



IO-Link Interface Description

PM1606
PM1706
PM1106

EN



Device variant

<p>PM1606</p> <p>Electronic pressure sensor, EHEDG, 3A, FDA, IO-Link, CRN, cULus, -125...2500 mbar, G1A Dichtkonus</p>		
<p>PM1706</p> <p>Electronic pressure sensor, EHEDG, 3A, FDA, IO-Link, CRN, cULus, -125...2500 mbar, G1A Aseptoflex Vario</p>		
<p>PM1106</p> <p>Electronic pressure sensor, EHEDG, 3A, FDA, IO-Link, CRN, cULus, -125...2500 mbar, 1.5" TriClamp</p>		

Vendor ID	310 / Bytes 1-54 (hex: 01-36)
Device ID	665 / Bytes 0-2-153 (hex: 00-02-99)
Bit rate	COM2
Minimum cycle time	3,2 ms
SIO mode supported	No
Block parameterization	Yes
Data storage	Yes
Supported profiles	10 / hex: 0xA Measuring Sensor 16384 / hex: 0x4000 Identification and Diagnosis
Support of IO-Link 1.0	Yes



NOTE:

- If the Vendor ID and Device ID is referenced in your PLC system, then it is ensured that
- the connected Device type is correct
 - the IO-Link datastorage is enabled
 - your application is still able to work, even your Device has been exchanged with a successor model



For process value update rate, as well as further information concerning sensor performance, see datasheet.



Unit conversion



This list provides conversion formulas to convert the transmitted IO-Link raw data into physical units.

Pressure

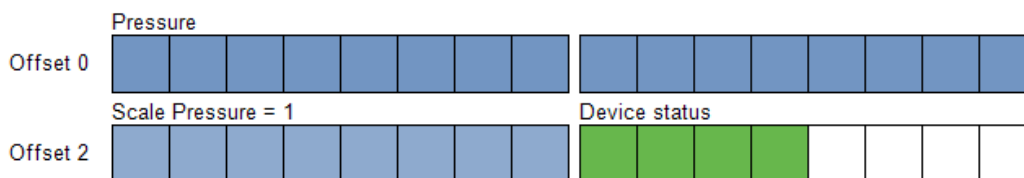
Value in [mbar]	= MeasurementValue	* 0.1
Value in [inH2O]	= MeasurementValue	* 0.040146
Value in [mmH2O]	= MeasurementValue	* 1.019716
Value in [psi]	= MeasurementValue	* 0.0014504
Value in [kPa]	= MeasurementValue	* 0.01



Process data

Process data input		RecordT (32 Bit)
Pressure		IntegerT (16 Bit)
Current pressure		
Value range [Pa]	(-2500 to 26250) * 10 -32760 32760 32764	(UL - underload) 0x8008 (OL - overload) 0x7FF8 (NoData) 0x7FFC

Device status		UIntegerT (4 Bit)
Current device status, a copy of the parameter [Device Status, Index 36] in the process data channel		
Value range	0 1 2 3 4	(Device is OK) (Maintenance required) (Out of specification) (Functional check) (Failure)



-Scale Pressure: This value enables a PLC function block to calculate the process data (from WORD 0) into the unit [Pa]



Data is transmitted in BigEndian format.
 The position of the process data bytes is shown according device transmit sequence.
 The content in your PLCs input buffer may vary according your PLCs data format.
 Please do not apply any byte swap feature.
 Example function blocks incl. documentation are available on www.ifm.com --> Startup Packages.



Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
Vendor name	16		StringT (19 Byte)	ifm electronic gmbh	7
Product Name	18		StringT (6 Byte)		7
Product Text	20		StringT (26 Byte)	Electronic pressure sensor	7
Serial Number	21		StringT (12 Byte)		7
Hardware Revision	22		StringT (2 Byte)		7
Firmware Revision	23		StringT (5 Byte)		7
Application-specific Tag	24		StringT (32 Byte)	***	7
Function Tag	25		StringT (32 Byte)	***	7
Location Tag	26		StringT (32 Byte)	***	7
Device Status	36		UIntegerT (8 Bit)	0 (Device is OK)	10
Detailed Device Status	37		OctetStringT (3 Byte) [8]	0x00,0x00,0x00	10
Process data input	40		RecordT (32 Bit)		
dAP	510		UIntegerT (16 Bit)	60	8
dAA	512		UIntegerT (16 Bit)	100	8
Device temperature	536		IntegerT (16 Bit)		10
Active Events	545		RecordT (32 Bit)		10
Param configuration fault	546		UIntegerT (32 Bit) [10]	0 (OK)	10
uni	551		UIntegerT (8 Bit)	1 (mbar)	8
Hi	560		IntegerT (16 Bit)		8
Lo	561		IntegerT (16 Bit)		8
ASP2 - PRES	630		IntegerT (16 Bit)	0	8
AEP2 - PRES	631		IntegerT (16 Bit)	25000	8
coF	5005		IntegerT (16 Bit)	0	8
MDC Descr	16512		RecordT (88 Bit)		9
Lower limit	16512	1	IntegerT (32 Bit)	-1250 (-1250)	
Upper limit	16512	2	IntegerT (32 Bit)	25000 (25000)	
Unit code	16512	3	UIntegerT (16 Bit)	1130 (Pa)	
Scale	16512	4	IntegerT (8 Bit)	1 (1)	



System Command



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

- Address: Index 2, Subindex 0
- Datatype: UInteger (8 Bit)
- AccessRight: Write Only

#	Text	Description
1	Upload Start	Start block parameter upload
2	Upload End	End block parameter upload
3	Download Start	Start block parameter download
4	Download End	Stop block parameter download
5	Store	Finalize block parameterization and start Data Storage
6	Break	Cancel block parameterization
130	Restore Factory Settings	
161	Reset [Hi] and [Lo] memory	
162	Reset [Lo] memory	
163	Reset [Hi] memory	
170	Reset COF	
194	Teach COF	
240	IO-Link 1.1 system test command 240, Event 8DFE appears	
241	IO-Link 1.1 system test command 241, Event 8DFE disappears	
242	IO-Link 1.1 system test command 242, Event 8DFF appears	
243	IO-Link 1.1 system test command 243, Event 8DFF disappears	



Identification

Vendor name	Index 16	Subindex 0	StringT (19 Byte)	ReadOnly
The vendor name that is assigned to a Vendor ID.				
Factory setting	ifm electronic gmbh			
Product Name	Index 18	Subindex 0	StringT (6 Byte)	ReadOnly
Complete product name.				
Product Text	Index 20	Subindex 0	StringT (26 Byte)	ReadOnly
Additional product information for the device.				
Factory setting	Electronic pressure sensor			
Serial Number	Index 21	Subindex 0	StringT (12 Byte)	ReadOnly
Unique, vendor-specific identifier of the individual device.				
Hardware Revision	Index 22	Subindex 0	StringT (2 Byte)	ReadOnly
Unique, vendor-specific identifier of the hardware revision of the individual device.				
Firmware Revision	Index 23	Subindex 0	StringT (5 Byte)	ReadOnly
Unique, vendor-specific identifier of the firmware revision of the individual device.				
Application-specific Tag	Index 24	Subindex 0	StringT (32 Byte)	ReadWrite
Possibility to mark a device with user- or application-specific information.				
Factory setting	***			
Function Tag	Index 25	Subindex 0	StringT (32 Byte)	ReadWrite
Plant designation, describes the device functionality				
Factory setting	***			
Location Tag	Index 26	Subindex 0	StringT (32 Byte)	ReadWrite
Location designation, identifies the device location				
Factory setting	***			



Parameters

dAP	Index 510	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Damping of the measured signal				
Factory setting	60			
Value range [s]	(0 to 4000) * 0.001			
dAA	Index 512	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Response time between process value change and change of the analog output				
Factory setting	100			
Value range [s]	(0 to 4000) * 0.001			
uni	Index 551	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of the physical unit				
Factory setting	1	(mbar)		
Value range	0	(kPa)		
	1	(mbar)		
	2	(psi)		
	3	(mmWS)		
	4	(inH2O)		
Hi	Index 560	Subindex 0	IntegerT (16 Bit)	ReadOnly
Maximum memory value				
Value range [mbar]	(-2500 to 26250) * 0.1			
	-32760	(UL - underload) 0x8008		
	32760	(OL - overload) 0x7FF8		
	32764	(NoData) 0x7FFC		
Lo	Index 561	Subindex 0	IntegerT (16 Bit)	ReadOnly
Minimum memory value				
Value range [mbar]	(-2500 to 26250) * 0.1			
	-32760	(UL - underload) 0x8008		
	32760	(OL - overload) 0x7FF8		
	32764	(NoData) 0x7FFC		
ASP2 - PRES	Index 630	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue start point 2 / Pressure. [ASP2] must be smaller than [AEP2]. Min Pressure distance [AEP2]-[ASP2] = 500 mbar. ! Rounded on stepwidth !				
Factory setting	0			
Value range [mbar]	(-1250 to 20000) * 0.1			
AEP2 - PRES	Index 631	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue end point 2 / Pressure. [AEP2] must be greater than [ASP2]. Min Pressure distance [AEP2]-[ASP2] ==> see [ASP2]. ! Rounded on stepwidth !				
Factory setting	25000			
Value range [mbar]	(3750 to 25000) * 0.1			
coF	Index 5005	Subindex 0	IntegerT (16 Bit)	ReadOnly
Zero-point calibration (Calibration offset)				
Factory setting	0			
Value range [%]	(-30 to 30) * 0.1			
MDC Descr	Index 16512	Subindex 0	RecordT (88 Bit)	ReadOnly
Description of the measurement data channel				
Lower limit		Subindex 1	IntegerT (32 Bit)	
Lower value measurement range				
Factory setting	-1250	(-1250)		
Value range	-1250	(-1250)		



Parameters

MDC Descr	Index 16512	Subindex 0	RecordT (88 Bit)	ReadOnly
Upper limit		Subindex 2	IntegerT (32 Bit)	
Upper value measurement range				
Factory setting	25000	(25000)		
Value range	25000	(25000)		
Unit code		Subindex 3	UIntegerT (16 Bit)	
Unit code of the measurement data				
Factory setting	1130	(Pa)		
Value range	1130	(Pa)		
Scale		Subindex 4	IntegerT (8 Bit)	
Range shifting (10 scale)				
Factory setting	1	(1)		
Value range	1	(1)		



Diagnosis

Device Status	Index 36	Subindex 0	UIntegerT (8 Bit)	ReadOnly
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Indicator for the current device condition and diagnosis state.

Factory setting	Value range	0	1	2	3	4
		(Device is OK)	(Device is OK)	(Maintenance required)	(Out of specification)	(Functional check)
				(Failure)		

Detailed Device Status	Index 37	Subindex 0	OctetStringT (3 Byte) [8]	ReadOnly
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List of all currently pending events in the device.

Factory setting	Value range
	0x00,0x00,0x00

Device temperature	Index 536	Subindex 0	IntegerT (16 Bit)	ReadOnly
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Current temperature of the device

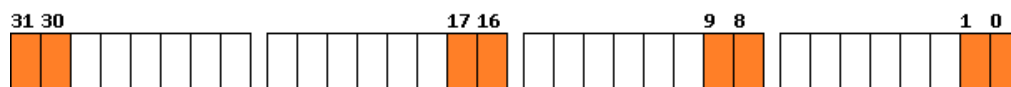
Value range [°C]	(-300 to 1600) * 0.1	(UL - underload) 0x8008	(OL - overload) 0x7FF8	(NoData) 0x7FFC
	-32760			
	32760			
	32764			

Active Events	Index 545	Subindex 0	RecordT (32 Bit)	ReadOnly
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Bit mask for current pending events

bitOffset	hex	Description
31	0x8DFF	Test Event 2. Device Status = 1 (Maintenance required)
30	0x8DFE	Test Event 1. Device Status = 1 (Maintenance required)
17	0x4220	Device temperature under-run
16	0x4210	Device temperature over-run
9	0x8C30	Process variable range under-run
8	0x8C10	Process variable range over-run
1	0x6320	Parameter error
0	0x5000	Device hardware fault

Value range true Event active
false Event inactive



Param configuration fault	Index 546	Subindex 0	UIntegerT (32 Bit) [10]	ReadOnly
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Displays the incorrectly set parameters

Factory setting	Value range	0	(OK)
		0	(OK)
		786432	(Device Access Locks, Index = 12)
		33554432	(dAA, Index = 512)
		41353216	(AEP2 - PRES, Index = 631)
		33423360	(dAP, Index = 510)
		41287680	(ASP2 - PRES, Index = 630)
		36110336	(uni, Index = 551)



Events

Code	Device status	PQ*	Class	Name	Description
0x4210 16912d	2 (Out of specification)	valid	Warning	Device temperature overrun	Clear source of heat
0x4220 16928d	2 (Out of specification)	valid	Warning	Device temperature underrun	Insulate device
0x5000 20480d	4 (Failure)	invalid	Error	Device hardware fault	Exchange device
0x6320 25376d	3 (Functional check)	invalid	Error	Parameter error	Check datasheet and values
0x8C10 35856d	2 (Out of specification)	valid	Warning	Process variable range overrun	Process data uncertain
0x8C30 35888d	2 (Out of specification)	valid	Warning	Process variable range underrun	Process data uncertain
0x8DFE 36350d	1 (Maintenance required)	valid	Warning	Test Event 1. Device Status = 1 (Maintenance required)	Event appears by setting index 2 to value 240, Event disappears by setting index 2 to value 241
0x8DFF 36351d	1 (Maintenance required)	valid	Warning	Test Event 2. Device Status = 1 (Maintenance required)	Event appears by setting index 2 to value 242, Event disappears by setting index 2 to value 243



Events are raised by the device itself to notify irregular device states.
PQ* = Process data quality.



Error types

Code	Name	Description
0x8000 32768d	Device application error - no details	Service was denied by the technology-specific application. No detailed root-cause information is available.
0x8011 32785d	Index not available	Read or write access attempt to a non-existing index.
0x8012 32786d	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
0x8020 32800d	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
0x8021 32801d	Service temporarily unavailable - local control	Parameter not accessible. The device is currently in an ongoing, locally controlled operation.
0x8022 32802d	Service temporarily unavailable - device control	Parameter not accessible. The technology-specific application is currently in a remotely triggered operation.
0x8023 32803d	Access denied	Write access to a read-only parameter or read access to write-only parameter.
0x8030 32816d	Parameter value out of range	Written parameter value is outside of the permitted value range.
0x8033 32819d	Parameter length overrun	Written parameter is longer than specified.
0x8034 32820d	Parameter length underrun	Written parameter is shorter than specified.
0x8035 32821d	Function unavailable	Written command is not supported by the technology-specific application.
0x8036 32822d	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
0x8040 32832d	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
0x8041 32833d	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.
0x8082 32898d	Application not ready	Read or write access denied. The technology-specific application is temporarily unavailable.



Error types are used for the ISDU response. Values unequal '0' indicate the cause of a failed ISDU read or write service.