

Signal converter 7379.5020 and 7379.5020/CO 4x analog input → IO – Link (V1.1)

Product Features:

- 2x analogue input for current (0...20mA or 4...20mA - adjustable)
- 2x analogue input for voltage (-10V ... +10V)
- High-precision reference output +10 V for potentiometer (> 1 kOhm)
- Simple device parameterization possible via IO-Link using various engineering tools
- Switchable averaging and adjustable sampling intervals for each analog input
- Adjustable limit value monitoring possible for each input
- Numerous connection options via expansion option (7379.5020/CO) (three additional control inputs and two additional control outputs)
- Generation of pending events (e.g. threshold value exceeded, line break, ...) possible
- Compact rail housing to EN60715

Available Options:

- 7379.5020:** Basic device with 4 analog inputs (16 bit) and reference output
- 7379.5020/CO:** Basic device with 4 analog inputs (16 bit), reference output and additional 3x HTL PNP control inputs and 2x PNP control outputs

Inhaltsverzeichnis

1. Safety Instructions and Responsibility	3
1.1. General Safety Instructions	3
1.2. Use according to the intended purpose	3
1.3. Installation	4
1.4. EMC Guidelines	5
1.5. Cleaning, Maintenance and Service Notes.....	5
2. Introduction	6
2.1. Function diagram	7
3. Electrical Connections	8
3.1. DC Power Supply	8
3.2. Analog Inputs	9
3.3. Reference Output.....	9
3.4. Control Inputs (only with option „CO“).	10
3.5. Control Outputs (only with option „CO“).....	11
3.6. IO-Link Interface.....	12
3.6.1. Usable IO Link masters	12
3.6.2. Communication data.....	12
3.6.3. Features	12
3.6.4. Front LED.....	12
3.6.5. Connection of the IO Link interface.....	13
3.6.6. Parameter data	13
3.6.7. System Commands	15
3.6.8. IO-Link Process data	16
3.6.9. Measuring ranges of the analog process values.....	17
3.6.10. Error types.....	18
3.6.11. Events.....	19
4. Parameter / Overview - Menu Structure	20
4.1. General Menu	21
4.2. In 1 (V) Properties.....	23
4.3. In 2 (V) Properties.....	25
4.4. In 1 (C) Properties.....	27
4.5. In 2 (C) Properties.....	29
5. Attachment	31
5.1. Parameter / serial codes.....	31
5.2. Dimensions	32
5.3. Technical Specifications.....	33

1. Safety Instructions and Responsibility

1.1. General Safety Instructions

This operation manual is a significant component of the unit and includes important rules and hints about the installation, function and usage. Non-observance can result in damage and/or impairment of the functions to the unit or the machine or even in injury to persons using the equipment!

Please read the following instructions carefully before operating the device and observe all safety and warning instructions! Keep the manual for later use.

A pertinent qualification of the respective staff is a fundamental requirement in order to use this manual. The unit must be installed, connected and put into operation by a qualified electrician.

Liability exclusion: The manufacturer is not liable for personal injury and/or damage to property and for consequential damage, due to incorrect handling, installation and operation. Further claims, due to errors in the operation manual as well as misinterpretations are excluded from liability.

In addition, the manufacturer reserves the right to modify the hardware, software or operation manual at any time and without prior notice. Therefore, there might be minor differences between the unit and the descriptions in operation manual.

The raiser respectively positioner is exclusively responsible for the safety of the system and equipment where the unit will be integrated.

During installation or maintenance all general and also all country- and application-specific safety rules and standards must be observed.

If the device is used in processes, where a failure or faulty operation could damage the system or injure persons, appropriate precautions to avoid such consequences must be taken.

1.2. Use according to the intended purpose

The unit is intended exclusively for use in industrial machines, constructions and systems. Non-conforming usage does not correspond to the provisions and lies within the sole responsibility of the user. The manufacturer is not liable for damages which have arisen through unsuitable and improper use.

Please note that device may only be installed in proper form and used in a technically perfect condition (in accordance to the Technical Specifications). The device is not suitable for operation in explosion-proof areas or areas which are excluded by the EN 61010-1 standard.

1.3. Installation

The device is only allowed to be installed and operated within the permissible temperature range. Please ensure an adequate ventilation and avoid all direct contact between the device and hot or aggressive gases and liquids.

Before installation or maintenance, the unit must be disconnected from all voltage-sources. Further it must be ensured that no danger can arise by touching the disconnected voltage-sources.

Devices which are supplied by AC-voltages must be connected exclusively by switches, respectively circuit-breakers with the low voltage network. The switch or circuit-breaker must be placed as near as possible to the device and further indicated as separator.

Incoming as well as outgoing wires and wires for extra low voltages (ELV) must be separated from dangerous electrical cables (SELV circuits) by using a double resp. increased isolation.

All selected wires and isolations must be conformed to the provided voltage- and temperature-ranges. Further all country- and application-specific standards, which are relevant for structure, form and quality of the wires, must be ensured. Indications about the permissible wire cross-sections for wiring are described in the Technical Specifications.

Before first start-up it must be ensured that all connections and wires are firmly seated and secured in the screw terminals. All (inclusively unused) terminals must be fastened by turning the relevant screws clockwise up to the stop.

Overvoltages at the connections must be limited to values in accordance to the overvoltage category II.

1.4. EMC Guidelines

All motrona devices are designed to provide high protection against electromagnetic interference. Nevertheless you must minimize the influence of electromagnetic noise to the device and all connected cables.

Therefore the following measures are mandatory for a successful installation and operation:

- Use shielded cables for all signal and control input and output lines.
- Cables for digital controls (digital I/O, relay outputs) must not exceed a length of 30 m and are allowed for in building operation only
- Use shield connection clamps to connect the cable shields properly to earth
- The wiring of the common ground lines must be star-shaped and common ground must be connected to earth at only one single point
- The device should be mounted in a metal enclosure with sufficient distance to sources of electromagnetic noise.
- Run signal and control cables apart from power lines and other cables emitting electromagnetic noise.

Please also refer to motrona manual "General Rules for Cabling, Grounding, Cabinet Assembly". You can download that manual by the link

<https://www.motrona.com/en/support/general-certificates.html>

1.5. Cleaning, Maintenance and Service Notes

To clean the front of the unit please use only a slightly damp (not wet!), soft cloth. For the rear no cleaning is necessary. For an unscheduled, individual cleaning of the rear the maintenance staff or assembler is self-responsible.

During normal operation no maintenance is necessary. In case of unexpected problems, failures or malfunctions the device must be shipped for back to the manufacturer for checking, adjustment and repair (if necessary). Unauthorized opening and repairing can have negative effects or failures to the protection-measures of the unit.

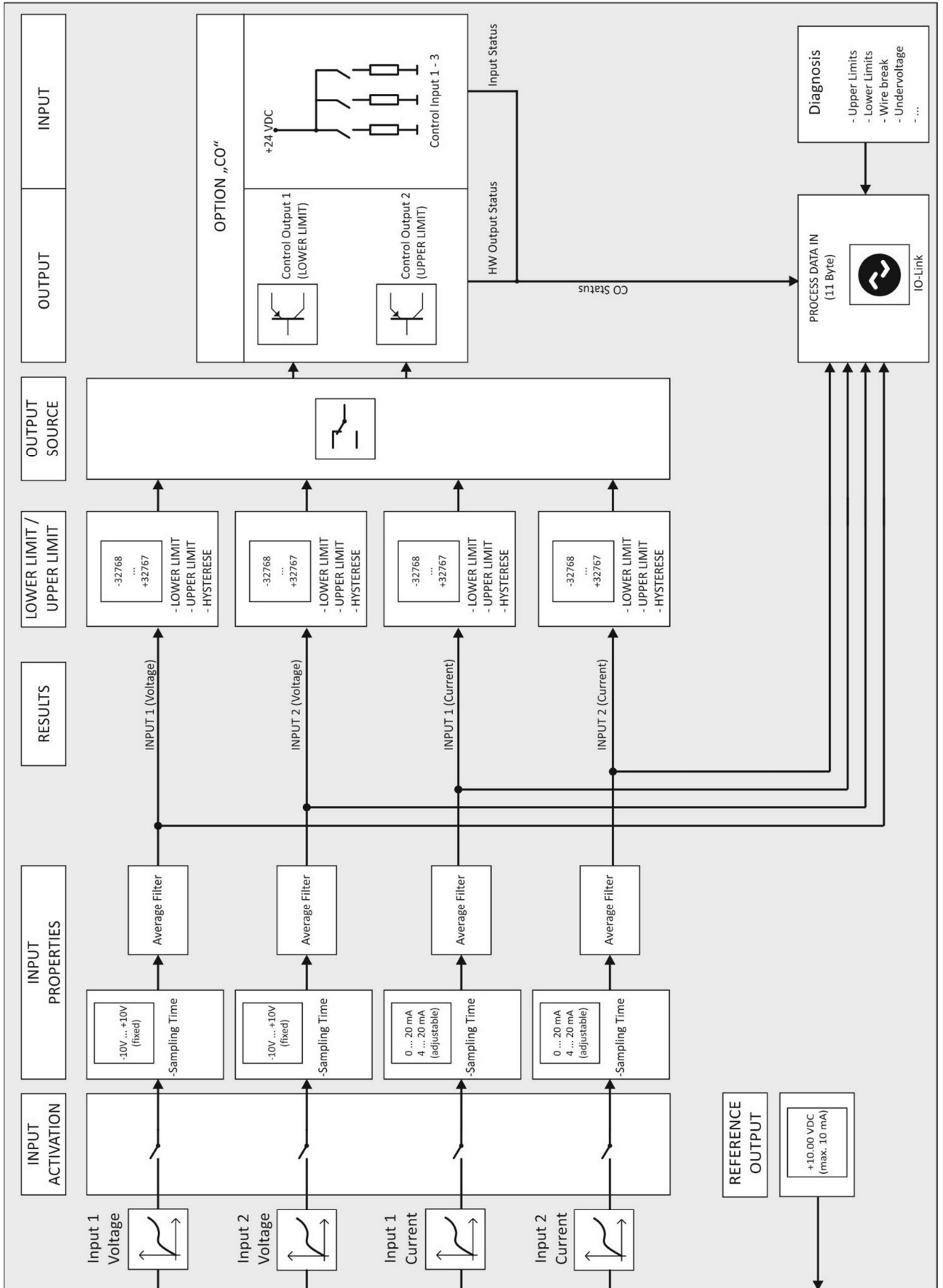
2. Introduction

The device can be used as a signal converter for analog standard signals (-10 ... +10 V or 0/4 ... 20 mA), which are to be transmitted as cyclic process values via IO-Link. In addition to its four analog inputs (two fixed as voltage inputs and the other two fixed as current inputs), the signal converter has a high-precision reference output (+10.00 V \pm 0.1%), which can be used to connect various potentiometers, for example

The "CO" expansion option also has three HTL PNP control inputs and two PNP switching outputs. These can be used to ensure that switching thresholds set by the user have been exceeded or fallen below. The current status of the digital inputs and outputs is also transmitted cyclically with the process input data, so that a wide variety of requirements can be covered here.

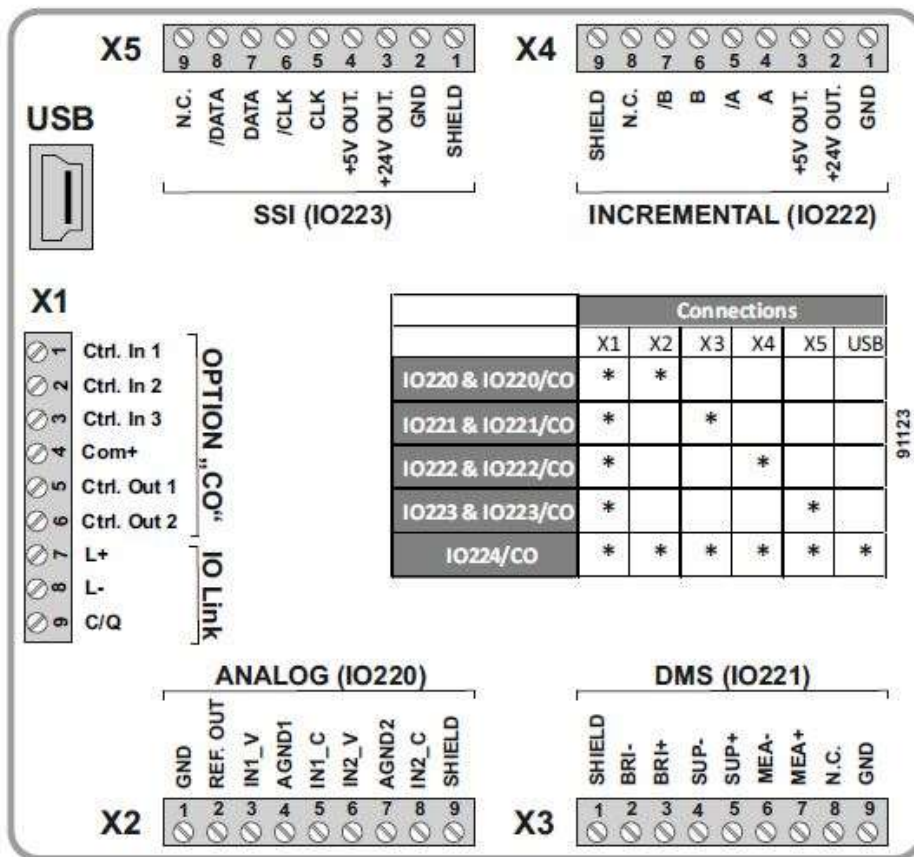
In addition, any pending events (e.g. line break, undershot lower threshold,...) can be generated if this is desired by the user. The individual device parameters can be set and saved using various engineering tools or during operation via IO-Link. Thanks to the supported "data storage" mechanism, an uncomplicated and problem-free exchange of devices is possible.

2.1. Function diagram



3. Electrical Connections

The terminal screws should be tightened with a slotted screwdriver (blade width 2mm).



3.1. DC Power Supply

The unit accepts DC supply from 18 to 30 V at the terminals X1 pin 7 (+) and 8 (-). The power consumption depends on the level of the supply voltage with approx. 75 mA (at 24V).

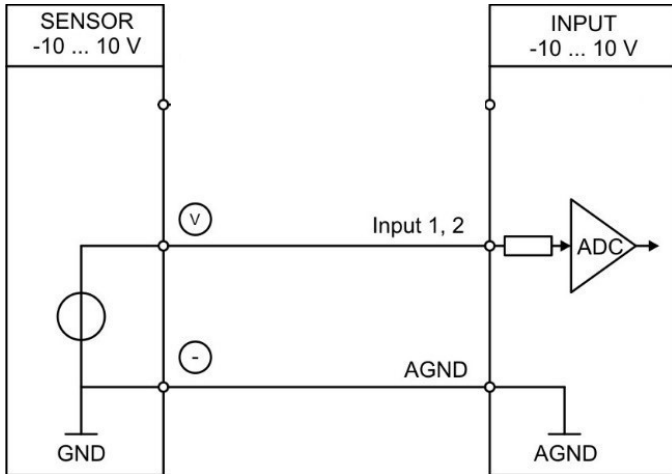
All GND terminals are internally interconnected.

3.2. Analog Inputs

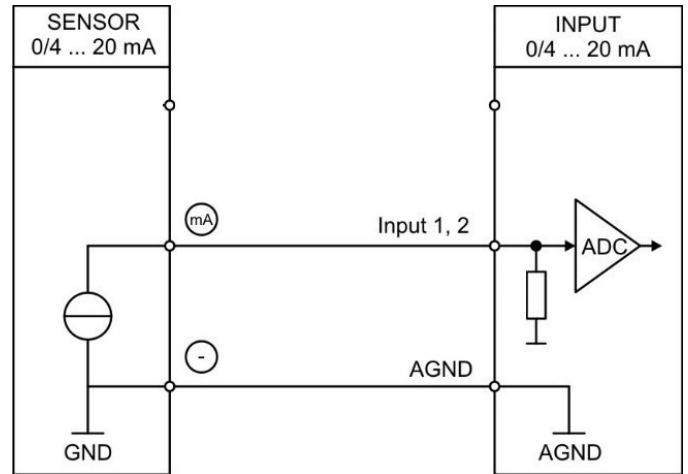
The reference potential (AGND) for the analog inputs is connected to terminal X2 pin 4 and pin 7. Two 16-bit analog inputs are available on terminal X2, pins 3 and 6. These are firmly designed as voltage inputs. Two additional 16-bit analog inputs are available on terminal X2, pins 5 and 8. These are firmly designed as current inputs.

Connection of the analog inputs:

voltage input



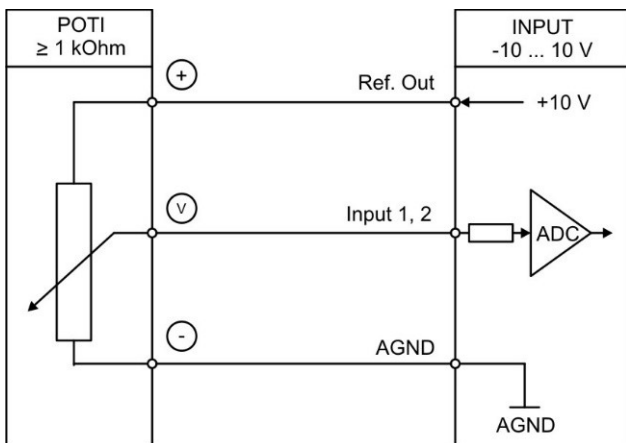
current input



3.3. Reference Output

A 10 V reference output is available on terminal X2 pin 2. This may be loaded with a maximum of 10 mA. The reference output can be used, to connect a potentiometer for example.

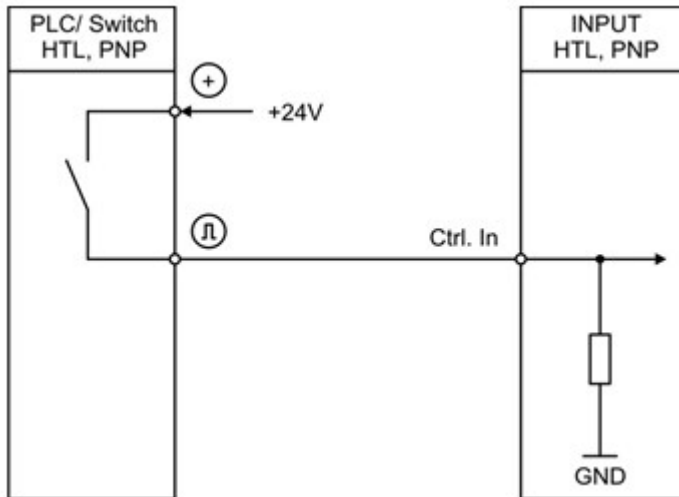
Reference output with potentiometer:



3.4. Control Inputs (only with option „CO“)

Three control inputs with HTL PNP characteristics are available on terminal X1, pins 1, 2 and 3. The current state of the control inputs is cyclically exchanged with the process data and can therefore be used for a wide variety of functions. (e.g. as a trigger signal for triggering a "system command" or for reading out actual values)

Connection of the control inputs:



Unconnected control inputs are always "LOW".

All inputs are designed to receive impulses from an electronic impulse source.



Notice for mechanical switching contacts:

When exceptionally mechanical contacts are used, please connect an external capacitor between GND (-) and the corresponding input (+). A capacity of 10 μF will reduce the input frequency to 20 Hz and miscounting due to contact bouncing will be eliminated.

3.5. Control Outputs (only with option "CO")

Two control outputs are available on terminal X1, pins 5 and 6. These signal, when limit values defined by the user have been undercut or exceeded. Control output 1 always reacts as soon as the lower limit value is undercut. Control output 2 always reacts as soon as the upper limit value has been exceeded.

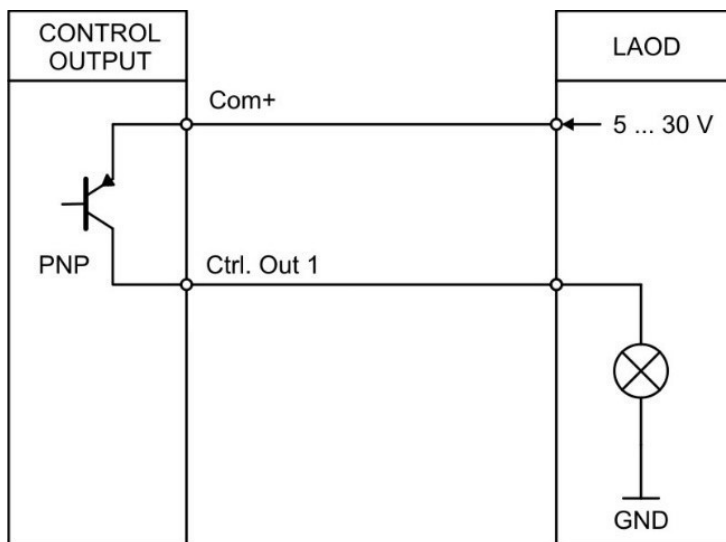


Notice:

Which analog input is to be used for this monitoring can be set using the "OUTPUT SOURCE" parameter in the "GENERAL MENU". For limit value monitoring, the required input channel must always be activated beforehand. (Parameter "GENERAL MENU" → "INPUT ACTIVATION")

These outputs Ctrl. Out 1 and 2 are designed as high side drivers. The status of the outputs is also transmitted cyclically with the IO-Link process data. The switching voltage is determined by the external voltage supplied to terminal X1 pin 4 (COM+). External damping measures are recommended for switching inductive loads.

Connection of the control outputs:



3.6. IO-Link Interface

This chapter contains important notes and information regarding IO-Link communication data. In addition to general information on the IO-Link connection, the parameter data of the device, the exchanged process data and the implemented system commands, error codes and events are discussed.

3.6.1. Usable IO Link masters

All IO-Link masters that support IO-Link Standard V1.1.

3.6.2. Communication data

Parameters	Values
Communication speed	COM 3
Transmission rate	230,4 kbit/s
IO-Link Revision	V1.1
Cycle time	min. 1 ms
Port class	Class A

3.6.3. Features

Feature	Unterstützt
Block parametrization	Yes
Data Storage	Yes
Events	Yes
SIO Mode	No

3.6.4. Front LED

In the case of devices without the "CO" option, the green LED on the front is used exclusively as a ready-to-operate display. As soon as a supply voltage has been applied to the device, it lights up continuously.

For devices with the extended "CO" option, the green LED on the front serves as a ready-to-operate display. It also signals the current IO-Link system status.

LED lights up continuously:

The device is connected to the supply voltage and there is no IO-Link communication. The device is in "START UP MODE".

LED flashes at 0.5 Hz:

Device is connected to the supply voltage and IO-Link communication is currently in "PREOPERATE MODE" (no cyclic data exchange takes place).

LED flashes at 1 Hz cycle:

The device is connected to the supply voltage and IO-Link communication is currently in "OPERATE MODE" (cyclic data exchange is taking place).

3.6.5. Connection of the IO Link interface

An interface for connecting to an IO-Link master port is available on terminal X1 pin 7 (L-), 8 (L+) and 9 (C/Q). Figure 1 shows the pin assignment of a standard M12 connector plug.

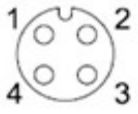
Assignment		
	Pin 1	Clamp L+
	Pin 2	Not connected
	Pin 3	Clamp L-
	Pin 4	IO-Link data line, C/Q

Fig. 1: Pin assignment M12 connection plug

Pin	Wire color
1 (L+)	brown
2 (n.c.)	white
3 (L-)	blue
4 (C/Q)	black

3.6.6. Parameter data

ISDU Index	DPP1 Index	Name of the Parameter	Access	Length in bytes	Default Value	Range
Identification Menu						
	7	VendorID	R	2	980 / 0x 03D4	-
	8					
	9	Device ID	R	3	2162945 / 0x210101	-
	10					
	11					
16		Vendor Name	R	12	motrona GmbH	-
17		Vendor Text	R	21	http://www.motrona.de	-
18		Product Name	R	15	signalconverter	-
19		Product ID	R	8	7379.5020 oder 7379.5020/CO	-
20		Product Text	R	39	analog converter with IO-Link interface	-
21		Serial Number	R	9	-	-
22		Hardware Revision	R	7	z.B.: 224I011	-
23		Firmware Revision	R	8	z.B.: 7379.502001A	-
24		Application Specific Tag	R/W	Max. 32	***	-
36		Device Status	R	1	0x00	0: Device is working properly 1: Maintenance required 2: Out of specification 3: functional test 4: Error 5-255: Reserved
40		Prozess Data Input	R	11	-	-

Continuation "Parameter data":

ISDU Index	DPP1 Index	Name of the Parameter	Access	Length in bytes	Default Value	Range
GENERAL MENU						
259		OUTPUT SOURCE	R/W	4	0	0..3
260		INPUT CONFIGURATION	R/W	4	0	0..3
261		INPUT ACTIVATION	R/W	4	15	0..15
262		DIAGNOSIS SETUP	R/W	4	0 (0x0000)	0..32767
IN 1 (V) PROPERTIES						
264		SAMPLING TIME (S)	R/W	4	10	1..60000
265		AVERAGE FILTER	R/W	4	0	0..4
266		LOWER LIMIT	R/W	4	0	-32768..32767
267		UPPER LIMIT	R/W	4	31211	-32768..32767
268		HYSTERESE LOWER LIMIT	R/W	4	15	0..32767
269		HYSTERESE UPPER LIMIT	R/W	4	15	0..32767
IN 2 (V) PROPERTIES						
273		SAMPLING TIME (S)	R/W	4	10	1..60000
274		AVERAGE FILTER	R/W	4	0	0..4
275		LOWER LIMIT	R/W	4	0	-32768..32767
276		UPPER LIMIT	R/W	4	31211	-32768..32767
277		HYSTERESE LOWER LIMIT	R/W	4	15	0..32767
278		HYSTERESE UPPER LIMIT	R/W	4	15	0..32767
IN 1 (C) PROPERTIES						
283		SAMPLING TIME (S)	R/W	4	10	1..60000
284		AVERAGE FILTER	R/W	4	0	0..4
285		LOWER LIMIT	R/W	4	0	0..32767
286		UPPER LIMIT	R/W	4	31211	0..32767
287		HYSTERESE LOWER LIMIT	R/W	4	15	0..32767
288		HYSTERESE UPPER LIMIT	R/W	4	15	0..32767
IN 2 (C) PROPERTIES						
293		SAMPLING TIME (S)	R/W	4	10	1..60000
294		AVERAGE FILTER	R/W	4	0	0..4
295		LOWER LIMIT	R/W	4	0	0..32767
296		UPPER LIMIT	R/W	4	31211	0..32767
297		HYSTERESE LOWER LIMIT	R/W	4	15	0..32767
298		HYSTERESE UPPER LIMIT	R/W	4	15	0..32767
Observation Menu						
657		Maximum (Input 1 - V)	R	2	-	-
658		Minimum (Input 1 - V)	R	2	-	-
659		Maximum (Input 2 - V)	R	2	-	-
660		Minimum (Input 2 - V)	R	2	-	-
661		Maximum (Input 1 - C)	R	2	-	-
662		Minimum (Input 1 - C)	R	2	-	-
663		Maximum (Input 2 - C)	R	2	-	-
664		Minimum (Input 2 - C)	R	2	-	-

3.6.7. System Commands



A system command is a write-only parameter that causes an action in the device. To invoke the desired action, the corresponding value must be written to **index 2, subindex 0**. If the desired command is a static command (s), this command remains active until the corresponding value is written again to index 2, subindex 0. By resending the command, the action is terminated.

Predefined commands

Name	Index	Subindex	Value	Description of the action	Dynamic (d)/static (s)
RESTORE FACTORY SETTINGS	2	0	130	Reset all parameters and application specific tag to factory settings.	(d)
APPLICATION RESET	2	0	129	Reset all parameters to factory settings.	(d)

Application specific commands

Name	Index	Subindex	Value	Description of the action	Dynamic (d)/static (s)
CLEAR MIN/MAX VALUES	2	0	160	Reset of the Min. / Max. values.	(d)
STORE EEPROM	2	0	168	Current parameter set is stored non-volatile in the EEPROM.	(d)

3.6.8. IO-Link Process data

Process input data (Total: 11 Byte):

(View from the IO-link master)

Bit	Byte	Subindex	Description
Bit 0	Byte 10	1	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input1_V)
Bit 1		2	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input1_V)
Bit 2		3	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input2_V)
Bit 3		4	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input2_V)
Bit 4		5	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input1_C)
Bit 5		6	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input1_C)
Bit 6		7	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input2_C)
Bit 7		8	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input2_C)
Bit 0	Byte 9	9	Diagnosis: Device supply undervoltage (< 17 V)
Bit 1		10	Diagnosis: Input voltage outside the nominal measuring range > 10,000V or < -10,000V - (Input1_V)
Bit 2		11	Diagnosis: Input voltage outside the nominal measuring range > 10,000V or < -10,000V - (Input2_V)
Bit 3		12	Diagnosis: Input current outside the nominal measuring range > 20,000 mA or < 0,000 mA at 0...20mA or < 4,000 mA at 4...20mA - (Input1_C)
Bit 4		13	Diagnosis: Input current outside the nominal measuring range > 20,000 mA or < 0,000 mA at 0...20mA or < 4,000 mA at 4...20mA - (Input2_C)
Bit 5		14	Diagnosis: Wire break < 2,000mA at 4...20mA configuration - (Input1_C)
Bit 6		15	Diagnosis: Wire break < 2,000mA at 4...20mA configuration - (Input2_C)
Bit 7		16	Diagnosis: Reserved
Bit 0	Byte 8	17	Input State: Control Input 1 (0: OFF / 1: ON))
Bit 1		18	Input State: Control Input 2 (0: OFF / 1: ON))
Bit 2		19	Input State: Control Input 3 (0: OFF / 1: ON))
Bit 3		20	HW Output State: Control Output 1 (0: OFF / 1: ON))
Bit 4		21	HW Output State: Control Output 2 (0: OFF / 1: ON))
Bit 5		22	Reserved
Bit 6		23	Reserved
Bit 7		24	Reserved
-	Byte 6...7	25	Process Value 4: Input 1 Voltage - (Datatype: Int16)
-	Byte 4...5	26	Process Value 3: Input 2 Voltage - (Datatype: Int16)
-	Byte 2...3	27	Process Value 2: Input 1 Current - (Datatype: Int16)
-	Byte 0...1	28	Process Value 1: Input 2 Current - (Datatype: Int16)



The acyclic request address of the process input data is **index 40**. The corresponding **subindex** and the corresponding data type of the desired value that is to be read can be found in the table above.

3.6.9. Measuring ranges of the analog process values

Nominal measuring range	Max. measuring range	Input resistance	Value (1 LSB)
0...20 mA	0... 20.997 mA	100 Ohm	641 nA
4...20 mA	0... 20.996 mA	100 Ohm	641 nA
-10V ... +10V	-10.498 V ... +10.498 V	1 MOhm	320 μ V

Measuring ranges of the analog inputs

Values	Output Value	Range
Decimal	0...20 mA	
> 32767	> 20.997 mA	Max output value
32767	20.997 mA	Clipping range
31212	20.0006 mA	
31211	20.000 mA	Nominal measuring range
1	641 nA	
0	0.000 mA	
< 0	0.000 mA	Understeer range

Current input with 0...20 mA configuration

Values	Output Value	Range
Decimal	4...20 mA	
> 26524	> 20.996 mA	Max output value
26524	20.996 mA	Clipping range
24970	20.0006 mA	
24969	20.000 mA	Nominal measuring range
1	4 mA + 641 nA	
0	4.000 mA	
-1	4 mA - 641 nA	Understeer range
-3121	2.000 mA	
-6243	0.000 mA	

Current input with 4...20 mA configuration

Values	Output Value	Range
Decimal	-10V ... +10V	
> 32767	> 10.498 V	Max output value
32767	10.498 V	Clipping range
31212	10.0003 V	
31211	10.000V	Nominal measuring range
1	320 μ V	
0	0.000 V	
-1	-320 μ V	Understeer range
-31211	-10.000 V	
-31212	-10.0003 V	
-32768	-10.498 V	Min output value
<-32768	<-10.498 V	

Voltage input

3.6.10. Error types

Error code	Name	Description
32768 / 0x 8000	Application errors in the device-no details	Access was denied by the device. No detailed information is available.
32785 / 0x 8011	Index does not exist	Access to a non-existent index.
32786 / 0x 8012	Subindex does not exist	Access to a non-existent subindex..
32800 / 0x 8020	Service not available at this time	The parameter cannot be accessed at this moment. The device does not allow this in the current state.
32803 / 0x 8023	Access denied	Write access to a read-only parameter.
32816 / 0x 8030	Parameter value out of range	Parameter value is outside the allowed range of values.
32817 / 0x 8031	Parameter value greater than specified range	The written parameter value is greater than the specified value range.
32818 / 0x 8032	Parameter value less than specified range	The written parameter value is smaller than the specified value range.
32819 / 0x 8033	Parameter length too large	Parameter length is greater than allowed.
32820 / 0x 8034	Parameter length too small	Parameter length is less than allowed.
32821 / 0x 8035	Function not available	The device does not support the command.
32822 / 0x 8036	Function not available at this time	The command is not supported by the device in its current state.
32832 / 0x 8040	Invalid parameter set	Written single parameter value collides with the other parameter settings.
32833 / 0x 8041	Inconsistent parameter set	Inconsistencies were detected at the end of the block parameter transfer. The device plausibility check failed.
32898 / 0x 8082	Application not ready	Access was denied because the device is not ready.

3.6.11. Events

Code	Typ	Device Status	Bedingung
0x1800	Warning	0x00	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input1_V)
0x1801	Warning	0x00	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input1_V)
0x1802	Warning	0x00	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input2_V)
0x1803	Warning	0x00	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input2_V)
0x1804	Warning	0x00	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input1_C)
0x1805	Warning	0x00	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input1_C)
0x1806	Warning	0x00	Diagnosis: Upper set threshold (Upper Limit) exceeded - (Input2_C)
0x1807	Warning	0x00	Diagnosis: Below the lower set threshold value (Lower Limit) - (Input2_C)
0x180C	Warning	0x02	Diagnosis: Device supply undervoltage (< 17 V)
0x1808	Warning	0x02	Diagnosis: Input voltage outside the nominal measuring range > 10,000V or < -10,000V - (Input1_V)
0x1809	Warning	0x02	Diagnosis: Input voltage outside the nominal measuring range > 10,000V or < -10,000V - (Input2_V)
0x180A	Warning	0x02	Diagnosis: Input current outside the nominal measuring range > 20,000 mA or < 0,000 mA at 0...20mA or < 4,000 mA at 4...20mA - (Input1_C)
0x180B	Warning	0x02	Diagnosis: Input current outside the nominal measuring range > 20,000 mA or < 0,000 mA at 0...20mA or < 4,000 mA at 4...20mA - (Input2_C)
0x1850	Error	0x04	Diagnosis: Wire break < 2,000mA at 4...20mA configuration - (Input1_C)
0x1851	Error	0x04	Diagnosis: Wire break < 2,000mA at 4...20mA configuration - (Input2_C)
0x8D68	Error	0x00	Device Test - Error
0x8D04	Warning	0x00	Device Test - Warning

4. Parameter / Overview - Menu Structure

The device is parameterized via the IO-Link interface using a suitable engineering tool, which is usually provided by the IO-Link master manufacturers.

[The link to the free download can be found on page 2.](#)

This section shows the overview of the individual menus and their parameters. The menu name is written in bold, the associated parameters are arranged directly under the menu name.

Menu / Parameter
GENERAL MENU
OUTPUT SOURCE
INPUT CONFIGURATION
INPUT ACTIVATION
DIAGNOSIS SETUP
IN 1 (V) PROPERTIES
SAMPLING TIME (S)
AVERAGE FILTER
LOWER LIMIT
UPPER LIMIT
HYSTERESE LOWER LIMIT
HYSTERESE UPPER LIMIT
IN 2 (V) PROPERTIES
SAMPLING TIME (S)
AVERAGE FILTER
LOWER LIMIT
UPPER LIMIT
HYSTERESE LOWER LIMIT
HYSTERESE UPPER LIMIT

Menu / Parameter
IN 1 (C) PROPERTIES
SAMPLING TIME (S)
AVERAGE FILTER
LOWER LIMIT
UPPER LIMIT
HYSTERESE LOWER LIMIT
HYSTERESE UPPER LIMIT
IN 2 (C) PROPERTIES
SAMPLING TIME (S)
AVERAGE FILTER
LOWER LIMIT
UPPER LIMIT
HYSTERESE LOWER LIMIT
HYSTERESE UPPER LIMIT

4.1. General Menu

The general parameters for this signal converter are described in this menu.

OUTPUT SOURCE		
This parameter defines the reference source to which the two switching outputs should react during limit value monitoring.		
0	INPUT 1 (Voltage)	Reference source is input 1 (voltage).
1	INPUT 2 (Voltage)	Reference source is input 2 (voltage).
2	INPUT 1 (Current)	Reference source is input 1 (current).
3	INPUT 2 (Current)	Reference source is input 2 (current).

INPUT CONFIGURATION		
This parameter can be used to set the desired input configuration (0...20mA or 4...20mA) at the respective current input.		
0	IN1(C):0..20mA IN2(C):0..20mA	Input 1 (C): 0...20mA and Input 2 (C): 0...20mA
1	IN1(C):4..20mA IN2(C):0..20mA	Input 1 (C): 4...20mA and Input 2 (C): 0...20mA
2	IN1(C):0..20mA IN2(C):4..20mA	Input 1 (C): 0...20mA and Input 2 (C): 4...20mA
3	IN1(C):4..20mA IN2(C):4..20mA	Input 1 (C): 4...20mA and Input 2 (C): 4...20mA

INPUT ACTIVATION		
This parameter can be used to specify which analog input is to be activated on the signal converter.		
0	NO CHANNEL	No channel is activated
1	IN1V	Input 1 (V) is activated
2	IN2V	Input 2 (V) is activated
3	IN1V+IN2V	Input 1 (V) and input 2 (V) are activated
4	IN1C	Input 1 (C) is activated
5	IN1V+IN1C	Input 1 (V) & Input 1 (C) are activated
6	IN2V+IN1C	Input 2 (V) and input 1 (C) are activated
7	IN1V+IN2V+IN1C	Input 1 (V) , Input 2 (V) and Input 1 (C) are activated
8	IN2C	Input 2 (C) is activated
9	IN1V+IN2C	Input 1 (V) and input 2 (C) are activated
10	IN2V+IN2C	Input 2 (V) and Input 2 (C) are activated
11	IN1V+IN2V+IN2C	Input 1 (V) , Input 2 (V) and Input 2 (C) are activated
12	IN1C+IN2C	Input 1 (C) and input 2 (C) are activated
13	IN1V+IN1C+IN2C	Input 1 (V) , Input 1 (C) and Input 2 (C) are activated
14	IN2V+IN1C+IN2C	Input 2 (V) , Input 1 (C) and Input 2 (C) are activated
15	ALL CHANNELS	All four analog inputs are activated

Continuation „General Menu“:

DIAGNOSIS SETUP

This parameter can be used to specify which "events" are to be generated by the device.

Corresponding bit = 1 → associated event is generated as soon as the event is pending (appears) or is no longer pending (disappears).

Corresponding bit = 0 → associated event is not generated.

Min: 0x0000

Default: 0x0000

Max: 0x7FFF

Bit 0	0	Upper set threshold (Upper Limit) exceeded - (Input1_V)
Bit 1	0	Below the lower set threshold value (Lower Limit) - (Input1_V)
Bit 2	0	Upper set threshold (Upper Limit) exceeded - (Input2_V)
Bit 3	0	Below the lower set threshold value (Lower Limit) - (Input2_V)
Bit 4	0	Upper set threshold (Upper Limit) exceeded - (Input1_C)
Bit 5	0	Below the lower set threshold value (Lower Limit) - (Input1_C)
Bit 6	0	Upper set threshold (Upper Limit) exceeded - (Input2_C)
Bit 7	0	Below the lower set threshold value (Lower Limit) - (Input2_C)
Bit 8	0	Device supply undervoltage (< 17 V)
Bit 9	0	Input voltage outside the nominal measuring range > 10,000V or < -10,000V - (Input1_V)
Bit 10	0	Input voltage outside the nominal measuring range > 10,000V or < -10,000V - (Input2_V)
Bit 11	0	Input current outside the nominal measuring range > 20,000 mA or < 0,000 mA at 0...20mA or < 4,000 mA at 4...20mA - (Input1_C)
Bit 12	0	Input current outside the nominal measuring range > 20,000 mA or < 0,000 mA at 0...20mA or < 4,000 mA at 4...20mA - (Input2_C)
Bit 13	0	Wire break < 2,000mA at 4...20mA configuration - (Input1_C)
Bit 14	0	Wire break < 2,000mA at 4...20mA configuration - (Input2_C)
Bit 15	0	Reserve (nicht benutzt)

Notice:



The "Diagnosis Word" in the cyclic process data (byte 9 + byte10) always shows which events are currently pending. Only the associated events can be switched on or off with the appropriate setting of this parameter.

4.2. In 1 (V) Properties

The respective parameters for voltage input 1 are described in this menu.

SAMPLING TIME (S)

The value set here corresponds to the sampling interval of the analog input.

This interval defines the time interval in seconds between the individual samples of the analog signal.

	0,001	Shortest sampling time
	0,01	Default value
	60,000	Longest sampling time

AVERAGE FILTER

Selectable average filter function to avoid measuring fluctuations.

	0	No average value will be created
	1	4 numbers of floating average cycles
	2	8 numbers of floating average cycles
	3	16 numbers of floating average cycles
	4	32 numbers of floating average cycles

LOWER LIMIT

This parameter defines the lower limit.

	-32768	Smallest value
	0	Default value
	+32767	Highest value



If the value set here is underrun, control output 1 is set (if "OUTPUT SOURCE" = INPUT 1 (Voltage) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

UPPER LIMIT

This parameter defines the upper limit.

	-32768	Smallest value
	31211	Default value
	+32767	Highest value



If the value set here is exceeded, control output 2 is set (if "OUTPUT SOURCE" = INPUT 1 (Voltage) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

Continuation „In 1 (V) Properties“:

HYSTERESE LOWER LIMIT

This parameter defines a hysteresis for the lower limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "LOWER LIMIT" plus the hysteresis set here is exceeded, control output 1 is reset (if "OUTPUT SOURCE" = INPUT 1 (Voltage) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

HYSTERESE UPPER LIMIT

This parameter defines a hysteresis for the upper limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "UPPER LIMIT" minus the hysteresis set here is underrun, control output 2 is reset (if "OUTPUT SOURCE" = INPUT 1 (Voltage) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

4.3. In 2 (V) Properties

The respective parameters for voltage input 2 are described in this menu.

SAMPLING TIME (S)		
The value set here corresponds to the sampling interval of the analog input. This interval defines the time interval in seconds between the individual samples of the analog signal.		
	0,001	Shortest sampling time
	0,01	Default value
	60,000	Longest sampling time

AVERAGE FILTER		
Selectable average filter function to avoid measuring fluctuations.		
	0	No average value will be created
	1	4 numbers of floating average cycles
	2	8 numbers of floating average cycles
	3	16 numbers of floating average cycles
	4	32 numbers of floating average cycles

LOWER LIMIT		
This parameter defines the <u>lower</u> limit.		
	-32768	Smallest value
	0	Default value
	+32767	Highest value



If the value set here is underrun, control output 1 is set (if "OUTPUT SOURCE" = INPUT 2 (Voltage) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

UPPER LIMIT		
This parameter defines the <u>upper</u> limit.		
	-32768	Smallest value
	31211	Default value
	+32767	Highest value



If the value set here is exceeded, control output 2 is set (if "OUTPUT SOURCE" = INPUT 2 (Voltage) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

Continuation „In 2 (V) Properties“:

HYSTERESE LOWER LIMIT

This parameter defines a hysteresis for the lower limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "LOWER LIMIT" plus the hysteresis set here is exceeded, control output 1 is reset (if "OUTPUT SOURCE" = INPUT 2 (Voltage) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

HYSTERESE UPPER LIMIT

This parameter defines a hysteresis for the upper limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "UPPER LIMIT" minus the hysteresis set here is underrun, control output 2 is reset (if "OUTPUT SOURCE" = INPUT 2 (Voltage) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

4.4. In 1 (C) Properties

The respective parameters for current input 1 are described in this menu.

SAMPLING TIME (S)		
The value set here corresponds to the sampling interval of the analog input. This interval defines the time interval in seconds between the individual samples of the analog signal.		
	0,001	Shortest sampling time
	0,01	Default value
	60,000	Longest sampling time

AVERAGE FILTER		
Selectable average filter function to avoid measuring fluctuations.		
	0	No average value will be created
	1	4 numbers of floating average cycles
	2	8 numbers of floating average cycles
	3	16 numbers of floating average cycles
	4	32 numbers of floating average cycles

LOWER LIMIT		
This parameter defines the <u>lower</u> limit.		
	-32768	Smallest value
	0	Default value
	+32767	Highest value



If the value set here is underrun, control output 1 is set (if "OUTPUT SOURCE" = INPUT 1 (Current) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

UPPER LIMIT		
This parameter defines the <u>upper</u> limit.		
	-32768	Smallest value
	31211	Default value
	+32767	Highest value



If the value set here is exceeded, control output 2 is set (if "OUTPUT SOURCE" = INPUT 1 (Current) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

Continuation „In 1 (C) Properties“:

HYSTERESE LOWER LIMIT

This parameter defines a hysteresis for the lower limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "LOWER LIMIT" plus the hysteresis set here is exceeded, control output 1 is reset (if "OUTPUT SOURCE" = INPUT 1 (Current) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

HYSTERESE UPPER LIMIT

This parameter defines a hysteresis for the upper limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "UPPER LIMIT" minus the hysteresis set here is underrun, control output 2 is reset (if "OUTPUT SOURCE" = INPUT 1 (Current) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

4.5. In 2 (C) Properties

The respective parameters for current input 2 are described in this menu.

SAMPLING TIME (S)		
The value set here corresponds to the sampling interval of the analog input. This interval defines the time interval in seconds between the individual samples of the analog signal.		
	0,001	Shortest sampling time
	0,01	Default value
	60,000	Longest sampling time

AVERAGE FILTER		
Selectable average filter function to avoid measuring fluctuations.		
	0	No average value will be created
	1	4 numbers of floating average cycles
	2	8 numbers of floating average cycles
	3	16 numbers of floating average cycles
	4	32 numbers of floating average cycles

LOWER LIMIT		
This parameter defines the <u>lower</u> limit.		
	-32768	Smallest value
	0	Default value
	+32767	Highest value



If the value set here is underrun, control output 1 is set (if "OUTPUT SOURCE" = INPUT 2 (Current) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

UPPER LIMIT		
This parameter defines the <u>upper</u> limit.		
	-32768	Smallest value
	31211	Default value
	+32767	Highest value



If the value set here is exceeded, control output 2 is set (if "OUTPUT SOURCE" = INPUT 2 (Current) was selected), the corresponding bit is set in the "Diagnosis Word" of the cyclic process data and, if necessary, an "Event Appears" is generated (provided that the generation of this event was previously activated accordingly in "DIAGNOSIS SETUP").

Continuation „In 2 (C) Properties“:

HYSTERESE LOWER LIMIT

This parameter defines a hysteresis for the lower limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "LOWER LIMIT" plus the hysteresis set here is exceeded, control output 1 is reset (if "OUTPUT SOURCE" = INPUT 2 (Current) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

HYSTERESE UPPER LIMIT

This parameter defines a hysteresis for the upper limit value.

	0	Smallest value
	15	Default value
	+32767	Highest value



If the value set in "UPPER LIMIT" minus the hysteresis set here is underrun, control output 2 is reset (if "OUTPUT SOURCE" = INPUT 2 (Current) was selected), the corresponding bit in the "Diagnosis Word" of the cyclic process data reset and an "Event Dissappears" is generated (provided that the generation of this event was previously activated in "DIAGNOSIS SETUP").

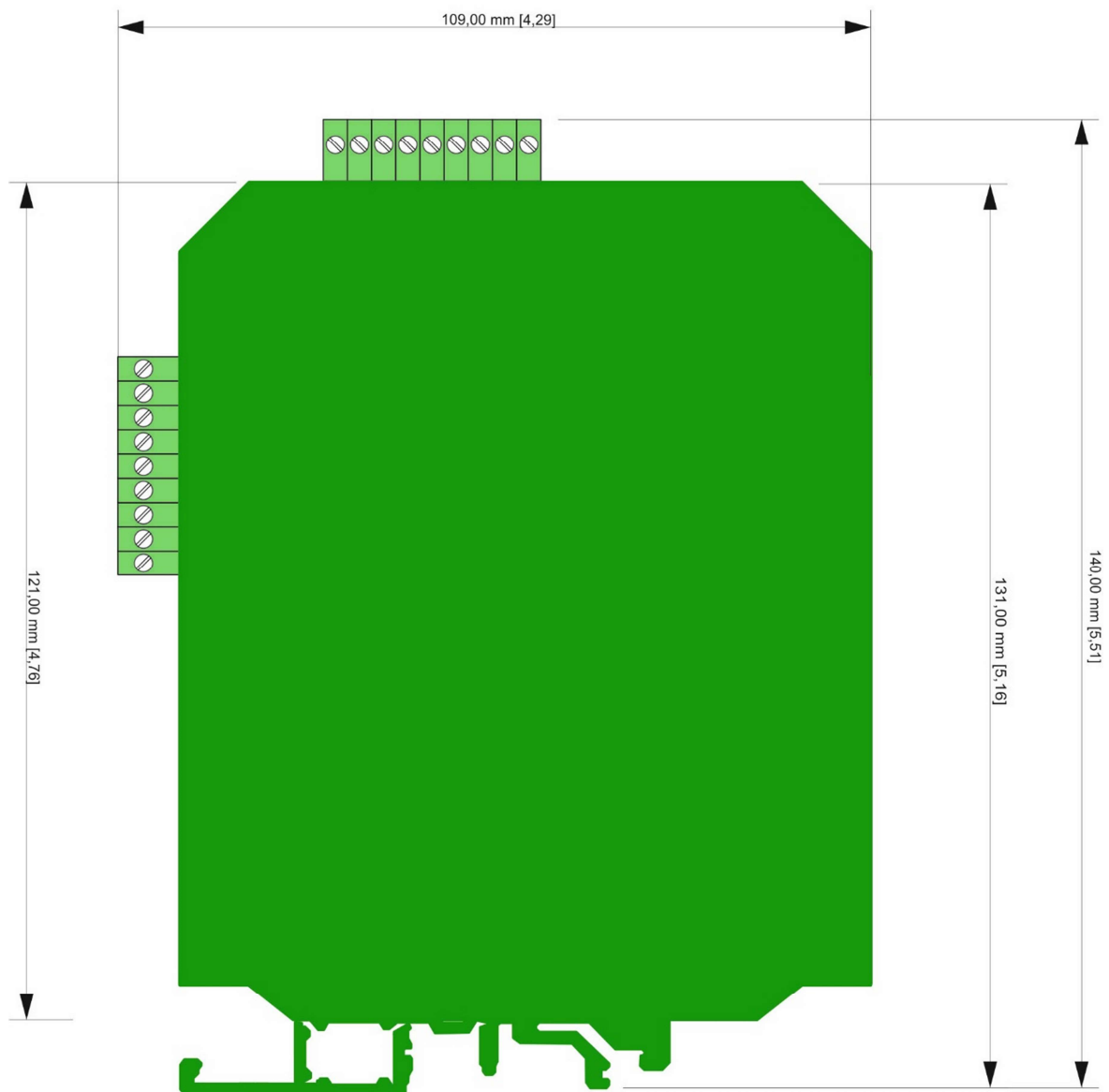
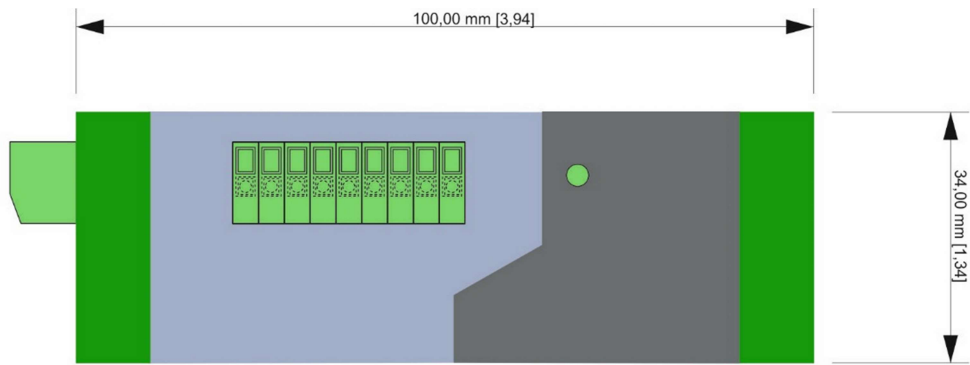
5. Attachment

5.1. Parameter / serial codes

#	Menu	Name	Ser.Code	Min	Max	Default
1	GENERAL MENU	FACTORY SETTINGS	00	0	1	0
2	GENERAL MENU	OUTPUT SOURCE	01	0	3	0
3	GENERAL MENU	INPUT CONFIGURATION	02	0	3	0
4	GENERAL MENU	INPUT ACTIVATION	03	0	15	0
5	GENERAL MENU	DIAGNOSIS SETUP	04	0	32767	0
6	IN 1 (V) PROPERTIES	SAMPLING TIME (S)	05	1	60000	10
7	IN 1 (V) PROPERTIES	AVERAGE FILTER	06	0	4	0
8	IN 1 (V) PROPERTIES	LOWER LIMIT	07	-32768	32767	0
9	IN 1 (V) PROPERTIES	UPPER LIMIT	08	-32768	32767	31211
10	IN 1 (V) PROPERTIES	HYSTERESE LOWER LIMIT	09	0	32767	15
11	IN 1 (V) PROPERTIES	HYSTERESE UPPER LIMIT	10	0	32767	15
12	IN 1 (V) PROPERTIES	—	11	0	0	0
13	IN 1 (V) PROPERTIES	—	12	0	0	0
14	IN 2 (V) PROPERTIES	SAMPLING TIME (S)	13	1	60000	10
15	IN 2 (V) PROPERTIES	AVERAGE FILTER	14	0	4	0
16	IN 2 (V) PROPERTIES	LOWER LIMIT	15	-32768	32767	0
17	IN 2 (V) PROPERTIES	UPPER LIMIT	16	-32768	32767	31211
18	IN 2 (V) PROPERTIES	HYSTERESE LOWER LIMIT	17	0	32767	15
19	IN 2 (V) PROPERTIES	HYSTERESE UPPER LIMIT	18	0	32767	15
20	IN 2 (V) PROPERTIES	—	19	0	0	0
21	IN 2 (V) PROPERTIES	—	20	0	0	0
22	IN 1 (C) PROPERTIES	—	21	0	0	0
23	IN 1 (C) PROPERTIES	SAMPLING TIME (S)	22	1	60000	10
24	IN 1 (C) PROPERTIES	AVERAGE FILTER	23	0	4	0
25	IN 1 (C) PROPERTIES	LOWER LIMIT	24	0	32767	0
26	IN 1 (C) PROPERTIES	UPPER LIMIT	25	0	32767	31211
27	IN 1 (C) PROPERTIES	HYSTERESE LOWER LIMIT	26	0	32767	15
28	IN 1 (C) PROPERTIES	HYSTERESE UPPER LIMIT	27	0	32767	15
29	IN 1 (C) PROPERTIES	—	28	0	0	0
30	IN 1 (C) PROPERTIES	—	29	0	0	0
31	IN 2 (C) PROPERTIES	—	30	0	0	0
32	IN 2 (C) PROPERTIES	SAMPLING TIME (S)	31	1	60000	10
33	IN 2 (C) PROPERTIES	AVERAGE FILTER	32	0	4	0
34	IN 2 (C) PROPERTIES	LOWER LIMIT	33	0	32767	0
35	IN 2 (C) PROPERTIES	UPPER LIMIT	34	0	32767	31211
36	IN 2 (C) PROPERTIES	HYSTERESE LOWER LIMIT	35	0	32767	15
37	IN 2 (C) PROPERTIES	HYSTERESE UPPER LIMIT	36	0	32767	15
38	IN 2 (C) PROPERTIES	—	37	0	0	0
39	IN 2 (C) PROPERTIES	—	38	0	0	0

5.2. Dimensions

Dimension in mm [inch]



5.3. Technical Specifications

Technical Specifications:		
Connections:	Connector type:	screw terminal, 1,5 mm ² / AWG 16
Power Supply:	Input voltage:	24 VDC (18 ... 30 VDC) through IO-Link
	Protection circuit:	reverse polarity protection
	Consumption:	approx. 90 mA (unloaded)
Reference output:	Output voltage:	+10 V
	Accuracy:	± 0,1 %
	Load:	max. 10 mA / ≥ 1 kOhm
Analog inputs:	Number of inputs:	4
	Configuration:	2x current and 2x voltage input
	Voltage input:	-10 ... +10 V (R _i ≈ 1 MOhm)
	Current input:	0 ... 20 mA / 4 ... 20 mA (R _i ≈ 100 Ohm)
	Resolution / Accuracy:	16 Bit / ± 0,2 % (25 °C)
Control inputs: (with option „CO“)	Number of inputs:	3
	Format:	HTL, PNP (Low 0 ... 3 V, High 9 ... 30 V)
	Frequency:	max. 1 kHz
	Reaction time:	1 ms
	Transmission Time (IO Link):	Approx. 1 ms – (Cyclus Time IO – Link)
	Load:	max. 2 mA at 24VDC
Control outputs: (with option „CO“)	Number of outputs:	2
	Format:	5 ... 30 V (depends on the Com+ voltage), PNP
	Output current:	max. 100 mA each output
	Reaction time:	min. 1 ms
	Transmission Time (IO Link):	(Depending on „Sampling Time“ and „Average Filter“ setting) Approx. 1 ms – (Cyclus Time IO – Link)
IO-Link:	Module / Specification:	Device / IO Link V1.1
	Bitrate:	COM 3 (230,4 kBit / s)
	Port Class:	Typ A
	Cyclus time:	min. 1 ms
	Data width:	11 Byte (4 x 2 Byte (input data) + 1 Byte („CO“ state) + 2 Byte (diagnose data))
Indicators:	Number of indicators:	1 LED
	Function:	1 x green for “ready for operate” state or actual “IO Link state” (with option “CO”)
Housing:	Material:	Plastic
	Mounting:	35 mm top hat rail (according to EN 60715)
	Dimensions (w x h x d): (without connectors)	34 x 100 x 131 mm / 1.34 x 3.94 x 5.16 inches
	Dimensions (w x h x d): (inclusive connectors)	34 x 109 x 140 mm / 1.34 x 4.65 x 5.51 inches
	Weight:	approx. 160 g
	Protection:	IP20
Ambient temperature:	Operation:	-20 °C ... +60 °C not condensing
	Storage:	-25 °C ... +70 °C
Ambient conditions:	Altitude:	max. 2000 meter above sea level
	Humidity:	max. 80% relative humidity to 30 °C
	Degree of pollution:	2
Failure rate:	MTBF in years: (continuous operation at 60 °C)	7379.5020: 102,7 a 7379.5020/CO: 92,9 a
Conformity and standards:	EMC 2014/30/EU:	EN 61326-1: 2013 for industrial location EN 55011: 2016 + A1: 2017 + A11: 2020 Class A
	RoHS (II) 2011/65/EU	
	RoHS (III) 2015/863:	EN IEC 63000: 2018