



Operating instructions
Speed monitor
DP2122

GB

Contents



1	Preliminary note	4
1.1	Symbols used	4
1.2	Warnings used	4
2	Safety instructions	5
3	Intended use	6
4	Function	7
4.1	Operating modes	7
4.2	Application as an IO-Link device	7
4.2.1	General information	7
4.2.2	Application example	8
4.2.3	IO Device Description (IODD)	8
4.3	Standard IO wiring	8
4.4	Function diagrams	9
4.4.1	Single point mode	9
4.4.2	Window mode	9
4.4.3	Two point mode	10
4.4.4	Deactivated mode	11
4.4.5	Standard IO mode	11
4.4.6	Switching delays	11
4.4.7	Switch-off delay	12
4.5	Start-up delay	12
5	Installation	13
6	Electrical connection	14
6.1	Mounting the connector	15
6.2	Removing the connector	15
6.3	Cable length	15
7	Operating and display elements	16
7.1	Push rings (pushbuttons)	16
7.2	LEDs	16
7.3	Display	17
8	Menu	18
8.1	General	18
8.2	Menu structure	19
8.2.1	Operating mode 1	19
8.2.2	Operating mode 2	20
8.3	Parameters of the main menu	20
8.3.1	SSC1 – speed monitor OUT1	20
8.3.2	SSC2 – speed monitor OUT2	21
8.3.3	EF – extended functions	21
8.4	Parameters for OUT1 (SSC1)	21
8.4.1	ModE – switch point mode	21
8.4.2	LoGc – switch point logic	21
8.4.3	SP1 – switch point 1	21
8.4.4	SP2 – switch point 2	21
8.4.5	HyS – switch points hysteresis	21
8.4.6	dS – switching delay	22
8.4.7	dr – switch-off delay	22
8.4.8	P-n – output configuration	22
8.5	Parameters for OUT2 (SSC2)	22
8.6	Parameters of the extended functions (EF)	22
8.6.1	rES – restore factory setting	22
8.6.2	Lo/Hi – min/max measured input values	22
8.6.3	dSt – start-up delay time	22
8.6.4	ScAL – set decimal point	22
8.6.5	C.FEP – custom user endpoint for frequency	23
8.6.6	PrSC – prescaler	23

8.6.7	coLr – display colours and colour changes	23
8.6.8	cFH/cFL – upper/lower value for colour change	24
8.6.9	diS.b – display power on	24
8.6.10	diS.U – refresh rate of the displayed measured value	25
8.6.11	CMPT – indication of the operating mode	25
8.7	Parameters adjustable via IO-Link	25
8.7.1	C.uni – customer-specific unit	25
8.7.2	FLASH_ON – activate flashing of the display	25
8.7.3	FLASH_OFF – deactivate flashing of the display	25
8.7.4	SSC counter – switching counter	25
8.7.5	internal_temperature – operating temperature microcontroller	25
8.7.6	operation_hours – operating hours	25
8.7.7	Application-specific tag	26
8.7.8	Location tag	26
8.7.9	Function tag	26
9	Parameter setting	27
9.1	Parameter setting in general	27
9.1.1	Example [ModE] - switch point mode for OUT2	27
9.2	Notes on programming	28
9.2.1	Locking / unlocking	28
9.2.2	Timeout	28
9.2.3	Numerical entries with [▼] or [▲]	28
10	Operation	29
11	Troubleshooting	30
12	Maintenance, repair and disposal	31
13	Factory settings	32

1 Preliminary note

You will find instructions, technical data, approvals and further information using the QR code on the unit / packaging or at www.ifm.com.

1.1 Symbols used

- ✓ Requirement
- ▶ Instructions
- ▷ Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note
Non-compliance may result in malfunction or interference.
-  Information
Supplementary note

1.2 Warnings used



CAUTION

Warning of personal injury

- ▷ Slight reversible injuries may result.

2 Safety instructions

- The unit described is a subcomponent for integration into a system.
 - The system architect is responsible for the safety of the system.
 - The system architect undertakes to perform a risk assessment and to create documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the architect of the system.
- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Intended use).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, programming, configuration, operation and maintenance of the product must be carried out by personnel qualified and authorised for the respective activity.
- Protect units and cables against damage.
- Replace damaged units, otherwise the technical data and safety will be impaired.

3 Intended use

The unit is a pulse evaluation system. It monitors rotating, linear, vibrating or oscillating movements.

It receives the pulses from external sensors, measures the pulse interval and calculates the input frequency. This value is compared with the set switch points; the outputs are switched in accordance with the set parameters.

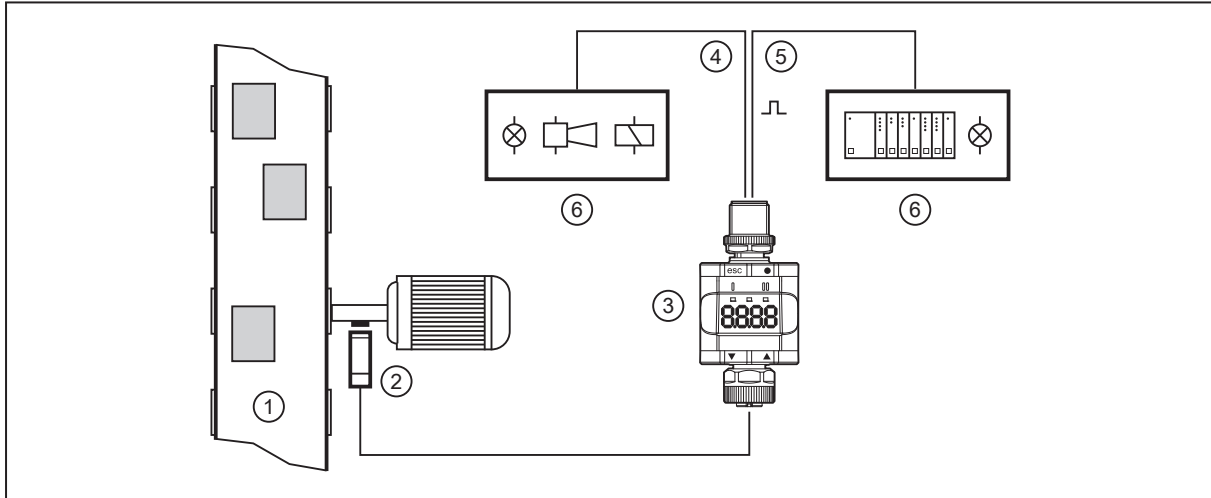


Fig. 1: Example: speed monitoring of a drive shaft on a conveyor belt

- | | |
|--------------------------------|---|
| 1: Conveyor belt | 2: Pulse pick-up on the drive shaft |
| 3: DP2122 | 4: Transistor output (e.g. to control a light indicator, horn or relay) |
| 5: Transistor output / IO-Link | 6: Signals depending on the selected switching function |



The unit is not suited for environments with particular requirements on mechanical stability (e.g. shock/vibration).

The unit is intended for indoor use only.

- ▶ Observe the operating conditions (→ Technical data at www.ifm.com).

4 Function

Depending on the setting of the IO-Link parameter [CMPT], the unit displays the current frequency in Hz or the rotational speed in RPM. It generates output signals according to the operating mode and the parameter setting. In addition, it makes the process data available via IO-Link (in Hz or RPM, depending on the operating mode).

The unit is designed for half-duplex communication. So the following options are possible:

- Remote display: reading and displaying the current frequency/speed
- Remote parameter setting: reading and changing the current parameter setting
- IO-Link parameter setting: IO Device Description (IODD) (→ [□ 8](#))

GB

4.1 Operating modes

The following operating modes are available:

Operating mode 1: HZ_M (default)	
Description	Displays the frequency in Hz
Application	Standard applications with frequency measurement in Hz
IODD designation	DP2122 Factory setting / (CMPT=HZ_M)
IO-Link device ID	1167 d / 00 04 8f h
IO-Link parameter CMPT	HZ_M (default)

Operating mode 2: rpnM	
Description	Displays the frequency in revolutions per minute (RPM)
Application	Converted values in RPM
IODD designation	DP2122 Status_B / (CMPT=rpnM)
IO-Link device ID	1294 d / 00 05 0e h
IO-Link parameter CMPT	rpnM



In operating mode 2, the display of the unit always shows kRPM.



Manual selection of the operating mode:

CMPT — indication of the operating mode (→ [□ 25](#)) and ModE — switch point mode (→ [□ 21](#)) for OUT2

Selection of the operating mode via IO-Link interface:

see document "Addition to the operating instructions: Selecting the operating mode using an IO-Link interface" at www.ifm.com

4.2 Application as an IO-Link device

4.2.1 General information

The unit has an IO-Link communication interface which requires an IO-Link capable module (IO-Link master).

The IO-Link interface allows direct access to the process and diagnostic data and enables setting of the parameters of the unit during operation.

You will find further information about IO-Link and all the necessary information about the required IO-Link hardware and software at:

www.ifm.com/gb/io-link

4.2.2 Application example

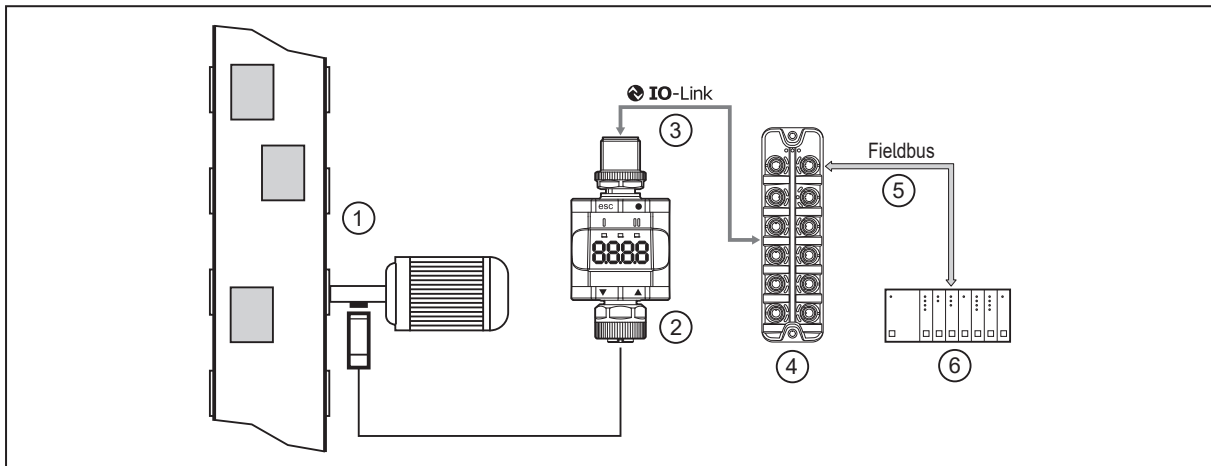


Fig. 2: Application example with IO-Link master

- | | |
|---|-------------------|
| 1: Conveyor belt and pulse pick-up | 2: DP2122 |
| 3: Fully bidirectional IO-Link communication | 4: IO-Link master |
| - Remote parameter setting: reading and changing the parameter setting. | |
| 5: Fieldbus (e.g. Profibus, Profinet etc.) | 6: PLC |

4.2.3 IO Device Description (IODD)

You will find the IODDs necessary for the configuration of the IO-Link device and detailed information about process data structure, diagnostic information and parameter addresses at:

www.ifm.com

4.3 Standard IO wiring

Switch points (standard IO mode) can also be used in combination with the standard inputs of a PLC. OUT1 and OUT2 can be switched to digital inputs (e.g. standard input modules). OUT1 and OUT2 can be evaluated via two digital inputs and implement a window function.

Voltage supply (pin 1 and 3) can be done via the input modules. With standard input modules, pins 1 and 3 are used for voltage supply (→ Electrical connection).

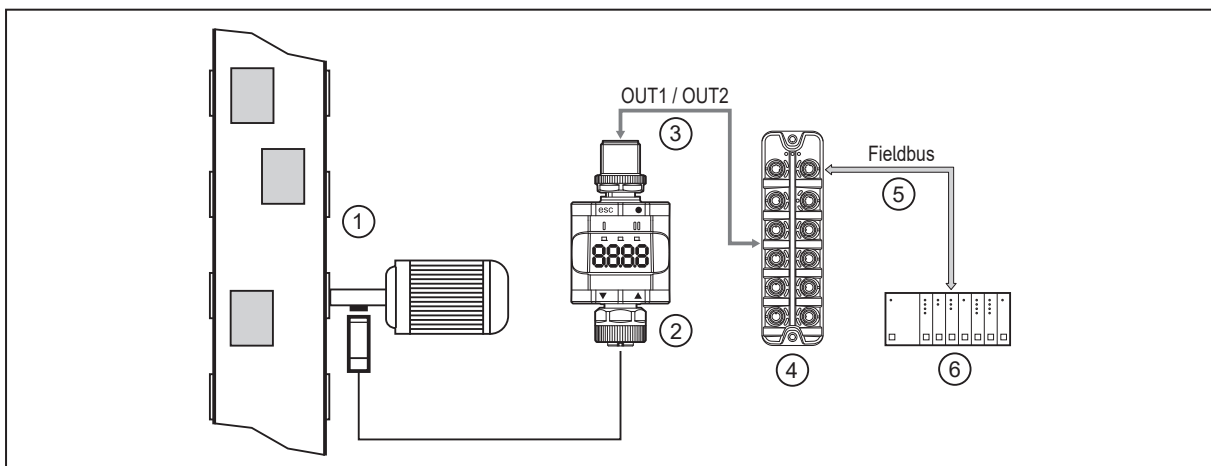
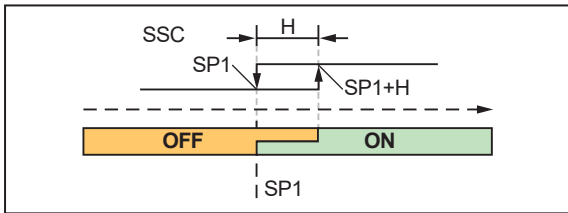


Fig. 3: Application example with a fieldbus system (e.g. AS-i)

- | | |
|--|----------------------------|
| 1: Conveyor belt and pulse pick-up | 2: DP2122 |
| 3: Digital outputs | 4: Digital fieldbus module |
| 5: Fieldbus (e.g. Profibus, Profinet etc.) | 6: PLC |

4.4 Function diagrams

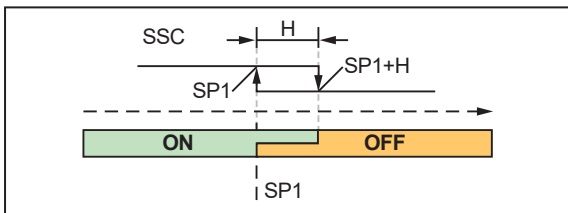
4.4.1 Single point mode



SP1: Overspeed: Reset point / underspeed: Switch point
 SP1+H: Overspeed: Switch point / underspeed: Reset point

Fig. 4: NO (IO-Link parameter LoGc: no / high active)

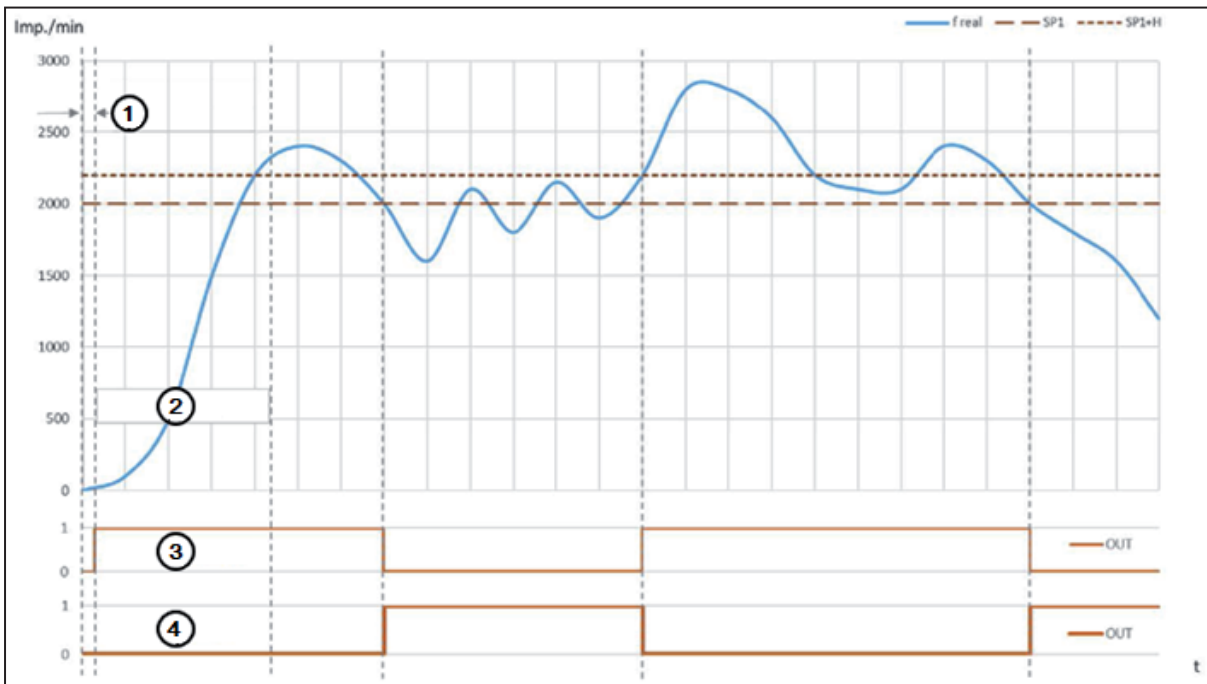
If a set rotational speed is not reached, this is signalled by the switching signal as open.



SP1: Overspeed: Reset point / underspeed: Switch point
 SP1+H: Overspeed: Switch point / underspeed: Reset point

Fig. 5: NC (IO-Link parameter LoGc: nc / low active)

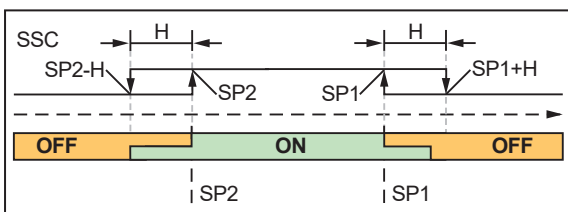
If a set rotational speed is not reached, this is signalled by the switching signal as closed.



1: Power-on delay time
 3: normally open

2: Start-up delay
 4: normally closed

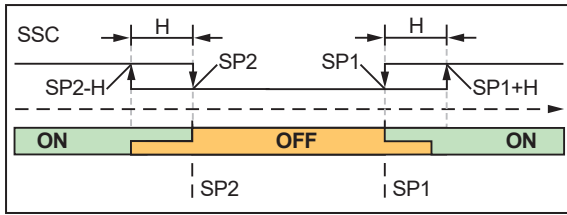
4.4.2 Window mode



SP1: switch-on point window
 SP1+H: Switch-off point
 SP2: switch-on point window
 SP2-H: Switch-off point

Fig. 6: NO (IO-Link parameter LoGc: no / high active)

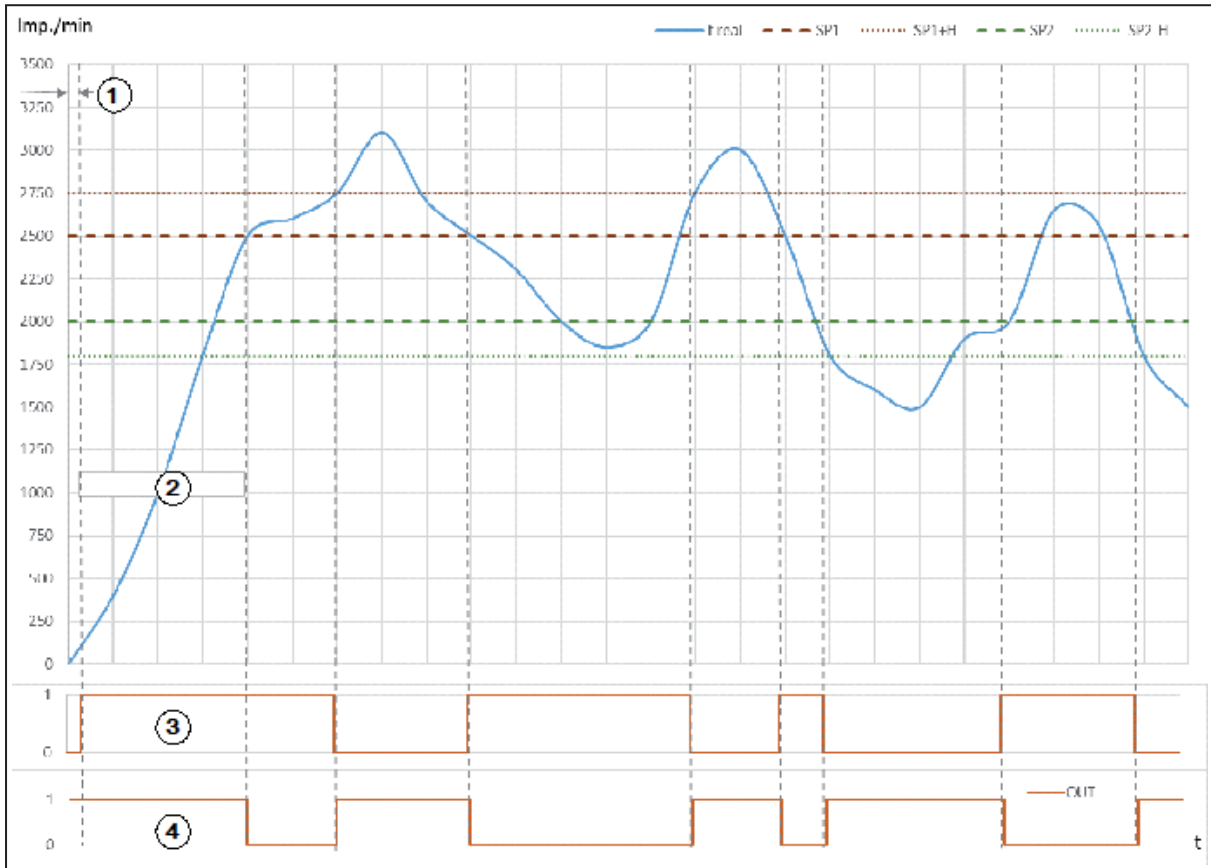
If the set speed range is left, the switching signal will signal this as open.



SP1: switch-off point window
 SP1+H: Switch-on point
 SP2: switch-off point window
 SP2-H: Switch-on point

Fig. 7: NC (IO-Link parameter LoGc: nc / low active)

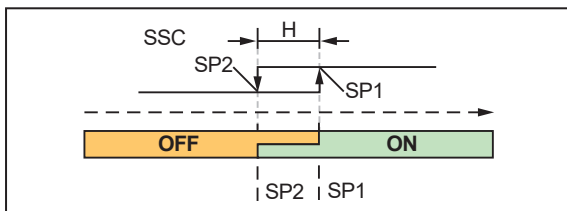
If the set speed range is left, the switching signal will signal this as closed.



1: Power-on delay time
 3: Normally open

2: Start-up delay
 4: Normally closed

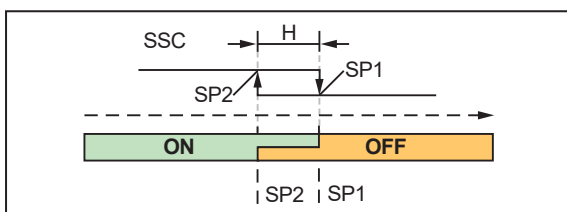
4.4.3 Two point mode



SP1: Overspeed: Switch point / underspeed: Reset point
 SP2: Overspeed: Reset point / underspeed: Switch point

Fig. 8: NO (IO-Link parameter LoGc: no / high active)

If a set rotational speed is not reached, this is signalled by the switching signal as open.



SP1: Overspeed: Switch point / underspeed: Reset point
 SP2: Overspeed: Reset point / underspeed: Switch point

Fig. 9: NC (IO-Link parameter LoGc: nc / low active)

If a set rotational speed is not reached, this is signalled by the switching signal as closed.

4.4.4 Deactivated mode

NO (IO-Link parameter LoGc: no / high active)
The switching signal is always signalled as open.

NC (IO-Link parameter LoGc: nc / low active)
The switching signal is always signalled as closed.

GB

4.4.5 Standard IO mode

The yellow LEDs indicate the switching status of the unit.

Switching function NO:

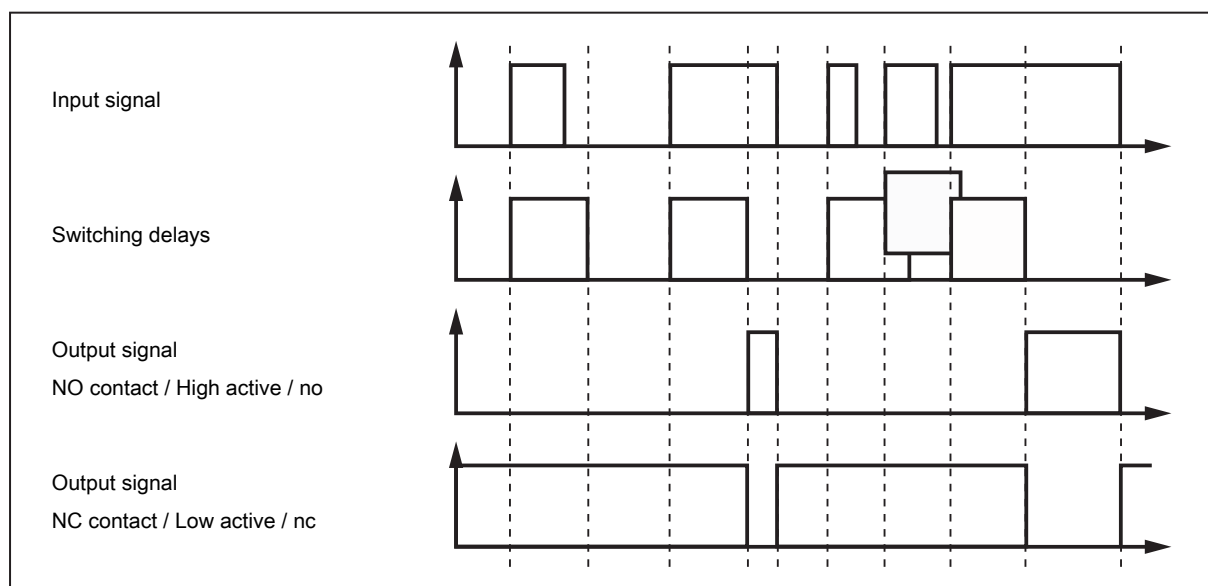
transistor output	LED yellow	Description
Closed	on	Rotational speed > SP1 and during start-up delay
Open	off	Rotational speed < SP2

Switching function NC:

transistor output	LED yellow	Description
Closed	on	Rotational speed < SP2
Open	off	Rotational speed > SP1 and during start-up delay

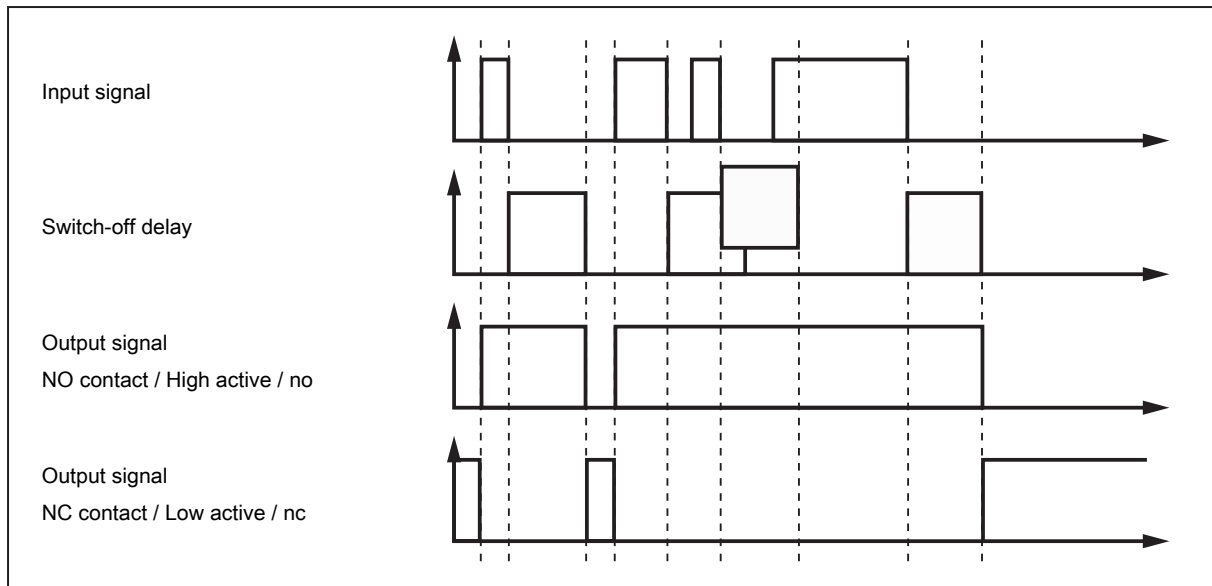
4.4.6 Switching delays

The switching delay enables filtering of input signals. The switching delay is activated or restarted by a positive switching edge of the input signal. Only if the input signal is still active after the delay time has elapsed, the output will be set to the active switching state. Pulses that are shorter than the switching delay will be filtered.



4.4.7 Switch-off delay

The switch-off delay enables filtering of input signals. The switching delay is activated or restarted by a negative switching edge of the input signal. Only if the input signal is still inactive after the delay time has elapsed, the output will be set to the inactive switching state. Pulse pauses that are shorter than the switch-back delay will be filtered.



4.5 Start-up delay

The start-up delay enables the suppression of error signals when a plant is started. It is effective after the power supply is applied and is dependent on a low speed.

If the drive is frequently switched on and off, it is advisable to couple the voltage supplies of the drive and the speed monitor. By doing so, the start-up delay is active every time the motor is turned on.

If a coupled connection of the voltage supplies is not possible, a start trigger point can be set in the process data or in SIO the via ENABLE (Pin 2) via IO-Link. The positive switching edge of the corresponding signal serves as the start trigger point. In addition, the system can start up by itself; after detection of the first pulses the delay timer is started (value: 0...999.9 s in steps of 0.1 seconds).

5 Installation

- ▶ Install the unit so that the M12 connection parts and the unit are protected from mechanical stress such as shock and vibration.
- ▶ If necessary, fix the unit with a clamp (use M4 screw or cable tie).

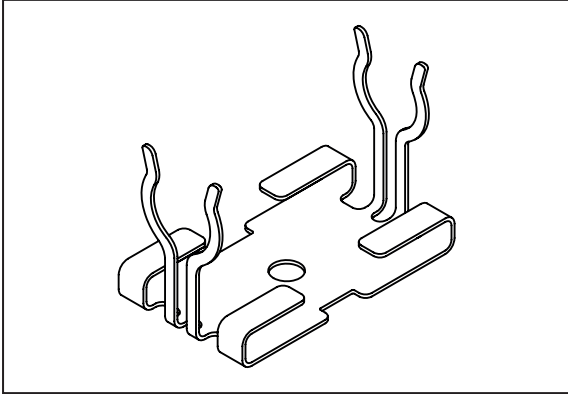


Fig. 10: Mounting clip

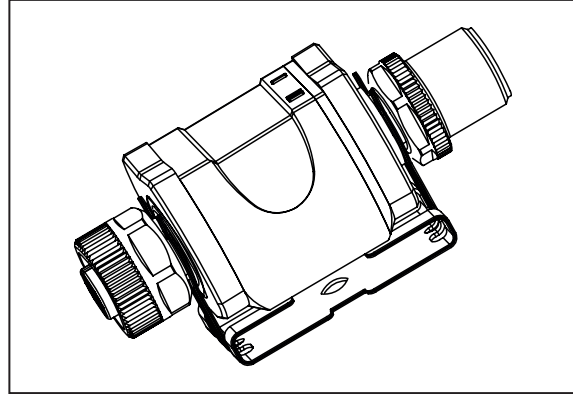


Fig. 11: Mounting clip with attached unit



The mounting clip is not supplied with the unit. More information about available accessories at www.ifm.com.

6 Electrical connection



The device must be connected by a qualified electrician.

Observe the national and international regulations for the installation of electrical equipment.

Voltage supply according to EN 50178, SELV, PELV.



CAUTION

Input current is not limited.

▷ No fire protection.

▶ Protect circuits.

Touchable surfaces of the unit are insulated to the circuits with basic insulation according to IEC 61010-1.

▶ Protect circuits.

Potential	M12 connector ①	Fuse
L+ / supply voltage	Pin 1	≤ 2 A

Required tripping characteristic of the fuses:

$T_{fuse} \leq 120$ s at max. 6.25 A (fire protection)

Alternatively supply the unit via a limited energy circuit according to IEC 61010-1 or class 2 according to UL1310.



Output reaction to overload or short circuit:

For self-protection of the output in case of excessive thermal load (due to short circuit or overload), the output driver starts clocking. If a short circuit / overload continues for several hours, the driver may be damaged!

▶ Disconnect power.

▶ Connect the unit as follows:

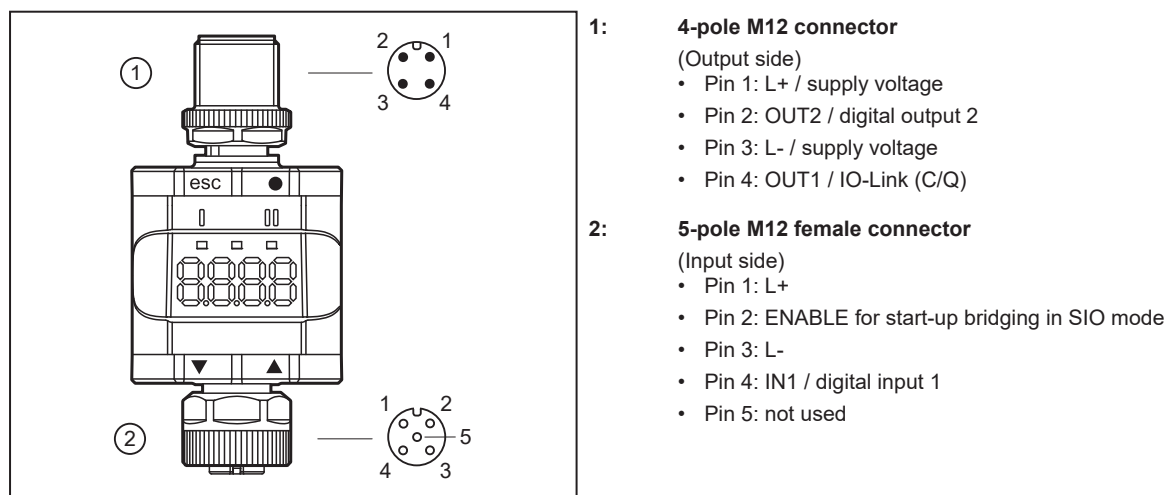


Fig. 12: Electrical connection



The unit must not be externally supplied via the 5-pole M12 input socket ② .



Always use the provided connection cables to connect other devices.

See also application examples (→ Intended use)

6.1 Mounting the connector

To achieve the protection rating indicated in the data sheet, the following has to be observed:

- ▶ Use IO-Link cable with IP class.
- ▶ Use M12 connectors with gold-plated contacts.
- ▶ Connect the connector with the unit. The arrow indicates the position of the coding.
- ▶ Carry out the fitting according to the indications of the cable manufacturer.
- Maximum tightening torque on the connector side ①: 1.8 Nm
- Maximum tightening torque on the socket side ②: 1.3 ± 0.1 Nm

GB

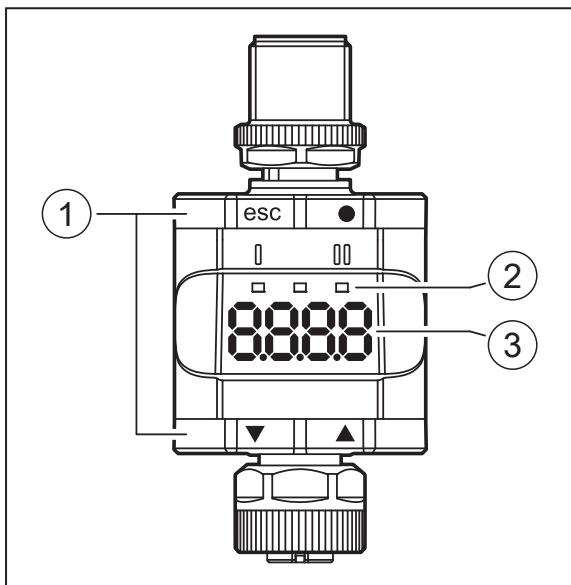
6.2 Removing the connector

- ▶ Press the connector against the unit and simultaneously loosen the coupling nut.

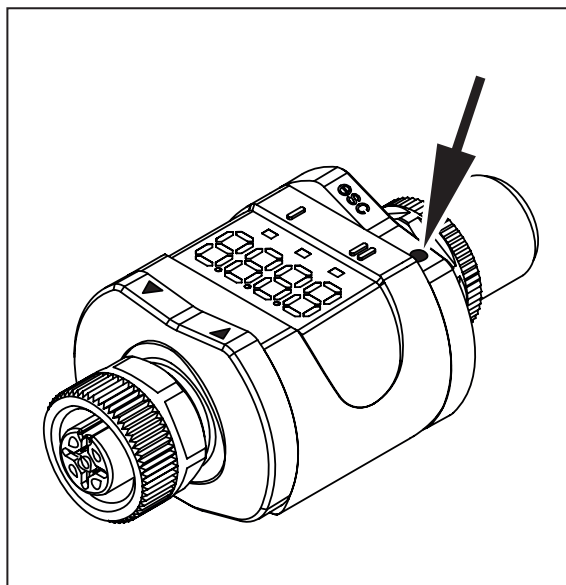
6.3 Cable length

- Without IO-Link communication: 30 m on each side
- With IO-Link communication: 20 m on the master side
- ▶ Provide all input and output side cables with a strain relief approx. 200 mm behind the connectors.

7 Operating and display elements



- 1: Push rings (pushbuttons)
- 2: LEDs
- 3: Display



Here, the Enter button [•] is shown pressed, as an example.

7.1 Push rings (pushbuttons)

To execute an [esc], [•], [▼] or [▲] command, press the corresponding corner of a push ring.

Button		Function
[esc]	Escape	Return to the previous menu. Exit parameter setting without saving the new value.
[•]	Enter	Open menu mode. Selection of the parameter and acknowledgement of a parameter value.
[▼]	Down	Selection of a parameter. Setting a parameter value (scrolling by holding down, incrementally by pressing repeatedly).
[▲]	Up	



To ensure correct operation of the push rings (buttons), do not install or place the unit directly on a metal surface.

For the installation use the mounting clip → Installation.

7.2 LEDs

LED	Colour	Status	Designation	
I	OUT1	yellow	on	Output 1 switched.
Power		green	on	Voltage supply OK. Unit in operating mode.
			off	Unit in programming mode.
II	OUT2	yellow	on	Output 2 switched.

Error signals and diagnosis: Troubleshooting

7.3 Display

Colour	Designation
Red/green	7-segment LED display, 4 digits, with colour change

Error signals and diagnosis: Troubleshooting

When [▼] or [▲] is pressed during the operating mode for 1 second, the unit of measurement will be displayed. The displayed unit of measurement depends on the parameter C.uni.

In the operating mode the input frequency is displayed. The display value is scaled automatically in the basic setting.



Operating mode 1:

Manual scaling via parameter [C.FEP] is activated by parameter [ScAL].



Manual scaling:

Display constraint to a step increment of 1 Hz.



Operating mode 2:

Process or parameter values with more than 4 digits cannot be fully displayed. In the local menu the setting accuracy is limited to the 4 visible digits.

8 Menu



If a scaling is set, the menu settings of all frequency and speed dependent parameters (SP, cFH, etc.) are also scaled.

8.1 General

Irrespective of the operating mode (standard IO mode or IO-Link device) there are two options to set the parameters of the unit:

- directly on the unit via the menu Parameter setting (→ [27](#))
- or via an IO-Link tool

Access via an IO-Link tool has a higher priority than parameter setting via the menu.



Parameter cloning and parameter setting backup is possible with an IO-Link tool.



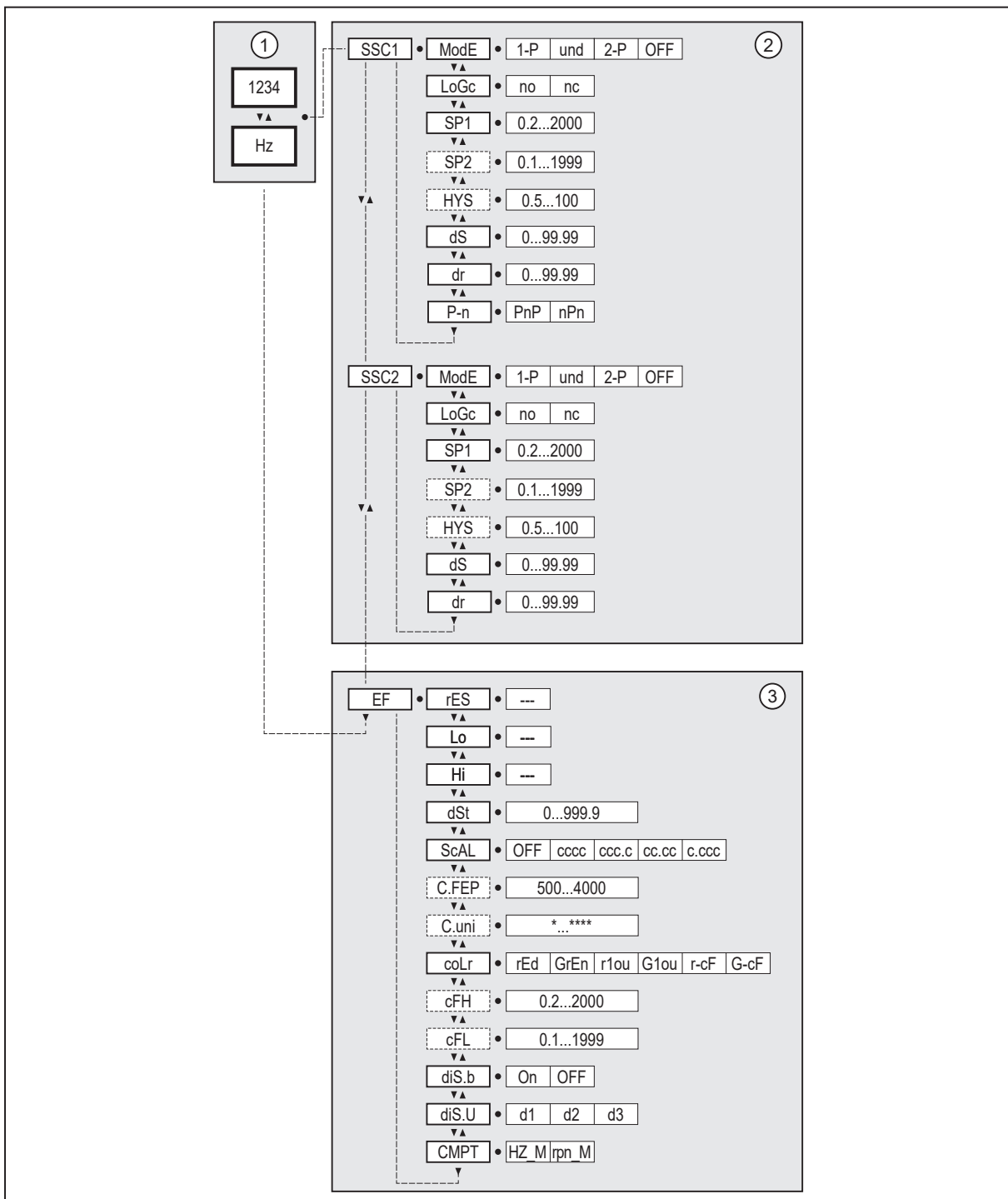
Some parameters can only be set via the IO-Link interface:
Parameters adjustable via IO-Link (→ [25](#)).



If the unit was locked via IO-link, it can also only be unlocked via the IO-Link interface:
Locking / unlocking (→ [28](#)).

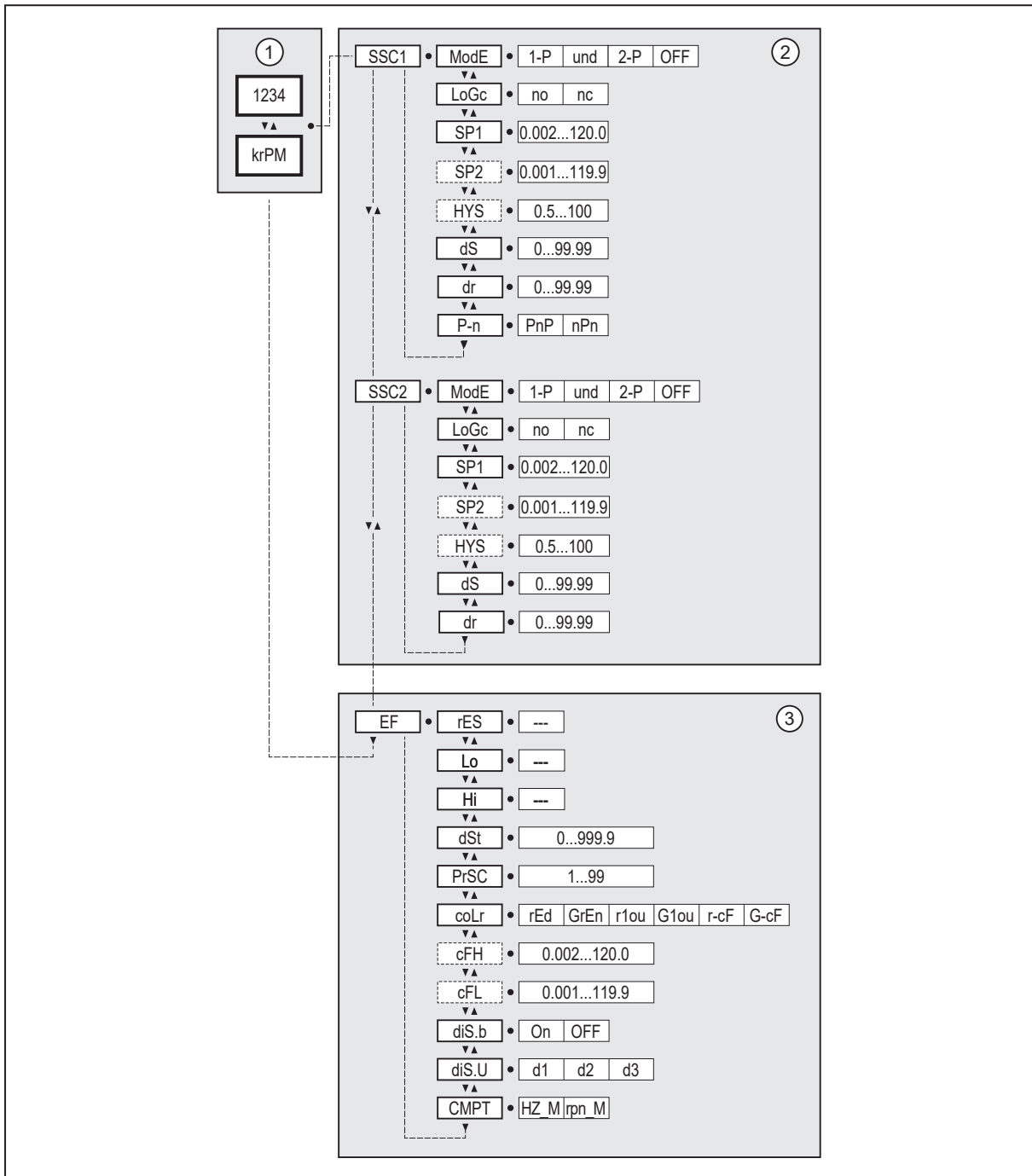
8.2 Menu structure

8.2.1 Operating mode 1



- 1: Operating mode → Operating modes
 2: Main menu → Parameters of the main menu
 3: Extended functions → Parameters of the extended functions (EF)
 → Parameter list and factory settings

8.2.2 Operating mode 2



- 1: Operating mode → Operating modes
- 2: Main menu → Parameters of the main menu
- 3: Extended functions → Parameters of the extended functions (EF)
→ Parameter list and factory settings

8.3 Parameters of the main menu

8.3.1 SSC1 – speed monitor OUT1

The parameter opens the menu of the settings for OUT1 of the speed monitor.

8.3.2 SSC2 – speed monitor OUT2

The parameter opens the menu of the settings for OUT2 of the speed monitor.

8.3.3 EF – extended functions

The parameter opens the extended functions menu.

GB

8.4 Parameters for OUT1 (SSC1)

8.4.1 ModE – switch point mode

Setting of the switch point mode.

- [1-p] = Single point mode (→ [9](#))
- [and] = Window mode (→ [9](#))
- [2-p] = Two point mode (→ [10](#))
- [OFF] = Deactivated mode (→ [11](#))

8.4.2 LoGc – switch point logic

Setting of the switch point logic: Function diagrams (→ [9](#)).

- [no] = switch is closed when activated.
- [nc] = switch is opened when activated.

8.4.3 SP1 – switch point 1

Threshold for the upper switch point.



In "Single point mode" SP1 is adjustable over its entire value range. In "Two point mode" and "Window mode" the lower limit is restricted by SP2. It always applies: $SP1 > SP2$.

8.4.4 SP2 – switch point 2

Threshold for the lower switch point.

Only active in the switch point modes "Two point mode" and "Window mode".



In "Single point mode" the existing setting of SP2 is ignored. When changing to "Two point mode" or "Window mode", SP2 is automatically adjusted. It always applies: $SP2 < SP1$.



SP1 limits the maximum setting value of SP2. It always applies: $SP2 < SP1$.

8.4.5 HyS – switch points hysteresis

Setting of the hysteresis with respect to switch points SP1 and SP2 Function diagrams (→ [9](#)).

Only active in the switch point modes "Single point mode" and "Window mode".

Setting range: 0.5...100 %,

Resolution 0.1 %

8.4.6 dS – switching delay

Delay when the output changes to the active switching status.

Setting range: 0...99.99 s

Resolution 0.01 s

8.4.7 dr – switch-off delay

Delay when the output changes to the idle state.

Setting range: 0...99.99 s

Resolution 0.01 s

8.4.8 P-n – output configuration

- [PnP] = load connected to ground
- [nPn] = load connected to VBB

8.5 Parameters for OUT2 (SSC2)

With the exception of P-n: see Parameters for OUT1 (SSC1) (→ [□ 21](#))

8.6 Parameters of the extended functions (EF)

8.6.1 rES – restore factory setting

Resets all parameters to the Factory settings (→ [□ 32](#)).

- ▶ Select [rES].
- ▶ Press [●].
- ▶ Press and hold [▲] or [▼] until [----] is displayed.
- ▶ Briefly press [●].

8.6.2 Lo/Hi – min/max measured input values

[Lo] = lowest measured value

[Hi] = highest measured value

Delete memory:

- ▶ Select [Hi] or [Lo].
- ▶ Press and hold [▲] or [▼] until [----] is displayed.
- ▶ Briefly press [●].

8.6.3 dSt – start-up delay time

Setting of the delay time between switch-on/reset of the unit and start of speed evaluation.

8.6.4 ScAL – set decimal point

Operating mode 1: Operating modes (→ [□ 7](#))

- [OFF] = indication in Hz with automatic decimal point setting.
- [cccc] = indication without decimal place.
- [ccc.c] = indication with 1 decimal place.
- [cc.cc] = indication with 2 decimal places.
- [c.ccc] = indication with 3 decimal places.



With a fixed display screen ([ScAL] ≠ OFF) only the decimal point is set. No automatic scaling takes place.

C.FEP – custom user endpoint for frequency (→ 23)



If [ScAL] is set to [cccc], [ccc.c], [cc.cc] or [c.ccc], decimal places of the frequency-dependent process and parameter values cannot be displayed.

Depending on the scaling factor, the parameters can be set via the display with an accuracy of 0.5 Hz (C.FEP=4000) to 4 Hz (C.FEP=500).

8.6.5 C.FEP – custom user endpoint for frequency

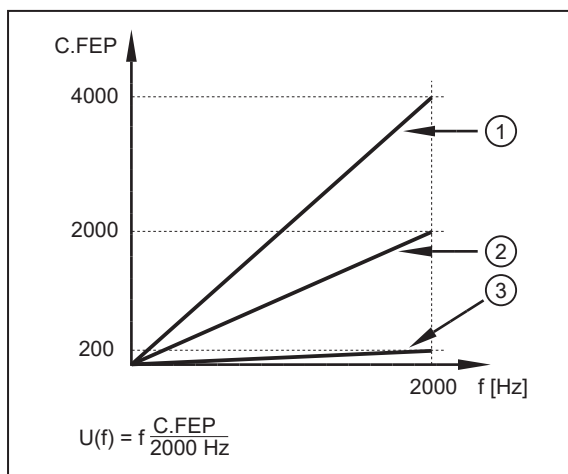
Settings for scaled display values.\

The parameters are only displayed in operating mode 1 and when [ScAL] is set to [cccc], [ccc.c], [cc.cc] or [c.ccc].



All displayed frequency/speed values are interpolated based on a 2-point approximation.

IO-Link process data and parameters are not influenced by scaling.



- 1: Scaling factor 2
 - 2: Scaling factor 1
 - 3: Scaling factor 0.5
- C.FEP max = 4000

U(f) corresponds to the scaled value
f corresponds to the value in Hz

8.6.6 PrSC – prescaler

Setting of the number of targets. The number of targets is automatically included in the measured values.

Only active in operating mode 2.

8.6.7 coLr – display colours and colour changes

Assignment of the display colours "red" and "green" within the measuring range.

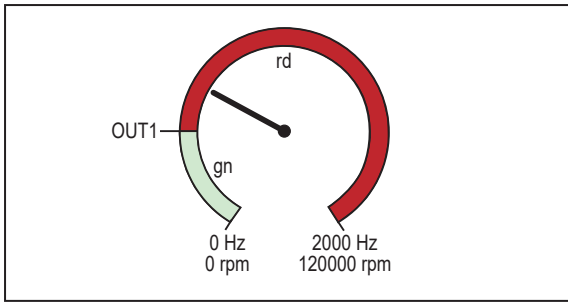


Fig. 13: Hysteresis function with [r1ou]

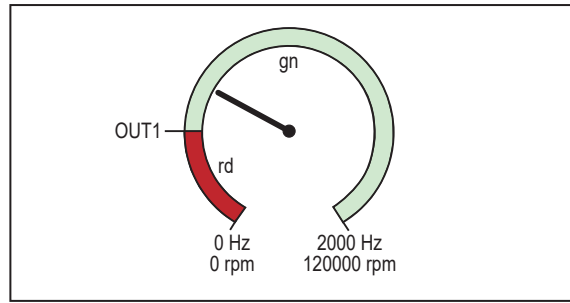


Fig. 14: Hysteresis function with [G1ou]

For b/w printouts: gn = green, rd = red

- [rEd] = continously red (independent of the measured value).
- [GrEn] = continously green (independent of the measured value).
- [r1ou] = red when OUT1 switches.
- [G1ou] = green when OUT1 switches.

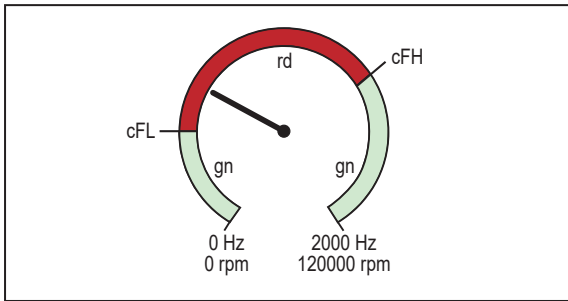


Fig. 15: Window function with [r1ou]

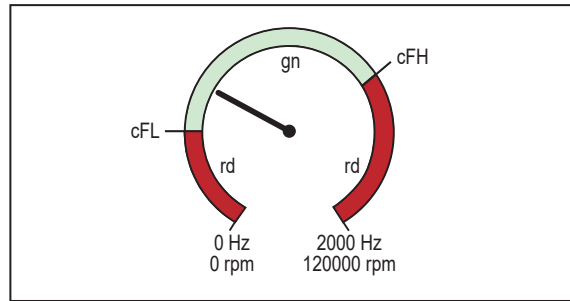


Fig. 16: Window function with [G1ou]

For b/w printouts: gn = green, rd = red

[r-cF] = red when the measured value is between the values [cFL] and [cFH].

[G-cF] = green when the measured value is between the values [cFL] and [cFH].

8.6.8 cFH/cFL – upper/lower value for colour change

If [coLr] is set to [r-cF] or [G-cF]

- ▶ Select [cFH] and set the upper limit.
Setting range corresponds to the measured values. The lowest setting value is [cFL].
- ▶ Select [cFL] and set the lower limit.
Setting range corresponds to the measured values. The highest setting value is [cFH].

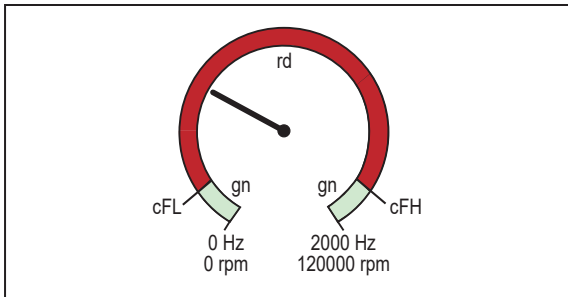


Fig. 17: Function [r-cF]

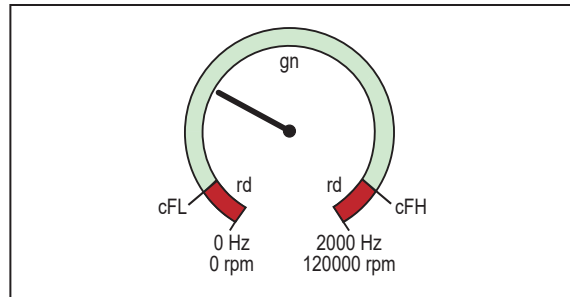


Fig. 18: Function [G-cF]

For b/w printouts: gn = green, rd = red

8.6.9 diS.b – display power on

- [OFF] = the measured value display is switched off in the operating mode.

- [On] = the measured value display is switched on in the operating mode.



Press any button to activate the display for at least 30 s in the switched-off state.

8.6.10 diS.U – refresh rate of the displayed measured value

- [d1] = update of the measured values every 50 ms.
- [d2] = update of the measured values every 200 ms.
- [d3] = update of the measured values every 600 ms.



Even with an unsteady frequency, [d1] provides optimum readability.

8.6.11 CMPT – indication of the operating mode

Indicates the operating mode: Operating modes (→ 7)

- [HZ_M] = DP2122_FREQ (unit of measurement Hz and customer-specific).
- [rpnM] = DP2122_REVL (unit of measurement rpm).



If the operating mode is changed, the parameters of the unit are reset to the factory settings with the exception of CMPT.

8.7 Parameters adjustable via IO-Link

The following functions or parameters are only available via IO-Link tools.

8.7.1 C.uni – customer-specific unit

Customer-specific unit with max. 4 characters.

8.7.2 FLASH_ON – activate flashing of the display

Used to identify a unit. Display flashes and shows [dEVC].

8.7.3 FLASH_OFF – deactivate flashing of the display

Deactivates the flashing of the display.

8.7.4 SSC counter – switching counter

Counts the state changes from low to high of the internal detection. Counter values are not saved permanently.

8.7.5 internal_temperature – operating temperature microcontroller

Reads the data from the internal temperature sensor of the microcontroller.

8.7.6 operation_hours – operating hours

Only counts full operating hours. Operating times of less than one full hour are not saved. Counter readings are saved permanently.

8.7.7 Application-specific tag

Customer-specific application description, max. 32 characters long.

Default value: " *** " / can be freely defined by the customer

8.7.8 Location tag

Customer-specific location tag of the unit, max. 32 characters long.

Default value: " *** " / can be freely defined by the customer

8.7.9 Function tag

Customer-specific function tag of the unit, max. 32 characters long.

Default value: " *** " / can be freely defined by the customer

9 Parameter setting

! During parameter setting the unit remains in the operating mode. It continues its monitoring functions with the existing parameters until the parameter setting has been completed.

9.1 Parameter setting in general

Each parameter setting consists of 6 steps:

Step		Button
1	Change from operating mode to parameter setting mode.	[•]
2	Select the requested parameter [SP1], [C.FEP], etc.	[▲] or [▼]
3	Change to the programming mode of the parameter.	[•]
4	Select or change the parameter value.	[▲] or [▼] > 2 s
5	Acknowledge the set parameter value.	[•]
6	Return to the operating mode.	[esc]

9.1.1 Example [ModE] - switch point mode for OUT2

Step		Display
1	Change from operating mode to parameter setting mode.	
	<ul style="list-style-type: none"> ▶ Press [•] to get to the menu. ▷ The first parameter is displayed. 	SSC 1
2	Select the requested parameter, here [SSC2].	
	<ul style="list-style-type: none"> ▶ Press [▼] until [SSC2] is displayed. ▶ Press [•] to get to the extended functions menu. ▷ The first parameter of the extended functions is displayed. 	SSC2 Node
3	Change to the programming mode of the parameter.	
	<ul style="list-style-type: none"> ▶ Press [•] to change to the programming mode. ▷ The currently set parameter value is displayed. 	1-P
4	Select or change the parameter value, here e.g. [und].	
	<ul style="list-style-type: none"> ▶ Press [▼] or [▲] for at least 2 s. ▷ The currently set parameter value flashes, here e.g. [1-P]. ▷ After 2 s: <ul style="list-style-type: none"> - value is changed continuously by keeping the button pressed. - value is changed incrementally by pressing the button once. Numerical values (→ 9.2.3) 	1-P und
5	Acknowledge the set parameter value.	
	<ul style="list-style-type: none"> ▶ Briefly press [•]. ▷ The parameter is displayed again. ▷ The new setting value is saved. 	Node
Setting of other parameters:		
▶ Press [▼] or [▲] until the requested parameter is displayed.		
6	Return to the operating mode.	
	<ul style="list-style-type: none"> ▶ Press [esc]. ▶ - Press [▼] or [▲] several times until the current measured value is displayed. - Or wait for the timeout function (approx. 30 s). ▷ The unit has returned to the operating mode. ▷ The current value is displayed. 	12.34

9.2 Notes on programming

9.2.1 Locking / unlocking

The unit can be locked electronically to prevent unauthorised setting. Set parameter values and settings can be displayed but not changed.

To lock the unit:

- ▶ Make sure that the unit is in normal operating mode.
- ▶ Press [esc] + [▲] simultaneously for 10 s.
- ▷ [Loc] is displayed.
- ▷ The unit is locked.
- ▷ [Loc] is briefly displayed if you try to change parameter values.

To unlock the unit:

- ▶ Press [esc] + [▲] simultaneously for 10 s.
- ▷ [uLoc] is displayed.

On delivery the unit is not locked.



Customer locking

If [C.Loc] is displayed when an attempt is made to modify a parameter value, an IO-Link communication is active (temporary locking).



Software locking

If [S.Loc] is displayed, the sensor is permanently locked via software. This locking can only be removed using an IO-Link parameter setting software.

9.2.2 Timeout

If no button is pressed for 30 s during parameter setting, the unit returns to the operating mode with the unchanged value.

9.2.3 Numerical entries with [▼] or [▲]

- ▶ Press [▼] or [▲] for at least 2 s.
- ▷ After 2 s:
 - value is changed continuously by keeping the button pressed.
 - value is changed incrementally by pressing the button once.

Value is incrementally reduced with [▼] and increased with [▲].

10 Operation

After power on, the unit is in the operating mode (SIO). It carries out its measurement and evaluation functions and provides output signals according to the set parameters: Menu.

11 Troubleshooting

Display,	LED			Error	Troubleshooting
	I	Power	II		
OFF	off	off	off	Supply voltage too low.	Check/correct the supply voltage: Electrical connection (→ □ 14)
SC	flashes	any	flashes	Excessive current at the switching output OUTx (see LED I/II).	Check switching output for short circuit or excessive current. Remove the fault.
C.Loc	any	any	any	Parameter setting via pushbuttons locked due to active IO-Link transmission.	Wait until parameter setting via IO-Link is finished.
S.Loc	any	any	any	Parameter setting via pushbuttons disabled by software.	Unlocking only possible via IO-Link interface/IO-Link parameter setting software.
Loc	any	any	any	Parameter setting via pushbuttons disabled.	Unlock pushbuttons.
OL	any	on	any	Process value too high (measured frequency > 5000 Hz / > 300000 RPM).	Check connected sensor and value range.
Rotating segment	any	any	any	Temperature in housing exceeds limit value.	Press any button to switch the display on for 30 s.

12 Maintenance, repair and disposal

Cleaning the unit:

- ▶ Disconnect the unit from the voltage supply.
- ▶ Clean the unit from dirt using a soft, chemically untreated and dry micro-fibre cloth.

The operation of the unit is maintenance-free.

Only the manufacturer is allowed to repair the unit.

- ▶ After use dispose of the device in an environmentally friendly way in accordance with the applicable national regulations.

13 Factory settings

Parameters		Factory settings	User settings
SSC1.ModE	Switch point mode OUT1	1-p	<ul style="list-style-type: none"> • 1-P • and • 2-P • OFF
SSC1.LoGc	Switch point logic OUT1	no	<ul style="list-style-type: none"> • no • nc
SSC1.SP1	Switch point 1 OUT 1	11	
SSC1.SP2	Switch point 2 OUT 1	10	
SSC1.HyS	Switch point hysteresis OUT1	10 %	
SSC1.dS	Switching delay OUT1	0 s	
SSC1.dr	Switch-off delay OUT1	0 s	
SSC1.P-n	Output configuration	PnP	<ul style="list-style-type: none"> • PnP • NPN
SSC2.ModE	Switch point mode OUT2	1-P	<ul style="list-style-type: none"> • 1-P • and • 2-P • OFF
SSC2.LoGc	Switch point logic OUT2	no	<ul style="list-style-type: none"> • no • nc
SSC2.SP1	Switch point 1 OUT2	22	
SSC2.SP2	Switch point 2 OUT2	20	
SSC2.HyS	Switch point hysteresis OUT2	10 %	
SSC2.dS	Switching delay OUT2	0 s	
SSC2.dr	Switch-off delay OUT2	0 s	
rES	Factory setting		
Lo	Lowest measured input value	----	
Hi	Highest measured input value	----	
dSt	Startup delay time 0 s		
PrSC (only operating mode 2)	Prescaler	1	
ScAL (only operating mode 1)	Set decimal point	OFF	<ul style="list-style-type: none"> • OFF • cccc • ccc.c • cc.cc • c.ccc
C.FEP (only operating mode 1)	User endpoint for frequency	2000	
C.uni (only operating mode 1)	Customer-specific unit	Unit	
coLr	Display: colour setting	rEd	<ul style="list-style-type: none"> • rEd • grEn • r1ou • G1ou • r-cF • G-cF
cFH	Colour change: upper limit value	11	
cFL	Colour change: lower limit value	10	

Parameters		Factory settings	User settings
diS.b	Display power on	On	<ul style="list-style-type: none">• On• OFF
diS.U	Refresh rate of the displayed value	d2 (200 ms)	<ul style="list-style-type: none">• OFF• d1 (50 ms)• d2 (200 ms)• d3 (600 ms)
CMPT	Indication of the operating mode	HZ_M	<ul style="list-style-type: none">• HZ_M• rpnM