ROSEMOUNT

IO-Link

IO-Link Interface Description

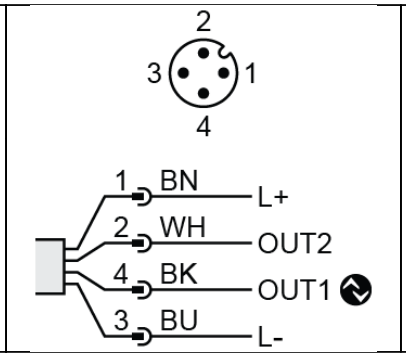
Rosemount 1208A Level and Flow Transmitter

EN

IODD-PDFCreator V 2.0.0.112
Rosemount-000008-20220608-IODD1.1, V1.00.3

Table of Contents

1 Device variant

Rosemount 1208A Level and Flow Transmitter Level and Flow Transmitter, IO-Link		

2 Communication

Vendor ID	0x026 38 d / Bytes 38d
Device ID	0x0008 8 d / Bytes 0d 8d
Bit rate	COM2
Minimum cycle time	6 ms
SIO mode supported	Yes
Block parameterization	No
Data storage	Yes
Supported profiles	Smart Sensor Profil Device Identification Process Data Variable Device Diagnosis

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	page
Vendor name	16		StringT (19 Byte)	Rosemount Inc.	9
Product Name	18		StringT (20 Byte)	Rosemount 1208A	9
Product Text	20		StringT (26 Byte)	Level and Flow Transmitter	9
Serial Number	21		StringT (13 Byte)		9
Hardware Version	22		StringT (7 Byte)		9
Firmware Version	23		StringT (10 Byte)		9
Application Specific Tag	24		StringT (32 Byte)	***	9
Function Tag	25		StringT (32 Byte)	***	9
Location Tag	26		StringT (32 Byte)	***	9
Device Status	36		UIntegerT (8 Bit)	0 (Device is OK)	26
Detailed Device Status	37		OctetStringT (3 byte) [6]	0x00,0x00,0x00	26
Process data input	40		RecordT (64 Bit)		10
Bluetooth Option	303		UIntegerT (8 Bit)	0 (No)	27
Bluetooth Radio UID	304		StringT (20 Byte)		29
4 mA Measured Current	405		Float32T	4.0	24
20 mA Measured Current	406		Float32T	20.0	25
Write Protection	407		BooleanT	false (Write Protection off)	11
Digital Outputs P-n	500		UIntegerT (8 Bit)	0 (PnP)	11
Damping Value	510		UIntegerT (16 Bit)	20	25
Alarm Mode	532		UIntegerT (8 Bit)		16
Active Events	545		RecordT (32 Bit)		27
Engineering Units	551		UIntegerT (8 Bit)	0 (Metric)	11
Simulation Status	570		UIntegerT (8 Bit)	0 (Off)	24
Simulated Level	572		IntegerT (16 Bit)	5000	24
OUT1 Configuration	580		UIntegerT (8 Bit)	0 (Disabled)	11
Alarm On Delay	581		UIntegerT (16 Bit)	0	12
Alarm Off Delay	582		UIntegerT (16 Bit)	0	12
OUT2 Configuration	590		UIntegerT (8 Bit)	1 (Analog Output 4-20 mA)	14
Alarm On Delay	591		UIntegerT (16 Bit)	0	14
Alarm Off Delay	592		UIntegerT (16 Bit)	0	14
Calibration Offset	681		IntegerT (16 Bit)	0	19
Input Voltage	940		UIntegerT (16 Bit)		27
Bluetooth Diagnosis	1574		RecordT (32 Bit)		29
Reference Height	1604		UIntegerT (16 Bit)	10000	11
Bottom Offset	1611		IntegerT (16 Bit)	0	19
Upper Null Zone	1612		UIntegerT (16 Bit)	0	19
Measurement Recovery Time	1613		UIntegerT (16 Bit)	180	25
General Threshold	1614		UIntegerT (16 Bit)	100	25
Echo Peaks	1615		RecordT (400 Bit)		34
Measurement Variables	1616		RecordT (200 Bit)		28
Analog Output Details	2250		RecordT (32 Bit)		31
Current	2251		Float32T		31
Percent of Range	2252		Float32T		31
DO1 Details	2276		RecordT (32 Bit)		30
DO2 Details	2278		RecordT (32 Bit)		31

3 Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
Bluetooth Connection St...	5300		UIntegerT (32 Bit)		29
Min Electronic Temp	6073		Float32T	20.0	29
Max Electronic Temp	6074		Float32T	20.0	29
Application Mode	6086		UIntegerT (32 Bit)	0 (Default Mode)	24
Bluetooth Radio	11600		UIntegerT (32 Bit)	1 (Enabled)	19
Upper Range Value (20 mA)	11701		Float32T	10.0	17
Lower Range Value (4 mA)	11702		Float32T	0.0	17
Low Alarm Value	11703		Float32T	3.5	18
High Alarm Value	11704		Float32T	21.5	17
Low Saturation Value	11705		Float32T	3.8	17
High Saturation Value	11706		Float32T	20.5	17
Analog Control Variable	11707		UIntegerT (32 Bit)	0 (Level)	16
Alarm Configuration	11751		RecordT (32 Bit)		11
DO Control Variable	11752		UIntegerT (32 Bit)	0 (Level)	11
Low Alarm	11754		UIntegerT (32 Bit)	0 (Enabled)	12
SP2-Low Alarm Set Point	11755		Float32T	0.0	12
SP2-Hysteresis Low Alarm	11756		Float32T	0.005	14
SP1-High Alarm Set Point	11758		Float32T	10.0	12
SP1-Hysteresis High Alarm	11759		Float32T	-0.005	12
High Alarm	11760		UIntegerT (32 Bit)	0 (Enabled)	12
Alarm Configuration	11766		RecordT (32 Bit)		14
DO Control Variable	11767		UIntegerT (32 Bit)	0 (Level)	14
Low Alarm	11769		UIntegerT (32 Bit)	0 (Enabled)	15
SP2-Low Alarm Set Point	11770		Float32T	0.0	15
SP2-Hysteresis Low Alarm	11771		Float32T	0.005	16
SP1-High Alarm Set Point	11773		Float32T	10.0	14
SP1-Hysteresis High Alarm	11774		Float32T	-0.005	15
High Alarm	11775		UIntegerT (32 Bit)	0 (Enabled)	14
Volume Flow Calc. Method	13780		UIntegerT (32 Bit)	0 (Disabled)	19
Constant K (from [m] an...	13782		Float32T	0.0	23
Exponent n (from [m] an...	13783		Float32T	0.0	23
Maximum Level Value	13784		Float32T	0.0	24
Volume Flow Table Size	13785		UIntegerT (32 Bit)	2	19
Flow Table	16305		RecordT (960 Bit)		21
Flow Table	16306		RecordT (960 Bit)		23

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
128	Device Reset	Press to reset/restart the Device
128	Device Reset	
130	Restore Factory Settings	Press to restore the Factory configuration
130	Restore Factory Settings	
176	Start simulation (60 min)	Press to start the Level and Volume Flow Simulation
177	Stop simulation	Press to stop the Level and Volume Flow Simulation
180	Enter 4 mA Fixed Current Mode	Press to enter the fixed 4 mA Current Mode. The 4 mA Current Calibration must be performed prior the 20 mA Current calibration
181	Enter 20 mA Fixed Current Mode	Press to enter the fixed 20 mA Current Mode (this is done after the 4 mA calibration)
182	Exit Fixed Current Mode	Press to exit the Fixed Current Mode
183	Calibrate 4 mA	Press to perform the 4 mA Current Calibration
184	Calibrate 20 mA	Press to perform the 20 mA Current Calibration
190	Enter Demonstration Mode	Press to enter the Demonstration Mode
191	Exit Demonstration Mode	Press to exit the Demonstration Mode and enter the Default Mode

4 System Commands

System Commands	Text	Description
192	Reset Bluetooth Security	The Bluetooth security reset process will erase the established login passwords

5 Identification

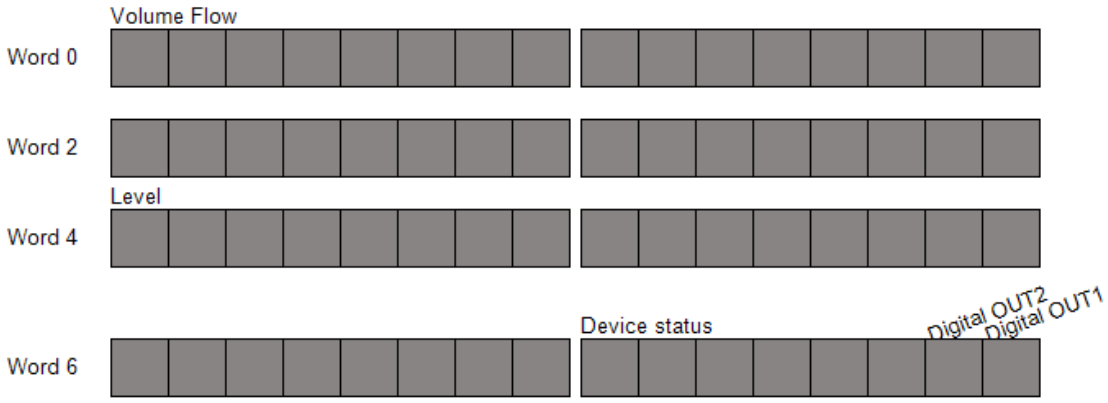
5.1 Identification

Vendor name	**Index 16**	**Subindex 0**	**StringT (19 Byte)**	**ReadOnly**
Factory setting	**Rosemount Inc.**			
Product Name	**Index 18**	**Subindex 0**	**StringT (20 Byte)**	**ReadOnly**
Factory setting	**Rosemount 1208A**			
Product Text	**Index 20**	**Subindex 0**	**StringT (26 Byte)**	**ReadOnly**
Factory setting	**Level and Flow Transmitter**			
Serial Number	**Index 21**	**Subindex 0**	**StringT (13 Byte)**	**ReadOnly**
Hardware Version	**Index 22**	**Subindex 0**	**StringT (7 Byte)**	**ReadOnly**
Firmware Version	**Index 23**	**Subindex 0**	**StringT (10 Byte)**	**ReadOnly**
Application Specific Tag	**Index 24**	**Subindex 0**	**StringT (32 Byte)**	**ReadWrite**
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	***			

6 Observation

6.1 Observation

Process data input		RecordT (64 Bit)
Volume Flow		Float32T
Calculated Volume Flow Value [m³/h]		
Level		IntegerT (16 Bit)
Measured Level Value [mm]		
Value range [m]	(0 To 15000) * 0.001	
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)	
Digital OUT2		BooleanT
Digital OUT2 state		
Value range	false (Inactive) true (Active)	
Digital OUT1		BooleanT
Digital OUT1 state		
Value range	false (Inactive) true (Active)	



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 Parameter

7.1.1 Basic Setup

Engineering Units	Index 551	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Engineering units for Length, temperature and volume flow. Metric: [m], [°C] and m³/h. Imperial: [inch], [°F] and US gal/h				
Factory setting Value range	**0** 0 1	**(Metric)** (Metric) (Imperial)		

Reference Height	Index 1604	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Distance between the Device Reference Point and Zero Level.				
Factory setting Value range [m]	**10000** (200 To 15000) * 0.001			

Digital Outputs P-n	Index 500	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Output polarity for the switching outputs				
Factory setting Value range	**0** 0 1	**(PnP)** (PnP) (nPn)		

Write Protection	Index 407	Subindex 0	BooleanT	ReadWrite
Write protects all Device Parameters.				
Factory setting Value range	**false** false true	**(Write Protection off)** (Write Protection off) (Write Protection on)		

7.2 OUT1 Digital Output

OUT1 Configuration	Index 580	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of the M12 connector output pin 4 (OUT1)				
Factory setting Value range	**0** 0 5	**(Disabled)** (Disabled) (Digital Output Normally Open)		

DO Control Variable	Index 11752	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Select between Volume Flow or Level to control the Digital Output				
Factory setting Value range	**0** 0 6	**(Level)** (Level) (Volume Flow)		

Alarm Configuration	Index 11751	Subindex 0	RecordT (32 Bit)	ReadWrite
Alarm On Delay		bitOffset 5	BooleanT	
Configures if Alarm On Delay is used only for lost surface alarms. HW faults and passing Alarm Set Points will trigger Alarm without any delay				
Value range	0 1	(Always) (Lost surface)		

7 Parameter

Alarm On Delay	Index 581	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when the digital output transfers from Normal to Alarm State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

Alarm Off Delay	Index 582	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when digital output transfers from Alarm to Normal State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

7.2.1 Set Point Configuration

High Alarm	Index 11760	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the High Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP1-High Alarm Set Point	Index 11758	Subindex 0	Float32T	ReadWrite
Set Point 1-High Set Point. If the measured value is above this set point, the Digital Output is set to Alarm State				
Factory setting	**10.0**			

SP2-Low Alarm Set Point	Index 11755	Subindex 0	Float32T	ReadWrite
Set Point 2-Low Set Point. If the measured value is under this set point, the Digital Output is set to Alarm State				
Factory setting	**0.0**			

Low Alarm	Index 11754	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the Low Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP1-Hysteresis High Alarm	Index 11759	Subindex 0	Float32T	ReadWrite
Set Point 1-Hysteresis (High Set Point)				
Factory setting	**-0.005**			

SP2-Hysteresis Low Alarm	Index 11756	Subindex 0	Float32T	ReadWrite
Set Point 2-Hysteresis (Low Set Point)				
Factory setting	**0.005**			

7.3 OUT1 Digital Output

OUT1 Configuration	Index 580	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of the M12 connector output pin 4 (OUT1)				
Factory setting	**0**	**(Disabled)**		
Value range	0	(Disabled)		
	5	(Digital Output Normally Open)		

7 Parameter

DO Control Variable	Index 11752	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Select between Volume Flow or Level to control the Digital Output				
Factory setting	**0**	**(Level)**		
Value range	0	(Level)		
	6	(Volume Flow)		

Alarm Configuration	Index 11751	Subindex 0	RecordT (32 Bit)	ReadWrite
Alarm On Delay		bitOffset 5	BooleanT	
Configures if Alarm On Delay is used only for lost surface alarms. HW faults and passing Alarm Set Points will trigger Alarm without any delay				
Value range	0	(Always)		
	1	(Lost surface)		

Alarm On Delay	Index 581	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when the digital output transfers from Normal to Alarm State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

Alarm Off Delay	Index 582	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when digital output transfers from Alarm to Normal State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

7.3.1 Set Point Configuration

High Alarm	Index 11760	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the High Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP1-High Alarm Set Point	Index 11758	Subindex 0	Float32T	ReadWrite
Set Point 1-High Set Point. If the measured value is above this set point, the Digital Output is set to Alarm State				
Factory setting	**10.0**			

SP2-Low Alarm Set Point	Index 11755	Subindex 0	Float32T	ReadWrite
Set Point 2-Low Set Point. If the measured value is under this set point, the Digital Output is set to Alarm State				
Factory setting	**0.0**			

Low Alarm	Index 11754	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the Low Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP1-Hysteresis High Alarm	Index 11759	Subindex 0	Float32T	ReadWrite
Set Point 1-Hysteresis (High Set Point)				
Factory setting	**-0.005**			

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SP2-Hysteresis Low Alarm	Index 11756	Subindex 0	Float32T	ReadWrite
Set Point 2-Hysteresis (Low Set Point)				
Factory setting	**0.005**			

7.4 OUT2 Digital Output

OUT2 Configuration	Index 590	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of the M12 connector output pin 2 (OUT2)				
Factory setting	**1**	**(Analog Output 4-20 mA)**		
Value range	0	(Disabled)		
	1	(Analog Output 4-20 mA)		
	5	(Digital Output Normally Open)		

DO Control Variable	Index 11767	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Select between Volume Flow or Level to control the Digital Output				
Factory setting	**0**	**(Level)**		
Value range	0	(Level)		
	6	(Volume Flow)		

Alarm Configuration	Index 11766	Subindex 0	RecordT (32 Bit)	ReadWrite
Alarm On Delay		bitOffset 5	BooleanT	
Configures if Alarm On Delay is used only for lost surface alarms. HW faults and passing Alarm Set Points will trigger Alarm without any delay				
Value range	0	(Always)		
	1	(Lost surface)		

Alarm On Delay	Index 591	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when the digital output transfers from Normal to Alarm State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

Alarm Off Delay	Index 592	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when digital output transfers from Alarm to Normal State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

7.4.1 Set Point Configuration

High Alarm	Index 11775	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the High Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP1-High Alarm Set Point	Index 11773	Subindex 0	Float32T	ReadWrite
Set Point 1-High Set Point. If the measured value is above this set point, the Digital Output is set to Alarm State				
Factory setting	**10.0**			

7 Parameter

Low Alarm	Index 11769	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the Low Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP2-Low Alarm Set Point	Index 11770	Subindex 0	Float32T	ReadWrite
Set Point 2-Low Set Point. If the measured value is under this set point, the Digital Output is set to Alarm State				
Factory setting	**0.0**			

SP1-Hysteresis High Alarm	Index 11774	Subindex 0	Float32T	ReadWrite
Set Point 1-Hysteresis (High Set Point)				
Factory setting	**-0.005**			

SP2-Hysteresis Low Alarm	Index 11771	Subindex 0	Float32T	ReadWrite
Set Point 2-Hysteresis (Low Set Point)				
Factory setting	**0.005**			

7.5 OUT2 Digital Output

OUT2 Configuration	Index 590	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of the M12 connector output pin 2 (OUT2)				
Factory setting	**1**	**(Analog Output 4-20 mA)**		
Value range	0	(Disabled)		
	1	(Analog Output 4-20 mA)		
	5	(Digital Output Normally Open)		

DO Control Variable	Index 11767	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Select between Volume Flow or Level to control the Digital Output				
Factory setting	**0**	**(Level)**		
Value range	0	(Level)		
	6	(Volume Flow)		

Alarm Configuration	Index 11766	Subindex 0	RecordT (32 Bit)	ReadWrite
Alarm On Delay		bitOffset 5	BooleanT	
Configures if Alarm On Delay is used only for lost surface alarms. HW faults and passing Alarm Set Points will trigger Alarm without any delay				
Value range	0	(Always)		
	1	(Lost surface)		

Alarm On Delay	Index 591	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when the digital output transfers from Normal to Alarm State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

Alarm Off Delay	Index 592	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The time delay for when digital output transfers from Alarm to Normal State				
Factory setting	**0**			
Value range	(0 To 1800) [s]			

7 Parameter

7.5.1 Set Point Configuration

High Alarm	Index 11775	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the High Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP1-High Alarm Set Point	Index 11773	Subindex 0	Float32T	ReadWrite
Set Point 1-High Set Point. If the measured value is above this set point, the Digital Output is set to Alarm State				
Factory setting	**10.0**			

Low Alarm	Index 11769	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enable or Disable the Low Alarm				
Factory setting	**0**	**(Enabled)**		
Value range	0	(Enabled)		
	1	(Disabled)		

SP2-Low Alarm Set Point	Index 11770	Subindex 0	Float32T	ReadWrite
Set Point 2-Low Set Point. If the measured value is under this set point, the Digital Output is set to Alarm State				
Factory setting	**0.0**			

SP1-Hysteresis High Alarm	Index 11774	Subindex 0	Float32T	ReadWrite
Set Point 1-Hysteresis (High Set Point)				
Factory setting	**-0.005**			

SP2-Hysteresis Low Alarm	Index 11771	Subindex 0	Float32T	ReadWrite
Set Point 2-Hysteresis (Low Set Point)				
Factory setting	**0.005**			

7.6 OUT2 Analog Output

OUT2 Configuration	Index 590	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of the M12 connector output pin 2 (OUT2)				
Factory setting	**1**	**(Analog Output 4-20 mA)**		
Value range	0	(Disabled)		
	1	(Analog Output 4-20 mA)		
	5	(Digital Output Normally Open)		

Analog Control Variable	Index 11707	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Select between Volume Flow or Level to control the Analog Output				
Factory setting	**0**	**(Level)**		
Value range	0	(Level)		
	6	(Volume Flow)		

Alarm Mode	Index 532	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Select Analog High or Low Alarm Current				
Value range	0	(Low Alarm)		
	2	(High Alarm)		

7 Parameter

7.6.1 Analog Range Values

Upper Range Value (20 mA)	Index 11701	Subindex 0	Float32T	ReadWrite
Defines the Level Value where the Analog Current is 20 mA				
Factory setting	**10.0**			

Lower Range Value (4 mA)	Index 11702	Subindex 0	Float32T	ReadWrite
Defines the Level Value where the Analog Current is 4 mA				
Factory setting	**0.0**			

7.6.2 Analog Alarm Limits

High Alarm Value	Index 11704	Subindex 0	Float32T	ReadWrite
The high alarm current for the Analog Output when the device enters the alarm mode				
Factory setting Value range [mA]	**21.5** (20.0 To 22.5) * 1.0			

High Saturation Value	Index 11706	Subindex 0	Float32T	ReadWrite
The device will continue to set a current that corresponds with the measurement up until this limit (and then freeze)				
Factory setting Value range [mA]	**20.5** (20.0 To 22.5) * 1.0			

Low Saturation Value	Index 11705	Subindex 0	Float32T	ReadWrite
The device will continue to set a current that corresponds with the measurement down until this limit (and then freeze)				
Factory setting Value range [mA]	**3.8** (3.5 To 4.0) * 1.0			

Low Alarm Value	Index 11703	Subindex 0	Float32T	ReadWrite
The low alarm current for the Analog Output when the device enters the alarm mode				
Factory setting Value range [mA]	**3.5** (3.5 To 4.0) * 1.0			

7.7 OUT2 Analog Output

OUT2 Configuration	Index 590	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Configuration of the M12 connector output pin 2 (OUT2)				
Factory setting Value range	**1** 0 1 5	**(Analog Output 4-20 mA)** (Disabled) (Analog Output 4-20 mA) (Digital Output Normally Open)		

Analog Control Variable	Index 11707	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Select between Volume Flow or Level to control the Analog Output				
Factory setting Value range	**0** 0 6	**(Level)** (Level) (Volume Flow)		

7 Parameter

Alarm Mode	Index 532	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Select Analog High or Low Alarm Current				
Value range	0 2	(Low Alarm) (High Alarm)		

7.7.1 Analog Range Values

Upper Range Value (20 mA)	Index 11701	Subindex 0	Float32T	ReadWrite
Defines the Level Value where the Analog Current is 20 mA				
Factory setting	**10.0**			

Lower Range Value (4 mA)	Index 11702	Subindex 0	Float32T	ReadWrite
Defines the Level Value where the Analog Current is 4 mA				
Factory setting	**0.0**			

High Alarm Value	Index 11704	Subindex 0	Float32T	ReadWrite
The high alarm current for the Analog Output when the device enters the alarm mode				
Factory setting Value range [mA]	**21.5** (20.0 To 22.5) * 1.0			

High Saturation Value	Index 11706	Subindex 0	Float32T	ReadWrite
The device will continue to set a current that corresponds with the measurement up until this limit (and then freeze)				
Factory setting Value range [mA]	**20.5** (20.0 To 22.5) * 1.0			

Low Saturation Value	Index 11705	Subindex 0	Float32T	ReadWrite
The device will continue to set a current that corresponds with the measurement down until this limit (and then freeze)				
Factory setting Value range [mA]	**3.8** (3.5 To 4.0) * 1.0			

Low Alarm Value	Index 11703	Subindex 0	Float32T	ReadWrite
The low alarm current for the Analog Output when the device enters the alarm mode				
Factory setting Value range [mA]	**3.5** (3.5 To 4.0) * 1.0			

7.8 Bluetooth Configuration

Bluetooth Radio	Index 11600	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Indicates whether Bluetooth functionality is enabled or not by the user. When disabled, the Bluetooth interface is incapable of transmitting or receiving any wireless signals and may only be enabled via wired communication to the device.				
Factory setting Value range	**1** 0 1	**(Enabled)** (Disabled) (Enabled)		

7 Parameter

7.9 Geometry

Reference Height	Index 1604	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Distance between the Device Reference Point and Zero Level.				
Factory setting	**10000**			
Value range [m]	(200 To 15000) * 0.001			

7.9.1 Advanced

Calibration Offset	Index 681	Subindex 0	IntegerT (16 Bit)	ReadWrite
Difference between the surface distance measured by the device compared to the distance measured by a control method, e.g. hand-dipping with a measurement tape				
Factory setting	**0**			
Value range [m]	(-100 To 100) * 0.001			

Upper Null Zone	Index 1612	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Defines how close to the device reference point a level value is accepted. You can change this value to block out disturbing echoes close to the antenna. View the Echo Peaks to find out if there are disturbing echoes close to the tank top				
Factory setting	**0**			
Value range [m]	(0 To 10000) * 0.001			

Bottom Offset	Index 1611	Subindex 0	IntegerT (16 Bit)	ReadWrite
Distance between the Zero Level point and the tank bottom				
Factory setting	**0**			
Value range [m]	(-10000 To 10000) * 0.001			

7.10 Volume Flow

Volume Flow Calc. Method	Index 13780	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Enter the type of preferred Volume Flow calculation method				
Factory setting	**0**	**(Disabled)**		
Value range	0	(Disabled)		
	1	(Linearization Table)		
	2	(Parshall flume)		
	3	(Khafagi-Venturi flume)		

7.10.1 Volume Flow Table

Volume Flow Table Size	Index 13785	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Number of used Table Points				
Factory setting	**2**			
Value range	(2 To 30)			

Flow Table	Index 16305	Subindex 0	RecordT (960 Bit)	ReadWrite
Contains the Flow Table strapping points				
Point 1,Level		bitOffset 928	Float32T	
Factory setting	**0.0**			
Value range [m]	(0.0 To 15.0) * 1.0			

7 Parameter

Flow Table	Index 16305	Subindex 0	RecordT (960 Bit)	ReadWrite
Point 1, Volume Flow		bitOffset 896	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 2,Level		bitOffset 864	Float32T	
Factory setting Value range [m]	**10.0** (0.0 To 15.0) * 1.0			
Point 2, Volume Flow		bitOffset 832	Float32T	
Factory setting Value range [m³/h]	**10.0** (0.0 To 5000000.0) * 1.0			
Point 3,Level		bitOffset 800	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 3, Volume Flow		bitOffset 768	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 4,Level		bitOffset 736	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 4, Volume Flow		bitOffset 704	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 5,Level		bitOffset 672	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 5, Volume Flow		bitOffset 640	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 6,Level		bitOffset 608	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 6, Volume Flow		bitOffset 576	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 7,Level		bitOffset 544	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 7, Volume Flow		bitOffset 512	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 8,Level		bitOffset 480	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 8, Volume Flow		bitOffset 448	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 9,Level		bitOffset 416	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			

7 Parameter

Flow Table	Index 16305	Subindex 0	RecordT (960 Bit)	ReadWrite
Point 9, Volume Flow		bitOffset 384	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 10,Level		bitOffset 352	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 10, Volume Flow		bitOffset 320	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 11,Level		bitOffset 288	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 11, Volume Flow		bitOffset 256	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 12,Level		bitOffset 224	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 12, Volume Flow		bitOffset 192	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 13,Level		bitOffset 160	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 13, Volume Flow		bitOffset 128	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 14,Level		bitOffset 96	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 14, Volume Flow		bitOffset 64	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 15,Level		bitOffset 32	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 15, Volume Flow		bitOffset 0	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			

Flow Table	Index 16306	Subindex 0	RecordT (960 Bit)	ReadWrite
Contains the Flow Table strapping points				
Point 16,Level		bitOffset 928	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 16, Volume Flow		bitOffset 896	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			

7 Parameter

Flow Table	Index 16306	Subindex 0	RecordT (960 Bit)	ReadWrite
Point 17,Level		bitOffset 864	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 17, Volume Flow		bitOffset 832	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 18,Level		bitOffset 800	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 18, Volume Flow		bitOffset 768	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 19,Level		bitOffset 736	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 19, Volume Flow		bitOffset 704	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 20,Level		bitOffset 672	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 20, Volume Flow		bitOffset 640	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 21,Level		bitOffset 608	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 21, Volume Flow		bitOffset 576	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 22,Level		bitOffset 544	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 22, Volume Flow		bitOffset 512	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 23,Level		bitOffset 480	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 23, Volume Flow		bitOffset 448	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 24,Level		bitOffset 416	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 24, Volume Flow		bitOffset 384	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			

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Flow Table	Index 16306	Subindex 0	RecordT (960 Bit)	ReadWrite
Point 25,Level		bitOffset 352	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 25, Volume Flow		bitOffset 320	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 26,Level		bitOffset 288	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 26, Volume Flow		bitOffset 256	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 27,Level		bitOffset 224	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 27, Volume Flow		bitOffset 192	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 28,Level		bitOffset 160	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 28, Volume Flow		bitOffset 128	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 29,Level		bitOffset 96	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 29, Volume Flow		bitOffset 64	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			
Point 30,Level		bitOffset 32	Float32T	
Factory setting Value range [m]	**0.0** (0.0 To 15.0) * 1.0			
Point 30, Volume Flow		bitOffset 0	Float32T	
Factory setting Value range [m³/h]	**0.0** (0.0 To 5000000.0) * 1.0			

7.10.2 Volume Flow Formula

Constant K (from [m] and [m³/h])	Index 13782	Subindex 0	Float32T	ReadWrite
The flume specific factor K in formula Q = K * H (exp n) where H is the measured level. For Khafagi-Venturi the exp n is 1.5				
Factory setting Value range	**0.0** (0.0 To 500000.0)			

Exponent n (from [m] and [m³/h])	Index 13783	Subindex 0	Float32T	ReadWrite
The flume specific exponent n in formula Q = K * H (exp n) where H is the measured level				
Factory setting Value range	**0.0** (0.0 To 5.0)			

7 Parameter

Maximum Level Value	Index 13784	Subindex 0	Float32T	ReadWrite
The flume maximum Level (weir height)				
Factory setting	**0.0**			
Value range [m]	(0.0 To 15.0) * 1.0			

7.10.3 Volume Flow Formula

Constant K (from [m] and [m³/h])	Index 13782	Subindex 0	Float32T	ReadWrite
The flume specific factor K in formula Q = K * H (exp n) where H is the measured level. For Khafagi-Venturi the exp n is 1.5				
Factory setting	**0.0**			
Value range	(0.0 To 500000.0)			

Maximum Level Value	Index 13784	Subindex 0	Float32T	ReadWrite
The flume maximum Level (weir height)				
Factory setting	**0.0**			
Value range [m]	(0.0 To 15.0) * 1.0			

7.11 Service Tools

7.11.1 Application Mode

Application Mode	Index 6086	Subindex 0	UIntegerT (32 Bit)	ReadOnly
Factory setting	**0**	**(Default Mode)**		
Value range	0	(Default Mode)		
	1	(Demonstration Mode)		

7.11.2 Maintenance

7.11.3 Simulation

Simulated Level	Index 572	Subindex 0	IntegerT (16 Bit)	ReadWrite
Enter the desired Simulated Level Value				
Factory setting	**5000**			
Value range [m]	(0 To 15000) * 0.001			

Simulation Status	Index 570	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Factory setting	**0**	**(Off)**		
Value range	0	(Off)		
	1	(On)		

7.11.4 Analog Out Calibration

4 mA Measured Current	Index 405	Subindex 0	Float32T	ReadWrite
Enter the measured current for the 4 mA calibration				
Factory setting	**4.0**			
Value range [mA]	(3.8 To 4.2) * 1.0			

7 Parameter

20 mA Measured Current	Index 406	Subindex 0	Float32T	ReadWrite
Enter the measured current for the 20 mA calibration				

Factory setting **20.0**
Value range [mA] (19.8 To 20.2) * 1.0

7.12 Advanced Setup

Measurement Recovery Time	Index 1613	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The maximum time set from when the measurement is lost until it is communicated				

Factory setting **180**
Value range (0 To 1000) [s]

Damping Value	Index 510	Subindex 0	UIntegerT (16 Bit)	ReadWrite
The parameter defines how fast the device reacts to a change of level value (step response). A high value makes the level steady, but the device will in turn react slowly to level changes in the tank.				

Factory setting **20**
Value range [s] (0 To 6000) * 0.1

General Threshold	Index 1614	Subindex 0	UIntegerT (16 Bit)	ReadWrite
Threshold for which a returned echo Signal Strength needs to be above to be considered the product surface				

Factory setting **100**
Value range [mV] (0 To 20000) * 1.0

8 Diagnosis

8.1 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) [6]	ReadOnly
Factory setting	**0x00,0x00,0x00**			

Active Events	Index 545	Subindex 0	RecordT (32 Bit)	ReadOnly
Bit mask for current pending events				
Bit23 0x8CEA		bitOffset 23	BooleanT	
Bluetooth Warning - Restart the Device. If the condition persist, disable Bluetooth or replace the Device, see Bluetooth Diagnosis				
Value range	0	(noEv)		
	1	(Bluetooth Warning)		
Bit22 0x8CE8		bitOffset 22	BooleanT	
Master is overloading the Device EEPROM memory - Reconfigure the Master and Restart the Device. Device Status = 1 (Maintenance required)				
Value range	0	(noEv)		
	1	(Max EEPROM write cycles expired)		
Bit21 0x8CE9		bitOffset 21	BooleanT	
Device memory failure - Restore factory settings. Device Status = 4 (Failure)				
Value range	0	(noEv)		
	1	(Parameter fault)		
Bit20 0x6000		bitOffset 20	BooleanT	
Device software fault. Device Status = 4 (Failure)				
Value range	0	(noEv)		
	1	(Device Software fault)		
Bit19 0x5111		bitOffset 19	BooleanT	
Primary supply voltage under-run. Device Status = 2 (Out of Specification)				
Value range	0	(noEv)		
	1	(Low input voltage)		
Bit18 0x5110		bitOffset 18	BooleanT	
Primary supply voltage over-run. Device Status = 2 (Out of Specification)				
Value range	0	(noEv)		
	1	(High input voltage)		
Bit17 0x5100		bitOffset 17	BooleanT	
General power supply fault. Device Status = 4 (Failure)				
Value range	0	(noEv)		
	1	(Multiple startups)		
Bit16 0x8C01		bitOffset 16	BooleanT	
Simulation active. Device Status = 3 (Functional check)				
Value range	0	(noEv)		
	1	(Simulation active)		

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Active Events	Index 545	Subindex 0	RecordT (32 Bit)	ReadOnly
Bit15 0x4210		bitOffset 15	BooleanT	
Device temperature over-run - Clear source of heat. Device Status = 2 (Out of Specification)				
Value range	0 1	(noEv) (Internal temp high)		
Bit14 0x4220		bitOffset 14	BooleanT	
Device temperature under-run - Insulate Device. Device Status = 2 (Out of Specification)				
Value range	0 1	(noEv) (Internal temp low)		
Bit13 0x8C40		bitOffset 13	BooleanT	
Maintenance required – Cleaning. Device Status = 1 (Maintenance required)				
Value range	0 1	(noEv) (Clean antenna)		
Bit12 0x8C20		bitOffset 12	BooleanT	
Measurement range over-run. Device Status = 2 (Out of Specification)				
Value range	0 1	(noEv) (Volume Flow Calculation is saturated due to level is outside the configured range)		
Bit10 0x8CBC		bitOffset 10	BooleanT	
Level measurement lost - Check application. Device Status = 4 (Failure)				
Value range	0 1	(noEv) (Level meas lost)		
Bit2 0x7710		bitOffset 2	BooleanT	
Short circuit. Device Status = 2 (Out of Specification)				
Value range	0 1	(noEv) (DO short circuit)		
Bit1 0x6320		bitOffset 1	BooleanT	
Parameter error - Check configuration. Device Status = 4 (Failure)				
Value range	0 1	(noEv) (Parameter config error)		
Bit0 0x5000		bitOffset 0	BooleanT	
Device hardware fault. Device Status = 4 (Failure)				
Value range	0 1	(noEv) (Device hardware fault)		

Input Voltage	Index 940	Subindex 0	UIntegerT (16 Bit)	ReadOnly
The measured Power Supply voltage				
Value range [V]	(0 To 360) * 0.1			

Bluetooth Option	Index 303	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Indicates if the 1208A contains the Bluetooth option				
Factory setting Value range	**0** 0 1	**(No)** (No) (Yes)		

8.1.1 Measurement Variables

Measurement Variables	Index 1616	Subindex 0	RecordT (200 Bit)	ReadOnly
Measurement Variables				

8 Diagnosis

Measurement Variables	Index 1616	Subindex 0	RecordT (200 Bit)	ReadOnly
Level		bitOffset 168	Float32T	
The Level Value (The Reference Distance - Measured Distance)				
Value range [m]	(0.0 To 15.0) * 1.0			
Level Status		bitOffset 160	UIntegerT (8 Bit)	
Measurement Status, Good, Bad, Degraded or Simulated				
Value range	0	(Good)		
	1	(Simulated)		
	2	(Degraded)		
	3	(Bad)		
Distance		bitOffset 128	Float32T	
The Distance from the device reference point to the surface				
Value range [m]	(0.0 To 15.0) * 1.0			
Distance Status		bitOffset 120	UIntegerT (8 Bit)	
Measurement Status, Good, Bad, Degraded or Simulated				
Value range	0	(Good)		
	1	(Simulated)		
	2	(Degraded)		
	3	(Bad)		
Signal Strength		bitOffset 88	Float32T	
The reflected Signal Strength from the surface				
Value range [mV]	(0.0 To 100000.0) * 1.0			
Signal Strength Status		bitOffset 80	UIntegerT (8 Bit)	
Measurement Status, Good, Bad, Degraded or Simulated				
Value range	0	(Good)		
	1	(Simulated)		
	2	(Degraded)		
	3	(Bad)		
Electronics Temperature		bitOffset 48	Float32T	
The internal electronics temperature				
Value range	(-60.0 To 100.0) [°C]			
Volume Flow		bitOffset 8	Float32T	
The calculated Volume Flow Value				
Volume Flow Status		bitOffset 0	UIntegerT (8 Bit)	
Measurement Status, Good, Bad, Degraded or Simulated				
Value range	0	(Good)		
	1	(Simulated)		
	2	(Degraded)		
	3	(Bad)		

8.2 Bluetooth Information

Bluetooth Radio	Index 11600	Subindex 0	UIntegerT (32 Bit)	ReadWrite
Indicates whether Bluetooth functionality is enabled or not by the user. When disabled, the Bluetooth interface is incapable of transmitting or receiving any wireless signals and may only be enabled via wired communication to the device.				
Factory setting	**1**	**(Enabled)**		
Value range	0	(Disabled)		
	1	(Enabled)		

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Bluetooth Connection Status	Index 5300	Subindex 0	UIntegerT (32 Bit)	ReadOnly
Indicates whether or not this device has an active Bluetooth connection.				
Value range	0 1	(Disconnected) (Connected)		

Bluetooth Radio UID	Index 304	Subindex 0	StringT (20 Byte)	ReadOnly
The unique identifier for this device's Bluetooth radio.UID				

Bluetooth Diagnosis	Index 1574	Subindex 0	RecordT (32 Bit)	ReadOnly
Bluetooth Diagnosis Details.				
Function Limited		bitOffset 0	BooleanT	
Limited internal Bluetooth communication				
Value range	0 1	(-) (Function Limited)		
Electronics Error		bitOffset 1	BooleanT	
Bluetooth HW Error				
Value range	0 1	(-) (Electronics Error)		
Firmware Warning		bitOffset 2	BooleanT	
Update the Bluetooth firmware				
Value range	0 1	(-) (Firmware Out of Date)		

8.3 Electronics Temperature

Min Electronic Temp	Index 6073	Subindex 0	Float32T	ReadOnly
The measured minimum electronics temperature				
Factory setting Value range	**20.0** (-60.0 To 30.0) [°C]			

Max Electronic Temp	Index 6074	Subindex 0	Float32T	ReadOnly
The measured maximum electronics temperature				
Factory setting Value range	**20.0** (10.0 To 100.0) [°C]			

8.4 Digital Output

DO1 Details	Index 2276	Subindex 0	RecordT (32 Bit)	ReadOnly
Digital Output Detailed Information.				
Function		bitOffset 12	BooleanT	
Informs if the Digital Output function is Disabled or Enabled by the software configuration				
Value range	0 1	(Enabled/On) (Disabled/Off)		
State		bitOffset 9	BooleanT	
Informs if the Digital Output is Inactive (open) or Active (closed)				
Value range	0 1	(Active/On) (Inactive/Off)		

8 Diagnosis

DO1 Details	Index 2276	Subindex 0	RecordT (32 Bit)	ReadOnly
Set Point Alarm		bitOffset 4	BooleanT	
Informs if the Digital Output is in Alarm State due to the measured value is above the High Alarm Set Point or below the Low Alarm Set Point				
Value range	0 1	(-) (Alarm On)		
Invalid Level Alarm		bitOffset 5	BooleanT	
If true, the Digital Output is in Alarm State due to invalid measurement value				
Value range	0 1	(-) (Alarm On)		
Switch Delay		bitOffset 10	BooleanT	
If true, the Digital Output is waiting for the expired delay time to change state				
Value range	0 1	(-) (Active/On)		
Set Points configuration		bitOffset 13	BooleanT	
Informs if the Digital Output Set Points are correct configured. SP1-High Alarm must be > SP2-Low Alarm, including hysteresis				
Value range	0 1	(-) (Incorrect)		
Output Overload		bitOffset 14	BooleanT	
Informs if the Digital Output is overloaded. Check for short circuit				
Value range	0 1	(-) (Overload detected)		

DO2 Details	Index 2278	Subindex 0	RecordT (32 Bit)	ReadOnly
Digital Output Detailed Information.				
Function		bitOffset 12	BooleanT	
Informs if the Digital Output function is Disabled or Enabled by the software configuration				
Value range	0 1	(Enabled/On) (Disabled/Off)		
State		bitOffset 9	BooleanT	
Informs if the Digital Output is Inactive (open) or Active (closed)				
Value range	0 1	(Active/On) (Inactive/Off)		
Set Point Alarm		bitOffset 4	BooleanT	
Informs if the Digital Output is in Alarm State due to the measured value is above the High Alarm Set Point or below the Low Alarm Set Point				
Value range	0 1	(-) (Alarm On)		
Invalid Level Alarm		bitOffset 5	BooleanT	
If true, the Digital Output is in Alarm State due to invalid measurement value				
Value range	0 1	(-) (Alarm On)		
Switch Delay		bitOffset 10	BooleanT	
If true, the Digital Output is waiting for the expired delay time to change state				
Value range	0 1	(-) (Active/On)		
Set Points configuration		bitOffset 13	BooleanT	
Informs if the Digital Output Set Points are correct configured. SP1-High Alarm must be > SP2-Low Alarm, including hysteresis				
Value range	0 1	(-) (Incorrect)		

8 Diagnosis

DO2 Details	Index 2278	Subindex 0	RecordT (32 Bit)	ReadOnly
Output Overload		bitOffset 14	BooleanT	
Informs if the Digital Output is overloaded. Check for short circuit				
Value range	0 1	(-) (Overload detected)		

8.5 Analog Output

Analog Output Details	Index 2250	Subindex 0	RecordT (32 Bit)	ReadOnly
Analog Output Details (status).				
Function		bitOffset 7	BooleanT	
Informs if the current loop is disabled or enabled by the software configuration off OUT2				
Value range	0 1	(Analog Output Enabled) (Analog Output Disabled)		
Alarm		bitOffset 0	BooleanT	
Informs if the Analog Output Current is the Alarm Current				
Value range	0 1	(-) (Active/On)		
Saturated		bitOffset 1	BooleanT	
Informs if the Analog Output is saturated				
Value range	0 1	(-) (Active/On)		
Fixed Current Mode		bitOffset 3	BooleanT	
Informs if the Analog Output is in fixed current mode				
Value range	0 1	(-) (Active/On)		
Configured Span		bitOffset 4	BooleanT	
Informs if the configured Analog Output span less than 10 mm				
Value range	0 1	(-) (Too small)		
Current Loop Open		bitOffset 5	BooleanT	
Informs if the current loop is open or closed				
Value range	0 1	(-) (Current Loop Open)		

Current	Index 2251	Subindex 0	Float32T	ReadOnly
The Analog Output Loop Current.				
Value range [mA]	(0.0 To 22.5) * 1.0			

Percent of Range	Index 2252	Subindex 0	Float32T	ReadOnly
Percent of Range always follows the Loop Current. The Upper and Lower Range Values map the Loop Current Value to the Percent of Range.				
Value range [%]	(-3.125 To 115.63) * 1.0			

8.6 Echo Peaks

Echo Peaks	Index 1615	Subindex 0	RecordT (400 Bit)	ReadOnly
Found Echo Peaks				

8 Diagnosis

Echo Peaks	Index 1615	Subindex 0	RecordT (400 Bit)	ReadOnly
Echo 1 Type		bitOffset 392	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 1 Distance		bitOffset 376	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 1 Signal Strength		bitOffset 360	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 2 Type		bitOffset 352	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 2 Distance		bitOffset 336	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 2 Signal Strength		bitOffset 320	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 3 Type		bitOffset 312	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 3 Distance		bitOffset 296	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 3 Signal Strength		bitOffset 280	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 4 Type		bitOffset 272	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 4 Distance		bitOffset 256	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 4 Signal Strength		bitOffset 240	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			

8 Diagnosis

Echo Peaks	Index 1615	Subindex 0	RecordT (400 Bit)	ReadOnly
Echo 5 Type		bitOffset 232	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 5 Distance		bitOffset 216	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 5 Signal Strength		bitOffset 200	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 6 Type		bitOffset 192	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 6 Distance		bitOffset 176	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 6 Signal Strength		bitOffset 160	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 7 Type		bitOffset 152	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 7 Distance		bitOffset 136	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 7 Signal Strength		bitOffset 120	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 8 Type		bitOffset 112	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 8 Distance		bitOffset 96	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 8 Signal Strength		bitOffset 80	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			

8 Diagnosis

Echo Peaks	Index 1615	Subindex 0	RecordT (400 Bit)	ReadOnly
Echo 9 Type		bitOffset 72	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 9 Distance		bitOffset 56	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 9 Signal Strength		bitOffset 40	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			
Echo 10 Type		bitOffset 32	UIntegerT (8 Bit)	
The Classified Echo Type				
Value range	0 1 2 6	(Unknown) (Suppressed) (Surface) (Tank Bottom Echo)		
Echo 10 Distance		bitOffset 16	UIntegerT (16 Bit)	
The measured distance from the device reference point to the reflection				
Value range [m]	(0 To 15000) * 0.001			
Echo 10 Signal Strength		bitOffset 0	UIntegerT (16 Bit)	
The measured Signal Strength of the reflection				
Value range [mV]	(0 To 65535) * 1.0			

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
0x5100 20736d	4 (Failure)	valid	Error	General power supply fault	Check availability
0x5110 20752d	2 (Out of specification)	valid	Warning	Primary supply voltage over-run	Check tolerance
0x5111 20753d	2 (Out of specification)	valid	Warning	Primary supply voltage under-run	Check tolerance
0x6000 24576d	4 (Failure)	valid	Error	Device software fault	Check firmware revision
0x6320 25376d	4 (Failure)	invalid	Error	Parameter error	Check data sheet and values
0x7710 30480d	2 (Out of specification)	valid	Error	Short circuit	Check installation
0x8C01 35841d	3 (Functional check)	valid	Warning	Simulation active	Check operational mode
0x8C20 35872d	2 (Out of specification)	valid	Error	Measurement range over-run	Check application
0x8C40 35904d	unchanged	valid	Notification	Maintenance required - Cleaning	Clean device
0x8CBC 36028d	4 (Failure)	valid	Error	Level Measurement Lost	Check Application
0x8CE8 36072d	1 (Maintenance required)	valid	Warning	Max EEPROM write cycles expired	Check Master and Restart the Device
0x8CE9 36073d	4 (Failure)	valid	Error	Device Memory Failure	Restore factory settings
0x8CEA 36074d	3 (Functional check)	valid	Warning	Bluetooth Warning	Restart the Device. If the condition persist, disable Bluetooth or replace the device. See Bluetooth Diagnosis

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
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
0x8031 32817d	Parameter value above limit	Written parameter value is above its specified value range
0x8032 32818d	Parameter value below limit	Written parameter value is below its specified 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.

Process Data Input

Value in [m³/h]	= Transmitted value	* 1
Value in [gal/h]	= Transmitted value	* 264.172052
Value in [in]	= Transmitted value	* 39.3700787

Process Data Input

Value in [m]	= Transmitted value	* 0.001
Value in [gal/h]	= Transmitted value	* 0.26417205
Value in [in]	= Transmitted value	* 0.03937007