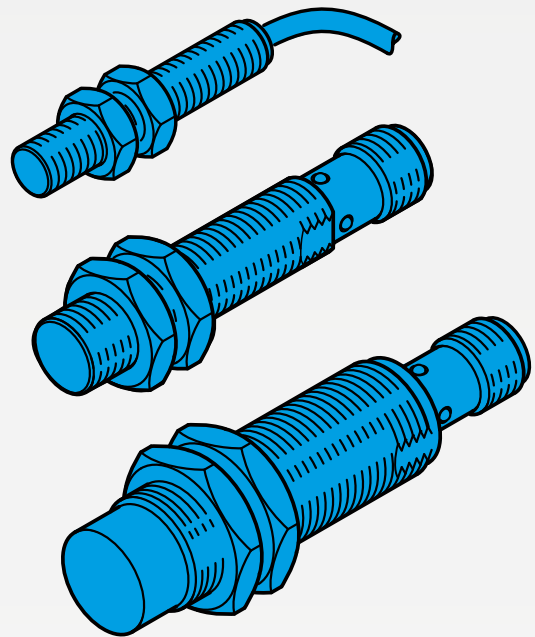


INDUCTIVE PROXIMITY SENSORS WITH IO-LINK

INM, INE



600019-0000EN · Rev 1 · 2026/09

OPERATING INSTRUCTIONS

TABLE OF CONTENTS

1 PRELIMINARY NOTE	4
1.1 About the product	4
1.2 Symbols	4
1.3 Abbreviations, terms	4
2 SAFETY INSTRUCTIONS	5
3 APPLICABILITY OF DOCUMENTATION	5
4 INTENDED USE	5
5 PRODUCT DESCRIPTION	5
5.1 Main features	5
5.2 Product overview Product identification, variants of product	5
6 ASSEMBLY & INSTALLATION ORIENTATION	6
6.1 General conditions for assembly	6
6.2 Installation requirements and spacing guidelines	6
6.2.1 D4, M5, M8, M12, M18 and M30: flush-mounted or shielded installation	6
6.2.2 M8, M12 and M18 non-flush or unshielded installation	7
6.2.3 M30 Non-flush or unshielded installation	7
6.2.4 Sensors installed opposite each other	7
7 ELECTRICAL CONNECTION ELECTRICAL DATA	8
7.1 General notes:	8
7.2 Pin assignment Connection assignment	8
7.2.1 Schematic diagram: D4, M5, M8	8
7.2.2 Schematic diagram: M12, M18, M30	8
8 COMMISSIONING	8
8.1 Operating modes Device operation	8
8.2 Standard I/O mode (SIO)	8
9 LED STATUS INDICATOR	9
9.1 Standard I/O mode (SIO) D4, M5, M8	9
9.2 Standard I/O mode (SIO) M12, M18, M30	9

10 IO-LINK MODE | IO-LINK COMMUNICATION**9**

10.1 IODD.....	10
10.2 Sensor identification	11
10.3 Process data.....	11
10.4 Parameters for the switching output.....	12
10.5 Diagnosis.....	13
10.6 Events.....	13
10.7 IO-Link parameters in detail	13
10.8 Presence detection (SSC).....	13
10.9 Configuring the switching output	14
10.10 Timer	14
10.10.1 Timer mode.....	15
10.10.2 Turned off	15
10.10.3 Switch-on delay (T-on)	15
10.10.4 Switch-off delay (T-off)	16
10.10.5 T-on and T-off delay	16
10.10.6 Single pulse, rising edge	16
10.10.7 Timer delay	17
10.11 Internal sensor parameters	17
10.11.1 Maximum temperature since startup	17
10.11.2 Minimum temperature since startup	17
10.11.3 Detection counter	18
10.11.4 Application-specific tag	18
10.12 Process data variable	18

**11 SWITCHING OUTPUT LOGIC: NO/NC OPERATION
(SELECTABLE VIA IO-LINK)****19**

11.1 General notes	19
11.2 Switching output function: NO/NC (normally open/normally closed)	19
11.3 IO-Link interface.....	19
11.4 IODD file (I/O device description)	20
11.4.1 IO-Link identification	20
11.4.2 IO-Link process data	21
11.4.3 IO-Link basic functions (default and system commands)	21
11.5 Factory setting Default setting.....	22

1 PRELIMINARY NOTE

1.1 ABOUT THE PRODUCT



IMPORTANT! The technical data, the instructions and the instruction leaflet can be found via the QR code on the packaging or alternatively via the article number at www.di-soric.com

1.2 SYMBOLS



Warning symbol about personal harm



Note on efficient and trouble-free operation



Important! Malfunctions or faults are possible if not observed

1.3 ABBREVIATIONS, TERMS

NC	Normally closed (1 = Inverted) (1 = Low-active)
NO	Normally open (0 = Not inverted) (0 = High-active)
PELV	Protective extra low voltage
SELV	Safety extra low voltage
NEC	National Electrical Code
UL	Underwriters Laboratories
SSC	Switching signal channel
SP1	Setpoint 1 (threshold value 1 / switching point 1) (setpoint 1)
SP2	Setpoint 2 (threshold value 2 / switching point 2) (setpoint 2)
PNP output:	Plus switching, connects load with U+
NPN output:	Ground switching, connects load with ground
PP output:	Push-pull output (differential mode: Connects load with ground or U+)
rw	Read and Write
ro	Read-Only
wo	Write-Only
StringT (X)	ASCII string, X characters long
IntegerTX	Signed integer, X bits long
UIntegerTX	Unsigned integer, X bits long
OctetStringT (X)	Octet array, X octets long
PDV	Process Data Variable
I/O	Input/Output
SO	Switching Output

2 SAFETY INSTRUCTIONS

 **WARNING!** The device is not a safety component pursuant to 2006/42/EC and EN 61496-1/-2. The device may not be used for personal protection! Non-compliance can lead to death or serious injury! The device may only be used for the intended purpose!

3 APPLICABILITY OF DOCUMENTATION

These instructions apply only to the inductive IO-Link sensors and only to the extent no new documentation has been published. These operating instructions describe the function, operation and installation of the product for proper use.

4 INTENDED USE

di-soric inductive sensors are suitable for the noncontact detection of ferrous and non-ferrous metallic objects for general position and presence detection in industrial automation applications. The devices operate on the eddy current principle; when a metallic target object approaches the sensor surface, the magnetic field generated by the sensor interacts with the target object and triggers a change in the sensor's status.

The di-soric INM and INE sensors are equipped with IO-Link communication. These devices can be operated and configured via an IO-Link master.

5 PRODUCT DESCRIPTION

5.1 MAIN FEATURES

Our 3-pin IO-Link inductive sensors with an extended detection range (long/high switching distance) meet the highest quality standards and are available in 6 different housing designs: D4, M5, M8, M12, M18, M30, flush or non-flush.

They can be operated in standard I/O mode (SIO); this is the default operating mode. When connected to an IO-Link master, they automatically switch to IO-Link mode and can be easily operated and configured remotely via the IO-Link interface.

Thanks to the IO-Link interface, these devices are significantly more intelligent and offer many additional configuration options, such as settings for switching distance and hysteresis, as well as timer functions for output.

5.2 PRODUCT OVERVIEW | PRODUCT IDENTIFICATION, VARIANTS OF PRODUCT

Below is a list of the di-soric inductive product variants. You can find more information about our inductive proximity sensors in the data sheets and on our website: www.di-soric.com

Product series	Sleeve design	Installation type	Connection
INM	D4	Flush	Cable / Pigtail, M8, 3-pin, A-coded
INE	M5		
INE	M8	Flush / Non-flush	Cable / Connector, M12, 3-pin, A-coded
	M12		
	M18		
	M30		

6 ASSEMBLY & INSTALLATION ORIENTATION

6.1 GENERAL CONDITIONS FOR ASSEMBLY



IMPORTANT! The permitted ambient conditions for operation of the device must be maintained. Technical information on this can be found on di-soric.com. The sensor is to be protected against mechanical loads, e.g., impacts and shocks.

The sensor may be mounted in any position, as long as mounting is performed free of impacts and vibration.



NOTE:

Do not exert any mechanical pressure on the sensor. Following this instruction will prevent detrimental effects on the sensor function.



NOTE:

Be on the lookout for METAL in the vicinity

6.2 INSTALLATION REQUIREMENTS AND SPACING GUIDELINES

The following are examples of the installation instructions for the di-soric inductive sensors in sizes D4, M5, M8, M12, M18 and M30, as well as with and without a flush-mount design.

6.2.1 D4, M5, M8, M12, M18 AND M30: FLUSH-MOUNTED OR SHIELDED INSTALLATION

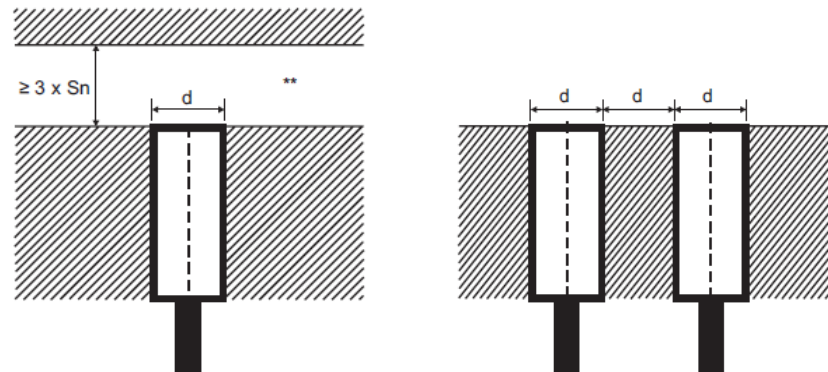
Flush installation is preferred whenever possible. A sensor that is flush-mounted in metal requires a metal-free space in front of the sensor's surface.



NOTE:

In addition, a safe distance from other inductive sensors must be maintained to prevent mutual interference.

** Free zone or non-damping material



Flush-mounted sensors embedded in damping material

Several flush-mounted sensors embedded in damping material



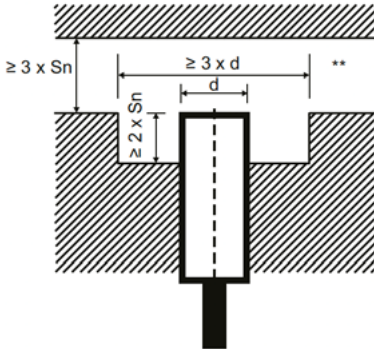
NOTE:

Pre-damping can result in a reduction in the detection range or in unintended detection.

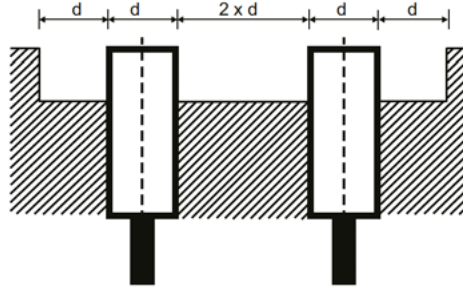
6.2.2 M8, M12 AND M18 NON-FLUSH OR UNSHIELDED INSTALLATION

Without any shielding, the sensor's coil generates a magnetic field. Consequently, the sensor is triggered when a metal object approaches the device from behind, from the side or from the front.

** Free zone or non-damping material



Non-flush sensors embedded in damping material



Several non-flush sensors embedded in damping material

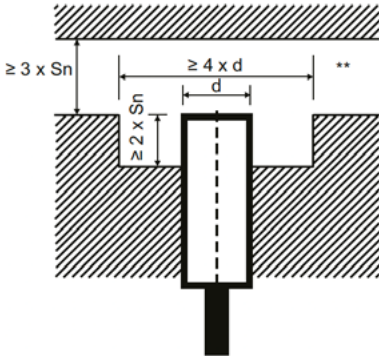


NOTE: More clearance is required to achieve greater operational reliability. This clearance is also present in the threaded housing.

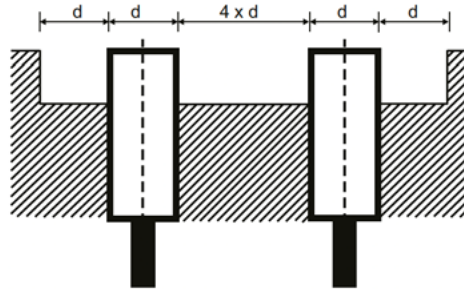
6.2.3 M30 NON-FLUSH OR UNSHIELDED INSTALLATION

The distances between the metal-free zones vary depending on the sensor size and model; refer to the data sheet and the relevant installation instructions to ensure a process-safe installation.

** Free zone or non-damping material



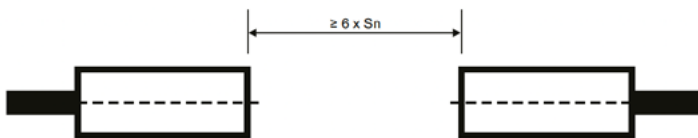
Non-flush sensors embedded in damping material



Several non-flush sensors embedded in damping material

6.2.4 SENSORS INSTALLED OPPOSITE EACH OTHER

If two inductive sensors are installed with their sensing surfaces facing each other, a safety distance must be maintained to prevent mutual interference.



If the sensors are mounted opposite each other, a minimum distance of 6 x Sn (nominal switching distance) must be maintained



NOTE: Please note that the distance is defined relative to the nominal switching distance (Sn) and therefore varies depending on the sensor model and size.

7 ELECTRICAL CONNECTION | ELECTRICAL DATA

7.1 GENERAL NOTES:



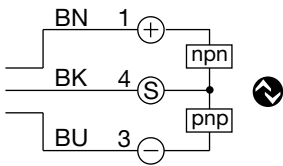
IMPORTANT! The device may only be installed by a qualified electrician. National and international regulations for setting up electrotechnical systems are to be adhered to.

7.2 PIN ASSIGNMENT | CONNECTION ASSIGNMENT

Please note! The pin assignments for the di-soric inductive sensors are shown in the following figures:

7.2.1 SCHEMATIC DIAGRAM: D4, M5, M8

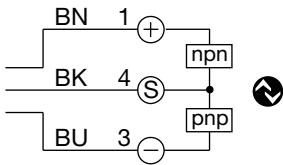
The pin assignments for the INM and INE series with diameters D4, M5 and M8 are shown below.



PIN	Color	Signal	Description
1	Brown	10 to 30VDC	Device power supply
3	Blue	GND	Ground
4	Black	Load	IO-Link / Output / SIO mode

7.2.2 SCHEMATIC DIAGRAM: M12, M18, M30

The pin assignments for the INE series with diameters of M12, M18 and M30 are shown below.



PIN	Color	Signal	Description
1	Brown	10 to 36VDC	Device power supply
3	Blue	GND	Ground
4	Black	Load	IO-Link / Output / SIO mode

8 COMMISSIONING

Due to the switch-on delay (Power ON delay) (tv), the sensor is not ready for operation until approximately 50 ms after the power supply is turned on. If the sensor is connected to an IO-Link master, no additional settings are required. IO-Link communication starts automatically after the IO-Link master sends a wake-up request to the sensor.

8.1 OPERATING MODES | DEVICE OPERATION

The di-soric IO-Link inductive sensors feature a switching output (SO) and can be operated in two different modes: SIO mode (Standard I/O mode) or IO-Link mode.

8.2 STANDARD I/O MODE (SIO)

If the sensor is operating in SIO mode (default setting), an IO-Link master is not required. The device functions as a standard inductive sensor and can be operated via a fieldbus or control unit (e.g., PLC) connected to the sensor's PNP, NPN or push-pull digital input (standard I/O connection). One of the biggest advantages of these inductive sensors is the ability to configure

them via an IO-Link master; after being disconnected from the master, the sensors retain their most recent parameters and configuration settings.

This allows, for example, the sensor's output to be configured as PNP, NPN or push-pull, or timer functions such as T-on and T-off delays to be added, enabling a single sensor to meet multiple application requirements.

9 LED STATUS INDICATOR

9.1 STANDARD I/O MODE (SIO) D4, M5, M8

The INM and INE series from di-soric, available in diameters D4, M5 and M8, are equipped with a yellow LED for status indication. The LED status indicator can be interpreted as follows during normal operation:

Yellow LED	Output	Description
OFF	OFF	N.O. Output; object not present N.C. Output; object present
ON	ON	N.O. Output; object present N.C. Output; object not present
Flashing	f: 2 Hz	Short circuit or overload

9.2 STANDARD I/O MODE (SIO) M12, M18, M30

The INE series, available in M12, M18 and M30 housing sizes, features one yellow and one green LED each, which can be interpreted as follows during standard operation: The LED indicates whether the sensor is in operating mode or not:

Yellow LED	Output	Description
OFF	OFF	N.O. Output; object not present N.C. Output; object present
ON	ON	N.O. Output; object present N.C. Output; object not present
Flashing	f: 2 Hz	Short circuit or overload
Green LED	Output	Description
OFF	-	The sensor is not ready for operation
ON	-	The sensor is ready for operation

10 IO-LINK MODE | IO-LINK COMMUNICATION

IO-Link is a communication system for connecting intelligent sensors and actuators to automation systems.

IO-Link is standardized in the IEC 61131-9 standard.

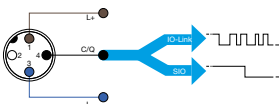
The devices have the following IO-Link specification: IO-Link version V1.1.4, COM2 (38.4 kbaud), Smart Sensor Profile 2nd edition V1.2 SSP 2.1

The device can also be parameterized with appropriate IO-Link parameterization software and an IO-Link master.

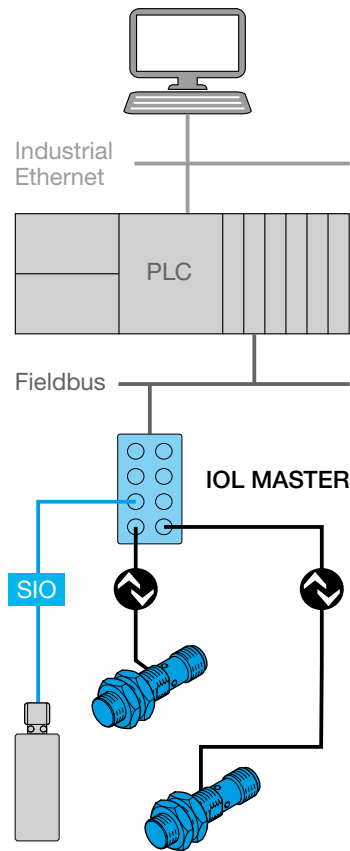
Offline parameterization can be performed with the following di-soric products:

- with a computer and IOL-Master with software version V 5.1 and higher
- without a computer with IOL-Portable

Communication via IO-Link takes place over a standard unshielded cable with three or four wires. The maximum distance between the master and the sensor is 20 m.



The IO-Link master establishes the connection between IO-Link devices and the automation system. An IO-Link master may have multiple IO-Link ports. One IO-Link device can be connected to each port (point-to-point communication).



Possible system architecture

10.1 IODD

In addition to an IO-Link master with software, you also need the IODD (IO Device Description) for the device. The IODD can be found via the QR code on the packaging or via the article number at www.di-soric.com under "Downloads".

You can also find the IODD in the IODDfinder portal of the IO-Link Consortium: ioddfinder.io-link.com

The IODD consists of an XML file and images. The download file is a ZIP file. The IODD describes IO-Link devices. It contains information regarding identification, device parameters, process and diagnostics data, communication properties and the structure of the user interface in the engineering tool.



NOTE: In the IODD download at www.di-soric.com, there are HTML files that graphically represent the contents of the XML main file. The following descriptions were taken from the English HTML file with the "Specialist" user role.

10.2 SENSOR IDENTIFICATION

IO-Link enables the identification of IO-Link devices with an IO-Link master connected. The following identification data is located in the Identification menu:

Identification Menu	
V_VendorName	
V_VendorText	
V_ProductName	
V_ProductText	
V_ProductID	
V_SerialNumber	
V_HardwareRevision	
V_FirmwareRevision	
V_ApplicationSpecificTag, ro	
V_CP_FunctionTag, ro	
V_CP_LocationTag, ro	

Parameter description	Dec index	Hex index	R/W	Value	Data type
Vendor name	16	0x0010	RO	di-soric GmbH & Co. KG	StringT
Vendor text	17	0x0011	RO	SOLUTIONS. CLEVER. PRACTICAL.	StringT
Product name	18	0x0012	RO	INE-M05/28V-B1.3G3-2R3	StringT
Product ID	19	0x0013	RO	214378	StringT
Product text	20	0x0014	RO		StringT
Firmware version	23	0x0017	RO		StringT
Application-specific tag	24	0x0018	RW		StringT

10.3 PROCESS DATA

The process data is transferred to the master in a cyclical data telegram. The PDIn input data has a data length of 1 byte.

ProcessData id=P_status

ProcessDataIn "PD Input" id=PI_SSP_PDI8_SSC

bit length: 8
data type: 8-bit Record (subindex access not supported)

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
1	0	Boolean	false = Low, true = High					SSC	Indicates the detection status of a switching signal channel depending on sensor data and SSC Config.

Octet 0

bit offset	7	6	5	4	3	2	1	0
subindex	/////	/////	/////	/////	/////	/////	/////	1

Basic functions are established through the IO-Link standard. The description of elementary commands is below.

Resetting the device to factory settings (application reset) with value 129

Resetting the device to factory settings and disconnecting IO-Link (back to box) with value 131

Standard Variable "System Command" index=2 id=V_SystemCommand

description: Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.

data type: 8-bit UInteger

allowed values: 65 = Teach SP, 129 = Application Reset, 131 = Back-to-box, 252, 253, 254, 255

access rights: wo

modifies other variables

octet	0
bit offset	7 - 0
element bit	7 - 0

10.4 PARAMETERS FOR THE SWITCHING OUTPUT

Variable "SSC Param - SP" index=56 id=V_SSP_SSC_SP

description: Defines the switchpoint within the detection range.

data type: 16-bit Integer

allowed values: 0 = 33, 1 = 50, 2 = 75, 3 = 100

default value: 3

access rights: rw

octet	0	1	
bit offset	15 - 8	7 - 0	
element bit	15 - 8	7 - 0	

Using index 56, the switching distance for the M12, M18 and M30 variants can be set to 33%, 50%, 75% or 100%. For the D4, M5 and M8 models, the setting options are 50% or 100%.

The switching distance is set to 100% at the factory.

Variable "SSC Config - Logic" index=57 id=V_SSP_SSC_Logic

description: Defines the logical representation of the switching signal SSC in the process data.

data type: 8-bit UInteger

allowed values: 0 = High active, 1 = Low active

default value: 0

access rights: rw

octet	0	
bit offset	7 - 0	
element bit	7 - 0	

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record

access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
1	72	8-bit UInteger	0 = Disabled, 1 = PNP, 2 = NPN, 3 = PP	1				Mode	
2	64	8-bit UInteger			ro			Reserved	
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	
4	48	8-bit UInteger			ro			Reserved	
5	32	16-bit Integer	1..32767	100				Delay Duration	
6	16	16-bit UInteger			ro			Reserved	
7	8	8-bit UInteger			ro			Reserved	
8	0	8-bit UInteger			ro			Reserved	

octet	0	1	2	3	4	5	6	7
bit offset	79 - 72	71 - 64	63 - 56	55 - 48	47 - 40	39 - 32	31 - 24	23 - 16
subindex	1	2	3	4	5	5	6	6
element bit	7 - 0	7 - 0	7 - 0	7 - 0	15 - 8	7 - 0	15 - 8	7 - 0

octet	8	9	
bit offset	15 - 8	7 - 0	
subindex	7	8	
element bit	7 - 0	7 - 0	

10.5 DIAGNOSIS

IO-Link diagnosis enables efficient maintenance of the device. The Diagnosis menu can be found below.

Diagnosis Menu	
Device Status Information	
V_DeviceStatus	
V_DetailedDeviceStatus	
V_ErrorCount	
V_DetectCount	
V_CurrentTemperature °C	
V_MaxTemperature °C	
V_MinTemperature °C	
V_TEMP.Maximum Temperature Warning * 1 + 0 °C, rw Dec.0	
V_TEMP.Minimum Temperature Warning * 1 + 0 °C, rw Dec.0	

10.6 EVENTS

Events			
Code	Type	Name	Description
16384 (0x4000)	Error	Temperature fault	Overload
16912 (0x4210)	Warning	Device temperature overrun	Clear source of heat
16928 (0x4220)	Warning	Device temperature underrun	Insulate device

Event code	Name	Description
16384	Temperature fault	Overload
16912	Device temperature overrun	Clear source of heat
16928	Device temperature underrun	Insulate device

Event code 16384 indicates a temperature error. This indicates overheating.

Event codes 16912 and 16928, on the other hand, display a warning. Code 16912 indicates that the heat source should be removed, whereas event code 16928 indicates that the device should be insulated.

10.7 IO-LINK PARAMETERS IN DETAIL

The parameterization or the switching output state of the inductive proximity sensors can be configured using the IO-Link master as described below.

If the sensor is disconnected from the master, it switches to SIO mode and retains its last configuration setting.

10.8 PRESENCE DETECTION (SSC)

When a metallic target object approaches the sensor surface, the magnetic field generated by the sensor interacts with the target object, and the sensor changes its status. The following settings are available for detecting the presence (or absence) of a metallic object in front of the sensor surface:



NOTE:

Setpoint 1 (SP1) and setpoint 2 (SP2):

The D4, M5 and M8 sizes can be set to 50% or 100% of the maximum rated switching distance.

The M12, M18 and M30 sizes can be set to 33%, 50%, 75% or 100% of the maximum rated switching distance.

10.9 CONFIGURING THE SWITCHING OUTPUT

When the index = 64 and the subindex = 1, the switching output (SO) can be configured. The permissible values are: 0 = disabled, 1 = PNP, 2 = NPN, 3 = push-pull. The default value or factory setting is 1 for PNP (normally open).

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
1	72	8-bit UInteger	0 = Disabled, 1 = PNP, 2 = NPN, 3 = PP	1				Mode	
V_Conf_SO1	Mode	64 (0x0040)	1 (0x01)	RW	1	0= Disabled 1= PNP 2= NPN 3= PP		UIntegerT (8)	X

10.10 TIMER

The timer function is set to index = 64, with subindex = 3 for timer mode and subindex = 5 for the delay time.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	
4	48	8-bit UInteger			ro			Reserved	
5	32	16-bit Integer	1..32767	100				Delay Duration	
6	16	16-bit UInteger			ro			Reserved	
7	8	8-bit UInteger			ro			Reserved	
8	0	8-bit UInteger			ro			Reserved	
V_Conf_SO1	Timer mode	64 (0x0040)	3 (0x03)	RW	0	0= Disabled 1= T-on delay 2= T-off delay 3= T-on and T-off delay 4= One shot Leading edge 5= One shot Trailing edge		UIntegerT (8)	X



NOTE:

The timer allows users to use various timer functions.

This is achieved by adjusting the two timer parameters:

- Timer mode at subindex 3 with the default value of 0 for disabled
- Timer delay at subindex 5 with the default value of 100 for timer delay as shipped.

10.10.1 TIMER MODE

The timer mode is set to index = 64 and subindex = 3. The permissible values are: 0 = Disabled, 1 = T-on delay, 2 = T-off delay, 3 = T-on delay and T-off delay, 4 = Rising edge, 5 = Falling edge. The timer mode is disabled by default (default value 0 = disabled).

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	



NOTE:

The timer mode for inductive sensors specifies which type of timer function is applied to the switching output. The following options are available: 0 = Disabled, 1 = T-on-delay, 2 = T-off-delay, 3 = T-on-delay and T-off-delay, 4 = one-shot rising edge, 5 = one-shot falling edge.

10.10.2 TURNED OFF

At index 64 and subindex = 3, the value is set to 0, where 0 = disabled.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	



NOTE:

This option disables the timer function. This is true regardless of the value set for the timer's delay.

10.10.3 SWITCH-ON DELAY (T-ON)

At index = 64 and subindex = 3, the value is set to 1, where 1 = T-on delay.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	



NOTE:

The switching output is activated only after the sensor has actually triggered and the set time delay has elapsed.

10.10.4 SWITCH-OFF DELAY (T-OFF)

At index = 64 and subindex = 3, the value is set to 2, where 2 represents the T-off delay.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	



NOTE: The switching output is deactivated with a delay, starting from the moment the metal object is removed from the front of the sensor.

10.10.5 T-ON AND T-OFF DELAY

At index = 64 and subindex = 3, the timer mode value is set to 3, where 3 = T-on and T-off delay.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	



NOTE: If selected, the T-on and T-off delays are applied when the switching output is generated.

10.10.6 SINGLE PULSE, RISING EDGE

At index = 64 and subindex = 3, the value is set to 4, where 4 = rising edge.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
3	56	8-bit UInteger	0 = Disabled, 1 = T-on Delay, 2 = T-off Delay, 3 = T-on and T-off Delay, 4 = One Shot Leading Edge, 5 = One Shot Trailing Edge	0				Timer Mode	



NOTE: Each time a target object is detected in front of the sensor, the switching output generates a pulse of constant length on the rising edge of the detection.

10.10.7 TIMER DELAY

The time delay has an index of 64 and a subindex of 5. The valid value range is 1 to 32,767. The factory setting or default value is 100 ms.

Variable "Switching Output" index=64 id=V_Conf_SO1

data type: 80-bit Record
access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
5	32	16-bit Integer	1..32767	100				Delay Duration	



NOTE: This parameter defines the actual duration of the delay. The delay can be set to any integer value between 1 and 32,767.

10.11 INTERNAL SENSOR PARAMETERS

In addition to the parameters that directly affect the output configuration, the sensor also has various internal parameters that are useful for setup and diagnostic purposes.

10.11.1 MAXIMUM TEMPERATURE SINCE STARTUP

The variable "Maximum temperature since startup" is located at index 205.

Variable "Max Temperature Since Startup" index=205 id=V_MaxTemperature

data type: 16-bit Integer
access rights: ro

octet	0	1
bit offset	15 - 8	7 - 0
element bit	15 - 8	7 - 0



NOTE: This parameter informs the user of the highest temperature detected since the device was turned on.

10.11.2 MINIMUM TEMPERATURE SINCE STARTUP

The variable "Minimum temperature since startup" is at index=206.

Variable "Min Temperature Since Startup" index=206 id=V_MinTemperature

data type: 16-bit Integer
access rights: ro

octet	0	1
bit offset	15 - 8	7 - 0
element bit	15 - 8	7 - 0



NOTE: This parameter informs the user of the lowest temperature detected since the device was turned on.

10.11.3 DETECTION COUNTER

The variable "Number of detections since startup" is set to index=210.

Variable "Number of Detections Since Startup" index=210 id=V_DetectCount

data type: 32-bit Integer
access rights: ro

octet	0	1	2	3	
bit offset	31 - 24	23 - 16	15 - 8	7 - 0	
element bit	31 - 24	23 - 16	15 - 8	7 - 0	



NOTE:

This parameter stores the number of detections made by the sensor since it was turned on.

10.11.4 APPLICATION-SPECIFIC TAG

The default variable "Application-specific tag" is set to index=24.

Standard Variable "Application-specific Tag" index=24 id=V_ApplicationSpecificTag

description: Possibility to mark a device with user- or application-specific information.
data type: 32-octet String UTF-8
default value: ""
access rights: rw

octet	0	1	2	3	4	5	6	7
bit offset	255 - 248	247 - 240	239 - 232	231 - 224	223 - 216	215 - 208	207 - 200	199 - 192



NOTE:

The user can enter a designation for the IO-Link sensor to easily identify the sensor's location in the machine.

10.12 PROCESS DATA VARIABLE

When index = 40, the process data is read in.

ProcessData id=P_status

ProcessDataIn "PD Input" id=PI_SSP_PDI8_SSC

bit length: 8
data type: 8-bit Record (subindex access not supported)

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
1	0	Boolean	false = Low, true = High					SSC	Indicates the detection status of a switching signal channel depending on sensor data and SSC Config.



NOTE: When the sensor is operating in IO-Link mode, the user can access the cyclic process data variable. By default, the process data contains only information about the status of the switching output.

11 SWITCHING OUTPUT LOGIC: NO/NC OPERATION (SELECTABLE VIA IO-LINK)

11.1 GENERAL NOTES

Switching on the supply voltage puts the device into operation. After the time delay before availability has elapsed, the device is operational.

In the delivery state, the parameters are set to the factory setting. The device can also be adjusted via appropriate IO-Link configuration software.

11.2 SWITCHING OUTPUT FUNCTION: NO/NC (NORMALLY OPEN/NORMALLY CLOSED)

The switching logic that defines the logical representation of the switching signal in the process data is set to index 57 subindex 0. The allowed values are 0 for high-active and 1 for low-active. In the factory settings, 0 is preset for high-active.

V_SSP_SSC_Logik	SSC Config - Logic	57 (0x0039)	0 (0x00)	RW	0	0=High active 1=Low active	Defines the logical representation of the switching signal SSC in the process data.	UIntegerT (8)	X
-----------------	--------------------	-------------	----------	----	---	-------------------------------	---	---------------	---



NOTE:

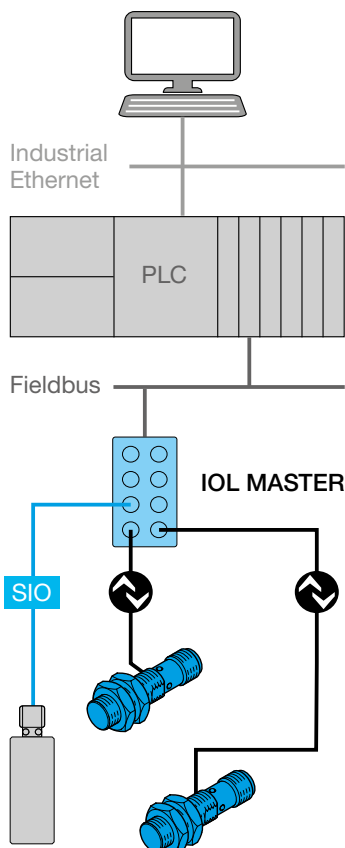
NO: Closer contact (normally open): If an object is in the range of the active switching zone, the output is closed. (0 = High-active) (0 = Not inverted) (Normal operation)

NC: Opener contact (normally closed): If an object is in the range of the active switching zone, the output is open. (1 = Low-active) (1 = Inverted) (Inverted operation)



NOTE: The "switching point logic" or switching principle determines how the switching information is transferred. The switching output means an output with an on/off signal. With this function, the user can switch the switching output between closer operation (normally open) and opener operation (normally closed).

11.3 IO-LINK INTERFACE



Our inductive sensors with IO-Link can be configured and operated with an IO-Link master. In this way, configurations such as closer / opener, PNP / NPN and much more can be set according to your needs and saved permanently. The sensor can transmit diagnostics data via IO-Link. If you do not use IO-Link, then the sensor can be used in classic fashion as a proximity switch.

The di-soric inductive proximity sensors have the following IO-Link specification:

IO-Link version V1.1.4 COM2 (38.4 kbaud), profile smart sensor 2nd edition V1.2 SSP 2.1

The device can also be adjusted via appropriate IO-Link configuration software.

Offline parameterization can be performed with the following di-soric products:

- with PC IOL-Master with software version: V 5.1 and higher
- or without PC with IOL-Portable

The IO-Link master establishes the connection between IO-Link devices and the automation system. An IO-Link master may have several IO-Link ports (channels). One IO-Link device can be connected to each port (point-to-point communication). Thus, IO-Link is point-to-point communication and not a field bus.

Possible system architecture

11.4 IODD FILE (I/O DEVICE DESCRIPTION)

All functions, device parameters and settings for the sensor are compiled in an I/O device description file (IODD file). The IODD file is required to establish communication between the IO-Link master and the sensor.

In addition to an IO-Link master with software, you also need the IODD (IO Device Description) for the device. The IODD can be found via the QR code on the packaging or via the article number at www.di-soric.com under "Downloads". You can also find the IODD in the IODDfinder portal of the IO-Link Consortium: <https://ioddfinder.io-link.com>

The IODD is a zip file that consists of a main file and optional external language files (XML format) and image files (PNG format). The IODD describes IO-Link devices. It contains information on:

- Process and diagnostics data
- Description of the parameters, including their names, valid value ranges, data types and addresses (index and subindex)
- Communication characteristics, including the device's minimum cycle time
- Device ID, article number, device image and manufacturer logo



NOTE: Under www.di-soric.com "Downloads", there are html files that display the contents of the XML main file in a graphic format in the respective IODD zip files.

11.4.1 IO-LINK IDENTIFICATION

The default variable "Provider name" is set to index = 16 and defines the name associated with a provider ID.

Standard Variable "Vendor Name" index=16 id=V_VendorName

description: The vendor name that is assigned to a Vendor ID.
data type: 64-octet String UTF-8
default value: "di-soric GmbH & CO. KG"
access rights: ro

Identification Menu
V_VendorName
V_VendorText
V_ProductName
V_ProductText
V_ProductID
V_SerialNumber
V_HardwareRevision
V_FirmwareRevision
V_ApplicationSpecificTag, ro
V_CP_FunctionTag, ro
V_CP_LocationTag, ro



NOTE: IO-Link enables the identification of sensors with a connected IO-Link master. In the "Identification" menu, you will find the device's identification information listed above

11.4.2 IO-LINK PROCESS DATA

The default variable "Process data input" is located at index 40.

Standard Variable "PD Input" index=40 id=V_ProcessDataInput

description: Last valid process input data of the device.
data type: see ProcessDataIn!
access rights: ro
dynamic

ProcessData id=P_status

ProcessDataIn "PD Input" id=PI_SSP_PDI8_SSC

bit length: 8
data type: 8-bit Record (subindex access not supported)

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
1	0	Boolean	false = Low, true = High					SSC	Indicates the detection status of a switching signal channel depending on sensor data and SSC Config.
V_Process Data Input	TPD Input	40 (0x0028)	0 (0x00)	RO			Last valid process input data of the device.	Process Data InUnionT	X



NOTE: In a cyclic data telegram, the process data from the devices is transmitted to the master. The PDIn input data is transmitted with a data length of 1 byte.

11.4.3 IO-LINK BASIC FUNCTIONS (DEFAULT AND SYSTEM COMMANDS)

The main basic functions are described in index 2. The data type is UInteger 8-bit. The permissible values are as follows: 129 = Application reset, 131 = Back-to-box.

Standard Variable "System Command" index=2 id=V_SystemCommand

description: Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.
data type: 8-bit UInteger
allowed values: 65 = Teach SP, 129 = Application Reset, 131 = Back-to-box, 252, 253, 254, 255
access rights: wo
modifies other variables

octet	0
bit offset	7 - 0
element bit	7 - 0

Parameters Menu

General Settings

V_SystemCommand, Button:=129

Description=The parameter of the technology-specific application are set to default values. Identification parameter remain unchanged. An upload to the data storage of the master will be executed, if activated in the port configuration of the master.



NOTE: Basic functions of devices are determined through IO-Link default variables and commands. The description of elementary commands is below:

- At index 2, there is the option to reset the sensor to factory settings (application reset) with the value 129. Resetting the device to factory settings and disconnecting IO-Link (back to box) with value 131.

11.5 FACTORY SETTING | DEFAULT SETTING

di-soric IO-Link inductive sensors INM and INE in sizes D4, M5, M8, M12, M18 and M30 are shipped with the following factory settings:

- PNP, NO
- Switching distance: 100%
- A green LED indicates that the device is ready for operation
- Yellow LED indicates the switch state
- Presence detection (SSC1)
- All timers are disabled

SOLUTIONS. CLEVER. PRACTICAL.

di-soric GmbH & Co. KG | Steinbeisstrasse 6 | 73660 Urbach | Germany
Phone +49 71 81 98 79-0 | Fax +49 71 81 98 79-179 | info@di-soric.com

www.di-soric.com