idle.

b) Prior to performing any work at the device, make sure power supply is and will remain off.

⚠ DANGER

Explosion

Sparks may cause fire or explosion.

a) Do not use the device in the near vicinity of explosive or highly flammable materials.

NOTICE

Severe runout errors of the drive shaft reduce service life and may cause angular errors.

Severe runout errors of the drive shaft cause vibrations that cut down on the encoder service live and may cause angular errors.

a) Keep runout errors of drive shaft down to a minimum (recommended: ≤ 0.03 mm; maximum: ≤ 0.2 mm).

NOTICE

Equipment damage by mechanical overload

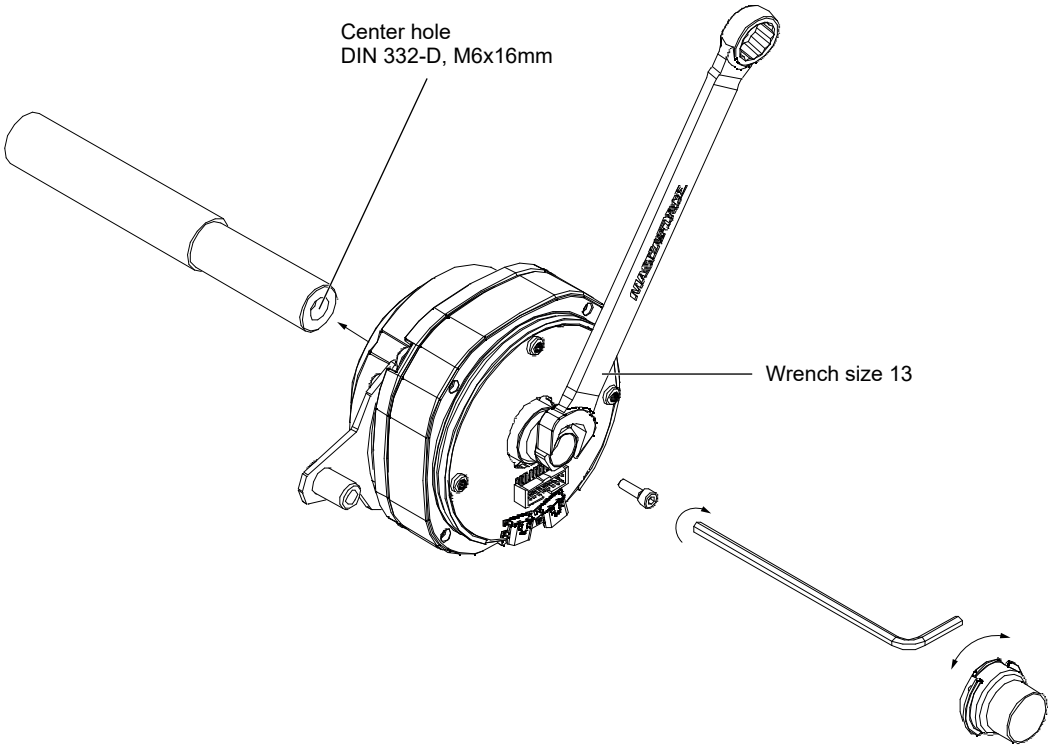
Rigid mounting may cause overload by constraining forces.

a) Do not limit the device mobility.

b) Observe the mounting instructions.

c) Adhere to the specified distances and/or angles.

5.3.1 Mounting preparations - non-through hollow shaft



Ill. 5: Mounting the encoder

Tool:

- 5 mm
- 13 mm

Instruction:

a) Remove the cover (bayonet fitting).

b) Apply grease onto the drive shaft.

c) Check the drive shaft. The drive shaft should have the smallest possible runout error, as this will lead to angular errors. Runout errors cause vibrations that may shorten the service life.

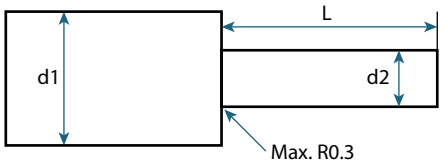
d) Slide the rotary encoder onto the shaft.

e) Screw the encoder into the central bore of the connecting shaft with M6 screw (torque 6 Nm).
Select a screw that will engage in the central thread by at least 9 mm. For doing so we recommend the *Hübner Berlin assembly and disassembly kit; order number 11077087*.

f) Mount the encoder in a way ensuring the electrical connection is protected against direct water ingress.

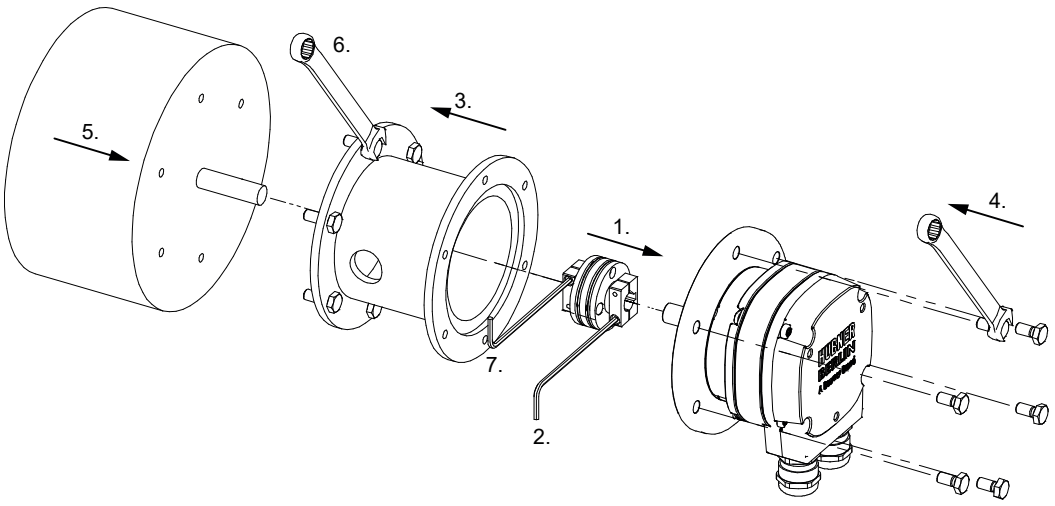
g) Reattach the cap (bayonet catch).

Recommended connecting shaft



Ød1	Ød2	L	Tolerance
≥24 mm	12 mm	min. 40 mm max. 53 mm	h6, js6, h7, g6, f7
≥24 mm	16 mm	min. 40 mm max. 53 mm	h6, js6, h7, g6, f7

5.3.2 Preparing installation



Ill. 6: Mounting the encoder

Tool:

- 2.5 mm

Instruction:

a) Attach the washer to the encoder shaft at a torque of M_t=1 Nm (1), (2).

b) Prior to installation, check runout error and drive dimensions.

c) Mount the encoder in a way ensuring the electrical connection is protected against direct water ingress.

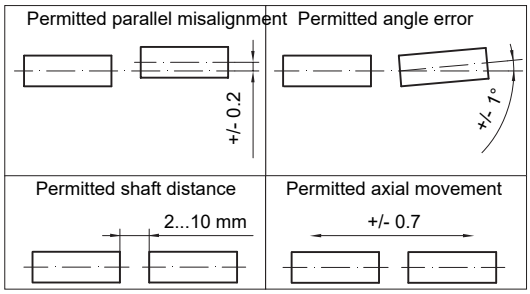
d) Apply grease onto the drive shaft.

e) Mount the attachment device (customer-specific) to the drive (5), (6) using the fastening screws.

f) Mount encoder using suitable screws, e.g. M6 x 16mm (ISO 40179) (3), (4).

g) Fasten the washer at the specified torque (7).

Maximum permitted mounting error when using the Baumer Hübner K35 flexible coupling



NOTICE

Damage to the encoder ball bearings.

Avoid hard impacts on the encoder shaft during installation on the already mounted washer.

a) During encoder installation keep runout error and angular errors down to the minimum.

b) Observe the maximum permitted mounting error tolerances.

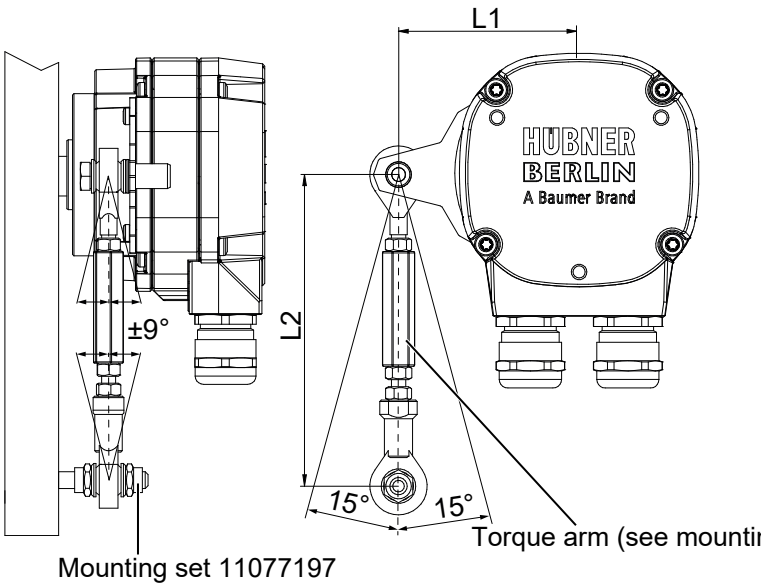
5.4 Mounting torque arm to drive

NOTICE

Incorrect mounting of the torque arm may reduce service life and cause angular errors

For example, ±0.03 mm torque arm backlash would result in a run-out error of 0.06 mm at the drive shaft and may entail severe angular errors.

a) No backlash in torque arm mounting.



a) Mount the torque arm in a way that the shift towards the torque plate's right angle does not exceed 15° to the left or right.

b) Mount the torque arm in away that the shift towards the vertical encoder axis does not exceed 9° towards the back or front.

5.5 Avoiding and calculating angular errors

Instruction:

a) Make sure that the drive runout error does not exceed 0.2 mm (0.03 mm recommended) to prevent angular errors.

b) Keep angular errors by concentricity run-out at a minimum by increasing gap L1. For doing so, various torque plates for are available on request.

c) Note that length L2 of the torque arm should be ≥ L1.

d) Angular error Δp_{mech} calculation is as follows (mit R = runout error in mm and L1 =vertical gap of torque arm towards device center in mm):
$\Delta p_{mech} = \pm 90°/\pi \times R/L1$
calculation example:
R= 0.06 mm and L1 = 69.5 mm equals an angular error of Δp_{mech} von ±0.025°.

6 Electrical installation

⚠ DANGER

Injury by to secondary damage

Encoder failure or incorrect signals may entail system control errors.

a) Eliminate secondary encoder damage by the relevant safety precautions in the downstream electronics.

NOTICE

Sensor damage due to faulty power supply.

The sensor can be damaged due to faulty power supply.

a) Operate the sensor only with protected low voltage and safe electrical isolation of protection class III.

NOTICE

Sensor damage or unintended operation due to work on live parts.

Work on live parts may lead to unintentional operation.

a) Disconnect the power before carrying out any cable.

b) Disconnect the power before connecting or disconnecting electrical connections.

NOTICE

Sensor damage by excessive switching voltage.

The sensor's overload limit is for protection only and not intended as limit for the permanently switching voltage.

a) Make sure that the maximum permitted switching voltage is not exceeded.

6.1 Connecting the supply cable to the encoder

NOTICE

Equipment damage by ESD

The electronic components in the device are sensitive to high voltage

a) Do not touch terminals or electronic components.

b) Protect output terminals from external voltage.

c) Do not exceed the maximum operating voltage.

NOTICE

Equipment damage by soiling

Soiling may cause short circuiting and damage of the sensing unit.

a) Ensure absolute cleanliness at all times when working with the device.

b) Prevent any oil or grease from penetrating inside the device.

NOTICE

Equipment damage due to dust or moisture

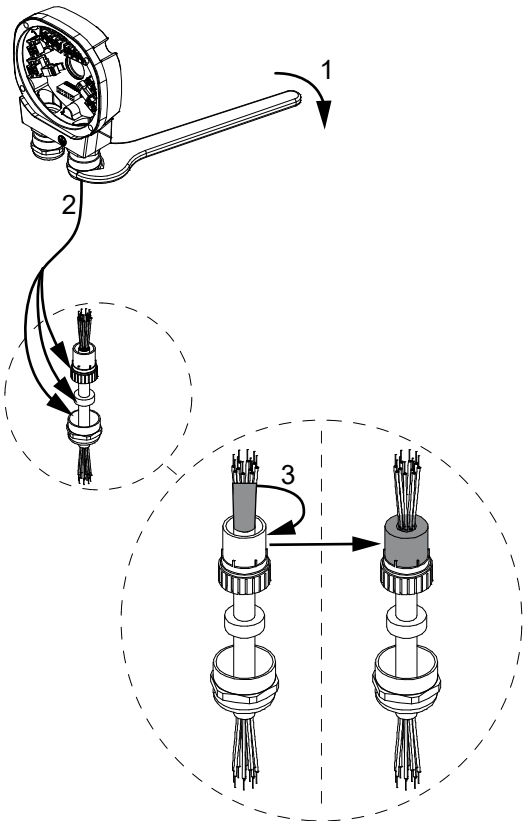
Inappropriate cable diameters may entail ingress of dust or moisture. In this case, the protection class is no longer ensured causing device failure or malfunction.

a) Use only appropriately sized cables to make sure the specified protection class is being ensured.

INFO

Connection cables are not included in delivery.

Preparing the cable



Ill. 7: Preparing the cable

Recommended to use the Baumer sensor cable HEK 8 or alternatively a shielded cable twisted in pairs. Cable routing should be in one piece and away from power supply cables.

- Differential cable connection:
  - HTL: 1 ... 3 kΩ
  - TTL: 120 Ω
- Use wire end ferrules of correct size.
- Outside diameter: Ø5 ... 13 mm

Tool:

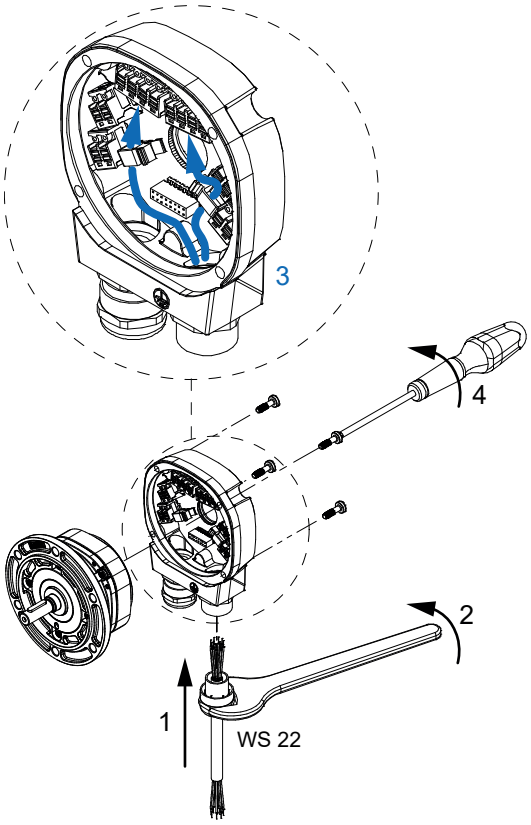
- ⎔ 22
- ✪ TX 20

Instruction:

a) Loosen cable gland (1) and guide the prepared cable through the cable gland (2).

b) Drag the cable shield over the EMC ring (3).

Cable connection



Ill. 8: Cable connection

Instruction:

a) Guide the cable through the opening into the terminal box (1).

b) Tighten the cable gland at a torque of 8 Nm (2).

c) Position the wires at the terminal.
- Make sure the signal wires are twisted in pairs.

d) After doing so, check wires and cable again whether they are securely in place.

e) Secure the cables with the cable holders (3).

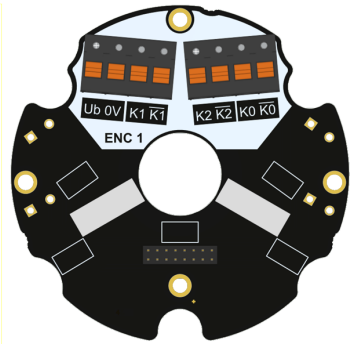
f) Screw on the terminal box at a torque of 2 ... 3 Nm(4).

Further information on mounting:

- When mounting the encoder make sure it is oriented in a way that prevents any water accumulation at the cable inlet.
- Ensure sufficient strain relief at the cable.
- We recommend labeling the cable.

6.2 Connection assignment

HOG840



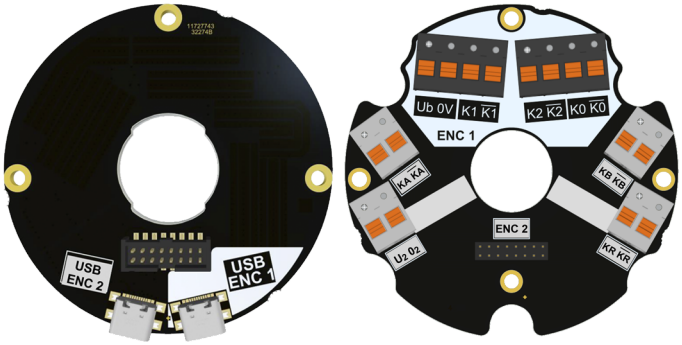
Ub	Operating voltage - encoder 1
0V	Ground connection - encoder 1
K0	Zero pulse (reference signal) - encoder 1
$\overline{K0}$	Zero pulse inverted - encoder 1
K1	Output signal channel 1 - encoder 1
$\overline{K1}$	Output signal channel 1 inverted - encoder 1
K2	Output signal channel 2 - encoder 1
$\overline{K2}$	Output signal channel 2 inverted - encoder 1

HOG860, HOG860 Smart

Ub	Operating voltage - encoder 1
0V	Ground connection - encoder 1
K0	Zero pulse (reference signal) - encoder 1
$\overline{K0}$	Zero pulse inverted - encoder 1
K1	Output signal channel 1 - encoder 1
$\overline{K1}$	Output signal channel 1 inverted - encoder 1
K2	Output signal channel 2 - encoder 1
$\overline{K2}$	Output signal channel 2 inverted - encoder 1

HOG860 Smart	
USB ENC1	USB-C for parameterization

HOG870, HOG870 Smart

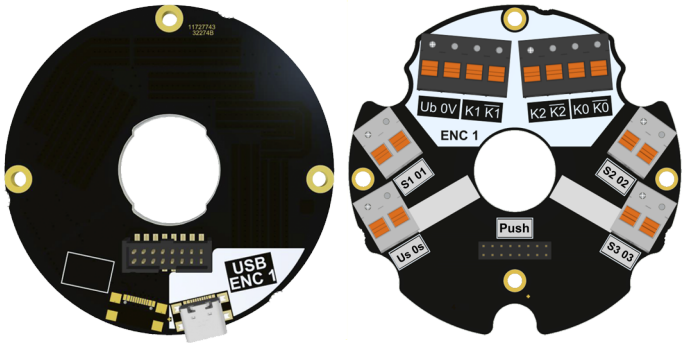


Ub	Operating voltage - encoder 1
0V	Ground connection - encoder 1
K0	Zero pulse (reference signal) - encoder 1
$\overline{K0}$	Zero pulse inverted - encoder 1
K1	Output signal channel 1 - encoder 1
$\overline{K1}$	Output signal channel 1 inverted - encoder 1
K2	Output signal channel 2 - encoder 1
$\overline{K2}$	Output signal channel 2 inverted - encoder 1

U2	Operating voltage - encoder 2
02	Ground connection - encoder 2
KR	Zero pulse (reference signal) - encoder 2
$\overline{KR}$	Zero pulse inverted - encoder 2
KA	Output signal channel 1 - encoder 2
$\overline{KA}$	Output signal channel 1 inverted - encoder 2
KB	Output signal channel 2 - encoder 2
$\overline{KB}$	Output signal channel 2 inverted - encoder 2

HOG870 Smart	
USB ENC1	USB-C for parameterization - encoder 1
USB ENC2	USB-C for parameterization - encoder 2

HOG890



Ub	Operating voltage - encoder 1
0V	Ground connection - encoder 1
K0	Zero pulse (reference signal) - encoder 1
$\overline{K0}$	Zero pulse inverted - encoder 1
K1	Output signal channel 1 - encoder 1
$\overline{K1}$	Output signal channel 1 inverted - encoder 1
K2	Output signal channel 2 - encoder 1
$\overline{K2}$	Output signal channel 2 inverted - encoder 1

Us	Operating voltage - Push output
0s	Ground connection - Push output
S1	Push switching output 1
S2	Push switching output 2
S3	Push switching output 3
01	Ground connection - Push output 1
02	Ground connection - Push output 2
03	Ground connection - Push output 3

USB ENC1	USB-C for parameterization

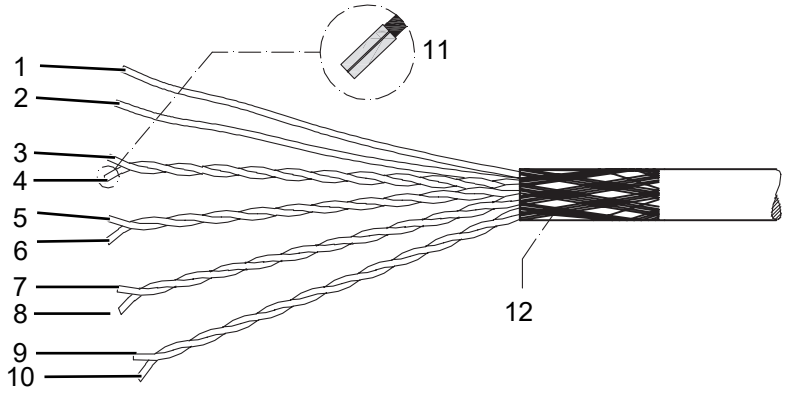
6.3 HEK 8 - Sensor cable

INFO

Recommended to use Baumer Hübner HEK 8 sensor cable or alternatively a shielded cable twisted in pairs. Cable routing should be in one piece and away from power supply cables.

Cable connection:

- HTL: 1 ... 3 kΩ
- TTL: 120 Ω

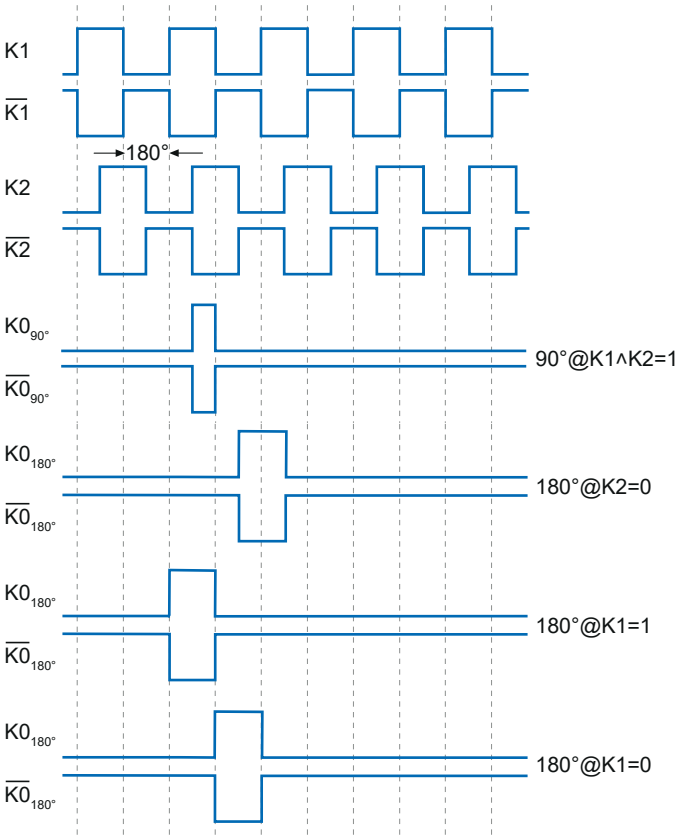


Ill. 9: Sensor cable HEK 8

1	Red = +UB	2	Blue = 0V (⊥)
3	White = K1	4	Brown = $\overline{K1}$
5	Green = K2	6	Yellow = $\overline{K2}$
7	Gray = K0	8	Pink = $\overline{K0}$
9	Do not use	10	Do not use
11	Use ferrules	12	Cable shield

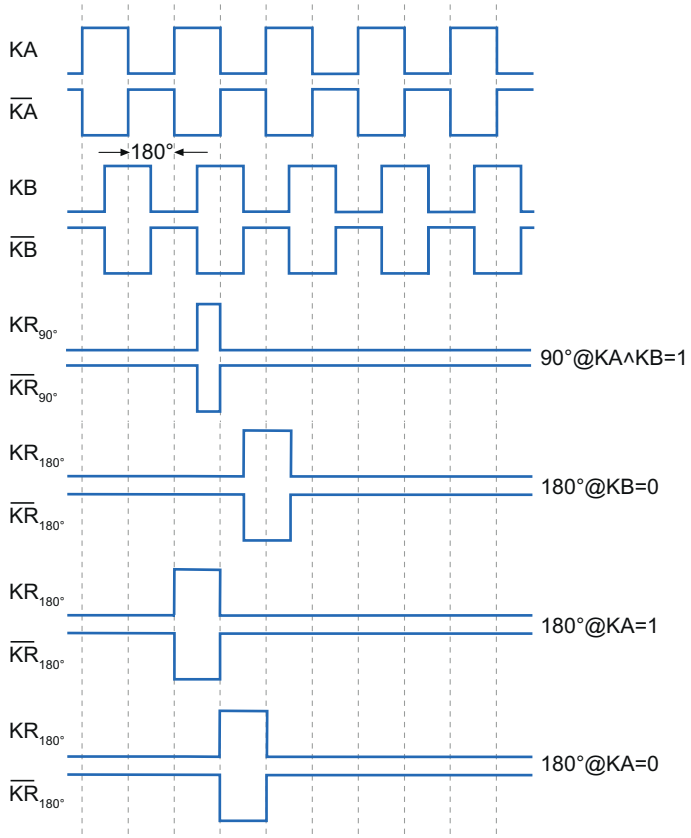
6.4 Output signals

Output signals all variants



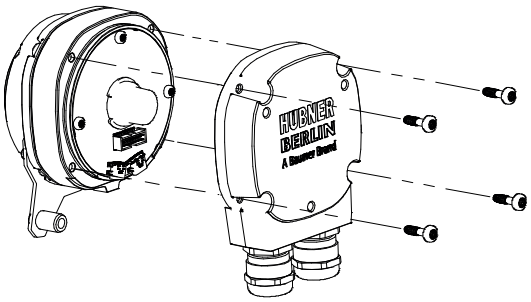
Ill. 10: Output signal behavior at positive direction of rotation

Output signals redundant variants (Encoder 2)



Ill. 11: Output signal behavior at positive direction of rotation

6.5 Mounting the terminal box



Ill. 12: Mounting the terminal box

Tool

- TX 20

Instruction:

- Attach the terminal box using a Torx screw driver (TX20). Tighten the screws applying a torque of 2-3 Nm.

7 Disassembly

NOTICE

Equipment damage due to mechanical impact

Strong vibration may lead to overload by constraining force.

a) Never apply force. If properly performed, all components can be uninstalled smoothly.

b) Use only suitable tools to uninstall.

NOTICE

Equipment damage by adhering liquids

Sticky liquids may damage sensing unit and ball bearings. Disassembling a device which is stuck to the axis can lead to destruction.

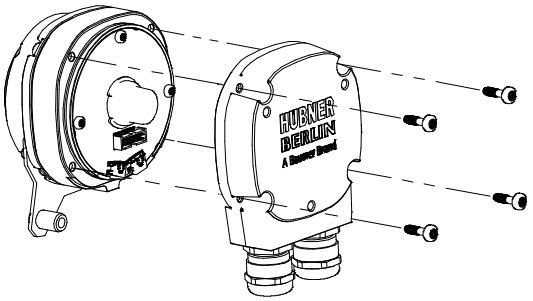
a) Do not use adhesive liquids to fasten the device.

NOTICE

The device can be easily removed via the cheese-had screw (M8x45 mm, ISO 4762) and threaded pin (M6x10 mm, ISO 7436).

7.1 Detaching encoders with blind hollow shaft

Unscrewing the terminal box



Ill. 13: Unscrewing the terminal box

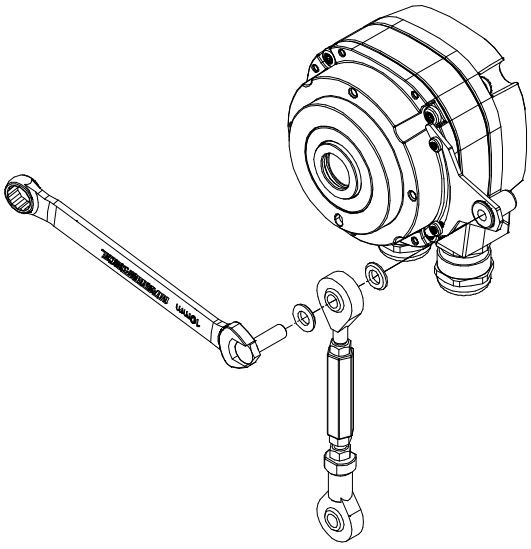
Tool

- TX 20

Instruction:

- Loosen the housing screws and detach the terminal box.

Detaching the torque arm



Ill. 14: Detaching the torque arm

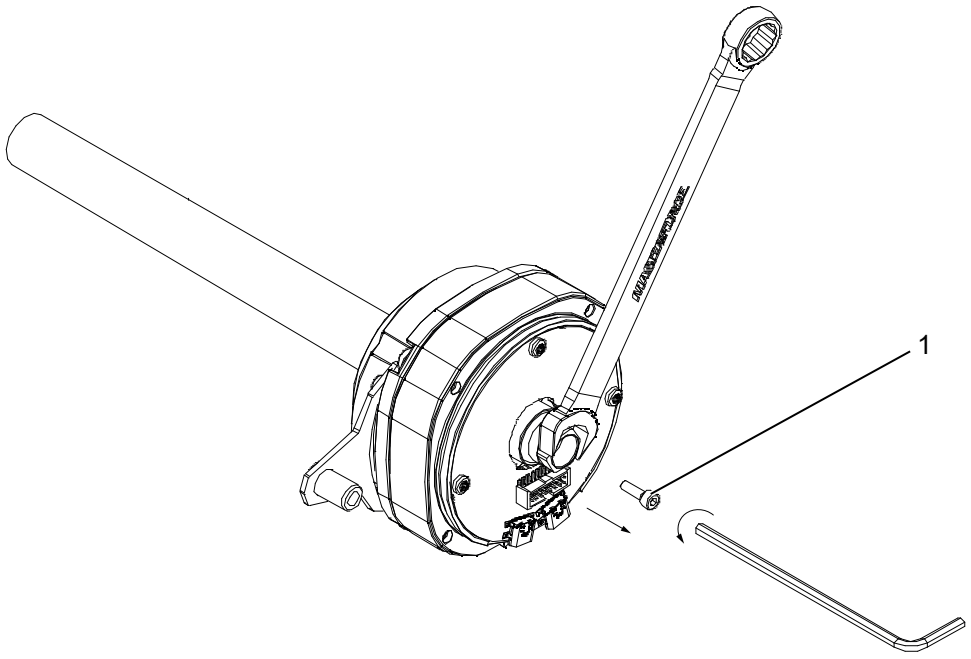
Tool

- ⎔ 10 mm

a) Loosen the screw at the torque arm.

b) Loosen the cylinder screw at grounding strap.

Unscrewing cylinder screw



Ill. 15: Unscrewing cylinder screw

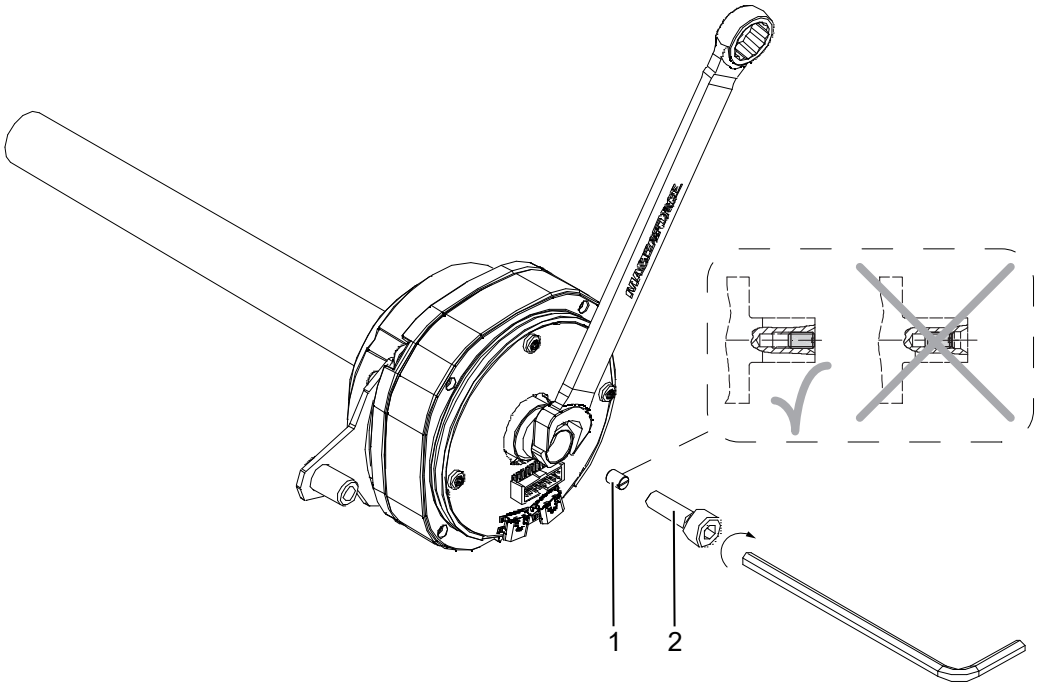
1	Cylinder screw M6x30 mm (ISO 4762)

Tool

- ⎔ 5 mm
- ⎔ 13 mm

◆ Unscrew the cylinder screw and secure at the hollow shaft using a wrench.

Uninstall encoder from drive shaft



1	Threaded pin M6	2	Cylinder screw M8x45 mm (ISO 4762)

Tool

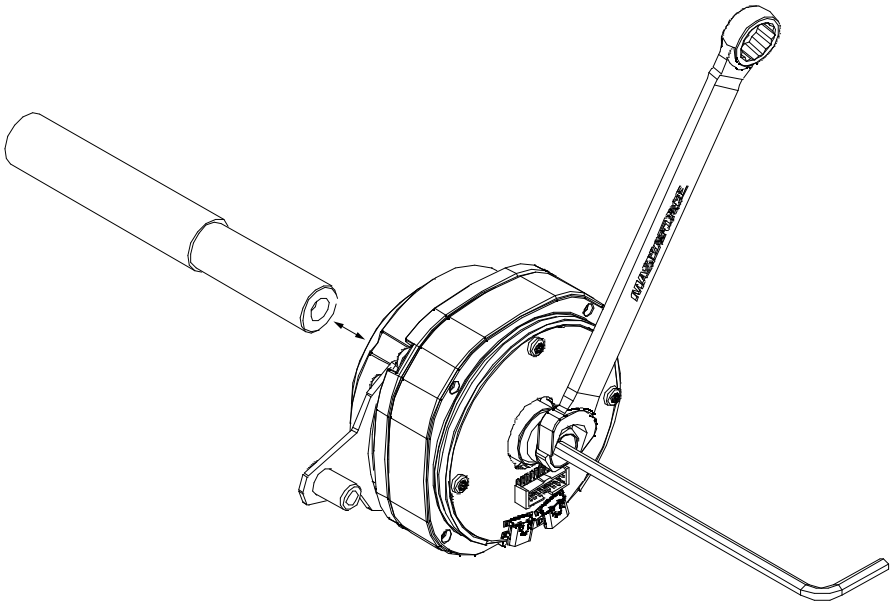
- 6 mm
- 13 mm

a) Screw the M6 grub screw into the central bore to protect the drive shaft.

b) Slide encoder off the drive shaft by tightening the M8 cylinder screw while securing at the hollow shaft using a wrench.

Result:

✓ The encoder comes off the drive shaft.



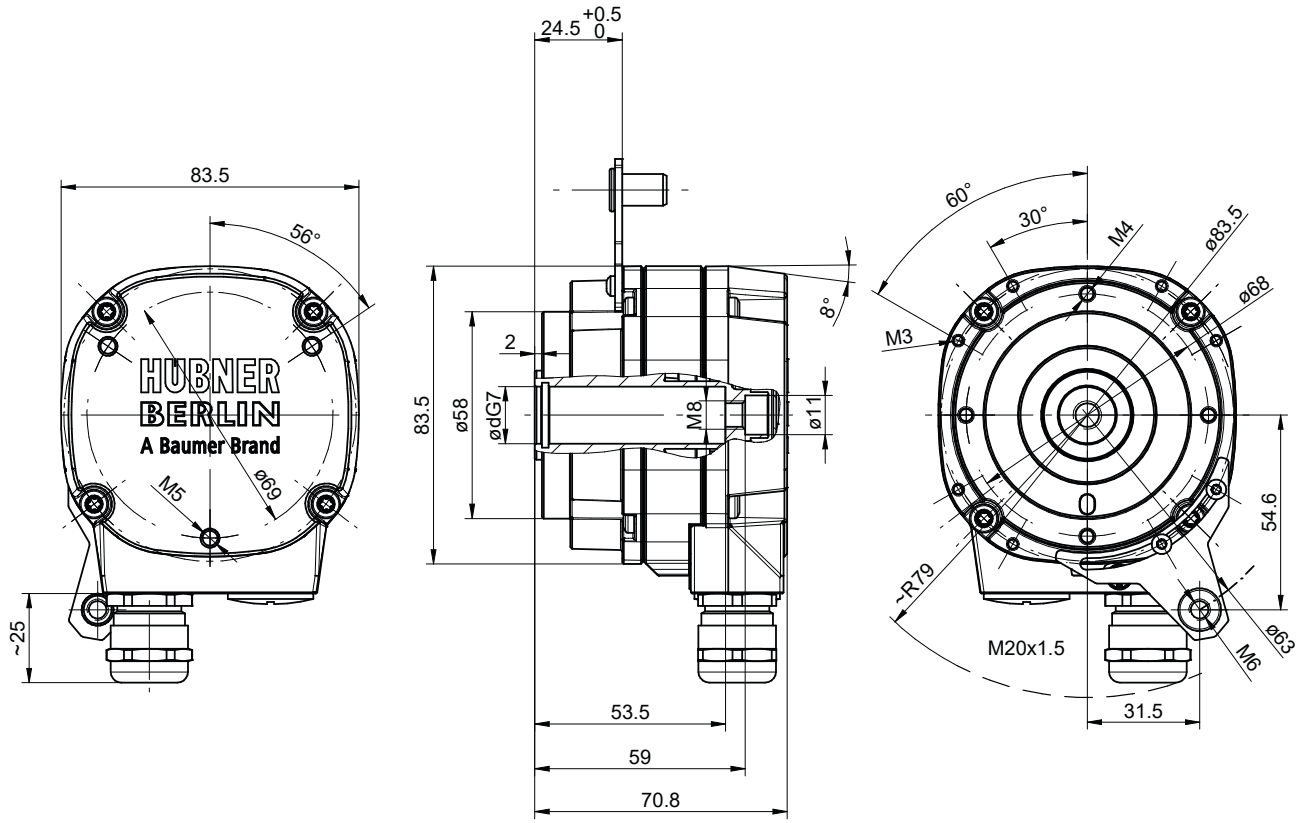
8 Maintenance

The device is maintenance-free. No special preventive maintenance is required. Any repair or maintenance work that require opening the device must be carried out by the manufacturer only.

9 Dimensional drawings

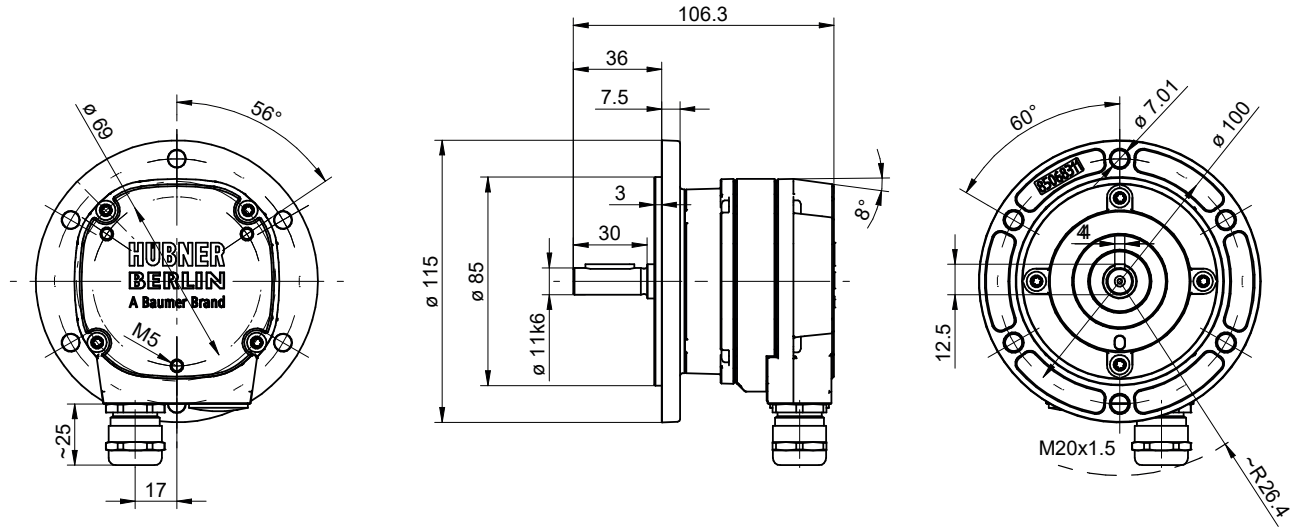
9.1 Dimensional drawings HOG840, HOG860

Hollow shaft



Ill. 16: Dimensions of blind hollow shaft in mm (unless specified otherwise)

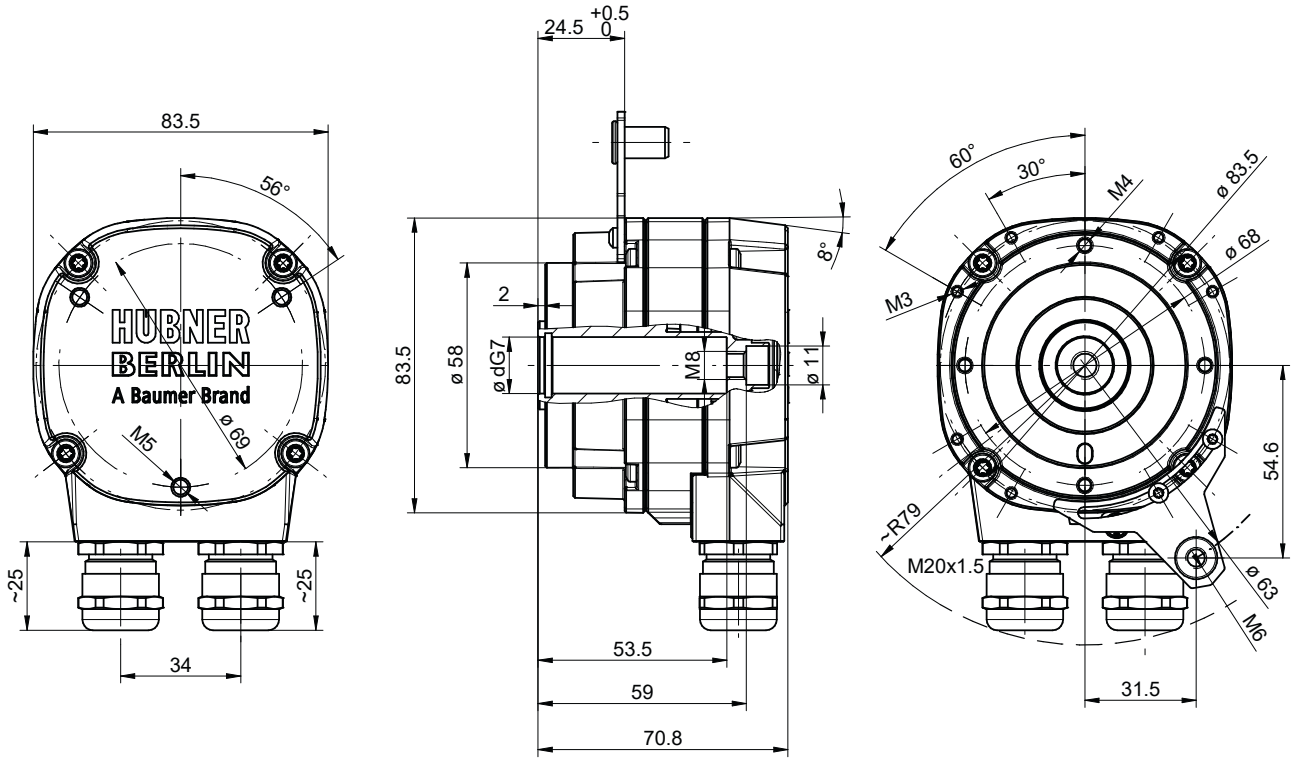
Solid shaft



Ill. 17: Hollow shaft dimensions (in mm, unless specified otherwise)

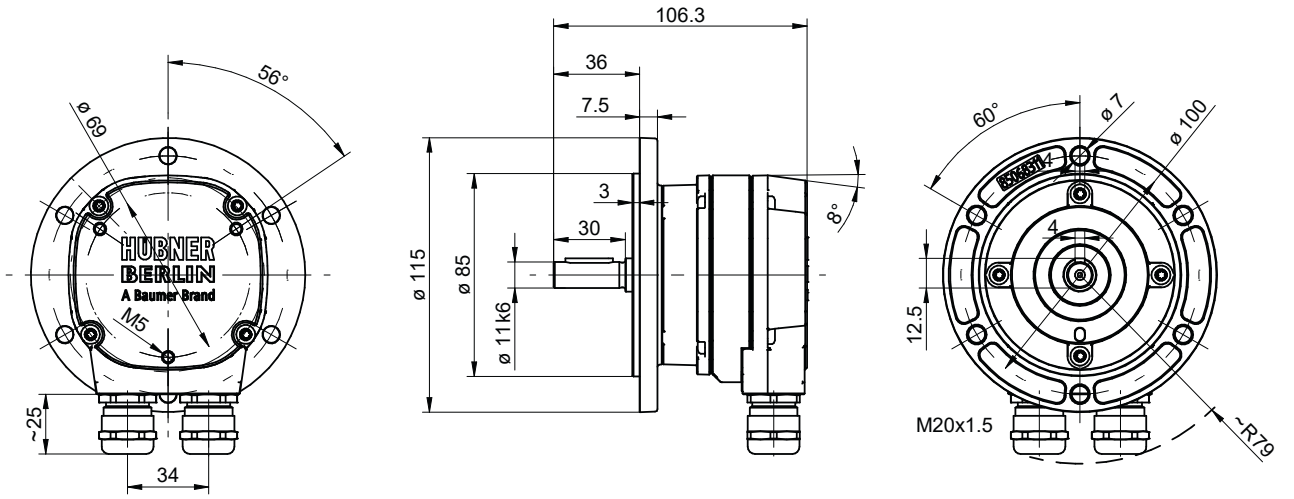
9.2 Dimensional drawings HOG870 and HOG890

Hollow shaft



Ill. 18: Dimensions of blind hollow shaft in mm (unless specified otherwise)

Solid shaft



Ill. 19: Hollow shaft dimensions (in mm, unless specified otherwise)

List of illustrations

9007199920253195

Baumer
Passion for Sensors

Baumer Germany GmbH & Co. KG
Bodenseeallee 7
DE-78333 Stockach
www.baumer.com

Baumer
Passion for Sensors

Software Manual

Baumer Sensor Suite

for HOG encoder

EN-US

V1 | 12/13/2024

Table of contents

1 About this document

1.1 Purpose

The present instruction manual describes HeavyDuty HOG encoder parameterization using *Baumer Sensor Suite (BSS)*.

A general description of *BSS* is available as a separate manual.

This manual applies for user-configurable variants of the following product families:

- HOG860
- HOG870
- HOG890

1.2 Applicable documents

- Download at www.baumer.com:
  - Instruction manual
  - Manual BSS
  - Data sheet
  - EU Declaration of Conformity
  - Certificates and Approvals
- Attached to product:
  - General information sheet
  - Quickstart

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

1.4 Labels in this manual

Identifier	Usage	Example
Dialog element	Indicates dialog elements.	Click ***OK***.
Unique name	Indicates the names of products, files, etc.	*Internet Explorer* is not supported in any version.
`Code`	Indicates entries.	Enter the following IP address: `192.168.0.250`

2 Introduction

Baumer Sensor Suite (BSS) is a software for evaluation, selection and parameterization of supported IO-Link devices and *Baumer* CANopen appliances. By intuitive visualization of sensor functions, the software further supports application engineers in the implementation of IO-Link and Baumer CANopen devices.

Further to *Baumer* IO-Link devices and *Baumer* CANopen devices, *BSS* can also be used for parameterization of IO-Link devices from other manufacturers for which *IO Device Description (IODD)* is available.

The software provides a modular architecture with varied screen views for different tasks. The *BSS* basic version provides the views *Catalog*, *Device Library* and *Device Cockpit*.

View	Description
Catalog	This view provides all supported *Baumer* IO-Link devices and Baumer CANopen devices with related detailed technical information.
Device Library	This view provides an overview of existing IODDs (IO Device Descriptions) enables IODD import and deletion as well as information on IODD contents. Hence, you can availability of the required parameters in the IO-Link device or detailed IO-Link device-specific parameterization options prior to sensor use.
Device Cockpit	This view enables device connection, parameterization and diagnostics. The dashboard enables individual views of device data. Other views provide both tabular and raw data view. Add-ons offering device-optimized, predefined graphical presentation of device functions are available for connectable Baumer products.

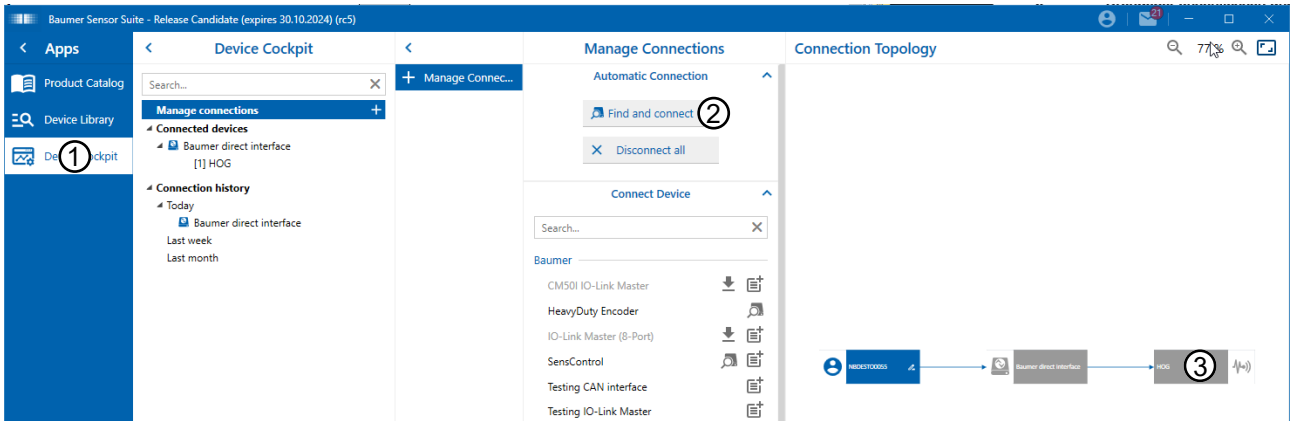
The HeavyDuty encoders HOG8.xx and HOG10.xx are integrated as an add-on in the ***Device Cockpit*** where they can be selected once connection has been established.

INFO

Create user account

A free user account is required for accessing the *Baumer Sensor Suite*.

3 Encoder connection and connecting BSS



Condition:

⇨ BSS has been installed.

Instruction:

a) Establish connection between encoder and the computer having BSS installed via USB-C port.

b) Run BSS.

c) Select (1) to open view ***Device Cockpit***.

d) Click ***Find and connect*** (2) in area ***Manage Connections***.

✓ The connected encoder is being searched for. This may take a few seconds.

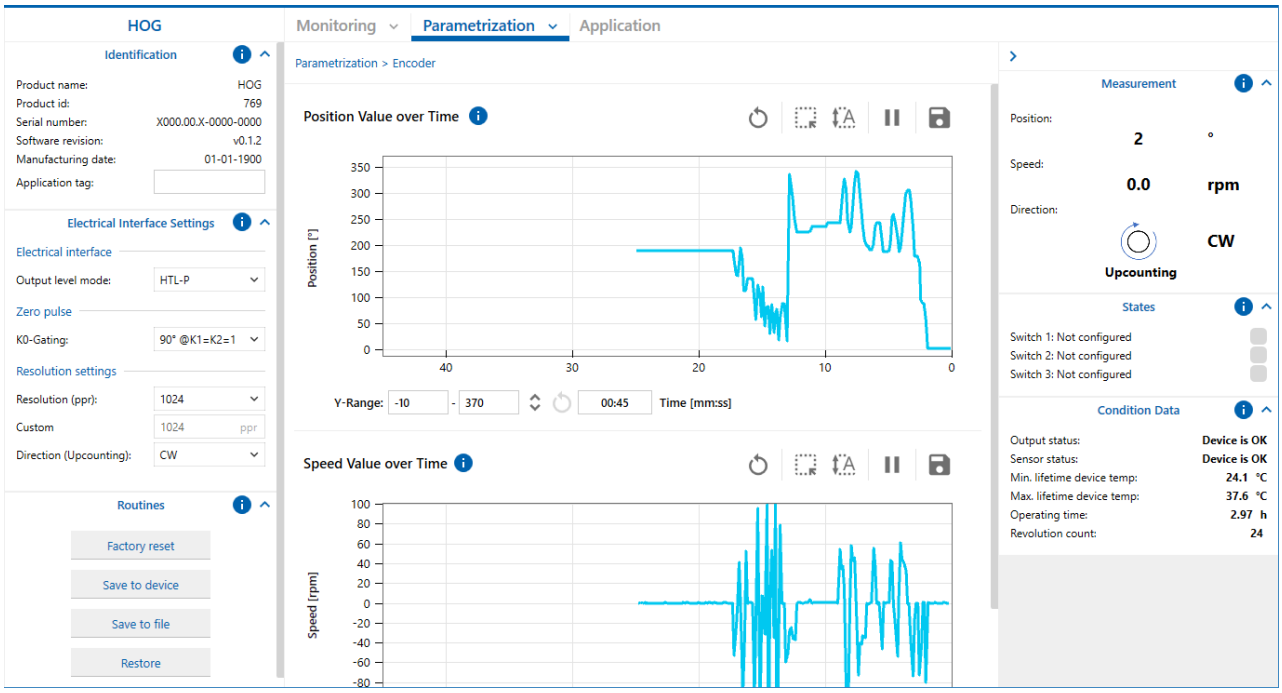
✓ As soon as the encoder has been identified it appears in area ***Connection Topology***(3).

e) Select HOG in area ***Connection Topology*** or in the Device Cockpit at ***Connected devices***.

f) Open *HOG Add-on* by click on icon (3).

Result:

✓ You are provided with the user interface for encoder parameterization or monitoring.



Ill. 1: View *HOG Add-on* (example)

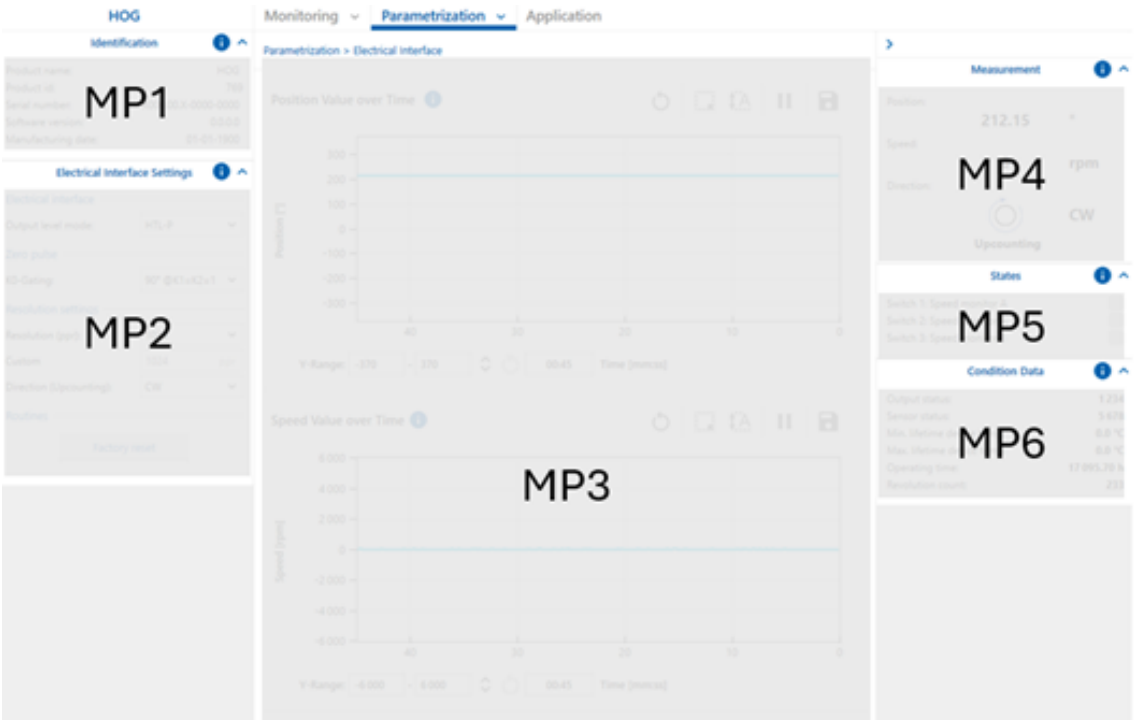
4 Overview HOG add-on

4.1 Area Monitoring and Parameterization

INFO

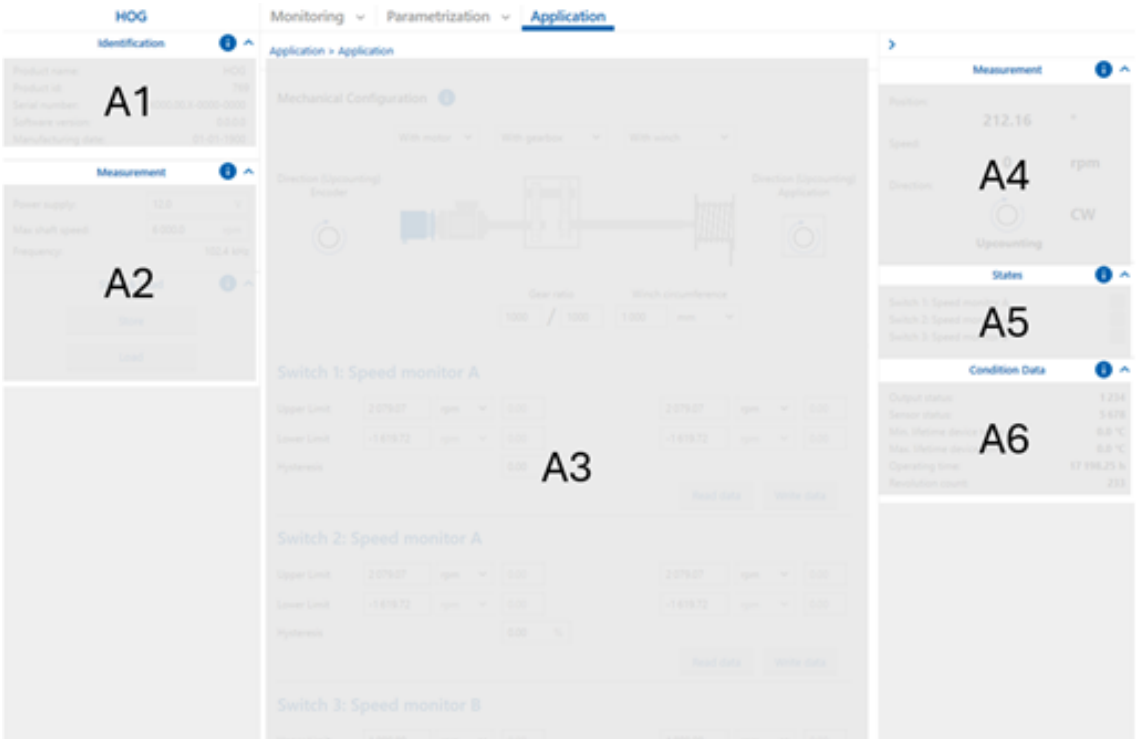
Views ***Monitoring*** and ***Parametrization*** are identically structured and provide the same information.

Settings can be edited in view ***Parametrization***. View ***Monitoring*** is read only.



Header	Selection of the basic software functions. Parameter selection of encoder (encoders) or switch (switches) is in drop-down menus ***Monitoring*** and ***Parametrization***.
MP1	General information on the connected encoder. *Identification [▶ 9]*
MP2	Display (monitoring) or editing (parameterization) of encoder parameters. The fields provided change according to the selected parameterization.
MP3	Monitoring diagrams: Provide the current speed and position information or switching states over time in the form of diagrams.
MP4	Indicates current position (0-360°), speed and direction of rotation which are read by the connected encoder. *Measurement [▶ 10]*
MP5	Display of current switching output status. *States [▶ 10]*
MP6	Overview on current status and to-date history on temperature, runtime and revolutions. *Condition Data [▶ 11]*
ⓘ	The tooltips provide detailed explanation on individual parameters/functions. Click icon to view the tooltip on a specific parameter.

4.2 Area Application



A1	General information on the connected encoder. *Identification [▶ 9]*
A2	Enter additional information on the application: ▪ Power supply applied ▪ Maximum shaft speed (Shaft Speed) ▪ This is required for automated frequency calculation. This information has no effect on the encoder settings.
A3	Maps the selected application environment. The input fields can support parameter calculation. Switch-specific input fields come in the lower area, according to the selected switch. The related parameterized values can be read in and after having defined new ones they are written back into the encoder as new parameters.
A4	Indicates current position (0-360°), speed and direction of rotation which are read by the connected encoder. *Measurement [▶ 10]*
A5	Display of current switching output status. *States [▶ 10]*
A6	Overview on current status and to-date history on temperature, runtime and revolutions. *Condition Data [▶ 11]*
ⓘ	The tooltips provide detailed explanation on individual parameters/functions. Click icon to view the tooltip on a specific parameter.

5 Monitoring/Parametrization

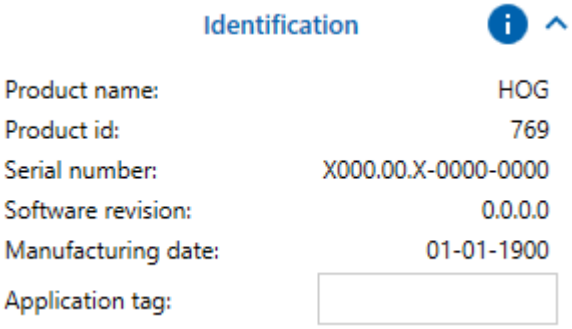
INFO

Views ***Monitoring*** and ***Parametrization*** are identically structured and provide the same information.

Settings can be edited in view ***Parametrization***. View ***Monitoring*** is read only.

5.1 Identification

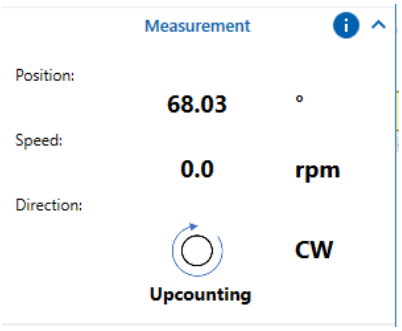
Area ***Identification*** (MP1, A1) is provided in each view. It presents the following information on the connected encoder:



Product Name	Product family name of connected encoder
Product id	Product identification number of *Baumer Sensor Suite*
Serial number	Unique serial number of the connected encoder. Use the serial number to retrieve on the Baumer website the order-specific configuration as a registered user.
Software revision	Firmware version installed on connected encoder
Manufacturing date	Production date of connected sensor in format `dd-mm-yyyy`.
Application tag	This field my provide a brief application description. View ***Parametrization*** can define ***Application tag***(max. 32 characters).

5.2 Measurement

Area ***Measurement*** (MP4, A4) is provided in each view. Here, the display shows the CURRENT encoders values.



Position	Shows the current encoder position. Either 0° to 360° or 360° to 0° according to direction of rotation. Having completed a revolution, value would start again at 0° (clockwise rotation CW) or 360° (counterclockwise rotation CCW). Value presentation rounds to two decimal digits.
Speed	Shows current speed in rpm (revolutions per minute).
Direction	Shows the direction of rotation defined for positive counting.

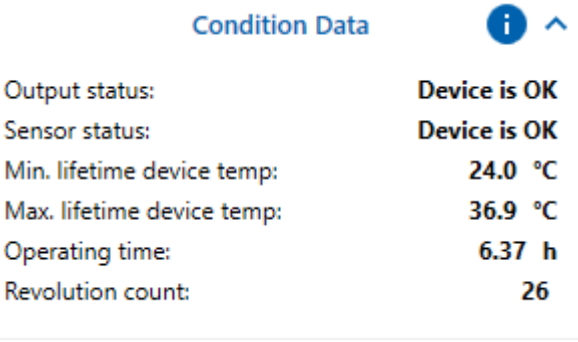
5.3 States

Area ***States*** (MP5, A5) is provided in each view. Here you see the current status of the related switch, together with parameterized switch type.

Gray	Switch is enabled resp. has not triggered.
Yellow	Switch is enabled resp. has triggered.

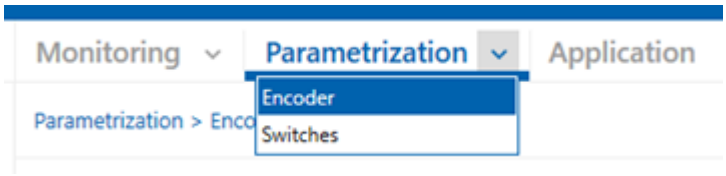
5.4 Condition Data

Area ***Condition Data*** (MP6, A6) is provided in each view. Here you see the general encoder status.

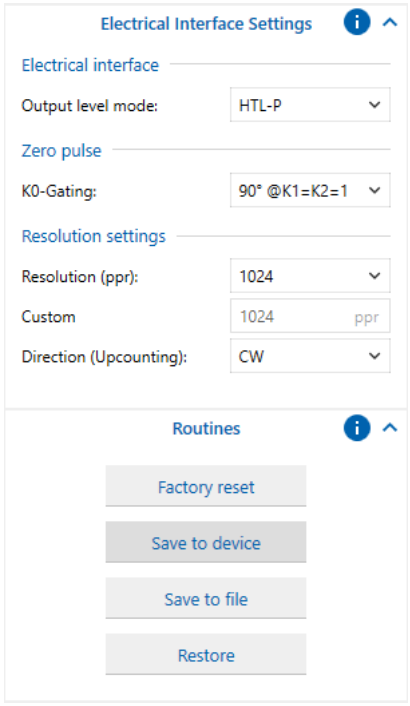


Output status	Provides the output status. In the event of error, please check encoder wiring. Cause is either a cabling error or output overload.
Sensor status	In the event of internal hardware error, you can see the error code here. In the event of hardware error contact customer service.
Min. lifetime device temp	Minimum device temperature in the present service life.
Max. lifetime device temp	Maximum device temperature in the present service life.
Operating time	Device operating time (total runtime).
Revolution count	Total revolutions over device lifetime.

5.5 Encoder

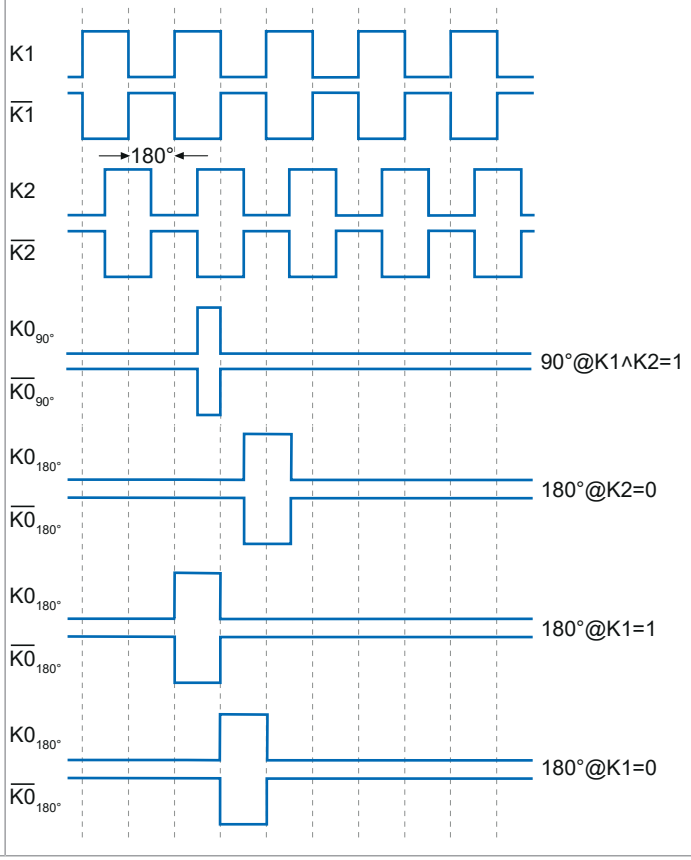


Area ***Electrical Interface Settings*** (MP2) is for defining (***Parametrization***) or presenting (***Monitoring***) the parameters for general encoder setting.



Ill. 2: Encoder settings (example) in view ***Parametrization***

Electrical Interface		
	Output level mode	Setting the output signal. Permitted values: ▪ HTL-P ▪ TTL

Zero Pulse		
	K0-Gating	Type of zero pulse position. Permitted values: ▪ 90° @K1=K2=1 ▪ 180° @K2=0 ▪ 180° @K1=1 ▪ 180° @K1=0 Graphic display of setting-specific input signals: 

Resolution Settings		
	Resolution (ppr)	Display of selected predefined resolutions. Permitted values: ▪ 50 ▪ 500 ▪ 512 ▪ 1000 ▪ 1024 ▪ 2048 ▪ 2500 ▪ 4096 ▪ 5000 ▪ Custom Selecting value Custom here will allow in the next step a user-defined value in field ***Custom***.
	Custom	User-specific value for non-standard resolution. Only enabled if value Custom was previously selected at ***Resolution (ppr)***.
	Direction (Upcounting)	Selection/display of the set direction of rotation with positive speed, respectively if display position is from 0° to 360° . ▪ CW = clockwise rotation ▪ CCW = counterclockwise rotation

These buttons are only available in view ***Parametrization***:

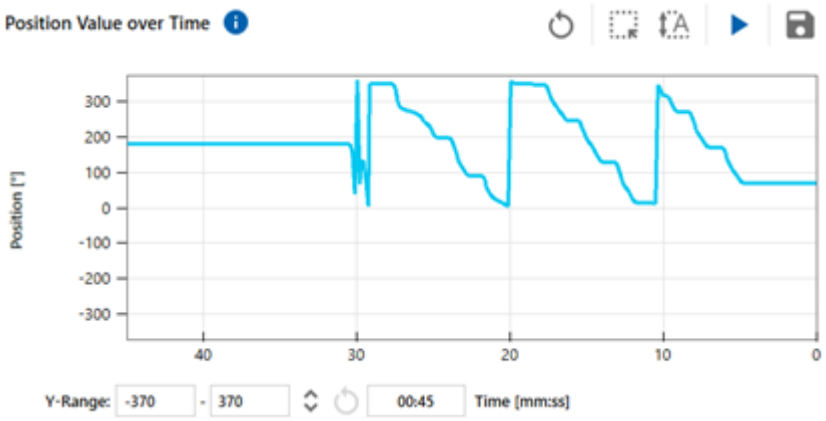
Factory Reset	At ***Factory Reset*** means restore default in the entire parameterization.
Save to device	The encoder would permanently adopt the set parameters.
Save to file	The set parameters are saved in an external file.
Restore	The saved parameters are loaded out of external file. Current parameterization is overwritten. For permanent encoder parameterization execute ***Save to device*** in the next step.

5.5.1 Monitoring Diagrams

There are different types of diagrams:

- **Switch state over Time**
  - Presents the current status of a switching output as a graph over time.
- **Position Value over Time**
  - Presents current encoder position value as a graph over time.
- **Speed Value over Time**
  - Presents the current encoder speed value as a graph over time.

Way of operation and presentation are all the same.



Ill. 3: Diagram **Position Value over Time** (example)

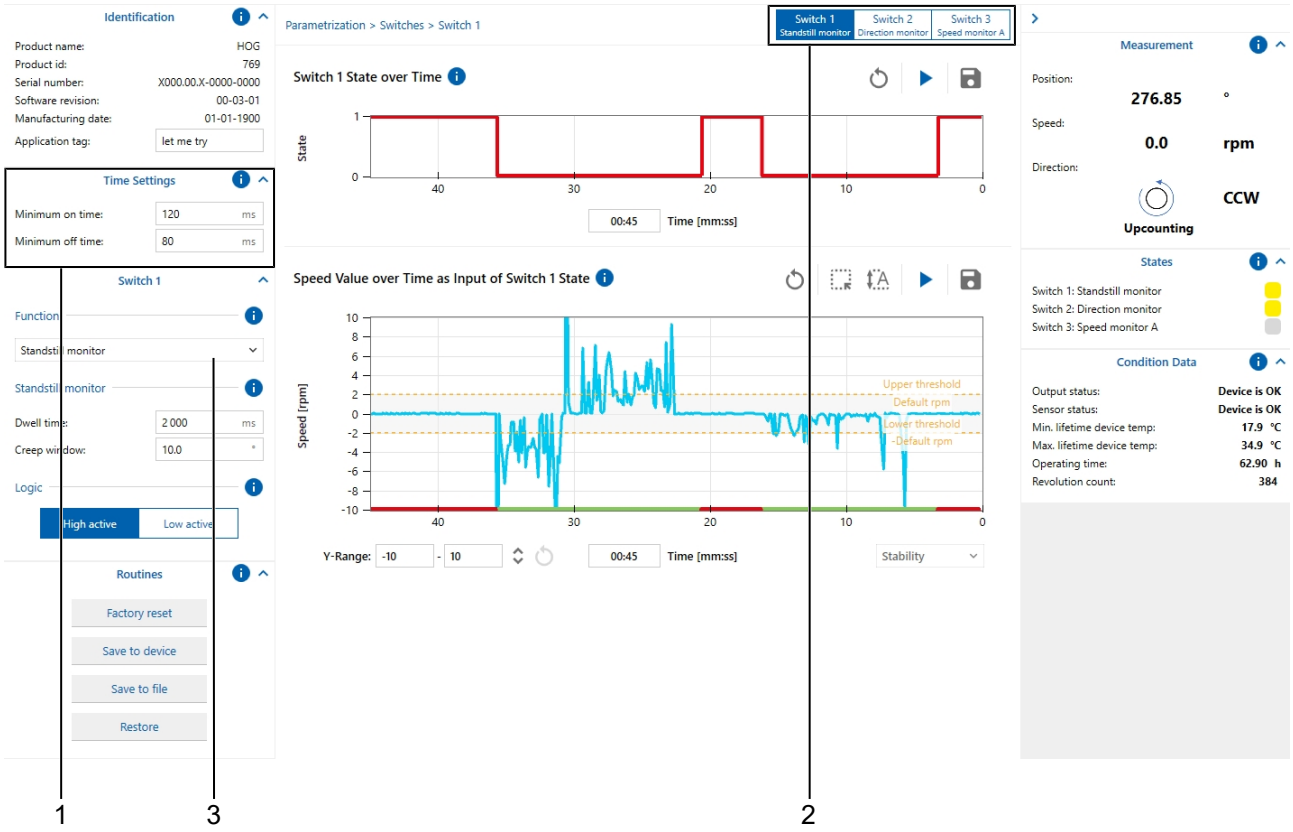
	Reloading graph
	Enlarging selected area
	Adapting area automatically to displayed graph
	Stop graph and display freeze. Display resumed when pressing again.
	Saving the displayed values to CSV file.
Y-Range	Here, you can specify the min and max limits for Y-axis.
	Inverting Y-axis
Time [mm:ss]	Defining the display time (X-axis)

5.6 Switches

Three switching outputs (switches) are available for individual parameterization.
The switches can have individual functions:

- Standstill and Creep Detection
- Direction Monitoring
- Speed Monitoring
- Events
- Test
- Not configured

Switch parameterization



INFO

Time Setting (1)

The minimum switching duration for both switching status can be individually parameterized to ensure reliable detection by the higher-level control.

a) First, select the switch to be parameterized (2).

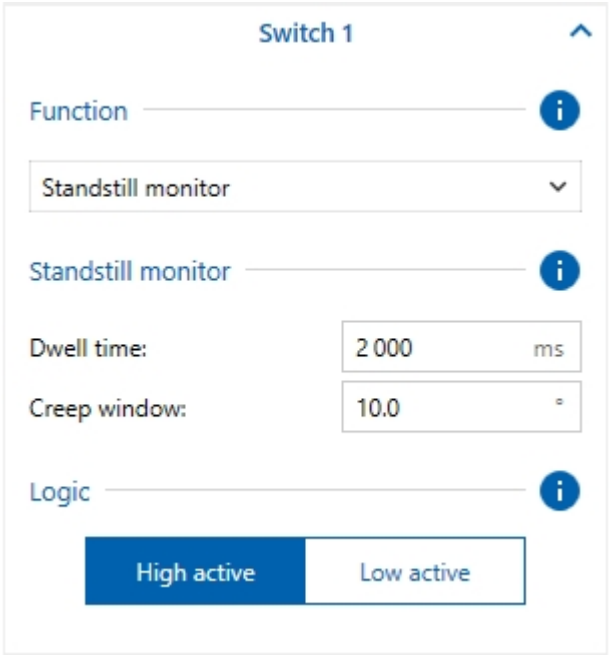
b) Assign the switch the desired function (3).

✓ You are provided with the parameters for the desired function.

c) Proceed with switch parameterization.
Settings are described in detail in the following chapters.

5.6.1 Standstill and Creep Detection

One of the three switches can be parameterized for standstill and creep down to a speed of 0 rpm.

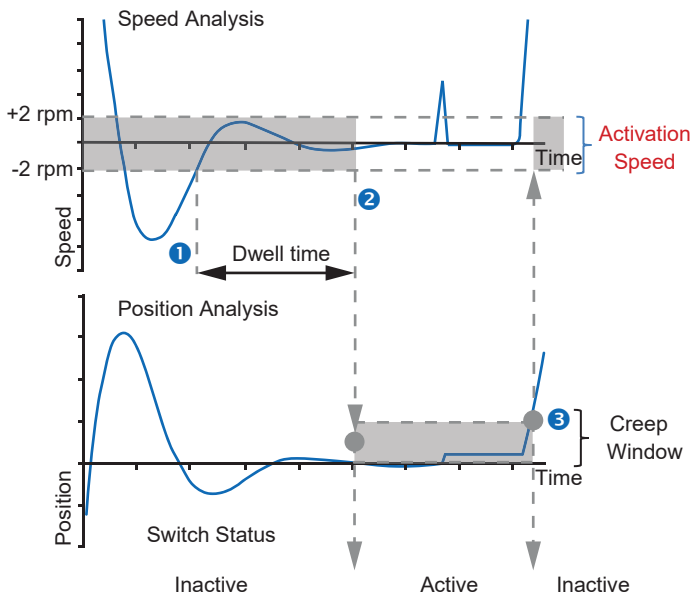


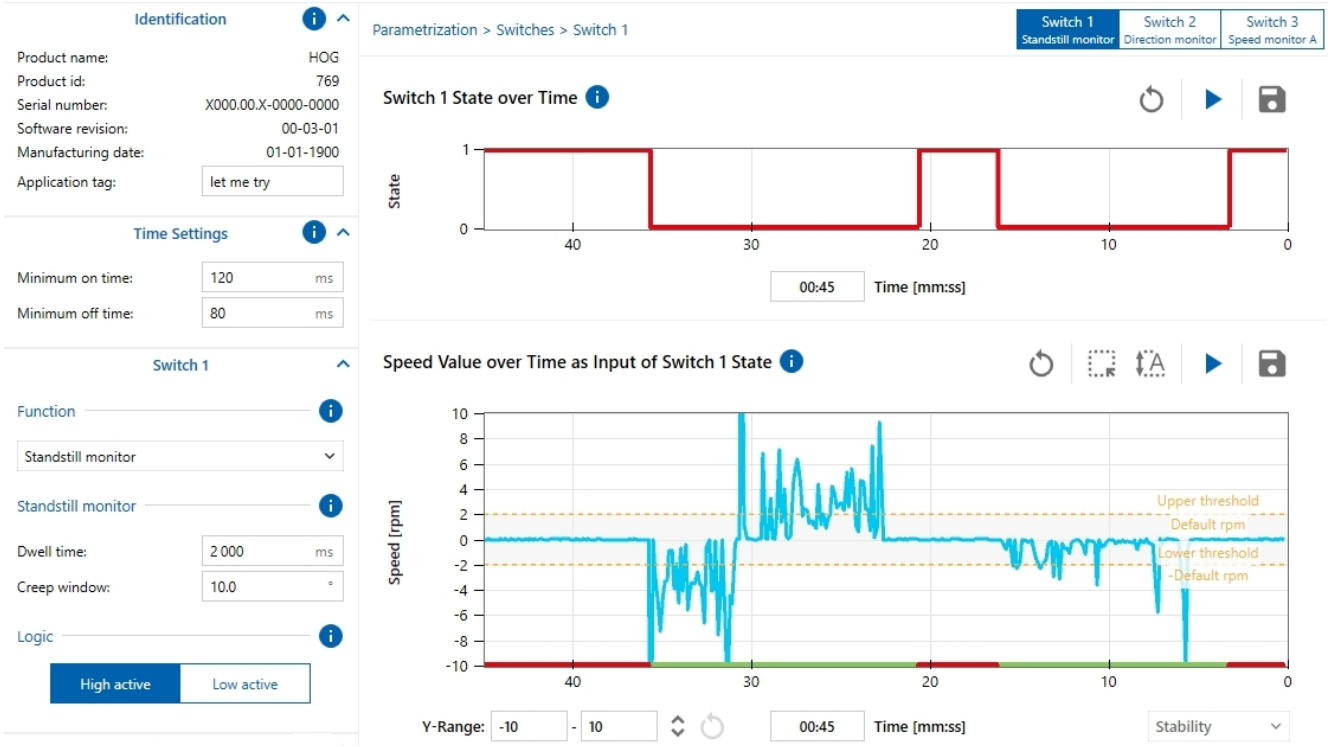
Function	Mode ***Standstill monitor*** is selected.
Dwell time	Defining the dwell time. The encoder must remain within ±2 rpm for this time until switch would trigger.
Creep window	Maximum position window in [°]. Window the system may still move in one or the other direction which would be still indicated as a standstill.

(Dwell time) would start as soon as speed is within the trigger speed of ±2 rpm.

Speed remaining below the trigger speed and having elapsed dwell time would set the switch to **active**. Furthermore, internal monitoring would change from speed to position monitoring. The switching status remains on **active** for the time the position value is within the parameterized *Creep Windows*.

Leaving *Creep Windows* in one of the two directions would set switch to **inactive** again and monitoring returns to speed monitoring.

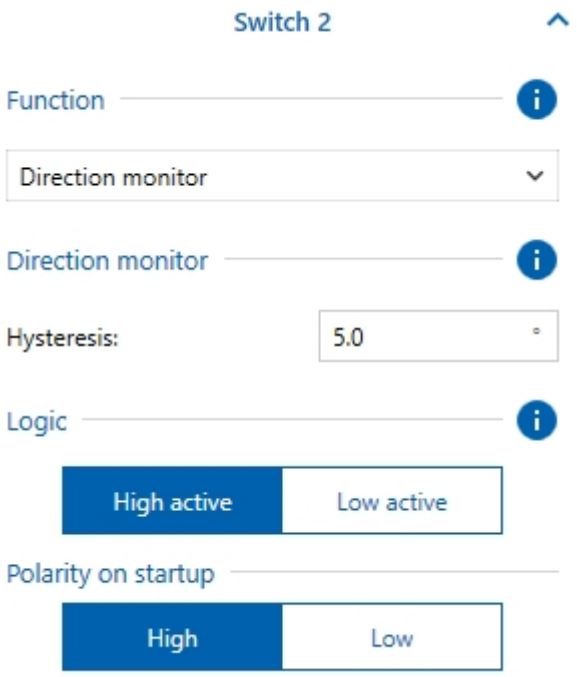




Ill. 4: Switch parameterization as *Standstill monitor* (example)

5.6.2 Direction Monitoring

One of the three switches can be used for direction monitoring.



Ill. 5: Parameters for mode *Direction Monitoring*

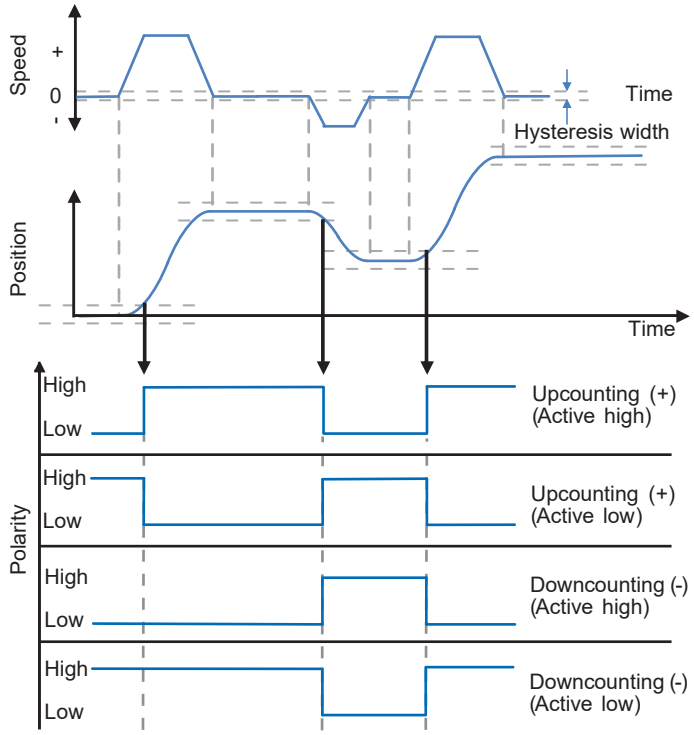
Function	Mode ***Direction Monitoring*** is selected.
Hysteresis	Defining the permitted hysteresis.

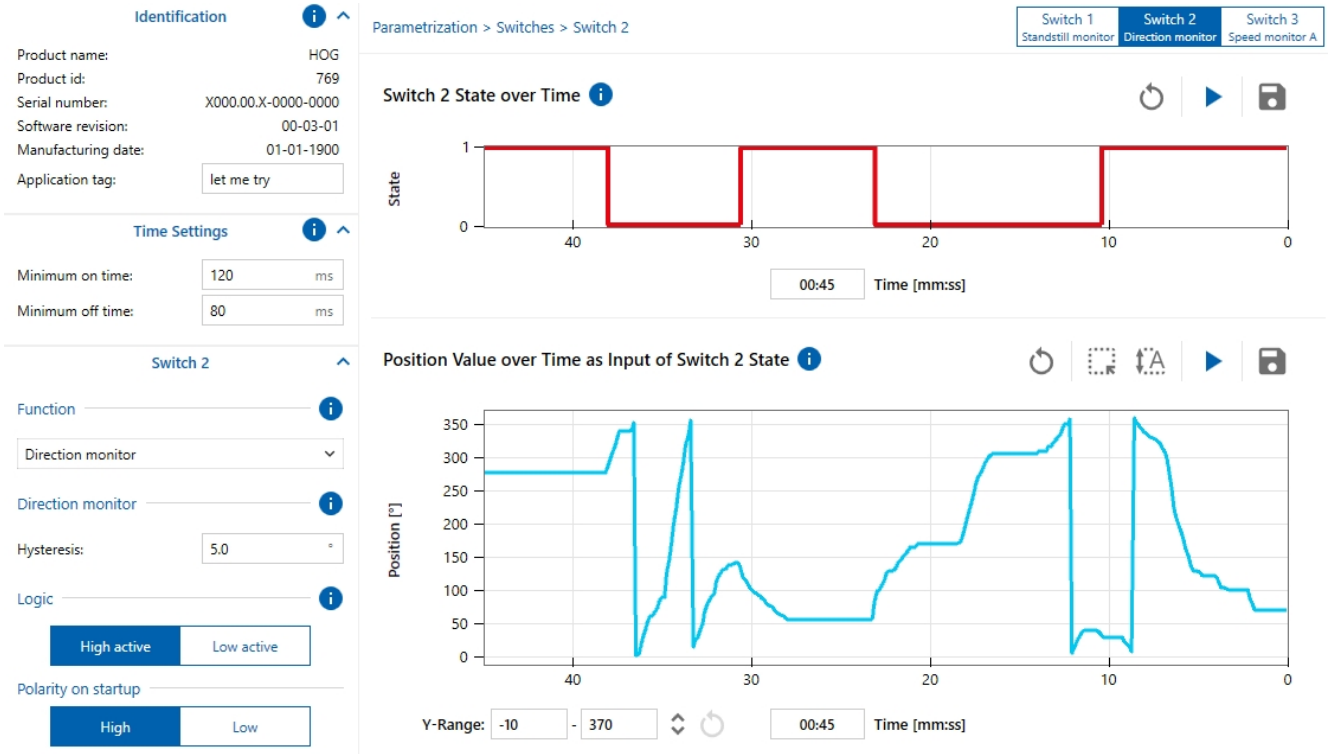
When the position value is reaching the maximum hysteresis level in upward direction, the switch would change to:

- **High** in mode High Active
- **Low** in mode Low Active

Changing direction and reaching the minimum hysteresis level, the switch would change to:

- **Low** in mode High Active
- **High** in mode Low Active

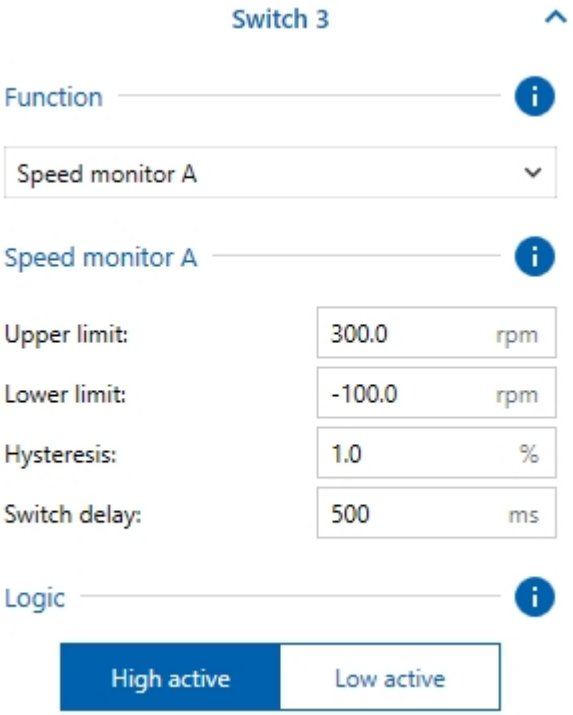




Ill. 6: Switch parameterization as *Direction monitor* (example)

5.6.3 Speed Monitoring

Up to three switches can be parameterized as speed monitoring. Three different speeds can be parameterized for monitoring, or several switches can be assigned the same monitoring speed.

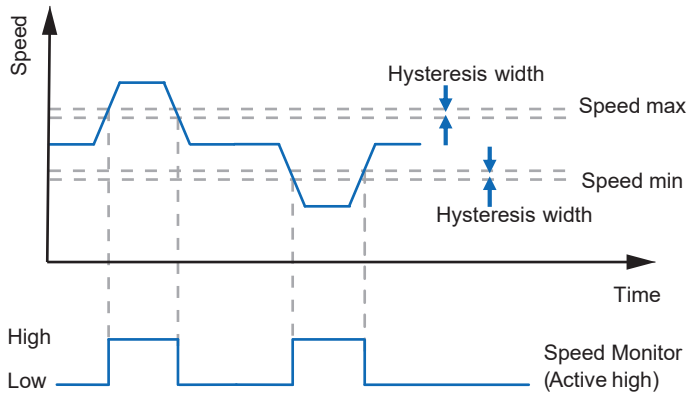


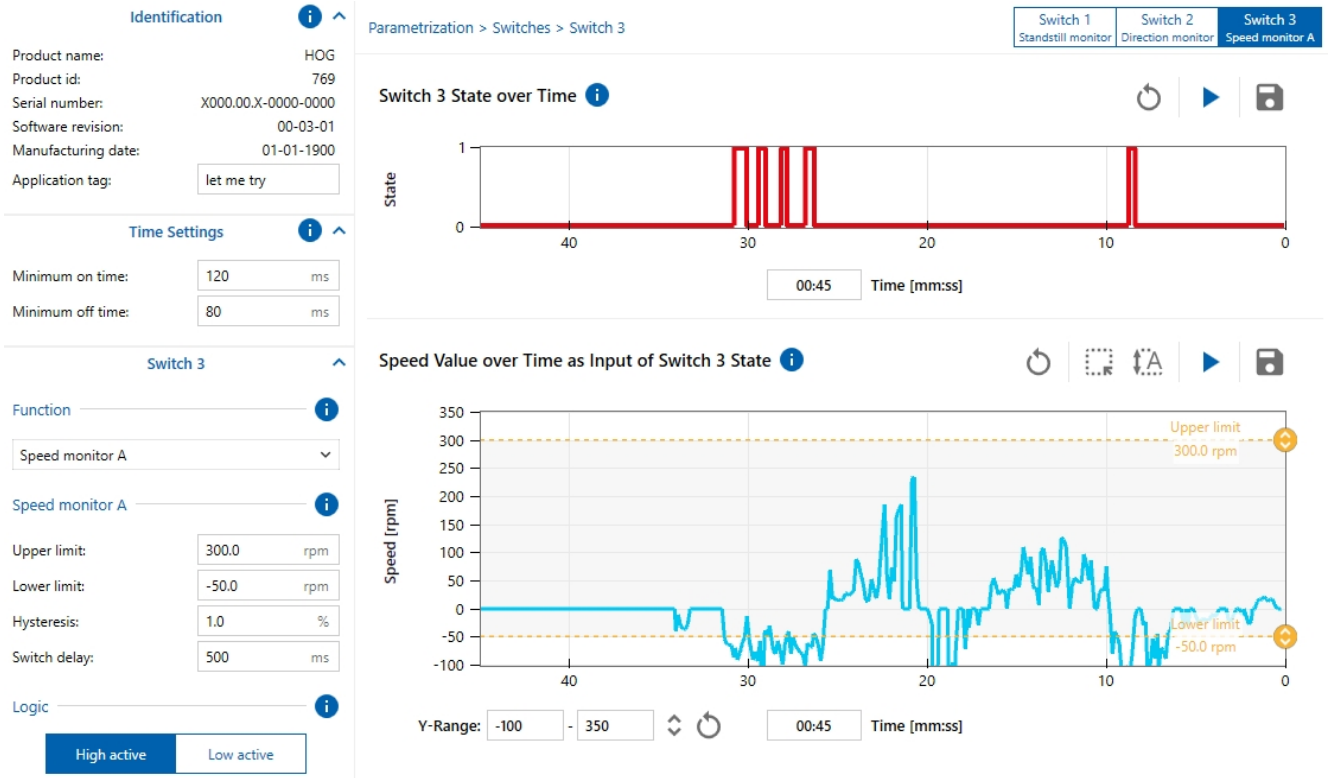
Ill. 7: Parameters for mode *Speed Monitoring*

Function	Mode ***Speed monitor A***, ***Speed monitor B*** or ***Speed monitor C*** has been selected.
Upper limit	Maximum limit of speed monitoring.
Lower limit	Minimum limit of speed monitoring.
Hysteresis	Speed hysteresis.
Switch delay	Time to be either exceeded or fallen below prior to switch triggering. This enables filtering of short-term speed fluctuations in the application. Value range: 0 ... 5000 ms

If speed is above or below the set limits, the switch would change to active mode.

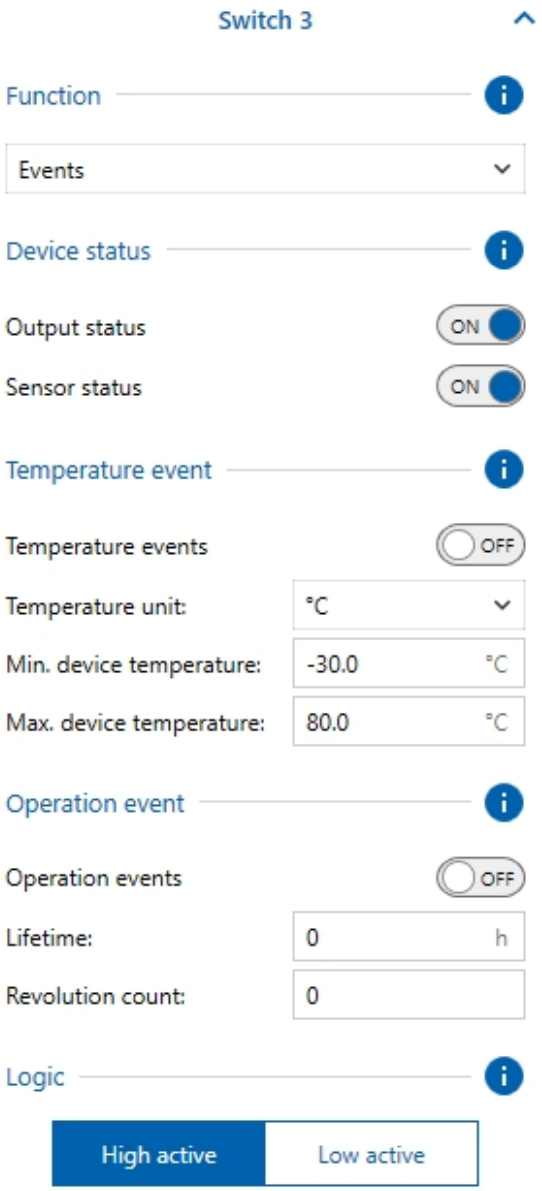
- **High** in mode High Active
- **Low** in mode Low Active





Ill. 8: Switch parameterization as *Speed monitor* (example)

5.6.4 Events



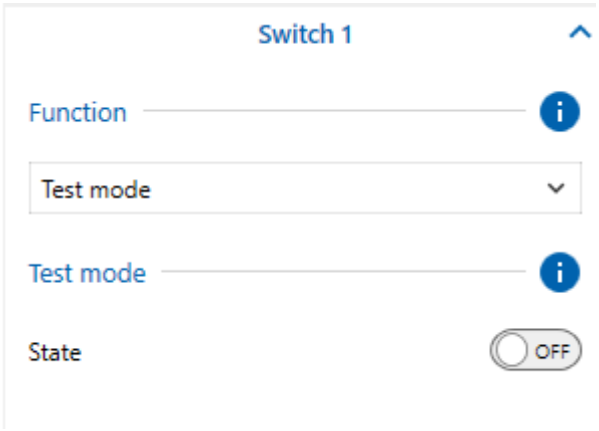
Source selection	Selection of the event type to trigger the switching output.

Device status	▪ ***Output status***
	  ▪ Output status (Output): Active in the event of cabling error or output overload.
	▪ ***Sensor status***
	  ▪ Sensor status: Active in the event of encoder failure

Temperature event	The switch becomes active when reaching the user-defined minimum or maximum device temperature.
Operation event	The user can define a particular life cycle and number of revolutions. The switch is active when reaching the specified service life or number of revolutions. If zero, no event would be triggered.
Logic	▪ High active ▪ Low active

5.6.5 Test Mode

This mode is used to test the connected units in the application.



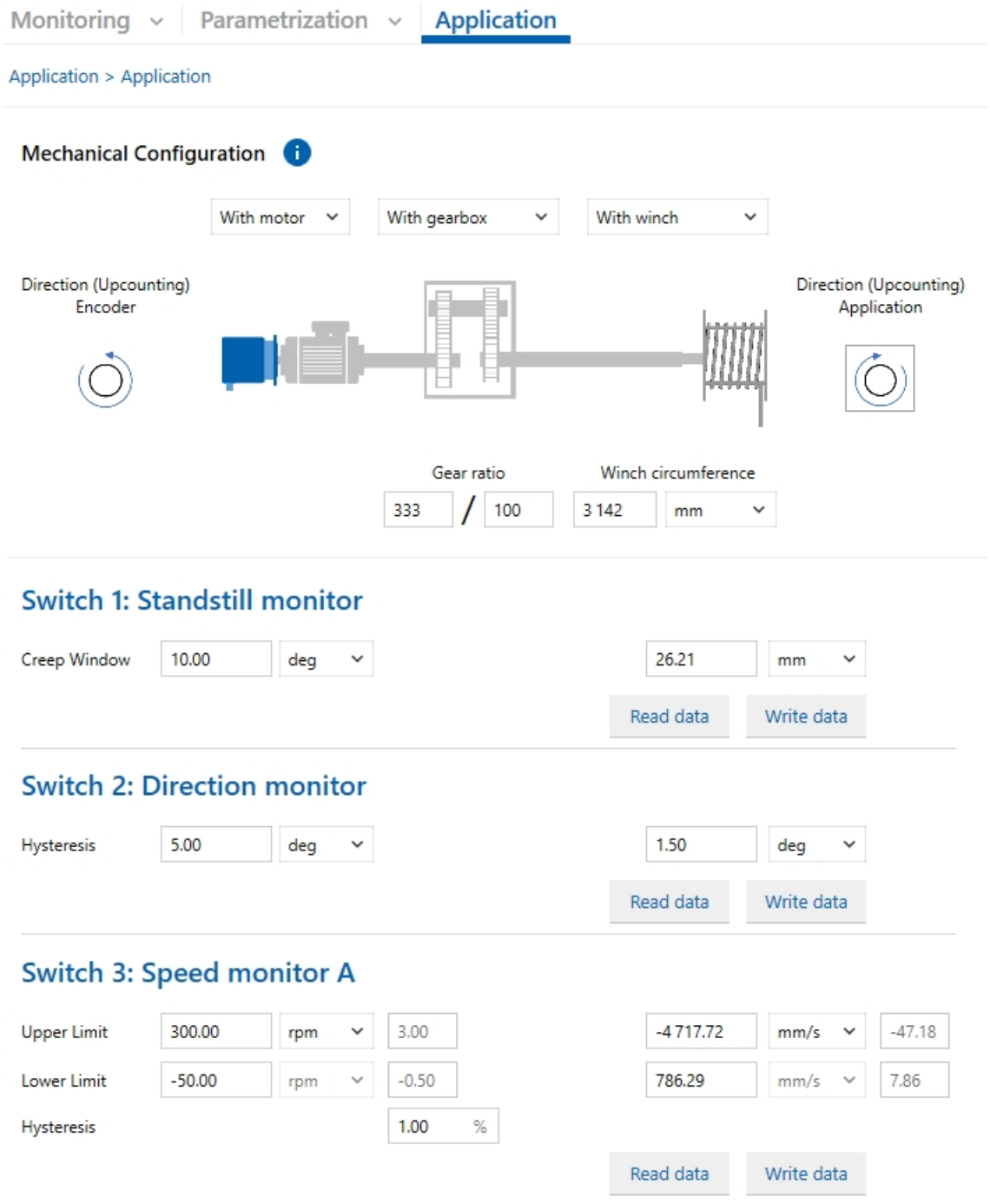
Function	Mode ***Test mode*** is selected.
State	Here you can manually switch on or off the selected switch. ▪ ON: Switch enabled ▪ ON: Switch disabled

6 Application

Area ***Application*** is intended to ease parameterization of switching functions by simplified representation of the application for parameterization based on the target values of the end application. To access this area, at least ONE switch must be configured to one of the 3 switching functions ***Standstill monitor***, ***Direction monitor*** or ***Speed monitor***.

6.1 Mechanical Configuration

This area is intended to present a simplified representation of your application.



Use the drop-down boxes for parameterization of the mechanical configuration. This includes:

- Motor (yes/no) - 1
  - Selection without technical effect but for clear visualization only.
- Gearbox (yes/no) - 2
  - If a gearbox has been selected, the entered gear ratio is used for encoder value calculation.
- End application - 3
  - Rotative

    No further conversion
  - Winch

    Winch scope, if applicable
  - Linear motor

    Thread pitch if applicable
- Moving direction of end application - 4
  - Based on the encoder's direction of rotation, here you can define whether the mechanical transmission chain would revert the sign of the moving direction.
  - (To represent gear reversal or dependency to winch winding direction.)

The permitted parameters are presented in the display, according to switching function configured in chapter ***Parametrization***.

You select between different units. The entered value is automatically converted according to application parameters and user unit. Possible user units:

- Position (deg, rad, rev, mm, inch)
- Speed (deg/s, rad/s, rpm, mm/s, inch/s)

Read data Readout of the current encoder parameters.

Write data New parameters are transmitted to encoder.

⚠ CAUTION

Not executing Write data means encoder parameterization remains unchanged!

6.2 Measurement

Further information on the description of the application. The data entered here is not relevant for the calculation of parameters.

The signal frequency of the incremental signals is calculated and displayed based on the maximum speed using the parameterized resolution.

7 Default settings

This function restores default in the entire sensor values and parameterization. Default will be restored in the entire user settings. You have the following options:

Designation	Description
Application Reset	Restores default in the parameterization of the technology-specific application. Identification parameters will be retained.
Restore Factory Settings	Restores default in all device parameters.

Adjustable parameters	Factory setting for sensor
Speed Monitor 1-3	
Maximum speed threshold for speed switch 0-2	600 rpm
Speed hysteresis (in percent) for speed switch 0-2	2 %
Minimum speed for speed switch 0-2	-600 rpm
Switch delay in ms	0 ms
Inversion of speed switch 0-2	High Active
Standstill Monitor	
Position window for creep detetction in deg	1 deg
Dwell time for standstill detetction in ms	1000 ms
Inversion of creep detection switch	High Active
Direction Monitor	
Hysteresis for direction switch	1 deg
Direction on startup	High
Inversion of direction switch	High Active
Event Monitor	
Maximum revolution count for event	0 (Unlimited) revolutions
Minimum temperature for event	-30 °C
Maximum temperature for event	80 °C
Maximum runtime for event	0 (Unlimited) hours
Minimum ON time for all switches	100 ms
Minimum OFF time for all switches	100 ms
Functionality assigned to switch 0	Not configured
Functionality assigned to switch 1	Not configured
Functionality assigned to switch 2	Not configured
Supply voltage in volts	24 V
Signal level of switches: HTL or TTL	HTL
Maximum application speed	0 rpm
Resolution (ppr)	1024
Zero Gating Option	90° @ AB=11
Direction (upcounting)	CW
Short descritpion of the application	None (empty)

Adjustable parameters	Factory setting for sensor
Gear ratio nominator for applications with gear box	1000
Gear ratio denominator for applications with gear box	1000
Circumference of the winch	1000 mm
Unit for winch circumference	mm
Unit for screw thread	mm/rev
Determines if a gear box is attached	Yes
Determines if a winch is attached	Yes
Determines if attached to motor	Yes
Unit used for position values	deg
Unit used for speed values	rpm
Unit used for temperature	°C
Rotation direction in application. CW or CCW	CW
Output status event enable	Off
Sensor event enable	Off
Temperature event enable	Off
Operation time event enable	Off
Polarity for event configuration	Off
Unveränderliche Parameter	
Lifetime revolution count	NONE
Lifetime minimum temperature	NONE
Lifetime maximum temperature	NONE
Total runtime since being brought into service	NONE
Warnings from sensor, drivers or temperature sensor	NONE
Errors from sensor, drivers or temperature sensor	NONE
Product name	HOG
Product ID	769
Serial number	NONE
Software version number	NONE
Date of manufacturing	NONE

List of illustrations

663783947

Baumer
Passion for Sensors

Baumer Germany GmbH & Co. KG
Bodenseeallee 7
DE-78333 Stockach
www.baumer.com