IO-Link Interface Description

NAI 8273
Pressure Transmitter and Switch

Firmware V 1.xx

FPI 8237
Flush Membrane Transmitter and Switch

Firmware V 1.xx

Trafag sensors & controls
Switzerland

Industriestrasse 11
8608 Bubikon

+41 44 922 32 32
www.trafag.com

Content

1 General information

1.1 Related products

This interface description applies to the following products:

Product	Datasheet	Firmware
NAT 8273	H72621	V 1.xx
FPI 8237	H72622	V 1.xx

1.2 Electrical connection

		8273.XX.XXXX.**32**	**8237**.XX.XXXX.**35**
		M12x1 4-pole	M12x1 5-pole
Signal	**Description**	**Pin**	**Pin**
L+	positive supply	1	1
Out 2, I/Q	SIO switching output	2	2
L-	negative supply	3	3
Out 1, C/Q IO-Link	IO-Link or SIO switching output	4	4
NC	Not connected, no function	-	5

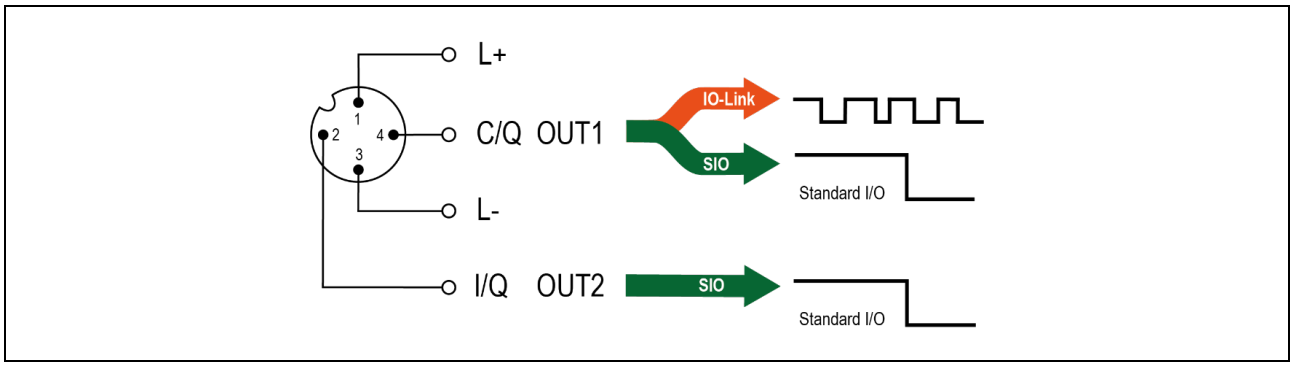


Figure 1 Electrical connection and operating modes

1.3 Operating modes

The NAI 8273 is capable to operate in two different modes
- SIO mode (PNP, NPN or Push-Pull)
- IO-Link communication mode

1.3.1 SIO mode

In SIO mode, the pressure measuring device operates as conventional pressure switch with PNP, NPN or Push-Pull output signal on the provide output pins. The device operates in SIO mode as soon as it is powered up and not connected to an IO-Link master.

1.3.2 IO-Link communication mode

The pressure measuring device switches automatically to IO-Link communication mode when it is connected to an IO-Link master.

1.4 IO Device Description (IODD)

The IODDs for the NAI 8273 and FPI 8237 devices are available in the IODDfinder.

Related device versions and IODDs

Refer to chapter 9 on page 17

2 Communication

Vendor ID	1531 (hex: 05FB)
Device ID	Refer to chapter 9 on page 17
Bit rate	COM3
Minimum cycle time	1 ms
SIO mode supported	Yes
Block parameterization	Yes
Data storage	Yes
Supported profiles	Identification and Diagnosis (0x4000), Measurement Data Channel (0x800A) Measuring and Switching Sensor (DMSS), SSP4.1.2
IO-Link version	1.1
Support of IO-Link 1.0	No

3 Process data

The process data are transmitted cyclically.

IO-Link Process Data						
IntegerT(16)	IntegerT(8)	8 bit (vendor specific)				
16 … 31	8 … 15	4 …7	2 … 3	Bit 1	Bit 0	
Pressure value	Scale exponent	Device status	reserved	SSC 1.2 Pressure	SSC 1.1 Pressure	Double Word 0
Temperature value	Scale exponent	Device status	reserved	SSC 2.2 Temperature	SSC 2.1 Temperature	Double Word 1

SSC: Switching Signal Channel (Bit 0, Bit 1)

3.1 Double Word 0 (Pressure)

Name	Format	Sub index	Bit offset	Bit length	Value range	Remarks	Unit
Pressure value	IntegerT16	1	16	16	-32’000 to 32’000	Current measured pressure value -32760, 32760 indicate out of range	Pascal (Pa)
Scale	IntegerT8	2	8	8	The value depends on the pressure range. Refer to chapter 9 on page 17	10^{scale}, Scale ≙ exponent e.g.: 10^scale * Pressure value = pressure in Pa 10^2 * 10’000 = 1’000’000 Pa = 10 bar	
Device status	UInteger8	5	4	4	Refer to chapter 5.1 on page 12		
Switching state SSC 1.2 Pressure	BooleanT	4	1	1			
Switching state SSC 1.1 Pressure	BooleanT	3	0	1			

3.2 Double Word 1 (Temperature)

The source of the temperature value (media or device temperature) depends on the product configuration, please refer to the respective datasheet.

Name	Format	Sub index	Bit offset	Bit length	Value range	Remarks	Unit
Temperature value	IntegerT16	1	16	16	-32’000 to 32’000	Current measured Temperature value -32760, 32760 indicate out of range	°C
Scale	IntegerT8	2	8	8	-2	10^{scale}, Scale ≙ exponent	
Device status	UInteger8	5	4	4	Refer to chapter 5.1 on page 12		
Switching state SSC 2.2 Temperature	BooleanT	4	1	1			
Switching state SSC 2.1 Temperature	BooleanT	3	0	1			

4 Parameters

4.1 Direct parameters

Index hex	Name	Format	Access	Default value
0x0002	Min Cycle Time		R	1000µs
0x0005	Process Data Input Length		R	8
0x0006	Process Data Output Length		R	0
0x0007	VendorID 1		R	0x05
0x0008	VendorID 2		R	0xFB
0x0009	DeviceID 1		R	Device identification
0x000A	DeviceID 2		R	Device identification
0x000B	DeviceID 3		R	Device identification

4.2 Identification

Index hex (dec)	Name	Format	Access	Default value	Value range	Remarks
0x0010 (16)	VendorName	STRING[64]	R	Trafag AG		
0x0011 (17)	VendorText	STRING[64]	R	www.trafag.com/io-link		
0x0012 (18)	ProductName	STRING[64]	R		NAI 8273 or FPI 8237	
0x0013 (19)	ProductID	STRING[64]	R			ProductID of the device
0x0014 (20)	ProductText	STRING[64]	R	Pressure transmitter / switch		
0x0015 (21)	SerialNumber	STRING[16]	R			Serial number of the device
0x0016 (22)	HardwareRevision	STRING[64]	R			Hardware revision of the device
0x0017 (23)	FirmwareRevision	STRING[64]	R	1.xx		Firmware revision of the device
0x0018 (24)	ApplicationSpecificTag	STRING[32]	RW	***		Designate device with application-specific information
0x0019 (25)	FunctionTag	STRING[32]	RW	***		Designate device with function-specific information
0x001A (26)	LocationTag	STRING[32]	RW	***		Designate device with location-specific information
0x0040 (64)	Type Code	STRING[48]	R	Type code of the device		
0x0041 (65)	Order Number (Mat#)	STRING[24]	R	Order number of the device		

4.3 Switching output configuration

4.3.1 Pressure channel switching signal configuration

Index hex	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x003C			Pressure Switching Signal Channel 1.1 Parameters	IntegerT32[2]				
	1	0	SSC1.1 Param.SP1	IntegerT32	RW	75% nominal pressure	> SP2, lower to upper limit of the pressure range (page 17)	IntegerT16 sign extended
	2	32	SSC1.1 Param.SP2	IntegerT32	RW	25% nominal pressure	Lower to upper limit of the pressure range (page 17)	Resulting hysteresis SP1 – SP2 ≥ 1 % nominal pressure Not applicable for "Single Point Mode" IntegerT16 sign extended
0x003D	0		Pressure Switching Signal Channel 1.1 Config	RecordT48				
	1	40	SSC1.1 Config.Logic	UIntegerT8	RW	0	0 = high active 1 = low active	high active ≙ normally open low active ≙ normally closed
	2	32	SSC1.1 Config.Mode	UIntegerT8	RW	3	0 = Switchpoint Mode 'Deactivated' 1 = Switchpoint Mode 'Single Point Mode' 2 = Switchpoint Mode 'Window' 3 = Switchpoint Mode 'Two Point Mode'	For graphical description refer to page 19
	3	0	SSC1.1 Config.Hyst	IntegerT32	RW	0	0 … full scale of the pressure range or 32'000	Applicable for function modes "Single Point Mode" and "Window Mode"
0x0062	0	0	SSC1.1 Activation Delay	UIntegerT16	RW	0 [ms]	0 … 65535 [ms]	Delay time related to SP1
0x0063	0	0	SSC1.1 Deactivation Delay	UIntegerT16	RW	0 [ms]	0 … 65535 [ms]	Delay time related to SP2
0x003E			Pressure Switching Signal Channel 1.2 Parameters	IntegerT32[2]				
	1	0	SSC1.2 Param.SP1	IntegerT32	RW	75% nominal pressure	> SP2, lower to upper limit of the pressure range (page 17)	IntegerT16 sign extended
	2	32	SSC1.2 Param.SP2	IntegerT32	RW	25% nominal pressure	Lower to upper limit of the pressure range (page 17)	Resulting hysteresis SP1 – SP2 ≥ 1 % nominal pressure Not applicable for "Single Point Mode" IntegerT16 sign extended
0x003F	0		Pressure Switching Signal Channel 1.2 Config	RecordT48				
	1	40	SSC1.2 Config.Logic	UIntegerT8	RW	0	0 = high active 1 = low active	high active ≙ normally open low active ≙ normally closed
	2	32	SSC1.2 Config.Mode	UIntegerT8	RW	3	0 = Switchpoint Mode 'Deactivated' 1 = Switchpoint Mode 'Single Point Mode' 2 = Switchpoint Mode 'Window' 3 = Switchpoint Mode 'Two Point Mode'	For graphical description refer to page 19
	3	0	SSC1.2 Config.Hyst	IntegerT32	RW	0	0 … upper limit of the pressure range or 32'000	Applicable for function modes "Single Point Mode" and "Window Mode"
0x0064	0	0	SSC1.2 Activation Delay	UIntegerT16	RW	0	0…. 65535 [ms]	Delay time related to SP1
0x0065	0	0	SSC1.2 Deactivation Delay	UIntegerT16	RW	0 [ms]	0…. 65535 [ms]	Delay time related to SP2

4.3.2 Temperature channel switching signal configuration

Index hex	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x400C			Switching Signal Channel 2.1 Temperature Parameters	IntegerT32[2]				
	1	0	SSC2.1 Param.SP1	IntegerT32	RW	60°C	-40 … 130	IntegerT16 sign extended
	2	32	SSC2.1 Param.SP2	IntegerT32	RW	30°C	-40 … 130	Resulting hysteresis SP1 – SP2 ≥ 1°C Not applicable for "Single Point Mode" IntegerT16 sign extended
0x400D	0		Switching Signal Channel 2.1 Temperature Config	RecordT48				
	1	40	SSC2.1 Config.Logic	UIntegerT8	RW	0	0 = high active 1 = low active	high active ≙ normally open low active ≙ normally closed
	2	32	SSC2.1 Config.Mode	UIntegerT8	RW	3	0 = Switchpoint Mode 'Deactivated' 1 = Switchpoint Mode 'Single Point Mode' 2 = Switchpoint Mode 'Window' 3 = Switchpoint Mode 'Two Point Mode'	For graphical description refer to page 19
	3	0	SSC2.1 Config.Hyst	IntegerT32	RW	0	0…170 0: no hysteresis	Applicable for "Single Point Mode" and "Window Mode"
0x0072	0	0	SSC2.1 Activation Delay	UIntegerT16	RW	0	0…. 65535 [ms]	Delay time related to SP1
0x0073	0	0	SSC2.1 Deactivation Delay	UIntegerT16	RW	0	0…. 65535 [ms]	Delay time related to SP2
0x400E			Switching Signal Channel 2.2 Temperature Parameters	IntegerT32[2]				
	1	0	SSC2.2 Param.SP1	IntegerT32	RW	60°C	-40 … 130	IntegerT16 sign extended
	2	32	SSC2.2 Param.SP2	IntegerT32	RW	30°C	-40 … 130	Resulting hysteresis SP1 – SP2 ≥ 1°C Not applicable for "Single Point Mode" IntegerT16 sign extended
0x400F	0		Switching Signal Channel 2.2 Temperature Config	RecordT48				
	1	40	SSC2.2 Config.Logic	UIntegerT8	RW	0	0 = high active 1 = low active	high active ≙ normally open low active ≙ normally closed
	2	32	SSC2.2 Config.Mode	UIntegerT8	RW	3	0 = Switchpoint Mode 'Deactivated' 1 = Switchpoint Mode 'Single Point Mode' 2 = Switchpoint Mode 'Window' 3 = Switchpoint Mode 'Two Point Mode'	For graphical description refer to page 19
	3	0	SSC2.2 Config.Hyst	IntegerT32	RW	0	0…170 0: no hysteresis	Applicable for function modes "Single Point Mode" and "Window Mode"
0x0074	0	0	SSC2.2 Activation Delay	UIntegerT16	RW	0	0…. 65535 [ms]	Delay time related to SP1
0x0075	0	0	SSC2.2 Deactivation Delay	UIntegerT16	RW	0	0…. 65535 [ms]	Delay time related to SP2

4.3.3 Switching output configuration OUT1

OUT1 = C/Q line in SIO mode

Index hex	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x005F	0	0	Channel Source	UIntegerT8	RW	0	0 = Pressure SSC 1.1 1 = Pressure SSC 1.2 2 = Temperature SSC 2.1 3 = Temperature SSC 2.2	Refer to chapter 4.3.1 and 4.3.2 for the channel configurations
0x0061	0	0	Polarity	UIntegerT8	RW	0	0 = PNP 1 = NPN 2 = Push-Pull high active 3 = Push-Pull low active	
0x0066	0	0	Error behaviour	UIntegerT8	RW	0	0 = Tri-State 1 = NPN/PNP: Open / Push-Pull: High 2 = NPN/PNP: Closed / Push-Pull: Low 3 = Last valid state	Refer to chapter 4.3.5 on page 9

4.3.4 Switching output configuration OUT2

OUT2 = I/Q line in SIO mode

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0c0060	0	0	Channel Source	UIntegerT8	RW	1	0 = Pressure SSC 1.1 1 = Pressure SSC 1.2 2 = Temperature SSC 2.1 3 = Temperature SSC 2.2	Refer to chapter 4.3.1 and 4.3.2 for the channel configurations
0x0068	0	0	Polarity	UIntegerT8	RW	0	0 = PNP 1 = NPN 2 = Push-Pull high active 3 = Push-Pull low active	
0x0067	0	0	Error behaviour	UIntegerT8	RW	0	0 = Tri-State 1 = NPN/PNP: Open / Push-Pull: High 2 = NPN/PNP: Closed / Push-Pull: Low 3 = Last valid state	Refer to chapter 4.3.5 on page 9

4.3.5 Error behaviour for switching outputs

Value	PNP	NPN	Effect on OUT1 or OUT2
0	off	off	tri-state
1	on	off	L+ signal level (i.e. 24V nominal)
2	off	on	L- singal level (i.e. 0V)
3	-	-	last valid signal level (before error)

Table 1 SIO output behaviour in case of fault

The error behaviour comes into play when the transmitter is operated in SIO mode. In SIO mode, the digital output signal is determined by the various SSC configuration parameters and finally by the actual measured value (pressure or temperature). If - for whatever error reason - the pressure/temperature measurand is no longer available and this can be detected by the unit, it may be important to set OUT1 or OUT2 to a specific, predefined output state.

4.4 Signal processing

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x004B	0	0	Pressure offset correction (Pcor)	IntegerT16	RW	0	± upper limit of the pressure range	Refer also to the system command pressure zero-set. The offset correction value has the same scaling as the according process value.
0x004C	0	0	Temperature offset correction (tCor)	IntegerT16	RW	0	--130 … +130 [°C]	
0x004D	0	0	Damping for pressure channel	UIntegerT16	RW	0	0 = deactivated 1…. 65535 [ms] Tau as time constant	low pass filter, 1st order
0x004E	0	0	Damping for pressure SSC1.1 and SSC1.2	UIntegerT16	RW	0	0 = deactivated 1…. 65535 [ms] Tau as time constant	low pass filter, 1st order

4.5 Overload thresholds

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x0050	0	0	Pressure overload threshold	IntegerT16	RW	103 % nominal pressure	Lower limit of the pressure range to 103 % of the upper limit of the pressure range (page 17)	Hysteresis 3% of the nominal pressure range, Affects the “pressure overload counter” 0x0051 (page 13) and the event 0x8C10 (page 14)
0x0052	0	0	Temperature overload threshold	IntegerT16	RW	130°C	-40°C … 130°C	Hysteresis 5°C Affects the “temperature overload counter” 0x0053 (13) and the event 0x4210 (14)

4.6 Teach-In

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x003A	0	0	Teach Select	UIntegerT8	RW	Pressure SSC 1.1	0 = Default (Pressure SSC 1.1) 1 = Pressure SSC 1.1 2 = Pressure SSC 1.2 11 = Temperature SSC 2.1 12 = Temperature SSC 2.2 255 = All SSC	
0x003B	0	0	Teach Result	RecordT8	R		According to IO-Link specification	

4.7 MDC descriptor

4.7.1 Pressure

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x4080			MDC Descriptor	RecordT11	R			
	1	56	Lower value measurement range	IntegerT32	R		-32000	The value depends on the pressure range. Refer to chapter 9 on page 17
	2	24	Upper value measurement range	IntegerT32	R		32000	The value depends on the pressure range. Refer to chapter 9 on page 17
	3	8	Unit Code	UIntegerT16	R	1130	Pa	1130 for “Pa”
	4	0	Scale	IntegerT32	R		The value depends on the pressure range. Refer to chapter 9 on page 17	System specific

4.7.2 Temperature

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x4081			MDC Descriptor	RecordT11	R			
	1	56	Lower value measurement range	IntegerT32	R		-32000	
	2	24	Upper value measurement range	IntegerT32	R		32000	
	3	8	Unit Code	UIntegerT16	R	1001	°C	1001 for “°C”
	4	0	Scale	IntegerT32	R		-2	

5 Diagnosis

5.1 General

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x0024	0	0	Device status	UInteger8	R	0	0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure	
0x0025	0	0	Detailed Device Status	RecordT3	R	-		

5.1.1 Display unit

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x0049	0	0	Display unit for pressure	UInteger8	RW	bar	0 = bar 1 = psi 2 = MPa 3 = Pa	
0x004A	0	0	Display unit for temperature	UInteger8	RW	°C	0 = °C 1 = °F	

5.1.2 Operating hours

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0c0054	0	0	Lifetime operating hours	UIntegerT32	R	0	0 … 4294967295 [hours]	Total amount of operating hours since first power on. [h]. Non resettable
0c0055	0	0	Resettable operating hours	UIntegerT32	R	0	0 … 4294967295 [hours]	Total amount of operating hours since last reset

5.1.3 Device Temperature

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0c0076	0	0	Current device temperature	UIntegerT32	R	0	-4000 … 12500 -32000 bis 32000	

5.2 Memory / Device History

5.2.1 Pressure

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0c0042	0	0	Minimum Memory Value Media Pressure	UIntegerT16	R	0	valid measurements in range: [-32'000, +32'000] indicator values: underflow -32'760, overflow +32'760	Lowest measured pressure measured since last value reset
0x0043	0	0	Maximum Memory Value Media Pressure	UIntegerT16	R	0	valid measurements in range: [-32'000, +32'000] indicator values: underflow -32'760, overflow: +32'760	Highest measured pressure measured since last value reset
0x0051	0	0	Pressure overload counter	UIntegerT16	R	0	0 ... 65535	Increment if measured pressure > "Pressure overload threshold" 0x0051 (page 10)

5.2.2 Temperature

Index hex (dec)	Subindex	Bit offset	Name	Format	Access	Default value	Value range	Remarks
0x0044	0	0	Minimum Memory Value Temperature	UIntegerT16	R	0	valid measurements in range: [-32'000, +32'000] (scale exp: -2)	Lowest measured media temperature
0x0045	0	0	Maximum Memory Value Temperature	UIntegerT16	R	0	valid measurements in range: [-32'000, +32'000] (scale exp: -2)	Highest measured media temperature
0x0046	0	0	Minimum Memory Value Device Temperature	UIntegerT16	R	0	valid measurements in range: [-32'000, +32'000] (scale exp: -2)	Lowest measured device temperature
0x0047	0	0	Maximum Memory Value Device Temperature	UIntegerT16	R	0	valid measurements in range: [-32'000, +32'000] (scale exp: -2)	Highest measured device temperature
0x0053	0	0	Temperature overload counter	UIntegerT16	R	0	0 … 65535	Increment if measured temperature > "Temperature overload threshold" 0x0052 (page 10)

6 Events

Code	Device status	Type	Name	Remark
0x5000	4	Error	Device hardware fault	Replace the measuring device
0x7710	4	Error	Short-circuit	Check installation
0x8C10	2	Warning	Pressure measurand overrun	If pressure > “Pressure overload threshold” 0x0051, including hysteresis details refer to page 10
0x8C30	2	Warning	Pressure measurand underrun	If pressure < P-min - 3% of P-max
0x4210	2	Warning	Temperature measurand overrun	If temperature > “Temperature overload threshold” 0x0052, including hysteresis details refer to page 10, clear source of heat
0x4220	2	Warning	Temperature measurand underrun	If temperature < -40°C
0x6320	4	Error	Parameter error	Wrong ISDU parametrization
0xFF91	0	Notification	Data storage upload request	Request for data storage upload
0x1800	4	Error	Error Module Initialization	Device start-up fails
0x1801	4	Error	Error Hardware Incompatibility	Device software on wrong hardware (PCB)
0x1802	4	Error	Error File system Mounting	Unable to mount filesystem
0x1803	4	Notification	Error Boot Config File Loading	Boot config loading failed (currently unused)
0x1804	4	Notification	Error Communication Config File Loading	Communication config loading failed
0x1805	4	Notification	Error Application Config File Loading	Application config loading failed
0x1806	0	Notification	Error Unexpected Device Reset	Device did reset and restart unexpectedly
0x1807	1	Notification	Error History File Saving	History data saving failed
0x1808	1	Notification	Error History File Loading	History data loading failed
0x1809	4	Notification	Error Boot Config File Saving	Boot config saving failed
0x180A	4	Notification	Error Communication Config File Saving	Communication config saving failed
0x180B	4	Notification	Error Application Config File Saving	Application configuration saving failed
0x1810	4	Error	Error Sensor Initialization	ASCI initialization failed
0x1811	4	Error	Error External Clock	ASIC (ext.) clock not detected
0x1812	4	Error	Error Boot Failure	ASIC did not boot
0x1815	4	Error	Error Sensor Break	ASIC detected sensor break
0x1816	4	Error	Error CRC RAM	ASIC detected RAM CRC

7 Error types

Error code	Name	Description
0x8000	Device application error	The request has been refused by the Device application
0x8011	Index not available	A read or write access occurred to a non-existing Index.
0x8012	Subindex not available	A read or write access occurred to a non-existing subindex.
0x8020	Service temporarily not available	The requested parameter is not accessible due to the current state of the device application.
0x8021	Service temporarily not available – local control	The requested parameter is not accessible due to an ongoing local operation at the device.
0x8022	Service temporarily not available – device control	The Parameter is not accessible due to a remote triggered state of the device application
0x8023	Access denied	Write access to a read-only parameter.
0x8030	Parameter value out of range	Parameter value is outside of its permitted range of values.
0x8031	Parameter value above limit	Parameter value is above the specified value range.
0x8032	Parameter value below limit	Parameter value is below the specified value range.
0x8033	Parameter length overrun	Parameter length is greater than its specified length.
0x8034	Parameter length underrun	Parameter length is less than its specified length.
0x8035	Function not available	The command is not supported by the device application.
0x8036	Function temporarily unavailable	The command is not available due to the current state of the device application.
0x8040	Invalid parameter set	The written parameter value is not consistent with other actual parameter settings.
0x8041	Inconsistent parameter set	The plausibility check of the block parameter transfer found inconsistencies.
0x8082	Application not ready	A read or write access was refused due to a temporarily unavailable application.

8 System commands

System command	Name	Format	Access	Remarks
0x80	Device reset	UIntegerT8	W	
0x81	Application reset	UIntegerT8	W	
0x82	Restore factory settings	UIntegerT8	W	
0x83	Back-to-box	UIntegerT8	W	
0x41	Teach SP1	UIntegerT8	W	(Single value teach)
0x42	Teach SP2	UIntegerT8	W	(Single value teach)
0xA1	Reset minimum and maximum pressure memory	UIntegerT8	W	
0xA2	Reset minimum pressure memory	UIntegerT8	W	
0xA3	Reset maximum pressure memory	UIntegerT8	W	
0xA4	Reset pressure overload counter	UIntegerT8	W	
0xA5	Reset minimum and maximum media temperature memory	UIntegerT8	W	
0xA6	Reset minimum media temperature memory	UIntegerT8	W	
0xA7	Reset maximum media temperature memory	UIntegerT8	W	
0xA8	Reset temperature overload counter	UIntegerT8	W	
0xA9	Reset operating hours	UIntegerT8	W	
0xAA	Pressure zero-set	UIntegerT8	W	Offset correction. The currently applied pressure level becomes the new zero point.
0xAB	Reset temperature offset	UIntegerT8	W	
0xAC	Reset pressure offset	UIntegerT8	W	
0xC3	Reset all device temperature memories	UIntegerT8	W	
0xC4	Reset minimum device temperature memory	UIntegerT8	W	
0xC5	Reset maximum device temperature memory	UIntegerT8	W	

9 Device versions and IODDs

9.1 NAI 8273, accuracy 0.3 %

Pressure range	Code	DeviceID	Lower limit	Upper limit	Scale
-0.2 ... 0.2	A8	100'057	-20'000	20'000	0
-0.4 ... 0	D3	100'000	-4'000	0	1
-0.4 ... 0.4	A9	100'001		4'000	1
-1 ... 0	D4	100'002	-1'000	0	1
-1 ... 1.0	B1	100'003	-1'000	10'000	1
-1 ... 1.6	B3	100'004	-1'000	16'000	1
-1 ... 4	B6	100'005	-1'000	4'000	2
-1 ... 6	B7	100'006	-1'000	6'000	2
-1 ... 10	B8	100'007	-1'000	10'000	2
-1 ... 16	B9	100'008	-1'000	16'000	2
-1 ... 25	C0	100'009	-1'000	25'000	2
0 ... 0.2	68	100'010	0	20'000	0
0 ... 0.4	69	100'011	0	4'000	1
0 ... 1	71	100'012	0	10'000	1
0 ... 2.5	75	100'013	0	25'000	1
0 ... 10	78	100'014	0	10'000	2
0 ... 40	81	100'015	0	4'000	3
0 ... 60	82	100'016	0	6'000	3
0 ... 100	83	100'017	0	10'000	3
0 ... 160	85	100'018	0	16'000	3
0 ... 250	74	100'019	0	25'000	3
0 ... 400	84	100'020	0	4'000	4
0 ... 600	86	100'021	0	6'000	4
0 ... 700	87	100'022	0	7'000	4

Pressure range 5-fold overpressure	Code	DeviceID	Lower limit	Upper limit	Scale
0 ... 2.5	55	100'023	0	25'000	1
0 ... 4	56	100'024	0	4'000	2
0 ... 6	57	100'025	0	6'000	2
0 ... 10	58	100'026	0	10'000	2
0 ... 16	59	100'027	0	16'000	2
0 ... 25	60	100'028	0	25'000	2
0 ... 40	61	100'029	0	4'000	3
0 ... 60	62	100'030	0	6'000	3
0 ... 100	63	100'031	0	10'000	3
0 ... 160	65	100'032	0	16'000	3

9.2 NAI 8273, accuracy 0.5 %

Pressure range	Code	DeviceID	Lower limit	Upper limit	Scale
-1 ... 4	B6	100’033	-1’000	4’000	2
-1 ... 6	B7	100’034	-1’000	6’000	2
-1 ... 10	B8	100’035	-1’000	10’000	2
-1 ... 16	B9	100’036	-1’000	16’000	2
-1 ... 25	C0	100’037	-1’000	25’000	2
0 ... 2.5	75	100’038	0	25’000	1
0 ... 10	78	100’058	0	10’000	2
0 ... 40	81	100’039	0	4’000	3
0 ... 60	82	100’040	0	6’000	3
0 ... 100	83	100’041	0	10’000	3
0 ... 160	85	100’042	0	16’000	3
0 ... 250	74	100’043	0	25’000	3
0 ... 400	84	100’044	0	4’000	4
0 ... 600	86	100’045	0	6’000	4
0 ... 700	87	100’046	0	7’000	4

Pressure range 5-fold overpressure	Code	DeviceID	Lower limit	Upper limit	Scale
0 ... 2.5	55	100’047	0	25’000	1
0 ... 4	56	100’048	0	4’000	2
0 ... 6	57	100’049	0	6’000	2
0 ... 10	58	100’050	0	10’000	2
0 ... 16	59	100’051	0	16’000	2
0 ... 25	60	100’052	0	25’000	2
0 ... 40	61	100’053	0	4’000	3
0 ... 60	62	100’054	0	6’000	3
0 ... 100	63	100’055	0	10’000	3
0 ... 160	65	100’056	0	16’000	3

9.3 FPI 8237

Pressure range	Code	DeviceID	Lower limit	Upper limit	Scale
-0.5 ... 0.5	A7	100’098	-20’000	20’000	0
-1 ... 0	D4	100’096	-1’000	0	1
-1 ... 1.0	B1	100’088	-1’000	10’000	1
-1 ... 1.6	B3	100’089	-1’000	16’000	1
-1 … 2.5	B4	100’090	-1’000	25’000	1
-1 ... 4	B6	100’091	-1’000	4’000	2
-1 ... 6	B7	100’092	-1’000	6’000	2
-1 ... 10	B8	100’093	-1’000	10’000	2
-1 ... 16	B9	100’094	-1’000	16’000	2
-1 ... 25	C0	100’095	-1’000	25’000	2

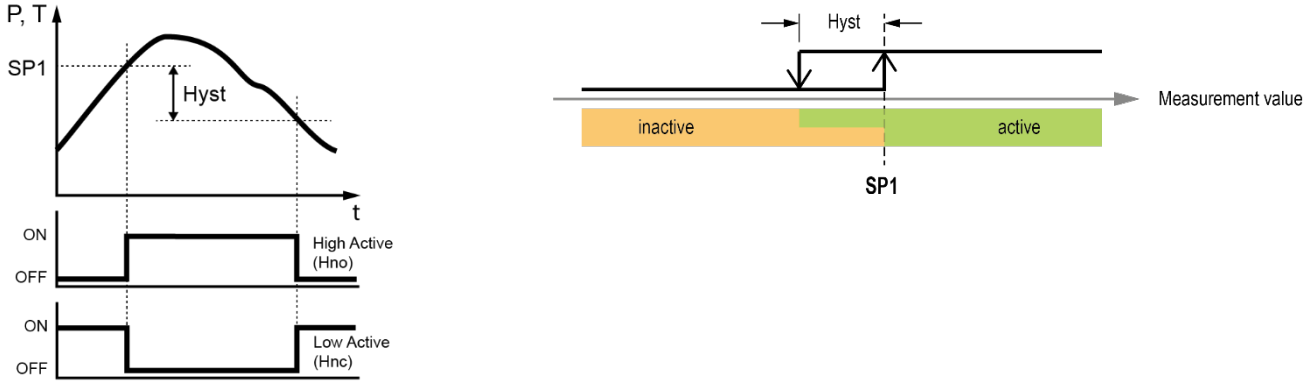
Pressure range	Code	DeviceID	Lower limit	Upper limit	Scale
0 ... 1	71	100’078	0	10’000	1
0 …1.6	73	100’079	0	16’000	1
0 ... 2.5	75	100’080	0	25’000	1
0 … 4	76	100’081	0	4’000	2
0 … 6	77	100’082	0	6’000	2
0 ... 10	78	100’083	0	10’000	2
0 … 16	79	100’084	0	16’000	2
0 … 25	80	100’085	0	25’000	2
0 ... 40	81	100’086	0	4’000	3
0 ... 100	83	100’087	0	10’000	3

10 Appendix

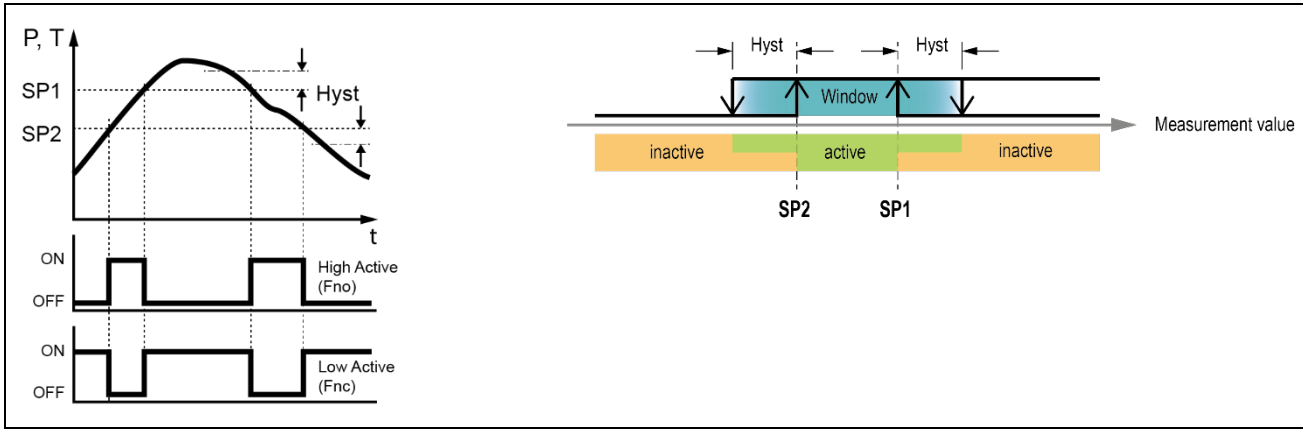
10.1 Switching outputs configuration description

The following graphical descriptions are related to the parameters of the Switching output configuration on page 7 and 8.

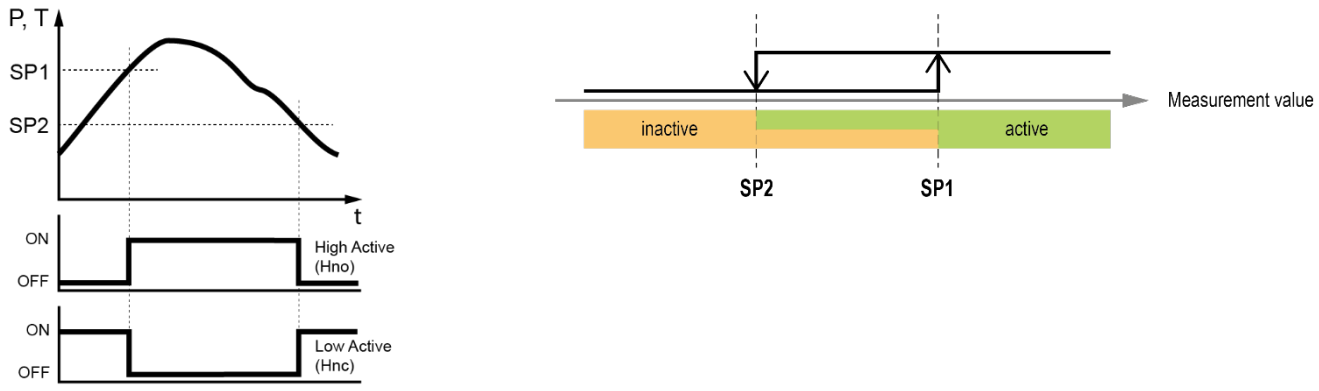
10.1.1 Single Point Mode



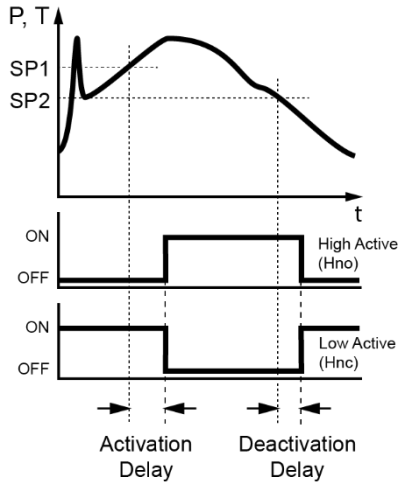
10.1.2 Window Mode



10.1.3 Two Point Mode



10.1.4 Delay times



The “Activation Delay” is related to SP1
The “Deactivation Delay” is related to SP2