

CSS/CSX High Speed

Color Sensor

SICK
Sensor Intelligence.



Described product

CSS / CSX High Speed

Manufacturer

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Legal information

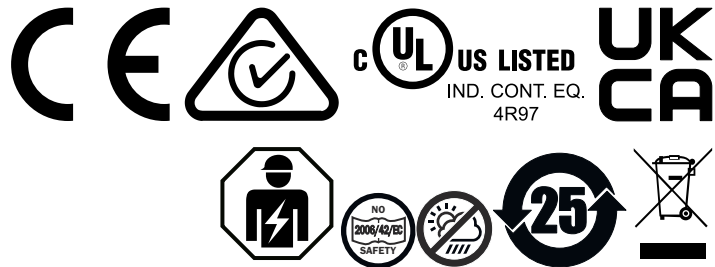
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Original document

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1 About this document

1.1 Information on the operating instructions

These operating instructions provide important information on how to use devices from SICK AG.

Prerequisites for safe work are:

- Compliance with all safety notes and handling instructions supplied
- Compliance with local work safety regulations and general safety regulations for device applications

The operating instructions are intended to be used by qualified personnel and electrical specialists.



NOTE

Read these operating instructions carefully before starting any work on the device, in order to familiarize yourself with the device and its functions.

The instructions constitute an integral part of the product and are to be stored in the immediate vicinity of the device so they remain accessible to staff at all times. Should the device be passed on to a third party, these operating instructions should be handed over with it.

These operating instructions do not provide information on operating the machine in which the device is integrated. For information about this, refer to the operating instructions of the specific machine.

1.2 Scope

These operating instructions serve to incorporate the device into a customer system. Step-by-step instructions are given for all required actions.

These instructions apply to all listed device variants of the product.

Available device variants are listed on the online product page.

www.sick.com/CSS_CSX_High_Speed

Commissioning is described using one particular device variant as an example.

Simplified device designation in the document

In the following, the sensor is referred to simply as “CSS/CSX” or “device”.

1.3 Explanation of symbols

Warnings and important information in this document are labeled with symbols. The warnings are introduced by signal words that indicate the extent of the danger. These warnings must be observed at all times and care must be taken to avoid accidents, personal injury, and material damage.



DANGER

... indicates a situation of imminent danger, which will lead to a fatality or serious injuries if not prevented.

**WARNING**

... indicates a potentially dangerous situation, which may lead to a fatality or serious injuries if not prevented.

**CAUTION**

... indicates a potentially dangerous situation, which may lead to minor/slight injuries if not prevented.

**NOTICE**

... indicates a potentially harmful situation, which may lead to material damage if not prevented.

**NOTE**

... highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

1.4 Additional information

**NOTE**

All the documentation available for the device can be found on the online product page at:

► www.sick.com/CSS_CSX_High_Speed

The following information is available for download from this page:

- Type-specific online data sheets for device variants, containing technical data and dimensional drawings
 - EU declaration of conformity for the product family
 - Dimensional drawings and 3D CAD dimension models in various electronic formats
 - These operating instructions, available in English and German, and in other languages if necessary
 - Other publications related to the devices described here
 - Publications dealing with accessories
 - IO-Link device description IODD, driver file SDD for configuration software SOPAS ET and technical information IO-Link v1.1
-

1.5 Customer service

If you require any technical information, our customer service department will be happy to help. To find your agency, see the final page of this document.

**NOTE**

Before calling, make a note of all type label data such as type code, serial number, etc., to ensure faster processing.

2 Safety information

2.1 Intended use

The CSS/CSX High Speed color sensor is an opto-electronic sensor for the optical, non-contact detection of colored objects.

A CSS/CSX is designed for mounting and may only be operated according to its intended function. For this reason, a CSS/CSX is not equipped with direct safety devices.

The system designer must provide measures to ensure the safety of persons and systems in accordance with the legal guidelines.

SICK AG assumes no liability for losses or damage arising from the use of the product, either directly or indirectly. This applies in particular to use of the product that does not conform to its intended purpose and is not described in this documentation.

2.2 Improper use

- The device does not constitute a safety-relevant device according to the EC Machinery Directive (2006/42/EC).
- The device must not be used in explosion-hazardous areas.
- Any other use that is not described as intended use is prohibited.
- Any use of accessories not specifically approved by SICK AG is at your own risk.

The device is not suitable for the following applications (this list is not exhaustive):

- As a safety device to protect persons, their hands, or other body parts
- Underwater
- In explosion-hazardous areas
- Outdoors, without additional protection



NOTICE

Danger due to improper use!

Any improper use can result in dangerous situations.

Therefore, observe the following information:

- ▶ The device should be used only in line with intended use specifications.
- ▶ All information in these operating instructions must be strictly complied with.

2.3 Limitation of liability

Applicable standards and regulations, the latest state of technological development, and our many years of knowledge and experience have all been taken into account when assembling the data and information contained in these operating instructions. The manufacturer accepts no liability for damage caused by:

- Failure to observe the operating instructions
- Improper use
- Use by untrained personnel
- Unauthorized conversions
- Technical modifications
- Use of unauthorized spare parts, wear and tear parts, and accessories

With special variants, where optional extras have been ordered, or owing to the latest technical changes, the actual scope of delivery may vary from the features and illustrations shown here.

2.4 Requirements for skilled persons and operating personnel



WARNING

Risk of injury due to insufficient training!

Improper handling of the device may result in considerable personal injury and material damage.

- All work must only ever be carried out by the stipulated persons.

The operating instructions state the following qualification requirements for the various areas of work:

- **Instructed personnel** have been briefed by the operating entity about the tasks assigned to them and about potential dangers arising from improper action.
- **Skilled personnel** have the specialist training, skills, and experience, as well as knowledge of the relevant regulations, to be able to perform tasks assigned to them and to detect and avoid any potential dangers independently.
- **Electricians** have the specialist training, skills, and experience, as well as knowledge of the relevant standards and provisions to be able to carry out work on electrical systems and to detect and avoid any potential dangers independently. In Germany, electricians must meet the specifications of the DGUV V3 Work Safety Regulations (e.g., Master Electrician). Other relevant regulations applicable in other countries must be observed.

The following qualifications are required for various activities:

Activities	Qualification
Mounting, maintenance	■ Basic practical technical training ■ Knowledge of the current safety regulations in the workplace
Electrical installation, device replacement	■ Practical electrical training ■ Knowledge of current electrical safety regulations ■ Knowledge of the operation and control of the devices in their particular application
Commissioning, configuration	■ Basic knowledge of the design and setup of the described connections and interfaces ■ Basic knowledge of data transmission ■ Knowledge of the operation and control of the devices in their particular application
Operation of the devices in their particular application	■ Knowledge of the operation and control of the devices in their particular application ■ Knowledge of the software and hardware environment in the application

2.5 Hazard warnings and operational safety

Please observe the safety notes and the warnings listed here and in other chapters of these operating instructions to reduce the possibility of risks to health and avoid dangerous situations.

2.6 Eye safety



NOTICE EYE SAFETY

The product is equipped with an LED illumination unit. The sensor meets the criteria of risk group 1 according to IEC 62471:2006. No special measures are required (e.g., eye protection).

2.7 Repair

The product is a replacement device. The device is not intended to be repaired. Interference with or modifications to the device on the part of the customer will invalidate any warranty claims against SICK AG.

3 Product description

3.1 Product ID

3.1.1 Type label

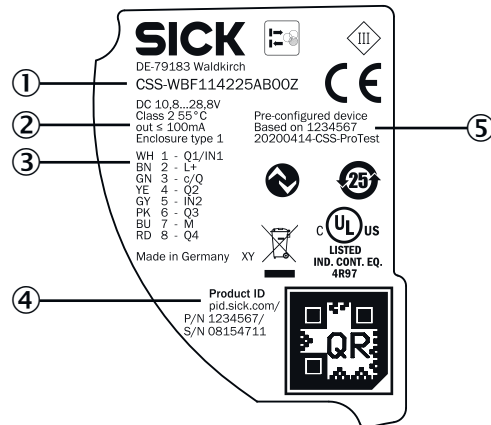


Figure 1: Type label is an example

- ① Device name
- ② Electrical data and environmental data
- ③ Pin assignment
- ④ PID with QR code
- ⑤ Specification for pre-configured devices

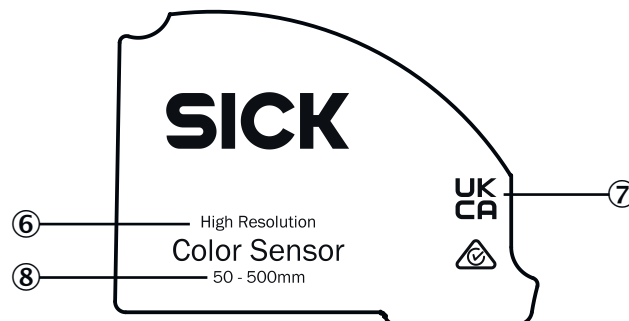


Figure 2: Type label is an example

- ⑥ Device name
- ⑦ Approvals
- ⑧ Sensing distance

3.1.2 Type code

Table 1: Type code

1	2	-	3	4	5	6	7	8	9	10	11	12	13	14
CS	S	-	W	B	F	A	1	4	2	2	5	A	A	10
Position					Meaning									
1					Basic type					CS = Color sensor				
2					Form factor					S = Small X = Large				
3					Light sender					W = RGB				

Position	Meaning	
4	Switching output	B = push/pull N = NPN
5	Function	F = High Speed
6	Light spot direction	1 = Longitudinal A = Round, large
7	Sensing distance	1 = Sensing distance 13 mm 5 = Sensing distance 60 mm
8	Filtering	4 = no filter
9	Light emission	2 = Short side 1 = Short side
10	Operation	2 = Short side
11	Connection type	5 = M12; male connector, 5-pin 8 = M12; male connector, 8-pin
12	Communication	A = IO-Link R = RS485 2 = No communication
13	Device type	A = Smart Task C = preconfigured Z = standard
14	Serial no. ATF/Special	10 = AFC10 (logic functions) ZZ = standard

3.2 Product features and functions

3.2.1 Device view

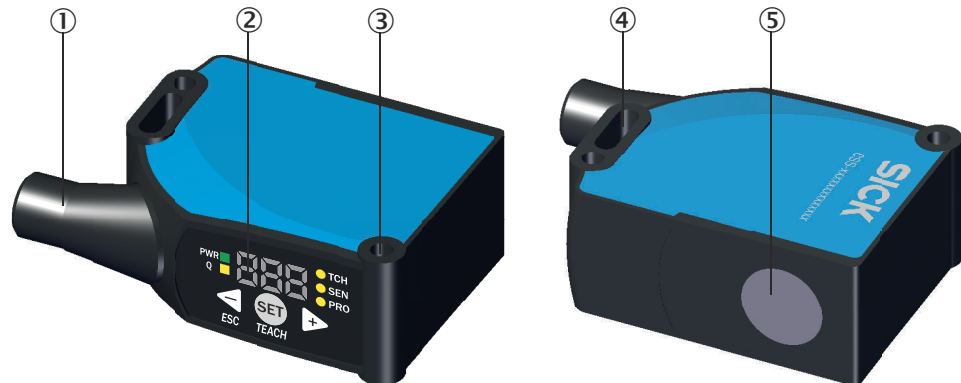


Figure 3: CSS High Speed

- ① Connection
- ② Display and control panel
- ③ Fixing hole
- ④ Fixing hole
- ⑤ Light emission

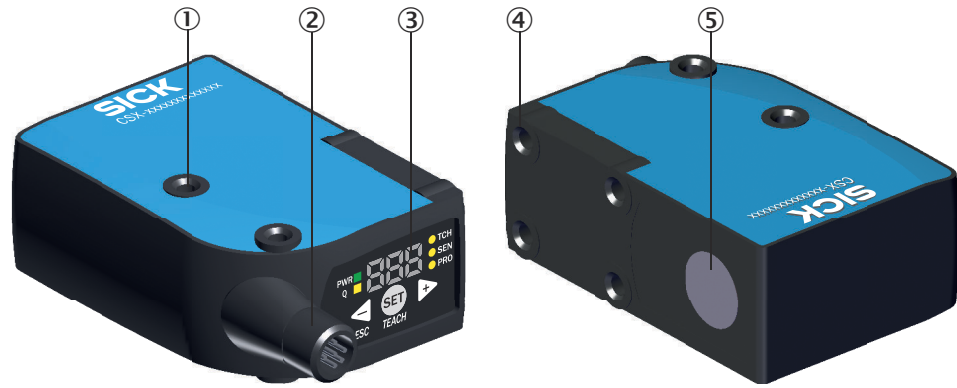


Figure 4: CSX High Speed

- ① Connection
- ② Display and control panel
- ③ Fixing hole
- ④ Fixing hole
- ⑤ Light emission

3.2.2 Product characteristics

Color sensors are used to detect, separate or verify objects based on their color. The color sensors output the detected color as RGB or L*a*b values.

4 Mounting

4.1 Scope of delivery

- Color sensor in the type ordered
- Quickstart
- Safety notes

4.2 Mounting requirements

- For the typical space requirements for the device, see the type-specific dimensional drawing, [see "Dimensional drawing", page 44](#).
- Comply with technical data, such as the permitted ambient conditions for operation of the device (e.g., temperature range, EMC interference emissions, ground potential) [see "Technical data", page 44](#)
- To prevent condensation, avoid exposing the device to rapid changes in temperature.
- Protect the device from direct sunlight, spotlights, or flashlights.
- The device must only be mounted using the pairs of (CSS), or threaded mounting holes (CSX) provided for this purpose.
- Shock and vibration resistant mounting.

4.3 Mounting the device

The CSS / CSX High Speed is equipped with an elongated or round light spot, depending on the variant. The sensor must be mounted in the nominal sensing distance and preferred direction (see graphic).

[table 2](#) gives an overview of the sensing distances and light spot sizes.

In the case of high-gloss materials, the sensor should be angled at 15° to the side for better detection reliability.

Table 2: Sensing distance / Light spot size

CSS / CSX-	xxx1xxxxxxxxx	xxx5xxxxxxxxx
Working range	13 mm	60 mm
Light spot size	2x4 mm	12 mm round

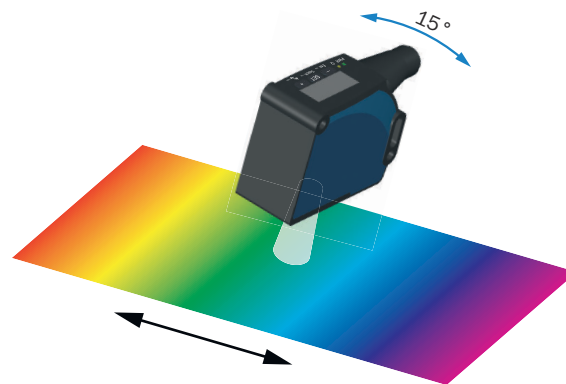


Figure 5: Mounting the CSS/CSX High Speed

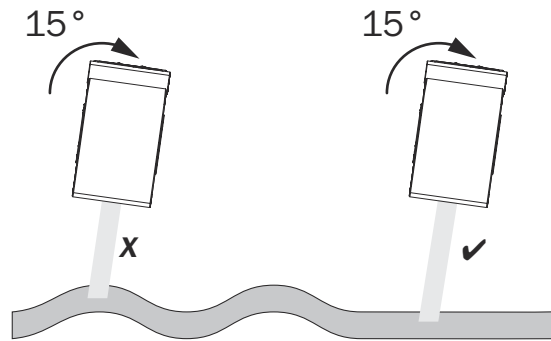


Figure 6: Mounting the CSS/CSX High Speed

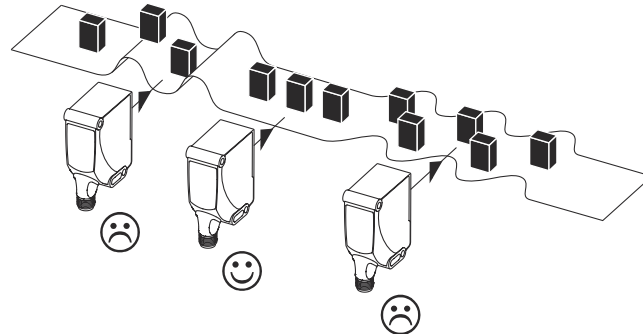


Figure 7: Mounting the CSS/CSX High Speed

5 Electrical installation

5.1 Notes on electrical installation



NOTICE

Equipment damage due to incorrect supply voltage!

An incorrect supply voltage may result in damage to the equipment.

- Only operate the device with safety/protective extra-low voltage (SELV/PELV).
- The sensor is a device of protection class III.



NOTICE

Equipment damage due to incorrect supply voltage!

An incorrect supply voltage may result in damage to the equipment.

- Only operate the device with an LPS (limited power source) in accordance with IEC 62368-1 or an NEC Class 2 power supply unit.



NOTICE

Equipment damage or unpredictable operation due to working with live parts!

Working with live parts may result in unpredictable operation.

- Only carry out wiring work when the power is off.
- Only connect and disconnect electrical connections when the power is off.

- **The electrical installation must only be performed by electrically qualified personnel.**
- **Standard safety requirements must be observed when working on electrical systems!**
- Only switch on the supply voltage for the device when the connection tasks have been completed and the wiring has been thoroughly checked.
- When using extension cables with open ends, ensure that bare wire ends do not come into contact with each other (risk of short-circuit when supply voltage is switched on!). Wires must be appropriately insulated from each other.
- Wire cross-sections in the supply cable from the user's power system must be selected in accordance with the applicable standards.
- The sensor must be protected with a fuse suitable for the cross-circuit of the connecting cable.
- Only operate the device with an LPS (limited power source) in accordance with IEC 62368-1 or an NEC Class 2 power supply unit.
- All circuits connected to the device must be designed as SELV/PELV circuits.



NOTE

Layout of data cables

- Implement the shielding design correctly and completely.
- To avoid interference, e.g., from switching power supplies, motors, clocked drives, and contactors, always use cables and layouts that are suitable for EMC.
- Do not lay cables over long distances in parallel with voltage supply cables and motor cables in cable channels.

The IP enclosure rating for the device is only achieved under the following conditions:

- The cables plugged into the connections are screwed tight.

If these instructions are not complied with, the IP enclosure rating for the device is not guaranteed!

5.2 Note on the swivel connector



NOTICE

Damage to the connector unit from over-tightening!

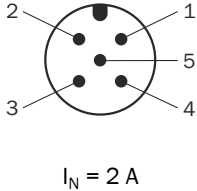
The connector unit on the device has two opposite end positions.

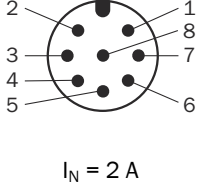
- Do not rotate the connector unit from either of the two end positions by more than 270°.

5.3 Pin assignment of the connections

The pin assignment varies depending on the device variant.

$U_B = 10.8 \text{ V} \dots 28.8 \text{ V DC}$

CSS/CSX	xBxxxxx5A Push/Pull	xNxxxxx52 NPN
1 - BN	L+	L+
2 - WH	QL/IN1	QL2 / IN1
3 - BU	M	M
4 - BK	QL1 / C	QL1
5 - GY	IN2	IN2
		

CSS / CSX	xBxxxxx8A Push/Pull	xNxxxxx82 NPN	xBxxxxx8R RS485
1 - WH	QL1 / IN1	IN1	IN1
2 - BN	L+	L+	L+
3 - GN	QL1 / C	QL1	QL1
4 - YE	QL2	QL2	QL2
5 - GY	IN2	IN2	IN2
6 - PK	QL3	QL3	RS485_A
7 - BU	M	M	M
8 - RD	QL4	QL4	RS485_B
			



NOTE

The wire colors are not standardized for 8-pin sensor cables. Please also observe the pin assignment of the cable used.

Legend

L+ = Supply voltage

QL(1)/IN1 = Switching output or input 1 (configurable, factory setting is switching output)

QL1/C = Communication and switching output (can be used for communication via IO-Link, factory setting is switching output)

QL1 = Switching output 1

QL2 = Switching output 2

QL3 = Switching output 3

QL4 = Switching output 4

M = ground

IN1 = Input 1 (factory setting is blanking)

IN2 = Input 2 (factory setting is external teach-in)

RS485_A/RS485_B= RS485 communication

5.4 Connecting the supply voltage



NOTICE

Risk of damage to the device!

The device can become damaged if it is connected to a voltage supply that is already switched on.

- Only connect the device when the supply cable is de-energized.
-

The device must be connected to a power supply unit with the following properties:

- Supply voltage DC 10.8 V – 28.8 V (SELV/PELV according to the currently applicable standards)
- Power consumption (without load on the outputs) = max. 1.5 W

To ensure protection against short-circuits/overload in the customer's supply cables, the wire cross-sections used must be appropriately selected and protected.

5.5 Wiring the interfaces

5.5.1 Wiring the digital inputs

Voltage level at the input starts the corresponding function of the device.

Electrical values

Level active: $10\text{ V} \leq U \leq U_V$

Level deactivated: $U_{in} \leq 2\text{ V}$

5.5.2 Wiring the digital outputs

In each case, the digital outputs are short-circuit protected and overcurrent protected.

Push/pull switching behavior

Electrical values

The sum current (100 mA) is for all digital outputs.

Push/pull

Level active: $U_V - 3\text{ V}$

Level deactivated: $\leq 3\text{ V}$

In the case of a push/pull sensor with PNP switching behavior, the signal must be inverted in the control system in order to obtain the same result as a sensor with NPN switching behavior.

NPN

Level active: U_V

Level deactivated: $\leq 3\text{ V}$

Table 3: Push-pull

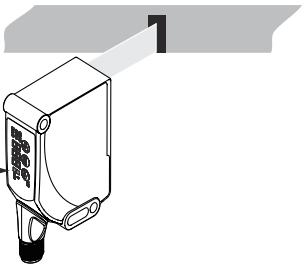
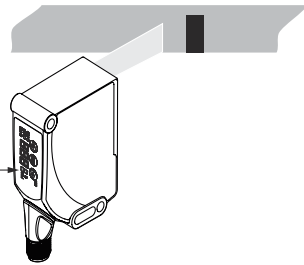
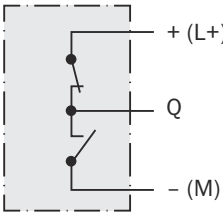
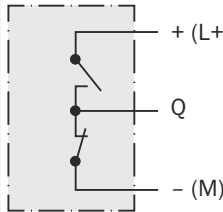
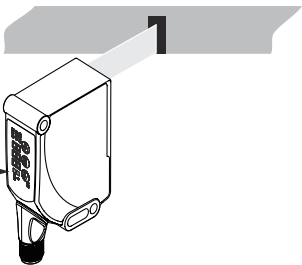
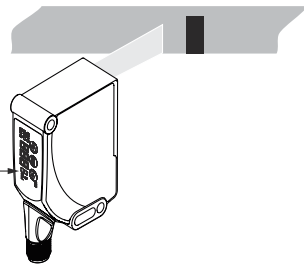
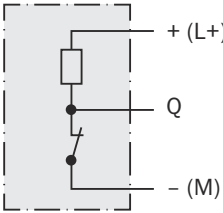
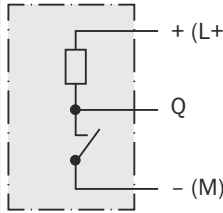
	PWR Q 	PWR Q 
Q Push-pull (≤ 100 mA)	+ (L+) Q - (M) 	+ (L+) Q - (M) 

Table 4: NPN

	PWR Q 	PWR Q 
Q NPN (≤ 100 mA)	+ (L+) Q - (M) 	+ (L+) Q - (M) 

6 Commissioning

One or more colors can be taught in via the operating menu. The sensor then outputs the color matching value (CMV) in the process. This indicates how close the detected color value is to the taught-in color value (teach-in).

- 999 absolutely same color value
- 000 greatest possible dissimilarity

Teach-in method

- Single Value Teach-in = one color point
- Multi Value Teach-in = dynamic teach-in with multiple color points
- Teach-in quick access = In the RUN menu, select the view of the switching output that is to be taught in (e.g. q_1). Press and hold the SET pushbutton for > 1 s = the sensor switches to Multi Value Teach-in (factory setting). If a Single Value Teach-in is performed via the display, the sensor also applies this teach-in method for teach-in quick access.

Other settings can be set on the SEN and PRO menu level.



NOTE

If no settings are made on the sensor for 5 minutes, standby mode (display off) is activated to save electricity. The settings made – and not confirmed via the SET pushbutton – are not saved. To quit standby mode, one of the operating keys must be pushed.

The following menu sequence indicates how the teach-in can be performed:

Position the object/mark in the light spot.

Only the object/mark needs to be taught in, not the background.

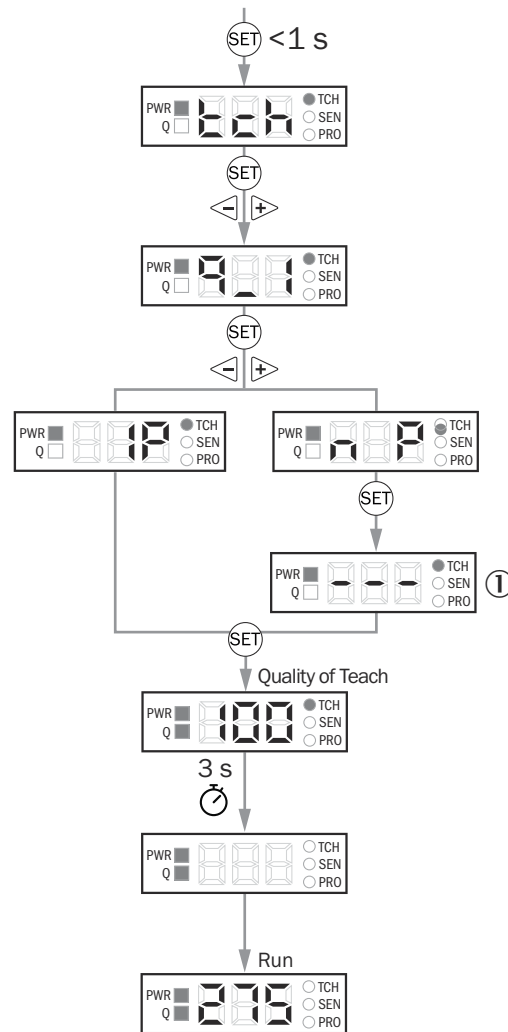


Figure 8: Commissioning of CSS/CSX High Speed

① Move object/mark through the light spot.

6.1 Extended commissioning

Another teach-in can be added to the existing teach-in (Add). This enables different colors (Qints) to be taught-in for the same switching output (QL). This is especially recommended if objects of different characteristics (e.g., slightly different color gradients) are to be distinguished from other objects/from the background with high sensitivity.



NOTE

Due to memory capacities, the Add function is only available if a response time of 150 ms or higher is set.

6.2 First step to commissioning with Modbus RTU

6.2.1 Radio interference



NOTE

Using the device in residential areas may cause radio interference. The operating entity is responsible for taking appropriate measures (e.g., shielding).

The following describes the first steps for commissioning with Modbus RTU. In the description, we refer to the “Modbus application protocol specification V1.1” Modbus standard as well as “Modbus over serial line specification and implementation guide V1.02” available at www.modbus.org.

6.2.2 Setting the ID and baud rate

The following conditions must be met for communication with the Modbus master:

- A correct slave address must be set on the CSS/CSX.
Correct is:
 - A slave address that is free in the Modbus network
 - A slave address that the master expects
- The same baud rate must be set on the CSS/CSX as in the master.

The following parameters are factory set on the CSS/CSX:

- Slave address: 10
- Baud rate: 19,200 bps
- Parity: Even

The following communication parameters can be allocated to the GLS100:

- Slave address: 1 to 247 (0 is generally assigned to the master)
- Baud rate:
 - 0: 1,200 bps
 - 1: 2,400 bps
 - 2: 4,800 bps
 - 3: 19,200 bps**
 - 4: 19,200 bps
 - 5: 38,400 bps
 - 6: 57,600 bps
 - 7: 115,200 bps

6.2.3 Basic information about Modbus and reading out code information

Modbus is based on RS-485 with a Modbus RTU protocol structure. Data exchange is always based on requests from the client and responses from the server devices. The respective request/response string looks like this:

Request

Byte	0	1	2	3	4	5	6	7
ModBus contents	Server address	“Function code” e.g. 0x04 Read “Input registers”	Readout: Start address (16 bit unsigned)		Readout: Number register N (16 bit unsigned)		Checksum (16 bit unsigned)	

Response

Byte	0	1	2	3	4	2xN+5	2xN+6	2xN+7
ModBus contents	Server address	Response: "Function code" 0x04	Number of bytes, 2xN	Start register		Register contents	Checksum (16 bit unsigned)	

The relevant code information is provided in "Section result data". Read it out periodically (not more often than every 50 ms) (addresses 320 to 331) using "Modbus function code #4":

Example request (hex): 0A 04 00 C3 00 01 C0 8D

Table 5: Request (hex): 0A 04 00 C3 00 01 C0 8D

Byte	0	1	2	3	4	5	6	7
ModBus contents	Slave Address	"Function code" 0x04 Read input registers	Readout number of registers (16 bit unsigned)	Readout start address (16 bit unsigned)		Checksum (16 bit unsigned)		
Value (hex)	0x0A	0x04	0x00C3	0x0001		0xC08D		
Description	The address of the Modbus slave CSS (factory setting) is 0x0A.	The Modbus "function code" for reading out the "input register" is 0x04	Start at register 195.	Read one register.		Checksum (16 bit unsigned)		
Data type	unsigned 8-bit	unsigned 8-bit	unsigned 16-bit	unsigned 16-bit		unsigned 16-bit		

Response (hex): 0A 04 02 0007 027C

Table 6: Response (hex): 0A 04 02 0007 027C

Byte	0	1	2	3 ... 4	5...6
ModBus contents	Slave Address	Response function code 0x04 Read input registers	No of bytes returned, 2xN	First register to read from	CRC
Value (hex)	0x0A	0x04	0x02	0x039B	0x5DAA
Description	10	4	2	923	
Data type	The address of the Modbus slave CSS (factory setting) is 0x0A.	The Modbus "function code" for reading out the "input register" is 0x04	Reading out the number of registers gives: 2*2=4 bytes.	Reading the start address for 2 register / 4 bytes results in: Value for CMV1	Checksum (16 bit unsigned)
ModBus contents	unsigned 8-bit	unsigned 8-bit	unsigned 8-bit	unsigned 16-bit	unsigned 16-bit

After the sensor response, interpret the status in register 320. If bits 0, 1, 2 are set in the status, all registers have been received and are valid.

The following is an overview of the various “sections” and individual register addresses and their values. Configuration data can be read out and, if necessary, written in the “section configuration” and the color values and color match values (CMV) in the “section results”.

“Input registers” register group (read-only)

The “Input registers” can be read using function code 0x04.

“Device Identification” section

The device identification details (all of data type ASCII string) can be found from 0x00 onwards in the address range of the input register.

Table 7: “Device Identification” section

Address	Name	#Registers	Description
0	Vendor name	4	SICK AG
4	Product code	4	Respective part number
8	Firmware version	6	
14	Vendor URL	6	www.sick.com
20	Product name	16	
36	Model name	9	
45	Serial number	4	
49	Application name	16	
65	SickModbusProfileVersion	6	
71	Hardware version	2	
73	Device-specific name	16	

Result section

The Section Index registers contain, among other things, the respective color values and color match values (CMV):

Table 8: Result section

Address	Content	#Registers	Comment
192	QL and Status	1	
193	Qint	2	
195	CMV QL1	1	
196	CMV QL2	1	
197	CMV QL3	1	
198	CMV QL4	1	
199	Color Value L	1	
200	Color Value A	1	
201	Color Value B	1	
202	Color Value R	1	
203	Color Value G	1	
204	Color Value B	1	

Register QL and Status:

Table 9: Register QL and Status:

Bit	7	6	5	4	3	2	1	0
Content	-		PD invalid	QoR alarm	QL4	QL3	QL2	QL1

Status section

The result data starts at address 0xC0:

Table 10: Status section

Address	Content	#Registers	Comment
4096	Device Status	1	0 = Device is OK 1 = Maintenance required 3 = Functional Check 2 = Out of Specification 4 = Failure 5 - 255 = Reserved
4097	Current temperature	1	Internal device temperature in °C.
4098	Maximum temperature all time	1	Maximum internal device temperature since production of sensor in °C.
4099	Minimum temperature all time	1	Minimum internal device temperature since production of sensor in °C.
4100	Total operating hours	2	Operating hours since production of sensor in h.
4102	Maximum temperature since last reset	1	Maximum internal device temperature since last reset via system command in °C.
4103	Minimum temperature since last reset	1	Minimum internal device temperature since last reset via system command in °C.
4104	Operating hours since last reset	2	Operating hours since last reset via system command in h.
4106	Distance to object	1	Distance to object in 0.1 mm step.
4107	Currently selected operating mode	1	0 = Mark/Object positioning 1 = Fast sorting 2 = Object separation 3 = Color verification 255 = Manual setting
4108	Quality levels	12	QoR level of the 24 Qints
4120	Color match values	24	Color Match Values to all teach objects
4144	Teach-in Status	1	
4145	Quality of run	1	Quality level in percent.
4146	Active job bank	1	Select the job bank of the sensor which should be active. 0 = Activate job bank 1 1 = Activate job bank 2 2 = Activate job bank 3 3 = Activate job bank 4
4147	Quality of Teach	1	Quality of teach level in percent.

“Holding registers” register group (read-write)

The following registers are used to configure the sensor via Modbus and can be read using function code 0x03, written to individually using function code 0x06, or written to continuously using function code 0x10.

Commands section

Table 11: Commands section

Address	Content	#Registers	Comment
96	Set Application name	16	
113	Restore factory settings	1	Set a number ≥ 1 for restore factory settings
114	Application reset	1	Set a number ≥ 1 for application reset
115	Reset diagnostic parameters	1	Set a number ≥ 1 for reset diagnostic parameters
116	Set device name	16	
132	Set operating mode	1	
133	Single value teach-in	1	Value (0 to 23) indicates teach-in channel
134	Start multi value teach-in	1	Value (0 to 23) indicates teach-in channel
135	Stop multi value teach-in	1	Set a number ≥ 1 to stop the started dynamic teach
136	Abort teach-in sequence	1	Set a number ≥ 1 to abort the started dynamic teach
137	Remove teach object	1	Value (0 to 23) indicates teach-in channel
138	Activate job bank	1	

Configuration section



NOTE

Changes become active only after a “power cycle”.

Address	Content	#Registers	Ref. IO-Link Index	Comment
144	Modbus RTU slave address	1	239	1 - 247 (Default: 10)
145	Modbus RTU baud rate	1	240	0: 1,200 bps 1: 2,400 bps 2: 4,800 bps 3: 9,600 bps 4: 19,200 bps (Default) 5: 38,400 bps 6: 57,600 bps 7: 115,200 bps
146	Modbus RTU parity setting	1	241	0: None 1: Even (Default) 2: Odd
147	Local user interface lock	1	12/4 + 160	0 = Interface unlocked 1 = Interface fully locked 2 = Teach-in available
148	Sender configuration	1	97	0 = Sender active (default) 1 = Sender not active
149	Pin 2 configuration	1	121	0 = Deactivated 39 = Switching output QL1 34 = Switching output QL2 Standard inputs: 1 = External input (Smart Task) Device specific: 20 = Blanking 80 = Single value teach QL1 81 = Single value teach QL2 90 = Activate job bank (LSB)

Address	Content	#Registers	Ref. IO-Link Index	Comment
150	Pin 5 configuration	1	122	0 = Deactivated Standard inputs: 1 = External input (Smart Task) Device specific: 20 = Blanking 80 = Single value teach QL1 81 = Single value teach QL2 90 = Activate job bank (MSB)
151	Find me	1	204	0 = Deactivated (default) 1 = All LEDs flash at 1 Hz 16 = All LEDs + QLs flash at 1 Hz
152	Energy saving mode for display	1	234/1	0 = Off 1 = On (default)
153	Turn display	1	234/2	0 = Not turned (default) 1 = Turned
154	Measurement averaging	1	89	0 = No averaging 1 = Low averaging 2 = Medium averaging 3 = High averaging 4 = Highest averaging
155	Output mode	1	293	0 = Standard (default) 1 = Best fit 2 = Coded
156	Distance regulation enabled	1	294	0 = Deactivated 1 = Activated (default)
157	Color mode	1	295	0 = C + I mode 1 = C mode 2 = I mode
158	Quality of run alarm threshold	1	176	Threshold position in percent. 0 - 90 (default: 50)
160	Qint. 1 teach data	22	60	Teach data content for a Qint1.
182	Qint. 1 configuration	2	61	Link to the teach object for which the Qint is configured. Qint1 = 0, Qint24 = 23 and sensitivity of respective Qint.
184	Qint. 2 teach data	22	62	Teach data content for a Qint2.
206	Qint. 2 configuration	2	63	Link to the teach object for which the Qint is configured. Qint1 = 0, Qint24 = 23 and sensitivity of respective Qint.
736	Inverter ext. input	1	1093	0 = Not inverted (default) 1 = inverted Bit 0: Inverter Ext. input 1 (Pin 2) Bit 1: Inverter Ext. input 2 (Pin 5)
737	Input selector 1	2	1209	0 = Input not selected (default) 1 = Input selected Bit 0: Qint. 1 Bit 1: Qint. 2 ... Bit 23: Qint. 24 Bit 24: Ext. input 1 (Pin 2) Bit 25: Ext. input 2 (Pin 5)

Address	Content	#Registers	Ref. IO-Link Index	Comment
739	Logic 1	1	1210	1 = And 2 = Or (default)
740	Timer 1 mode	1	1211	0 = Deactivated 1 = T-on delay 2 = T-off delay 3 = T-on/T-off delay 4 = Impulse
741	Time 1 setup	1	1212	Time value in ms. 1 - 30,000 (Default: 1)
742	Inverter 1	1	1213	0 = Not inverted (default) 1 = inverted
743	Input selector 2	2	1214	0 = Input not selected (default) 1 = Input selected Bit 0: Qint. 1 Bit 1: Qint. 2 ... Bit 23: Qint. 24 Bit 24: Ext. input 1 (Pin 2) Bit 25: Ext. input 2 (Pin 5)
744	Logic 2	1	1215	1 = And 2 = Or (default)
745	Timer 2 mode	1	1216	0 = Deactivated 1 = T-on delay 2 = T-off delay 3 = T-on/T-off delay 4 = Impulse
746	Time 2 setup	1	1217	Time value in ms. 1 - 30,000 (Default: 1)
747	Inverter 2	1	1218	0 = Not inverted (default) 1 = inverted
748	Input selector 3	2	1219	0 = Input not selected (default) 1 = Input selected Bit 0: Qint. 1 Bit 1: Qint. 2 ... Bit 23: Qint. 24 Bit 24: Ext. input 1 (Pin 2) Bit 25: Ext. input 2 (Pin 5)
749	Logic 3	1	1220	1 = And 2 = Or (default)
750	Timer 3 mode	1	1221	0 = Deactivated 1 = T-on delay 2 = T-off delay 3 = T-on/T-off delay 4 = Impulse
751	Time 3 setup	1	1222	Time value in ms. 1 - 30,000 (Default: 1)
752	Inverter 3	1	1223	0 = Not inverted (default) 1 = inverted

Address	Content	#Registers	Ref. IO-Link Index	Comment
753	Input selector 4	2	1224	0 = Input not selected (default) 1 = Input selected Bit 0: Qint. 1 Bit 1: Qint. 2 ... Bit 23: Qint. 24 Bit 24: Ext. input 1 (Pin 2) Bit 25: Ext. input 2 (Pin 5)
754	Logic 4	1	1225	1 = And 2 = Or (default)
755	Timer 4 mode	1	1226	0 = Deactivated 1 = T-on delay 2 = T-off delay 3 = T-on/T-off delay 4 = Impulse
756	Time 4 setup	1	1227	Time value in ms. 1 - 30,000 (Default: 1)
757	Inverter 4	1	1228	0 = Not inverted (default) 1 = inverted

7 Operation

Simultaneous operation via IO-Link and the control panel are not possible.



NOTE

If no settings are made on the sensor for 5 minutes, standby mode (display off) is activated to save electricity. The settings made – and not confirmed via the SET pushbutton – are not saved. To quit standby mode, one of the operating keys must be pushed.

7.1 Control elements

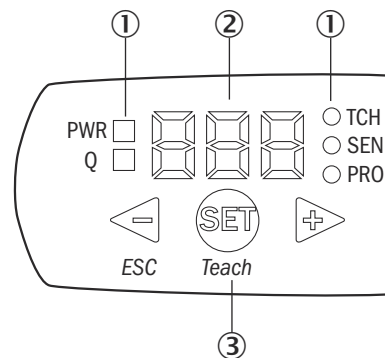


Figure 9: Control elements

Table 12: Control elements and functions

Num-ber	Name	Function
1	PWR	Lights up when the voltage supply is connected. Flashes when IO-Link communication is active.
	Q	Lights up when a color is taught in in the field of view.
	TCH	Illuminates when the “teach-in” menu is selected.
	SEN	Illuminates when the “sensitivity” menu is selected.
	PRO	Illuminates when the “advanced settings” menu is selected.
2	Segment display	Shows menu item, values, or qualities.
3	Plus	Scrolls through menu items or increases values.
	SET/Teach	Press < 1 s: Opens the menu, confirms entries, or switches to lower-level menus. Press > 1 s: Triggers teach-in quick access. The last selected teach-in mode (Single Value or Multi Value) is run on Q1.
	Minus/ESC	Switches to the previous menu item, decreases values, or cancels the current operation (press for > 3 s).

7.2 Navigation tree, general

Table 13: List of abbreviations

Display	Meaning
Add	Add another teach-in to the existing teach-in
At	Blanking

Display	Meaning
b-F	Best Fit mode
bSY	Busy
Cod	Coded mode
CoL	Color
dLY	Delay
dSP	Display switch
Err	Error
FUII	Number of colors that can be taught in exceeded
Job	Parameter sets
Jo1	Parameter set 1
Jo2	Parameter set 2
Jo3	Parameter set 3
Jo4	Parameter set 4
Jo5	Parameter set 5
LoA	Load
LoC	Locked
LOG	Input function for Smart Task
nF	Deactivate pin
n P	Multi-Value teach-in
oFF	Off
PI2	Pin 2 configuration
PI5	Pin 5 configuration
Pro	Pro level (advanced settings)
q_1	Switching output 1
q_2	Switching output 2
q_3	Switching output 3
q_4	Switching output 4
q-F	Output Mode
rES	Reset
rSP	Response time
Sen	Sensitivity
Std	Standard
Sto	Store
tch	Teach-in
toF	Timer – OFF delay
ton	Timer – ON delay
tP	Pulse generator
tq1	Teach-in switching output 1
tq2	Teach-in switching output 2
tSh	Switch-on/switch-off delay (on/off delay)
tur	Turn (display)

7.3 Activating or deactivating the pushbutton lock

1. Press and hold the plus button for 10 seconds.



2. The pushbutton lock is active or deactivated.

7.4 Resetting the device (factory setting)

Resetting to factory settings deletes all saved settings (jobs).



Figure 10: Factory Reset menu

In the Settings menu

1. Open the menu with the SET pushbutton
2. Select PRO with the +/- pushbutton
3. Confirm the selection with the SET pushbutton
4. Select rES with the +/- pushbutton
5. Open the Factory Reset menu with the SET pushbutton
6. Select Factory Reset YES with the +/- pushbutton
7. Confirm the selection with the SET pushbutton
 - The display shows Factory Reset. The factory settings are active.

7.5 Teach-in

7.5.1 Teach-in modes

The CSS color sensor offers two different teach-in modes:

Single Value Teach-in

For a single value teach-in, one teach-in point is recorded. The sensor then has exactly one teach-in color available. Deviations from the teach-in are always determined against this one color.

This teach-in is recommended when:

- the color is uniform.
- the conditions are stable
 - no gloss
 - constant distance
 - uniformly aligned objects (position and angle)
- the detection of this teach-in value needs to be very accurate, i.e., a high-resolution color comparison is desired.

Multi Value Teach-in

For a multi value teach-in, several teach-in values can be recorded dynamically. Deviations from the teach-in are always determined against this taught-in color range. This teach-in is particularly suitable for structured or fluctuating color gradients. Structured surfaces such as wood can thus be distinguished from each other in a very stable manner.

7.5.2 Teach-in via control panel

7.5.2.1 Single value teach-in

A single value teach-in is used to teach-in a single color. To do so, the object must be in the field of view, i.e. within the light spot. The light spot should only capture the color to be taught in. Because only the object needs to be taught in, not the background.

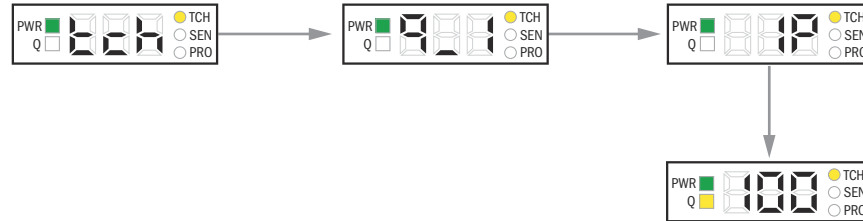


Figure 11: Single Value Teach-in

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select the **tch** menu with the **SET** pushbutton
3. Confirm the selection with the **SET** pushbutton
4. Select the desired switching output **q_1** with the **+/-** pushbutton
5. Confirm the selection with the **SET** pushbutton
6. Select **1P** with the **+/-** pushbutton
7. Confirm the selection with the **SET** pushbutton
- ✓ A value between 0 and 100 indicates the quality of the teach-in process.

7.5.2.2 Multi value teach-in

For a multi-value teach-in, the object is taught in on the basis of a color range; this can be particularly helpful for structured surfaces or surfaces that are not completely monochromatic (such as wood). Various color points are used to define a target space, around which a tolerance zone (sensitivity) is also defined. This teach-in is therefore not a single color point, but rather an area in the color space.

Move object/mark through the light spot during teach-in.

Only the object needs to be taught in, not the background.

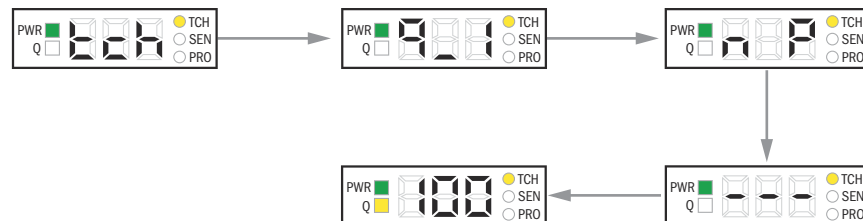


Figure 12: Multi Value Teach-in

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select the **tch** menu with the **SET** pushbutton
3. Confirm the selection with the **SET** pushbutton
4. Select the desired switching output **q_1** with the **+/-** pushbutton
5. Confirm the selection with the **SET** pushbutton
6. Select **n P** with the **+/-** pushbutton
7. Confirm the selection with the **SET** pushbutton
- ✓ A value between 0 and 100 indicates the quality of the teach-in process.

7.5.3 Teach-in - external teach-in

An input pin must be configured to execute the teach-In via an external input. The external teach-in is always a single-value teach-in.
The following pins can be used for an external teach-in:

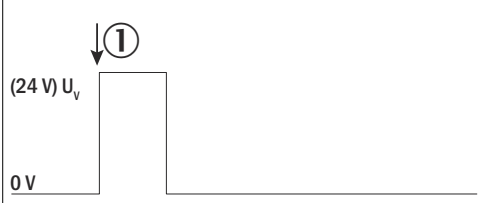
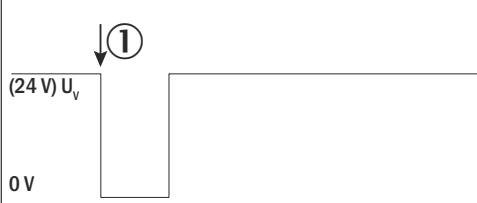
Table 14: External teach-in pin

xBxxxxx5A	xBxxxxx8A
Pin 2 Teach QL1: External teach-in for QL1 Teach QL2: External teach-in for QL2	Pin 1 Teach QL1: External teach-in for QL1 Teach QL2: External teach-in for QL2
Pin 5 Teach QL1: External teach-in for QL1 Teach QL2: External teach-in for QL2	Pin 5 Teach QL1: External teach-in for QL1 Teach QL2: External teach-in for QL2

Coming from the RUN menu:

1. Set the desired pin to "Teach QL".
 2. Position the object in the light spot.
 3. Activate teach-in via the control cable (ET). (Level active: U_B , 24 V)
- ✓ The teach-in process is complete.

Table 15: External teach-in

Push-pull	NPN
	

① Teach point

7.6 Additional settings

7.6.1 Output Mode

The color sensor has 24 color memory locations. These can be assigned to up to 4 switching outputs. One color can be taught-in at each color memory location. During the process (RUN mode), the sensor compares the detected color with the active color memory location.

Output Mode Standard (Std)

One or more colors are assigned to each of the up to 4 switching outputs QL1-4. A maximum of four states can be monitored via the switching outputs. If the colors of two switching outputs need to be detected, both switching outputs are active (high).

Output Mode Best Fit (b-F)

Only one switching output can be active (high) at a time. The sensor selects the switching output with the highest CMV (= Color Matching Value).

Output Mode Coded (Cod)

The switching outputs are considered to be binary coded. This means up to 16 states (= 15 colors) can be distinguished via 4 QL. The table below provides an overview of this.

	QL4	QL3	QL2	QL1
Color 1	-	-	-	x

	QL4	QL3	QL2	QL1
Color 2	-	-	X	-
Color 3	-	-	X	X
Color 4	-	X	-	-
...				
Color 15	X	X	X	X
No Teach-in color active	-	-	-	-

For the xBxxxxx5A variants, only 3 colors and the “No Teach-in color active” state can be mapped in Coded mode

Selecting the output mode on the display



Figure 13: Output Mode

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select **PRO** with the +/- pushbutton
3. Confirm with the **SET** pushbutton.
4. Select **q-F** with the +/- pushbutton
5. Confirm with the **SET** pushbutton.
6. Select the desired Output Mode with the +/- pushbutton
7. Confirm the selection with the **SET** pushbutton

7.6.2 Setting the sensitivity

The sensitivity is specified as the threshold of the CMV (= Color Matching Value). This indicates how close the detected color value is to the taught-in color value (teach-in):

- 999 = absolutely same color values
- 000 = greatest possible dissimilarity

The sensitivity can therefore be set as the threshold of the CMV from 000 to 999.

Selecting the sensitivity on the display



Figure 14: Sensitivity

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select the **Sen** menu with the +/- pushbutton.
3. Confirm the selection with the **SET** pushbutton
4. Select **q_1** with the +/- pushbutton.
5. Select **265** with the +/- pushbutton.
6. Confirm the selection with the **SET** pushbutton

7.6.3 Setting the switch-on and switch-off delay



Figure 15: Sensitivity

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select the **dLY** menu with the +/- pushbutton.
3. Confirm the selection with the **SET** pushbutton
4. Select Multi **q_1** with the +/- pushbutton
5. Confirm the selection with the **SET** pushbutton
6. Set desired delay type and delay time.
7. Confirm the selection with the **SET** pushbutton

7.6.4 Setting the response time

The sensor offers the following response times for selection:

- 36 μ s
- 72 μ s
- 150 μ s
- 300 μ s
- 600 μ s

As a general rule, the color resolution of the sensor is most accurate at high response times. The response time should therefore be set as high as possible, and as low as necessary.

Selecting the response time on the display



Figure 16: Response Time

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select **rSP** with the +/- pushbutton
3. Confirm with the **SET** pushbutton.
4. Select the desired response time with the +/- pushbutton
5. Confirm with the **SET** pushbutton

7.6.5 Pin settings

Multifunctional pins are available to which different functions can be assigned.

Table 16: Pin settings for xBxxxx5A

xBxxxxx5A	Function
Pin 2	Output or input
Pin 5	Input

Table 17: Pin settings for xBxxxx8A:

xBxxxxx8A:	Function
Pin 1	Output or input
Pin 5	Input

Available configurations are:

Pin 2 (xBxxxxxx5A) / pin 1 (xBxxxxxx8A)

- Ext. Input Smart Task (LoC): Input function for the smart task A00
- Blanking (At): If the pin is HIGH, no switching outputs are active
- Output QL1 (q_1): Switching output QL1
- Output QL2 (q_2): Switching output QL2 (only available for xBxxxxxx5A)
- Teach-in QL1 (tq1): External teach-in for QL1
- Teach-in QL2: External teach-in for QL2
- Activate Job: This selection must be activated if you want to switch between different “jobs” (sensor statuses with stored colors and configurations) via external switch inputs on the multifunctional pins. This function supports easy format management in the customer application.

Pin 5

- Ext. Input Smart Task (LoC): Input function for the smart task A00
- Blanking (At): If the pin is HIGH (tq1), no switching outputs are active
- Teach-in QL1 (q_1): External teach-in for QL1
- Teach-in QL2 (q_2): External teach-in for QL2
- Activate Job: This selection must be activated if you want to switch between different “jobs” (sensor statuses with stored colors and configurations) via external switch inputs on the multifunctional pins. This function supports easy format management in the customer application.

If job switching is configured via input pins, job switching via the control panel is not possible.

If both input lines are configured for job switching, switching between jobs is performed according to the following table:

Table 18: Jobs

IN2 Low		IN2 High	
Job 1	↔	Job 2	IN1 Low
↓↑	↔	↓↑	
Job 3	↔	Job 4	IN1 High

IN1 = Activate Job, IN2 = Activate Job

IN2 = Activate Job, IN1 = Activate Job

As long as only one input line is configured for job selection, it is only possible to switch between two jobs:

At IN2 between the columns in the table.

Between the rows for IN1.

For example, with IN2 between job 1 and 2 or with IN1 between job 1 and 3.

Selecting the pin setting on the display



Figure 17: Pin 2 Setting



Figure 18: Pin 5 Setting

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select **Pro** with the +/- pushbutton

3. Confirm with the **SET** pushbutton.
4. Select **pin 2** or **pin 5** with the +/- pushbutton
5. Confirm with the **SET** pushbutton.
6. Select desired function.
7. Confirm with the **SET** pushbutton.

7.6.6 Aligning display

If the sensor is mounted at a 180° rotated position, the display can be rotated accordingly.

The available options are

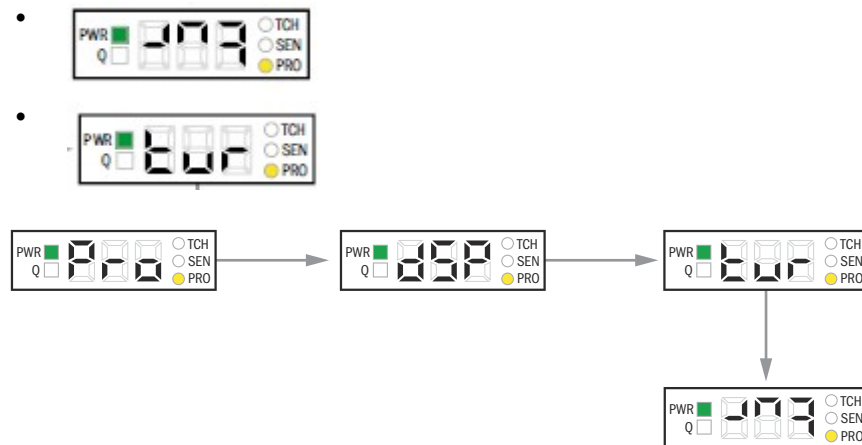


Figure 19: Display Direction menu

In the **Settings** menu

1. Select **Pro** with the +/- pushbutton.
2. Confirm the selection with the **SET** pushbutton
3. Select **dSP** with the +/- pushbutton
4. Confirm the selection with the **SET** pushbutton
5. Select the desired direction with the +/- pushbutton
6. Confirm the selection with the **SET** pushbutton
 - The display shows **tur** in the respective direction

7.6.7 Activating jobs

The sensor continuously saves the current configuration to the job selected here. The job will therefore be saved in all cases.

Selecting Activate Job on the display

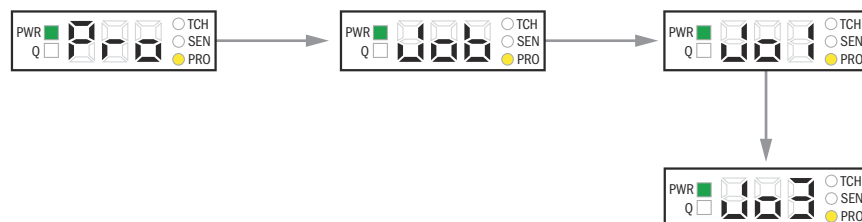


Figure 20: Activate Job

Coming from the RUN menu:

1. Open the menu with the **SET** pushbutton
2. Select **Pro** with the +/- pushbutton
3. Confirm with the **SET** pushbutton.
4. Select **Job** with the +/- pushbutton

5. Confirm with the **SET** pushbutton
6. Select the desired job with the **+/-** pushbutton
7. Confirm the selection with the **SET** pushbutton

7.6.8 Other displays and functions

Control panel locked



If the device is undergoing an internal process (e.g., reading or storing parameter sets or teaching-in via IO-Link), the control panel is locked and the device shows “bSY” on the segment display.

Short-circuit and overcurrent detection



In the event of a short-circuit, Err appears on the display and the Q LED flashes.

Live measured value (run mode)

In run mode, the device displays the current value.



Display standby



NOTE

Control panel standby mode is not activated when a teach-in process is ongoing or while an error message is displayed.

If no settings are made on the device for 5 minutes, standby mode is activated to save electricity. Any settings made which have not been confirmed are not adopted.

To quit standby mode, one of the operating keys must be pushed.

8 Troubleshooting

8.1 Possible errors during commissioning

LED indicator/fault pattern	Cause	Measures
- Q-LED flashes - Indicator on display "Err"	- Short-circuit / Overcurrent - Sensor is not connected properly	- Disconnect sensor from the power network - Check pin assignment - Reconnect sensor - Check the current at the switching output
Low quality of teach after teach-in	Variance of the individual teach-in values for a multi-value teach-in is too large.	Teach in object again

8.2 Possible errors during operation

Table 19: Troubleshooting during operation

Display, error situation	Cause	Measure
No switching event any more	• Sensor contaminated • Target has changed	• Clean sensor • Check parameter settings • Perform teach process again
Full	Number of colors taught in exceeded.	The number of taught-in colors depends on the selected scan response time.

9 Maintenance

9.1 Maintenance

During operation, the device works maintenance-free.

Depending on the assignment location, the following preventive maintenance tasks may be required for the device at regular intervals:

Table 20: Maintenance schedule

Maintenance work	Interval	Implementation
Clean housing and front screen	Cleaning interval depends on ambient conditions and climate	Specialist
Check screw connections and plug connectors	Every 6 months	Specialist

9.2 Cleaning the device

At regular intervals (e.g., weekly), check the light emission window and the housing of the device for dirt. This is especially relevant in harsh operating environments (dust, abrasion, damp, fingerprints, etc.). The lens of the light emission window must be kept clean and dry during operation.



NOTICE

Device damage due to improper cleaning!

Improper cleaning may result in device damage.

- Only use suitable cleaning agents.
- Never use sharp objects for cleaning.

Cleaning the light emission window



NOTICE

Damage to the light emission window!

Reduced reading performance due to scratches or streaks on the light emission window!

- ▶ Clean the light emission window only when wet.
- ▶ Use a mild cleaning agent that does not contain powder additives. Do not use aggressive cleaning agents, such as acetone, etc.
- ▶ Avoid any movements that could cause scratches or abrasions on the light emission window.
- ▶ Only use cleaning agents suitable for the lens material.



NOTE

Static charge may cause dust particles to stick to the light emission window. This effect can be avoided by using an anti-static glass cleaner in combination with the SICK lens cloth (can be obtained from www.sick.com).



NOTE

If the light emission window is scratched or damaged (cracked or broken), the device must be replaced. Contact SICK Service to arrange this.

Cleaning the housing

In order to ensure that the heat produced by the internal power loss is adequately dissipated, the housing surface must be kept clean.

10 Decommissioning

10.1 Disassembly and disposal

Disassembling the device

1. Switch off the supply voltage to the device.
2. Detach all connecting cables from the device.
3. If the device is being replaced, mark its position and alignment on the bracket or surroundings.
4. Detach the device from the bracket.

Disposing of the device

Any device which can no longer be used must be disposed off in an environmentally friendly manner in accordance with the applicable country-specific waste disposal regulations.



NOTE

Disposal of batteries, electric and electronic devices

- According to international directives, batteries, accumulators and electrical or electronic devices must not be disposed of in general waste.
- The owner is obliged by law to return this devices at the end of their life to the respective public collection points.



■ This symbol on the product, its package or in this document, indicates that a product is subject to these regulations.

10.2 Returning devices

- Do not dispatch devices to the SICK Service department without consultation.



NOTE

To enable efficient processing and allow us to determine the cause quickly, please include the following when making a return:

- Details of the contact person
- Description of the application
- Description of the fault that occurred

11 Technical data

11.1 Dimensional drawing

CSX High Speed TW 13 mm, light emission long side

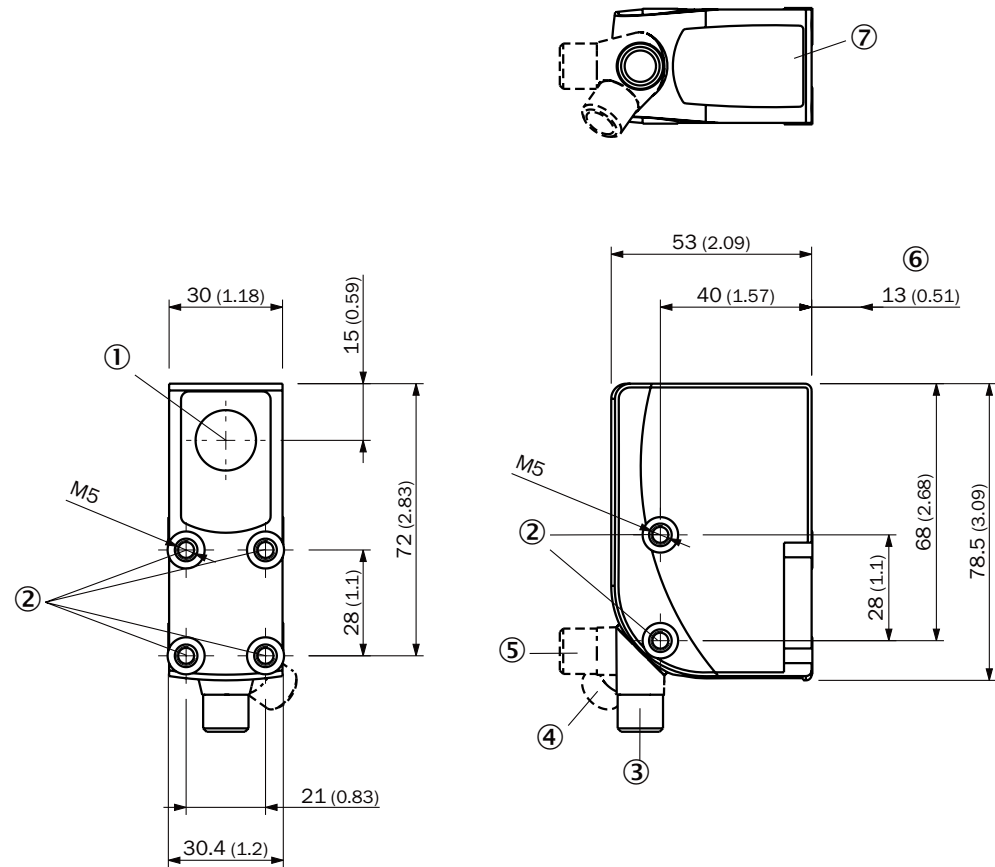


Figure 21: CSX High Speed TW 13 mm, light emission long side

- ① Optical axis light emission long housing side
- ② M5 threaded mounting hole
- ③ Male connector M12, delivery state
- ④ M12 male connector, end stop right
- ⑤ M12 male connector, end stop left
- ⑥ Sensing distance
- ⑦ Display and setting elements

CSX High Speed TW 13 mm, light emission short side

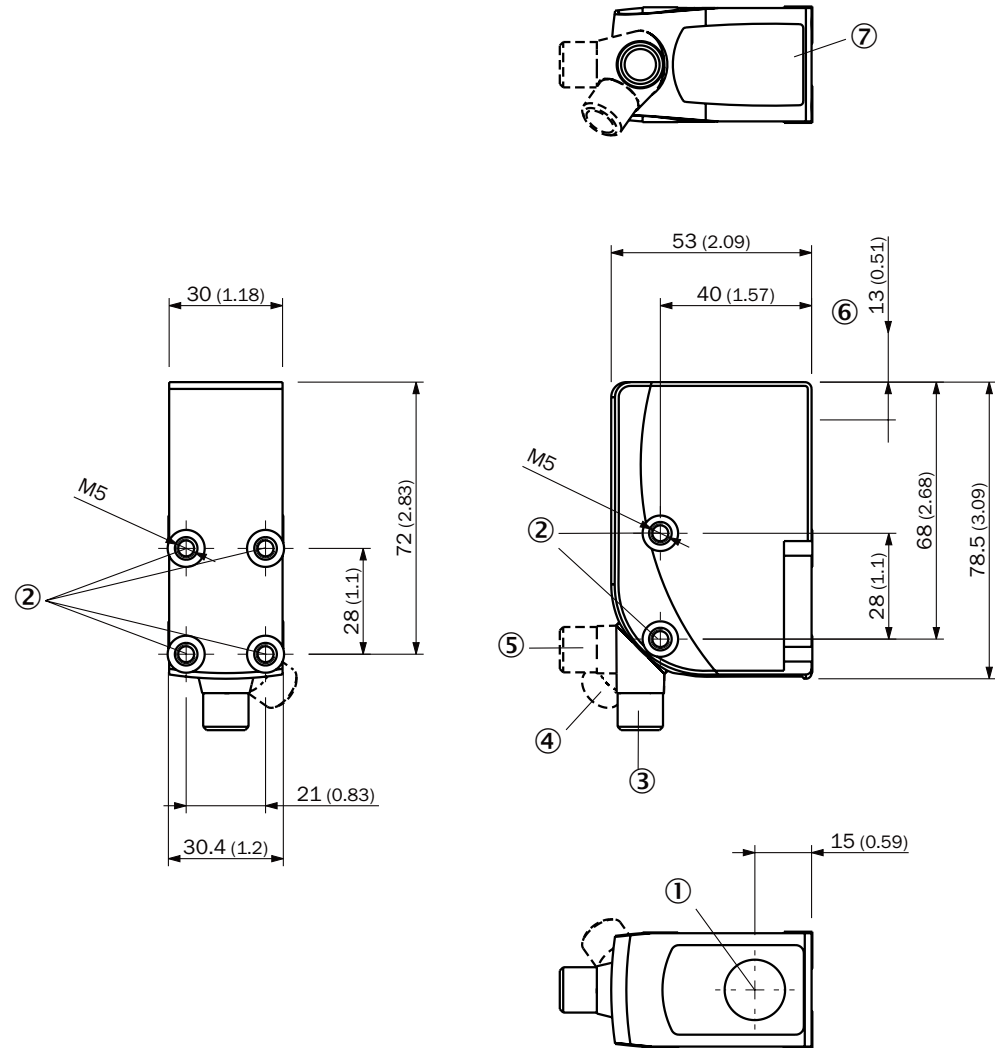


Figure 22: CSX High Speed TW 13 mm, light emission short side

- ① Optical axis light emission short housing side
- ② M5 threaded mounting hole
- ③ Male connector M12, delivery state
- ④ M12 male connector, end stop right
- ⑤ M12 male connector, end stop left
- ⑥ Sensing distance
- ⑦ Display and setting elements

CSX High Speed TW 60 mm, light emission long side

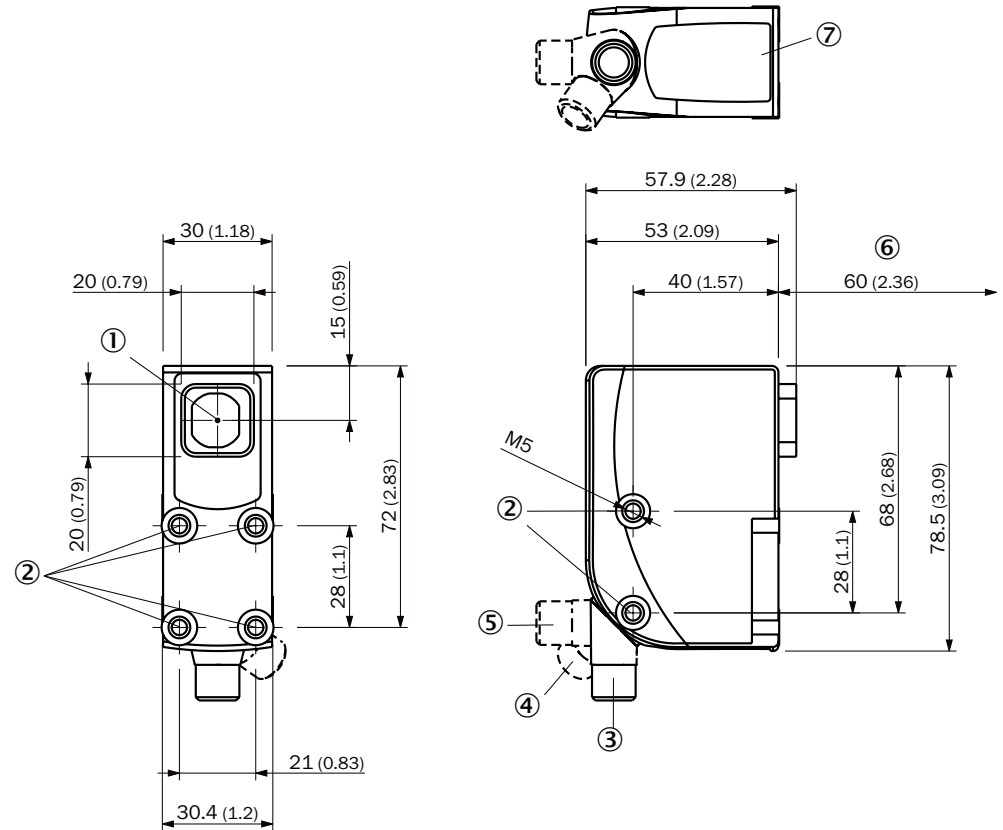


Figure 23: CSX High Speed TW 60 mm, light emission long side

- ① Optical axis light emission long housing side
- ② M5 threaded mounting hole
- ③ Male connector M12, delivery state
- ④ M12 male connector, end stop right
- ⑤ M12 male connector, end stop left
- ⑥ Sensing distance
- ⑦ Display and setting elements

CSX High Speed TW 60 mm, light emission short side

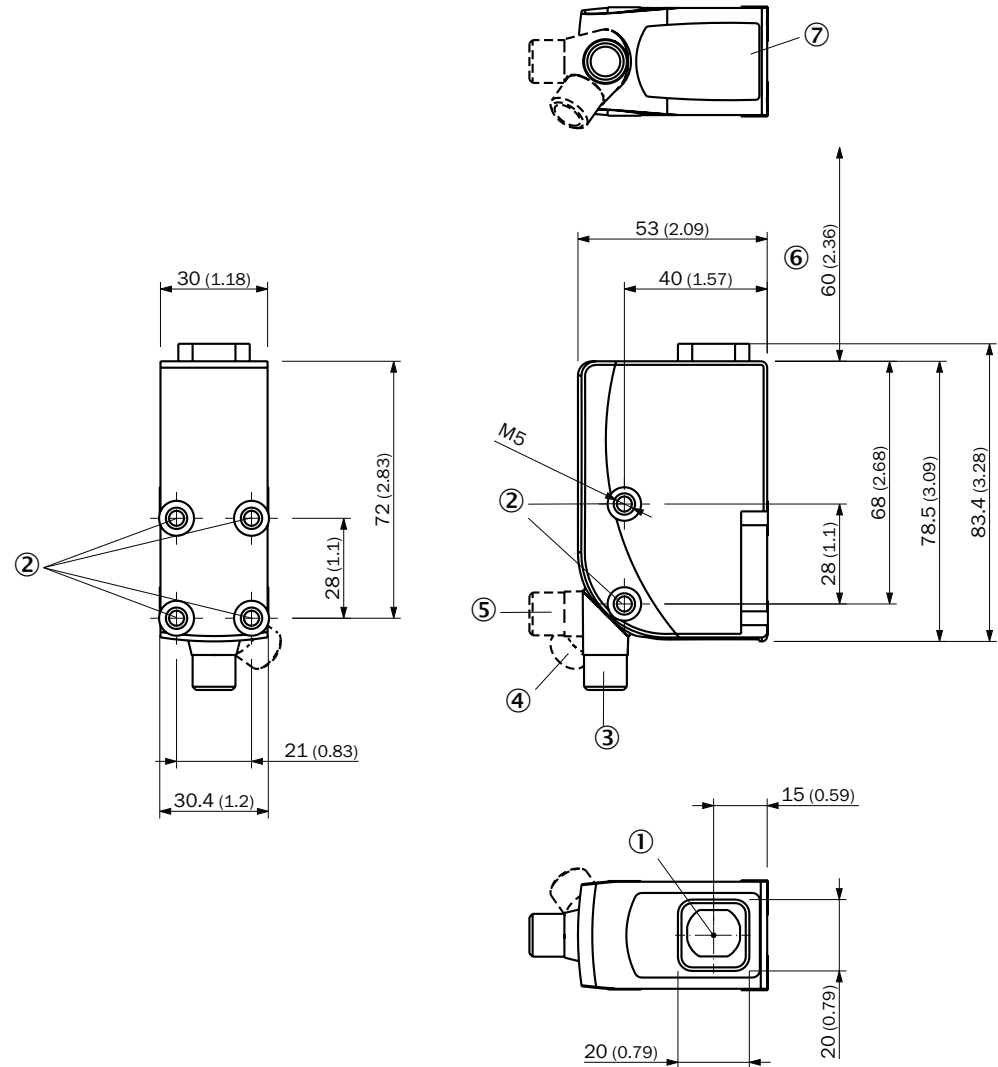


Figure 24: CSX High Speed TW 60 mm, light emission short side

- ① Optical axis light emission short housing side
- ② M5 threaded mounting hole
- ③ Male connector M12, delivery state
- ④ M12 male connector, end stop right
- ⑤ M12 male connector, end stop left
- ⑥ Sensing distance
- ⑦ Display and setting elements

CSS High Speed TW 13 mm

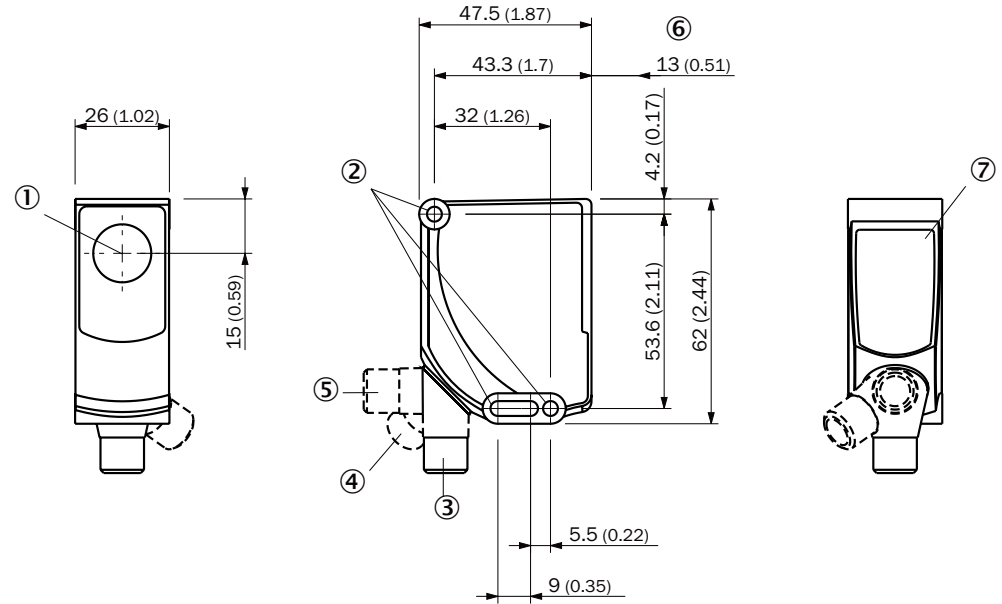


Figure 25: CSS High Speed TW 13 mm

- ① Optical axis
- ② Fixing hole
- ③ Male connector M12, delivery state
- ④ M12 male connector, end stop right
- ⑤ M12 male connector, end stop left
- ⑥ Sensing distance
- ⑦ Display and setting elements

CSS High Speed TW 60 mm

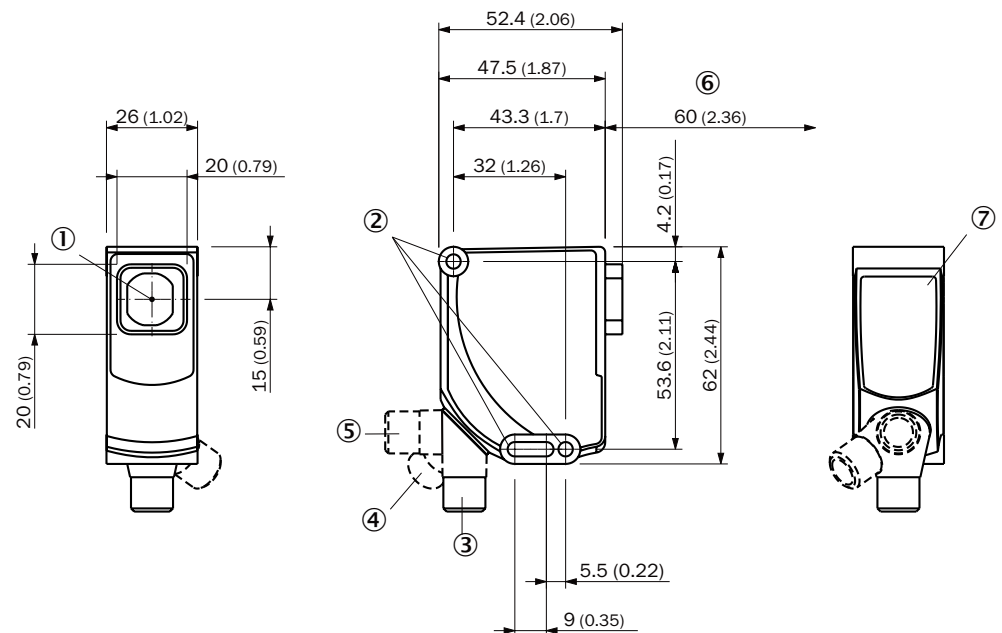


Figure 26: CSS High Speed TW 60 mm

- ① Optical axis
- ② Fixing hole

- ③ Male connector M12, delivery state
- ④ M12 male connector, end stop right
- ⑤ M12 male connector, end stop left
- ⑥ Sensing distance
- ⑦ Display and setting elements

12 Accessories



NOTE

Accessories can be found on the online product page at:

► www.sick.com/CSS_CSX_High_Speed

13 Annex

13.1 EU declaration of conformity

The EU declaration of conformity and other certificates can be downloaded from the Internet at:

► www.sick.com/CSS_High_Resolution

13.2 Certification according to UL60947-5-2



The CSS/CSX color sensors are certified in accordance with UL60947-5-2 if it is supplied with power by LPS or Class 2 power supply units.

The certification is only valid with corresponding device identification on the type label of the respective device.

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