SCHUNK

Software manual
PGL-Plus-P with Integrated Sensor System
IO-Link Protocol

Hand in hand for tomorrow

Imprint

Technical changes:
We reserve the right to make alterations for the purpose of technical improvement.

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Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management

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Please read the operating manual in full and keep it close to the product.

Table of Contents

1 General

1.1 About this manual

This software manual describes the operating and parameterization options of the gripper PGL-plus P IO-Link.

Applicable documents

- General terms of business *
- Assembly and Operating Manual- PGL-plus P *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com**.

The following abbreviations are used:

- OutLinLow – Lower system boundary (gripper finger in "open" position)
- OutLinHigh – Upper system boundary (gripper finger in "closed" position)
- OSS – Output switching signal (physical output)
- R – Read access
- R/W – Read and write access
- SDCI – Single-drop digital communication interface
- SIO – Standard input output mode
- SSC – Switching Signal Channel (programmable position)
- SP – Setpoint
- S1 – LED1 on the sensor
- S2 – LED2 on the sensor
- TECom – Teach Command
- TESel – Teach Select
- TEStat – Teach Status
- TP – TechPoint
- W – Write access

1.2 Trademarks

IO-Link® is s brand of IO-Link-Community.

1.3 IO-Link Basics

Fieldbus independent interface

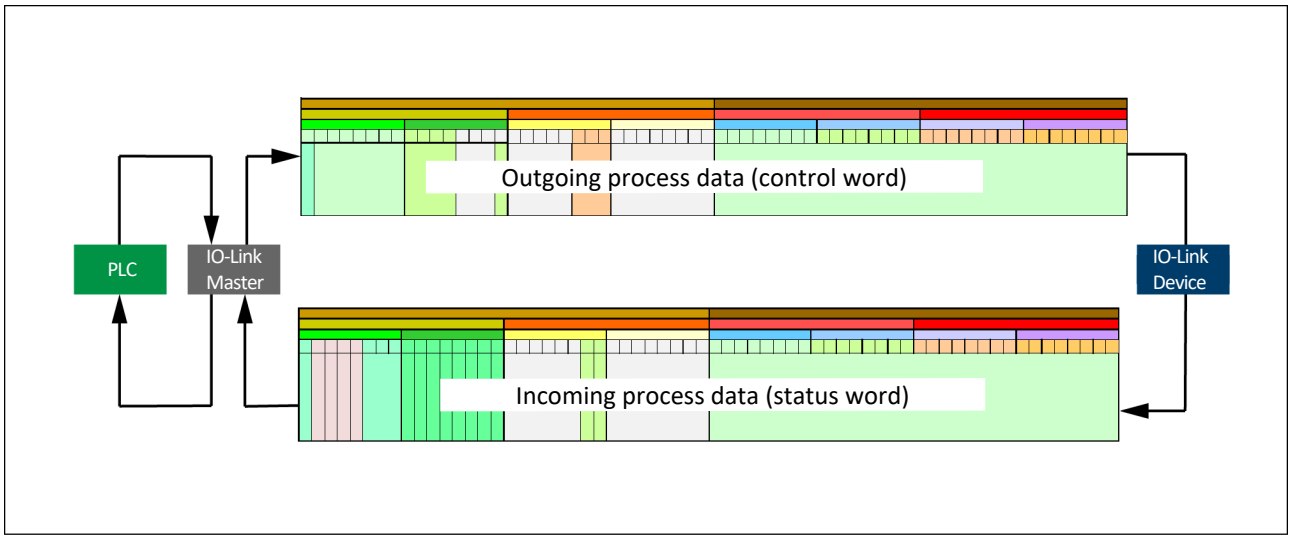
IO-Link is a point-to-point interface for connecting a SCHUNK product (IO-Link device) to a control system (IO-Link master). Via this interface it is possible to transfer parameters, process data and diagnostic data. Parameter data are transfered to the IO-Link device from the master (actuator or sensors). In the opposite direction, the master receives cyclical process data and, if required, service and diagnostic data.

Further information on IO-Link can be found at www.io-link.com.

1.4 Data exchange

Cyclical data exchange

To exchange cyclic process data between an IO-Link device and a controller, the IO-Link data are transferred from the IO-Link master to the previously set address ranges. The user program of the controller accesses the process values via these addresses and processes them. Conversely, the cyclic data exchange is performed from the controller to the IO-Link device.



Cyclical data exchange

Further information, ▶ 3 [🗋 12] and ▶ 4 [🗋 13]

Acyclical data exchange

The exchange of acyclic data, such as parameters or events, takes place over a specified index and sub-index range. Using the index and sub-index range, it is possible to access the data of the device in a targeted manner (e.g. for a reparameterization of the device or master during operation).

Further information, ▶ 5 [🗋 15].

2 Quick start

2.1 Quick start (IO-Link)

2.1.1 Notes on quick start with IO-Link

Factory settings

The "Restore Factory Settings" function resets all sensor parameters to the delivery status.
Further information: ▸ 5.3 [🗋 21] and ▸ 6 [🗋 32].

Changing sensors

When a sensor is changed, the following points must be observed:

- System boundaries must be taught in

  The **system boundaries** can be taught in again after a sensor replacement or in the case of stroke limitation, using cyclic or acyclic data exchange.

  - Cyclic data exchange ▸ 6.2 [🗋 36]
  - Acyclic data exchange ▸ 6.1 [🗋 32]
- All changeable sensor parameters required for sensor operation (e.g. configuration of the SSCs, the alarms, the OSSs, measurement data source, etc.) that deviate from the factory settings/delivery status must be parameterized in the new sensor. (Data storage function or acyclic data exchange)

2.1.2 Parameters in the delivery status

The gripper is preconfigured in the delivery status and can be used directly with the following functions:

- Output of the jaw stroke position (IO-Link – process data)
- Output of the two gripper end positions (IO-Link – process data / SIO mode – OUT1/OUT2)

System boundaries are taught in

- OutLinLow = Gripper "open"
- OutLinHigh = Gripper closed
- Set parameters:

Measurement value source =	SCALED distance
Measurement value filter =	110 Hz
OutScaledMax =	16384

SSC1 and SSC2 are taught in to the gripper end positions:

- SSC1 = Gripper "closed"

SSC1 Logic I	High active
SSC1 mode =	Gripping point mode
SSC1 delay =	0 ms
SSC1 hysteresis =	see following Table
SSC1 tolerance / target window =	see following Table

- SSC2 = Gripper "open"

SSC2 logic =	High active
SSC2 mode =	Gripping point mode
SSC2 delay =	0 ms
SSC2 hysteresis =	see following Table
SSC2 tolerance / target window =	see following Table

SSC1 and SSC2 are assigned to the two OSSx

- OSS1

OSS1_A1 source (OUT1; PIN 4) =	SSC1
OSS1 logic =	High active

- OSS2

OSS2_A1 source (OUT2; PIN2) =	SSC2
OSS2 logic =	0 (High active)

(Alarm 1-3) are deactivated

Size PGL-plus-P	Tolerance [digits]	Hysteresis [digits]
10	410	205
13	320	160
16	260	130
20	210	105
25	180	90

Tab.: default values: Tolerance and Hysteresis

Other default values are marked in the individual parameters/ acyclic data, ▸ 5 [🗋 15].

2.1.3 Teach in workpieces or positions via switching points SP1/SP2

- Cyclic data exchange:
  Teach in switching points SP1/SP2 of the individual SSCs (SSC1-SSC8), ▸ 6 [🗋 32].
- Acyclic data exchange :
  All parameters of the sensor can be changed via acyclic data exchange, ▸ 6.2 [🗋 36].

2.1.4 Hysteresis

The hysteresis can be taught in via acyclic data.

Teach in the hysteresis, ▸ 5.4.3 [🗋 24].

2.2 Quick start (SIO)

In SIO mode, the following parameters can be changed using the teaching tool:

- System boundaries
- Switching points SP1/SP2 of the SSCs that are assigned to the two OSSx.
- Hysteresis of the SSCs that are assigned to the two OSSx.
- Reset to factory settings.

2.2.1 Notes on quick start with SIO

Factory settings

Restoring the factory settings is possible using the teaching tool, ▸ 6.3.4 [🗋 52].

Changing sensors

When a sensor is changed, the following points must be observed:

- System boundaries must be taught in
- All changeable sensor parameters required for sensor operation (e.g. configuration of the SSCs, the alarms, the OSSs, measurement data source, etc.) that deviate from the factory settings/delivery status must be parameterized in the new sensor. (Data storage function or acyclic data exchange)

Teach-in system boundaries: The OutLinLow and OutLinHigh parameters can be taught-in again after a sensor replacement or in the case of stroke limitation, using a teaching tool.
For further information, see chapter ▸ 6.3.3 [🗋 50].

2.2.2 Parameters in the delivery status

The gripper is preconfigured in the delivery status and can be used directly with the following functions:

- Output of the jaw stroke position (IO-Link – process data)
- Output of the two gripper end positions (IO-Link – process data / SIO mode – OUT1/OUT2)

System boundaries are taught in

- OutLinLow = Gripper "open"
- OutLinHigh = Gripper closed
- Set parameters:

Measurement value source = SCALED distance
Measurement value filter = 110 Hz
OutScaledMax = 16384

SSC1 and SSC2 are taught in to the gripper end positions:

- SSC1 = Gripper "closed"

SSC1 Logic I	High active
SSC1 mode =	Gripping point mode
SSC1 delay =	0 ms
SSC1 hysteresis =	see following Table
SSC1 tolerance / target window =	see following Table

- SSC2 = Gripper "open"

SSC2 logic =	High active
SSC2 mode =	Gripping point mode
SSC2 delay =	0 ms
SSC2 hysteresis =	see following Table
SSC2 tolerance / target window =	see following Table

SSC1 and SSC2 are assigned to the two OSSx

- OSS1

OSS1_A1 source (OUT1; PIN 4) =	SSC1
OSS1 logic =	High active

- OSS2

OSS2_A1 source (OUT2; PIN2) =	SSC2
OSS2 logic =	0 (High active)

(Alarm 1-3) are deactivated

Size PGL-plus-P	Tolerance [digits]	Hysteresis [digits]
10	410	205
13	320	160
16	260	130
20	210	105
25	180	90

Tab.: default values: Tolerance and Hysteresis

Other default values are marked in the individual parameters/ acyclic data, ▸ 5 [🗋 15].

2.2.3 Teach in workpieces or positions via switching points SP1/SP2

SP1/SP2 The switching points of the two SSCx assigned to OSS1 and OSS2 can be taught in with the teaching tool.

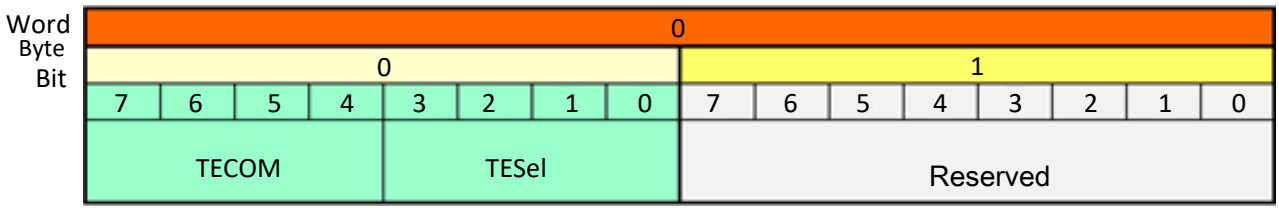
Further information on teaching in switching points, ▸ 6.3.2 [🗋 42].

2.2.4 Hysteresis

The teaching in of the hysteresis using the teaching tool is only possible in Gripping Point mode and Gripping Range mode.

Further information on teaching in the hysteresis, ▸ 6.3.2 [🗋 48].

3 Outgoing process data (control word)



3.1 Teach Select (TESel)

Teach Select is used to select the SSC to be taught in and the system boundaries.

Control word	Value	Description
TESel	0 (0b xxxx.0000): No command	No command, default
	1 (0b xxxx.0001): OutScale	Select system boundaries
	2 (0b xxxx.0010): SSC1	Select *Switching Signal Channel 1*
	3 (0b xxxx.0011): SSC2	Select *Switching Signal Channel 2*
	4 (0b xxxx.0100): SSC3	Select *Switching Signal Channel 3*
	5 (0b xxxx.0101): SSC4	Select *Switching Signal Channel 4*
	6 (0b xxxx.0110): SSC5	Select *Switching Signal Channel 5*
	7 (0b xxxx.0111): SSC6	Select *Switching Signal Channel 6*
	8 (0b xxxx.1000): SSC7	Select *Switching Signal Channel 7*
	9 (0b xxxx.1001): SSC8	Select *Switching Signal Channel 8*
	10–15: Reserved	Reserved (No function)

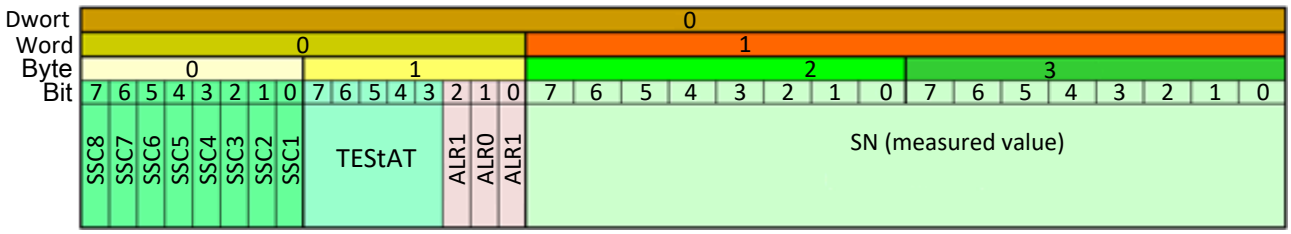
3.2 Teach Command (TECom)

Teach Command is used to execute the teach commands. The teach commands are applied to the value selected with TESel. The teach-in procedure is executed with a rising edge, i.e. when the status of the bits changes from 0 to 1.

Control word	Value	Description
TECom	0 (0b 0000.xxxx): No Command	No command, default
	1 (0b 0001.xxxx): Teach Apply	Confirm and apply teach-in procedure
	2 (0b 0010.xxxx): Teach OutLinLow	Teach in system boundary *OutLinLow*
	3 (0b 0011.xxxx): Teach OutLinHigh	Teach in system boundary *OutLinHIgh*
	4 (0b 0100.xxxx): Single Value Teach SP1	Teach in SP1 of the selected *SSCx*
	5 (0b 0101.xxxx): Single Value Teach SP2	Teach in SP2 of the selected *SSCx*
	6 (0b 0110.xxxx): Teach Cancel	Cancel teach-in procedure
	7–15: Reserved	Reserved (No function)

Examples of teaching in the SSCx and system boundaries, ▸ 6 [🗋 32].

4 Incoming process data (status word)



4.1 Switching Signal Channel (SSCx)

If SSCs are parameterized ▶ 6.2.2 [🗋 37], the incoming process data shows which SSCx is active.

Depending on the SSC configuration (logic):

- SSCx is active = 1, otherwise 0. (SSCx logic = high active) (default setting)
- SSCx is active = 0, otherwise 1. (SSCx logic = low active)

Depending on the parameterization, several SSCs can be active at the same time.

4.2 Alarm (ALRx)

If alarms are parameterized ▶ 5.2.3 [🗋 19], the incoming process data shows which alarm (1–3) is active.

Alarm is active = 1, otherwise 0.

Depending on the parameterization, several alarms can be active at the same time.

4.3 Teach status (TEStat)

The current teach status of the product is displayed.

Process data	Value	Description
TEStat	0 (0b 0000.0xxx): IDLE	Product is idle
	1 (0b 0000.1xxx): SP1 SUCCESS	SP1 successfully taught in
	3 (0b 0001.1xxx): SP12 SUCCESS	SP12 successfully taught in
	4 (0b 0010.0xxx): WAIT FOR COMMAND	Waiting for teach command (TECom)
	5 (0b 0010.1xxx): BUSY	Product is busy
	6 (0b 0011.0xxx): Reserved	Reserved (No function)
	7 (0b 0011.1xxx): ERROR	Error during teach-in procedure
	8...11: Reserved	Reserved (No function)
	12 (0b 0110.0xxx): OutLinLow SUCCESS	System boundary OutLinLow successfully taught in
	13 (0b 0110.1xxx): OutLinHigh SUCCESS	System boundary OutLinHigh successfully taught in
	14...31: Reserved	Reserved (No function)

Examples of teaching in the SSCx and system boundaries, ▶ 6 [🗋 32].

4.4 Measured value (SN measurement value)

The following possible values can be represented by the measured value depending on the parameterization, ▶ 5.2.1 [🗋 16]:

- SCALED distance (default)
- Temperature
- Raw distance
- Raw distance temperature compensated
- LIN distance

The maximum value range of scaled distance corresponds to the setting under OutScaledMax, ▶ 5.2.1 [🗋 16].

Conversion of SN measurement value "Temperature" in °C

(SN measurement value "Temperature" + Offset) * Gradient = Temperature [°C]

Offset = -75 digits Gradient = 1 °C/digits

Example:
SN measurement value = 101
(101 digits - 75 digits) * 1 °C/digits = 26 °C

5 Acyclic device data and events

5.1 Identification data

5.1.1 Identification data overview

Acyclic data provided:

Index	Name	Data type	Access rights	Data size	Factory settings
0x10	Vendor name	char[16]	R	64 Byte	Manufacturer name: SCHUNK
0x11	Vendor text	char[32]	R	64 Byte	additional information about the manufacturer: schunk.com
0x12	Product name	char[32]	R	64 Byte	Product designation: Sensor PGL+P IOL xx (BG)
0x13	Product ID	char[16]	R	64 Byte	Size ID number
0x14	Product text	char[32]	R	64 Byte	Sensor system PGL+P IOL
0x15	Serial number	char[16]	R	16 Byte	–
0x16	Hardware revision	char[16]	R	64 Byte	–
0x17	Firmware revision	char[16]	R	64 Byte	–
0x18	Application-specific tag	char[32]	R/W	32 Byte	Free text field for application-specific identification: (default: ***)
0x0C	Device access locks	BooleanT	R/W	2 byte	Bit 0 = parameter write access lock Bit 1= data storage lock Bit 2–15 reserved Bit status: 0 = unlocked (default) 1 = locked

5.1.2 Function & location tag

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x48	0x01	Function tag	R/W	char[32]	Free text field for application-specific identification (default: ***)
	0x02	Location tag	R/W	char[32]	Free text field for application-specific identification (default: ***)

5.2 Parameter

5.2.1 SCU – Sensor Configuration Unit

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x40	0x01	Measurement start-up time	R/W	uint16	Start-up time of the measuring: 0…65535 ms (default: 0 ms)
	0x02	Measurement value source	R/W	uint18	Selection of the measured value source: 0 = SCALED distance (default) 1 = Temperature 2 = LIN distance 3 = Raw Dist IND TCOMP
	0x03	Measurement value filter	R/W	uint8	Filter for averaging: 0 = 1 Khz 2 = 250 Hz 4 = 110 Hz (Default) 8 = 55 Hz 16 = 28 Hz 24 = 19 Hz 32 = 14 Hz
	0x04	OutScaledMax	R/W	uint16	Scaling maximum: 0 to 2^14 (0 … 16384)
	0x05	OutLinLow	R/W	int16	Lower system boundary: 0 to 2^14 (0 … 16384)
	0x06	OutLinHigh	R/W	int16	Upper system boundary: 0 to 2^14 (0 … 16384)
	0x07	OutLinLow Offset	R/W	int16	Additional offset for the lower system boundary: 0 to 2^14 (0 … 16384) (default: 0)
	0x08	OutLinHigh Offset	R/W	int16	Additional offset for the upper system boundary: 0 to 2^14 (0 … 16384) (default: 0)

5.2.2 Output switching signal (OSS) configuration

The two outputs of the sensor, output 1 (PIN4) and output 2 (PIN2) can be parameterized.

Setting options:

- Output logic
- Selection of up to 2 sources per output
- Selection of logical links (conditions) of the two sources

The OSS are assigned to the outputs and displays:

- OSS1 – display LED S1; output PIN4 (SIO mode)
- OSS2 – display LED S2; output PIN2 (SIO mode)

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x42	0x01	OSS1 Logic	R/W	uint8	OSS1 Logic – Logic of sensor output 1 (PIN4) when used in SIO mode: 0 = High active (NO) (default) 1 = Low active (NC) 2 = ON 3 = OFF
	0x02	OSS2 Logic	R/W	uint8	OSS2 Logic – Logic of sensor output 2 (PIN2) when used in SIO mode: 0 = High active (NO) (default) 1 = Low active (NC) 2 = ON 3 = OFF
	0x03	OSS1 Condition	R/W	uint8	OSS1 Condition – Condition of sensor output 1 (PIN4) when used in SIO mode: 0 =OSS1_A1 (default) 1 =OSS1_A1 AND* OSS1_A2 2 =OSS1_A1 OR* OSS1_A2 3 =OSS1_A1 XOR* OSS1_A2
	0x04	OSS2 Condition	R/W	uint8	OSS2 Condition – Condition of sensor output 2 (PIN2) when used in SIO mode: 0 =OSS2_A1 (default) 1 =OSS2_A1 AND* OSS2_A2 2 =OSS2_A1 OR* OSS2_A2 3 =OSS2_A1 XOR* OSS2_A2

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description	
0x42	0x05	OSS1_A1 Source	R/W	uint8	OSS1 Source A1 – Source 1 of sensor output 1 (PIN4) when used in SIO mode:	
					0 = SSC1 [default]	4 = SSC5
					1 = SSC2	5 = ALR1
					2 = SSC3	6 = ALR2
					3= SSC4	7 = ALR3
	0x06	OSS1_A2 Source	R/W	uint8	OSS1 Source A2 – Source 2 of sensor output 1 (PIN4) when used in SIO mode:	
					0 = SSC1 (default)	4 = SSC5
					1 = SSC2	5 = ALR1
					2 = SSC3	6 = ALR2
					3= SSC4	7 = ALR3
	0x07	OSS2_A1 Source	R/W	uint8	OSS2 Source A1 – Source 1 of sensor output 2 (PIN2) when used in SIO mode:	
					0 = SSC1	4 = SSC5
					1 = SSC2 (default)	5 = ALR1
					2 = SSC3	6 = ALR2
					3= SSC4	7 = ALR3
	0x08	OSS2_A2 Source	R/W	uint8	OSS2 Source A2 – Source 2 of sensor output 2 (PIN2) when used in SIO mode:	
					0 = SSC1	4 = SSC5
					1 = SSC2 (default)	5 = ALR1
					2 = SSC3	6 = ALR2
					3= SSC4	7 = ALR3

5.2.3 SMAU – Sensor Measurement Alarm Unit

The sensor includes up to 3 parameterizable alarms. The 3 alarms are reported back via IO-Link in the process data and as an IO-Link event (if parameterized).

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x47	0x01	Measurement alarm 1 threshold	R/W	uint16	Threshold value for alarm 1: (default: 0)
	0x02	Measurement alarm 1 hysteresis	R/W	uint16	Hysteresis of alarm 1: (default: 0)
	0x03	Measurement alarm 1 configuration	R/W	uint8	Selection of the configuration of alarm 1: 0 = Always OFF (default) 1 = Active 2 = Active / IO-Link event generation
	0x04	Measurement alarm 1 source	R/W	uint8	Selection of the source of alarm 1: 0 = SCALED distance (default) 1 = Temperature 2 = MHM median 3 = MHM deviation 50% 4 = MHM deviation
	0x05	Measurement alarm 2 threshold	R/W	uint16	Threshold value for alarm 2: (default: 0)
	0x06	Measurement alarm 2 hysteresis	R/W	uint16	Hysteresis of alarm 2: (default: 0)
	0x07	Measurement alarm 2 configuration	R/W	uint8	Selection of the configuration of alarm 2: 0 = Always OFF (default) 1 = Active 2 = Active / IO-Link event generation
	0x08	Measurement alarm 2 source	R/W	uint8	Selection of the source of alarm 2: 0 = SCALED distance (default) 1 = Temperature 2 = MHM median 3 = MHM deviation 50% 4 = MHM deviation

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x47	0x09	Measurement alarm 3 threshold	R/W	uint16	Threshold value for alarm 3: (default: 0)

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
	0x0A	Measurement alarm 3 hysteresis	R/W	uint16	Hysteresis of alarm 3: (default: 0)
	0x0B	Measurement alarm 3 configur-ation	R/W	uint8	Selection of the configuration of alarm 3: 0 = Always OFF (default) 1 = Active 2 = Active / IO-Link event generation
	0x0C	Measurement alarm 3 source	R/W	uint8	Selection of the source of alarm 3: 0 = SCALED distance (default) 1 = Temperature 2 = MHM median 3 = MHM deviation 50% 4 = MHM deviation

5.3 System commands

5.3.1 System command

System command contains all the necessary acyclic commands:

- Device reset
- Reset device to factory settings
- Locate device
- Reset histogram module
- Teach commands
- Request parameters from master

Index	Parameter	Access rights	Data size/ Data type	Description
0x02	System_command	W	UINT8	0x80 = Device reset 0x82 = Restore factory settings 0xA0 = Locate device * 0xA1 = Clear MHM BIN 0xA2 = Teach OutLinLow 0xA3 = Teach OutLinHigh 0xA4 = Store new set of factory settings 0x05 = ParamDownloadStore 0x40 = Teach Apply 0x41 = Single Value Teach SP1 0x42 = Single Value Teach SP2 0x43 = Two Value Teach SP1 TP1 0x44 = Two Value Teach SP1 TP2 0x45 = Two Value Teach SP2 TP1 0x46 = Two Value Teach SP2 TP2 0x47 = Dynamic Teach SP1 Start 0x48 = Dynamic Teach SP1 Stop 0x49 = Dynamic Teach SP2 Start 0x4A = Dynamic Teach SP2 Stop 0x4F = Teach Cancel Abort

* Locate device: S1/S2 flash alternately for 30 sec. with a frequency of 1 Hz.

5.3.2 Data storage

The data storage (DS) function enables the consistent and up-to-date storage of device parameters at superordinate levels such as PLC programs or fieldbus parameter servers.

Data storage therefore enables simple sensor replacement in the event of a failure by temporarily storing all the parameters required for operation. Further information on sensor replacement, ▶ 2.1.1 [🗋 7] and ▶ 2.2.1 [🗋 10].

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x03	0x01	DS_Command	R/W	UINT8	0x00: Reserved 0x01: DS_UploadStart 0x02: DS_UploadEnd 0x03: DS_DownloadStart 0x04: DS_DownloadEnd 0x05: DS_Break 0x06 to 0xFF: Reserved
	0x02	State_Property	R	UINT8	Bit 0: Reserved Bit 1 and 2: State of Data Storage 0b00: Inactive 0b01: Upload 0b10: Download 0b11: Data Storage locked Bit 3 to 6: Reserved Bit 7: DS_UPLOAD_FLAG "1": DS_UPLOAD_REQ pending "0": no DS_UPLOAD_REQ
	0x03	Data_Storage_ Size	R	UINT32	255
	0x04	Parameter_ Checksum	R	UINT32	
	0x05	Index_List	R	array (of octetstr3)	

5.4 Teach in workpiece and end position

5.4.1 Teach-in-channel-select

Index	Parameter	Access rights	Data size/ Data type	Description
0x3A	Ti Select	R/W	UINT8	Selection of SSCx to be taught in: 0 = Default (SSC1) (default) 1 = SSC1 2 = SSC2 3 = SSC3 4 = SSC4 5 = SSC5 6 = SSC6 7 = SSC7 8 = SSC8 255 = ALL SSC

5.4.2 Teach Status

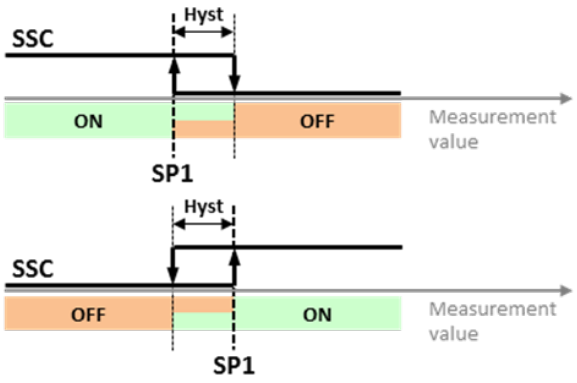
Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x3B	0x01	State	R	BooleanT[4]	Teach Status feedback: 0 = IDLE 1 = SP1 SUCCESS 3 = SP12 SUCCESS 4 = WAIT FOR COMMAND 5 = BUSY 6 = Reserved 7 = ERROR 8..11 = Reserved 12 = OutLinLow SUCCESS 13 = OutLinHigh SUCCESS 14..15 = Vendor specific
	0x02	Flag SP1 -> TP1	R	BooleanT[1]	"0" = Teach point not taught in or not successfully taught in "1" = Teach point successfully taught in
	0x03	Flag SP1 -> TP2	R	BooleanT[1]	"0" = Teach point not taught in or not successfully taught in "1" = Teach point successfully taught in
	0x04	Flag SP2 -> TP1	R	BooleanT[1]	"0" = Teach point not taught in or not successfully taught in "1" = Teach point successfully taught in
	0x05	Flag SP2 -> TP2	R	BooleanT[1]	"0" = Teach point not taught in or not successfully taught in "1" = Teach point successfully taught in

5.4.3 Switching Signal Channel (SSC): Parameters & configuration

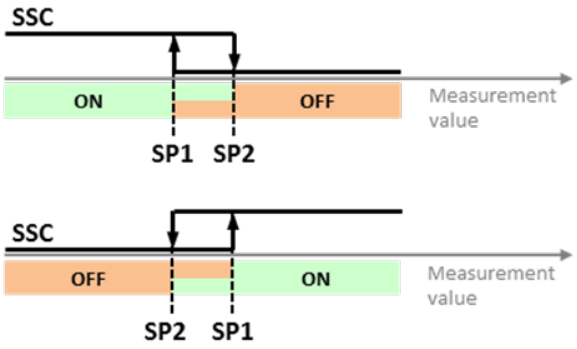
With the help of the SSCs, up to 8 positions, workpieces or end positions can be taught and output via the process data.

The SSCs can be configured in the following modes

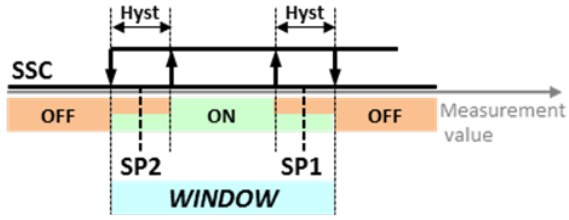
Single Point Mode



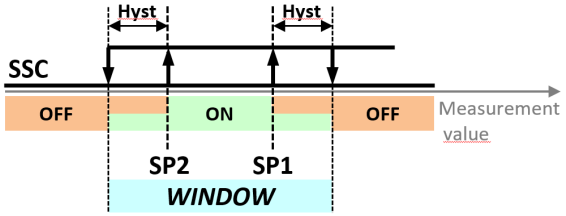
Two Point Mode



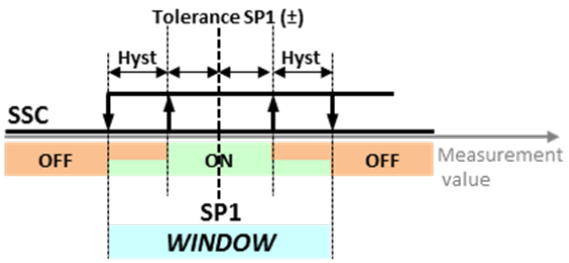
Window Mode



Gripping Range Mode



Gripping Point Mode (default)



Switching Signal Channel 1–8

Tab.: Index assignment Switching Signal Channel (SSC)

	SSC1	SSC2	SSC3	SSC4	SSC5	SSC6	SSC7	SSC8
Index *1	0x3C	0x400C	0x400E	0x4010	0x4012	0x4014	0x4016	0x4018
Index *2	0x3D	0x400D	0x400F	0x4011	0x4013	0x4015	0x4017	0x4019

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
*1	0x01	Setpoint 1	R/W	INT32	Switching Point for Single Point-, Window. and Two Point-, Gripping Range-, Gripping Point modes
	0x02	Setpoint 2	R/W	INT32	Second switching point for Single Point-, Window- and Two Point-, Gripping Range-, Gripping Point modes
*2	0x01	Logic	R/W	UINT8	Selection of the switching logic of the SSC: 0 = High active (default) 1 = Low active 2..7F = Reserved 80..FF = Vendor specific
	0x02	Mode	R/W	UINT8	Selection of the mode of the SSC: 0 = Deactivated 1 = Single point 2 = Window 3 = Two point 4..7F = Reserved 80 = Gripping Range 81 = Gripping point (Default) 82..FF = Vendor specific
	0x03	Hysteresis	R/W	INT32	Hysteresis (Hyst) for Single Point-, Window-, Gripping Point-, Gripping Range mode (default) PGL-plus-P 10 = 205 digits PGL-plus-P 13 = 160 digits PGL-plus-P 16 = 130 digits PGL-plus-P 20 = 105 digits PGL-plus-P 25 = 90 digits
	0x04	Tolerance / target window	R/W	INT32	Tolerance / target window for the Gripping Point mode (default) PGL-plus-P 10 = 410 digits PGL-plus-P 13 = 320 digits PGL-plus-P 16 = 260 digits PGL-plus-P 20 = 210 digits PGL-plus-P 25 = 180 digits
	0x05	Delay	R/W	INT32	Switch-on delay for the Gripping Range- and Gripping Point modes. The switch-on delay represents the time period in which the switch-on condition must be fulfilled before the SSC switches on. (default: 0)

5.4.4 TE0 – Teach offset

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x41	0x01	Teach offset	R/W	INT16	Value that is applied as an offset when a single-value teach is performed. (default: 0)

5.5 Diagnostics

5.5.1 Device & detailed device status

Index	Parameter	Access rights	Data size/Data type	Description
0x24	Device status	R	UINT8	Feedback of device status: 0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure 5...255 = Reserved
0x25	Detailed device status	R	Array (of octetstr3)	Feedback of the more detailed device status: 3 = Over temperature 4 = Under temperature 5 = Under voltage 6 = Short circuit 7 = Ferrit, coil, PCB failure 9 = Component malfunction

5.5.2 SMU – Sensor Monitor Unit

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x46	0x01	Ambient/current temperature	R	UINT16	Display of the current ambient temperature: [resolution 1 °C].
	0x02	Max lifetime temperature	R	UINT16	Highest temperature reached in the lifetime of the sensor: [resolution 1 °C].
	0x03	Min lifetime temperature	R	UINT16	Lowest temperature reached in the lifetime of the sensor: [resolution 1 °C].
	0x04	Lifetime temperature cycle count	R	UINT8	Number of temperature cycles over the entire service life. Threshold for counting: 55 °C Hysteresis: –20 K Ex: Cycle is incremented at 55 °C. If the temperature falls below 35 °C and then rises again to 55 °C, the cycle is incremented again.
	0x05	Lifetime operating hours	R	UINT32	Number of operating cycles over the entire service life
	0x06	Lifetime power-on cycles	R	UINT32	Number of boot procedures over the entire service life
	0x07	Lifetime EMC disturbances	R	UINT32	Number of EMC disturbances over the entire service life
	0x08	EVENT FLAG	R	UINT8	Display of pending events: 0 = Coil failure 1 = Short circuit on output 2 = EMC disturbances 3 = Collision on output 4 = Over temperature 5 = Under temperature 6 = Under voltage 7 = Reserved An access to the subindex resets the event flags
	0x09	Under temperature event count	R	UINT32	Number of under temperature cycles over the entire service life.
	0x0A	Over temperature event count	R	UINT32	Number of over temperature cycles over the entire service life.
	0x0B	Under voltage event count	R	UINT32	Number of under voltage events over the entire service life.

5.5.3 Device Description

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x49	0x01	Profile compatibility	R	CHAR[32]	SSP-DMSS 4.3.1
	0x03	Supply voltage range (Ub)	R	CHAR[16]	18…30 VDC
	0x04	Max. output current	R	CHAR[16]	≤ 200 mA
	0x07	Enclosure rating	R	CHAR[16]	IP67

5.5.4 Gripper characteristics

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x4B	0x01	Gripper name	R/W	CHAR[32]	Gripper-specific
	0x02	Gripper ID	R/W	CHAR[32]	Gripper-specific
	0x03	Gripper stroke per jaw	R/W	CHAR[16]	Gripper-specific
	0x04	Gripper force	R/W	CHAR[16]	Gripper-specific
	0x05	Gripper weight	R/W	CHAR[16]	Gripper-specific
	0x06	Gripper serial number	R/W	CHAR[16]	Gripper-specific

5.5.5 Measurement Histogram Modules

Index	Sub index	Parameter	Access rights	Data size/ Data type	Description
0x004A	0x01	MHM Source	R/W		Selection of the source for the MHM: 0 = Distance 1 = Temperature
	0x02	MHM Trigger	R/W		Selection of the trigger for the MHM: 0 = OFF 1 = ON
	0x03	Range start	R/W		0…16384
	0x04	Range end	R/W		0…16384
	0x05	BIN 1	R		Counter for measured value range 1
	0x06	BIN 2	R		…
	0x07	BIN 3	R		…
	0x08	BIN 4	R		…
	0x09	BIN 5	R		…
	0x10	BIN 6	R		…
	0x11	BIN 7	R		…
	0x12	BIN 8	R		…
	0x13	BIN 9	R		…
	0x14	BIN 10	R		…
	0x15	BIN 11	R		…
	0x16	BIN 12	R		…
	0x17	BIN 13	R		…
	0x18	BIN 14	R		…
	0x19	BIN 15	R		…
	0x20	BIN 16	R		Counter for measured value range 16
	0x21	Median	R		Median of the 16 measured values
	022	Deviation 50%	R		Standard deviation from median
	0x23	Target value	R/W		0…16384
	0x24	Deviation	R		Deviation from target value

5.5.6 Error types

Error Code	Additional code	Designation	Description
0x80	0x11	Index not available	Access is made to a non-existent index
	0x12	Subindex not available	Access is made to a non-existent subindex
	0x22	Service temporarily not available – Device control	The parameter cannot be accessed due to a device application status triggered by remote access.
	0x23	Access denied	Write access to a read-only parameter
	0x30	Value out of range parameter	Written parameter value is outside its permissible value range
	0x33	Length overrun parameter	The length of the written parameter is longer than the predefined allowed length
	0x34	Length underrun parameter	The length of the written parameter is shorter than the predefined allowed length
	0x35	Function not available	Written command is not supported by the device application
	0x36	Function temporarily not available	The written command is not available due to the current status of the device
	0x41	Inconsistent parameter set	Parameter inconsistencies were found at the end of the parameter transfer (block), device plausibility check failed

5.5.7 Events

Event code	Type	Designation	Description
0x1800	Warning	EMC disturbances	EMC disturbance detected by the sensor
0x1801	Warning	Under IOL voltage	Under IOL voltage detected by the sensor
0x1803	Warning	Short circuit	Short circuit detected by the sensor
0x1804	Error	Under voltage	Under voltage detected by the sensor
0x1807	Error	Ferrites, coil, PCB failure	Ferrit, coil, PCB failure detected by the sensor
0x1808	Notification	Alarm 1	Threshold value for alarm 1 reached
0x1809	Notification	Alarm 2	Threshold value for alarm 2 reached
0x180A	Notification	Alarm 3	Threshold value for alarm 3 reached
0x180B	Notification	Trigger Teach	New SP successfully taught in
0x180C	Notification	Factory settings	Factory settings successfully restored
0x180D	Warning	Temperature limit	Threshold value of the temperature limit reached

6 Teach-in procedures

The following options for teach-in and parameterization are available in the product:

- Cyclic data exchange:
  The following parameters can be changed via cyclic data exchange:
  - Teach in system boundaries (OutLinLow / OutLinHigh)
  - Teach in switching points SP1/SP2 of the individual SSCs (SSC1-SSC8)
- Acyclic data exchange :
  All parameters of the sensor can be changed via acyclic data exchange
- Teaching tool:
  Note: The Teaching tool is not included in teh scope of delivery an can be purchased from SCHUNK (ID.-No.: 0301030).
  The following parameters can be changed using the teaching tool:
  - Teach in system boundaries (OutLinLow / OutLinHigh)
  - Teach in the switching points SP1/SP2 of the SSCs that are assigned to the two OSSx.
  - Teach in the hysteresis of the SSCs that are assigned to the two OSSx.
  - Reset to factory settings.

6.1 Cyclical data exchange

6.1.1 Teach in system boundaries

The system boundaries can be taught in again after a sensor replacement or in case of stroke limitation, via the cyclic data.

NOTE
System boundaries can also be taught in separately from each other

Teach in lower system boundaries

1. Move gripper to end position 1 **"Open"**

2. Select 'Teach in system boundaries' **"Out Scale"**

Command	PDOut.TESel	(0b 0000.0001) *(0b xxxx.0001)*	0x01 *1 = Out Scale*
Feedback signal	none		
	3. Teach in lower system boundaries		
Command	PDOut.TESel	(0b 0010.0001) *(0b 0010.xxxx)* *(0b xxxx.0001)*	0x21 *0d2 = Teach OutLinLow* *0d1 = Out Scale*
Feedback signal	PDIn.TEStat	(0b 0010.0000) *(0b 0010.0xxx)*	0x20 *0d4 = Waiting for command*

4. Confirm the teach-in procedure

Command	PDOut.TESel	(0b 0001.0001)	0x11
		(0b 0001.xxxx)	*0d1 = Teach Apply*
		(0b xxxx.0001)	*0d1 = Out Scale*
Feedback signal	PDIn.TEStat	(0b 0110.0000)	0x60
		(0b 0110.0xxx)	*12 = OutLinLow SUCCESS*

Teach in upper system boundaries

5. Move gripper to end position 2 "Closed"

6. Select 'Teach in system boundaries' "Out Scale"

Command	PDOut.TESel	(0b 0000.0001)	0x01
		(0b xxxx.0001)	*1 = Out Scale*
Feedback signal	none		

7. Teach in upper system boundaries

Command	PDOut.TESel	(0b 0011.0001)	0x31
		(0b 0011.xxxx)	*0d3 = Teach OutLinHigh*
		(0b xxxx.0001)	*0d1 = Out Scale*
Feedback signal	PDIn.TEStat	(0b 0010.0000)	0x20
		(0b 0010.0xxx)	*0d4 = Waiting for command*

8. Confirm the teach-in procedure

Command	PDOut.TESel	(0b 0001.0001)	0x11
		(0b 0001.xxxx)	*0d1 = Teach Apply*
		(0b xxxx.0001)	*0d1 = Out Scale*
Feedback signal	PDIn.TEStat	(0b 0110.1000)	0x68
		(0b 0110.1xxx)	*13 = OutLinLow SUCCESS*

9. End teach-in procedure

Command	PDOut.TESel	(0b 0110.0001)	0x61
		(0b 0110.xxxx)	*0d6 = Teach Cancel*
		(0b xxxx.xxx1)	*0d1 = Out Scale*
Feedback signal	PDIn.TEStat	(0b 0000.0000)	0x00
		(0b 0000.0xxx)	*0d0 = No command*

6.1.2 Teach in Switching Signal Channel (SSCx)

The switching points (setpoint 1 = SP1/ setpoint 2 = SP2) of the individual SSCs can be taught in by cyclic data. All other parameters of the SSCs can only be changed via the acyclic data exchange.

The number of switching points to be taught in depends on the set mode of the SSC to be taught in.

Mode	SSC
Gripping Point Mode (default)	SP1
Gripping Range Mode	SP1 & SP2
Single Point Mode	SP1
Two Point Mode	SP1 & SP2
Window Mode	SP1 & SP2

The teaching in of an SP1 is performed according to the following method (example using SSC1):

1. Move gripper to position to be taught in for SP1 "Position X1"

2. Select SSC to be taught in "SSC1"

Command	PDOut.TESel	(0b 0000.0010) *(0b xxxx.0010)*	0x02 *0d2 = SSC1*
Feedback signal	none		

3. Teach in SP1

Command	PDOut.TESel	(0b 0100.0010) *(0b 0100.xxxx)* *(0b xxxx.0010)*	0x42 *0d4 = Single Value Teach SP1* *0d2 = SSC1*
Feedback signal	PDIn.TEStat	(0b 0010.0000) *(0b 0010.0xxx)*	0x20 *0d4 = Waiting for command*

4. Confirm the teach-in procedure

Command	PDOut.TESel	(0b 0001.0010) *(0b 0001.xxxx)* *(0b xxxx.0010)*	0x12 *0d1 = Teach Apply* *0d2 = SSC1*
Feedback signal	PDIn.TEStat	(0b 0000.1000) *(0b 0000.1xxx)*	0x08 *0d1 = SP1 SUCCESS*

5. End the teach-in procedure

Command	PDOut.TESel	(0b 0110.0010) *(0b 0110.xxxx)* *(0b xxxx.0001)*	0x62 *0d6 = Teach Cancel* *0d2 = SSC1*
Feedback signal	PDIn.TEStat	(0b 0000.0000) *(0b 0000.0xxx)*	0x00 *0d0= No command*

The teaching in of SP1 and SP2 (only necessary for two point and window mode) is done according to the following method (example using SSC3):

1. Move gripper to position to be taught in for SP2 "Position X1"

2. Select SSC to be taught in "SSC3"

Command	PDOut.TESel	(0b 0000.0100) *(0b xxxx.0100)*	0x04 *0d4 = SSC3*
Feedback signal	none		

3. Teach in SP2

Command	PDOut.TESel	(0b 0101.0100) *(0b 0101.xxxx)* *(0b xxxx.0100)*	0x54 *0d5 = Single Value Teach SP2* *0d4 = SSC3*
Feedback signal	PDIn.TEStat	(0b 0010.0000) *(0b 0010.0xxx)*	0x20 *0d4 = Waiting for command*

4. Move gripper to position to be taught in for SP1 "Position X2"

5. Teach in SP1

Command	PDOut.TESel	(0b 0100.0100) *(0b 0100.xxxx)* *(0b xxxx.0100)*	0x44 *0d4 = Single Value Teach SP1* *0d4 = SSC3*
Feedback signal	PDIn.TEStat	(0b 0010.0000) *(0b 0010.0xxx)*	0x20 *0d4 = Waiting for command*

6. Confirm the teach-in procedure

Command	PDOut.TESel	(0b 0001.0100) *(0b 0001.xxxx)* *(0b xxxx.0100)*	0x14 *0d1 = Teach Apply* *0d4 = SSC3*
Feedback signal	PDIn.TEStat	(0b 0001.1000) *(0b 0001.1xxx)*	0x18 *0d3 = SP12 SUCCESS*

7. End the teach-in procedure

Command	PDOut.TESel	(0b 0110.0010) *(0b 0110.xxxx)* *(0b xxxx.0010)*	0x64 *0d6 = Teach Cancel* *0d4 = SSC3*
Feedback signal	PDIn.TEStat	(0b 0000.0000) *(0b 0000.0xxx)*	0x00 *0d0= No command*

- SP1 and SP2 cannot be taught in individually.
- It is essential to observe the sequence when teaching in (first SP2 then SP1).
- SP2 must have a smaller process data value than SP1.

6.2 Acyclical data exchange

6.2.1 Teach in system boundaries

The system boundaries can be taught in again after a sensor replacement or in case of stroke limitation, via the acyclic data.

NOTE
System boundaries can also be taught in separately from each other

Teach in lower system boundaries

1. Move gripper to end position 1 "Open"

2. Teach in lower system boundaries

Command	System_ command	(I: 0x02)	0xA2 (Teach OutLinLow)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x04 (Wait for Command)

3. Confirm the teach-in procedure

Command	System_ command	(I: 0x02)	0x40 (Teach Apply)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x0C (OutLinLow SUCCESS)

Teach in upper system boundaries

4. Move gripper to end position 2 "Closed"

5. Teach in upper system boundaries

Command	System_ command	(I: 0x02)	0xA3 (Teach OutLinHigh)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x04 (Wait for Command)

6. Confirm the teach-in procedure

Command	System_ command	(I: 0x02)	0x40 (Teach Apply)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x0D (OutLinHigh SUCCESS)

6.2.2 Teach in Switching Signal Channel (SSCx)

All parameters of the SSCs can be changed via the acyclic data exchange. The switching points (setpoint 1 = SP1/ setpoint 2 = SP2) of the individual SSCs can be taught in via 2 options in the acyclic data exchange.

1. Directly via the two parameters setpoint 1 and setpoint 2 of the individual SSCx
2. Using the System_command (command)

The number of switching points to be taught in depends on the set mode of the SSC to be taught in.

Mode	SSC
Gripping Point Mode (default)	SP1
Gripping Range Mode	SP1 & SP2
Single Point Mode	SP1
Two Point Mode	SP1 & SP2
Window Mode	SP1 & SP2

The teaching in of an SP1 is performed according to the following method (example using SSC3):

1. Move gripper to position to be taught in for SP1 "Position X1"

2. Select SSC to be taught in

Command	Teach-In select	(I: 0x3A)	0x03 "SSC3"
Feedback signal	Teach-In select	(I: 0x3A)	0x03 "SSC3"

3. Teach in SP1

Command	System_ command	(I: 0x02)	0x41 (Single Value Teach SP1)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x04 (Wait for Command)

4. Confirm the teach-in procedure

Command	System_ command	(I: 0x02)	0x40 (Teach Apply)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x01 (SP1 SUCCESS)

Comment

Error if SP1 <= OutLinLow und SP1 >= OutlinHigh (Outlinlow = 785 ; LIN Distance during teach-in procedure 785)

The teaching in of SP1 and SP2 (only necessary for two point and window mode) is done according to the following method (example using SSC3):

1. Move gripper to position to be taught in for SP2 "Position X1"

2. Select SSC to be taught in "SSC3"

Command	Teach-In select	(I: 0x3A)	0x03 "SSC3"
Feedback signal	Teach-In select	(I: 0x3A)	0x03 "SSC3"

3. Teach in SP2

Command	System_ command	(I: 0x02)	0x42 (Single Value Teach SP2)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	(Wait for Command)

4. Move gripper to position to be taught in for SP1 "Position X2"

5. Teach in SP1

Command	System_ command	(I: 0x02)	0x41 (Single Value Teach SP1)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x04 (Wait for Command)

6. Confirm the teach-in procedure

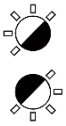
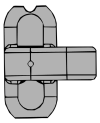
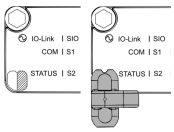
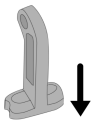
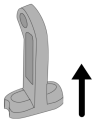
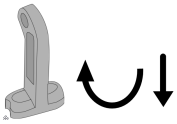
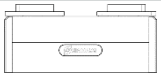
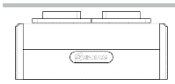
Command	System_ command	(I: 0x02)	0x40 (Teach Apply)
Feedback signal	Teach Status	(I: 0x3B / S:0x01)	0x03 (SP12 SUCCESS)

- SP1 and SP2 cannot be taught in individually.
- It is essential to observe the sequence when teaching in (first SP2 then SP1).
- SP2 must have a smaller process data value than SP1.

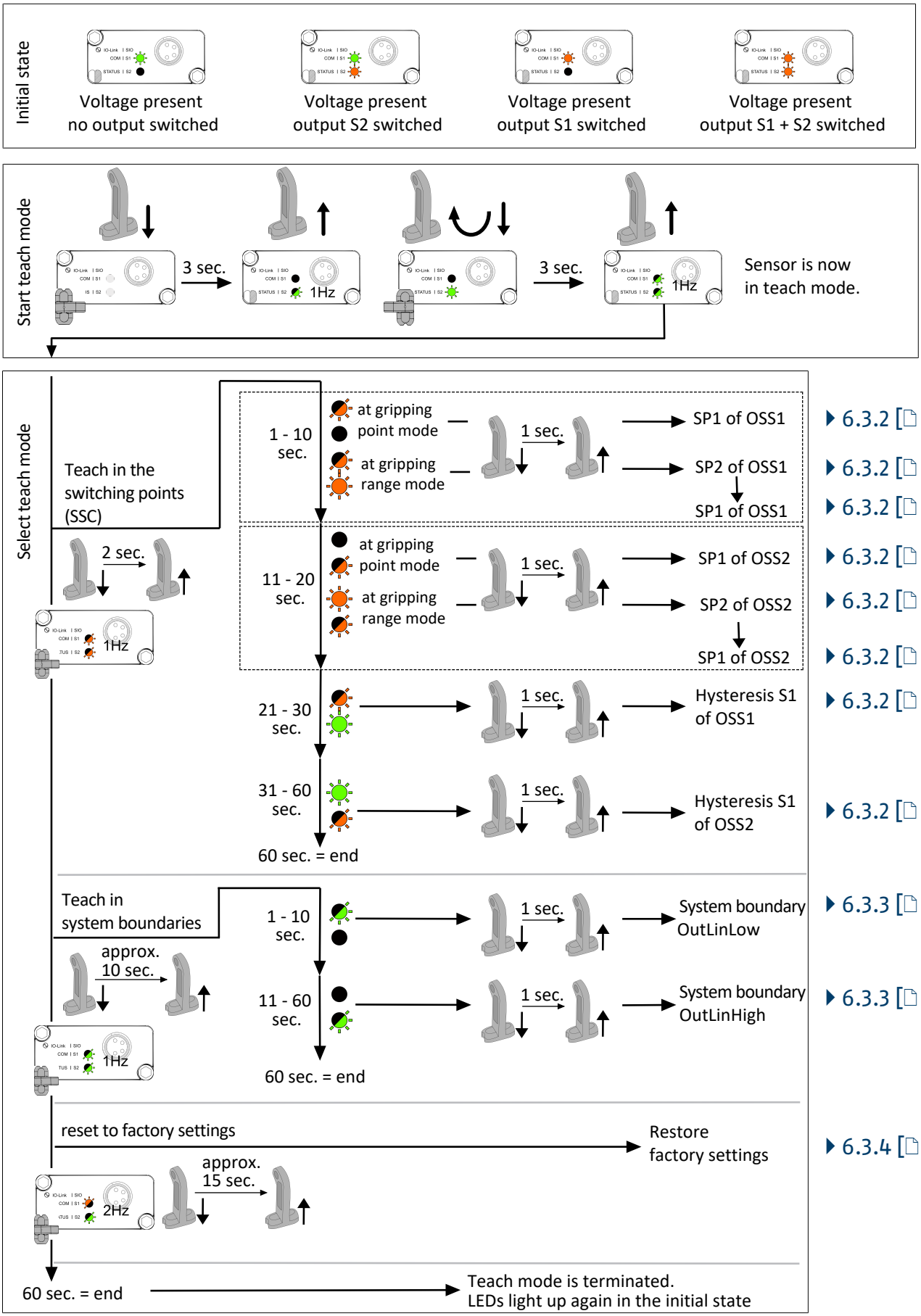
6.3 Teaching tool

Legend

The following symbols are used in the sequence descriptions of the teach-in procedures:

Symbol	Description
	LED off
	LED on
	LED flashing
	LEDs flashing alternately
	Teaching tool (magnetic) The teaching tool has two different magnetic poles. Therefore, please note in which direction the handle is pointing
	Bearing surface on the sensor for the teaching tool
	Place the teaching tool on the sensor
	Remove the teaching tool from the sensor
	Turn the teaching tool by 180° and put it back on again
	Direction of movement of the gripper jaws
	Gripper jaws in "open" position (side view)
	Gripper jaws in "closed" position (side view)

6.3.1 Start and selection of the teach-in procedure



▸ 6.3.2 [🗋 42]
▸ 6.3.2 [🗋 44]
▸ 6.3.2 [🗋 45]
▸ 6.3.2 [🗋 43]
▸ 6.3.2 [🗋 46]
▸ 6.3.2 [🗋 47]
▸ 6.3.2 [🗋 48]
▸ 6.3.2 [🗋 49]
▸ 6.3.3 [🗋 50]
▸ 6.3.3 [🗋 51]
▸ 6.3.4 [🗋 52]

6.3.2 Teach in Switching Signal Channel (SSCx)

The magnet teaching tool (MT) can only be used to teach in the two SSCx that are assigned to the OSS1 and OSS2.
All other parameters of the SSCs and also the assignment of the SSCx to the OSSx can only be changed via the acyclic data exchange.

NOTE

It is only possible to teach in with the magnet teaching tool if only one SSC is assigned to an OSS at a time. (OSSx condition = 0 (OSSx_A1) <– Default setting)

The number of switching points to be taught in depends on the set mode of the SSC to be taught in.

Mode	SSC
Gripping Point Mode (default)	SP1
Gripping Range Mode	SP1 & SP2
Single Point Mode	SP1
Two Point Mode	SP1 & SP2
Window Mode	SP1 & SP2

The OSS are assigned to the outputs and displays:

OSS	Display	Output
OSS1	LED S1	PIN4 (SIO mode)
OSS2	LED S2	PIN2 (SIO mode)

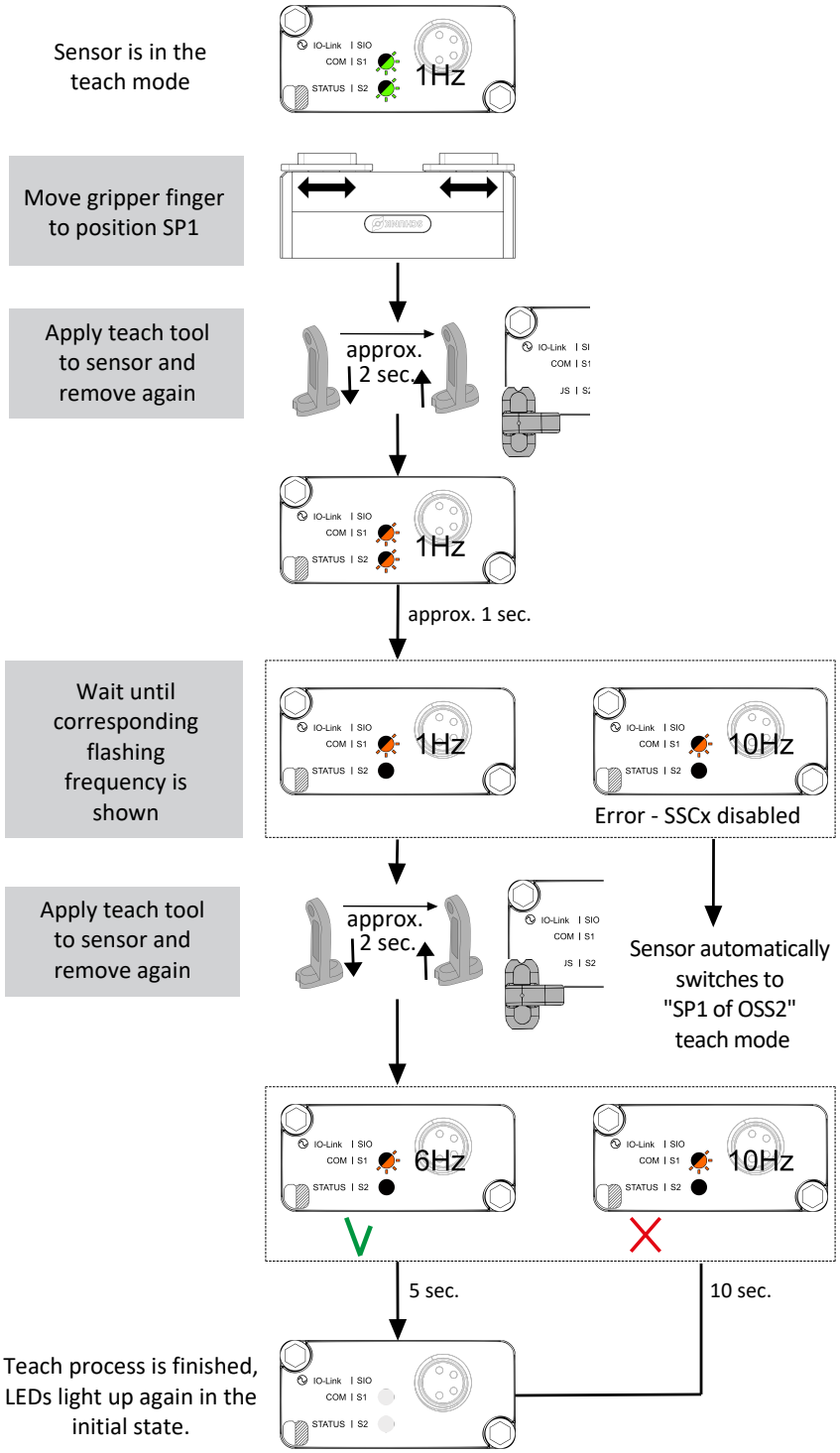
The hystereses of the individual SSCx can be re-taught in for the gripping-range and gripping-point modes.

Teach in a switching point (setpoint 1)

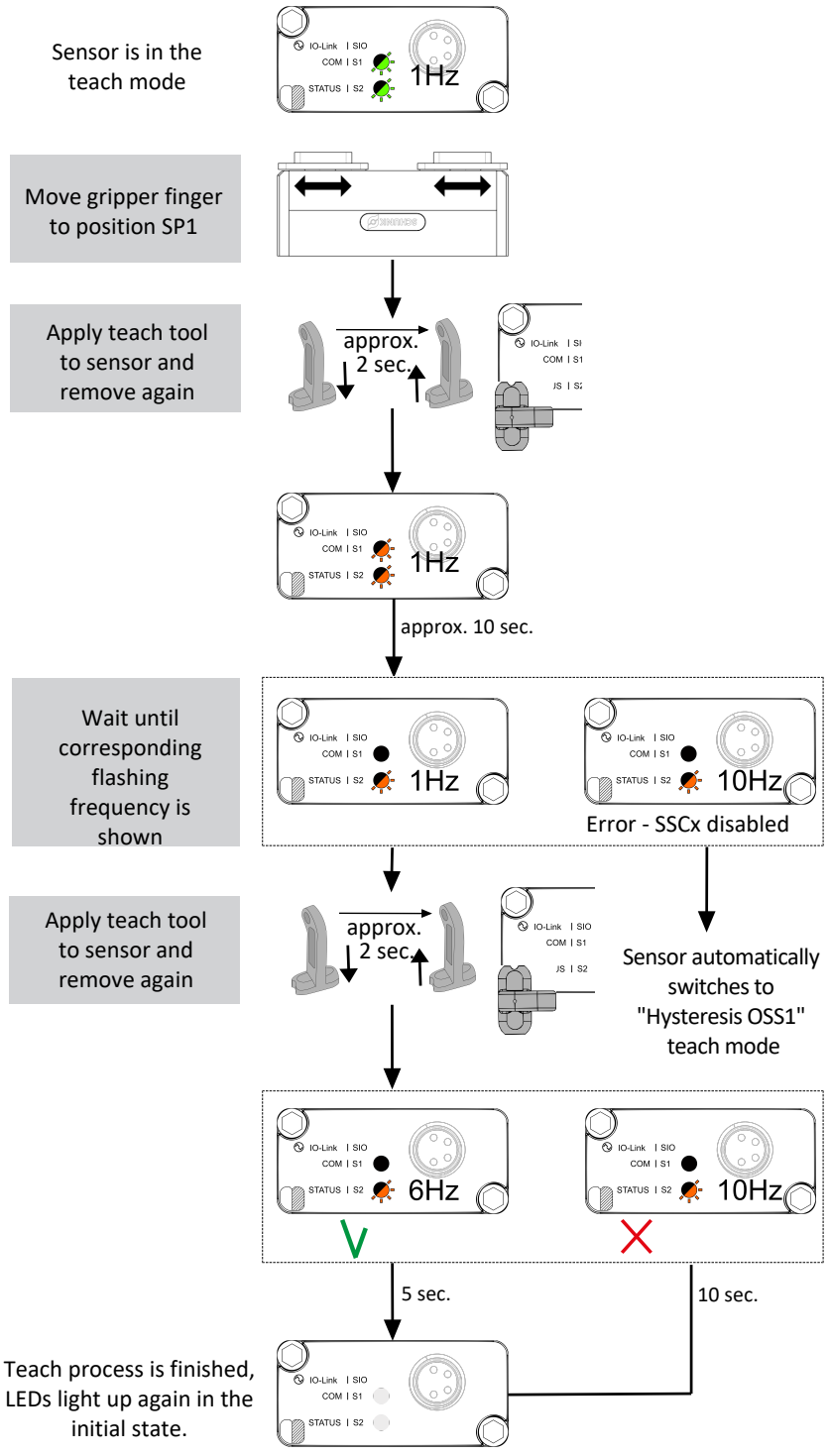
The teaching in of the switching point is used for the modes:

- Gripping Point Mode (default)
- Single Point Mode

Setpoint 1 (SP1) of OSS1



Setpoint 1 (SP1) of OSS2

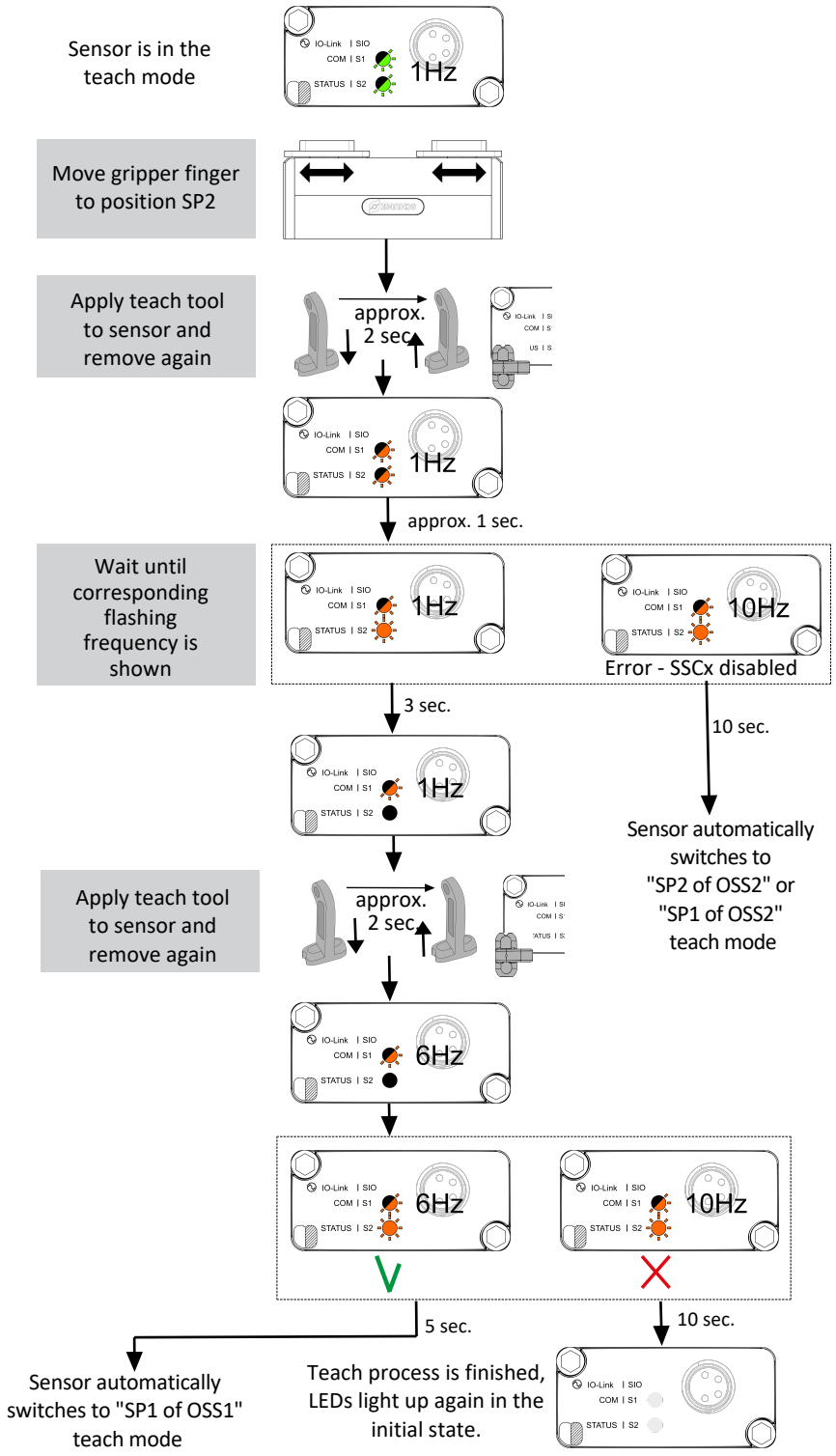


Teach in two switching points

The teaching in of two switching points is used for the modes:

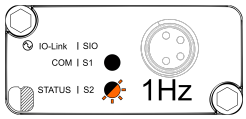
- Gripping Range Mode
- Two Point Mode
- Window Mode

Setpoint 2 (SP2) of OSS1

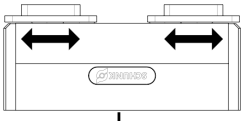


Setpoint 1 (SP1) of OSS1

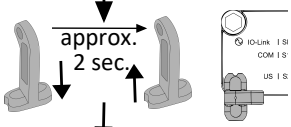
Teach mode SP2 of OSS1 has been terminated. The sensor automatically switches to SP1 of OSS1 teach mode

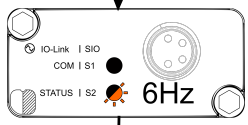


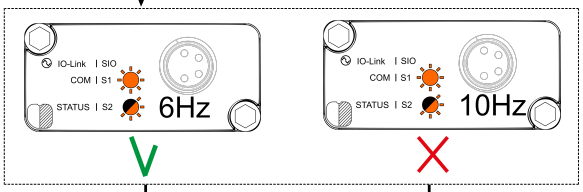
Move gripper finger to position SP1



Apply teach tool to sensor and remove again



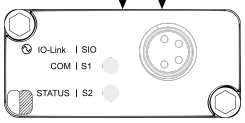




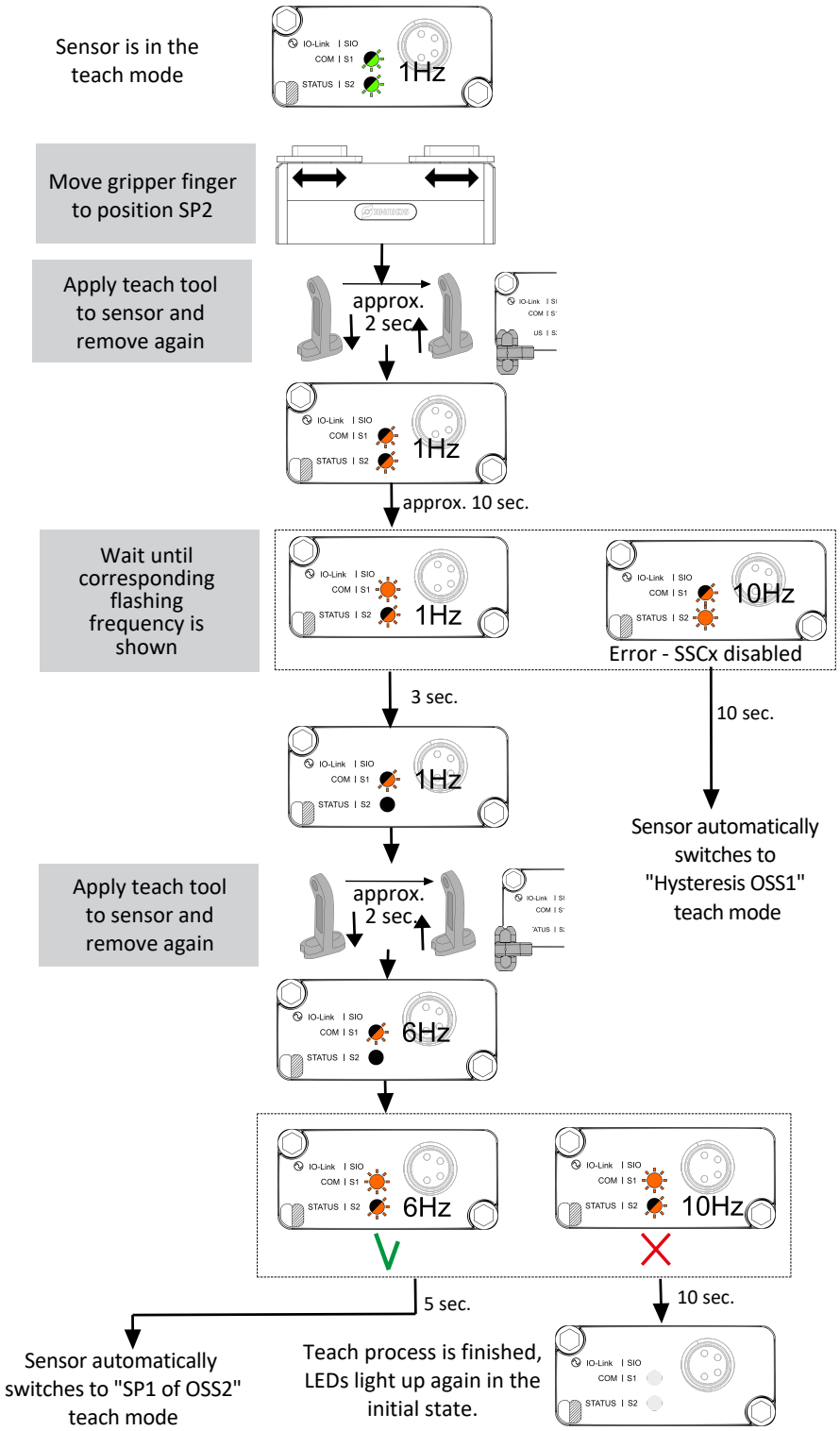
5 sec.

10 sec.

Teach process is finished, LEDs light up again in the initial state.

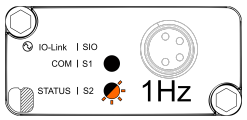


Setpoint 2 (SP2) of OSS2

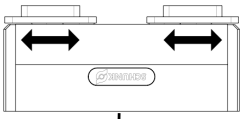


Setpoint 1 (SP1) of OSS2

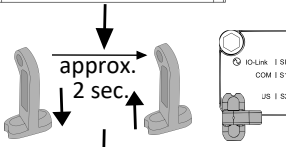
Teach mode SP2 of OSS2 has been terminated. The sensor automatically switches to SP1 of OSS2 teach mode

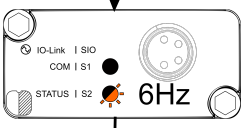


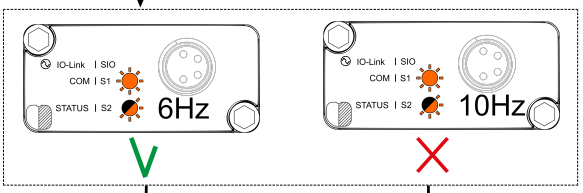
Move gripper finger to position SP1



Apply teach tool to sensor and remove again



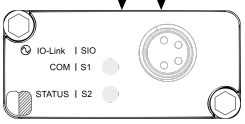




5 sec.

10 sec.

Teach process is finished, LEDs light up again in the initial state.

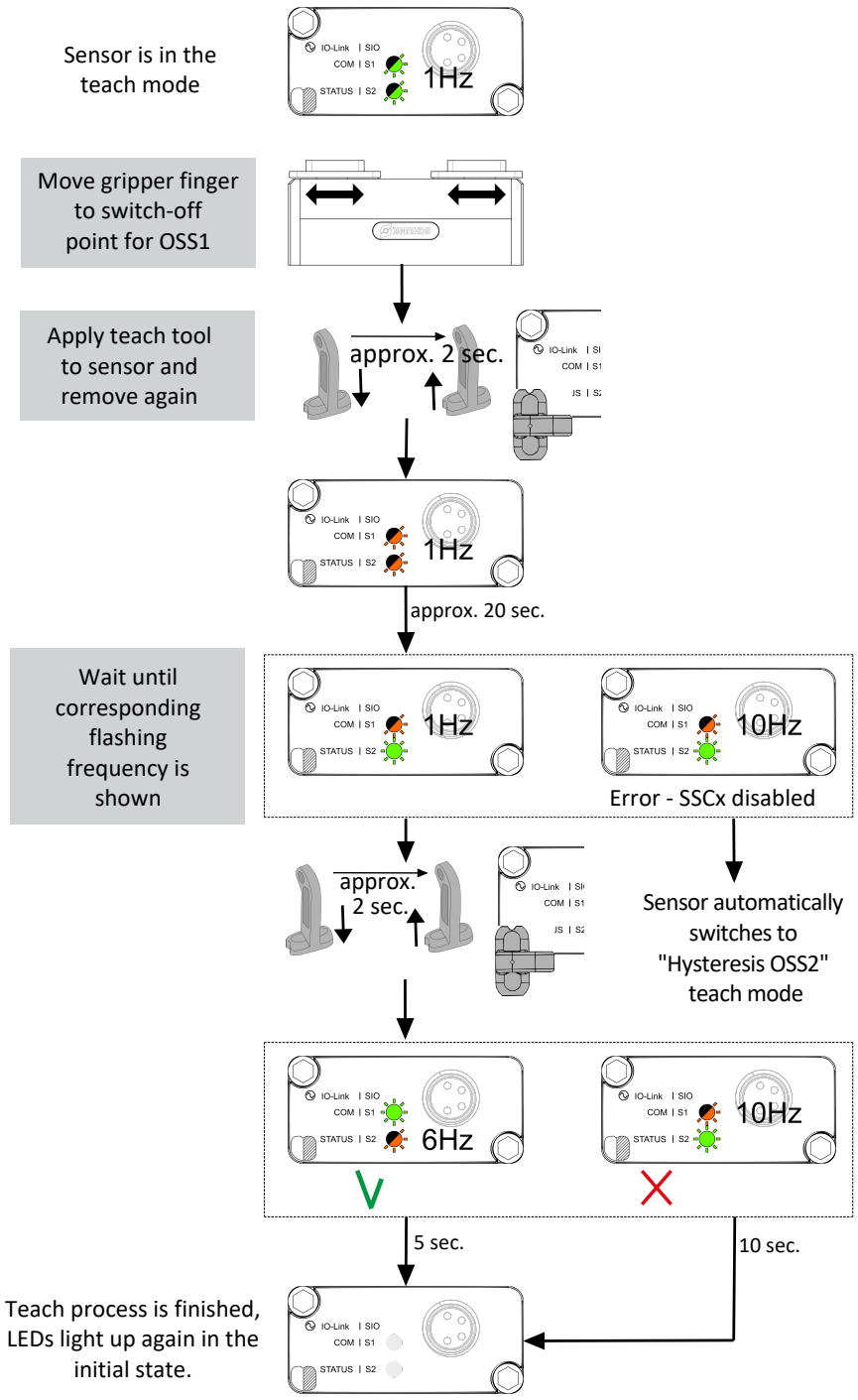


Teach in the hysteresis

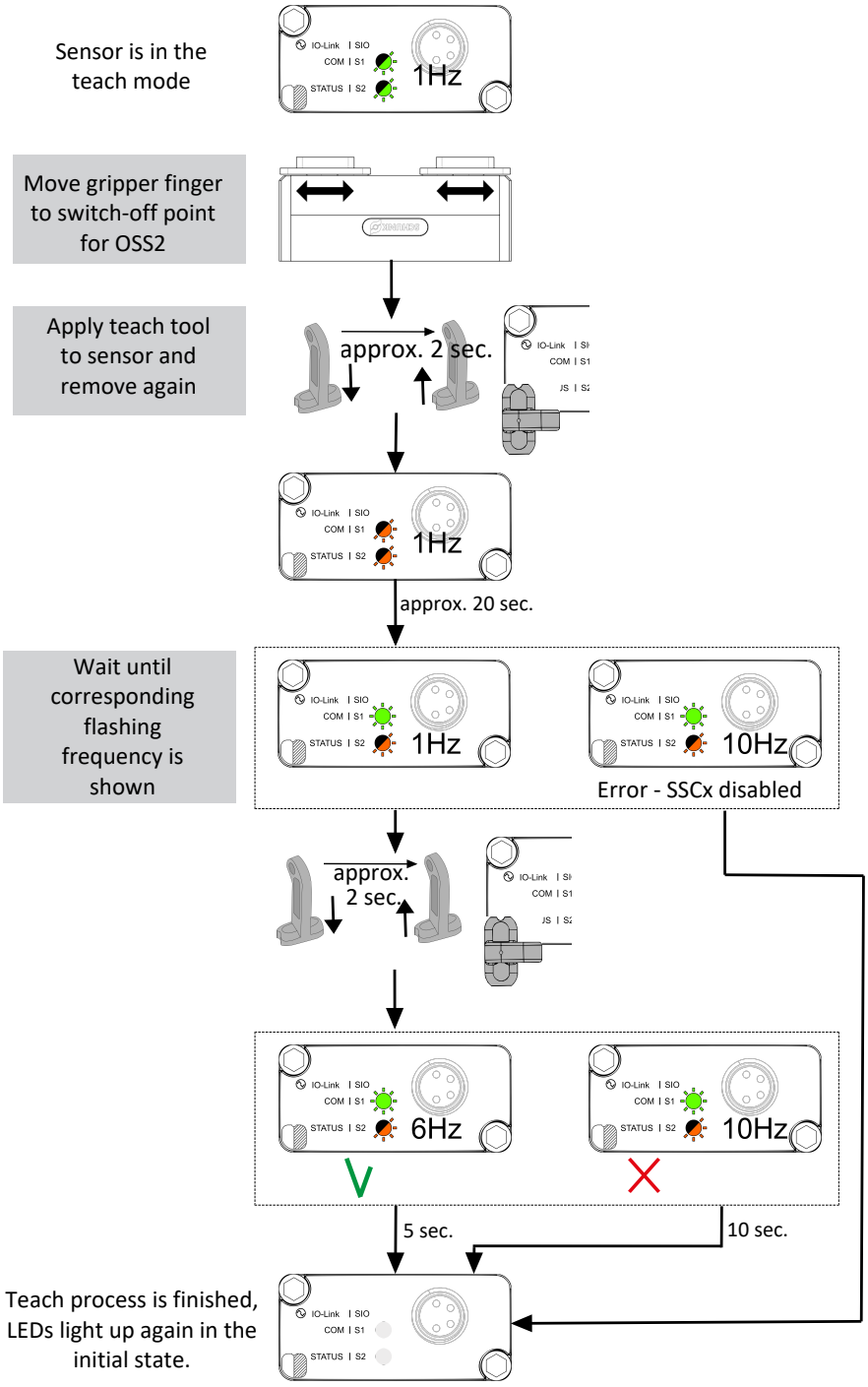
It is only possible to teach in the hysteresis using the teaching tool in the following two modes:

- Gripping Point Mode
- Gripping Range Mode

Hysteresis of OSS1



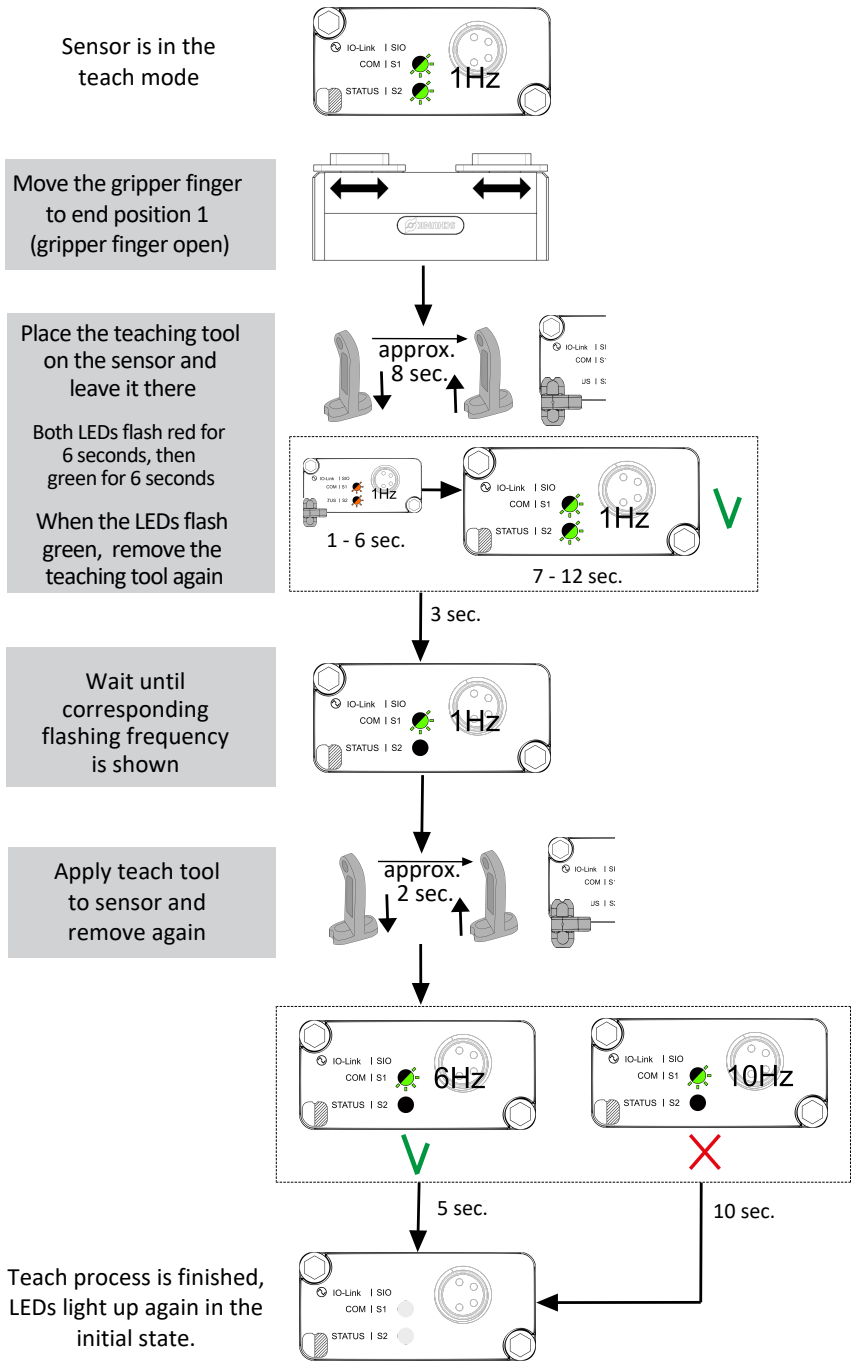
Hysteresis of OSS2



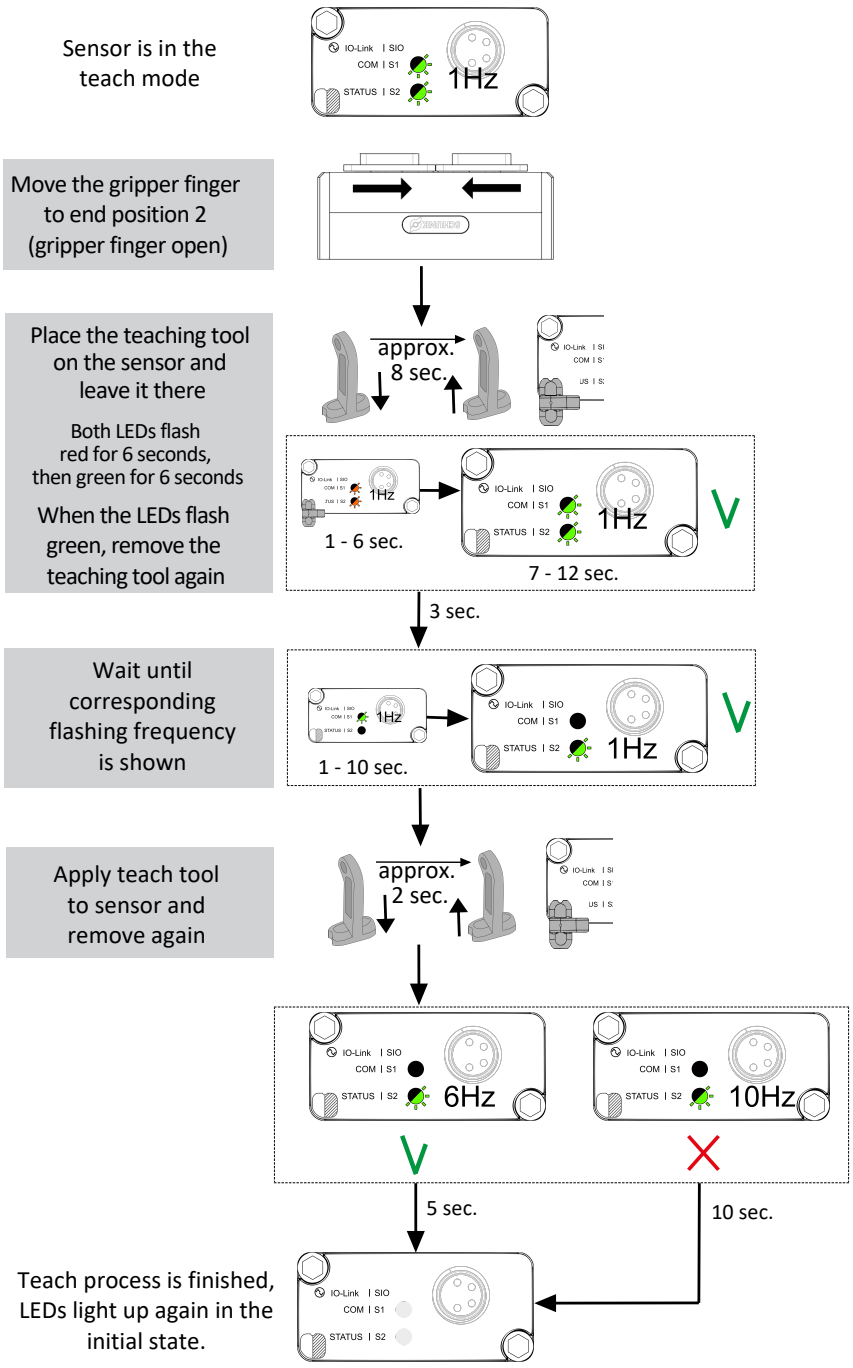
6.3.3 Teach in system boundaries

The system boundaries (OutLinLow und OutLinHigh) can be taught-in again after a sensor replacement or in the case of stroke limitation, using a teaching tool.

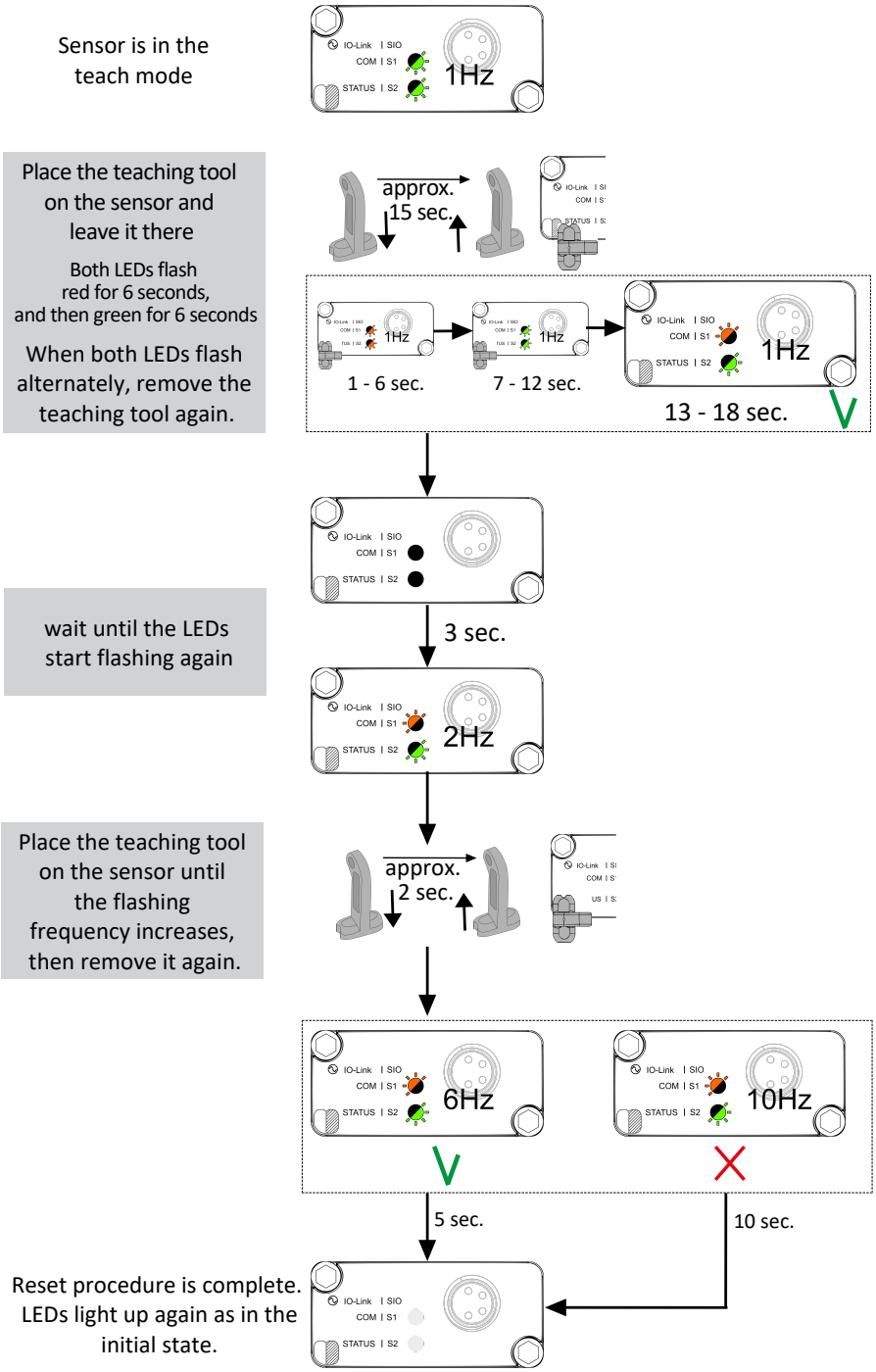
System boundary - OutLinLow ("Gripper Open")



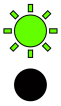
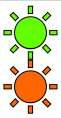
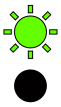
System boundary – OutLinHigh ("Gripper Closed")



6.3.4 Restore factory settings



7 LED status

Mode	LED	Description
SIO		Sensor output OUT1 (Pin4) = active Sensor output OUT2 (Pin2) = active
		Sensor output OUT1 (Pin4) = active
		Sensor is ready for operation
		Sensor output OUT2 (Pin2) = active
	For further LED display states see teach-in procedures▸ 6 [🗋 32]	
IO-Link (SDCI)		Voltage supply wrong polarity/invalid range
		IO-Link communication not active
		IO-Link communication active
		Error (message via IO-Link)
	For further LED display states see teach-in procedures ▸ 6 [🗋 32]	

8 Troubleshooting

Behavior	Possible cause	Corrective action
Both LEDs OFF	No power supply	Check voltage supply and apply voltage if necessary
	Sensor cable broken	Replace sensor cable
No IO-Link communication possible	No power supply	Check voltage supply and apply voltage if necessary
	Sensor cable broken	Replace sensor cable
	IO-Link connection disconnected	Establish IO-Link connection via software
Sensor cannot be set in teach-in procedure (SIO-Mode)	Sensor is disturbed or influenced by external magnetic fields.	Extend distance between sensor and interference sources Possible sources of interference: - Motors (coils) - relays - Linear motors - Electrical welding - Foreign magnets
	No power supply	Check voltage supply and apply voltage if necessary
	Sensor cable broken	Replace sensor cable
Sensor automatically switches to teach-in mode	Sensor is disturbed or influenced by external magnetic fields.	Extend distance between sensor and interference sources Possible sources of interference: - Motors (coils) - relays - Linear motors - Electrical welding - Foreign magnets

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