



PM1504

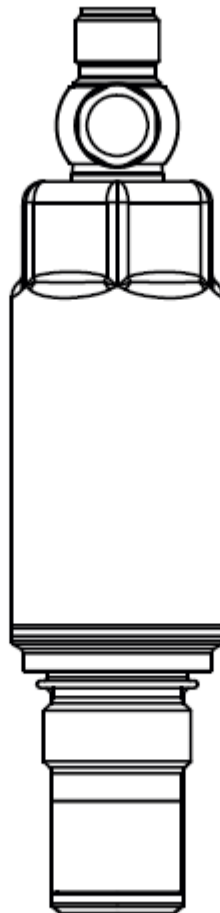




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1 Device variant

<p>PM1504</p> <p>Electronic pressure sensor, -1.000...10.000 bar, TA: G 1/2; Weitere technische Dokumentation: G1/2" Dichtkonus</p>	<p>①</p> <p>②</p>	
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2 Communication

Vendor ID	0x0136 310 d / Bytes 1d 54d
Device ID	0x0003FD 1021 d / Bytes 0d 3d 253d
Bit rate	COM2
Minimum cycle time	4,5 ms
SIO mode supported	No
Block parameterization	Yes
Data storage	Yes
Supported profiles	Identification and Diagnosis Measurement Data Channel (standard resolution)
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



3 Parameter overview

Parameter	Index	Subindex	Type	Factory setting
Vendor name	16		StringT (19 Byte)	ifm electronic gmbh
Vendor text	17		StringT (11 Byte)	www.ifm.com
Product Name	18		StringT (6 Byte)	PM1504
Product ID	19		StringT (6 Byte)	PM1504
Product Text	20		StringT (26 Byte)	Electronic pressure sensor
Serial Number	21		StringT (12 Byte)	
Hardware Version	22		StringT (2 Byte)	
Firmware Version	23		StringT (5 Byte)	
Application Specific Tag	24		StringT (32 Byte)	***
Function Tag	25		StringT (32 Byte)	***
Location Tag	26		StringT (32 Byte)	***
Device Status	36		UIntegerT (8 Bit)	0 (Device is OK)
Detailed Device Status	37		OctetStringT (3 byte) [10]	0x00,0x00,0x00
Process data input	40		RecordT (64 Bit)	
dAP	510		UIntegerT (16 Bit)	60
dAA	512		UIntegerT (16 Bit)	100
FOU2	532		UIntegerT (8 Bit)	1 (OU)
Device temperature	536		IntegerT (16 Bit)	
Active Events	545		RecordT (32 Bit)	
Param configuration fault	546		UIntegerT (32 Bit) [10]	0 (OK)
uni.P	551		UIntegerT (8 Bit)	1 (bar)
Hi.P	560		IntegerT (16 Bit)	
Lo.P	561		IntegerT (16 Bit)	
Hi.T	562		IntegerT (16 Bit)	
Lo.T	563		IntegerT (16 Bit)	
ASP2 - PRES	630		IntegerT (16 Bit)	0
AEP2 - PRES	631		IntegerT (16 Bit)	10000
uni.T	841		UIntegerT (8 Bit)	0 (°C)
coF	5005		IntegerT (16 Bit)	0
MDC Descr	16512		RecordT (88 Bit)	
Lower limit	16512	1	IntegerT (32 Bit)	-1000 (-1000)
Upper limit	16512	2	IntegerT (32 Bit)	10000 (10000)
Unit code	16512	3	UIntegerT (16 Bit)	1130 (Pa)
Scale	16512	4	IntegerT (8 Bit)	2 (2)



4 System Commands



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

System Commands	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.P] and [Lo.P] memory	
162	Reset [Lo.P] memory	
163	Reset [Hi.P] memory	
165	Reset [Hi.T] and [Lo.T] memory	
166	Reset [Lo.T] memory	
167	Reset [Hi.T] 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	



5 Identification

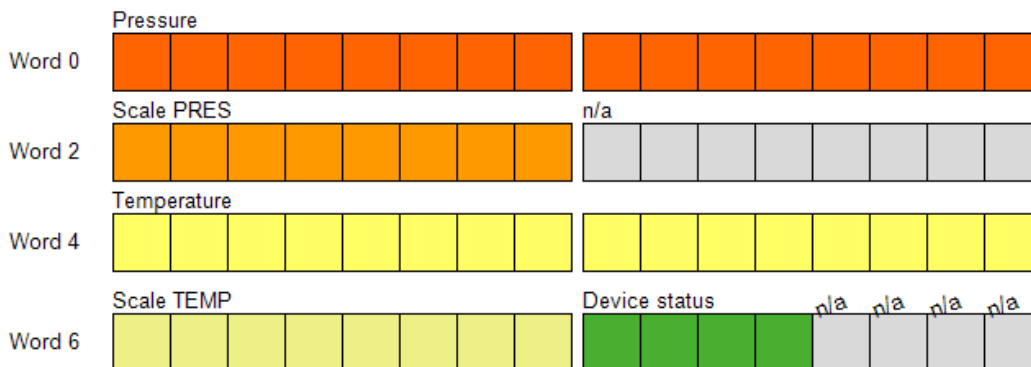
Vendor name Factory setting	Index 16 ifm electronic gmbh	Subindex 0	StringT (19 Byte)	ReadOnly
Vendor text Factory setting	Index 17 www.ifm.com	Subindex 0	StringT (11 Byte)	ReadOnly
Product Name Factory setting	Index 18 PM1504	Subindex 0	StringT (6 Byte)	ReadOnly
Product Text Factory setting	Index 20 Electronic pressure sensor	Subindex 0	StringT (26 Byte)	ReadOnly
Product ID Factory setting	Index 19 PM1504	Subindex 0	StringT (6 Byte)	ReadOnly
Serial Number	Index 21	Subindex 0	StringT (12 Byte)	ReadOnly
Hardware Version	Index 22	Subindex 0	StringT (2 Byte)	ReadOnly
Firmware Version	Index 23	Subindex 0	StringT (5 Byte)	ReadOnly
Application Specific Tag Factory setting	Index 24 ***	Subindex 0	StringT (32 Byte)	ReadWrite
Function Tag Plant designation, describes the device functionality Factory setting	Index 25 ***	Subindex 0	StringT (32 Byte)	ReadWrite
Location Tag Location designation, identifies the device location Factory setting	Index 26 ***	Subindex 0	StringT (32 Byte)	ReadWrite



6 Observation

6.1 Process Data Input/Output

Process data input	Index 40	Subindex 0	RecordT (64 Bit)
Pressure			IntegerT (16 Bit)
Current pressure			
Value range [bar]	(-1000 To 10500) * 0.001		
	32760	(OL)	
	32764	(NoData)	
Temperature			IntegerT (16 Bit)
Current temperature			
Value range [°C]	(-3008 To 15998) * 0.01		
	-32760	(UL)	
	32760	(OL)	
	-32762	(cr.UL)	
	32762	(cr.OL)	
	32764	(NoData)	
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	(Device is OK)	
	1	(Maintenance required)	
	2	(Out of specification)	
	3	(Functional check)	
	4	(Failure)	



-Scale PRES: A PLC profile function block calculates the pressure part of the process data (from WORD 0) into the unit [Pa]

-Scale TEMP: A PLC profile function block calculates the temperature part of the process data (from WORD 4) into the unit [°C]



Process data displayed according device sort order.
Please note: Siemens PLCs swap the high and low byte when using byte addressing.



7 Parameter

7.1 Memory

7.1.1 Pressure

Lo.P	Index 561	Subindex 0	IntegerT (16 Bit)	ReadOnly
Minimum memory value for pressure				
Value range [bar]	(-1000 To 10500) * 0.001 32760 32764		0.001 (OL) (NoData)	

Hi.P	Index 560	Subindex 0	IntegerT (16 Bit)	ReadOnly
Maximum memory value for pressure				
Value range [bar]	(-1000 To 10500) * 0.001 32760 32764		0.001 (OL) (NoData)	

7.1.2 Temperature

Lo.T	Index 563	Subindex 0	IntegerT (16 Bit)	ReadOnly
Minimum memory value for temperature				
Value range [°C]	(-3008 To 15998) * 0.01 -32760 32760 -32762 32762 32764		0.01 (UL) (OL) (cr.UL) (cr.OL) (NoData)	

Hi.T	Index 562	Subindex 0	IntegerT (16 Bit)	ReadOnly
Maximum memory value for temperature				
Value range [°C]	(-3008 To 15998) * 0.01 -32760 32760 -32762 32762 32764		0.01 (UL) (OL) (cr.UL) (cr.OL) (NoData)	

7.2 Analog Output 2

7.2.1 Pressure

ASP2 - PRES	Index 630	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue start point 2 / Pressure. ASP2 shall be below AEP2. Min distance AEP2...ASP2 = 2.000 bar. For details, see operating manual.				
Factory setting Value range [bar]	0 (-1000 To 8000) * 0.001			



7 Parameter

AEP2 - PRES	Index 631	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue end point 2 / Pressure. AEP2 shall be above ASP2. Min distance AEP2...ASP2 ==> see ASP2. For details, see operating manual.				
Factory setting	10000			
Value range [bar]	(1000 To 10000) * 0.001			

7.3 Fault Configuration Output 2

FOU2	Index 532	Subindex 0	UIntegerT (8 Bit)	ReadWrite
[OUT 2] behaviour in case of fault				
Factory setting	1	(OU)		
Value range	1	(OU)		
	2	(On)		

7.4 Calibration

coF	Index 5005	Subindex 0	IntegerT (16 Bit)	ReadOnly
Zero-point calibration (Calibration offset)				
Factory setting	0			
Value range [%]	(-30 To 30) * 0.1			

7.5 Damping

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			

7.6 Setting of the sensor display

uni.T	Index 841	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of temperature unit				
Factory setting	0	(°C)		
Value range	0	(°C)		
	1	(°F)		



7 Parameter

uni.P	Index 551	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of pressure unit				
Factory setting	1	(bar)		
Value range	0	(MPa)		
	1	(bar)		
	2	(psi)		

7.7 Setup

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	-1000	(-1000)		
Value range	-1000	(-1000)		
Upper limit		Subindex 2	IntegerT (32 Bit)	
Upper value measurement range				
Factory setting	10000	(10000)		
Value range	10000	(10000)		
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	2	(2)		
Value range	2	(2)		



8 Diagnosis

8.1 Diagnosis

8.1.1 Diagnosis

Device Status	Index 36	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Factory setting	0	(Device is OK)		
Value range	0	(Device is OK)		
	1	(Maintenance required)		
	2	(Out of specification)		
	3	(Functional check)		
	4	(Failure)		
	(5 To 255)	(Reserved)		

Detailed Device Status	Index 37	Subindex 0	OctetStringT (3 byte) [10]	ReadOnly
Factory setting	0x00,0x00,0x00			

Device temperature	Index 536	Subindex 0	IntegerT (16 Bit)	ReadOnly
Current temperature of the device				
Value range [°C]	(-25 To 125) * 1			
	-32760	(UL)		
	32760	(OL)		
	32764	(NoData)		

Active Events	Index 545	Subindex 0	RecordT (32 Bit)	ReadOnly
Bit mask for current pending events				
Bit_31		bitOffset 31	BooleanT	
Test Event 2. Device Status = 1 (Maintenance required)				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x8DFF)		
Bit_30		bitOffset 30	BooleanT	
Test Event 1. Device Status = 1 (Maintenance required)				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x8DFE)		
Bit_18		bitOffset 18	BooleanT	
Measurement range over-run				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x8C20)		
Bit_17		bitOffset 17	BooleanT	
Component malfunction				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x5010)		
Bit_15		bitOffset 15	BooleanT	
Device temperature over-run				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x4210)		



8 Diagnosis

Active Events	Index 545	Subindex 0	RecordT (32 Bit)	ReadOnly
Bit_14		bitOffset 14	BooleanT	
Device temperature under-run				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x4220)		
Bit_9		bitOffset 9	BooleanT	
Process variable range under-run				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x8C30)		
Bit_8		bitOffset 8	BooleanT	
Process variable range over-run				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x8C10)		
Bit_1		bitOffset 1	BooleanT	
Parameter error				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x6320)		
Bit_0		bitOffset 0	BooleanT	
Device hardware fault				
Factory setting	0	(noEv)		
Value range	0	(noEv)		
	1	(0x5000)		
Param configuration fault	Index 546	Subindex 0	UIntegerT (32 Bit) [10]	ReadOnly
Displays the incorrectly set parameters				
Factory setting	0	(OK)		
Value range	0	(OK)		
	786432	(Device Access Locks, Index = 12)		
	34865152	(FOU2, Index = 532)		
	33554432	(dAA, Index = 512)		
	41353216	(AEP2 - PRES, Index = 631)		
	55115776	(uni.T, Index = 841)		
	33423360	(dAP, Index = 510)		
	36110336	(uni.P, Index = 551)		
	41287680	(ASP2 - PRES, Index = 630)		



9 Events

Code	Device status	PQ*	Class	Name	Description
0x4210 16912d	2 (Out of specification)	valid	Warning	Device temperature over-run	Clear source of heat
0x4220 16928d	2 (Out of specification)	valid	Warning	Device temperature under-run	Insulate device
0x5000 20480d	4 (Failure)	invalid	Error	Device hardware fault	Device Exchange
0x5010 20496d	3 (Functional check)	valid	Error	Component malfunction	Repair or exchange
0x6320 25376d	3 (Functional check)	invalid	Error	Parameter error	Check data sheet and values
0x8C10 35856d	2 (Out of specification)	valid	Warning	Process variable range over-run	Process data uncertain
0x8C20 35872d	3 (Functional check)	valid	Error	Measurement range over-run	Check application
0x8C30 35888d	2 (Out of specification)	valid	Warning	Process variable range under-run	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



10 Error types

Code	Name	Description
0x8000 32768d	Device application error - no details	Service has been refused by the device application and no detailed information of the incident is available
0x8011 32785d	Index not available	Access occurs to a not existing index
0x8012 32786d	Subindex not available	Access occurs to a not existing subindex
0x8020 32800d	Service temporarily not available	Parameter is not accessible due to the current state of the device application
0x8021 32801d	Service temporarily not available - local control	Parameter is not accessible due to an ongoing local operation at the device
0x8022 32802d	Service temporarily not available - device control	Parameter is not accessible due to a remote triggered state of the device application
0x8023 32803d	Access denied	Write access on a read-only parameter
0x8030 32816d	Parameter value out of range	Written parameter value is outside its permitted value range
0x8033 32819d	Parameter length overrun	Written parameter length is above its predefined length
0x8034 32820d	Parameter length underrun	Written parameter length is below its predefined length
0x8035 32821d	Function not available	Written command is not supported by the device application
0x8036 32822d	Function temporarily unavailable	Written command is not available due to the current state of the device application
0x8040 32832d	Invalid parameter set	Written single parameter collides with other actual parameter settings
0x8041 32833d	Inconsistent parameter set	Parameter inconsistencies were found at the end of block parameter transfer, device plausibility check failed
0x8082 32898d	Application not ready	Read or write service is refused due to a temporarily unavailable application



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



11 Unit conversion



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

Value in [bar]	= Transmitted value	* 0.001
Value in [psi]	= Transmitted value	* 0.01450377
Value in [MPa]	= Transmitted value	* 0.0001
Value in [°C]	= Transmitted value	* 0.01
Value in [°F]	= Transmitted value	* 0.018 + 32