Baumer
Passion for Sensors



Software Manual

Baumer Sensor Suite

for EHOG encoder

EN-US

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1 About this document

1.1 Purpose

The present instruction manual describes HeavyDuty EHOG 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:

- EHOG840
- EHOG860
- EHOG870
- EHOG890
- EHOG1060
- EHOG1070
- EHOG1090
- EHOG1095

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 EHOG8.xx and EHOG10.xx are integrated as an add-on in the ***Device Cockpit*** where they can be selected once connection has been established.

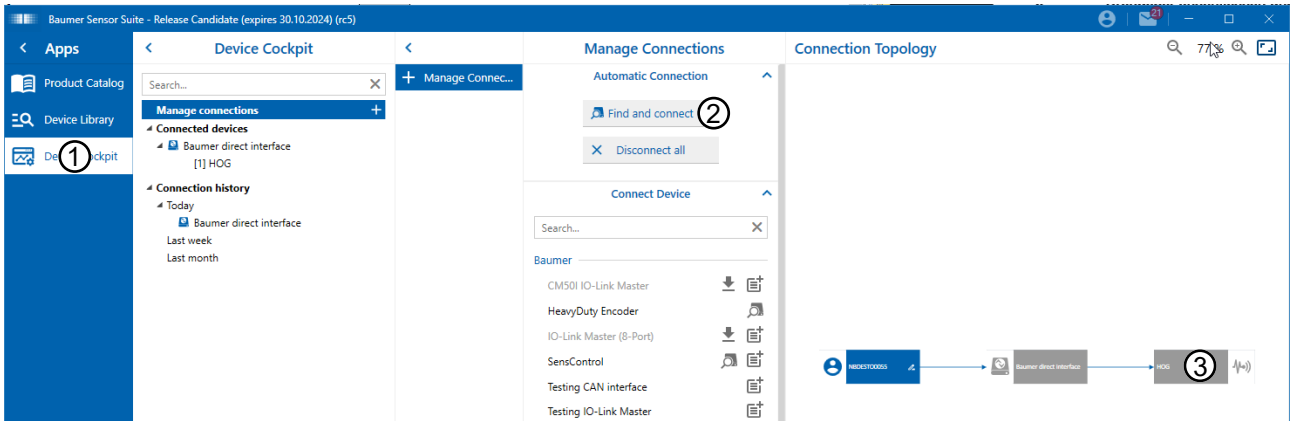


INFO

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.

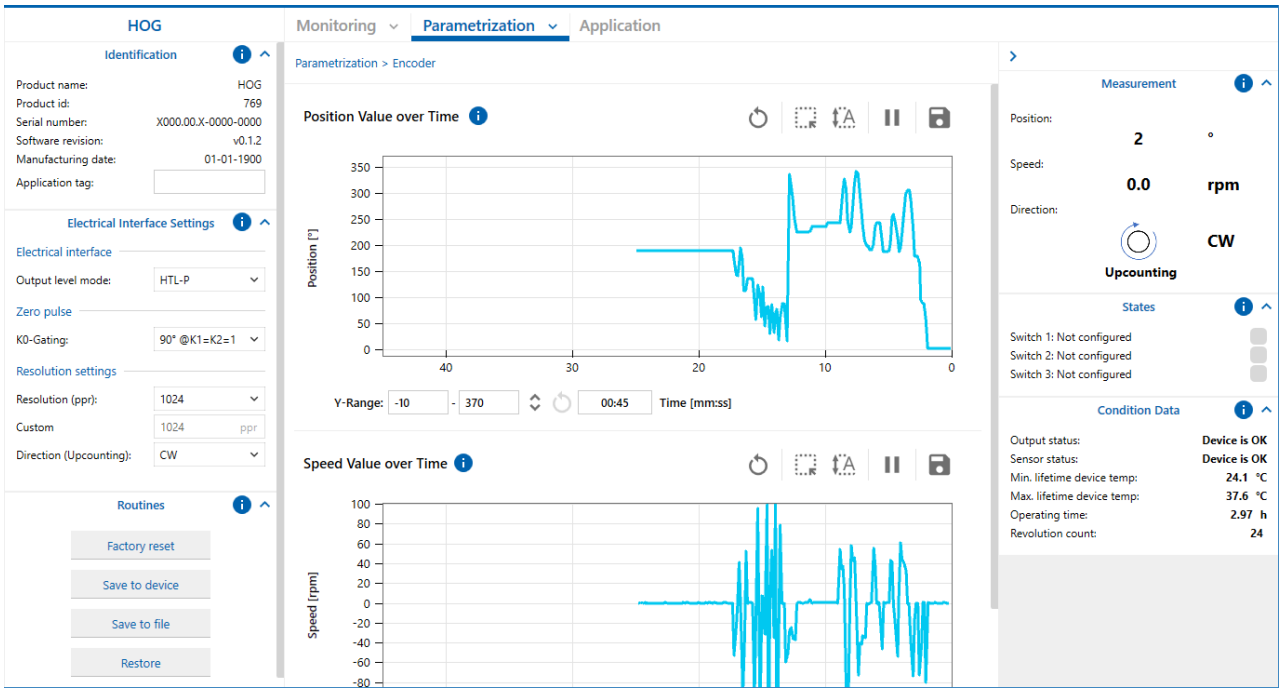
✓ As soon as the encoder has been identified it appears in area ***Connection Topology***(3).

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)

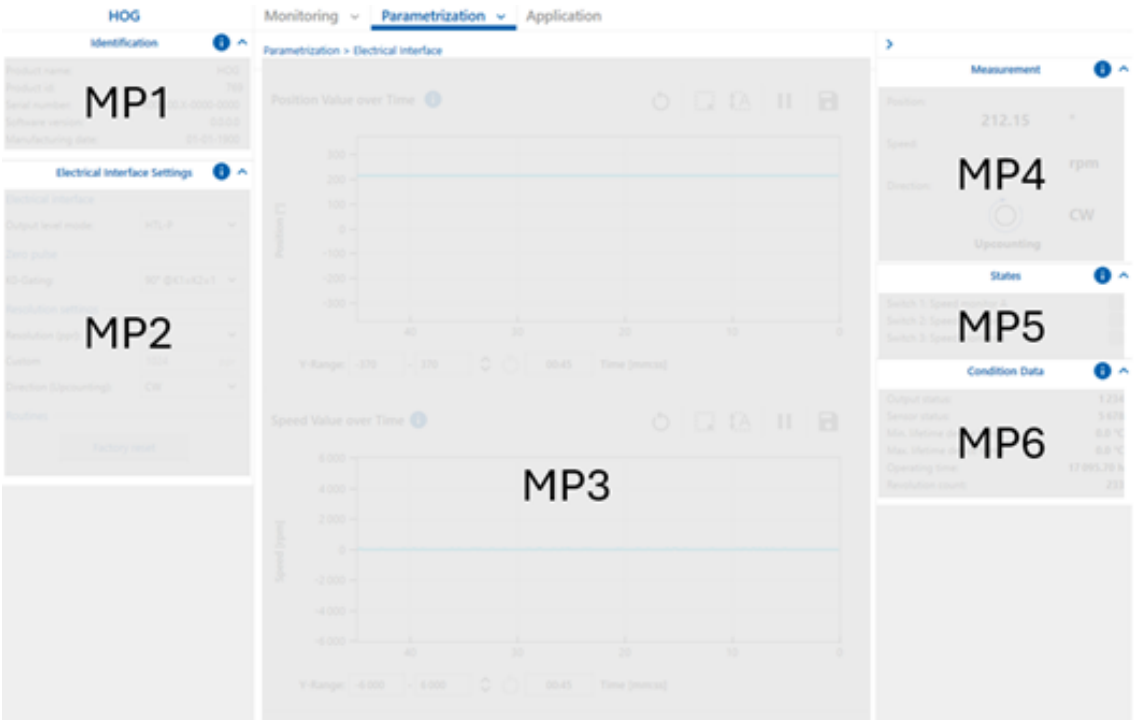
4 Overview HOG add-on

4.1 Area Monitoring and Parameterization

INFO

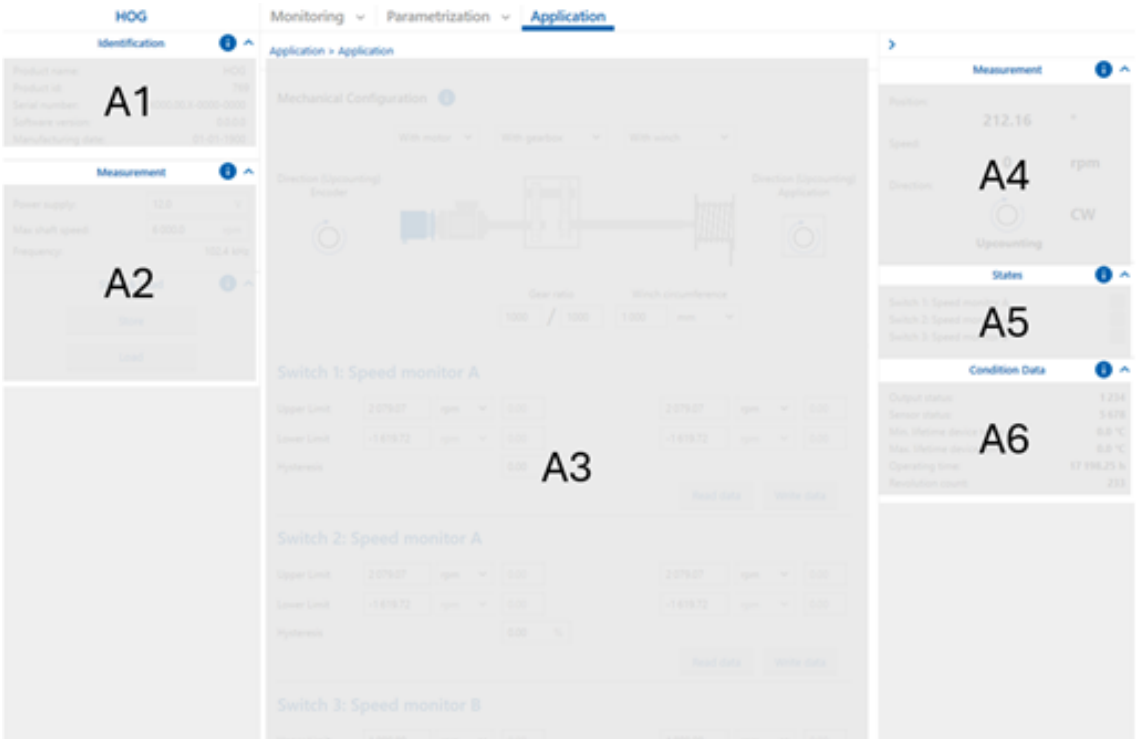
Views ***Monitoring*** and ***Parametrization*** are identically structured and provide the same information.

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

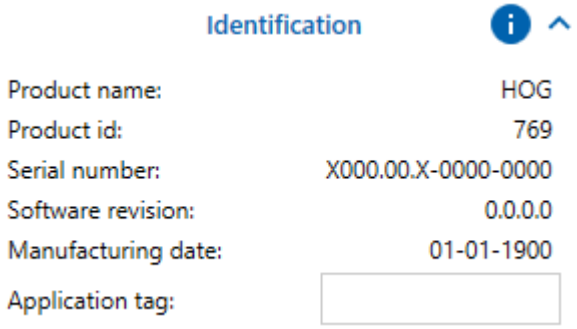
INFO

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

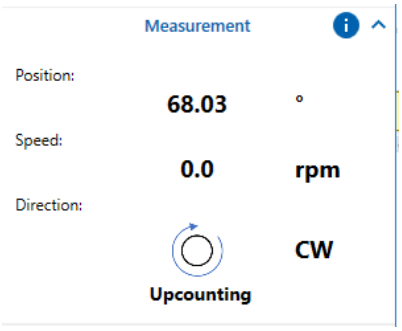
Area ***Identification*** (MP1, A1) is provided in each view. It presents the following information on the connected encoder:



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

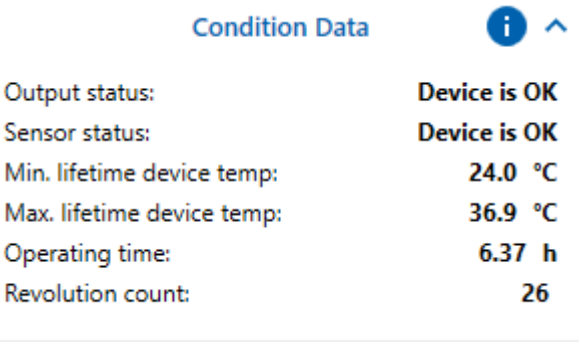
Area ***States*** (MP5, A5) is provided in each view. Here you see the current status of the related switch, together with parameterized switch type.



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

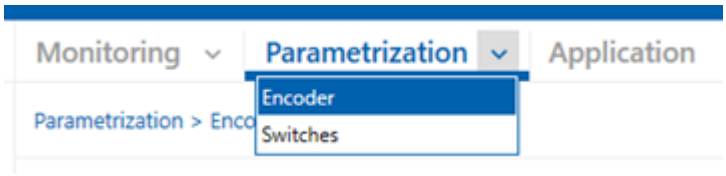
5.4 Condition Data

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

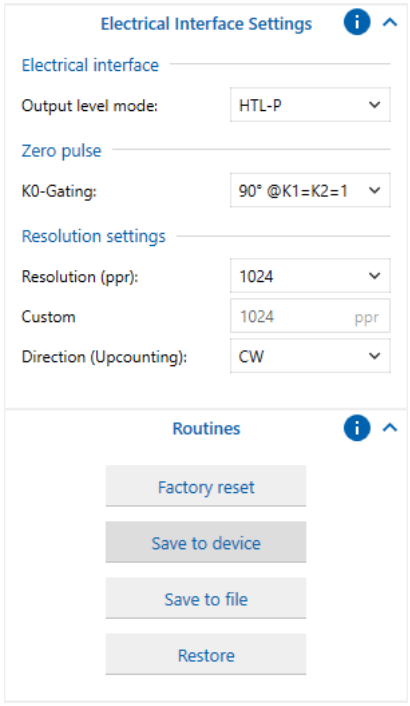


Output status	Provides the output status. In the event of error, please check encoder wiring. Cause is either a cabling error or output overload.
Sensor status	In the event of internal hardware error, you can see the error code here. In the event of hardware error contact customer service.
Min. lifetime 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

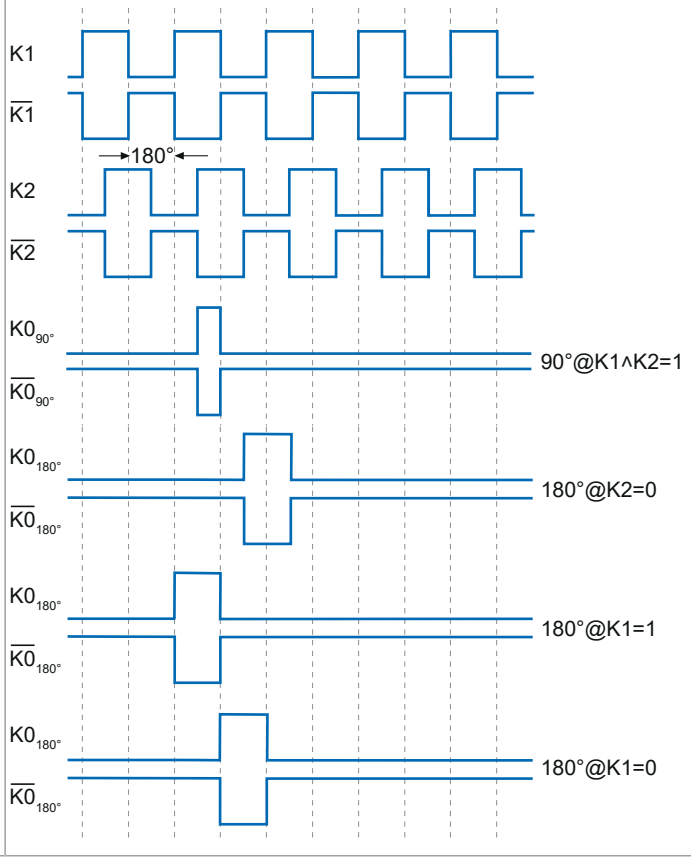


Area ***Electrical Interface Settings*** (MP2) is for defining (***Parametrization***) or presenting (***Monitoring***) the parameters for general encoder setting.



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***:

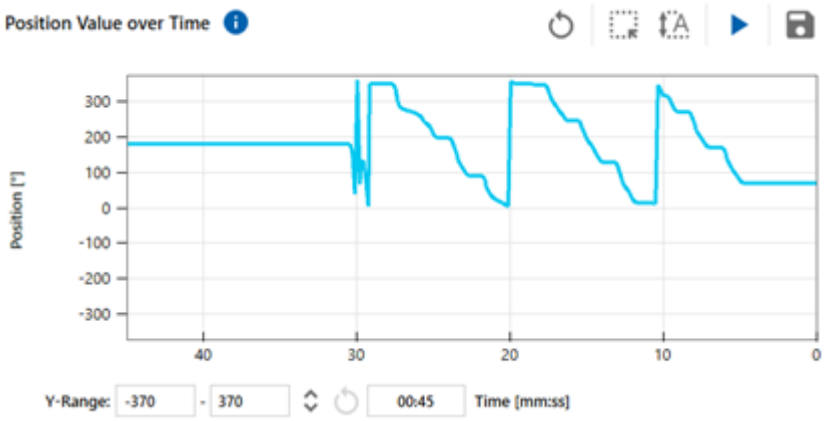
Factory Reset	At ***Factory Reset*** means restore default in the entire parameterization.
Save to device	The encoder would permanently adopt the set parameters.
Save to file	The set parameters are saved in an external file.
Restore	The saved parameters are loaded out of external file. Current parameterization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

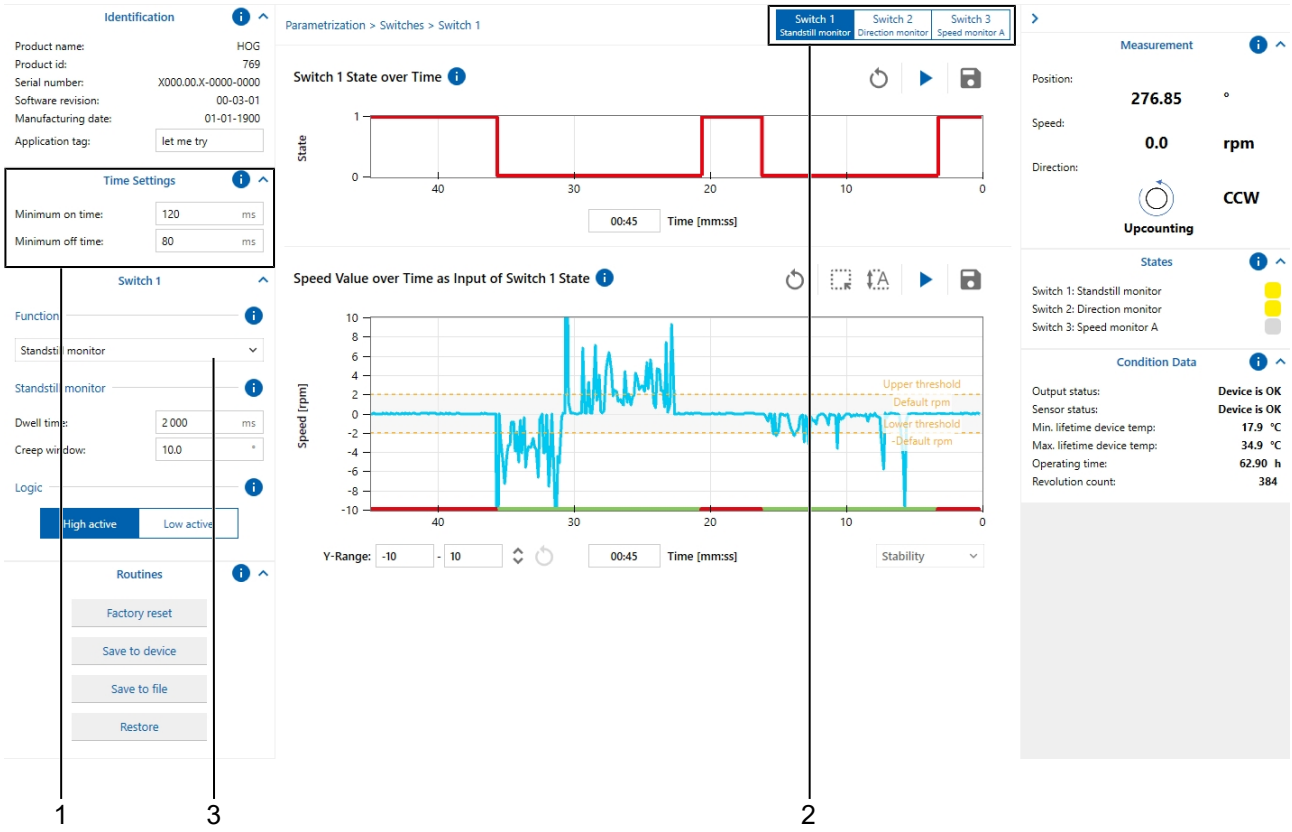
5.6 Switches



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.

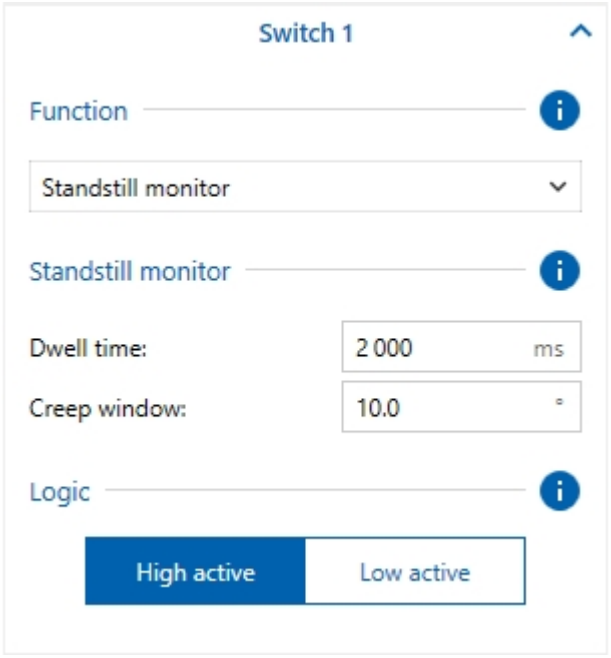
Instruction:

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.

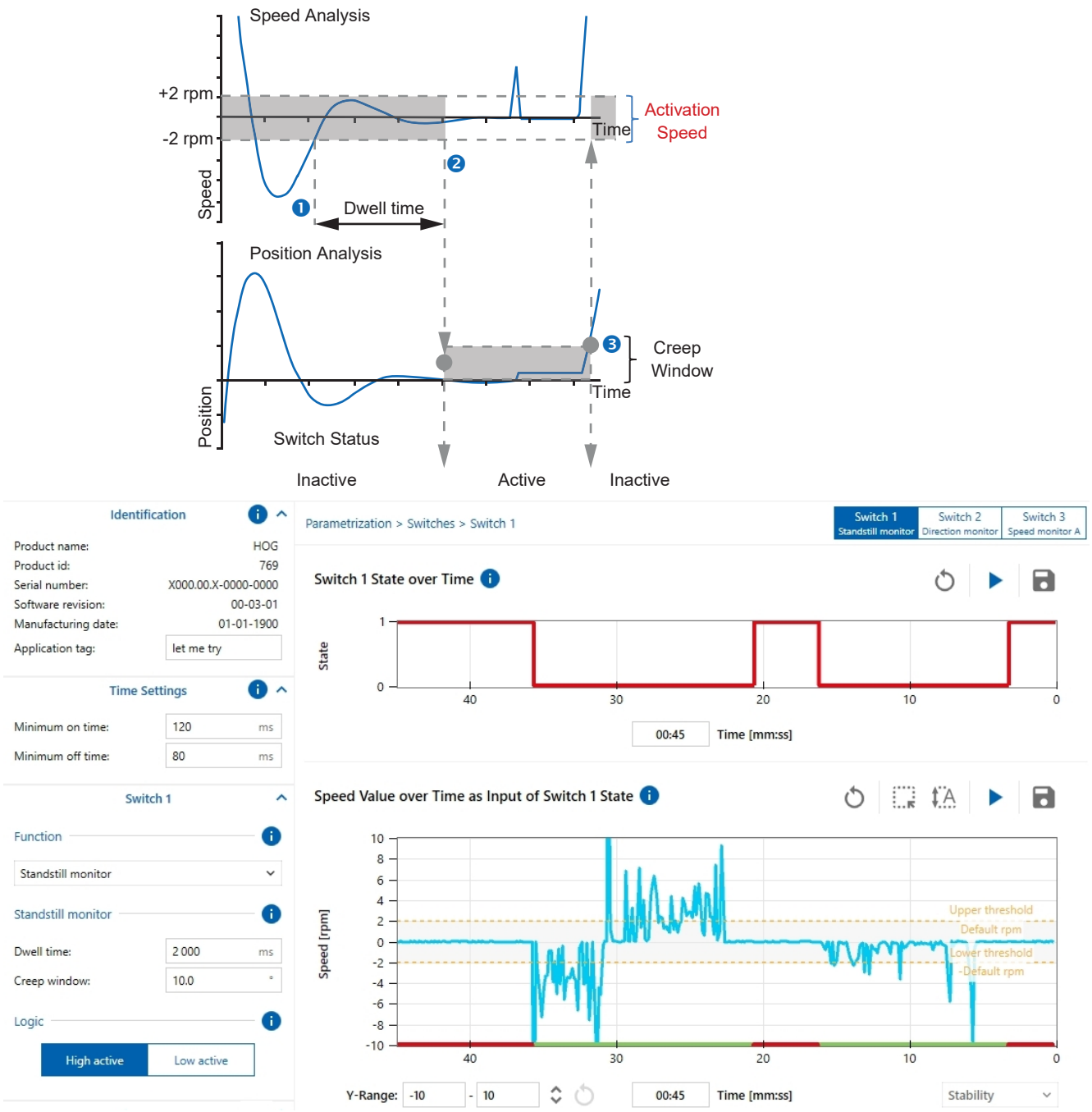


Function	Mode ***Standstill monitor*** is selected.
Dwell time	Defining the dwell time. The encoder must remain within ±2 rpm for this time until switch would trigger.
Creep window	Maximum position window in [°]. Window the system may still move in one or the other direction which would be still indicated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



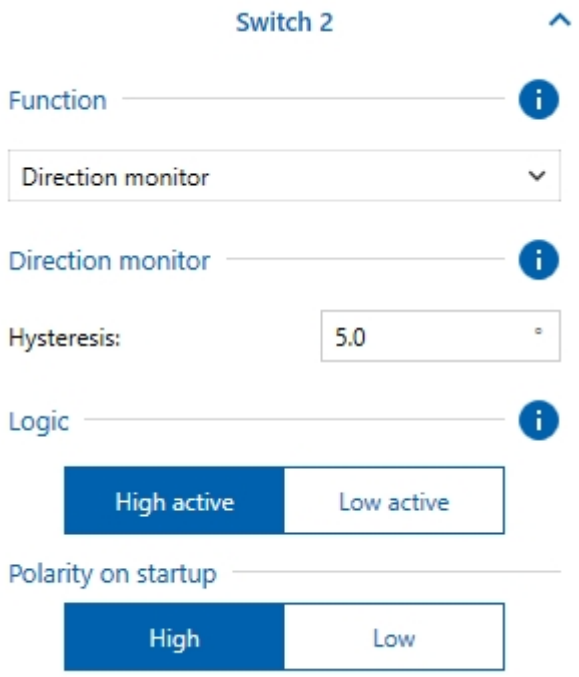
Ill. 4: Switch parameterization as *Standstill monitor* (example)

INFO

Encoders with Solid-State-Relay do not feature mode ***High active*** or ***Low active*** (***Logic***).

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:

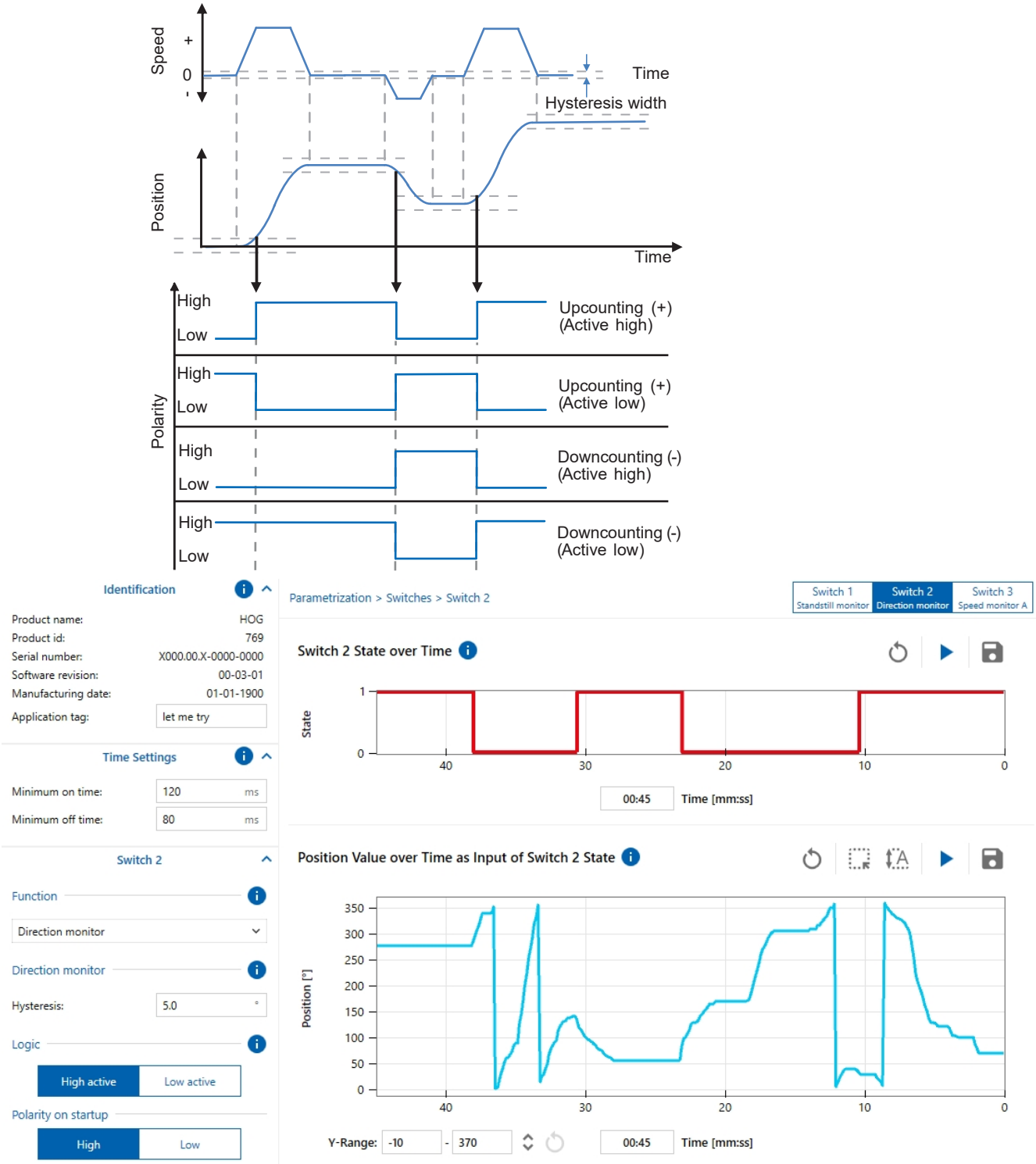
- **High** in mode High Active
- **Low** in mode Low Active

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

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

INFO

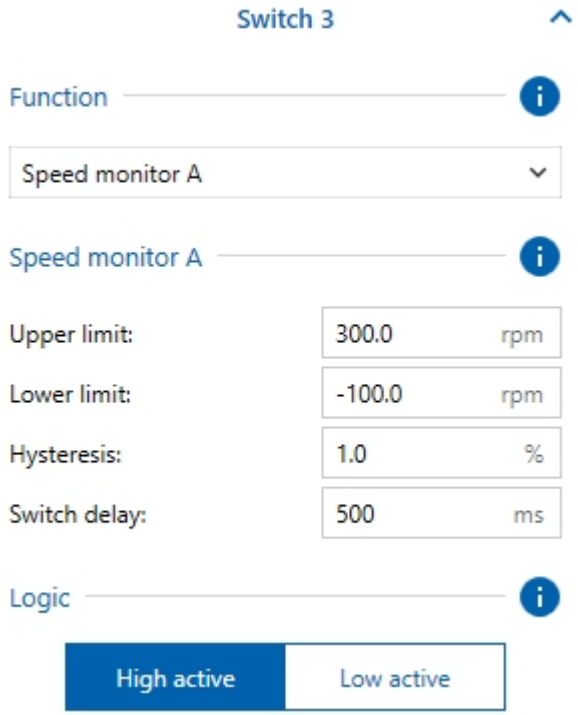
Encoders with Solid-State-Relay do not feature mode ***High active*** or ***Low active*** (***Logic***).



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*

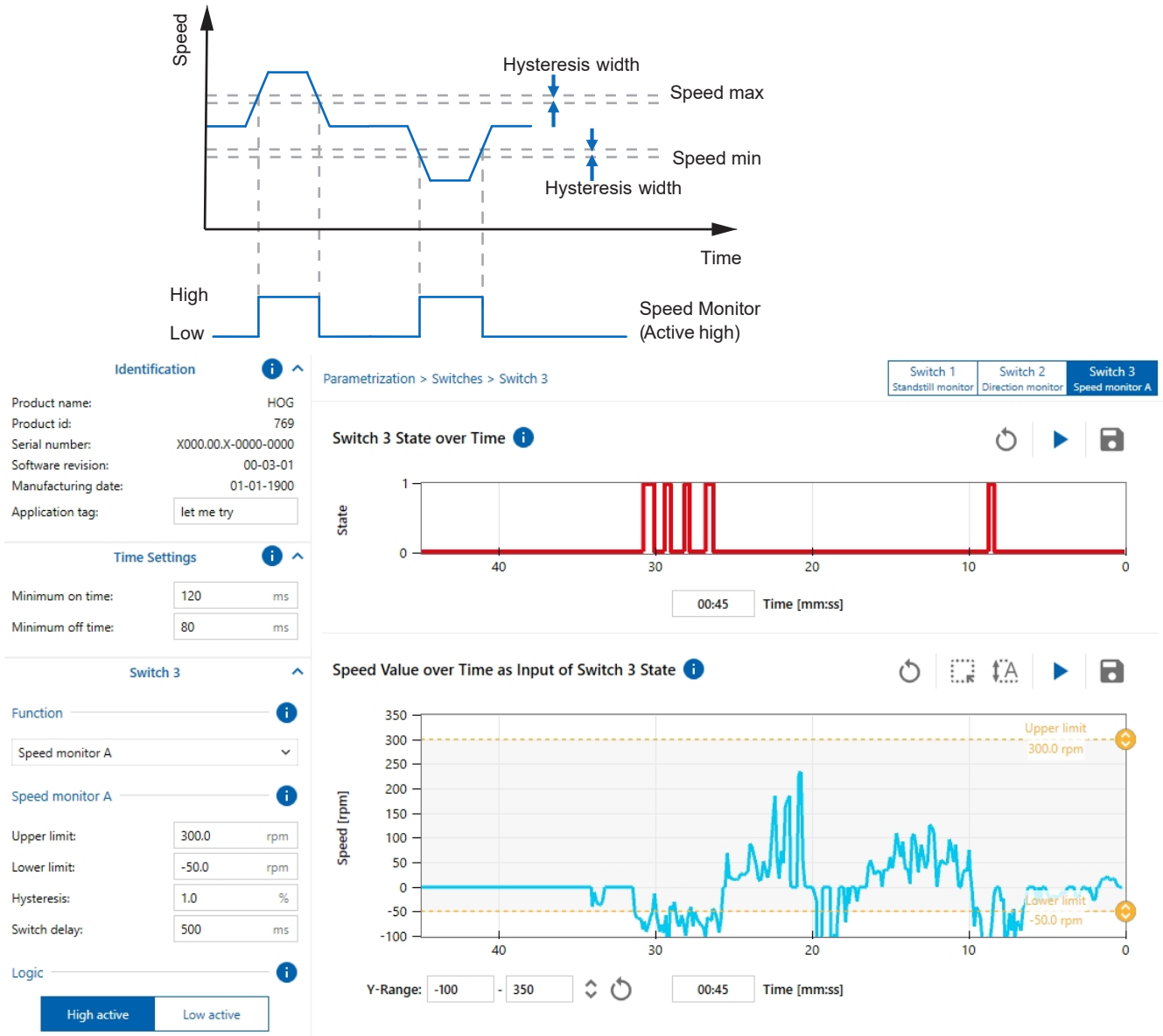
Function	Mode ***Speed monitor A***, ***Speed monitor B*** or ***Speed monitor C*** has been selected.
Upper limit	Maximum limit of speed monitoring.
Lower limit	Minimum limit of speed monitoring.
Hysteresis	Speed hysteresis.
Switch delay	Time to be either exceeded or fallen below prior to switch triggering. 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

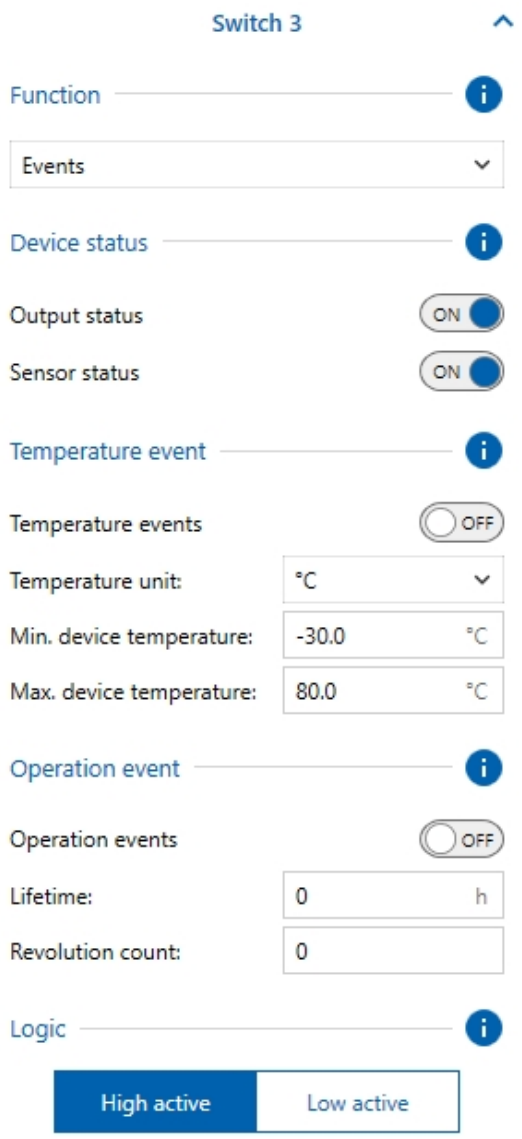
INFO

Encoders with Solid-State-Relay do not feature mode ***High active*** or ***Low active*** (***Logic***).



III. 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

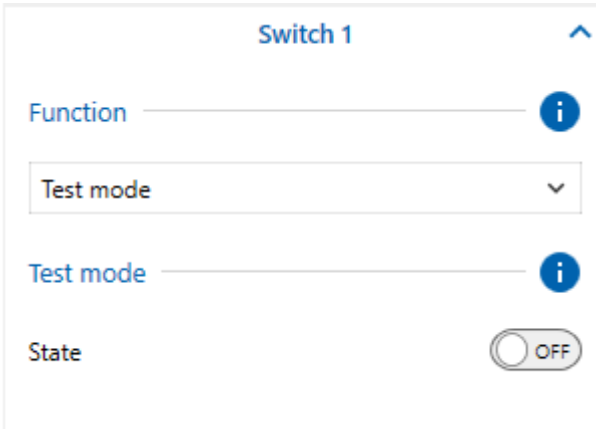
Temperature event	The switch becomes active when reaching the user-defined minimum or maximum device temperature.
Operation event	The user can define a particular life cycle and number of revolutions. The switch is active when reaching the specified service life or number of revolutions. If zero, no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

INFO

Encoders with Solid-State-Relay do not feature mode ***High active*** or ***Low active*** (***Logic***).

5.6.5 Test Mode

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



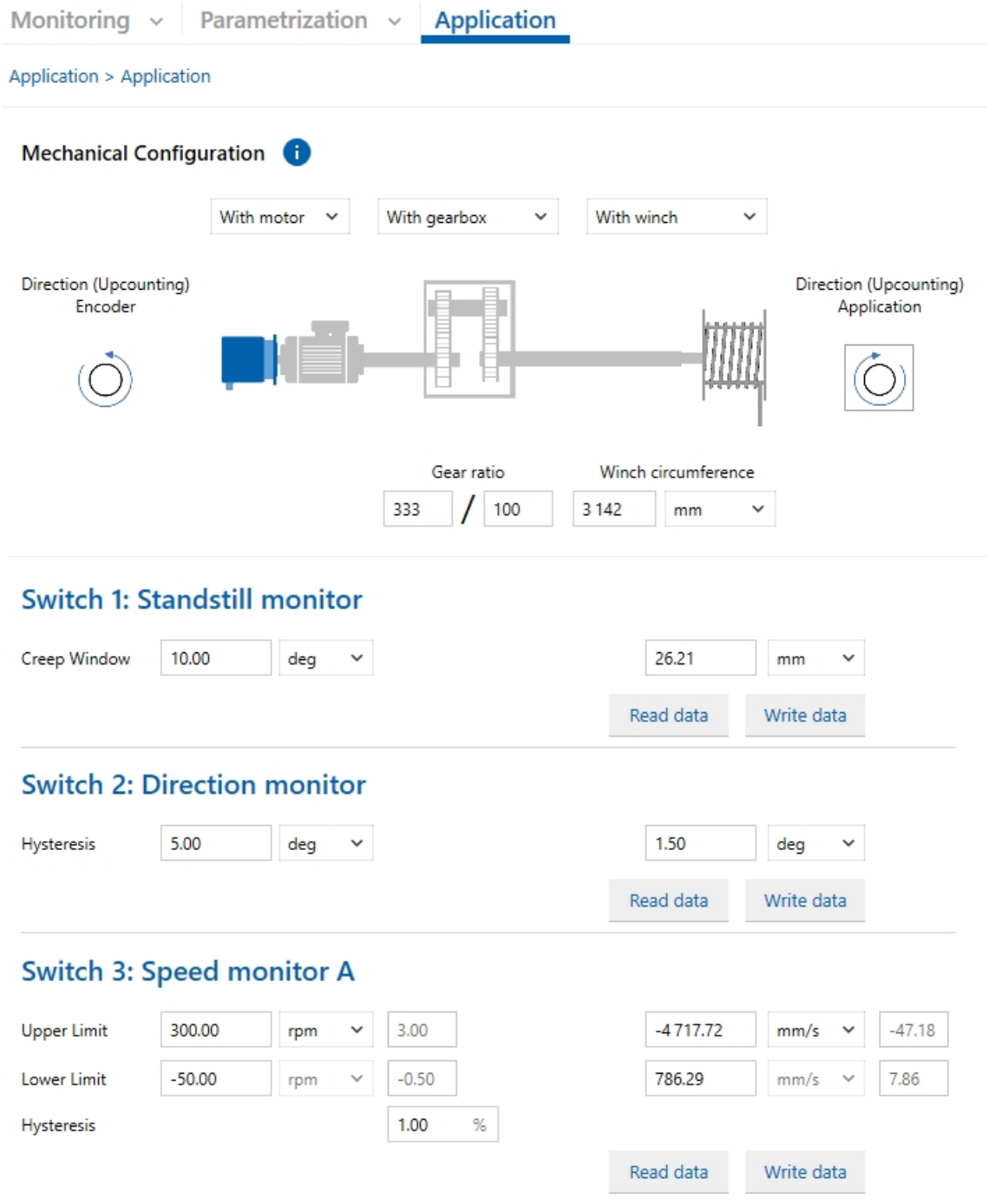
Function	Mode ***Test mode*** is selected.
State	Here you can manually switch on or off the selected switch. ▪ ON: Switch enabled ▪ ON: Switch disabled

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.

Configurable parameters	Sensor factory defaults	Min	Max	Unit	Variant
Speed Monitor 1-3					
Maximum speed threshold for speed switch 0-2	600	-6000	6000	rpm	all
Minimum speed for speed switch 0-2	-600	-6000	6000	rpm	all
Speed hysteresis (in percent) for speed switch 0-2	2	0	50	%	all
Switch delay in ms	0 ms	0	5000	ms	all
Inversion of speed switch 0-2	High Active	–	–	–	all
Standstill Monitor					
Position window for creep detetction in deg	1	1	1000000	deg	all
Dwell time for standstill detetction in ms	1000	1000	1000000	ms	all
Inversion of creep detection switch	High Active	–	–	–	all
Direction Monitor					
Hysteresis for direction switch	1	0	50	deg	all
Direction on startup	High	–	–	–	all
Inversion of direction switch	High Active	–	–	–	all
Event Monitor					
Output status	off	–	–	–	all
Sensor status	off	–	–	–	all
Temperature events	off	–	–	–	all
Temperature unit	°C	–	–	–	non-US region
	°F	–	–	–	US region
Min. device temperature	-30	-1000	1000	°C	only EHOG840
	-40	-1000	1000	°C	all other variants
Max. device temperature	85	-1000	1000	°C	only EHOG840
	100	-1000	1000	°C	all other variants
Operation events					
Revolution count	0 (no limit)	–	–	rev	all
Lifetime	0 (no limit)	–	–	h	all
Logic	High Active	–	–	–	all

Configurable parameters	Sensor factory defaults	Min	Max	Unit	Variant
Testmode					
State	off	–	–	–	all
Switch configuration					
Minimum ON time for all switches	100 ms	0	10000	ms	all
Minimum OFF time for all switches	100 ms	0	10000	ms	all
Functionality assigned to switch 0	Not configured	–	–	–	all
Functionality assigned to switch 1	Not configured	–	–	–	all
Functionality assigned to switch 2	Not configured	–	–	–	all
Electrical interface settings					
Output level mode	HTL-P	–	–	–	all
K0-Gating	90° @ K1=K2=1	–	–	–	all
Resolution settings					
Resolution	1024	1	5000	ppr	all
Direction (upcounting)	CW	–	–	–	all
Measurement					
Power supply	24	0	60	V	all
Max. shaft speed	0	–	–	–	all
Application tag	–	–	–	–	all
Has motor	no	–	–	–	all
Has gearbox	no	–	–	–	all
Gear ratio nominator	1000	1	65535	–	all
Gear ratio denominator	1000	1	65535	–	all
Has winch	no	–	–	–	all
Winch circumference	1	0	65535	m	non-US region
	50	0	65535	inch	US region
Has motor	no	–	–	–	all
Rotational direction of application	CW	–	–	–	all

Fix parameters

Adjustable parameters	Factory defaults
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

Adjustable parameters	Factory defaults
Software version number	NONE
Date of manufacturing	NONE

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