CANEO series5x – Firmware V1.x

Revision A | 2026-09-15

Introduction

CANEO series50 and series52 SENSORswitches can be used in IO-Link and in non-IO-Link environments, while CANEO series53 and series54 SENSORswitches are dedicated to IO-Link usage, only.

For non-IO-Link usage, the sensor features one or two standard Digital Outputs and up to two standard Digital Inputs (E1, E2), which can be used to control the sensor's LED (and text display).

The related parameters can be configured during deployment and commissioning via IO-Link:

- Behavior of the Touch Sensor
- Function of the Digital Output – PNP/NPN/PushPull, Normally Open/Closed
- Function of the up to two Digital Inputs (E1, E2)
  - LED and display control
  - Locking/release of Digital Output
- LED and display behavior for various states

If the sensor detects IO-Link communication, it automatically switches to the IO-Link communication mode. The IO-Link standard offers different communication mechanisms:

- **Acyclic Data** (Indexed Service Data Units): Used to set the sensor configuration during commissioning.
- **Cyclic Process Data**: Used to receive the sensor's state and influence its behavior during runtime.
- **Events**: The sensor will report events in case of error.

> **INFO**
>
> Process Data, ISDUs and events of the sensor, their respective numeric indices, offsets, and values, are described in the IODD file of the sensor. It is highly recommended to use this file when integrating the sensor in an application.

Revision History

Rev. A

- Initial version.

Touch Zones

CANEO series5x SENSORswitches offer one to four touch zones.

Configuration options

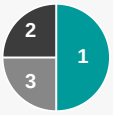
For each zone, its behavior can be configured as follows.

- Sensor Mode (Dynamic / Static / Toggle / Toggle Exclusive)
- Touch Sensitivity (High / Middle / Low)
- Minimum Actuation Time
- Output Activation Delay
- Output Snap Time (for Static Mode)
- Output Minimum Impulse Time

For details, see the respective IO-Link ISDUs.

Zone numbering

The touch zones 1 to 4 are enumerated depending on the product variant as follows.

Product Variant	Zones	Zone 1	Zone 2	Zone 3	Zone 4
Cx50		entire sensor area			
Cx52H		upper half of sensor	lower half of sensor		
Cx52V		left half of sensor	right half of sensor		
Cx53D		lower half of sensor	up left quarter of sensor	up right quarter of sensor	
Cx53L		left half of sensor	up right quarter of sensor	down right quarter of sensor	
Cx53R		right half of sensor	up left quarter of sensor	down left quarter of sensor	
Cx53U		upper half of sensor	down left quarter of sensor	down right quarter of sensor	
Cx54		up left quarter of sensor	up right quarter of sensor	down right quarter of sensor	down left quarter of sensor

Output link

On CANEO series50 and series52, touch zone 1 will operate Output 1 (Pin 4 on M12 connector / Pin 1 on milligrid connector / black wire). If available on the series52 product variant, touch zone 2 will operate Output 2 (Pin 5 on M12 connector).

Scenes

The display of a CANEO series5x is configured using up to eight scenes.

Triggers

For each scene, a set of triggers can be selected to decide when a scene is shown.

- Touch input (zone) X touched or not.
- Control input X active or not.

A scene will be active if all configured triggers are positive.

Typical assignment of scene triggers:

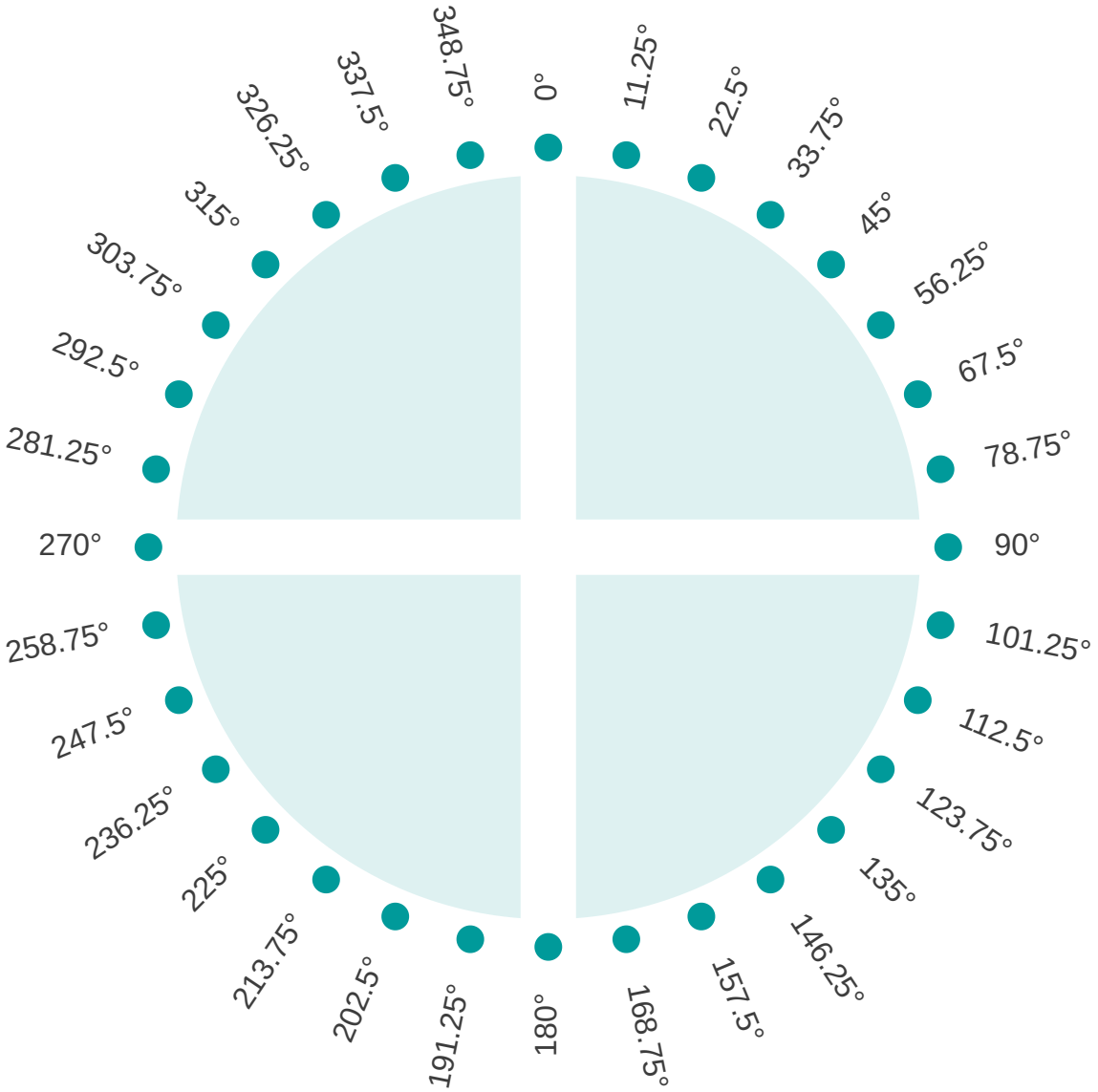
Variant	LED Control	Scene 1	Scene 2	Scene 3	Scene 4	Scene 5	Scene 6	Scene 7	Scene 8
series50	**Automatic**	Zone 1 not touched	Zone 1 touched						
series50	**Semi-Automatic**	Control Input 1 inactive	Control Input 1 active	Zone 1 touched					
series50	**Manual**	Control Input 1 and 2 inactive	Control Input 1 active, 2 inactive	Control Input 1 inactive, 2 active	Control Input 1 and 2 active				
series52	**Automatic**	Zone 1 not touched	Zone 1 touched			Zone 2 not touched	Zone 2 touched		
series52	**Semi-Automatic**	Control Input 1 inactive	Control Input 1 active	Zone 1 touched		Control Input 1 (or 2) inactive	Control Input 1 (or 2) active	Zone 2 touched	
series52	**Manual**	Control Input 1 and 2 inactive	Control Input 1 active, 2 inactive	Control Input 1 inactive, 2 active	Control Input 1 and 2 active	Control Input 1 and 2 inactive	Control Input 1 active, 2 inactive	Control Input 1 inactive, 2 active	Control Input 1 and 2 active
series53	**Automatic**	(large) Zone 1 not touched	(large) Zone 1 touched	Zone 2 not touched	Zone 2 touched	Zone 3 not touched	Zone 3 touched		
series54	**Automatic**	Zone 1 not touched	Zone 1 touched	Zone 2 not touched	Zone 2 touched	Zone 3 not touched	Zone 3 touched	Zone 4 not touched	Zone 4 touched

The scenes will be processed in order 1 to 8. Thus, a scene with a greater number can possibly override settings that have been applied by a scene with a lower number. Up to five scenes can be active at a time.

LED Ring

By specifying a Segment Start and Segment Length, the active segment of the LED ring is selected. Segment Start position 0 is at the top (12 o'clock), and position increases clockwise. Typically, the segment is chosen such that it matches with the touch zone that triggers the scene.

For the selected segment color, brightness, animation effect and its speed can be configured.



16-segment Display

On product variants with 16-segment display, its content and appearance can be configured:

- displayed text,
- text color and brightness,
- scrolling of the text.

Characters are displayed as shown below.

If multiple scenes are active due to their respective triggers, the display settings of the scene with the greatest number will be used. A text consisting of a single space character is interpreted as no text configured.

Special Display Patterns

Up to 10 arbitrary 18-bit display patterns can be defined. In the display text configuration, they can be refered to by '§0' ... '§9'.

Definition of Pattern Bitmask

Segment	a	b	c	d	e	f	g	h	k	m	n	p	r	s	t	u	lower dp	upper dp
Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Timer

Each scene can run a timer when it is triggered. On Display products, time (in s) will be shown on the display. When the timer is elapsed, the scene will become inactive. If another scene is active due to its triggers, its

settings will be applied.

Brightness Control

Brightness of LED Ring and 16-segment Display can be configured independently.

There is a global setting for each. Additionally, brightness can be set per scene. Global and per-scene value are multiplied to yield the effective brightness.

The brightness can also automatically adjust to the ambient brightness. When this feature is enabled, the global brightness values are refered to as minimum brightness.

With high device temperature, the maximum brightness is reduced: If the temperature exceeds 60 °C, "100 %" brightness is linearly downscaled with increasing temperature until 5 % is reached at 90 °C.

Measurement Mode

The device can indicate an analog measurement value that is presented as a voltage signal on E1 that ranges from 0V to VDC.

This display function is active only if no other scene is active according to the configured triggers (esp. "no touch" triggers).

The input voltage range will be linearly scaled to a displayed value range. The resolution of the value can be set and the value can be suffixed by a unit.

Depending on the displayed value, the LED ring will fill clockwise, starting at 12 o'clock.

Color and brightness of LED ring and number display are taken from Scene 1. (Hence, scene 1 should be configured without any triggers when using measurement mode.)

Alarms for high or low value can be configured. Using alarm thresholds and dedicated scene triggers, scenes can be configured to indicate these events on the LED ring.

Example: Container Fill level in 0.1 %

- Input signal: 2 ... 10 V measurement signal
- Displayed values: 0.0 ... 100.0 - fill level of a container in % with resolution 0.1

Parameter	Value	Explanation
Minimum Input Voltage (V)	0	Will map to Minimum Displayed Value (0.0)
Maximum Input Voltage (V)	10	Will map to Maximum Displayed Value (100.0)
Minimum Displayed Value	0	
Maximum Displayed Value	1000	100 [%] * 10 for resolution 0.1
Resolution	0.1	

IO-Link Interface

The IO-Link Interface complies to IO-Link Specification V1.1.5 (October 2025). https://io-link.com/fileadmin/user_upload/Downloads/Package_2025/IOL-Interface-Spec_10002_V1.1.5_Oct2025.zip

Vendor ID	1239
Device Family	CANEO SENSORbutton

Device Name	CANEO series50 Touch	CANEO series50 Touch Display	CANEO series52 Duo-Touch	CANEO series52 Duo-Touch Display	CANEO series53 Multi-Touch	CANEO series53 Multi-Touch Display	CANEO series54 Multi-Touch	CANEO series54 Multi-Touch Display
Device ID	2820	2816	2821	2817	2822	2818	2823	2819

Communication Interface

IO-Link Version	V1.1
Bitrate	COM2
Minimum Cycle Time	14800µs
Process Data Input Bits	64
Process Data Output Bits	112
SIO Supported	Yes - for series50 and series52 No - for series53 and series54
ISDU Supported	Yes
Data Storage	Yes
Block Parameter	Yes
Supported Profiles	FW-Update (49)

IO-Link Process Data

Until valid Process Data have been received, CANEO series5x devices control their display according to the configured scene triggers.

When Process Data is marked *invalid* by the master, the recent valid data will be used for display control.

> **INFO**
>
> IO-Link Bit Offset counts from the last byte of the data array.

Process Data Input

64 bit / 8 bytes

Structure

Byte	0	1	2	3	4	5	6	7
Bit Offset	32				24	16	8	0
Data	*reserved*				Zone 4 actuated	Zone 3 actuated	Zone 2 actuated	Zone 1 actuated

Field Reference

Bit Offset	Name	Datatype	Values	Info
0	Zone 1 actuated	8-bit UIntegerT	0 … 1	
8	Zone 2 actuated	8-bit UIntegerT	0 … 1	
16	Zone 3 actuated	8-bit UIntegerT	0 … 1	
24	Zone 4 actuated	8-bit UIntegerT	0 … 1	
32	Reserved	32-bit UIntegerT		

Process Data Output

128 bit / 16 bytes

Structure

Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Bit Offset	80						72	64	32				16		8	0
Data	Text to display						Text Color	Text Select	Number to display				Active Scenes		*reserved*	Scene Selection Mode

Field Reference

Bit Offset	Name	Datatype	Values	Info
0	Scene Selection Mode	8-bit UIntegerT	0 - Local Data 1 - Process Data	*Local Data* : Scenes are activated by the SENSORswitch according to the configured triggers. *Process Data* : Scenes are active according to the bits of *Active Scenes* Process Data field.
8	*reserved*			
16	Active Scenes (Bitmask)	16-bit UIntegerT	0 ... 65535	Bit 0 - Scene 1 Bit 1 - Scene 2 ...
32	Number to display	32-bit IntegerT	-9999...99999	
64	Text Select	8-bit UIntegerT	0 - From Scene 1 - Number given 2 - Text given	*From Scene* : Display shows the text as configured in that active scene that has the greatest number. *Number given* : Display shows the number given in these Process Data. *Text given* : Display shows the text given in these Process Data.
72	Text Color	8-bit UIntegerT	0 - Off 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 7 - White 8 - Orange 9 - Violet 10 - Turquoise 11 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2 130 - Custom Color 3 131 - Custom Color 4	
80	Text to display	StringT[6]		

IO-Link ISDUs

Access Rights: **ro** – Read Only, **rw** – Read/Write, **wo** – Write Only

System Commands

Name	Index (- Subindex)	Bytes	Access	Values	Description
System Command	2	1	wo	see below	

Value	Name	Description
128	Device Reset	A warm start is triggered and the device will be set to an initial state. The communication will be interrupted by the device and then reinitiated by the master.
129	Application Reset	The parameters of the technology-specific application are set to default values. Identification parameters remain unchanged. An upload to the data storage of the master will be executed, if activated in the port configuration of the master.
130	Restore Factory Settings	The parameter of the device are reset to factory settings. Note: A download of the data storage may be executed on the next power cycle and overwrite the factory default settings!
131	Back-to-box	The parameters of the device are set to factory default values and communication will be inhibited until the next power cycle. Note: Directly detach the device from the master port!
160	Calibrate Actuator	Calibrates the Linear Resonance Actuator which is used for tactile feedback. It will vibrate during calibration.

Identification

Name	Index (-Subindex)	Bytes	Access	Values	Description
Vendor Name	16	23	ro	CAPTRON Electronic GmbH	
Product Name	18	32	ro	CANEO series5x Touch (Display)	
Product Text	20		ro	*order code*	
Product ID	19	8	ro	Cx5x-X	
Serial Number	21	13	ro	xxxxxx.xxxxxx	
Hardware Revision	22	1	ro	1	
Firmware Revision	23	4	ro	V1.x	
Application-specific Tag	24	32	rw		
Function Tag	25	32	rw		
Location Tag	26	32	rw		
Hardware Identification Key	17342	10	ro	HW00200001	

Touch Input Parameters

Touch Input	1	2	3	4
Location series50	entire surface			
Location series52	up or left	down or right		
Location series53	large	small up or left	small down or right	
Location series54	up left	up right	down right	down left
Index A	516	517	518	519
Index B	512	513	514	515

Name	Index (-Subindex)	Bytes	Access	Values	Description
Sensor Mode	A - 1	1	rw	0 - Dynamic 1 - Static 2 - Toggle 3 - Toggle Exclusive	*Dynamic* : When the user touches the sensor, the touch input is active for “Output Minimum Impulse Time”; even though the user continues touching, the output will switch off after that time. *Static* : Touch input is active as long as the user touches the sensor (and at least for the “Output Minimum Impulse Time”). *Toggle* : The touch input will toggle on / off each time the sensor is touched. It can only be set back after “Output Minimum Impulse Time” is over. *Toggle Exclusive* : Like toggle. Additionally, all other touch inputs are set to off when this input switches on.
Touch Sensitivity	B - 2	1	rw	0 - High 1 - Middle 2 - Low	*High* : For operation with gloves. *Middle* : For operation with finger tip. *Low* : For operation with flat finger.
Minimum Actuation Time	A - 2	2	rw	0 ... 65535 [ms]	Time the sensor must be activated before output on Pin 4 switches, “Actuation Flag” is set to “Actuated” and “Actuation Count” goes up.
Minimum Actuation Time (Toggle Off)	A - 3	2	rw	0 ... 65535 [ms]	Time the sensor must be touched in “Toggle” mode to before output on Pin 4 turns OFF and “Actuation Flag” is set to “Idle”.
Output Activation Delay	A - 5	2	rw	0 ... 65535 [ms]	Time the switching of the output is delayed when the sensor has been actuated.
Output Snap Time (Static Mode)	A - 6	2	rw	0 ... 65535 [ms]	Time after which the output snaps in (toggles); a value of 0 means no snap-in. For Static Sensor Mode, only.
Output Minimum Impulse Time	A - 4	4	rw	10...86400000 [ms]	The minimal time (ms) of the output signal when the sensor is activated. The output signal cannot be interrupted. In toggle mode the sensor can only be deactivated after the minimal output signal length is over.

Inputs and Outputs

Name	Index (- Subindex)	Bytes	Access	Values	Description
Input Mode E1	272 - 1	1	rw	0 - Active Low 1 - Active High	*Active Low* : Input is considered active if voltage is below 20% VDC. *Active High* : Input is considered active if voltage is above 80% VDC.
Input Mode E2	272 - 2	1	rw	0 - Active Low 1 - Active High	*Active Low* : Input is considered active if voltage is below 20% VDC. *Active High* : Input is considered active if voltage is above 80% VDC.
Output 1 Mode	520 - 1	1	rw	0 - NPN 1 - PNP 2 - Push/Pull	*NPN* : Output signal is pulled down to 0V when output is on. *PNP* : Output signal is pushed up to +VDC when output is on *Push/Pull* : Output signal is pushed up to +VDC when output is on and is pulled down to 0V when it is off.
Output 1 NO/NC	520 - 2	1	rw	0 - Normally Open 1 - Normally Closed	
Output 1 Locking	520 - 3	1	rw	0 - No locking 1 - Release by E1 2 - Release by E2 3 - Release by E1 and E2	*No locking* : The output signal will be ON when sensor is touched. *Release by E1* : The output signal will be ON when sensor is touched and gets an Input signal on E1. *Release by E2* : The output signal will be ON when sensor is touched and gets an Input signal on E2. *Release by E1 and E2* : The output signal will be ON when sensor is touched and gets an Input signal on both E1 and E2.
Output 2 Mode	521 - 1	1	rw	0 - NPN 1 - PNP 2 - Push/Pull	*NPN* : Output signal is pulled down to 0V when output is on. *PNP* : Output signal is pushed up to +VDC when output is on *Push/Pull* : Output signal is pushed up to +VDC when output is on and is pulled down to 0V when it is off.
Output 2 NO/NC	521 - 2	1	rw	0 - Normally Open 1 - Normally Closed	

Name	Index (-Subindex)	Bytes	Access	Values	Description
Output 2 Locking	521 - 3	1	rw	0 - No locking 1 - Release by E1 2 - Release by E2 3 - Release by E1 and E2	*No locking* : The output signal will be ON when sensor is touched. *Release by E1* : The output signal will be ON when sensor is touched and gets an Input signal on E1. *Release by E2* : The output signal will be ON when sensor is touched and gets an Input signal on E2. *Release by E1 and E2* : The output signal will be ON when sensor is touched and gets an Input signal on both E1 and E2.
Tactile Feedback Mode	522	1	rw	0 - Off 1 - Pulse 2 - Continuous 3 - Continuous pulses	*Pulse* : Tactile feedback is active for 400 ms when triggered. *Continuous* : Tactile feedback is continuously active when triggered (for 10 s at maximum). *Continuous pulses* : Tactile feedback is continuously turned on and off when triggered (for 10 s at maximum).
Tactile Feedback Effect	522 - 2	1	rw	1 - Strong Click 4 - Sharp Click 7 - Soft Bump 10 - Double Click 14 - Strong Buzz 24 - Sharp Tick 27 - Short Double Click 34 - Short Double Sharp Tick 37 - Long Double Sharp Click 47 - Buzz 52 - Pulsing Strong 56 - Pulsing Sharp 58 - Transition Click 64 - Transition Hum 118 - Continuous Buzz - 100%	

Display

Name	Index (- Subindex)	Bytes	Access	Values	Description
Control Mode	523 - 1	1	rw	0 - Local data 1 - Measurement data	*Local data* : Display is controlled by touch inputs and digital states of E1 and E2. *Measurement data* : Display is controlled by voltage on E1 according to Measurement settings.
Adaptive Brightness	523 - 2	1	rw	0 - Off 1 - On	
Manual Brightness - 16 segment display	523 - 3	1	rw	0...100 [%]	General setting for 16-segment display.
Manual Brightness - LED ring	523 - 4	1	rw	0...100 [%]	General setting for LED ring.
Orientation	523 - 5	1	rw	0 - Standard 1 - Rotated	Use if the SENSORswitch is mounted upside down.
Display Pattern X = 0 ... 9	541 - X	4	rw	00h ... 3FFFFh	Bitmask for arbitrary display pattern. See Special Display Patterns

Custom Colors

Index X for four custom colors: 306, 307, 308, 309

Name	Index (- Subindex)	Bytes	Access	Values	Description
Red	X - 1	1	rw	0 ... 255	Red component of color
Green	X - 2	1	rw	0 ... 255	Green component of color
Blue	X - 3	1	rw	0 ... 255	Blue component of color

Measurement

Name	Index (-Subindex)	Bytes	Access	Values	Description
Maximum Input Voltage	524 - 1	2	rw	0 ... 32000 [0.001 V]	This voltage on E1 is mapped to Maximum Displayed Value. For CAPTRON SDC, this is 10 V.
Minimum Input Voltage	524 - 2	2	rw	0 ... 32000 [0.001 V]	This voltage on E1 is mapped to Minimum Displayed Value. For CAPTRON SDC, this is 2 V.
Maximum Displayed Value	524 - 3	4	rw	-9999...99999	This value is displayed when Maximum Input Voltage is set on E1.
Minimum Displayed Value	524 - 4	4	rw	-9999...99999	This value is displayed when Minimum Input Voltage is set on E1.
Resolution	524 - 5	1	rw	0 - 1 1 - 0.1 2 - 0.01 3 - 0.001 4 - 0.0001	Defines the location of the period on the display.
Unit	524 - 6	3	rw		Displayed with the acquired value on E1, if number of digits suffice.
Low Alarm Threshold	524 - 7	4	rw	-9999...99999	Low Alarm scene trigger will be active if displayed value is below this threshold.
High Alarm Threshold	524 - 8	4	rw	-9999...99999	High Alarm scene trigger will be active if displayed value is above this threshold.

Scenes

Index X for Scenes 1 ... 16: 525, ... 540

Name	Index (-Subindex)	Bytes	Access	Values	Description
Trigger by Touch Input 1	X - 1	1	rw	0 - Ignored 1 - No Touch 2 - Touch	A scene is activated if all configured triggers are positive. *Ignored*: This trigger is ignored for the scene. *No Touch*: Scene is triggered when touch zone is not actuated. *Touch*: Scene is triggered when touch zone is actuated.
Trigger by Touch Input 2	X - 2	1	rw	0 - Ignored 1 - No Touch 2 - Touch	*Not available on series50.* A scene is activated if all configured triggers are positive. *Ignored*: This trigger is ignored for the scene. *No Touch*: Scene is triggered when touch zone is not actuated. *Touch*: Scene is triggered when touch zone is actuated.
Trigger by Touch Input 3	X - 3	1	rw	0 - Ignored 1 - No Touch 2 - Touch	*Not available on series50 and series52.* A scene is activated if all configured triggers are positive. *Ignored*: This trigger is ignored for the scene. *No Touch*: Scene is triggered when touch zone is not actuated. *Touch*: Scene is triggered when touch zone is actuated.
Trigger by Touch Input 4	X - 4	1	rw	0 - Ignored 1 - No Touch 2 - Touch	*Only available on series54.* A scene is activated if all configured triggers are positive. *Ignored*: This trigger is ignored for the scene. *No Touch*: Scene is triggered when touch zone is not actuated. *Touch*: Scene is triggered when touch zone is actuated.

Name	Index (-Subindex)	Bytes	Access	Values	Description
Trigger by Control Input 1	X - 5	1	rw	0 - Ignored 1 - Inactive 2 - Active	A scene is activated if all configured triggers are positive. *Ignored*: This trigger is ignored for the scene. *Inactive*: Scene is triggered when input is inactive. *Active*: Scene is triggered when input is active.
Trigger by Control Input 2	X - 6	1	rw	0 - Ignored 1 - Inactive 2 - Active	A scene is activated if all configured triggers are positive. *Ignored*: This trigger is ignored for the scene. *Inactive*: Scene is triggered when input is inactive. *Active*: Scene is triggered when input is active.
Trigger by high/low alarm	X - 7	1	rw	0 - Ignored 1 - Low Alarm 2 - High Alarm	*for Measurement mode, only* *Ignored*: This trigger is ignored for the scene. *Low Alarm*: Scene is triggered on Low Alarm. *High Alarm*: Scene is triggered on High Alarm.
LED ring Color	X - 8	1	rw	0 - Off 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 7 - White 8 - Orange 9 - Violet 10 - Turquoise 11 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2 130 - Custom Color 3 131 - Custom Color 4	
LED ring Brightness	X - 9	1	rw	0...100 [%]	Value is multiplied by general “Manual Brightness - LED ring“.

Name	Index (- Subindex)	Bytes	Access	Values	Description
LED ring Segment Start	X - 10	1	rw	0...31 [11.25 °]	Position of first LED to be active for this scene. 0 refers to top (12 o'clock). Angle is counted clockwise.
LED ring Segment Length	X - 11	1	rw	3 - 45° 7 - 90° 15 - 180° 25 - 270° 32 - 360°	Width of angle segment on the LED ring to be active for this scene.
LED ring Effect	X - 12	1	rw	0 - Static Ring 1 - Static Ring Even 2 - Static Ring Odd 3 - Flash Ring 4 - Pulse Ring 5 - Breath 6 - Throbber Clockwise 7 - Throbber Counter Clockwise 8 - Join 9 - Split 10 - Circle Point Clockwise 11 - Circle Point Counter Clockwise 12 - Circle Fill Clockwise 13 - Circle Fill Counter Clockwise 14 - Rainbow Runner Clockwise 15 - Rainbow Runner Counter Clockwise 16 - Timer: Circle Clear Clockwise 17 - Timer: Circle Clear Counter Clockwise 18 - Timer: Circle Fill Clockwise 19 - Timer: Circle Fill Counter Clockwise	Effects 16 to 19 are available only when the Timer is active.
LED ring Effect Speed	X - 13	1	rw	1...60 [0.1 Hz] 0 - Default Frequency	Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz - Applies only for animated effects.
Text Color	X - 14	1	rw	0 - Off 1 - Red 2 - Green 3 - Blue 4 - Yellow	

Name	Index (-Subindex)	Bytes	Access	Values	Description
				5 - Magenta 6 - Cyan 7 - White 8 - Orange 9 - Violet 10 - Turquoise 11 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2 130 - Custom Color 3 131 - Custom Color 4	
Text Brightness	X - 15	1	rw	0...100 [%]	Value is multiplied by general “Manual Brightness - 16 segment display“.
Displayed Text	X - 16	32	rw		
Text Scroll Speed	X - 17	1	rw	1...255 [0.1 Hz] 0 - Default Frequency	
Text Scroll Mode	X - 18	1	rw	0 - No scrolling 1 - Scroll left 2 - Scroll right 3 - Closing 4 - Opening	*Scroll left* : Text moves across the display from right to left. *Scroll right* : Text moves across the display from left to right. *Closing* : The first character of the text moves from left towards the center, the second from right. *Opening* : The first character of the text moves from the center to the left, the second to the right.
Text Scroll Repetition	X - 19	1	rw	0 - Infinite 1...255	
Timer Function	X - 20	1	rw	0 - disabled 1 - count down 2 - count up 3 - count up infinitely	*disabled* : Timer is not active for this scene. *count down* : Timer is active and counts down a predefined Time. *count up* : Timer is active and counts up for a predefined Time. *count up infinitely* : Timer is active and counts up infinitely.
Timer Timeout	X - 21	2	rw	0 ... 65535 [s]	Time after which the timer stops.

Diagnosis

Name	Index (-Subindex)	Bytes	Access	Values	Description
Triggered Scenes	542	16	ro	Array of 16 elements: 0 - No - respective scene is not triggered 1 - Yes - respective scene is triggered	
Device Status	36	1	ro	0...4	Device Status according to IO-Link Specification B.2.20
Detailed Device Status	37	24	ro		Device Status according to IO-Link Specification B.2.21
Error Code	282	2	ro	0 ... 65535	see Diagnostics section
Lot Number	280	12	ro		
Device internal Temperature	257	2	ro	-32768 ... 32767 [0.1 °C]	
Supply Voltage	256	2	ro	0 ... 65535 [0.001 V]	
Control Input E1 voltage	277	2	ro	0 ... 65535 [0.001 V]	
Control Input E2 voltage	278	2	ro	0 ... 65535 [0.001 V]	
MCU Voltage	279	2	ro	0 ... 65535 [0.001 V]	

IO-Link Events

Event Code	Type	Definition and recommended maintenance action
6144	Error	Output Overload • Output current too high - max. 200 mA
16912	Warning	Device temperature overrun • Clear source of heat
20496	Error	Component malfunction • Repair or exchange
20752	Warning	Primary supply voltage overrun • Check valid voltage range
20753	Warning	Primary supply voltage underrun • Check valid voltage range
25376	Error	Parameter error • Check datasheet and values

series5x Diagnostics & Error Codes

Self Diagnosis

The SENSORswitch includes the following diagnosis features:

- **Self Test**:
  - Function of LEDs is periodically checked.
- **Monitoring** of Supply Voltage and MCU Temperature
- **Output Overload Detection**

Detected errors are indicated via IO-Link Events and/or in the **Error Code** IO-Link Parameter, as well as by blinking patterns of the LED. Device with display additionally show the error code as text "E....".

Error Codes

Blink Code	IO-Link Error Code	Description
1	0x0001	Internal error
4	0x0008	Supply voltage out-of-range
9	0x0100	Memory error
12	0x0800	LED error
13	0x1000	Overload error on digital output
15	0x4000	Temperature overrun