




## IO-Link Interface Description

M/80/IOL/15T/CC

EN

## Device variant

<p><b>M/80/IOL/15T/CC</b></p> <p><b>Compressed air meter, 0.25...75.00 m³/h, R 1/2"</b></p>	<p>The image not available</p>	
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Vendor ID	942 / Bytes 3-174 (hex: 03-AE)	
Device ID	2010010 / Bytes 30-171-154 (hex: 1E-AB-9A)	
Bit rate	COM2	
Minimum cycle time	7,2 ms	
SIO mode supported	Yes	
Block parameterization	Yes	
Data storage	Yes	
Supported profiles	16384 / hex: 0x4000	Identification and Diagnosis
	32778 / hex: 0x800A	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.

## Unit conversion



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

### Totaliser

Value in [m <sup>3</sup> ]	= MeasurementValue	* 1
Value in [ft <sup>3</sup> ]	= MeasurementValue	* 35.3146667

### Flow

Value in [m <sup>3</sup> /h]	= MeasurementValue	* 0.01
Value in [ft <sup>3</sup> /s]	= MeasurementValue	* 0.043657
Value in [ft <sup>3</sup> /min]	= MeasurementValue	* 0.00588578
Value in [ft <sup>3</sup> /h]	= MeasurementValue	* 0.353147
Value in [m/s]	= MeasurementValue	* 0.0133067
Value in [L/min]	= MeasurementValue	* 0.166667

### Pressure

Value in [bar]	= MeasurementValue	* 0.01
Value in [psi]	= MeasurementValue	* 0.145038
Value in [kPa]	= MeasurementValue	* 1

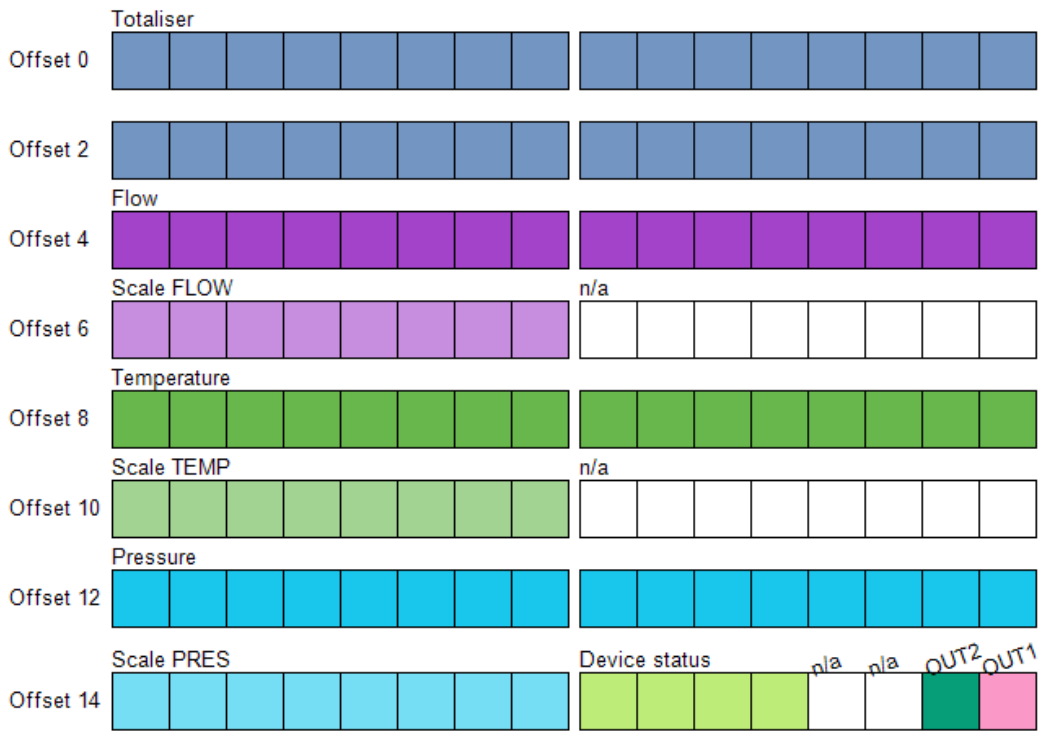
### Temperature

Value in [°C]	= MeasurementValue	* 0.01
Value in [°F]	= MeasurementValue	* 0.018 + 32

## Process data

Process data input		RecordT (128 Bit)
Totaliser		Float32T
Quantity meter which continuously totals the volumetric flow since the last reset		
Value range [m³/h]	(0 to 10000000) * 0.01	
Flow		IntegerT (16 Bit)
Current flow		
Value range [°C]	(0 to 9000) * 0.01	
	32760	(OL - overload) 0x7FF8
	32762	(cr.OL - critical overload) 0x7FFA
	32764	(NoData) 0x7FFC
Temperature		IntegerT (16 Bit)
Current temperature		
Value range [°C]	(-2400 to 7400) * 0.01	
	-32760	(UL - underload) 0x8008
	32760	(OL - overload) 0x7FF8
	-32762	(cr.UL - critical underload) 0x8006
	32762	(cr.OL - critical overload) 0x7FFA
	32764	(NoData) 0x7FFC
Pressure		IntegerT (16 Bit)
Current pressure		
Value range [bar]	(-100 to 2000) * 0.01	
	-32760	(UL - underload) 0x8008
	32760	(OL - overload) 0x7FF8
	32764	(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	(Device is OK)
	1	(Maintenance required)
	2	(Out of specification)
	3	(Functional check)
	4	(Failure)
OUT2		BooleanT
Current status of the digital signal [OUT2]		
Value range	false	(OFF)
	true	(On)
OUT1		BooleanT
Current status of the digital signal [OUT1]		
Value range	false	(OFF)
	true	(On)

# Process data

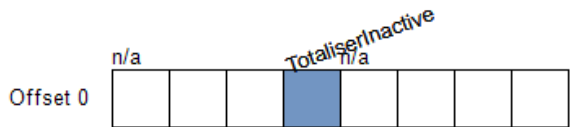


Scale FLOW: A PLC profile function block calculates the flow value of the process data (from WORD 4) into the profiled unit [m3/h]  
Scale TEMP: A PLC profile function block calculates the temperature value of the process data (from WORD 10) into the profiled unit [°C]  
Scale PRES: A PLC profile function block calculates the pressure value of the process data (from WORD 14) into the profiled 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.

Process data output		RecordT (8 Bit)
TotaliserInactive		BooleanT
Sets the digital signal [TotaliserInactive]		
Value range	false true	(OFF) (On)



## Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
Device Access Locks	12		RecordT (16 Bit)	false (Unlocked)	12
Vendor name	16		StringT (3 Byte)	IMI	11
Vendor text	17		StringT (15 Byte)	www.norgren.com	11
Product Name	18		StringT (15 Byte)	M/80/IOL/15T/CC	11
Product ID	19		StringT (15 Byte)	M/80/IOL/15T/CC	11
Product Text	20		StringT (20 Byte)	Compressed air meter	11
Serial Number	21		StringT (12 Byte)		11
Hardware Revision	22		StringT (2 Byte)		11
Firmware Revision	23		StringT (5 Byte)		11
Application-specific Tag	24		StringT (32 Byte)	***	11
Function Tag	25		StringT (32 Byte)	***	11
Location Tag	26		StringT (32 Byte)	***	11
Device Status	36		UIntegerT (8 Bit)	0 (Device is OK)	23
Detailed Device Status	37		OctetStringT (3 Byte) [11]	0x00,0x00,0x00	23
Process data input	40		RecordT (128 Bit)		
Process data output	41		RecordT (8 Bit)		
P-n	500		UIntegerT (8 Bit)	0 (PnP)	12
dAP.F	510		UIntegerT (16 Bit)	6	12
SEL1	520		UIntegerT (8 Bit)	1 (FLOW)	12
SEL2	521		UIntegerT (8 Bit)	1 (FLOW)	12
FOU1	531		UIntegerT (8 Bit)	4 (OFF)	12
FOU2	532		UIntegerT (8 Bit)	4 (OFF)	12
Active Events	545		RecordT (32 Bit)		23
Param configuration fault	546		UIntegerT (32 Bit) [10]	0 (OK)	24
Loc	550		UIntegerT (8 Bit)	1 (uLoc)	13
uni.F	551		UIntegerT (8 Bit)	0 (m³/h)	13
cFL.F	555		IntegerT (16 Bit)	28	13
cFH.F	556		IntegerT (16 Bit)	7497	13
Hi.F	560		IntegerT (16 Bit)		13
Lo.F	561		IntegerT (16 Bit)		13
Hi.T	562		IntegerT (16 Bit)		13
Lo.T	563		IntegerT (16 Bit)		13
Hi.P	564		IntegerT (16 Bit)		14
Lo.P	565		IntegerT (16 Bit)		14
S.On	570		UIntegerT (8 Bit)	0 (OFF)	14
S.Tim	571		UIntegerT (8 Bit)	2 (3 min)	14
S.FLW	572		IntegerT (16 Bit)	3750	14
S.TMP	573		IntegerT (16 Bit)	2500	14
S.PRS	574		IntegerT (16 Bit)	800	14
ou1	580		UIntegerT (8 Bit)	3 (Hno / Hysteresis fct normally open)	15
dS1	581		UIntegerT (16 Bit)	0	15
dr1	582		UIntegerT (16 Bit)	0	15
SP1 (FH1) - FLOW	583		IntegerT (16 Bit)	1500	15
rP1 (FL1) - FLOW	584		IntegerT (16 Bit)	1426	15
SP1 (FH1) - TEMP	585		IntegerT (16 Bit)	1199	15

## Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
rP1 (FL1) - TEMP	586		IntegerT (16 Bit)	1160	15
SP1 (FH1) - PRES	587		IntegerT (16 Bit)	320	15
rP1 (FL1) - PRES	588		IntegerT (16 Bit)	304	16
ou2	590		UIntegerT (8 Bit)	1 (I / Analog signal 4...20 mA)	16
dS2	591		UIntegerT (16 Bit)	0	16
dr2	592		UIntegerT (16 Bit)	0	16
SP2 (FH2) - FLOW	593		IntegerT (16 Bit)	3000	16
rP2 (FL2) - FLOW	594		IntegerT (16 Bit)	2926	16
SP2 (FH2) - TEMP	595		IntegerT (16 Bit)	2400	16
rP2 (FL2) - TEMP	596		IntegerT (16 Bit)	2361	16
SP2 (FH2) - PRES	597		IntegerT (16 Bit)	640	17
rP2 (FL2) - PRES	598		IntegerT (16 Bit)	624	17
ASP2 - FLOW	630		IntegerT (16 Bit)	0	17
AEP2 - FLOW	631		IntegerT (16 Bit)	7500	17
ASP2 - TEMP	632		IntegerT (16 Bit)	-1000	17
AEP2 - TEMP	633		IntegerT (16 Bit)	6000	17
ASP2 - PRES	634		IntegerT (16 Bit)	0	17
AEP2 - PRES	635		IntegerT (16 Bit)	1600	17
DIn2	676		UIntegerT (8 Bit)	2 (+EDG)	18
diS.U	800		UIntegerT (8 Bit)	2 (d3 / slow)	18
diS.R	801		UIntegerT (8 Bit)	0 (0 °)	18
diS.B	802		UIntegerT (8 Bit)	75 (75 %)	18
diS.L	803		UIntegerT (8 Bit)	5 (L3.TP)	18
coL.F	810		UIntegerT (8 Bit)	16 (bk/wh / Value black and white)	18
coL.T	811		UIntegerT (8 Bit)	16 (bk/wh / Value black and white)	19
coL.P	812		UIntegerT (8 Bit)	16 (bk/wh / Value black and white)	19
coL.V	813		UIntegerT (8 Bit)	16 (bk/wh / Value black and white)	19
uni.T	841		UIntegerT (8 Bit)	0 (°C)	19
uni.P	842		UIntegerT (8 Bit)	1 (bar)	19
cFL.T	861		IntegerT (16 Bit)	-1000	19
cFL.P	862		IntegerT (16 Bit)	-100	19
cFH.T	871		IntegerT (16 Bit)	6000	20
cFH.P	872		IntegerT (16 Bit)	1600	20
dAP.P	881		UIntegerT (16 Bit)	6	20
rEF.P	3000		IntegerT (16 Bit)	1013	20
rEF.T	3001		IntegerT (16 Bit)	15	20
LFC	3006		IntegerT (16 Bit)	10	20
TOTL_M	3014		Float32T		20
rTo - Totaliser reset t...	3015		IntegerT (16 Bit)	0 (OFF)	21
TOTL_T	3016		IntegerT (32 Bit)		21
ImPR1	3060		UIntegerT (8 Bit)	1 (YES)	21
ImPS1	3068		Float32T	0.0001	21
ImPR2	3160		UIntegerT (8 Bit)	1 (YES)	21
ImPS2	3168		Float32T	0.0001	22
coF	5001		IntegerT (16 Bit)	0	22

## Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
MDC Descr	16512		RecordT (88 Bit)		22
Lower limit	16512	1	IntegerT (32 Bit)	25 (25)	
Upper limit	16512	2	IntegerT (32 Bit)	7500 (7500)	
Unit code	16512	3	UIntegerT (16 Bit)	1349 (m³/h)	
Scale	16512	4	IntegerT (8 Bit)	-2 (-2)	



## 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.F] and [Lo.F] memory	
162	Reset [Lo.F] memory	
163	Reset [Hi.F] memory	
164	RESET_TOTALIZER	
165	Reset [Hi.T] and [Lo.T] memory	
166	Reset [Lo.T] memory	
167	Reset [Hi.T] memory	
176	Start simulation	
177	Stop simulation	
208	Reset [Hi.P] and [Lo.P] memory	

## System Command

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209	Reset [Lo.P] memory
210	Reset [Hi.P] memory
222	Flash On
223	Flash Off
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 (3 Byte)	ReadOnly
The vendor name that is assigned to a Vendor ID.				
Factory setting	IMI			
Vendor text	Index 17	Subindex 0	StringT (15 Byte)	ReadOnly
Additional information about the vendor.				
Factory setting	www.norgren.com			
Product Name	Index 18	Subindex 0	StringT (15 Byte)	ReadOnly
Complete product name.				
Factory setting	M/80/IOL/15T/CC			
Product ID	Index 19	Subindex 0	StringT (15 Byte)	ReadOnly
Vendor-specific product or type identification (e.g., item number or model number).				
Factory setting	M/80/IOL/15T/CC			
Product Text	Index 20	Subindex 0	StringT (20 Byte)	ReadOnly
Additional product information for the device.				
Factory setting	Compressed air meter			
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

Device Access Locks		Index 12	Subindex 0	RecordT (16 Bit)	ReadWrite
The access to the device parameters can be restricted by setting appropriate flags within this parameter.					
Factory setting	false				
bitOffset 2	Local Parameterization		This lock prevents the device settings from being changed via local		
Value range	true		(Locked)		
	false		(Unlocked)		
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P-n	Index 500	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Output polarity for the switching outputs				
Factory setting	0	(PnP)		
Value range	0 1	(PnP) (nPn)		

dAP.F	Index 510	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Damping of the flow signal				
Factory setting	6			
Value range [s]	(0 to 50) * 0.1			

SEL1	Index 520	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of the measurand for the evaluation via [OUT 1]				
Factory setting	1	(FLOW)		
Value range	1 2 3	(FLOW) (TEMP) (PRES)		

SEL2	Index 521	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of the measurand for the evaluation via [OUT 2]				
Factory setting	1	(FLOW)		
Value range	1 2 3	(FLOW) (TEMP) (PRES)		

FOU1	Index 531	Subindex 0	UIntegerT (8 Bit)	ReadWrite
[OUT 1] behaviour in case of fault				
Factory setting	4	(OFF)		
Value range	1 2 4	(OU) (On) (OFF)		

FOU2	Index 532	Subindex 0	UIntegerT (8 Bit)	ReadWrite
[OUT 2] behaviour in case of fault				
Factory setting	4	(OFF)		
Value range	1 2 4	(OU) (On) (OFF)		

## Parameters

Loc	Index 550	Subindex 0	UIntegerT (8 Bit)	ReadWrite
[Loc] locks the local user interface to prevent unintentional changes, [Loc] is resettable at the device				
<b>Factory setting</b>	<b>1</b>	<b>(uLoc)</b>		
Value range	0 1	(Loc) (uLoc)		
uni.F	Index 551	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of flow unit				
<b>Factory setting</b>	<b>0</b>	<b>(m³/h)</b>		
Value range	0 1 2 3 4 5	(m³/h) (L/min) (m/s) (ft³/h) (ft³/min) (ft/s)		
cFL.F	Index 555	Subindex 0	IntegerT (16 Bit)	ReadWrite
Lower value for flow colour change. cFL.F shall be below cFH.F. Min distance cFH.F...cFL.F ==> see cFH.F				
<b>Factory setting</b>	<b>28</b>			
Value range [m³/h]	(28 to 7460) * 0.01			
cFH.F	Index 556	Subindex 0	IntegerT (16 Bit)	ReadWrite
Upper value for flow colour change. cFH.F shall be above cFL.F. Min distance cFH.F...cFL.F = 0.37 m³/h. For details, see operating manual				
<b>Factory setting</b>	<b>7497</b>			
Value range [m³/h]	(65 to 7497) * 0.01			
Hi.F	Index 560	Subindex 0	IntegerT (16 Bit)	ReadOnly
Maximum memory value for flow				
Value range [m³/h]	(0 to 9000) * 0.01 32760 32762 32764	(OL - overload) 0x7FF8 (cr.OL - critical overload) 0x7FFA (NoData) 0x7FFC		
Lo.F	Index 561	Subindex 0	IntegerT (16 Bit)	ReadOnly
Minimum memory value for flow				
Value range [m³/h]	(0 to 9000) * 0.01 32760 32762 32764	(OL - overload) 0x7FF8 (cr.OL - critical overload) 0x7FFA (NoData) 0x7FFC		
Hi.T	Index 562	Subindex 0	IntegerT (16 Bit)	ReadOnly
Maximum memory value for temperature				
Value range [°C]	(-2400 to 7400) * 0.01 -32760 32760 -32762 32762 32764	(UL - underload) 0x8008 (OL - overload) 0x7FF8 (cr.UL - critical underload) 0x8006 (cr.OL - critical overload) 0x7FFA (NoData) 0x7FFC		
Lo.T	Index 563	Subindex 0	IntegerT (16 Bit)	ReadOnly
Minimum memory value for temperature				
Value range [°C]	(-2400 to 7400) * 0.01 -32760 32760 -32762 32762 32764	(UL - underload) 0x8008 (OL - overload) 0x7FF8 (cr.UL - critical underload) 0x8006 (cr.OL - critical overload) 0x7FFA (NoData) 0x7FFC		

## Parameters

Hi.P	Index 564	Subindex 0	IntegerT (16 Bit)	ReadOnly
Maximum memory value for pressure Value range [bar]	(-100 to 2000) * 0.01 -32760 32760 32764	(UL - underload) 0x8008 (OL - overload) 0x7FF8 (NoData) 0x7FFC		
Lo.P	Index 565	Subindex 0	IntegerT (16 Bit)	ReadOnly
Minimum memory value for pressure Value range [bar]	(-100 to 2000) * 0.01 -32760 32760 32764	(UL - underload) 0x8008 (OL - overload) 0x7FF8 (NoData) 0x7FFC		
S.On	Index 570	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Simulation state				
Factory setting	0	(OFF)		
Value range	0 1	(OFF) (On)		
S.Tim	Index 571	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Simulation duration				
Factory setting	2	(3 min)		
Value range	0 1 2 3 4 5 6 7 8 9 10	(1 min) (2 min) (3 min) (4 min) (5 min) (10 min) (15 min) (20 min) (30 min) (45 min) (60 min)		
S.FLW	Index 572	Subindex 0	IntegerT (16 Bit)	ReadWrite
Simulation of flow. ! Rounded on stepwidth !				
Factory setting	3750			
Value range [m³/h]	(25 to 9000) * 0.01 32760 32762	(OL - overload) 0x7FF8 (cr.OL - critical overload) 0x7FFA		
S.TMP	Index 573	Subindex 0	IntegerT (16 Bit)	ReadWrite
Simulation of temperature. ! Rounded on stepwidth !				
Factory setting	2500			
Value range [°C]	(-2400 to 7400) * 0.01 32760 32762 -32762 -32760	(OL - overload) 0x7FF8 (cr.OL - critical overload) 0x7FFA (cr.UL - critical underload) 0x8006 (UL - underload) 0x8008		
S.PRS	Index 574	Subindex 0	IntegerT (16 Bit)	ReadWrite
Simulation of pressure. ! Rounded on stepwidth !				
Factory setting	800			
Value range [bar]	(-100 to 1680) * 0.01 32760	(OL - overload) 0x7FF8		

## Parameters

ou1	Index 580	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Output configuration [OUT 1]				
Factory setting	3	(Hno / Hysteresis fct normally open)		
Value range	3	(Hno / Hysteresis fct normally open)		
	4	(Hnc / Hysteresis fct normally closed)		
	5	(Fno / Window fct normally open)		
	6	(Fnc / Window fct normally closed)		
	9	(ImP / Impulse output)		
	16	(OFF / Output Off)		

dS1	Index 581	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Switching delay for [OUT 1]				
Factory setting	0			
Value range [s]	(0 to 600) * 0.1			

dr1	Index 582	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Reset delay for [OUT 1]				
Factory setting	0			
Value range [s]	(0 to 600) * 0.1			

SP1 (FH1) - FLOW	Index 583	Subindex 0	IntegerT (16 Bit)	ReadWrite
Switch point 1 / Flow. SP1 shall be above rP1. Min distance SP1...rP1 = 0.37 m³/h. For details, see operating manual.				
Factory setting	1500			
Value range [m³/h]	(65 to 7497) * 0.01			

rP1 (FL1) - FLOW	Index 584	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reset point 1 / Flow. Reset point 1 / Flow. rP1 shall be below SP1. Min distance SP1...rP1 ==> see SP1.				
Factory setting	1426			
Value range [m³/h]	(28 to 7460) * 0.01			

SP1 (FH1) - TEMP	Index 585	Subindex 0	IntegerT (16 Bit)	ReadWrite
Switch point 1 / Temperature. SP1 shall be above rP1. Min distance SP1...rP1 = 0.20 °C. For details, see operating manual.				
Factory setting	1199			
Value range [°C]	(-980 to 6000) * 0.01			

rP1 (FL1) - TEMP	Index 586	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reset point 1 / Temperature. Reset point 1 / Temperature. rP1 shall be below SP1. Min distance SP1...rP1 ==> see SP1.				
Factory setting	1160			
Value range [°C]	(-1000 to 5980) * 0.01			

SP1 (FH1) - PRES	Index 587	Subindex 0	IntegerT (16 Bit)	ReadWrite
Switch point 1 / Pressure. SP1 shall be above rP1. Min distance SP1...rP1 = 0.08 bar. For details, see operating manual.				
Factory setting	320			
Value range [bar]	(-92 to 1600) * 0.01			

## Parameters

rP1 (FL1) - PRES	Index 588	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reset point 1 / Pressure. Reset point 1 / Pressure. rP1 shall be below SP1. Min distance SP1...rP1 ==> see SP1.				
<b>Factory setting</b>	<b>304</b>			
Value range [bar]	(-100 to 1592) * 0.01			
ou2	Index 590	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Output configuration [OUT 2]				
<b>Factory setting</b>	<b>1</b>	<b>(I / Analog signal 4...20 mA)</b>		
Value range	3	(Hno / Hysteresis fct normally open)		
	4	(Hnc / Hysteresis fct normally closed)		
	5	(Fno / Window fct normally open)		
	6	(Fnc / Window fct normally closed)		
	9	(ImP / Impulse output)		
	14	(In.D / Digital input)		
	16	(OFF / Output Off)		
	1	(I / Analog signal 4...20 mA)		
dS2	Index 591	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Switching delay for [OUT 2]				
<b>Factory setting</b>	<b>0</b>			
Value range [s]	(0 to 600) * 0.1			
dr2	Index 592	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Reset delay for [OUT 2]				
<b>Factory setting</b>	<b>0</b>			
Value range [s]	(0 to 600) * 0.1			
SP2 (FH2) - FLOW	Index 593	Subindex 0	IntegerT (16 Bit)	ReadWrite
Switch point 2 / Flow. SP2 shall be above rP2. Min distance SP2...rP2 = 0.37 m³/h. For details, see operating manual.				
<b>Factory setting</b>	<b>3000</b>			
Value range [m³/h]	(65 to 7497) * 0.01			
rP2 (FL2) - FLOW	Index 594	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reset point 2 / Flow. Reset point 2 / Flow. rP2 shall be below SP2. Min distance SP2...rP2 ==> see SP2.				
<b>Factory setting</b>	<b>2926</b>			
Value range [m³/h]	(28 to 7460) * 0.01			
SP2 (FH2) - TEMP	Index 595	Subindex 0	IntegerT (16 Bit)	ReadWrite
Switch point 2 / Temperature. SP2 shall be above rP2. Min distance SP2...rP2 = 0.20 °C. For details, see operating manual.				
<b>Factory setting</b>	<b>2400</b>			
Value range [°C]	(-980 to 6000) * 0.01			
rP2 (FL2) - TEMP	Index 596	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reset point 2 / Temperature. Reset point 2 / Temperature. rP2 shall be below SP2. Min distance SP2...rP2 ==> see SP2.				
<b>Factory setting</b>	<b>2361</b>			
Value range [°C]	(-1000 to 5980) * 0.01			



## Parameters

SP2 (FH2) - PRES	Index 597	Subindex 0	IntegerT (16 Bit)	ReadWrite
Switch point 2 / Pressure. SP2 shall be above rP2. Min distance SP2...rP2 = 0.08 bar. For details, see operating manual.				
<b>Factory setting</b>	<b>640</b>			
Value range [bar]	(-92 to 1600) * 0.01			
rP2 (FL2) - PRES	Index 598	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reset point 2 / Pressure. Reset point 2 / Pressure. rP2 shall be below SP2. Min distance SP2...rP2 ==> see SP2.				
<b>Factory setting</b>	<b>624</b>			
Value range [bar]	(-100 to 1592) * 0.01			
ASP2 - FLOW	Index 630	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue start point 2 / Flow. ASP2 shall be below AEP2. Min distance AEP2...ASP2 = 15.00 m³/h. For details, see operating manual.				
<b>Factory setting</b>	<b>0</b>			
Value range [m³/h]	(0 to 6000) * 0.01			
AEP2 - FLOW	Index 631	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue end point 2 / Flow. AEP2 shall be above ASP2. Min distance AEP2...ASP2 ==> see ASP2. For details, see operating manual.				
<b>Factory setting</b>	<b>7500</b>			
Value range [m³/h]	(1500 to 7500) * 0.01			
ASP2 - TEMP	Index 632	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue start point 2 / Temperature. ASP2 shall be below AEP2. Min distance AEP2...ASP2 = 14.00 °C. For details, see operating manual.				
<b>Factory setting</b>	<b>-1000</b>			
Value range [°C]	(-1000 to 4600) * 0.01			
AEP2 - TEMP	Index 633	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue end point 2 / Temperature. AEP2 shall be above ASP2. Min distance AEP2...ASP2 ==> see ASP2. For details, see operating manual.				
<b>Factory setting</b>	<b>6000</b>			
Value range [°C]	(400 to 6000) * 0.01			
ASP2 - PRES	Index 634	Subindex 0	IntegerT (16 Bit)	ReadWrite
Analogue start point 2 / Pressure. ASP2 shall be below AEP2. Min distance AEP2...ASP2 = 3.20 bar. For details, see operating manual.				
<b>Factory setting</b>	<b>0</b>			
Value range [bar]	(-100 to 1280) * 0.01			
AEP2 - PRES	Index 635	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.				
<b>Factory setting</b>	<b>1600</b>			
Value range [bar]	(220 to 1600) * 0.01			

## Parameters

DIn2	Index 676	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of digital input (Pin 2)				
Factory setting	2	(+EDG)		
Value range	2 3 0 1	(+EDG) (-EDG) (HIGH) (LOW)		

diS.U	Index 800	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Current display update rate				
Factory setting	2	(d3 / slow)		
Value range	0 1 2	(d1 / fast) (d2 / medium) (d3 / slow)		

diS.R	Index 801	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Current display rotation clockwise				
Factory setting	0	(0 °)		
Value range	0 1 2 3	(0 °) (90 °) (180 °) (270 °)		

diS.B	Index 802	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Current display brightness				
Factory setting	75	(75 %)		
Value range	25 50 75 100 0	(25 %) (50 %) (75 %) (100 %) (OFF)		

diS.L	Index 803	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Current layout of the display				
Factory setting	5	(L3.TP)		
Value range	0 1 2 3 5 6	(L1) (L2.Temp) (L2.Pres) (L2.Totl) (L3.TP) (L4)		

coL.F	Index 810	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Colour configuration volumetric flow				
Factory setting	16	(bk/wh / Value black and white)		
Value range	16 17 18 20 10 11	(bk/wh / Value black and white) (red / Value red) (green / Value green) (yellow / Value yellow) (r-cF / Value red when the measured value is inside the limits of [cFL.F] and [cFH.F]) (G-cF / Value green when the measured value is inside the limits of [cFL.F] and [cFH.F])		

## Parameters

coL.T	Index 811	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Colour configuration temperature				
Factory setting	16	(bk/wh / Value black and white)		
Value range	16	(bk/wh / Value black and white)		
	17	(red / Value red)		
	18	(green / Value green)		
	20	(yellow / Value yellow)		
	10	(r-cF / Value red when the measured value is inside the limits of [cFL.T] and [cFH.T])		
	11	(G-cF / Value green when the measured value is inside the limits of [cFL.T] and [cFH.T])		
coL.P	Index 812	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Colour configuration pressure				
Factory setting	16	(bk/wh / Value black and white)		
Value range	16	(bk/wh / Value black and white)		
	17	(red / Value red)		
	18	(green / Value green)		
	20	(yellow / Value yellow)		
	10	(r-cF / Value red when the measured value is inside the limits of [cFL.P] and [cFH.P])		
	11	(G-cF / Value green when the measured value is inside the limits of [cFL.P] and [cFH.P])		
coL.V	Index 813	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Colour configuration totaliser				
Factory setting	16	(bk/wh / Value black and white)		
Value range	16	(bk/wh / Value black and white)		
	17	(red / Value red)		
	18	(green / Value green)		
	20	(yellow / Value yellow)		
uni.T	Index 841	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of temperature unit				
Factory setting	0	(°C)		
Value range	0	(°C)		
	1	(°F)		
uni.P	Index 842	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Selection of pressure unit				
Factory setting	1	(bar)		
Value range	0	(kPa)		
	1	(bar)		
	2	(psi)		
cFL.T	Index 861	Subindex 0	IntegerT (16 Bit)	ReadWrite
Lower value for temperature colour change. cFL.T shall be below cFH.T. Min distance cFH.T...cFL.T ==> see cFH.T				
Factory setting	-1000			
Value range [°C]	(-1000 to 5965) * 0.01			
cFL.P	Index 862	Subindex 0	IntegerT (16 Bit)	ReadWrite
Lower value for pressure colour change. cFL.P shall be below cFH.P. Min distance cFH.P...cFL.P ==> see cFH.P				
Factory setting	-100			
Value range [bar]	(-100 to 1592) * 0.01			

## Parameters

cFH.T	Index 871	Subindex 0	IntegerT (16 Bit)	ReadWrite
Upper value for temperature colour change. cFH.T shall be above cFL.T. Min distance cFH.T...cFL.T = 0.35 °C. For details, see operating manual.				
<b>Factory setting</b>	<b>6000</b>			
Value range [°C]	(-965 to 6000) * 0.01			
cFH.P	Index 872	Subindex 0	IntegerT (16 Bit)	ReadWrite
Upper value for pressure colour change. cFH.P shall be above cFL.P. Min distance cFH.P...cFL.P = 0.08 bar. For details, see operating manual				
<b>Factory setting</b>	<b>1600</b>			
Value range [bar]	(-92 to 1600) * 0.01			
dAP.P	Index 881	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Damping of the pressure signal				
<b>Factory setting</b>	<b>6</b>			
Value range [s]	(0 to 500) * 0.01			
rEF.P	Index 3000	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reference pressure which refers to all measured and displayed values				
<b>Factory setting</b>	<b>1013</b>			
Value range [mbar]	(950 to 1050) * 1			
rEF.T	Index 3001	Subindex 0	IntegerT (16 Bit)	ReadWrite
Reference temperature which refers to all measured and displayed values				
<b>Factory setting</b>	<b>15</b>			
Value range [°C]	(0 to 25) * 1			
LFC	Index 3006	Subindex 0	IntegerT (16 Bit)	ReadWrite
Low flow cutoff				
<b>Factory setting</b>	<b>10</b>			
Value range [m³/h]	(9 to 80) * 0.01			
TOTL_M	Index 3014	Subindex 0	Float32T	ReadOnly
Consumed quantity before the last reset				
Value range [m³]	(0 to 10000000) * 1			

## Parameters

rTo - Totaliser reset time	Index 3015	Subindex 0	IntegerT (16 Bit)	ReadWrite
Determines the time for the next meter reset				
Factory setting	0	(OFF)		
Value range	0	(OFF)		
	4001	(1 h)		
	4002	(2 h)		
	4003	(3 h)		
	4004	(4 h)		
	4005	(5 h)		
	4006	(6 h)		
	4007	(7 h)		
	4008	(8 h)		
	4009	(9 h)		
	4010	(10 h)		
	4011	(11 h)		
	4012	(12 h)		
	4013	(13 h)		
	4014	(14 h)		
	4015	(15 h)		
	4016	(16 h)		
	4017	(17 h)		
	4018	(18 h)		
	4019	(19 h)		
	4020	(20 h)		
	4021	(21 h)		
	4022	(22 h)		
	4023	(23 h)		
	5001	(1 d)		
	5002	(2 d)		
	5003	(3 d)		
	5004	(4 d)		
	5005	(5 d)		
	5006	(6 d)		
	6001	(1 w)		
	6002	(2 w)		
	6003	(3 w)		
	6004	(4 w)		
	6005	(5 w)		
	6006	(6 w)		
	6007	(7 w)		
	6008	(8 w)		

TOTL_T	Index 3016	Subindex 0	IntegerT (32 Bit)	ReadOnly
Time in minuten since the last reset of totaliser				
Value range [min]	(0 to 10000000) * 1			
	-1	(unknown)		

ImPR1	Index 3060	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Pulse repetition active (= pulse output) or not active (= function preset meter)				
Factory setting	1	(YES)		
Value range	1	(YES)		
	0	(no)		

ImPS1	Index 3068	Subindex 0	Float32T	ReadWrite
Pulse value				
Factory setting	0.0001			
Value range [m³]	(0.0001 to 1000000) * 1			

ImPR2	Index 3160	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Pulse repetition active (= pulse output) or not active (= function preset meter)				
Factory setting	1	(YES)		
Value range	1	(YES)		
	0	(no)		

## Parameters

ImPS2	Index 3168	Subindex 0	Float32T	ReadWrite
Pulse value				
<b>Factory setting</b>	<b>0.0001</b>			
Value range [m <sup>3</sup> ]	(0.0001 to 1000000) * 1			
coF	Index 5001	Subindex 0	IntegerT (16 Bit)	ReadWrite
Zero-point calibration (Calibration offset)				
<b>Factory setting</b>	<b>0</b>			
Value range [bar]	(-80 to 80) * 0.01			
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				
<b>Factory setting</b>	<b>25</b>	<b>(25)</b>		
Value range	25	(25)		
Upper limit		Subindex 2	IntegerT (32 Bit)	
Upper value measurement range				
<b>Factory setting</b>	<b>7500</b>	<b>(7500)</b>		
Value range	7500	(7500)		
Unit code		Subindex 3	UIntegerT (16 Bit)	
Unit code of the measurement data				
<b>Factory setting</b>	<b>1349</b>	<b>(m<sup>3</sup>/h)</b>		
Value range	1349	(m <sup>3</sup> /h)		
Scale		Subindex 4	IntegerT (8 Bit)	
Range shifting (10 scale)				
<b>Factory setting</b>	<b>-2</b>	<b>(-2)</b>		
Value range	-2	(-2)		

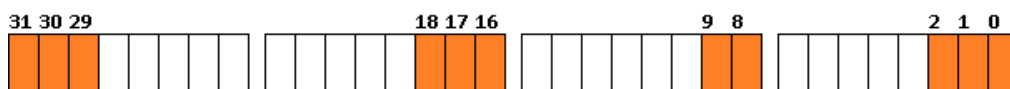
## Diagnosis

Device Status	Index 36	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Indicator for the current device condition and diagnosis state.				
Factory setting	0	(Device is OK)		
Value range	0	(Device is OK)		
	1	(Maintenance required)		
	2	(Out of specification)		
	3	(Functional check)		
	4	(Failure)		

Detailed Device Status	Index 37	Subindex 0	OctetStringT (3 Byte) [11]	ReadOnly
List of all currently pending events in the device.				
Factory setting	0x00,0x00,0x00			

Active Events	Index 545	Subindex 0	RecordT (32 Bit)	ReadOnly
Bit mask for current pending events				
bitOffset 31 (0x8DFF)	Test Event 2. Device Status = 1 (Maintenance required)			
bitOffset 30 (0x8DFE)	Test Event 1. Device Status = 1 (Maintenance required)			
bitOffset 29 (0x8CDB)	Flash sequence active. Device Status = 1 (Maintenance required)			
bitOffset 18 (0x5010)	Component malfunction			
bitOffset 17 (0x8C20)	Measurement range over-run			
bitOffset 16 (0x8C01)	Simulation active			
bitOffset 9 (0x8C30)	Process variable range under-run			
bitOffset 8 (0x8C10)	Process variable range over-run			
bitOffset 2 (0x7710)	Short circuit			
bitOffset 1 (0x6320)	Parameter error			
bitOffset 0 (0x5000)	Device hardware fault			

false Event inactive



## Diagnosis

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)		
	38469632	(SP1 (FH1) - PRES, Index = 587)		
	38207488	(SP1 (FH1) - FLOW, Index = 583)		
	38338560	(SP1 (FH1) - TEMP, Index = 585)		
	38535168	(rP1 (FL1) - PRES, Index = 588)		
	38273024	(rP1 (FL1) - FLOW, Index = 584)		
	38404096	(rP1 (FL1) - TEMP, Index = 586)		
	201064448	(ImPS1, Index = 3068)		
	200540160	(ImPR1, Index = 3060)		
	41549824	(ASP2 - PRES, Index = 634)		
	41287680	(ASP2 - FLOW, Index = 630)		
	41418752	(ASP2 - TEMP, Index = 632)		
	41615360	(AEP2 - PRES, Index = 635)		
	41353216	(AEP2 - FLOW, Index = 631)		
	41484288	(AEP2 - TEMP, Index = 633)		
	39124992	(SP2 (FH2) - PRES, Index = 597)		
	38862848	(SP2 (FH2) - FLOW, Index = 593)		
	38993920	(SP2 (FH2) - TEMP, Index = 595)		
	39190528	(rP2 (FL2) - PRES, Index = 598)		
	38928384	(rP2 (FL2) - FLOW, Index = 594)		
	39059456	(rP2 (FL2) - TEMP, Index = 596)		
	207618048	(ImPS2, Index = 3168)		
	207093760	(ImPR2, Index = 3160)		
	44302336	(DIn2, Index = 676)		
	197591040	(rTo - Totaliser reset time, Index = 3015)		
	34078720	(SEL1, Index = 520)		
	38010880	(ou1, Index = 580)		
	38076416	(dS1, Index = 581)		
	38141952	(dr1, Index = 582)		
	34799616	(FOU1, Index = 531)		
	34144256	(SEL2, Index = 521)		
	38666240	(ou2, Index = 590)		
	38731776	(dS2, Index = 591)		
	38797312	(dr2, Index = 592)		
	34865152	(FOU2, Index = 532)		
	36110336	(uni.F, Index = 551)		
	55115776	(uni.T, Index = 841)		
	55181312	(uni.P, Index = 842)		
	33423360	(dAP.F, Index = 510)		
	57737216	(dAP.P, Index = 881)		
	32768000	(P-n, Index = 500)		
	197001216	(LFC, Index = 3006)		
	196608000	(rEF.P, Index = 3000)		
	196673536	(rEF.T, Index = 3001)		
	327745536	(coF, Index = 5001)		
	52625408	(diS.L, Index = 803)		
	52428800	(diS.U, Index = 800)		
	52494336	(diS.R, Index = 801)		
	52559872	(diS.B, Index = 802)		
	53084160	(coL.F, Index = 810)		
	36438016	(cFH.F, Index = 556)		
	36372480	(cFL.F, Index = 555)		
	53149696	(coL.T, Index = 811)		
	57081856	(cFH.T, Index = 871)		
	56426496	(cFL.T, Index = 861)		
	53215232	(coL.P, Index = 812)		
	57147392	(cFH.P, Index = 872)		
	56492032	(cFL.P, Index = 862)		
	53280768	(coL.V, Index = 813)		
	37486592	(S.FLW, Index = 572)		
	37552128	(S.TMP, Index = 573)		
	37617664	(S.PRS, Index = 574)		
	37421056	(S.Tim, Index = 571)		
	36044800	(Loc, Index = 550)		



## Events

Code	Device status	PQ *	Class	Name	Description
0x5000 20480d	4 (Failure)	invalid	Error	Device hardware fault	Exchange device
0x5010 20496d	3 (Functional check)	valid	Error	Component malfunction	Repair or exchange
0x6320 25376d	3 (Functional check)	invalid	Error	Parameter error	Check datasheet and values
0x7710 30480d	3 (Functional check)	valid	Error	Short circuit	Check installation
0x8C01 35841d	3 (Functional check)	valid	Warning	Simulation active	Check operating mode
0x8C10 35856d	2 (Out of specification)	valid	Warning	Process variable range overrun	Process data uncertain
0x8C20 35872d	3 (Functional check)	valid	Error	Measurement range exceeded	Check application
0x8C30 35888d	2 (Out of specification)	valid	Warning	Process variable range underrun	Process data uncertain
0x8CDB 36059d	1 (Maintenance required)	valid	Warning	Flash sequence active. Device Status = 1 (Maintenance required)	Deactivate flash sequence
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.