OPERATING INSTRUCTIONS

Counter Stick – AKS-IXD1CXD15KXA71

Modules and gateways

SICK
Sensor Intelligence.

Described product

Counter Stick

AKS-IXD1CXD15KXA71

Manufacturer

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Germany

Legal information

Original document

This document is an original document of SICK AG.

Contents

1 About this document

These operating instructions supplement the supplied Quickstart guide and include additional information and more detailed descriptions of working with the AKS-IXD1CXD15KXA71 Counter Stick. The operating instructions are intended to be used by qualified personnel and electrical specialists.

1.1 Explanation of symbols

Physical damage

Warnings in these operating instructions are labeled with symbols. These warnings must be observed at all times and care must be taken to avoid physical damage.

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

Tips and recommendations

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

1.2 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:

- Failing to observe the operating instructions
- Incorrect use
- Use by untrained personnel
- Unauthorized conversions
- Technical modifications
- Use of unauthorized spare parts/consumable parts

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.

1.3 Scope of delivery

Included in the scope of delivery:

Counter Stick AKS-IXD1CXD15KXA71

Supplied documentation:

Quickstart

IODD supplementary sheet

1.4 Customer service

If you require any technical information, our customer service department will be happy to help. See the back page for your agency.

NOTE

NOTE!

In order to allow us to deal with the matter quickly, please note down the type designation and part number before calling. You can find the type designation and part number on the type label. see "Type label", page 7

1.5 EU declaration of conformity

The EU declaration of conformity can be downloaded from the Internet **www.sick.com/counter_stick** .

2 Safety information

2.1 Intended use

The AKS-IXD1CXD15KXA71 Counter Stick is an electronic device. The Counter Stick is intended to be used for the following activities:

- Counting binary switching signals

The Counter Stick must only be operated in a supply network protected with 8 A fuses. The maximum transferable data volume is 2 KB.

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 neither described nor mentioned in this documentation.

2.2 Incorrect use

The AKS-IXD1CXD15KXA71 Counter Stick must not be used in explosion-hazardous areas.

Any other use that is not described as intended use is prohibited.

No accessories may be connected which have not been explicitly stipulated, in terms of quantity and properties, and approved by SICK AG.

2.3 Requirements for qualified personnel

NOTICE

Damage to the device in the event of improper handling!

Improper handling may lead to physical damage.

For this reason:

- 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:

- **Qualified personnel**
  are able to carry out the work assigned to them and independently recognize potential risks due to their specialist training, knowledge, and experience, as well as knowledge of the relevant regulations.
- **Electrical specialists**
  are able to carry out work on electrical systems and independently recognize potential risks due to their specialist training, knowledge, and experience, as well as knowledge of the relevant standards and regulations. In Germany, electricians must meet the specifications of the BGV A3 Work Safety Regulations (e.g., Master Electrician). Other relevant regulations applicable in other countries must be observed.

3 Product description

3.1 Type label

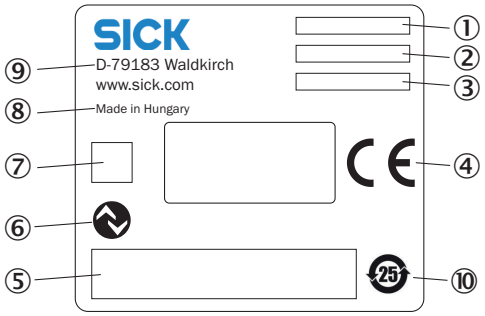
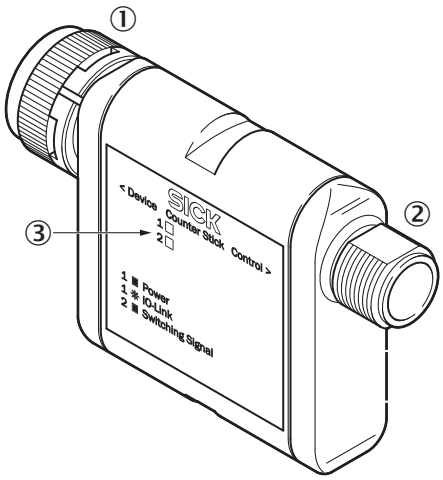


Figure 1: Type label

① Device type
② Dat code and serial number
③ Part number
④ CE mark
⑤ Bar code
⑥ IO-Link symbol
⑦ 2D code
⑧ Country of manufacture
⑨ Manufacturer address
⑩ Chinese RoHs mark

3.2 Setup and function

3.2.1 Setup



① M12 female connector, connection for IO-Link device (Device)
② M12 male connector, connection for PLC (Control)
③ Function indicators (LEDs)

3.2.2 Function

The AKS-IXD1CXD15KXA71 Counter Stick is intended for the following application scenarios:

- Counting binary switching signals (digital input)

3.3 Status indicators and operating elements

Function indicators

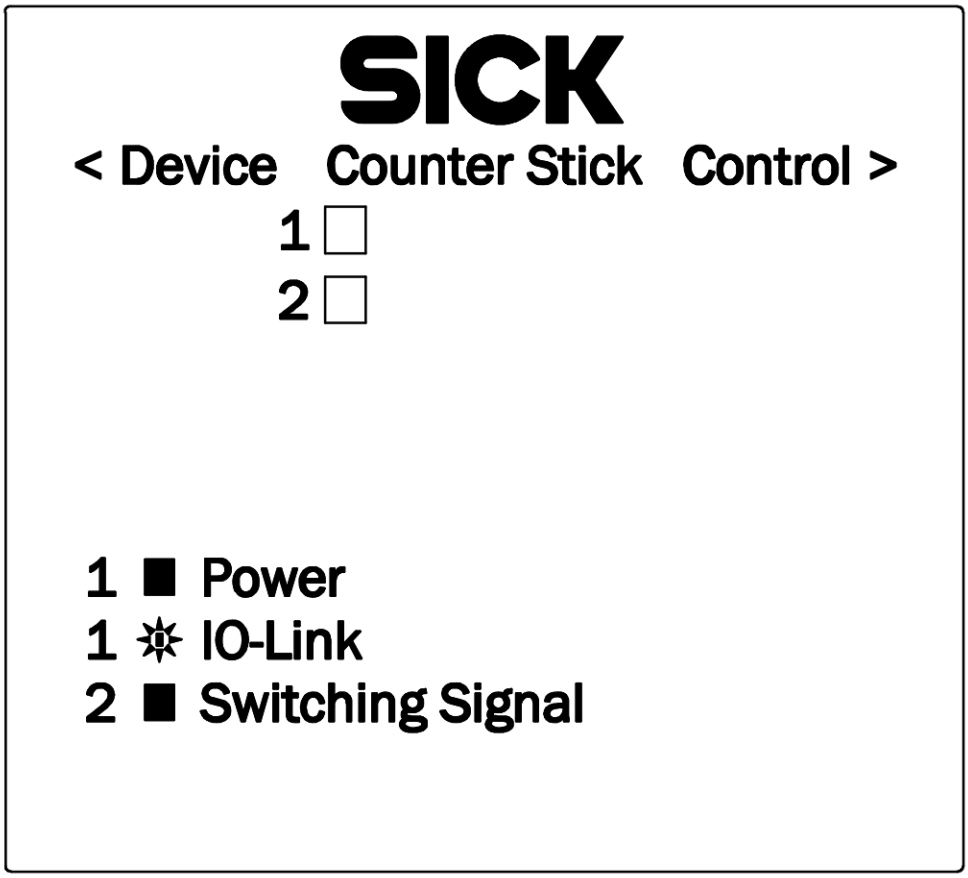


Figure 2: Function indicators

Function indicator	Description
Solid green	Power available
Flashing green	IO-Link communication available
Orange	Visualization of the binary switching signal of the connected device

3.4 Smart task

The A71 counter & debouncer smart function includes the following functions: A00 logic / counter / inverter, A01 counter, and A03 debouncer. This enables switching signals to be counted inside the device. Depending on the current count value, switching signals are generated which can be influenced by logic functions (e.g., window mode), time modes (switch-on delay, switch-off delay, switch-on/off delay, pulses), and inverters.

The input signals 1 and 2 can be debounced, which suppresses disruptive signal peaks. For every rising curve on the smart-function input 1, the count value is increased by 1 (or decreased, depending on counting mode **up** or **down**).

Two independent, adjustable switching thresholds (**low comparator value** and **high comparator value**) each generate a binary switching signal. The **preset mode** enables periodic counting up to the selected upper switching threshold (**high comparator value**), where a switching signal is generated, and begins again with the next rising curve at the **preset**

value. The count value can be reset to “0” at any time or preset to the **preset value** with the corresponding system control. Alternatively, the count value can be reset to “0” with a rising curve on input 2.

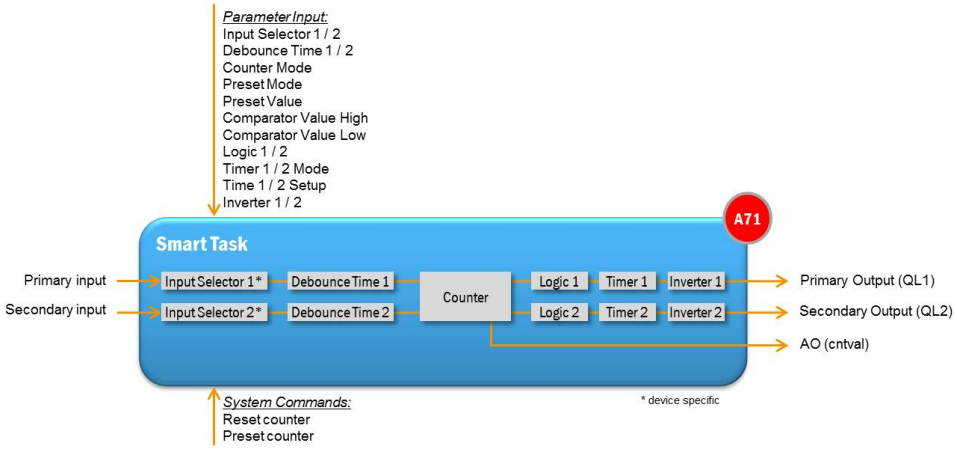


Figure 3: Smart task

Using the relevant configuration, pin 2 (on the PLC side) can be used as an external input (reset counter), as well as an external output (QL2), or it can be deactivated.

SIO mode: In this mode, pin 4 is a digital output. The signal emitted here corresponds to QL1.

Pin2 and Pin5 of the PLC and device side are connected to one another. The maximum counting speed is 1 kHz. The maximum count value is 16383.

The voltage level of the digital input must meet the following requisites for counting:

Low = smaller than 8 V

High = larger than 13 V

4 Mounting

4.1 Mounting the Counter Stick with a cable tie

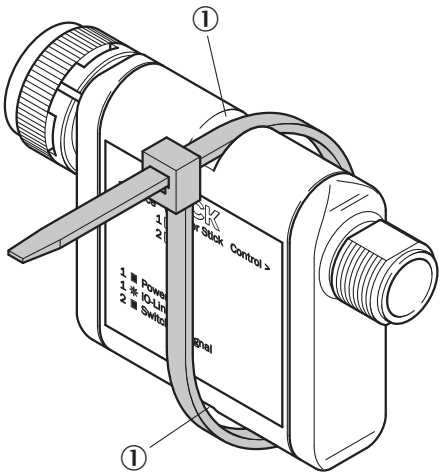
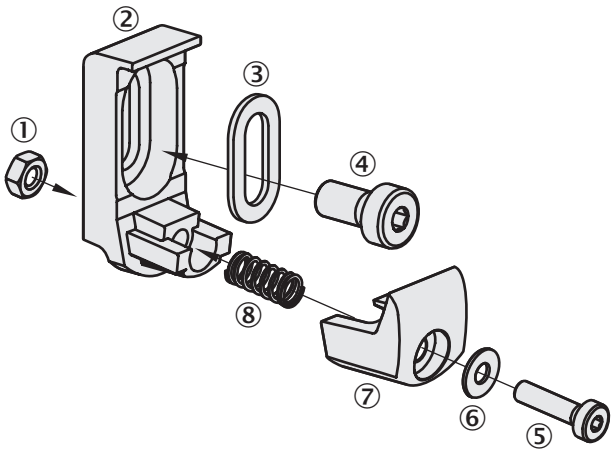


Figure 4: Mounting the Counter Stick with a cable tie

4.2 Mounting the Counter Stick with a C-Fix bracket

The C-Fix bracket is intended for mounting on mounting profiles with T-slots.



① Nut for M3 screw (position 5)
② Lower part
③ Washer
④ M5 screw, not included in scope of delivery
⑤ M3 screw
⑥ Washer
⑦ Upper part
⑧ Spring

1 Mount the lower part of the C-Fix bracket on a level surface as shown in Figure 5.
   - Torque for M5 screw: 3 Nm
2 Mount the upper part on the lower part as shown in Figure 5. Only tighten the M3 screw slightly.

3 Insert the Counter Stick into the C-Fix bracket and press downward gently.

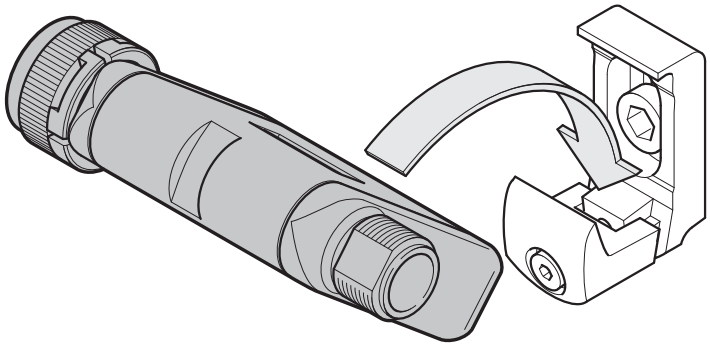


Figure 5: Insert Counter Stick

4 Rotate the Counter Stick until the slot clicks into place in the C-Fix bracket.

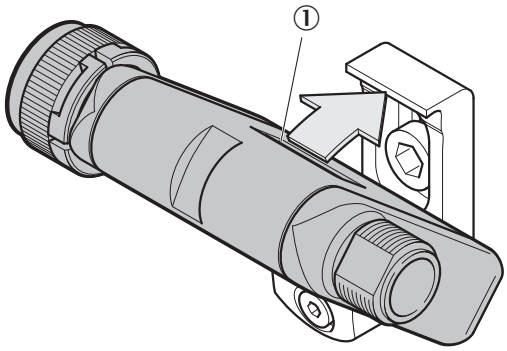


Figure 6: Click Counter Stick into place

① Slot which clicks into place in the C-Fix bracket

5 Secure the Counter Stick using the M3 screw.

- Torque for M3 screw: 1.5 Nm

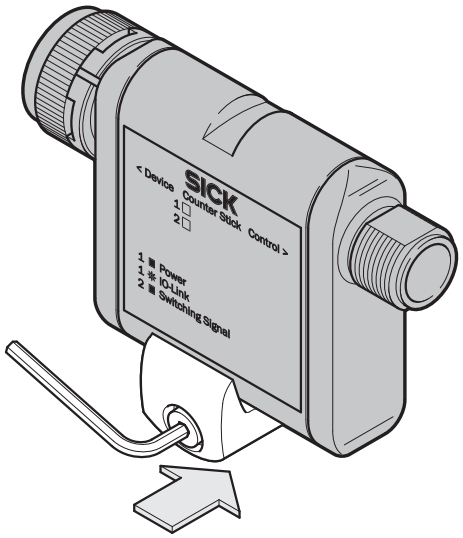


Figure 7: Secure Counter Stick

5 Electrical installation

5.1 Safety

Incorrect supply voltage

NOTICE
Equipment damage due to incorrect supply voltage!
An incorrect supply voltage may result in damage to the equipment.
For this reason:

- The supply voltage may be protected with max. 8 A fuses.

Excessive current load

NOTICE
Equipment damage due to excessive current load!
An excessive current load may result in damage to the equipment.
For this reason:

- Pins 2, 4, and 5 must not be loaded with a current greater than 300 mA.

5.2 Counter Stick electrical connections

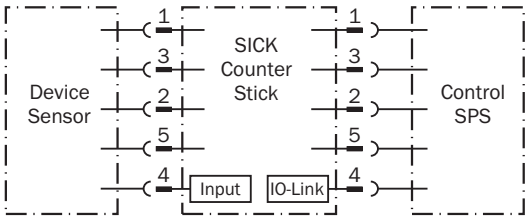


Figure 8: Counter Stick electrical connections *see "Counter Stick electrical connections", page 12*

1 Ensure that the voltage supply is not connected.
2 Connect the Counter Stick to the PLC using a 4-pin or 5-pin M12 cable. Make sure that at least pins 1 and 3 are connected to the supply voltage.
3 Connect the digital input device to the SICK Memory Stick using a 4-pin or 5-pin M12 cable. Make sure that at least pins 1 and 3 are connected to the supply voltage.

5.3 Connection diagrams

5.3.1 Connection diagram for the digital input device

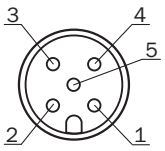


Figure 9: Connection diagram for the IO-Link device, M12 female connector, A-coded, 5-pin

Contact	Signal	Description
1	VDC_IN	+24 V (L+)

Table 1: Connection description for the IO-Link device, M12 female connector, A-coded, 5-pin

Contact	Signal	Description
2	PIN2_SENSOR	Transparent
3	GND_IN	0 V (M)
4	PIN4_SENSOR	IO-Link C
5	PIN5_SENSOR	Transparent

Table 1: Connection description for the IO-Link device, M12 female connector, A-coded, 5-pin

5.3.2 Connection diagram for the digital input device

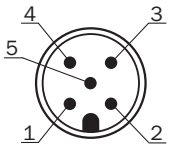


Figure 10: Connection diagram for the PLC, M12 male connector, A-coded, 5-pin

Contact	Signal	Description
1	VDC_OUT	+24 V (L+)
2	PIN2_PLC	Transparent
3	GND_IN	0 V (M)
4	PIN4_PLC/C	IO-Link C
5	PIN5_PLC	Transparent

Table 2: Connection description for the PLC, M12 male connector, A-coded, 5-pin

6 Cleaning and maintenance

SICK devices are maintenance-free. We do recommend checking the screw and male/female connections and cleaning the device at regular intervals.

7 Disposal

Please observe the following when disposing of the device:

- Do not dispose of the device in domestic refuse.
- Dispose of the device according to the relevant country-specific regulations.

8 Technical data

NOTE

On the Internet, www.sick.com/counter_stick you can download, save, and print the relevant online data sheet with technical data, dimensions, and connection diagrams for the SICK Memory Stick.

8.1 Dimensions

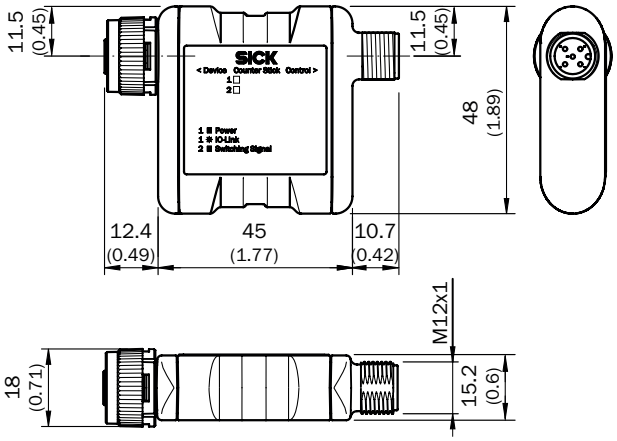


Figure 11: Dimensions of Counter Stick (in mm)

8.2 Electrical system and interface

IO-Link transfer	COM 2: 38.4 kBaud
IO-Link communication	IO-Link specification 1.1
IO-Link port	■ Number: 1 ■ Class: A
Pins 2, 4, and 5	Galvanically connected
Supply voltage	DC 18 to 32 V, protected with max. 8 A fuses
Current consumption	< 35 mA
Load current pins 2, 4, and 5	max. 300 mA
Current consumption with IO-Link device connected	max. 500 mA
Voltage drop on pins 2, 4, and 5	≤ 3 V
Frequency pins 2, 4, and 5	1 kHz

Table 3: Electrical system and interface

8.3 Ambient conditions

Mark of conformity	CE
Protection class	III
Ambient temperature range	■ Operation: –20 °C ... +70 °C ■ Storage: –25 °C ... +75 °C
Enclosure rating	IP 67
Shock resistance (EN 60947-5-2)	30 g 11 ms

Table 4: Ambient conditions

Vibration resistance (EN 60947-5-2)	10 ... 55 Hz, sine, 1 mm amplitude

Table 4: Ambient conditions

8.4 Mechanics

Dimensions	see "Dimensions", page 16
Connections/ports	■ 1 M12 female connector: connection: switching device (digital input) ■ 1 M12 male connector: PLC connection
Enclosure rating	IP 67
Shock resistance (EN 60947-5-2)	30 g 11 ms
Vibration resistance (EN 60947-5-2)	10 ... 55 Hz, sine, 1 mm amplitude

Table 5: Mechanics

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