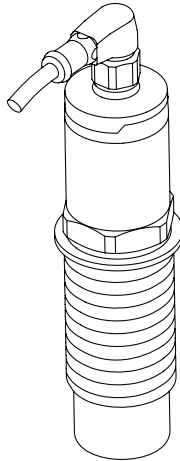




ENDRESS+HAUSER NIVECTOR FTI26 IO-LINK

Capacitance point level measurement
Interface Description



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IO-Link FTI26

1 General Specifications

- Vendor ID: 0x0011
- Device ID: v01.00.00 = 0x000300 / v02.00.00 = 0x000301
- IO-Link specification: version 1.1
- IO-Link Smart Sensor Profile 2nd Edition
- SIO mode: yes
- Speed: COM2; 38.4 kBaud
- Minimum cycle time: 6 msec.
- Process data width: 16 bit (Input)
- IO-Link data storage: yes
- Block configuration: no

2 Process data

The measuring device has two switch outputs. Both outputs are transmitted as process data via IO-Link.


- In the SIO mode, switch output 1 is switched at pin 4 of the M12 plug. In the IO-Link communication mode, this pin is reserved exclusively for communication.
- In addition, switch output 2 is always switched at pin 2 of the M12 plug.
- The process output data of the point level switch are transmitted cyclically in 16-bit chunks.

Bit	0 (LSB)	1	...	12	13 (MSB)	14	15
Measuring device	Coverage [0 to 400%], resolution 1%					OU1	OU2

Bit 14 reflects the status of switch output 1 and bit 15 the status of switch output 2. Here, the logical state “1” at the specific switch output corresponds to “closed” or 24 VDC.

The remaining 14 bits contain the coverage value [0 to 400%]

Bit	Process value	Value range
0 to 13	Raw measured value, not coverage [0 to 100]	u_Integer
14	OU1	0 = open 1 = closed
15	OU2	0 = open 1 = closed

 In addition, the coverage value can be read via ISDU (hex) 0x0028 – acyclic service.

3 Reading out and writing device data (ISDU – Indexed Service Data Unit)

Device data are always exchanged acyclically and at the request of the IO-Link master. Using the device data, the following parameter values or device statuses can be read out:

3.1 Endress+Hauser-specific device data

Designation	ISDU (dec)	ISDU (hex)	Size (byte)	Data type	Access	Default value	Value range	Offset/gain	Data storage	Range limits
Identification										
Extended order code	259	0x0103	60	String	r					
Parameters - Application										
Active switch settings	64	0x0040	1	UInt8	r/w	Standard	0 ~ Standard 1 ~ User	0/0	No	0 to 1
Active media settings	79	0x004F	1	UInt8	r/w	1 Medium	0 ~ 1 Medium 1 ~ 2 Media	0/0	No	0 to 1
Parameters if "Active switch settings = User" and "Active media settings = 1 Medium"										

Designation	ISDU (dec)	ISDU (hex)	Size (byte)	Data type	Access	Default value	Value range	Offset/gain	Data storage	Range limits
Reset user switch settings	65	0x0041	1	UInt8	r/w	False	0 ~ False 1 ~ Switch settings free 2 ~ Switch settings covered Out1 and Out2	0/0	No	0 to 2
Empty adjustment	90	0x005A	1	UInt8	w		1			
Free value	268	0x010C	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Full adjustment, Output 1 and Output 2	78	0x004E	1	UInt8	w		1			
Covered value Output 1 and 2	274	0x0112	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switch point value Output 1 and 2 (SP1/FH1 and SP2/FH2)	73	0x0049	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switchback point value Output 1 and 2 (rP1/FL1 and rP2/FL2)	74	0x004A	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switching delay time Output 1 and 2(dS1 and dS2)	66	0x0042	2	UInt16	r/w	0.5s		0/0.1	Yes	0.3 to 60
Switchback delay time Output 1 and 2(dR1 and dR2)	67	0x0043	2	UInt16	r/w	1.0s		0/0.1	Yes	0.3 to 60
Parameters if "Active switch settings = User" and "Active media settings = 2 Medium"										
Reset user switch settings	77	0x004D	1	UInt8	r/w	False	0 ~ False 1 ~ Switch settings free 3 ~ Switch settings covered Out1 4 ~ Switch settings covered Out2	0/0	No	0-4
Empty adjustment	90	0x005A	1	UInt8	w		1			
Free value	268	0x010C	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Full adjustment, Output 1	87	0x0057	1	UInt8	w		1			
Covered value Output 1	269	0x010D	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switch point value Output 1 (SP1/FH1)	71	0x0047	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switchback point value Output 1 (rP1/FL1)	72	0x0048	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400

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Designation	ISDU (dec)	ISDU (hex)	Size (byte)	Data type	Access	Default value	Value range	Offset/gain	Data storage	Range limits
Switching delay time Output 1 (dS1)	81	0x0051	2	Uint16	r/w	0.5s		0/0.1	Yes	0.3 to 60
Switchback delay time Output 1 (dR1)	82	0x0052	2	Uint16	r/w	1.0s		0/0.1	Yes	0.3 to 60
Output mode Output 1	85	0x0055	1	Uint8	r/w	HNO	0 ~ HNO ⁽²⁾ 1 ~ HNC ⁽²⁾ 2 ~ FNC ⁽²⁾ 3 ~ FNC ⁽²⁾		Yes	0 to 3
Full adjustment, Output 2	88	0x0058	1	Uint8	w		1			
Covered value Output 2	273	0x0111	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switch point value Output 2 (SP2/FH2)	75	0x004B	2	Uint16	r/w	¹⁾		0/0	Yes	0 to 400
Switchback point value Output 2 (rP2/FL2)	76	0x004C	2	Int16	r/w	¹⁾		0/0	Yes	0 to 400
Switching delay time Output 2 (dS2)	83	0x0053	2	Int16	r/w	0.5s		0/0.1	Yes	0.3 to 60
Switchback delay time Output 2 (dR2)	84	0x0054	2	Uint16	r/w	1.0s		0/0.1	Yes	0.3 to 60
Output mode Output 2	86	0x0056	1	Uint8	r/w	HNC	0 ~ HNO ⁽²⁾ 1 ~ HNC ⁽²⁾ 2 ~ FNC ⁽²⁾ 3 ~ FNC ⁽²⁾		Yes	0 to 3
Parameters - System										
Operating hours	96	0x0060	4	Uint32	r			0 / 0.016667	No	0 to 2 [^] 32
uC-Temperature	91	0x005B	1	Int8	r			°C: 0 / 1 °F: 32 / 1.8 K: 273.15 / 1	No	-128 to 127
Unit changeover (UNI) – uC-Temperature	80	0x0050	1	Uint8	r/w	°C	0 ~ °C 1 ~ °F 2 ~ K	0/0	Yes	0 to 2
Minimum uC-Temperature	92	0x005C	2	Int16	r	127		°C: 0 / 1 °F: 32 / 1.8 K: 273.15 / 1	No	-128 to 127
Maximum uC-Temperature	93	0x005D	2	Int16	r	-128		°C: 0 / 1 °F: 32 / 1.8 K: 273.15 / 1	No	-128 to 127
Reset uC-Temperature	94	0x005E	1	Uint8	w		1			
Reset to factory settings (RES)	275	0x0113	1	Uint8	w		1			
Diagnosis										
Simulation switch Output 1 (OU1)	89	0x0059	1	Uint8	r/w	Off	0 ~ Off 1 ~ High 2 ~ Low	0/0	No	0 to 2
Simulation switch Output 2 (OU2)	68	0x0044	1	Uint8	r/w	Off	0 ~ Off 1 ~ High 2 ~ Low	0/0	No	0 to 2

Designation	ISDU (dec)	ISDU (hex)	Size (byte)	Data type	Access	Default value	Value range	Offset/gain	Data storage	Range limits
Device search	69	0x0045	1	UInt8	r/w	Off	0 ~ Off 1 ~ On	0/0	No	0 to 1
Sensor check	70	0x0046	1	UInt8	w		1	0/0	No	

- 1) As-delivered state depends on the options ordered.
- 2) For an explanation of the abbreviations, see the parameter description.

3.2 IO-Link-specific device data

Designation	ISDU (dec)	ISDU (hex)	Size (byte)	Data type	Access	Default value	Data storage
Serial number	21	0x0015	max. 16	String	ro		
Firmware version	23	0x0017	max. 64	String	ro		
ProductID	19	0x0013	max. 64	String	ro	FTI26	
ProductName	18	0x0012	max. 64	String	ro	Nivector	
ProductText	20	0x0014	max. 64	String	ro	Capacitance point level switch	
VendorName	16	0x0010	max. 64	String	ro	Endress+Hauser	
VendorText	17	0x0011	max. 64	String	ro	People for Process Automation	
Hardware Revision	22	0x0016	max. 64	String	ro		
Application Specific Tag	24	0x0018	32	String	r/w		
Actual Diagnostics (STA)	260	0x0104	4	String	ro		No
Last Diagnostic (LST)	261	0x0105	4	String	ro		No

3.3 System commands

Designation	ISDU (dec)	ISDU (hex)	Value range	Access
Reset to factory settings (RES)	2	0x0002	130	w
Device Access Locks. Data Storage Lock	12	0x000C	2 ~ Data storage • 0 ~ False • 2 ~ True	r/w

4 Overview of diagnostic events

Status signal/ diagnostic event	Diagnostic behavior	EventCode	Event text	Cause	Corrective measure
F270	Fault	0x5000	Defect in electronics/ sensor	Electronics/sensor defective	Replace device
S804	Warning	0x1801	Load current > 200 mA per output	Load current > 200 mA	Increase load resistance at switch output
			Overload at switch output 1 or output 2	Overload at switch output 1 or switch output 2	<ul style="list-style-type: none"> • Check output circuit • Replace device
M290	Warning	0x1816	Device wiring faulty	Device wiring is faulty	Remove plug and check wiring
C485	Warning	0x8C01	Simulation active	When the simulation of a switch output or current output is active, the device displays a warning.	Switch off simulation.
C182	Message	0x1807	Invalid calibration	Switch point/switchback point are too close together or interchanged.	<ul style="list-style-type: none"> • Check probe coverage • New adjustment recommen- ded and check switching behavior • Perform configuration again.
C103	Message	0x1813	Sensor check failed	Sensor check failed	<ul style="list-style-type: none"> • Repeat cleaning • Replace device
-	Message	0x1814	Sensor check passed	Sensor check	-
-	Information	0x1815	Timeout Reedcontact	Timeout reed contact	Remove test magnet
S825	Warning	0x1812	Ambient temperature outside of specification	Ambient temperature outside of specification	Operate device in the specified temperature range