

TRM - CANEO series4x

Capacitive Sensors – CANEO series4x

Device ID	1280
IODD Version	V1.0
Date	2021-07-09

Communication Interface

IO-Link Version	V1.1
Bitrate	COM2
Minimum Cycle Time	14800µs
Process Data Input Bits	80
Process Data Output Bits	112
SIO Supported	Yes
ISDU Supported	Yes
Data Storage	Yes
Block Parameter	No

Device Variants

Product ID	Name	Description
CS40K-MSBN	CANEO series40 Puck M12 connector	SENSORswitch with M12 connector
CS41A-APBK	CANEO series41 Solid red M12 connector	SENSORswitch with mounting support aluminum, red cover ring (RAL 3020), and M12 connector
CS41A-AQBK	CANEO series41 Solid gray M12 connector	SENSORswitch with mounting support aluminum, gray cover ring (RAL 7042), and M12 connector
CS41A-ARBK	CANEO series41 Solid black M12 connector	SENSORswitch with mounting support aluminum, black cover ring (RAL 9017), and M12 connector

CS41A-ASBK	CANEO series41 Solid yellow M12 connector	SENSORswitch with mounting support aluminum, yellow cover ring (RAL 1023), and M12 connector
CS41A-ATBK	CANEO series41 Solid green M12 connector	SENSORswitch with mounting support aluminum, green cover ring (RAL 6024), and M12 connector
CS41A-AUBK	CANEO series41 Solid blue M12 connector	SENSORswitch with mounting support aluminum, blue cover ring (RAL 5015), and M12 connector
CS41A-AVBK	CANEO series41 Solid orange M12 connector	SENSORswitch with mounting support aluminum, orange cover ring (RAL 2009), and M12 connector
CS41A-AWBK	CANEO series41 Solid white M12 connector	SENSORswitch with mounting support aluminum, white cover ring (RAL 9016), and M12 connector
CS41A-AZBK	CANEO series41 Solid gray B M12 connector	SENSORswitch with mounting support aluminum, gray cover ring (RAL 7043), and M12 connector
CS41K-DCBL	CANEO series41 Standard yellow M12 connector	SENSORswitch with yellow cover ring (RAL 1023) and M12 connector
CS41K-DEBL	CANEO series41 Standard orange M12 connector	SENSORswitch with orange cover ring (RAL 2009) and M12 connector
CS41K-DFBL	CANEO series41 Standard red M12 connector	SENSORswitch with red cover ring (RAL 3020) and M12 connector
CS41K-DGBL	CANEO series41 Standard white M12 connector	SENSORswitch with white cover ring (RAL 9016) and M12 connector
CS41K-DHBL	CANEO series41 Standard gray B M12 connector	SENSORswitch with gray cover ring (RAL 7043) and M12 connector
CS41K-DJBL	CANEO series41 Standard gray M12 connector	SENSORswitch with gray cover ring (RAL 7042) and M12 connector
CS41K-DKBL	CANEO series41 Standard green M12 connector	SENSORswitch with green cover ring (RAL 6024) and M12 connector
CS41K-DLBL	CANEO series41 Standard blue M12 connector	SENSORswitch with blue cover ring (RAL 5015) and M12 connector
CS41K-DMBL	CANEO series41 Standard black M12 connector	SENSORswitch with black cover ring (RAL 9017) and M12 connector

CS46K-FABM	CANEO series46 Standard red M12 connector	SENSORswitch with red cover ring (RAL 3020) and M12 connector
CS46K-FBBM	CANEO series46 Standard yellow M12 connector	SENSORswitch with yellow cover ring (RAL 1023) and M12 connector
CS46K-FCBM	CANEO series46 Standard orange M12 connector	SENSORswitch with orange cover ring (RAL 2009) and M12 connector
CS46K-FDBM	CANEO series46 Standard white M12 connector	SENSORswitch with white cover ring (RAL 9016) and M12 connector
CS46K-FEBM	CANEO series46 Standard gray M12 connector	SENSORswitch with gray cover ring (RAL 7043) and M12 connector
CS46K-FFBM	CANEO series46 Standard gray M12 connector	SENSORswitch with gray cover ring (RAL 7042) and M12 connector
CS46K-FGBM	CANEO series46 Standard green M12 connector	SENSORswitch with green cover ring (RAL 6024) and M12 connector
CS46K-FHBM	CANEO series46 Standard blue M12 connector	SENSORswitch with blue cover ring (RAL 5015) and M12 connector
CS46K-FIBM	CANEO series46 Standard black M12 connector	SENSORswitch with black cover ring (RAL 9017) and M12 connector

Process Data

Condition "LED Control Mode = 0"

<i>Process Data Input</i>			
Bit Length: 80			
Bit Offset	Name	Value	Info
0	Pin 2	4 - Input - OFF 5 - Input - ON	E1 input pin state: 4 - Input - OFF: no input signal on pin. 5 - Input - ON: input signal on pin.

		8 - Pin unused	8 - Pin unused: pin not used - parameter "Active input" is set to "None" Input On/Off depends on "E1/E2 Mode": For "Active High" high signal = "Input - On"; low signal = "Input - OFF". For "Active Low" high signal = "Input - Off"; low signal = "Input - On".
8	Pin 4	0 - Output - OFF 1 - Output - ON	0 - Output - OFF: sensor doesn't switch. 1 - Output - ON: sensor switches.
16	Pin 5	4 - Input - OFF 5 - Input - ON 8 - Pin unused	E2 input pin state: 4 - Input - OFF: no input signal on pin. 5 - Input - ON: input signal on pin. 8 - Pin unused: pin not used - parameter "Active input" is set to "None" Input On/Off depends on "E1/E2 Mode": For "Active High" high signal = "Input - On"; low signal = "Input - OFF". For "Active Low" high signal = "Input - Off"; low signal = "Input - On".
24	Actuation Flag	0 - Idle 1 - Actuated	0 - Idle: sensor is not actuated 1 - Actuated: sensor is actuated
32	Actuation Count	0 ... 65535	Number of actuation cycles since sensor has been turned on. Counter resets when sensor restarts and after 65535.
48	Actuation Strength	0...100 [%]	Damping of sensor in percent.
56	Surrounding Brightness	0...100 [%]	Shows ambient brightness in percent.

Process Data Output

Bit Length: 112

Bit Offset	Name	Value	Info
0	<i>unused</i>		

Condition "LED Control Mode = 1"

Process Data Input

Bit Length: 80

Bit Offset	Name	Value	Info
0	Pin 2	4 - Input - OFF 5 - Input - ON 8 - Pin unused	E1 input pin state: 4 - Input - OFF: no input signal on pin. 5 - Input - ON: input signal on pin. 8 - Pin unused: pin not used - parameter "Active input" is set to "None" Input On/Off depends on "E1/E2 Mode": For "Active High" high signal = "Input - On"; low signal = "Input - OFF". For "Active Low" high signal = "Input - Off"; low signal = "Input - On".
8	Pin 4	0 - Output - OFF 1 - Output - ON	0 - Output - OFF: sensor doesn't switch. 1 - Output - ON: sensor switches.
16	Pin 5	4 - Input - OFF 5 - Input - ON 8 - Pin unused	E2 input pin state: 4 - Input - OFF: no input signal on pin. 5 - Input - ON: input signal on pin. 8 - Pin unused: pin not used - parameter "Active input" is set to "None" Input On/Off depends on "E1/E2 Mode": For "Active High" high signal = "Input - On"; low signal = "Input - OFF". For "Active Low" high signal = "Input - Off"; low signal = "Input - On".
24	Actuation Flag	0 - Idle 1 - Actuated	0 - Idle: sensor is not actuated 1 - Actuated: sensor is actuated
32	Actuation Count	0 ... 65535	Number of actuation cycles since sensor has been turned on. Count resets on restart and after 65535.
48	Actuation Strength	0...100 [%]	Damping of sensor in percent.
56	Surrounding Brightness	0...100 [%]	Shows ambient brightness in percent.

Process Data Output

Bit Length: 112

Bit	Name	Value	Info
-----	------	-------	------

Offset			
0	LED Scene	0...7 255 – Automatic	Switch between LED scenes “0” to “7”. For control by activation and input pins set value to “255”.

Condition "LED Control Mode = 2"

Process Data Input

Bit Length: 80

Bit Offset	Name	Value	
0	Pin 2	4 - Input - OFF 5 - Input - ON 8 - Pin unused	E1 input pin state: 4 - Input - OFF: no input signal on pin. 5 - Input – ON: input signal on pin. 8 - Pin unused: pin not used - parameter “Active input” is set to “None” Input On/Off depends on "E1/E2 Mode": For "Active High" high signal = "Input - On"; low signal = “Input – OFF”. For "Active Low" high signal = "Input - Off"; low signal = “Input – On”.
8	Pin 4	0 - Output - OFF 1 - Output – ON	0 - Output – OFF: sensor doesn’t switch. 1 - Output – ON: sensor switches.
16	Pin 5	4 - Input - OFF 5 - Input - ON 8 - Pin unused	E2 input pin state: 4 - Input - OFF: no input signal on pin. 5 - Input – ON: input signal on pin. 8 - Pin unused: pin not used - parameter “Active input” is set to “None” Input On/Off depends on "E1/E2 Mode": For "Active High" high signal = "Input - On"; low signal = “Input – OFF”. For "Active Low" high signal = "Input - Off"; low signal = “Input – On”.
24	Actuation Flag	0 - Idle 1 – Actuated	0 - Idle: sensor is not actuated 1 - Actuated: sensor is actuated
32	Actuation Count	0 ... 65535	Number of actuation cycles since sensor has been turned on. Count resets on restart and after 65535.
48	Actuation Strength	0...100 [%]	Damping of sensor in percent.

56	Surrounding Brightness	0...100 [%]	Shows ambient brightness in percent.
----	------------------------	-------------	--------------------------------------

Process Data Output

Bit Length: 112

Bit Offset	Name	Value	Info
0	Active LEDs	0 ... 65535	Define which LEDs are active, set via Bin code "0000000000000000" to "1111111111111111".
16	LED Brightness	0...100 255 - Automatic Control [%]	Brightness of LED ring in percent. Value of 255 means automatic brightness control by sensor.
24	LED Color R	0 ... 255	Set customer specific colors. "R" – red value.
32	LED Color G	0 ... 255	Set customer specific colors. "G" – green value.
40	LED Color B	0 ... 255	Set customer specific colors. "B" – blue value.
48	LED Effect	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise 22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash Arrow Right	Choose LED ring effect

		12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
56	Effect Frequency	1...60 0 - Default Frequency [0.1 Hz]	Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.

Events

EventCodes	Definition and recommended maintenance action	Type
16912	Device temperature over-run - Clear source of heat	Warning
16928	Device temperature under-run - Insulate device	Warning
20496	Component malfunction - Repair or exchange	Error
20752	Primary supply voltage over-run - Check tolerance	Warning
20753	Primary supply voltage under-run - Check tolerance	Warning

Commands

ISDU Index 2 - System Command

Value	Name	Description

128	Device Reset	Reset the device
130	Restore Factory Settings	Restore Factory Settings
160	Trigger Self-Test	Self-Test will activate the switch; in Toggle mode the switch will remain activated

ISDU Indices

Access Rights: ro - Read Only, rw - Read/Write, wo - Write Only

Name	Index (- Subindex)	Access	Values	Info
System Command	2	wo	see above	
Identification				
Vendor Name	16	ro	CAPTRON Electronic GmbH	Vendor
Product Name	18	ro	CANEO series4x	Product Line
Product ID	19	ro	CS4xX-xxxx	Product Type
Product Text	20	ro		Product Order Code
Firmware Version	23	ro		Firmware Version
Serial Number	21	ro		Unique Product Serial Number
Symbol	276	ro		Touch surface symbol
Parameter				
Activation				
Sensor Mode	261	rw	3 - Static 2 - Dynamic 1 - Toggle	3 -Static: Sensor switches as long as touched or as "Output Minimum Impulse Time" is set. 2 -Dynamic: Sensor switches as long as "Output Minimum Impulse Time" is set.

				1 - Toggle: Sensor switches until touched again as long as touched. Can only be set back after "Output Minimum Impulse Time" is over.
Touch Sensitivity	260	rw	0 - High 1 - Middle 2 - Low	0 - High: Actuation strength > 4%. 1 - Middle: Actuation strength > 14%. 2 - Low: Actuation strength > 24%.
Minimum Actuation Time	263	rw	0 ... 65535 [ms]	Time the sensor has to be activated before Output on Pin 4 switches, "Actuation Flag" is set to "Actuated" and "Actuation Count" goes up.
Minimum Actuation Time (Toggle OFF)	283	rw	0 ... 65535 [ms]	Time the sensor has to be touched in Toggle mode to before Output on Pin 4 turns OFF and "Actuation Flag" is set to "Idle".
Output Activation Delay	324	rw	0 ... 65535 [ms]	The Time between switch activation and
I/O				
Active Inputs	271	rw	3 - None (3 pin mode) 4 - Pin 2 (E1) (4 pin mode) 5 - Pin 2 (E1) and Pin 5 (E2) (5 pin mode)	3 - None: Pin 2 and Pin 5 are off, input signals are not monitored. 4 - Pin 2 (E1) (4 pin mode): Pin 2 is monitored Pin 5 is off, input signals are not monitored. 5 - Pin 2 (E1) and Pin5 (E2) (4 pin mode): Pin 2 and Pin 5 are monitored.
E1/E2 Mode	272	rw	0 - Active Low 1 - Active High	0 - Active Low: Accepts a low signal as input to turn on 1 - Active High: Accepts a high signal as input to turn on
Output Locking	337	rw	0 - No locking 1 - Release by E1 2 - Release by E2 3 - Release by E1 and E2	0 - No locking: The output signal on "Pin4" will be ON when sensor is touched 1 - Release by E1: The output signal on "Pin4" will be ON when sensor is touched and gets an Input signal on E1. 2 - Release by E2 The output signal on "Pin4" will be ON when sensor is

				<p>touched and gets an Input signal on E2.</p> <p>3 - Release by E1 and E2: The output signal on "Pin4" will be ON when sensor is touched and gets an Input signal on E1 and E2.</p>
Output Mode	273	rw	<p>0 - NPN 1 - PNP 2 - PushPull</p>	<p>0 - NPN: Output signal pulled down to V0. 1 - PNP: Output signal pushed up to +VDC. 2 - PushPull: Output signal pushed up to +VDC and pulled down to V0.</p>
Output NO/NC	274	rw	<p>0 - NO (Normally Open) 1 - NC (Normally Closed)</p>	<p>0 - NO (Normally Open) 1 - NC (Normally Closed)</p>
Output Minimum Impulse Time	275	rw	<p>10...86400000 [ms]</p>	<p>The minimal time (ms) of the output signal when the sensor is activated.</p> <p>The output signal can not be interrupted.</p> <p>In toggle mode the sensor can only be deactivated after the minimal output signal length is over.</p>
LEDs				
LED Control Mode	293	rw	<p>0 - Automatic Scene selection 1 - Scene controlled by IO-Link Process Data 2 - Advanced control by IO-Link Process Data</p>	<p>0 - Automatic Scene selection: Operation of sensor using "Led Scenes" depending on "Actuation Flag" Status and E1, E2 input. Use for operation without IO-Link.</p> <p>1 - Scene controlled by IO-Link Process Data: Operation of sensor using "Led Scenes" controlled via IO-Link "Process Data Output" – "LED Scene". For use of preconfigured Scenes via IO-Link.</p> <p>2 - Advanced control by IO-Link Process Data: LED display completely controlled via "Process Data Output" – Process Data, no usage of "LED Scenes".</p>
Adaptive LED	270	rw	<p>0 - Off 1 - On</p>	<p>If turned "On" the sensor automatically adjusts the LED</p>

Brightness				Brightness depending on the "Surrounding Brightness".
Manual LED Brightness	305	rw	0...100 [%]	Brightness of LED Ring and 7-Segment Display. Sets minimal Brightness if "Adaptive LED Brightness" is turned "On".
Rotate Button	304	rw	0 - 0° 1 - 180°	Rotate LED Display – use if Button is mounted upside down.
Boot Sequence	314	rw	0 - Off 1 - Classic 2 - CANEO	0 "no sequence": Immediately available. 1 "Classic": Countdown sequence. 2 "CANEO": CANEO sequence.
Custom Color 1				
R	306 - 1	rw	0 ... 255	Set customer specific colors. "R" – red value.
G	306 - 2	rw	0 ... 255	Set customer specific colors. "G" – green value.
B	306 - 3	rw	0 ... 255	Set customer specific colors. "B" – blue value.
Custom Color 2				
R	307 - 1	rw	0 ... 255	Set customer specific colors. "R" – red value.
G	307 - 2	rw	0 ... 255	Set customer specific colors. "G" – green value.
B	307 - 3	rw	0 ... 255	Set customer specific colors. "B" – blue value.
Timer				
Timer Function	322 - 1	rw	0 - disabled 1 - count down 2 - count up 3 - count up infinitely	0 - disabled: No timer active Scene settings apply 1 - count down: Timer is active and counts down a predefined Time, when sensor enters a certain scene 2 - count up: Timer is active and counts up for a predefined Time, when sensor enters a certain scene 3 - count up infinitely: Timer is active

				and counts up infinitely, when sensor enters a certain scene
Trigger timer	322 - 2	rw	0 - when entering Scene 0 1 - when entering Scene 1 2 - when entering Scene 2 3 - when entering Scene 3 4 - when entering Scene 4 5 - when entering Scene 5 6 - when entering Scene 6 7 - when entering Scene 7	Trigger to start timer. The timer starts when sensor enters/falls back into a certain scene. Case: the output signal shall come in the beginning - before the timer starts.
Timer timeout	322 - 3	rw	0...9999 [s]	Timer timeout applies when "Timer Function" is set to "count up" or "count down"
LED Color	323 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	323 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise	Choose LED ring effect: The following effects are synchronized with the Timer

			22 - Throbber Counter Clockwise	24 - Timer Circle Clearing Clockwise
			4 - Solid Arrow Up	25 - Timer Circle Clearing Counter-Clockwise
			5 - Solid Arrow Down	26 - Timer Circle Filling Clockwise
			6 - Solid Arrow Left	27 - Timer Circle Filling Counter-Clockwise
			7 - Solid Arrow Right	
			8 - Flash Arrow Up	
			9 - Flash Arrow Down	
			10 - Flash Arrow Left	
			11 - Flash Arrow Right	
			12 - Animated Arrow Up	
			13 - Animated Arrow Down	
			14 - Animated Arrow Left	
			15 - Animated Arrow Right	
			16 - Circle Point Clockwise	
			17 - Circle Point Counter Clockwise	
			18 - Circle Fill Clockwise	
			19 - Circle Fill Counter Clockwise	
			20 - Static Ring Even	
			21 - Static Ring Odd	
			24 - Timer Circle Clearing Clockwise	
			25 - Timer Circle Clearing Counter-Clockwise	
			26 - Timer Circle Filling Clockwise	
			27 - Timer Circle Filling Counter-Clockwise	

			27 - Timer Circle Filling Counter- Clockwise	
Effect Frequency	323 - 3	rw	1...60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scenes				
LED Scene 0 (no Touch, E1 off, E2 off)				
LED Color	295 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	295 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise 22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash	Choose LED ring effect

			Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	295 - 3	rw	1...60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 1 (Touch, E1 off, E2 off)				
LED Color	296 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	296 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise	Choose LED ring effect

			22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	296 - 3	rw	1..60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 2 (no Touch, E1 on, E2 off)				
LED Color	297 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue	Choose color of LED ring

			<ul style="list-style-type: none"> 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2 	
LED Effect	297 - 2	rw	<ul style="list-style-type: none"> 0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise 22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill 	Choose LED ring effect

			Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	297 - 3	rw	1...60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 3 (Touch, E1 on, E2 off)				
LED Color	298 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	298 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise 22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash	Choose LED ring effect

			Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	298 - 3	rw	1...60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 4 (no Touch, E1 off, E2 on)				
LED Color	299 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	299 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise	Choose LED ring effect

			22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	299 - 3	rw	1..60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 5 (Touch, E1 off, E2 on)				
LED Color	300 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue	Choose color of LED ring

			<ul style="list-style-type: none"> 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2 	
LED Effect	300 - 2	rw	<ul style="list-style-type: none"> 0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise 22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill 	Choose LED ring effect

			Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	300 - 3	rw	1...60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 6 (no Touch, E1 on, E2 on)				
LED Color	301 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	301 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise 22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash	Choose LED ring effect

			Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	301 - 3	rw	1...60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
LED Scene 7 (Touch, E1 on, E2 on)				
LED Color	302 - 1	rw	0 - CANEO 1 - Red 2 - Green 3 - Blue 4 - Yellow 5 - Magenta 6 - Cyan 10 - Orange 11 - Violet 13 - Off 14 - Clean Blue 128 - Custom Color 1 129 - Custom Color 2	Choose color of LED ring
LED Effect	302 - 2	rw	0 - Static Ring 1 - Flash Ring 2 - Pulse Ring 3 - Throbber Clockwise	Choose LED ring effect

			22 - Throbber Counter Clockwise 4 - Solid Arrow Up 5 - Solid Arrow Down 6 - Solid Arrow Left 7 - Solid Arrow Right 8 - Flash Arrow Up 9 - Flash Arrow Down 10 - Flash Arrow Left 11 - Flash Arrow Right 12 - Animated Arrow Up 13 - Animated Arrow Down 14 - Animated Arrow Left 15 - Animated Arrow Right 16 - Circle Point Clockwise 17 - Circle Point Counter Clockwise 18 - Circle Fill Clockwise 19 - Circle Fill Counter Clockwise 20 - Static Ring Even 21 - Static Ring Odd	
Effect Frequency	302 - 3	rw	1..60 0 - Default Frequency [0.1 Hz]	Applies only for animated effects, Frequency of LED effect in 1/10 Hz, range: 0.1 ... 6 Hz.
Observation				
LED Control Mode	293	rw	0 - Automatic Scene selection 1 - Scene	0 - Automatic Scene selection: Operation of sensor using "Led Scenes" depending on "Actuation

			controlled by IO-Link Process Data 2 - Advanced control by IO-Link Process Data	<p>Flag” Status and E1, E2 input. Use for operation without IO-Link.</p> <p>1 - Scene controlled by IO-Link Process Data: Operation of sensor using “Led Scenes” controlled via IO-Link “Process Data Output” – “LED Scene”. For use of preconfigured Scenes via IO-Link.</p> <p>2 - Advanced control by IO-Link Process Data: LED display completely controlled via “Process Data Output” – Process Data, no usage of “LED Scenes”.</p>
Sensor Temperature	257	ro	-32768 ... 32767 [0.1 °C]	
Supply Voltage	256	ro	0 ... 65535 [0.001 V]	
Diagnosis				
Sensor Temperature	257	ro	-32768 ... 32767 [0.1 °C]	
Supply Voltage	256	ro	0 ... 65535 [0.001 V]	
Input E1 voltage	277	ro	0 ... 65535 [0.001 V]	
Input E2 voltage	278	ro	0 ... 65535 [0.001 V]	
MCU Voltage	279	ro	0 ... 65535 [0.001 V]	
Charge Code	280	ro	0 ... 4294967295	
Error Code	282	ro	0 ... 65535	
Flash Erase Count	259	ro	0 ... 65535	
Device Access Locks	12	rw		

LED Control

series4x supports three modes for controlling its LEDs.

- Automatic Scene Selection
- Scene controlled by IO-Link-Process Data
- Advanced Control by IO-Link Process Data

The control mode can be selected via IO-Link parameter *LED Control Mode*.

Control Modes

Automatic Scene Selection (LED Control Mode = 0)

The LEDs behave like the selected Scene. Scene *n* is selected by the state of Touch (Sensor actuation) and the state of the input pins E1 and E2:

LED Scene <i>n</i>	Actuation Flag	E1	E2	Active Inputs		
				None	Pin2 (E1)	Pin2 (E1) and Pin5 (E2)
0	0	0	0			
1	1	0	0			
2	0	1	0			
3	1	1	0			
4	0	0	1			
5	1	0	1			
6	0	1	1			
7	1	1	1			

The number of applicable scenes depends on parameter "*Active Inputs*":

Active Inputs	applicable scenes
None (3 pin mode)	0, 1

Pin2 (E1) (4 pin mode)	0 ... 3
Pin2 (E1) and Pin5 (E2) (5 pin mode)	0 ... 7

Scene controlled by IO-Link Process Data (*LED Control Mode = 1*)

The active Scene is set to the value written to "LED Scene". For "LED Scene" = 255, the active Scene is selected by inputs like "Automatic Scene Selection" (LED Control Mode = 0). LEDs always act like the active Scene. The Display behaviour depends on "Display Mode", for more Information see part "Process Data OUT (PDout)".

Advanced Control by IO-Link Process Data (LED Control Mode = 2)

The LED color, brightness, effect and effect frequency is controlled by IO-Link process data. For more Information see part "Process Data OUT (PDout)".

Timer

The timer functionality is designed for applications without IO-Link only. This means the "LED Control Mode" needs to be set to "Automatic scene Selection" so the timer can be started by activation of the switch or the inputs E1 / E2 - see Control Modes.

Activating a scene via IO Link when "LED Control Mode" is set to "Scene controlled by IO-Link Process Data" will not activate the Timer. If you want to control a Timer via IO-Link please use the "LED Control Mode" "Advanced Control by IO-Link Process Data" and run the timer on the PLC and display the time.

Note: Timer overwrites LED effect of the scene; Led effects with prefix timer are synchronized with the timer.

Case1: The output signal shall come in the beginning, before the timer runs down/up.

1. Set "Sensor Mode" to "Static" or "Dynamic"
2. Set "Timer Function" to "1 - count down" / "2 – count up"
3. Set "Trigger Timer" to "0 - when entering Scene 0"
4. Set "Timer timeout" to i.e. "10" s
5. Set "Output Minimum Impulse Time"
6. Set "LED Effect" for Timer

Note: "Sensor Mode" needs to be "Static" or "Dynamic". If the sensor is in "Toggle" mode the timer will start when the sensor is touched for a second time since it will be in "Scene 1" after the first touch and goes back to "Scene 0" after the second.

Case2: the output signal shall come at the end

1. Set "Sensor Mode" to "Static" or "Dynamic"

2. Set "Timer Function" to "1 - count down" / "2 - count up"
3. Set "Trigger Timer" to "1 - when entering Scene 1"
4. Set "Timer timeout" to i.e. "10"s
5. Set "Output Minimum Impulse Time" i.e. "300" ms
6. Set "Output Activation Delay" to i.e. "9700" ms.
7. Set "LED Effect" for Timer

Note: "Sensor Mode" needs to be "Static" or "Dynamic".

Note: "Output Activation Delay" = "Timer timeout" - "Output Minimum Impulse Time".

Case3: The timer shall count infinitely (display up to 9999 s)

1. Set "Sensor Mode" to "Toggle" (you will have an output signal as long as the timer counts)
2. Set "Timer Function" to "Count Up Infinite"
3. Set "Trigger Timer" to "1 - when entering Scene 1"
4. Set "Output Minimum Impulse Time" i.e. "300" ms
5. Set "Output Activation Delay" to 0 ms
6. Set "LED Effect" for timer

Note: "Sensor Mode" needs to be "toggle" to get a continuous output signal as long as the counter is active.

Note: "Output Activation Delay" = "Count down/up time" - "Output Minimum Impulse Time".

Note: The timer display / LED-ring stops counting up at 9999 s, the output signal stays until the switch is touched again.

Note: The timer can be ended if "Output Locking" is active and you put an input signal on one of the inputs.

Output Locking

The "Output Locking" was designed for applications without IO-Link only, the sensor needs to be set to "LED Control Mode" "Automatic Scene selection", it locks the "Pin 4" output signal but has no Impact on the "Actuation Flag". The "Output Locking" has no influence on the scene or scene change. This means touching / inputs on E1 / E2 will change the scene accordingly - see LED Control.

For locking the inputs need to be active according to "Active inputs".

Output locking can be used to interrupt an infinite timer / terminate an output signal.

Parameterization

Parameterization is done by writing a valid value to the desired ISDU Data Object. Written parameters are automatically saved approximately 1 second after the last write access is completed. In order to set the parameters back to delivery condition System Command 130 on Index 2 has to be forwarded.