

SITRANS F

Ultrasonic flowmeters SITRANS FST030

Function Manual

Introduction

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Setup

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Maintenance and diagnostics

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Communication

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Security

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Product documentation and
support

A

Unit abbreviations and
custom units

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7ME372 (HART/Modbus)

Legal information

Warning notice system

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 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
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indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.

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Introduction

1.1 Function Manual scope

Note

This Function Manual applies to the SITRANS FST030 only.

The FST030 transmitter can be connected to sensor types FSS200 and FSS100 - SONOKIT.

1.2 Purpose of this documentation

This manual contains a description of all device menus and is aimed at persons configuring the device. Some menus are only available for devices using specific communications systems (for example HART or Modbus), and some menus are not available in the current version. This is mentioned in the relevant chapter/subchapter titles.

The default settings and the setting ranges are listed in tables for each menu. Furthermore, the relation, if any, between menus is described.

Starting with chapter Setup (Page 23), the chapter and subchapter numbers equal the menu numbers in the HMI structure.

For menus with access level other than User (for example Read only or Expert), the access level is stated in parenthesis after the menu name.

1.3 Quick start wizards

The device offers a set of wizards which will guide you through configuration of parameters essential for your application. The quick commissioning wizards are described in the Commissioning chapter of the device Operating Instructions.

1.4 Document history

The following table shows major changes in the documentation compared to the previous edition.

The most important changes in the documentation when compared with the respective previous edition are given in the following table.

Edition	Note
12/2019	Support for external DSL functionality: path 3 and path 4, CH5 analog input. Support for gas installations.
03/2019	New functionalities: Scraper Pig detection, Rate of Change and Multipoint calibration
04/2017	First edition

1.5 Product compatibility

The following table shows major changes in the documentation compared to the previous edition.

Edition	Remarks	Product compatibility	Compatibility of device integration package	
12/2019	Gas installations support	HART/Modbus FW: 1.04.00 for gas FW: 1.03.00 for liquid HW: 002 and 003 Device revision 5 or later	SIMATIC PDM V8.2 or later	EDD: 1.04.00
			AMS Device Manager 12.0 or later	EDD: 1.04.00
			SITRANS DTM V4.1	EDD: 1.04.00
			Field communicator V3.8	EDD: 1.04.00
03/2019	Defect solved	HART/Modbus FW: 1.00.01 HW: 002 Device revision 4 or later	SIMATIC PDM V8.2 or later	EDD: 1.02.00
			AMS Device Manager 12.0 or later	EDD: 1.02.00
			SITRANS DTM V4.1	EDD: 1.02.00
			Field communicator V3.8	EDD: 1.02.00
04/2017	First edition Liquid installations support	HART/Modbus FW: 1.00.00 HW: 002 Device revision 3 or later	SIMATIC PDM V8.2 or later	EDD: 1.00.00 or 1.01.00
			AMS Device Manager 12.0 or later	EDD: 1.00.00 or 1.01.00
			SITRANS DTM V4.1	EDD: 1.00.00 or 1.01.00
			Field communicator V3.8	EDD: 1.00.00 or 1.01.00

1.6 Device documentation package

The user documentation package for this product includes the following documents

Document	Purpose	Intended users	Availability
Operating Instructions	Contains all information needed to • check and identify the delivered package • install and electrically connect the product • commission the product, (setting parameters via HMI menu) • operate and maintain the device on a daily basis • troubleshoot and remedy minor operation interruptions	Instrument technicians, plant operators	• On documentation disk • Available for download from homepage • Hardcopy can be purchased via PIA Life Cycle Portal
Sensor Installation Manual	Contains all information needed to install Clamp-on sensors.	Mechanical and electrical installers; instrument technicians	• Included in the delivery • On documentation disk • Available for download from homepage
Compact Operating Instructions - Ex	Contains all information needed to • satisfy the Special conditions for installation of Ex-certified products	Instrument technicians, plant operators with special training in systems for hazardous locations.	• On documentation disk • Available for download from homepage • Hardcopy can be ordered via PIA Life Cycle Portal
Function Manual	Contains • descriptions of all functions that can be accessed via the local display (HMI) • guide to setting parameters to obtain optimum operation of the device	Instrument technicians, plant operators	• Available for download from homepage • Hardcopy can be purchased via PIA Life Cycle Portal

1.7 Quick Start

The quick start wizard topics and introductory explanations are listed below. For detailed quick start wizard procedures refer to the FST030 Operating Instructions manual.

1.7.1 Quick commissioning

Description

Quick commissioning - The Quick commissioning wizard will guide you through configuration of parameters essential for your application. You configure parameters essential for your application by selecting the configuration path and sub-wizards appropriate for your application.

1.7.2 Sensor settings

Description

The sensor settings wizard will guide you through configuration of essential parameters.

1.7.3 Process values

The Process values wizard will guide you through setup of process values for your application. The prioritizing of the process values automatically configures the measurement views on the display. The process value configured as 1st process value appears as first value in the views.

1.7.4 Inputs and outputs

The Inputs and outputs wizard will guide you through setup of inputs and outputs on the available channels. The availability of channels 3 and 4 depends on the product configuration.

1.7.5 Copy configuration

This wizard allows you to copy the configuration from the SensorFlash to the device.

Setup

2.1 Sensor

2.1.1 Length unit

Description

Unit for length values.

Setting	ft; m; in; cm; mm
Default	m

Related

Path	Setup → Sensor → Length units
------	-------------------------------

2.1.2 Pipe

2.1.2.1 Pipe class

Description

Pipe class - Read only. Can only be changed via the Sensor Wizard. Indicates the pipe class chosen from the pipe data library included in the sensor setup wizard.

2.1.2.2 Pipe size

Description

Pipe size - Read only. Can only be changed via the Sensor Wizard. Indicates the pipe class chosen from the pipe data library included in the sensor setup wizard.

2.1.2.3 Outer pipe diameter

Description

External pipe diameter.

Setting	0.006 m to 10.0 m
Default	0.1 m

Related

Path	Setup → Sensor → Pipe → Outer pipe diameter
------	---

2.1.2.4 Wall thickness**Description**

Pipe wall thickness.

Setting	1.0 ⁻⁶ m to 0.5 m
Default	0.001 m

Related

Path	Setup → Sensor → Pipe → Wall thickness
------	--

2.1.2.5 Pipe material**Description**

Pipe material - Read only. Can only be changed via the Sensor Wizard.

Setting	Read only: Carbon steel; Stainless steel; ABS plastic; Aluminum; Black iron; Brass; Cast iron; Copper nickel 70/30; Copper nickel 90/10; Copper; Ductile iron; FRP plastic; Glass; Hastelloy; Inconel; Kynar plastic; Monel; Nickel; Polyethylene; PVC plastic; Teflon; Titanium
Default	Can only be changed via the Sensor wizard

Related

Path	Setup → Sensor → Pipe → Pipe material
------	---------------------------------------

2.1.2.6 Wall sound velocity**Description**

Pipe wall material sound velocity (clamp-on).

Use the shear velocity for metallic pipes. Use the longitudinal velocity for plastic pipes.

Setting	200.0 m/s to 4000.0 m/s
Default	3000.0 m/s

Related

Path	Setup → Sensor → Pipe → Wall sound velocity
------	---

2.1.2.7 Liner settings

Liner thickness

Description

Pipe liner thickness

Setting	0.0 m to 0.5 m
Default	0.0 m

Related

Path	Setup → Sensor → Pipe → Liner settings → Liner thickness
------	--

Liner material

Description

Liner material - Read only. Can only be changed via the Sensor Wizard.

Setting	Read only: Custom; Cement; Coal tar; Enamel; Glass; Plastic; Hi_dens_Poly; PTFE; Rubber
Default	Custom

Related

Path	Setup → Sensor → Pipe → Liner settings → Liner material
------	---

Liner sound velocity

Description

Liner material sound velocity (clamp-on).

Setting	200.0 m/s to 4000.0 m/s
Default	2000.0 m/s

Related

Path	Setup → Sensor → Pipe → Liner settings → Liner sound velocity
------	---

2.1.2.8 Inner pipe roughness

Description

Roughness of inner pipe/liner material.

Setting	0.0 m to 0.01 m
Default	0.0001 m

Related

Path	Setup → Sensor → Pipe → Inner pipe roughness
------	--

2.1.2.9 Inner pipe diameter**Description**

Read only. Calculated inner diameter of pipe (clamp-on).

Setting	
Default	0.0 m

Related

Path	Setup → Sensor → Pipe → Inner pipe diameter
------	---

2.1.2.10 Active compensations**Description**

Changes in pressure and/or temperature can result in changes to the pipe dimensions. Active compensations for pipe expansion due to temperature and for pipe expansion due to pressure can be enabled or disabled independently. The compensation is based on the pipe thermal expansion coefficient and modulus of elasticity.

Setting	Pipe expansion due to temperature, Pipe expansion due to pressure
Default	Multiselection

Related

Path	Setup → Sensor → Pipe → Active compensations
------	--

2.1.2.11 Pipe material thermal expansion coefficient**Description**

This value is used for compensation of pipe expansion due to temperature.

Setting	
Default	

Related

Path	Setup → Sensor → Pipe → Thermal expansion coefficient of the pipe material
------	--

2.1.2.12 Process temperature for calibration

Description

This value is used for compensation of pipe expansion due to temperature.

Setting	
Default	

Related

Path	Setup → Sensor → Pipe → Process temperature for calibration
------	---

2.1.2.13 Pipe material modulus of elasticity

Description

This value is used for compensation of pipe expansion due to pressure.

Setting	
Default	

Related

Path	Setup → Sensor → Pipe → Pipe material modulus of elasticity
------	---

2.1.2.14 Process pressure for calibration

Description

This value is used for compensation of pipe expansion due to pressure.

Setting	
Default	

Related

Path	Setup → Sensor → Pipe → Process pressure for calibration
------	--

2.1.3 Upstream and downstream conditions

2.1.3.1 Disturbed flow profile compensation

Description

Disturbed flow profile compensation enable/disable

Setting	Disabled; Enabled
Default	Disabled

Related

Path	Setup → Sensor → Upstream and downstream conditions → Disturbed flow profile compensation
------	---

2.1.3.2 Type of upstream condition**Description**

Compensation for upstream pipe geometry.

Setting	Straight run; Single elbow; Double elbow (in-plane); Double elbow (out-of-plane); Reducer; Expansion
Default	Straight run

Related

Path	Setup → Sensor → Upstream and downstream conditions → Type of upstream condition
------	--

2.1.3.3 Upstream distance**Description**

The distance to the upstream flow disturbance. The distance is given in pipe diameters.

Used for clamp-on flow profile compensation.

Setting	0 to 40
Default	0

Related

Path	Setup → Sensor → Upstream and downstream conditions → Upstream distance
------	---

2.1.3.4 Type of downstream condition**Description**

Compensation for downstream pipe geometry.

Setting	Straight run; Single elbow; Double elbow (in-plane); Double elbow (out-of-plane); Reducer; Expansion
Default	Straight run

Related

Path	Setup → Sensor → Upstream and downstream conditions → Type of downstream condition
------	--

2.1.3.5 Downstream distance

Description

The distance to the downstream flow disturbance. The distance is given in pipe diameters.
Used for clamp-on flow profile compensation.

Setting	0 to 40
Default	0

Related

Path	Setup → Sensor → Upstream and downstream conditions → Downstream distance
------	---

2.1.4 Medium characteristics

2.1.4.1 Process medium type

Description

Process medium types - Read only. Can only be changed via the Sensor Wizard. Indicates the fluid medium type chosen from the fluid data library included in the sensor setup wizard.

2.1.4.2 Expected sound velocity

Description

Expected sound velocity in the medium at process temperature.

Setting	100.0 m/s to 2500.0 m/s
Default	1500.0 m/s

Related

Path	Setup → Sensor → Medium characteristics → Expected sound velocity
------	---

2.1.4.3 Process temperature

Description

Temperature of media used for compensation.
Input during setup.

Setting	-273.0 °C to 400.0 °C
Default	20.0 °C

Related

Path	Setup → Sensor → Medium characteristics → Process temperature
------	---

2.1.4.4 Process pressure**Description**

Pressure value used for compensation.

Input during setup.

Setting	0.0 Pa to 100000000.0 Pa
Default	700000.0 Pa

Related

Path	Setup → Sensor → Medium characteristics → Process pressure
------	--

2.1.4.5 Kinematic viscosity / Dynamic viscosity (Gas variant)**Description**

Viscosity of media used for compensation.

Input during setup.

Setting	0.00 m ² /s (Pa*s) to 5000.0 m ² /s (Pa*s)
Default	0.000001 m ² /s (Pa*s)

(gas variant)

Related

Path	Setup → Sensor → Medium characteristics → Kinematic viscosity / Dynamic viscosity
------	---

2.1.4.6 Process density / Standard conditions gas density (Gas variant)**Description**

Density of media used for compensation.

Input during setup.

Setting	0.0 kg/m ³ to 2000.0 kg/m ³
Default	1000.0 kg/m ³

Related

Path	Setup → Sensor → Medium characteristics → Process density / Standard conditions gas density
------	---

2.1.4.7 Standard conditions Z factor

Description

Specifies the compressibility factor of the gas composition at standard conditions of temperature and pressure.

Input during setup.

Setting	0.1 to 5.0
Default	1.0

Related

Path	Setup → Sensor → Medium characteristics → Standard conditions Z factor
------	--

2.1.5 Sensor selection

2.1.5.1 Sensor model

Description

Installed sensor model (for multi-path all must be the same). Read only. Can only be changed via the Sensor Wizard. Indicates the Sensor model chosen from the sensor setup wizard.

Setting	Read only: FSS200 high precision; FSS200 / 1011 Universal; FSS200 / 991 high temperature; 1011 high precision liquid
Default	FSS200 / 1011 Universal

Related

Path	Setup → Sensor → Sensor selection → Sensor model
------	--

2.1.5.2 Clamp-on sensor size

Description

Installed sensor size. Read only. Can only be changed via the Sensor Wizard. Indicates the Sensor model chosen from the sensor setup wizard.

2.1.5.3 Nominal sensor frequency**Description**

Nominal frequencies for the sensors. Access level: Expert user only.

Setting	80000.0 Hz to 4000000.0 Hz
Default	1100000.0 Hz

Related

Path	Setup → Sensor → Sensor selection → Nominal sensor frequency
------	--

2.1.5.4 Sensor crystal projection**Description**

Length of the crystal projection onto the emitting surface of the sensor (clamp-on). Access level: Expert user only.

Setting	0.0 m to 0.3 m
Default	0.03409 m

Related

Path	Setup → Sensor → Sensor settings → Sensor crystal projection
------	--

2.1.5.5 Sensor phase velocity**Description**

The velocity at which the wave fronts traverse the interface between the wedge and pipe. Access level: Expert user only.

Setting	1000.0 m/s to 20000.0 m/s
Default	3695.5 m/s

Related

Path	Setup → Sensor → Sensor settings → Sensor phase velocity
------	--

2.1.5.6 Sensor inactive wedge**Description**

The part of the wedge that is not part of the sound path. Access level: Expert user only.

Setting	0.0 m to 0.05 m
Default	0.00076 m

Related

Path	Setup → Sensor → Sensor settings → Sensor inactive wedge
------	--

2.1.5.7 Sensor fixed time

Description

Fixed time in sensor wedge. Access level: Expert user only.

Setting	2.0×10^{-6} s to 200.0×10^{-6} s
Default	10.61×10^{-6} s

Related

Path	Setup → Sensor → Sensor settings → Sensor fixed time
------	--

2.1.5.8 Mounting hole offset

Description

Distance between spacer hole and sensor front face. Access level: Expert user only.

Setting	0.0 m to 0.05 m
Default	0.00953 m

Related

Path	Setup → Sensor → Sensor settings → Mounting hole offset
------	---

2.1.5.9 Spacing offset

Description

Sensor spacing offset

Setting	MIN; NOM; MAX and A,B, C, D for High Temperature sensors
Default	MIN

Related

Path	Setup → Sensor → Sensor selection → Spacing offset
------	--

2.1.5.10 Sensor temperature compensation

Description

Sensor temperature compensation

Setting	Disabled; Enabled
Default	Disabled

Related

Path	Setup → Sensor → Sensor selection → Sensor temperature compensation
------	---

2.1.5.11 Temperature code of the sensor**Description**

Temperature code selections for sensors.

Setting	T1 (21°C), T2
Default	T1 (21°C)

Related

Path	Setup → Sensor → Sensor selection → Temperature code of the sensor
------	--

2.1.5.12 Temperature compensation factor**Description**

Temperature compensation factors for the sensors. Access level: Expert user only.

Setting	0.0001 to 0.0009
Default	0.000638

Related

Path	Setup → Sensor → Sensor selection → Temperature compensation factor
------	---

2.1.5.13 Length of sensor cables**Description**

Length of sensor cable between transmitter/DSL and any sensors. All cables must have the same length.

Setting	0.0 m to 20.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Sensor selection → Length of sensor cables
------	---

2.1.6 Path settings

2.1.6.1 Installed paths

Description

Select the path(s) to enable or disable. Disabling a path does not change the settings for that path, but the path will no longer be used in the flow calculation. Path 3 and 4 are only available with external DSL variant.

Setting	Path 1; Path 2; Path 3; Path 4
Default	Disabled

Related

Path	Setup → Sensor → Path settings → Installed paths
------	--

2.1.6.2 Not available

menu is hidden

2.1.6.3 Path 1

2.1.6.3.1 Sensor frequency

Description

Desired sensor frequency for path 1. Default value is selected when performing frequency sweep.

Setting	80000.0 Hz to 4000000.0 Hz
Default	

Related

Path	Setup → Sensor → Path settings → Path 1 → Sensor frequency
------	--

2.1.6.3.2 Perform frequency sweep

Description

This function finds the optimum operation frequency of the sensors for the given measurement.

Setting	Execute
Default	Frequency sweep done / not running

Related

Path	Setup → Sensor → Path settings → Path 1 → Perform frequency sweep
------	---

2.1.6.3.3 Not available

menu is hidden

2.1.6.3.4 Not available

menu is hidden

2.1.6.3.5 Not available

menu is hidden

2.1.6.3.6 Path geometry**Description**

The number of crossings the signal makes through the pipe (Reflect or direct geometry for path 1).

Setting	Direct (1 traverse); Reflect (2 traverse); Direct (3 traverse); Reflect (4 traverse)
Default	Direct (1 traverse)

Related

Path	Setup → Sensor → Path settings → Path 1 → Path geometry
------	---

2.1.6.3.7 Sensor spacing**Description**

Sensor spacing - Distance between the front faces of the sensors for path 1.

Setting	-100.0 m to 100.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Path settings → Path 1 → Sensor spacing
------	--

2.1.6.3.8 Zero point adjustment

Description

Zero point adjustment. Can only be changed via the Sensor Wizard.

Note

Important

Please stop all flow in the pipe and perform this function. The flow velocity is measured prior and after the function has been applied.

Setting	5 to 300
Default	10

Related

Path	Setup → Sensor → Path settings → Path 1 → Zero point adjustment → Time duration
------	---

2.1.6.3.9 Serial number

Description

Serial number of sensor (clamp-on). You can enter the serial number for the sensors installed on each specific path.

Setting	
Default	

Related

Path	Setup → Sensor → Path settings → Path 1 → Serial number
------	---

2.1.6.4 Path 2

2.1.6.4.1 Sensor frequency

Description

Desired sensor frequency for path 2. Default value is selected when performing frequency sweep.

Setting	80000.0 Hz to 4000000.0 Hz
Default	

Related

Path	Setup → Sensor → Path settings → Path 2 → Sensor frequency
------	--

2.1.6.4.2 Perform frequency sweep**Description**

This function finds the optimum operation frequency of the sensors for the given measurement.

Setting	Execute
Default	Frequency sweep done / not running

Related

Path	Setup → Sensor → Path settings → Path 2 → Perform frequency sweep
------	---

2.1.6.4.3 Not available

menu is hidden

2.1.6.4.4 Not available

menu is hidden

2.1.6.4.5 Not available

menu is hidden

2.1.6.4.6 Path geometry**Description**

The number of crossings the signal makes through the pipe (Reflect or direct geometry for path 2).

Setting	Direct (1 traverse); Reflect (2 traverse); Direct (3 traverse); Reflect (4 traverse)
Default	Direct (1 traverse)

Related

Path	Setup → Sensor → Path settings → Path 2 → Path geometry
------	---

2.1.6.4.7 Sensor spacing**Description**

Sensor spacing - Distance between the front faces of the sensors for path 2.

Setting	-100.0 m to 100.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Path settings → Path 2 → Sensor spacing
------	--

2.1.6.4.8 Zero point adjustment

Description

Zero point adjustment. Can only be changed via the Sensor Wizard.

Note

Important

Please stop all flow in the pipe and perform this function. The flow velocity is measured prior and after the function has been applied.

Setting	5 to 300
Default	10

Related

Path	Setup → Sensor → Path settings → Path 2 → Zero point adjustment → Time duration
------	---

2.1.6.4.9 Serial number

Description

Serial number of sensor (clamp-on). You can enter the serial number for the sensors installed on each specific path.

Setting	
Default	

Related

Path	Setup → Sensor → Path settings → Path 2 → Serial number
------	---

2.1.6.5 Path 3

2.1.6.5.1 Sensor frequency

Description

Desired sensor frequency for path 3. Default value is selected when performing frequency sweep.

Setting	80000.0 Hz to 4000000.0 Hz
Default	

Related

Path	Setup → Sensor → Path settings → Path 3 → Sensor frequency
------	--

2.1.6.5.2 Perform frequency sweep**Description**

This function finds the optimum operation frequency of the sensors for the given measurement.

Setting	Execute
Default	Frequency sweep done / not running

Related

Path	Setup → Sensor → Path settings → Path 3 → Perform frequency sweep
------	---

2.1.6.5.3 Not available

menu is hidden

2.1.6.5.4 Not available

menu is hidden

2.1.6.5.5 Not available

menu is hidden

2.1.6.5.6 Path geometry**Description**

The number of crossings the signal makes through the pipe (Reflect or direct geometry for path 3).

Setting	Direct (1 traverse); Reflect (2 traverse); Direct (3 traverse); Reflect (4 traverse)
Default	Direct (1 traverse)

Related

Path	Setup → Sensor → Path settings → Path 3 → Path geometry
------	---

2.1.6.5.7 Sensor spacing**Description**

Sensor spacing - Distance between the front faces of the sensors for path 3.

Setting	-100.0 m to 100.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Path settings → Path 3 → Sensor spacing
------	--

2.1.6.5.8 Zero point adjustment

Description

Zero point adjustment. Can only be changed via the Sensor Wizard.

Note

Important

Please stop all flow in the pipe and perform this function. The flow velocity is measured prior and after the function has been applied.

Zero point adjustment - settings

Setting	5 to 300
Default	10

Related

Path	Setup → Sensor → Path settings → Path 3 → Zero point adjustment → Time duration
------	---

2.1.6.5.9 Serial number

Description

Serial number of sensor (clamp-on). You can enter the serial number for the sensors installed on each specific path.

Setting	
Default	

Related

Path	Setup → Sensor → Path settings → Path 3 → Serial number
------	---

2.1.6.6 Path 4**2.1.6.6.1 Sensor frequency****Description**

Desired sensor frequency for path 4. Default value is selected when performing frequency sweep.

Setting	80000.0 Hz to 4000000.0 Hz
Default	

Related

Path	Setup → Sensor → Path settings → Path 4 → Sensor frequency
------	--

2.1.6.6.2 Perform frequency sweep**Description**

This function finds the optimum operation frequency of the sensors for the given measurement.

Setting	Execute
Default	Frequency sweep done / not running

Related

Path	Setup → Sensor → Path settings → Path 4 → Perform frequency sweep
------	---

2.1.6.6.3 Not available

menu is hidden

2.1.6.6.4 Not available

menu is hidden

2.1.6.6.5 Not available

menu is hidden

2.1.6.6.6 Path geometry**Description**

The number of crossings the signal makes through the pipe (Reflect or direct geometry for path 4).

Setting	Direct (1 traverse); Reflect (2 traverse); Direct (3 traverse); Reflect (4 traverse)
Default	Direct (1 traverse)

Related

Path	Setup → Sensor → Path settings → Path 4 → Path geometry
------	---

2.1.6.6.7 Sensor spacing

Description

Sensor spacing - Distance between the front faces of the sensors for path 4.

Setting	-100.0 m to 100.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Path settings → Path 4 → Sensor spacing
------	--

2.1.6.6.8 Zero point adjustment

Description

Zero point adjustment. Can only be changed via the Sensor Wizard.

Note

Important

Please stop all flow in the pipe and perform this function. The flow velocity is measured prior and after the function has been applied.

Setting	5 to 300
Default	10

Related

Path	Setup → Sensor → Path settings → Path 4 → Zero point adjustment → Time duration
------	---

2.1.6.6.9 Serial number

Description

Serial number of sensor (clamp-on). You can enter the serial number for the sensors installed on each specific path.

Setting	
Default	

Related

Path	Setup → Sensor → Path settings → Path 4 → Serial number
------	---

2.1.6.7 Necessary number of measuring paths**Description**

List of measuring paths. If less than the specified number of paths are in a measuring state, the meter will report an error.

Setting	1 to 5
Default	1

Related

Path	Setup → Sensor → Path settings → Necessary number of measuring paths
------	--

2.1.6.8 Limit monitoring**Description**

User settable alarm limits for path diagnostics. Individual alarm limits apply to all installed paths.

2.1.6.8.1 Percentage of accepted bursts alarm limit**Description**

Set the desired limit for the percentage of accepted bursts. If the measured percentage accepted burst drops below this limit for any installed path, an alarm will be issued.

Setting	0 to 100
Default	50

Related

Path	Setup → Sensor → Path settings → Path diagnostic alarm limits → Percent bursts accepted alarm limit
------	---

2.1.6.8.2 Correlation factor alarm limit**Description**

Set the desired limit for the correlation factor. If the measured correlation factor drops below this limit for any installed path, an alarm will be issued.

Setting	0 to 1
Default	0.95

Related

Path	Setup → Sensor → Path settings → Path diagnostic alarm limits → Correlation factor alarm limit
------	--

2.1.6.8.3 Receive signal gain alarm limit

Description

Set the desired limit for the RxGain value. If the RxGain goes above this limit for any installed path, an alarm will be issued.

Setting	0 to 100 dB
Default	50 dB

Related

Path	Setup → Sensor → Path settings → Path diagnostic alarm limits → RxGain alarm limit
------	--

2.1.6.8.4 SNR alarm limit

Description

Set the desired limit for the measured SNR. If the measured SNR drops below this limit for any installed path, an alarm will be issued.

Setting	0 to 100 dB
Default	20 dB

Related

Path	Setup → Sensor → Path settings → Path diagnostic alarm limits → SNR alarm limit
------	---

2.1.7 User calibration

2.1.7.1 Slope

Description

A single point flow correction applied to volume flow equally at any flow rate.

$Q = Q * \text{Slope}$ (e.g. Slope of 0.99 = -1% correction)

Setting	0.5 to 2.0
Default	1.0

Related

Path	Setup → Sensor → User calibration → Slope
------	---

2.1.7.2 Path 1 offset

Description

User calibrated zero offset for path 1.

Delta time offset correction value, which can be determined at zero flow.

Setting	-1250 ns to 1250 ns
Default	0.0

Related

Path	Setup → Sensor → User calibration → Path 1 offset
------	---

2.1.7.3 Path 2 offset

Description

User calibrated zero offset for path 2.

Delta time offset correction value, which can be determined at zero flow.

Setting	-1250 ns to 1250 ns
Default	0.0

Related

Path	Setup → Sensor → User calibration → Path 2 offset
------	---

2.1.7.4 Path 3 offset

Description

User calibrated zero offset for path 3.

Calibrated delta time = delta time + Path 3 factory offset + Path 3 offset.

Setting	-1250 ns to 1250 ns
Default	0.0

Related

Path	Setup → Sensor → User calibration → Path 3 offset
------	---

2.1.7.5 Path 4 offset

Description

User calibrated zero offset for path 4.

Calibrated delta time = delta time + Path 4 factory offset + Path 4 offset.

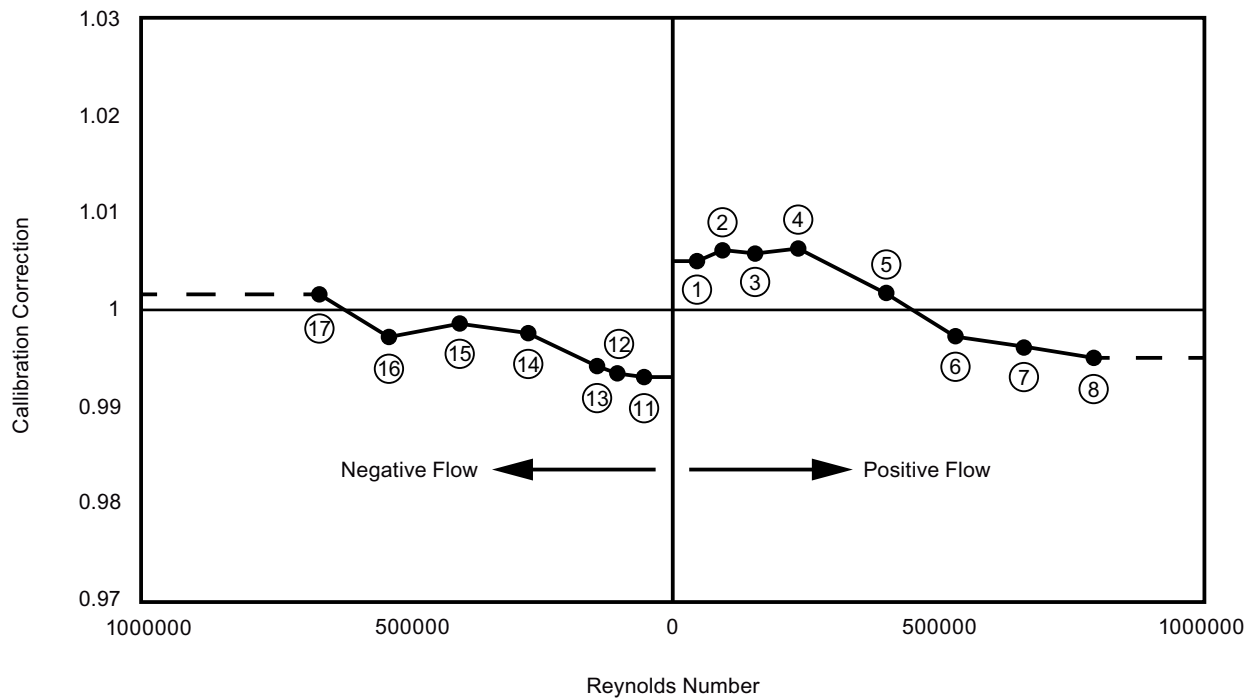
Setting	-1250 ns to 1250 ns
Default	0.0

Related

Path	Setup → Sensor → User calibration → Path 4 offset
------	---

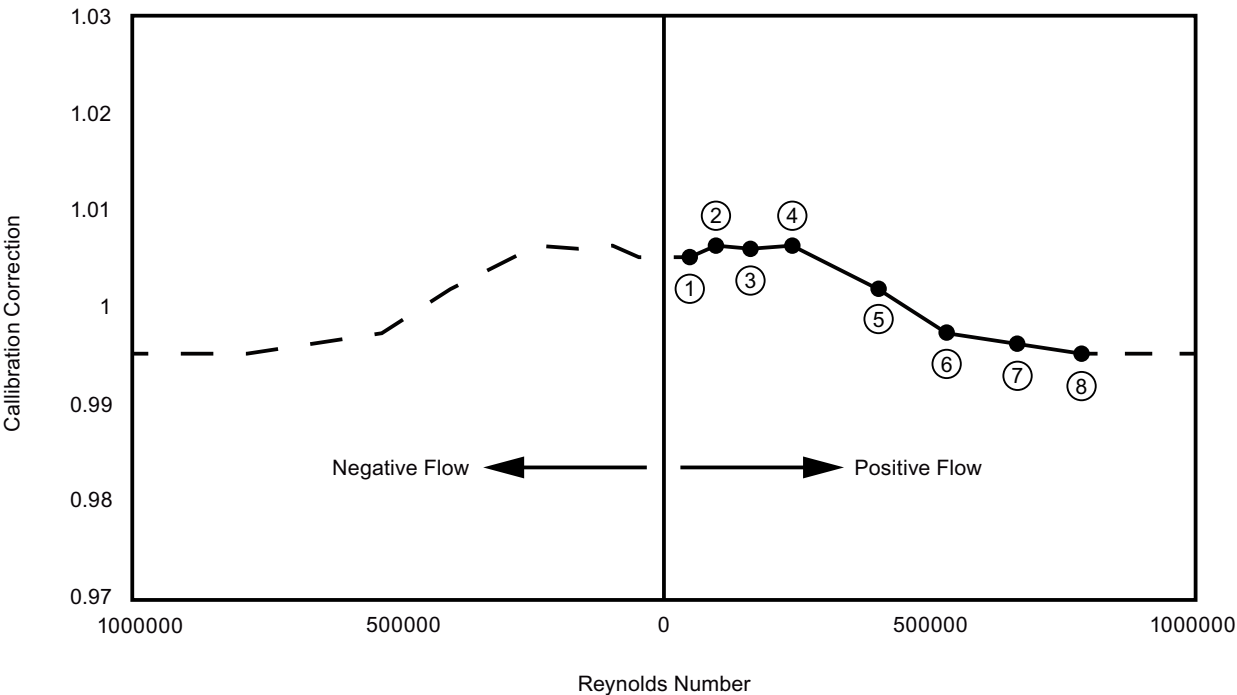
2.1.8 Multipoint calibration

FS230 provides an additional 20 point piecewise linear calibration table with user selectable input value: volume flow, Reynolds number or fluid sound velocity. The table can be configured for either a unidirectional or bidirectional calibration.



Point	Reynolds number	Calibration Correction	Point	Reynolds number	Calibration Correction
①	47339	1.0050	⑪	54231	0.9930
②	94701	1.0060	⑫	102932	0.9934
③	156034	1.0058	⑬	141382	0.9942
④	238385	1.0062	⑭	271843	0.9975
⑤	402304	1.0017	⑮	402304	0.9984
⑥	532765	0.9971	⑯	532765	0.9971
⑦	663226	0.9960	⑰	663226	1.0015
⑧	793687	0.9950	⑱	0	0
⑨	0	0	⑲	0	0
⑩	0	0	⑳	0	0

Figure 2-1 User Calibration Table Behavior (bidirectional calibration)



Point	Reynolds number	Calibration Correction
①	47339	1.0050
②	94701	1.0060
③	156034	1.0058
④	238385	1.0062
⑤	402304	1.0017
⑥	532765	0.9971
⑦	663226	0.9960
⑧	793687	0.9950
⑨	0	0
⑩	0	0

Figure 2-2 User Calibration Table Behavior (unidirectional calibration)

2.1.8.1 Enable multipoint calibration

Description

Enable or disable the multipoint calibration.

Setting	Disabled; Enabled
Default	Disabled

Related

Path	Setup → Sensor → Multipoint calibration → Enable multipoint calibration
------	---

2.1.8.2 Calibration function

Description

Select the desired input function for the multipoint calibration table. Access level: Expert user only

Setting	Volume flow, Reynolds number, Sound velocity
Default	Volume flow

Related

Path	Setup → Sensor → Multipoint calibration → Calibration function
------	--

2.1.8.3 Asymmetric calibration table

Description

Expert user only. Usage of the calibration table:

- Unidirectional: All 20 calibration points are used for positive flow calibration and are then mirrored for negative flow.
- Bidirectional: The calibration points 1-10 are used for positive flow calibration and the calibration points 11-20 are used for negative flow calibration.

Setting	Unidirectional; Bidirectional
Default	Unidirectional

Related

Path	Setup → Sensor → Multipoint calibration → Asymmetric calibration table
------	--

2.1.8.4 Save value to table

Description

Wizard for adding or editing individual calibration points in the Multipoint calibration table. The input units are dependent on the previously select calibration function.

Access level: Expert user only

Calibration point	Volume flow: 0.0 m ³ /s to 100000.0 m ³ /s Reynolds number: 0 to 1e9 Sound velocity: 0 to 100000.0 m/s
Default	0.0 m ³ /s

Related

Path	Setup → Sensor → Multipoint calibration → Save value to table
------	---

2.1.8.5 Reset calibration table

Description

Wizard for resetting the calibration table to default values, 0.0 input and 1.0 correction factor.
Access level: Expert user only

Related

Path	Setup → Sensor → Multipoint calibration → Reset calibration table
------	---

2.1.8.6 Multipoint calibration table

2.1.8.6.1 Calibration point 1 - 20

Description

Allows read-only access to the Multipoint calibration table values. Only visible when table is Enabled.

Note

Only available when Multipoint calibration is Enabled

Setting	0 to 1e9 (unit is dependent on Calibration function)
Default	0.0

Related

Path	Setup → Sensor → Multipoint calibration → Multipoint calibration table → Calibration points 1 - 20
------	--

2.1.8.6.2 Calibration value 1 - 20

Description

Calibration correction factor that is associated to Calibration points 1 through 20.

Access level: Expert user only.

Setting	0.5 to 2.0
Default	1.0

Related

Path	Setup → Sensor → Multipoint calibration → Multipoint calibration table → Calibration value 1 - 20
------	---

2.1.8.7 Protection calibration table

Description

Enable / Disable protection of the Multipoint calibration table. Access level: Expert user only

Setting	Disabled; Enabled
Default	Disabled

Related

Path	Setup → Sensor → Multipoint calibration → Protection calibration table
------	--

2.1.9 Oil table settings

The FS230 Hydrocarbon variant incorporates a Liquident® oil lookup table. The table is used to infer the density and viscosity of the oil product flowing through the metering section. Liquident represents the temperature and pressure compensated oil sound velocity. For liquid hydrocarbon Liquident strongly correlates to the MPMS reference density (density at 15.5°C), viscosity, and compressibility coefficients of the oil.

After the MPMS reference density and compressibility coefficients (K0, K1, K2) are determined for the flowing oil, the FS230 applies the API MPMS 11.1 algorithms. These algorithms calculate the density for the measured pressure and temperature, as well as the correction for standard volume flow rate.

Kinematic viscosity is derived in accordance with ASTM standard D341. This standard uses two known viscosity values for two different reference temperatures to derive the viscosity at any given temperature.

Table 2-1 Default oil table for FS230

Liquident [m/s]	Liquid identifier (0-255)	Standard Density [kg/m³]	Reference Viscosity 1 at 0 °C ¹⁾ [m²/s]	Reference Viscosity 2 at 40 °C ²⁾ [m²/s]	K0 [kg²/m⁶*K]	K1 [kg/m³*K]	K2 [1/K]
1100	1 - MTBE	647.0	0.0000010	0.0000006	346.4228	0.4388	0.0
1180	2 - LFP (distillate)	717.0	0.0000010	0.0000006	346.4228	0.4388	0.0
1200	3 - LR (petrol ether)	733.0	0.0000010	0.0000006	346.4228	0.4388	0.0
1330	4 - KEROSENE	775.0	0.0000035	0.0000022	594.5418	0.0	0.0
1350	5 - AVJET	818.0	0.0000035	0.0000022	594.5418	0.0	0.0
1380	6 - HS Diesel	819.0	0.0000055	0.0000035	186.9696	0.4862	0.0
1410	7 - LS Diesel	885.0	0.0000055	0.0000035	186.9696	0.4862	0.0
1420	8 - GASOIL	959.0	0.0000200	0.0000080	186.9696	0.4862	0.0
1490	9 - FO	930.0	0.0001190	0.0000300	186.9696	0.4862	0.0
1579	10 - HFO	985.0	0.0010490	0.0003000	186.9696	0.4862	0.0

¹⁾ Reference temperature 1

²⁾ Reference temperature 2

The K coefficients are derived from API MPMS 11.1 based on the associated commodity group. Therefore the K coefficients must be entered using the indicated SI units.

Table 2-2 K coefficients in SI units

Product	Density Range [kg/m ³]	K0 [kg ² /m ⁶ *K]	K1 [kg/m ³ *K]	K2 [1/K]
Crude Oil	610.6-1163.5	613.9723	0.0	0.0
Fuel Oils	838.3127-1163.5	186.9696	0.48618	0.0
Jet Fuels	787.5195-838.3127	594.5418	0.0	0.0
Transition Zone	770.3520-787.5195	2680.3206	0.0	-0.003363
Gasoline	610.6-770.3520	346.4228	0.43884	0.0
Lubricating Oil	800.9-1163.5	0.0	0.62780	0.0

2.1.9.1 Calculation method for oil PVs

Description

The "Calculation method for oil PVs" allows enabling or disabling the calculation of viscosity and density values. For example: When the viscosity calculation method is disabled, the kinematic viscosity will be derived from the "Kinematic viscosity" entry of the "Medium characteristics" menu.

Setting	Viscosity calculation method, Density calculation method
Default	Multiselection

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.2 Ref. temperature 1

Description

This is the reference temperature for reference viscosity 1.

Setting	-50 °C to 250 °C
Default	0.0 °C

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.3 Ref. temperature 2

Description

This is the reference temperature for reference viscosity 2.

Setting	-50 °C to 250 °C
Default	0.0 °C

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.4 Ref. temperature 3

Description

Ref. temperature 3 relates to the MPMS density values as well as K0, K1 and K2 coefficients in the Liquident table. Read only.

Default	15.556 °C (fixed)
---------	-------------------

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.5 Ref. pressure

Description

Ref. pressure relates to the MPMS density values as well as K0, K1 and K2 coefficients in the Liquident table. Read only.

Default	101325.0 Pa (fixed)
---------	---------------------

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.6 Read the oil table values

Description

Wizard for reading the contents of a selected row in the oil table. Read only.

Dataset in oil table	1 to 30 (select table row to read)
Oil Liquident	0 to 2500 m/s (entering a zero value disables the row entry)

Oil Liquid Identifier	1 to 255 (numeric identifier for the liquid type)
MPMS Ref. Density	600 to 1200 kg/m ³ (density associated with the Oil Liquid value)
Oil ref. viscosity 1	0.01 to 1e7 m ² /s (viscosity associated with Ref. temperature 1)
Oil ref. viscosity 2	0.01 to 1e7 m ² /s (viscosity associated with Ref. temperature 2)
Coefficient K0	0 to 2000 kg ² /(m ⁶ *K)
Coefficient K1	0 to 2000 kg/(m ³ *K)
Coefficient K2	0 to 2000 1/K

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.7 Sort the oil table values**Description**

Wizard for sorting the oil table in numerically ascending order by Liquid

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.8 Edit the oil table values**Description**

Wizard for editing the contents of a selected row in the oil table.

Dataset in oil table	1 to 30 (select table row to read)
Oil Liquid	0 to 2500 m/s (entering a zero value disables the row entry)
Oil Liquid Identifier	1 to 255 (numeric identifier for the liquid type)

MPMS Ref. Density	600 to 1200 kg/m ³ (density associated with the Oil Liquident value)
Oil ref. viscosity 1	0.01 to 1e7 m ² /s (viscosity associated with Ref. temperature 1)
Oil ref. viscosity 2	0.01 to 1e7 m ² /s (viscosity associated with Ref. temperature 2)
Coefficient K0	0 to 2000 kg ² /(m ⁶ *K)
Coefficient K1	0 to 2000 kg/(m ³ *K)
Coefficient K2	0 to 2000 1/K

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.9.9 Reset the oil table values**Description**

Deletes all oil table data from persistent memory and restores factory default table.

Related

Path	Setup → Sensor → Oil table settings
------	-------------------------------------

2.1.10 Liquident rate of change time interval**Description**

Time interval for Liquident Rate Of Change calculation. Enter a time interval corresponding to the longest expected passage time for the liquid interface. The liquid interface is defined as the mixture between two adjacent batches, or the buffer separating two batches.

The Liquident ROC (Rate of Change) represents the change in temperature and pressure compensated oil sound speed over a specified time duration. The Liquident ROC value can be sent to an analog output or used to trigger an interface alarm when the user specified ROC threshold is exceeded. This alarm notifies the pipeline operator that an interface between two different petroleum liquids is occurring at the flow sensors.

Setting	1 to 300 s
---------	------------

Related

Path	Setup → Sensor → Liquident ROC time interval
------	--

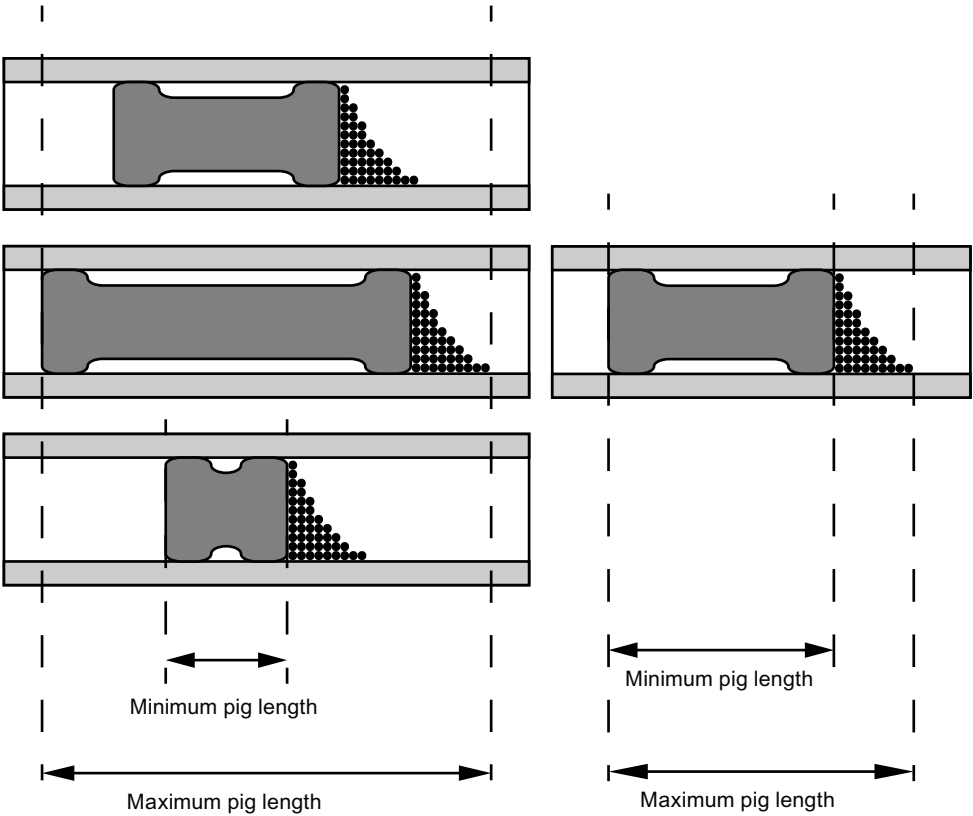
2.1.11 Scraper pig detection settings

Description

The "Scraper pig detection" function can be used to identify when a pipeline scraper pig passes the flow measurement section. The scraper pig event will trigger alarm code 27 "Scraper pig detected" which will also be stored in the transmitter diagnostic log file.

The minimum and maximum length of scraper pigs to be detected has to be specified. This will allow the detection of scraper pigs with different lengths.

- When scraper pigs of different lengths will pass through the pipe: The maximum pig length should be set to the length of the longest pig, plus any expected build-up in front of the scraper pig. The minimum pig length should be set to the length of the shortest scraper pig.
- When only one scraper pig length is used in the system: The maximum pig length should be set to the length of the scraper pig, plus any expected build-up in front of the scraper pig. The minimum pig length should be set to the length of the scraper pig.



Different pig lengths passing through the pipe One pig length passing through the pipe

2.1.11.1 Enable scraper pig detection

Description

Enables or disables the scraper pig detection function.

Setting	Disabled; Enabled
Default	Disabled

Related

Path	Setup → Sensor → Scraper pig detection settings → Enable scraper pig detection
------	--

2.1.11.2 Minimum length

Description

The length of the shortest scraper pig in use should be entered here.

Setting	0.0 to 30.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Scraper pig detection settings → Minimum length
------	--

2.1.11.3 Maximum length

Description

The length of the longest scraper pig in use should be entered here.

Setting	0.0 to 30.0 m
Default	0.0 m

Related

Path	Setup → Sensor → Scraper pig detection settings → Maximum length
------	--

2.1.11.4 Signal threshold of scraper pig

Description

Sets the signal amplitude threshold used to trigger the scraper pig detection.

Setting	-20 to 100 dBmV
Default	12 dBmV

Related

Path	Setup → Sensor → Scraper pig detection settings → Signal threshold of scraper pig
------	---

2.1.11.5 Blocked paths to start timer**Description**

Minimum number of paths required to be below the signal threshold to initiate pig detection. 0 selects the number of installed paths.

Access level: Expert user only.

Setting	0 to 4
Default	0

Related

Path	Setup → Sensor → Scraper pig detection settings → Blocked paths to start timer
------	--

2.1.11.6 Unblocked paths to end timer**Description**

Minimum number of paths required to be above the signal threshold before evaluating whether or not a pig as passed. 0 selects the number of installed paths.

Access level: Expert user only.

Setting	0 to 4
Default	0

Related

Path	Setup → Sensor → Scraper pig detection settings → Unblocked paths to end timer
------	--

2.1.11.7 Percent change of VoS accepted**Description**

Maximum allowed percent change in liquid sound velocity before and after pig passage. Used to suppress implausible receive signals due to reflections off the pig.

Access level: Expert user only.

Setting	0 to 50 %
Default	5 %

Related

Path	Setup → Sensor → Scraper pig detection settings → Percent change of VoS accepted
------	--

2.1.11.8 Max. length of pig reflections

Description

Used to suppress plausible receive signals due to reflections off the interior pig surface having the specified maximum length. Setting value to 0 disables this filter.

Access level: Expert user only.

Setting	0 to 5 m
Default	0.05 m

Related

Path	Setup → Sensor → Scraper pig detection settings → Max. length of pig reflections
------	--

2.1.12 Flow direction

Description

Flow direction is determined by the connection of sensors to “up” and “down” transmitter ports. If the system requires switching the flow direction after installation, the **Flow Direction** parameter must be changed from Positive to Negative to totalize correctly. The sensitivity and the accuracy of the sensor do not change with reverse flow.

Define positive and negative flow direction. Default positive flow direction is indicated by the arrow on the sensor.

Setting	Negative; Positive
Default	Positive

Related

Path	Setup → Sensor → Flow direction
------	---------------------------------

2.1.13 Miscellaneous

2.1.13.1 Preamplifier Setting

Description

Preamplifier settings

Access level: Expert user only

Auto (default): Will automatically turn on the pre-amplifier if the sensor type is clamp-on.

Off: Turns off the pre-amplifier regardless of the sensor type (inline or clamp-on).

On: Turns on the pre-amplifier regardless of the sensor type (inline or clamp-on).

Half transmit amplitude: Reduces the transmit signal from the default ± 10 volts to ± 5 volts and turns off the pre-amplifier. This may be necessary for the smaller SONO sensors which can saturate the amplifiers even with the pre-amp off.

Setting	Auto; Off; On; Half transmit amplitude
Default	Auto

Related

Path	Setup → Sensor → Miscellaneous → Preamplifier Setting
------	---

2.1.13.2 Number of pulses to be transmitted

Description

The number of pulses to configure optimum signal processing.

Access level: Expert user only.

Setting	1 to 10
Default	5

Related

Path	Setup → Sensor → Miscellaneous → Number of pulses to be transmitted
------	---

2.1.13.3 Minimum ringdown delay

Description

The minimum ringdown delay is needed for optimized signal processing.

Access level: Expert user only.

Read only.

The minimum ringdown delay setting for optimized signal processing is: **2000.000122 μ s**

2.1.13.4 Electronic time delay

Description

The time delay induced by the DSL electronics.

Access level: Expert user only.

Read only.

The time delay induced by the DSL electronics is: **0.519 μ s**

2.1.14 Configuration of test blocks

2.1.14.1 About

Description

NOTICE

Configuration data overwrite error

Running the test block configuration procedure will overwrite any existing sensor configuration.

Do not run the test block configuration procedure if configuration data is needed. Back up and record data as necessary.

The wizard configures the device for use with the Siemens sensor test blocks including sensor size and sensor path.

2.1.14.2 Sensor size

Sensor size	Sensor path
A1	Path 1; Path 2; Path 3; Path 4
A2	Path 1; Path 2; Path 3; Path 4
B1	Path 1; Path 2; Path 3; Path 4
B2	Path 1; Path 2; Path 3; Path 4
B3	Path 1; Path 2; Path 3; Path 4
C1	Path 1; Path 2; Path 3; Path 4
C2	Path 1; Path 2; Path 3; Path 4
C3	Path 1; Path 2; Path 3; Path 4
D1	Path 1; Path 2; Path 3; Path 4
D2	Path 1; Path 2; Path 3; Path 4
D3	Path 1; Path 2; Path 3; Path 4

Evaluate receive signal

The Rx signal can also be evaluated for proper signal characteristics prior to exiting the “Configuration of test blocks” wizard.

2.1.15 High flow compensation

Description

Only for gas applications

The high flow compensation is used to improve signal correlation and measurement reliability under conditions of high flow. It is recommended to perform the “Automatic” adjustment of the

compensation coefficients following the clamp-on sensor installation. During the "Automatic" adjustment the flow rate should be between approximately 6 m/s to 20 m/s depending on pipe size.

In cases where it is not possible to adjust the compensation coefficients between a flow rate of approximately 6 m/s to 20 m/s, the high flow compensation coefficients of the individual paths may be adjusted manually until the correct flow readings are obtained. Thereafter, the "Automatic" adjustment may be performed to optimize the compensation coefficients.

Note

Default high flow coefficient

The sensor setup wizard sets the high flow compensation coefficients to default values for the typical combination of high precision sensors and pipe material. The default value of 0.12 for steel pipe will typically enable the instrument to measure correctly under high flow conditions and will also enable an automatic adjustment under high flow conditions. If an automatic adjustment was attempted while the measurements were incorrect or unstable, the coefficients might have been overwritten with inappropriate values. In this case, a manual adjustment may be necessary. High precision sensors on carbon steel pipes typically require coefficients in the range of 0... 0.3.

2.1.15.1 Automatic (wizard)

Description

The "Automatic" adjustment wizard allows the flow meter to automatically measure the required high flow compensation. The flow meter will inhibit the automatic high flow compensation adjustment if the flow velocity is too low to accurately measure the required compensation.

Note

All paths in measurement state

All installed paths must be in measurement state and provide a stable and valid flow measurement before the "Automatic" adjustment is performed. Otherwise a power cycle may be required to abort the adjustment and unlock the menu.

Related

Path	Setup → Sensor → High flow compensation → Automatic (wizard)
------	--

2.1.15.2 Results of last adjustment

Setting	Path 1 error during adjustment Path 2 error during adjustment Path 3 error during adjustment Path 4 error during adjustment
---------	--

Related

Path	Setup → Sensor → High flow compensation → Results of last adjustment
------	--

2.1.15.3 Path 1

Description

Indicates the applied high flow compensation factor for path 1. This value will be overwritten after performing the automatic adjustment, or the value can be directly modified by the user.

Related

Path	Setup → Sensor → High flow compensation → Path 1
------	--

2.1.15.4 Path 2

Description

Indicates the applied high flow compensation factor for path 2. This value will be overwritten after performing the automatic adjustment, or the value can be directly modified by the user.

Related

Path	Setup → Sensor → High flow compensation → Path 2
------	--

2.1.15.5 Path 3

Description

Indicates the applied high flow compensation factor for path 3. This value will be overwritten after performing the automatic adjustment, or the value can be directly modified by the user.

Related

Path	Setup → Sensor → High flow compensation → Path 3
------	--

2.1.15.6 Path 4

Description

Indicates the applied high flow compensation factor for path 4. This value will be overwritten after performing the automatic adjustment, or the value can be directly modified by the user.

Related

Path	Setup → Sensor → High flow compensation → Path 4
------	--

2.2 Process values

2.2.1 Volume flow

2.2.1.1 Units

Description

Select units for displayed volume flow rate. Units are not applied at communication interface.

Setting	l/s; l/min; l/h; l/d; Ml/d; hl/s; hl/min; hl/min; hl/min; m³/s; m³/min; m³/h; m³/d; Mm³/d; gal/s; gal/min; gal/h; gal/d; Mgal/d; i.gal/s; i.gal/min; i.gal/h; i.gal/d; BBL31/s; BBL31/min; BBL31/h; BBL31/d; BBL42/s; BBL42/min; BBL42/h; BBL42/d; kBBL42/d; MBBL42/d; BBL31.5/s; BBL31.5/min; BBL31.5/h; BBL31.5/d; ft³/s; ft³/min; ft³/h; ft³/d; Mft³/d; af/min; af/h; af/d; in³/sec; in³/min; in³/h; in³/d; yd³/s; yd³/min; yd³/h; yd³/d; bush/s; bush/min; bush/h; bush/d; custom units
Default	m³/h

Related

Path	Setup → Process values → Volume flow → Units
------	--

2.2.1.2 Custom units library

Description

This wizard provides automatic configuration of custom units for common volume flow units not included in the Units menu. See Table B-1 Custom volume flow units (Page 359).

Related

Path	Setup → Process values → Volume flow → Custom units library
------	---

2.2.1.3 Custom units

Description

User specific text string for volume flow unit values (limited to 8 characters). The custom units can then be selected in volume flow units.

Setting	-
Default	Custom

Related

Path	Setup → Process values → Volume flow → Custom units
------	---

2.2.1.4 Custom conversion factor

Description

Conversion factor for user specific standard volume flow values related to SI m³/s.

Setting	-
Default	1.0

Related

Path	Setup → Process values → Volume flow → Custom conversion factor
------	---

2.2.1.5 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Standard volume flow → Decimal places
------	--

2.2.1.6 Low flow cut-off

Description

Volume flow limit for low flow cut off. Below limit volume flow output is forced to zero.

Setting	0.00 m ³ /h to 896.40 m ³ /h (depends on sensor)
Default	0.0 % of maximum flow (depends on sensor)

Related

Path	Setup → Process values → Volume flow → Low flow cut-off
------	---

2.2.1.7 Alarm and warning limits

2.2.1.7.1 Upper alarm limit

Description

Set Upper alarm limit. Alarm is triggered if measured value is above the limit.

Setting	-896.40 m ³ /h to 896.40 m ³ /h
Default	896.40 m ³ /h

Related

Path	Setup → Process values → Volume flow → Alarm and warning limits → Upper alarm limit
------	---

2.2.1.7.2 Upper warning limit**Description**

Exceeding this limit causes a warning.

Setting	-896.40 m ³ /h to 896.40 m ³ /h
Default	896.40 m ³ /h

Related

Path	Setup → Process values → Volume flow → Alarm and warning limits → Upper warning limit
------	---

2.2.1.7.3 Lower warning limit**Description**

Falling below this limit causes a warning.

Setting	-896.40 m ³ /h to 896.40 m ³ /h
Default	-896.40 m ³ /h

Related

Path	Setup → Process values → Volume flow → Alarm and warning limits → Lower warning limit
------	---

2.2.1.7.4 Lower alarm limit**Description**

Set Lower alarm limit. Alarm is triggered if measured value is below the limit.

Setting	-896.40 m ³ /h to 896.40 m ³ /h
Default	896.40m ³ /h

Related

Path	Setup → Process values → Volume flow → Alarm and warning limits → Lower alarm limit
------	---

2.2.1.7.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 m ³ /h to 896.40 m ³ /h
Default	0.0 m ³ /h

Related

Path	Setup → Process values → Volume flow → Alarm and warning limits → Hysteresis
------	--

2.2.2 Mass flow

2.2.2.1 Units

Description

Select units for displayed mass flow rate. Units are not applied at communication interface.

Setting	g/s; g/min; g/h; kg/s; kg/min; kg/h; kg/d; t/min; t/h; t/d; STon/min; STon/h; STon/d; T/h; T/d; lb/s; lb/min; lb/h; lb/d; custom units
Default	kg/h

Related

Path	Setup → Process values → Mass flow → Units
------	--

2.2.2.2 Custom units

Description

User specific string for mass flow values.

Setting	-
Default	-

Related

Path	Setup → Process values → Mass flow → Custom units
------	---

2.2.2.3 Custom conversion factor

Description

User specific conversion factor based on SI mass flow units kg/s.

Setting	-
Default	1.0

Related

Path	Setup → Process values → Mass flow → Custom conversion factor
------	---

2.2.2.4 Decimal places**Description**

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Mass flow → Decimal places
------	---

2.2.2.5 Low flow cut-off**Description**

Mass flow limit for low flow cut off. Below limit mass flow output is forced to zero.

Setting	0.00 to 3682800.00 kg/h (depends on sensor)
Default	0.0 % of maximum mass flow (depends on sensor)

Related

Path	Setup → Process values → Mass flow → Low flow cut-off
------	---

2.2.2.6 Alarm and warning limits**2.2.2.6.1 Upper alarm limit****Description**

If mass flow value exceeds this limit an alarm is triggered.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	3682800.00 kg/h

Related

Path	Setup → Process values → Mass flow → Alarm and warning limits → Upper alarm limit
------	---

2.2.2.6.2 Upper warning limit

Description

If mass flow value exceeds this limit a warning is triggered.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	3682800.00 kg/h

Related

Path	Setup → Process values → Mass flow → Alarm and warning limits → Upper warning limit
------	---

2.2.2.6.3 Lower warning limit

Description

If the mass flow value falls below this limit a warning is triggered.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	-3682800.00 kg/h

Related

Path	Setup → Process values → Mass flow → Alarm and warning limits → Lower warning limit
------	---

2.2.2.6.4 Lower alarm limit

Description

If mass flow value falls below this limit an alarm is triggered.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	-3682800.00 kg/h

Related

Path	Setup → Process values → Mass flow → Alarm and warning limits → Lower alarm limit
------	---

2.2.2.6.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.0 kg/h to 3682800.00 kg/h
Default	0.0 kg/h

Related

Path	Setup → Process values → Mass flow → Alarm and warning limits → Hysteresis
------	--

2.2.3 Standard volume flow

2.2.3.1 Units

Description

Select units for displayed standard volume flow rate. Units are not applied at communication interface.

Related

Setting	Nm ³ /h; Nm ³ /d; Sl/s; Sl/min; Sl/h; Sl/d; Sft ³ /s; Sft ³ /min; Sft ³ /h; Sft ³ /d; Sin ³ /sec; Sin ³ /min; Sin ³ /h; Sin ³ /d; Custom units
Default	Sm ³ /s

Related

Path	Setup → Process values → Standard volume flow → Units
------	---

2.2.3.2 Custom units library

Description

This wizard provides automatic configuration of custom units for common standard volume flow units not included in the Units menu (for Gas applications only). See Table B-2 Custom standard volume flow units (Page 359).

Related

Path	Setup → Process values → Standard volume flow → Custom units library
------	--

2.2.3.3 Custom units

Description

User specific text string for custom standard volume flow unit (limited to 8 characters). The custom units can then be selected in standard volume flow units. See Suggested custom unit labels and conversion factors (Page 359) for suggested custom unit labels and conversion factors.

Setting	-
Default	-

Related

Path	Setup → Process values → Standard volume flow → Custom units
------	--

2.2.3.4 Custom conversion factor**Description**

Conversion factor for user specific standard volume flow values related to Sm^3/s .

Setting	-
Default	1.0

Related

Path	Setup → Process values → Standard volume flow → Custom conversion factor
------	--

2.2.3.5 Decimal places**Description**

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Standard volume flow → Decimal places
------	--

2.2.3.6 Low flow cut-off**Description**

Standard volume flow limit for low flow cut off. Below limit standard volume flow output is forced to zero.

Setting	Min. $0.0 \text{ Sm}^3/\text{s}$
Default	$0.0 \text{ Sm}^3/\text{s}$

Related

Path	Setup → Process values → Standard volume flow → Low flow cut-off
------	--

2.2.3.7 Alarm and warning limits

2.2.3.7.1 Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	-10800000.00 Sm ³ /h to +10800000.00 Sm ³ /h
Default	3600.00 Sm ³ /h

Related

Path	Setup → Process values → Standard volume flow → Alarm and warning limits → Upper alarm limit
------	--

2.2.3.7.2 Upper warning limit

Description

Exceeding this limit causes a warning.

Setting	-10800000.00 Sm ³ /h to +10800000.00 Sm ³ /h
Default	3600.00 Sm ³ /h

Related

Path	Setup → Process values → Standard volume flow → Alarm and warning limits → Upper warning limit
------	--

2.2.3.7.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	-10800000.00 Sm ³ /h to +10800000.00 Sm ³ /h
Default	-3600.00 Sm ³ /h

Related

Path	Setup → Process values → Standard volume flow → Alarm and warning limits → Lower warning limit
------	--

2.2.3.7.4 Lower alarm limit

Description

Falling below this limit causes an alarm.

Setting	-10800000.00 Sm ³ /h to +10800000.00 Sm ³ /h
Default	-3600.00 Sm ³ /h

Related

Path	Setup → Process values → Standard volume flow → Alarm and warning limits → Lower alarm limit
------	--

2.2.3.7.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	-10800000.00 Sm ³ /h to +10800000.00 Sm ³ /h
Default	0.00 Sm ³ /h

Related

Path	Setup → Process values → Standard volume flow → Alarm and warning limits → Hysteresis
------	---

2.2.3.8 Standard temperature**Description**

Standard temperature - This value is used to calculate the standard process values.

Setting	0.0 °C (32 °F) to 100.0 °C (212.0 °F)
Default	15.0 °C (59.0 °F)

Related

Path	Setup → Process values → Standard volume flow → Standard temperature → Units
------	--

2.2.3.9 Standard pressure**Description**

Standard pressure - This value is used to calculate standard process values.

Setting	100000.0 Pa to 200000.0 Pa
Default	101325.0 Pa (pascal)

Related

Path	Setup → Process values → Standard volume flow → Standard pressure
------	---

2.2.4 Flow velocity

2.2.4.1 Units

Description

Select units for displayed flow velocity. Units are not applied at communication interface.

Units for flow velocity values.

Setting	m/s; m/h; in/s; in/min; ft/s; ft/min; custom units
Default	m/s

Related

Path	Setup → Process values → Flow velocity → Units
------	--

2.2.4.2 Custom units

Description

User specific text string to define custom unit values. The custom unit can then be selected in the flow velocity units.

Setting	-
Default	-

Related

Path	Setup → Process values → Flow velocity → Custom units
------	---

2.2.4.3 Custom conversion factor

Description

Conversion factor for custom unit flow velocity values based on SI velocity units m/s.

Setting	-
Default	1.0

Related

Path	Setup → Process values → Flow velocity → Custom conversion factor
------	---

2.2.4.4 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Flow velocity → Decimal places
------	---

2.2.4.5 Low flow cut-off**Description**

Flow velocity limit for low flow cut off. Below limit flow velocity output is forced to zero.

Setting	Min 0.00
Default	0.0 m/s

Related

Path	Setup → Process values → Flow velocity → Low flow cut-off
------	---

2.2.4.6 Alarm and warning limits**2.2.4.6.1 Upper alarm limit****Description**

If process value exceeds this limit an alarm is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	9999997952 m/s

Related

Path	Setup → Process values → Flow velocity → Alarm and warning limits → Upper alarm limit
------	---

2.2.4.6.2 Upper warning limit**Description**

If process value exceeds this limit a warning is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	9999997952 m/s

Related

Path	Setup → Process values → Flow velocity → Alarm and warning limits → Upper warning limit
------	---

2.2.4.6.3 Lower warning limit

Description

If process value falls below this limit a warning is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	-9999997952 m/s

Related

Path	Setup → Process values → Flow velocity → Alarm and warning limits → Lower warning limit
------	---

2.2.4.6.4 Lower alarm limit

Description

If the process value falls below this limit an alarm is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	-9999997952 m/s

Related

Path	Setup → Process values → Flow velocity → Alarm and warning limits → Lower alarm limit
------	---

2.2.4.6.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0 m/s to +9999997952 m/s
Default	0.00 m/s

Related

Path	Setup → Process values → Flow velocity → Alarm and warning limits → Hysteresis
------	--

2.2.5 Sound velocity

2.2.5.1 Units

Description

Select units for displayed sound velocity. Units are not applied at communication interface.

Setting	m/s; m/h; in/s; in/min; ft/s; ft/min; Custom units
Default	m/s

Related

Path	Setup → Process values → Sound velocity → Units
------	---

2.2.5.2**Custom units****Description**

User specific text string for custom sound velocity unit (limited to 8 characters). The custom unit can then be selected in the sound velocity units.

Setting	
Default	

Related

Path	Setup → Process values → Sound velocity → Custom units
------	--

2.2.5.3**Custom conversion factor****Description**

Conversion factor for custom unit sound velocity values based on SI velocity units m/s.

Setting	
Default	1.0

Related

Path	Setup → Process values → Sound velocity → Custom conversion factor
------	--

2.2.5.4**Decimal places****Description**

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Sound velocity → Decimal places
------	--

2.2.5.5 Alarm and warning limits

2.2.5.5.1 Upper alarm limit

Description

If process value exceeds this limit an alarm is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	9999997952 m/s

Related

Path	Setup → Process values → Sound velocity → Alarm and warning limits → Upper alarm limit
------	--

2.2.5.5.2 Upper warning limit

Description

If process value exceeds this limit a warning is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	9999997952 m/s

Related

Path	Setup → Process values → Sound velocity → Alarm and warning limits → Upper warning limit
------	--

2.2.5.5.3 Lower warning limit

Description

if the process value falls below this limit a warning is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	-9999997952 m/s

Related

Path	Setup → Process values → Sound velocity → Alarm and warning limits → Lower warning limit
------	--

2.2.5.5.4 Lower alarm limit

Description

If the process value falls below this limit an alarm is triggered.

Setting	-9999997952 m/s to +9999997952 m/s
Default	-9999997952 m/s

Related

Path	Setup → Process values → Sound velocity → Alarm and warning limits → Lower alarm limit
------	--

2.2.5.5.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0 m/s to +9999997952 m/s
Default	0.00 m/s

Related

Path	Setup → Process values → Sound velocity → Alarm and warning limits → Hysteresis
------	---

2.2.6 Liquident**2.2.6.1 Alarm and warning limits****2.2.6.1.1 Upper alarm limit****Description**

Exceeding this limit causes an alarm.

Setting	-9999997952 m/s to 9999997952 m/s
Default	9999997952 m/s

Related

Path	Setup → Process values → Liquident → Alarm and warning limits → Upper alarm limit
------	---

2.2.6.1.2 Upper warning limit**Description**

Exceeding this limit causes a warning.

Setting	-9999997952 m/s to 9999997952 m/s
Default	9999997952 m/s

Related

Path	Setup → Process values → Liquident → Alarm and warning limits → Upper warning limit
------	---

2.2.6.1.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	-9999997952 m/s to 9999997952 m/s
Default	-9999997952 m/s

Related

Path	Setup → Process values → Liquident → Alarm and warning limits → Lower warning limit
------	---

2.2.6.1.4 Lower alarm limit

Description

Falling below this limit causes an alarm.

Setting	-9999997952 m/s to 9999997952 m/s
Default	-9999997952 m/s

Related

Path	Setup → Process values → Liquident → Alarm and warning limits → Lower alarm limit
------	---

2.2.6.1.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0 m/s to +9999997952 m/s
Default	0.0 m/s

Related

Path	Setup → Process values → Liquident → Alarm and warning limits → Hysteresis
------	--

2.2.6.2 Temperature slope factor

Description

Temperature slope factor - This factor is used in connection with the standard condition temperature for calculating Liquident.

Setting	0.0 m/(s * K) to 8.0 m/(s * K)
Default	4.1 m/(s * K)

Related

Path	Setup → Process values → Liquident → Temperature slope factor
------	---

2.2.6.3 Pressure slope factor**Description**

Pressure slope factor - This factor is used in connection with the standard condition pressure to calculate Liquident.

Setting	-0.00003 m/(s * Pa) to 0.0 m/(s * Pa)
Default	-0.000004 m/(s * Pa)

Related

Path	Setup → Process values → Liquident → Pressure slope factor
------	--

2.2.7 Density**2.2.7.1 Units****Description**

Displays units for displayed density. Units are not applied at communication interface.

Read only.

Setting	µg/l; µg/m³; mg/l; g/ml; g/cm³; g/l; kg/l; kg/m³; lb/in³; lb/gal; lb/ft³; STon/yd³; custom units
Default	kg/m³

Related

Path	Setup → Process values → Density → Units
------	--

2.2.7.2 Custom units**Description**

User specific text string for custom density unit (limited to 8 characters). The custom unit can then be selected in the density units.

Setting	
Default	

Related

Path	Setup → Process values → Density → Custom units
------	---

2.2.7.3 Custom conversion factor

Description

Conversion factor for custom Density values based on SI density units kg/m³.

Setting	
Default	1.0

Related

Path	Setup → Process values → Density → Custom conversion factor
------	---

2.2.7.4 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Density → Decimal places
------	---

2.2.7.5 Alarm and warning limits

2.2.7.5.1 Upper alarm limit

Description

If density value exceeds this limit an alarm is triggered.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	900.00 kg/m ³

Related

Path	Setup → Process values → Density → Alarm and warning limits → Upper alarm limit
------	---

2.2.7.5.2 Upper warning limit

Description

If density value exceeds this limit a warning is triggered.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	890.00 kg/m ³

Related

Path	Setup → Process values → Density → Alarm and warning limits → Upper warning limit
------	---

2.2.7.5.3 Lower warning limit**Description**

if density value falls below this limit a warning is triggered.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	1.00 kg/m ³

Related

Path	Setup → Process values → Density → Alarm and warning limits → Lower warning limit
------	---

2.2.7.5.4 Lower alarm limit**Description**

If density value falls below this limit an alarm is triggered.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	1.00 kg/m ³

Related

Path	Setup → Process values → Density → Alarm and warning limits → Lower alarm limit
------	---

2.2.7.5.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	0.00 kg/m ³

Related

Path	Setup → Process values → Density → Alarm and warning limits → Hysteresis
------	--

2.2.8 Kinematic viscosity

2.2.8.1 Units

Description

Units for kinematic viscosity.

Read only.

Setting	m ² /s; cSt; St
Default	m ² /s

Related

Path	Setup → Process values → Kinematic viscosity → Units
------	--

2.2.8.2 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Kinematic viscosity → Decimal places
------	---

2.2.8.3 Alarm and warning limits

2.2.8.3.1 Upper alarm limit

Description

If process value exceeds this limit an alarm is triggered.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	+9999997952 m ² /s

Related

Path	Setup → Process values → Standard kinematic viscosity → Alarm and warning limits → Upper alarm limit
------	--

2.2.8.3.2 Upper warning limit

Description

If process value exceeds this limit a warning is triggered.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	+9999997952 m ² /s

Related

Path	Setup → Process values → Kinematic viscosity → Alarm and warning limits → Upper warning limit
------	---

2.2.8.3.3 Lower warning limit

Description

If process value falls below this limit a warning is triggered.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	-9999997952 m ² /s

Related

Path	Setup → Process values → Kinematic viscosity → Alarm and warning limits → Lower warning limit
------	---

2.2.8.3.4 Lower alarm limit

Description

If process value falls below this limit an alarm is triggered.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	-9999997952 m ² /s

Related

Path	Setup → Process values → Kinematic viscosity → Alarm and warning limits → Lower alarm limit
------	---

2.2.8.3.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 m ² /s to +9999997952 m ² /s
Default	0.00 m ² /s

Related

Path	Setup → Process values → Kinematic viscosity → Alarm and warning limits → Hysteresis
------	--

2.2.9 Pressure**2.2.9.1 Units****Description**

Select units for displayed pressure. Units are not applied at communication interface.

Setting	mbar (millibar); bar; Pa (pascals); kPa (kilopascals); MPa (Megapascals); psi (pounds per square inch); kgf/cm ² (kilogram force per square cm); mmH ₂ O (millimeters of water at 68 °F); inH ₂ O (inches of water at 68 °F); ftH ₂ O (feet of water at 68 °F); mmH ₂ O (millimeters of water at 4 °C); inH ₂ O (inches of water at 4 °C); mmHg (millimeters of mercury at 0 °C); inHg (inches of mercury at 0 °C); hPa (hectopascal); atm (atmosphere); torr; cmH ₂ O (centimeters of water at 4 °C); mH ₂ O (meters of water at 4 °C); cmHg (centimeters of mercury at 0 °C); mHg (meters of mercury at 0 °C); gf/cm ² (grams force per square cm); kg/m ² (kilograms per square meter); lb/ft ² (pounds per square foot); ftH ₂ O (feet water at 4 °C); ftH ₂ O (feet water at 60 °F)
Default	Pa

Related

Path	Setup → Process values → Pressure → Units
------	---

2.2.9.2 Decimal places**Description**

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Pressure → Decimal places
------	--

2.2.9.3 Alarm and warning limits**2.2.9.3.1 Upper alarm limit****Description**

If process value exceeds this limit an alarm is triggered.

Setting	-9999997952 Pa to +9999997952 Pa
Default	9999997952 Pa

Related

Path	Setup → Process values → Pressure → Alarm and warning limits → Upper alarm limit
------	--

2.2.9.3.2 Upper warning limit**Description**

If process value exceeds this limit a warning is triggered.

Setting	-9999997952 Pa to +9999997952 Pa
Default	9999997952 Pa

Related

Path	Setup → Process values → Pressure → Alarm and warning limits → Upper warning limit
------	--

2.2.9.3.3 Lower warning limit**Description**

If the process value falls below this limit a warning is triggered.

Setting	-9999997952 Pa to +9999997952 Pa
Default	-9999997952 Pa

Related

Path	Setup → Process values → Pressure → Alarm and warning limits → Lower warning limit
------	--

2.2.9.3.4 Lower alarm limit**Description**

if process value falls below this limit an alarm is triggered.

Setting	-9999997952 Pa to +9999997952 Pa
Default	-9999997952 Pa

Related

Path	Setup → Process values → Pressure → Alarm and warning limits → Lower alarm limit
------	--

2.2.9.3.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0 Pa to +9999997952 Pa
Default	0.00 Pa

Related

Path	Setup → Process values → Pressure → Alarm and warning limits → Hysteresis
------	---

2.2.10 Medium temperature

2.2.10.1 Units

Description

Select units for displayed temperature. Units are not applied at communication interface.

Setting	°C (degrees Celsius); °F (degrees Fahrenheit); °R (degrees Rankine); K (kelvins)
Default	°C (degrees Celsius)

Related

Path	Setup → Process values → Medium temperature → Units
------	---

2.2.10.2 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Medium temperature → Decimal places
------	--

2.2.10.3 Alarm and warning limits

2.2.10.3.1 Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	-272.77 to +400.00 °C
Default	280.00 °C

Related

Path	Setup → Process values → Medium temperature → Alarm and warning limits → Upper alarm limit
------	--

2.2.10.3.2 Upper warning limit

Description

Exceeding this limit causes a warning.

Related

Setting	-272.77 to +400.00 °C
Default	270.00 °C

Related

Path	Setup → Process values → Medium temperature → Alarm and warning limits → Upper warning limit
------	--

2.2.10.3.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	-272.77.00 to +400.00 °C
Default	-270.00 °C

Related

Path	Setup → Process values → Medium temperature → Alarm and warning limits → Lower warning limit
------	--

2.2.10.3.4 Lower alarm limit

Description

Falling below this limit causes an alarm.

Related

Setting	-272.77 to +400.00 °C
Default	-270.00 °C

Related

Path	Setup → Process values → Medium temperature → Alarm and warning limits → Lower alarm limit
------	--

2.2.10.3.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 °C to +200.00 °C
Default	0.00 °C

Related

Path	Setup → Process values → Medium temperature → Alarm and warning limits → Hysteresis
------	---

2.2.11 Standard density

2.2.11.1 Units

Description

Select units for displayed standard density. Units are not applied at communication interface.

Related

Setting	µg/l; µg/m³; mg/l; g/ml; g/cm³; g/l; kg/l; kg/m³; lb/in³; lb/gal; lb/ft³; STon/yd³; custom unit (see Custom density unit string / factor)
Default	kg/m³

Related

Path	Setup → Process values → Standard density → Units
------	---

2.2.11.2 Decimal places

Description

Decimal places

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Standard density → Decimal places
------	--

2.2.11.3 Alarm and warning limits

2.2.11.3.1 Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	900.00 kg/m ³

Related

Path	Setup → Process values → Standard density → Alarm and warning limits → Upper alarm limit
------	--

2.2.11.3.2 Upper warning limit

Description

Exceeding this limit causes a warning.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	900.00 kg/m ³

Related

Path	Setup → Process values → Standard density → Alarm and warning limits → Upper warning limit
------	--

2.2.11.3.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	1.00 kg/m ³

Related

Path	Setup → Process values → Standard density → Alarm and warning limits → Lower warning limit
------	--

2.2.11.3.4 Lower alarm limit**Description**

Falling below this limit causes an alarm.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	1.00 kg/m ³

Related

Path	Setup → Process values → Standard density → Alarm and warning limits → Lower alarm limit
------	--

2.2.11.3.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 kg/m ³ to +10000.00 kg/m ³
Default	0.00 kg/m ³

Related

Path	Setup → Process values → Standard density → Alarm and warning limits → Hysteresis
------	---

2.2.12 Standard kinematic viscosity**2.2.12.1 Units****Description**

Select unit for displayed standard kinematic viscosity. Unit is not applied at communication interface.

Read only.

Setting	m ² /s (square meters per second); cSt (1 centistoke = 1 mm ² /s); St (stokes, 1 St = 1cm ² /s)
Default	m ² /s (square meters per second)

Related

Path	Setup → Process values → Standard kinematic viscosity → Units
------	---

2.2.12.2 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Standard kinematic viscosity → Decimal places
------	--

2.2.12.3 Alarm and Warning limits

2.2.12.3.1 Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	+9999997952 m ² /s

Related

Path	Setup → Process values → Standard kinematic viscosity → Alarm and warning limits → Upper alarm limit
------	--

2.2.12.3.2 Upper warning limit

Description

Exceeding this limit causes a warning.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	+9999997952 m ² /s

Related

Path	Setup → Process values → Standard kinematic viscosity → Alarm and warning limits → Upper warning limit
------	--

2.2.12.3.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	-9999997952 m ² /s

Related

Path	Setup → Process values → Standard kinematic viscosity → Alarm and warning limits → Lower warning limit
------	--

2.2.12.3.4 Lower alarm limit**Description**

Falling below this limit causes an alarm.

Setting	-9999997952 m ² /s to +9999997952 m ² /s
Default	-9999997952 m ² /s

Related

Path	Setup → Process values → Standard kinematic viscosity → Alarm and warning limits → Lower alarm limit
------	--

2.2.12.3.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 m ² /s to +9999997952 m ² /s
Default	0.00 m ² /s

Related

Path	Setup → Process values → Standard kinematic viscosity → Alarm and warning limits → Hysteresis
------	---

2.2.13 API gravity**2.2.13.1 Alarm and warning limits****2.2.13.1.1 Upper alarm limit****Description**

Exceeding this limit causes an alarm.

Setting	-9999997952 °API to +9999997952 °API
Default	+9999997952 °API

Related

Path	Setup → Process values → API gravity → Alarm and warning limits → Upper alarm limit
------	---

2.2.13.1.2 Upper warning limit**Description**

Exceeding this limit causes a warning.

Setting	-9999997952 °API to +9999997952 °API
Default	+9999997952 °API

Related

Path	Setup → Process values → API gravity → Alarm and warning limits → Upper warning limit
------	---

2.2.13.1.3 Lower warning limit**Description**

Falling below this limit causes a warning.

Setting	-9999997952 °API to +9999997952 °API
Default	-9999997952 °API

Related

Path	Setup → Process values → API gravity → Alarm and warning limits → Lower warning limit
------	---

2.2.13.1.4 Lower alarm limit**Description**

Falling below this limit causes an alarm.

Setting	-9999997952 °API to +9999997952 °API
Default	-9999997952 °API

Related

Path	Setup → Process values → API gravity → Alarm and warning limits → Lower alarm limit
------	---

2.2.13.1.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 °API to +9999997952 °API
Default	0.00 °API

Related

Path	Setup → Process values → API gravity → Alarm and warning limits → Hysteresis
------	--

2.2.14 Standard API gravity

2.2.14.1 Alarm and warning limits

2.2.14.1.1 Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	-9999997952 °API to +9999997952 °API
Default	+9999997952 °API

Related

Path	Setup → Process values → Standard API gravity → Alarm and warning limits → Upper alarm limit
------	--

2.2.14.1.2 Upper warning limit

Description

Exceeding this limit causes a warning.

Setting	-9999997952 °API to +9999997952 °API
Default	+9999997952 °API

Related

Path	Setup → Process values → Standard API gravity → Alarm and warning limits → Upper warning limit
------	--

2.2.14.1.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	-9999997952 °API to +9999997952 °API
Default	-9999997952 °API

Related

Path	Setup → Process values → Standard API gravity → Alarm and warning limits → Lower warning limit
------	--

2.2.14.1.4 Lower alarm limit

Description

Falling below this limit causes an alarm.

Setting	-9999997952 °API to +9999997952 °API
Default	-9999997952 °API

Related

Path	Setup → Process values → Standard API gravity → Alarm and warning limits → Lower alarm limit
------	--

2.2.14.1.5 Hysteresis

Description

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 °API to +9999997952 °API
Default	0.00 °API

Related

Path	Setup → Process values → Standard API gravity → Alarm and warning limits → Hysteresis
------	---

2.2.15 Specific gravity

2.2.15.1 Alarm and warning limits

2.2.15.1.1 Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	-9999997952 SGU to +9999997952 SGU
Default	+9999997952 SGU

Related

Path	Setup → Process values → Specific gravity → Alarm and warning limits → Upper alarm limit
------	--

2.2.15.1.2 Upper warning limit

Description

Exceeding this limit causes a warning.

Setting	-9999997952 SGU to +9999997952 SGU
Default	+9999997952 SGU

Related

Path	Setup → Process values → Specific gravity → Alarm and warning limits → Upper warning limit
------	--

2.2.15.1.3 Lower warning limit

Description

Falling below this limit causes a warning.

Setting	-9999997952 SGU to +9999997952 SGU
Default	-9999997952 SGU

Related

Path	Setup → Process values → Specific gravity → Alarm and warning limits → Lower warning limit
------	--

2.2.15.1.4 Lower alarm limit

Description

Falling below this limit causes an alarm.

Setting	-9999997952 SGU to +9999997952 SGU
Default	-9999997952 SGU

Related

Path	Setup → Process values → Specific gravity → Alarm and warning limits → Lower alarm limit
------	--

2.2.15.1.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 SGU to +9999997952 SGU
Default	0.00 SGU

Related

Path	Setup → Process values → Specific gravity → Alarm and warning limits → Hysteresis
------	---

2.2.16 Standard specific gravity**2.2.16.1 Alarm and warning limits****2.2.16.1.1 Upper alarm limit****Description**

Exceeding this limit causes an alarm.

Setting	-9999997952 SGU to +9999997952 SGU
Default	+9999997952 SGU

Related

Path	Setup → Process values → Standard specific gravity → Alarm and warning limits → Upper alarm limit
------	---

2.2.16.1.2 Upper warning limit**Description**

Exceeding this limit causes a warning.

Setting	-9999997952 SGU to +9999997952 SGU
Default	+9999997952 SGU

Related

Path	Setup → Process values → Standard specific gravity → Alarm and warning limits → Upper warning limit
------	---

2.2.16.1.3 Lower warning limit**Description**

Falling below this limit causes a warning.

Setting	-9999997952 SGU to +9999997952 SGU
Default	-9999997952 SGU

Related

Path	Setup → Process values → Standard specific gravity → Alarm and warning limits → Lower warning limit
------	---

2.2.16.1.4 Lower alarm limit**Description**

Falling below this limit causes an alarm.

Setting	-9999997952 SGU to +9999997952 SGU
Default	-9999997952 SGU

Related

Path	Setup → Process values → Standard specific gravity → Alarm and warning limits → Lower alarm limit
------	---

2.2.16.1.5 Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0.00 SGU to +9999997952 SGU
Default	0.00 SGU

Related

Path	Setup → Process values → Standard specific gravity → Alarm and warning limits → Hysteresis
------	--

2.2.17 Rate of change (ROC)

2.2.17.1 Units

Description

Select unit for displayed rate of change. Unit is not applied at communication interface.

Setting	m/s ² (meters per second ²); ft/s ² (feet per second ²)
Default	m/s ² (meters per second ²)

Related

Path	Setup → Process values → Rate of change (ROC) → Units
------	---

2.2.17.2 Decimal places

Description

Sets the decimal places for the process value displayed in the display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Process values → Rate of change (ROC) → Decimal places
------	--

2.2.17.3 Alarm and warning limits

Upper alarm limit

Description

Exceeding this limit causes an alarm.

Setting	0 m/s ² to +9999997952 m/s ²
Default	10 m/s ²

Related

Path	Setup → Process values → Rate of change (ROC) → Alarm & warning limits → Upper alarm limit
------	--

Upper warning limit**Description**

Exceeding this limit causes a warning.

Setting	0 m/s ² to +9999997952 m/s ²
Default	10 m/s ²

Related

Path	Setup → Process values → Rate of change (ROC) → Alarm & warning limits → Upper warning limit
------	--

Hysteresis**Description**

Sets the hysteresis for alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	0 m/s ² to +9999997952 m/s ²
Default	10 m/s ²

Related

Path	Setup → Process values → Rate of change (ROC) → Alarm & warning limits → Hysteresis
------	---

2.3 Totalizers**2.3.1 Totalizer 1****2.3.1.1 Process value****Description**

Select the process value to be totalized.

Setting	Mass flow; Volume flow; Standard volume flow (only Hydrocarbon and gas applications)
Default	Mass flow

Related

Path	Setup → Totalizers → Totalizer 1 → Process value
------	--

2.3.1.2 Units

Description

Select units for displayed Totalizer 1. The set of units depends on the selected process value. Units are not applied at communication interface.

Setting	Process value = Mass flow: g; kg; t; STon; T; oz; lb; Process value = Volume flow: l; hl; m ³ ; gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush; Process value = Standard volume flow: NI; Nm ³ ; SI; Sft ³ ; Sm ³ ; custom units (see Custom units / Custom conversion factor)
Default	kg

Related

Path	Setup → Totalizers → Totalizer 1 → Units
------	--

2.3.1.3 Custom units library

Description

This wizard provides automatic configuration of custom units for common volume units not included in the Units menu (for Gas applications only). See Table B-3 Custom volume (totalizer) units (Page 359) and Table B-4 Custom std. volume (totalizer) units (Page 360).

See also

Suggested custom unit labels and conversion factors (Page 359)

Related

Path	Setup → Totalizers → Totalizer 1 → Custom units library
------	---

2.3.1.4 Custom units

Description

User specific string to define custom unit Totalizer 1 values.

Setting	-
Default	-

Related

Path	Setup → Totalizers → Totalizer 1 → Custom units
------	---

2.3.1.5 Custom conversion factor

Description

Conversion factor for user specific standard mass flow values related to SI kg.

Setting	-
Default	1.0

Related

Path	Setup → Totalizers → Totalizer 1 → Custom conversion factor
------	---

2.3.1.6 Decimal places**Description**

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Totalizers → Totalizer 1 → Decimal places
------	---

2.3.1.7 Direction**Description**

Totalizer 1 direction.

Setting	Forward and backward; Forward; Backward; Hold
Default	Forward

Related

Path	Setup → Totalizers → Totalizer 1 → Direction
------	--

2.3.1.8 Fail-safe behaviour**Description**

Behaviour of the totalizer during the occurrence of bad input value.

Setting	RUN; totalization is continued using the bad input value; HOLD; totalization is stopped; MEMORY; totalization is continued based on the last incoming good value
Default	RUN; totalization is continued using the bad input value

Related

Path	Setup → Totalizers → Totalizer 1 → Fail safe mode
------	---

2.3.1.9 Reset

Description

Reset totalizer to zero.

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Totalizer 1 → Reset
------	--

2.3.1.10 Preset

Description

Reset Totalizer 1 to selected preset value.

After selecting OK the user is asked for the PRESET value. The PRESET value units depend on the selected Process value.

Therefore the range of the Preset value is for:

- Mass flow: -9999997952 kg to +9999997952 kg
- Volume flow: -9999997952 m³ to +9999997952 m³
- Standard volume flow: -9999997952 Sm³ to +9999997952 Sm³

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Totalizer 1 → Preset
------	---

2.3.1.11 Alarm and warning limits

2.3.1.11.1 Upper alarm limit

Description

Alarm is triggered if Totalizer 1 value is above the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: +9999997952 kg Process value = Volume flow: +9999997952 m ³ Process value = Standard volume flow: +9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 1 → Alarm and warning limits → Upper alarm limit
------	---

2.3.1.11.2 Upper warning limit**Description**

Warning is triggered if Totalizer 1 value is above the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: +9999997952 kg Process value = Volume flow: +9999997952 m ³ Process value = Standard volume flow: +9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 1 → Alarm and warning limits → Upper warning limit
------	---

2.3.1.11.3 Lower warning limit**Description**

Warning is triggered if Totalizer 1 value is below the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: -9999997952 kg Process value = Volume flow: -9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 1 → Alarm and warning limits → Lower warning limit
------	---

2.3.1.11.4 Lower alarm limit**Description**

Alarm is triggered if Totalizer 1 value is below the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: -9999997952 kg Process value = Volume flow: -9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 1 → Alarm and warning limits → Lower alarm limit
------	---

2.3.1.11.5 Hysteresis**Description**

Hysteresis sets the alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	Process value = Mass flow: 0.00 kg to +9999997952 kg Process value = Volume flow: 0.00 m ³ to +9999997952 m ³ Process value = Standard volume flow: 0.00 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: 0.00 kg Process value = Volume flow: 0.00 m ³ Process value = Standard volume flow: 0.00 Sm ³

Related

Path	Setup → Totalizers → Totalizer 1 → Alarm and warning limits → Hysteresis
------	--

2.3.2 Totalizer 2**2.3.2.1 Process value****Description**

Select the process value to be totalized.

Setting	Mass flow; Volume flow; Standard volume flow (only Hydrocarbon and gas applications)
Default	Mass flow

Related

Path	Setup → Totalizers → Totalizer 2 → Process value
------	--

2.3.2.2 Units**Description**

Select units for displayed Totalizer 2. The set of units depends on the selected process value. Units are not applied at communication interface.

Setting	Process value = Mass flow: g; kg; t; STon; T; oz; lb; Process value = Volume flow: l; hl; m ³ ; gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush; Process value = Standard volume flow: NI; Nm ³ ; SI; Sft ³ ; Sm ³ ; custom units (see Custom units / Custom conversion factor)
Default	kg

Related

Path	Setup → Totalizers → Totalizer 1 → Units
------	--

2.3.2.3 Custom units library**Description**

This wizard provides automatic configuration of custom units for common volume units not included in the Units menu (for Gas applications only). See Table B-3 Custom volume (totalizer) units (Page 359) and Table B-4 Custom std. volume (totalizer) units (Page 360).

See also

Suggested custom unit labels and conversion factors (Page 359)

Related

Path	Setup → Totalizers → Totalizer 2 → Custom units library
------	---

2.3.2.4 Custom units**Description**

User specific string to define custom unit Totalizer 2 values.

Setting	-
Default	-

Related

Path	Setup → Totalizers → Totalizer 2 → Custom units
------	---

2.3.2.5 Custom conversion factor**Description**

Conversion factor for user specific standard mass flow values related to SI mass units kg.

Setting	-
Default	1.0

Related

Path	Setup → Totalizers → Totalizer 2 → Custom conversion factor
------	---

2.3.2.6 Decimal places**Description**

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Totalizers → Totalizer 2 → Decimal places
------	---

2.3.2.7 Direction

Description

Totalizer 2 direction.

Setting	Forward and backward; Forward; Backward; Hold
Default	Forward

Related

Path	Setup → Totalizers → Totalizer 2 → Direction
------	--

2.3.2.8 Fail safe behaviour

Description

Behavior of the totalizer during the occurrence of bad input value.

Setting	RUN; totalization is continued using the bad input value; HOLD; totalization is stopped; MEMORY; totalization is continued based on the last incoming good value
Default	RUN; totalization is continued using the bad input value

Related

Path	Setup → Totalizers → Totalizer 2 → Fail safe behaviour
------	--

2.3.2.9 Reset

Description

Reset totalizer to zero.

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Totalizer 2 → Reset
------	--

2.3.2.10 Preset**Description**

Reset Totalizer 2 to selected preset value.

After selecting OK the user is asked for the PRESET value. The PRESET value units depend on the selected Process value.

Therefore the range of the Preset value is for:

- Mass flow: -9999997952 kg to +9999997952 kg
- Volume flow: -9999997952 m³ to +9999997952 m³
- Standard volume flow: -9999997952 Sm³ to +9999997952 Sm³

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Totalizer 2 → Preset
------	---

2.3.2.11 Alarm and warning limits**2.3.2.11.1 Upper alarm limit****Description**

Alarm is triggered if Totalizer 2 value is above the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: +9999997952 kg Process value = Volume flow: +9999997952 m ³ Process value = Standard volume flow: +9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 2 → Alarm and warning limits → Upper alarm limit
------	---

2.3.2.11.2 Upper warning limit**Description**

Warning is triggered if Totalizer 2 value is above the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: +9999997952 kg Process value = Volume flow: +9999997952 m ³ Process value = Standard volume flow: +9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 2 → Alarm and warning limits → Upper warning limit
------	---

2.3.2.11.3 Lower warning limit**Description**

Warning is triggered if Totalizer 2 value is below the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: -9999997952 kg Process value = Volume flow: -9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 2 → Alarm and warning limits → Lower warning limit
------	---

2.3.2.11.4 Lower alarm limit**Description**

Alarm is triggered if Totalizer 2 value is below the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: -9999997952 kg Process value = Volume flow: -9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 2 → Alarm and warning limits → Lower alarm limit
------	---

2.3.2.11.5 Hysteresis

Description

Hysteresis sets the alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	Process value = Mass flow: 0.00 kg to +9999997952 kg Process value = Volume flow: 0.00 m ³ to +9999997952 m ³ Process value = Standard volume flow: 0.00 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: 0.00 kg Process value = Volume flow: 0.00 m ³ Process value = Standard volume flow: 0.00 Sm ³

Related

Path	Setup → Totalizers → Totalizer 2 → Alarm and warning limits → Hysteresis
------	--

2.3.3 Totalizer 3

2.3.3.1 Process value

Description

Select the cut-off filtered process value to be totalized.

Setting	Mass flow; Volume flow; Standard volume flow (only Hydrocarbon and gas applications)
Default	Mass flow

Related

Path	Setup → Totalizers → Totalizer 3 → Process value
------	--

2.3.3.2 Units

Description

Select units for displayed Totalizer 3. The set of units depends on the selected process value. Units are not applied at communication interface.

Setting	Process value = Mass flow: g; kg; t; STon; T; oz; lb; Process value = Volume flow: l; hl; m ³ ; gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush; Process value = Standard volume flow: NI; Nm ³ ; SI; Sft ³ ; Sm ³ ; custom units (see Custom units / Custom conversion factor)
Default	kg

Related

Path	Setup → Totalizers → Totalizer 1 → Units
------	--

2.3.3.3 Custom units library

Description

This wizard provides automatic configuration of custom units for common volume units not included in the Units menu. See Table B-3 Custom volume (totalizer) units (Page 359) and Table B-4 Custom std. volume (totalizer) units (Page 360).

See also

Suggested custom unit labels and conversion factors (Page 359)

Related

Path	Setup → Totalizers → Totalizer 3 → Custom units library
------	---

2.3.3.4 Custom units

Description

User specific string to define custom unit Totalizer 3 values.

Setting	-
Default	-

Related

Path	Setup → Totalizers → Totalizer 3 → Custom units
------	---

2.3.3.5 Custom conversion factor

Description

Conversion factor for user specific standard mass flow values related to SI mass units kg.

Setting	-
Default	1.0

Related

Path	Setup → Totalizers → Totalizer 3 → Custom conversion factor
------	---

2.3.3.6 Decimal places

Description

Sets the decimal places for the process value displayed in the local display.

Setting	Auto; No decimal place; 1 decimal place; 2 decimal places; 3 decimal places; 4 decimal places; 5 decimal places; 6 decimal places
Default	2 decimal places

Related

Path	Setup → Totalizers → Totalizer 3 → Decimal places
------	---

2.3.3.7 Direction**Description**

Totalizer 3 direction.

Setting	Forward and backward; Forward; Backward; Hold
Default	Forward

Related

Path	Setup → Totalizers → Totalizer 3 → Direction
------	--

2.3.3.8 Fail-safe behaviour**Description**

Behavior of the totalizer during the occurrence of bad input value.

Setting	RUN; totalization is continued using the bad input value; HOLD; totalization is stopped; MEMORY; totalization is continued based on the last incoming good value
Default	RUN; totalization is continued using the bad input value

Related

Path	Setup → Totalizers → Totalizer 3 → Fail safe mode
------	---

2.3.3.9 Reset**Description**

Reset totalizer to zero.

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Totalizer 3 → Reset
------	--

2.3.3.10 Preset

Description

Reset Totalizer 3 to selected preset value.

After selecting OK the user is asked for the PRESET value. The PRESET value units depend on the selected Process value.

Therefore the range of the Preset value is for:

- Mass flow: -9999997952 kg to +9999997952 kg
- Volume flow: -9999997952 m³ to +9999997952 m³
- Standard volume flow: -9999997952 Sm³ to +9999997952 Sm³

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Totalizer 3 → Preset
------	---

2.3.3.11 Alarm and warning limits

2.3.3.11.1 Upper alarm limit

Description

Alarm is triggered if Totalizer 3 value is above the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: +9999997952 kg Process value = Volume flow: +9999997952 m ³ Process value = Standard volume flow: +9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 3 → Alarm and warning limits → Upper alarm limit
------	---

2.3.3.11.2 Upper warning limit

Description

Warning is triggered if Totalizer 3 value is above the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: +9999997952 kg Process value = Volume flow: +9999997952 m ³ Process value = Standard volume flow: +9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 3 → Alarm and warning limits → Upper warning limit
------	---

2.3.3.11.3 Lower warning limit**Description**

Warning is triggered if Totalizer 3 value is below the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: -9999997952 kg Process value = Volume flow: -9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 3 → Alarm and warning limits → Lower warning limit
------	---

2.3.3.11.4 Lower alarm limit**Description**

Alarm is triggered if Totalizer 3 value is below the limit.

Setting	Process value = Mass flow: -9999997952 kg to +9999997952 kg Process value = Volume flow: -9999997952 m ³ to +9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: -9999997952 kg Process value = Volume flow: -9999997952 m ³ Process value = Standard volume flow: -9999997952 Sm ³

Related

Path	Setup → Totalizers → Totalizer 3 → Alarm and warning limits → Lower alarm limit
------	---

2.3.3.11.5 Hysteresis

Description

Hysteresis sets the alarm and warning limits. The hysteresis is the distance between the limits for activation and deactivation of an alarm/warning.

Setting	Process value = Mass flow: 0.00 kg to +9999997952 kg Process value = Volume flow: 0.00 m ³ to +9999997952 m ³ Process value = Standard volume flow: 0.00 Sm ³ to +9999997952 Sm ³
Default	Process value = Mass flow: 0.00 kg Process value = Volume flow: 0.00 m ³ Process value = Standard volume flow: 0.00 Sm ³

Related

Path	Setup → Totalizers → Totalizer 3 → Alarm and warning limits → Hysteresis
------	--

2.3.4 Reset all totalizers

Description

Reset command to reset totalizers 1 to 3 to zero.

Setting	Cancel; OK
Default	Cancel

Related

Path	Setup → Totalizers → Reset all totalizers
------	---

2.4 Inputs and outputs

The available configuration of the hardware functionality of input and output is described in the following table.

Table 2-3 Hardware and software configuration of the input/output channels

Channel	HW configuration (fixed when ordering)	SW configuration available to the user
1	Current output	Current (4-20 mA) HART
1	Modbus	Modbus

Channel	HW configuration (fixed when ordering)	SW configuration available to the user
2	Signal output	Outputs: • Current output (0/4-20 mA) • Frequency output • Pulse output • Status output – Alarm class – Alarm item – NAMUR status signals
3	Signal input/output	Inputs: • Current input (0/4-20 mA) • Digital input: – Totalizer reset – Remote zero adjust – Force outputs – Freeze process values Outputs: • Current output (0/4-20 mA) • Frequency output • Pulse output • Status output – Alarm class – Alarm item – NAMUR status signals
	Relay output	Status Output: • Alarm class • Alarm item • NAMUR status signals

Channel	HW configuration (fixed when ordering)	SW configuration available to the user
4	Signal input/output	Inputs: • Current input (0/4-20 mA) • Digital input: – Totalizer reset – Remote zero adjust – Force outputs – Freeze process values Outputs: • Current output (0/4-20 mA) • Frequency output • Pulse output • Status output – Alarm class – Alarm item – NAMUR status signals
	Relay output	Status Output: • Alarm class • Alarm item • NAMUR status signals
5 & 6	Input	Inputs: • RTD measurement – PT100, PT500 and PT1000 – 2, 3 and 4 wire connection • Current input (4 – 20 mA) (External digital sensor link (DSL) only)

Current output

All four channels can be configured as current output.

Current output configuration

The following process values can be assigned to the current output:

- Volume flow
- Mass flow
- Sound velocity
- Flow velocity
- Density
- Medium temperature

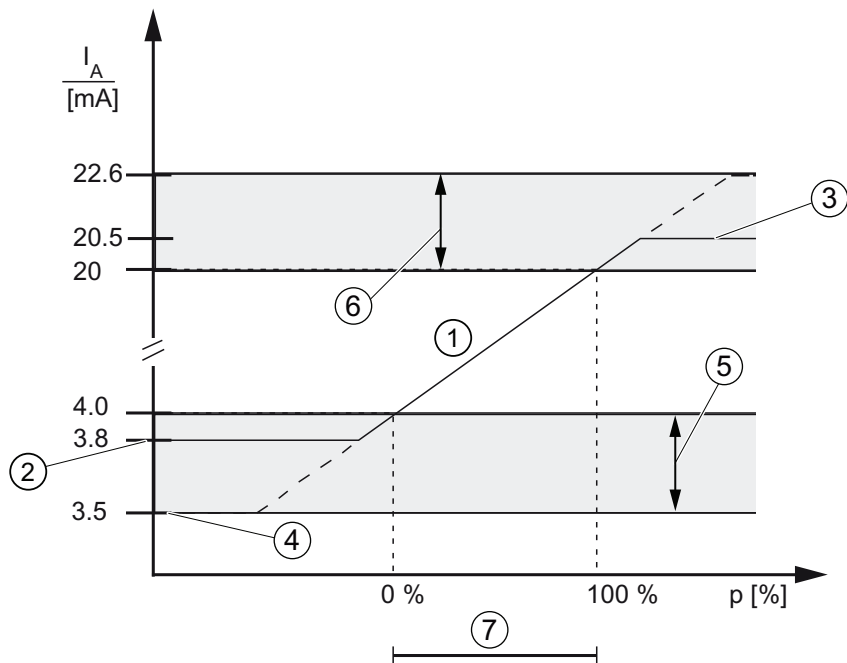
- Pressure
- Kinematic viscosity

The following process values are additionally available in devices for oil applications:

- Standard volume flow
- Standard kinematic viscosity
- Standard density
- Liquident - available with oil software option only
- API gravity
- Standard API gravity
- Specific gravity
- Standard specific gravity
- Rate of change - for hydrocarbon interface detection

All process variables are available through channels 1 to 4.

The accuracy specified for the analog output signal applies only within the range 4 to 20 mA. Lower limit (4 mA) and upper limit (20 mA) can be assigned to any specific flow values.



- ① Linear control range
- ② Lower saturation limit
- ③ Upper saturation limit
- ④ Lower fault current value
- ⑤ Recommended setting range for lower fault current
- ⑥ Recommended setting range for upper fault current
- ⑦ Measuring range

Figure 2-3 Current limits for NAMUR configuration

The fail safe current output signal can be selected to:

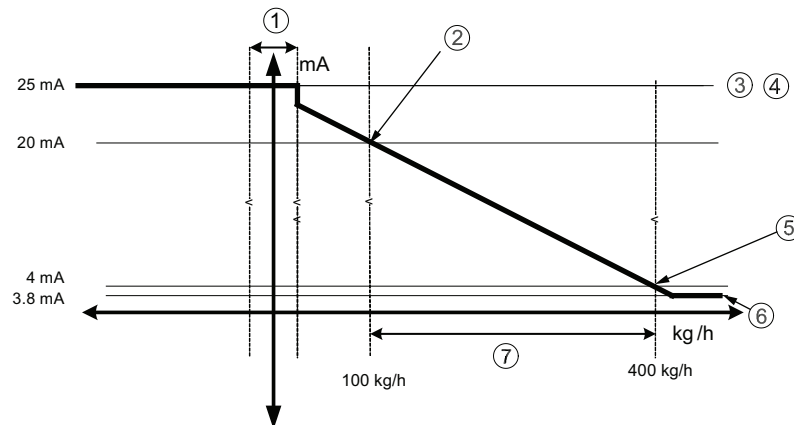
- Lower fault current (defined in the Loop current scale selection)
- Upper fault current (defined in the Loop current scale selection)
- Last valid value (the last process value before the failure occurred)
- Current value (actual measured value)
- Fail-safe value (within the range of 0 mA to 25 mA ¹⁾)

¹⁾ For channel 1 the range is 3.5 mA to 25 mA

Output scaling configuration

Below are four examples describing configuration possibilities for a current output.

Positive flow with negative scaling

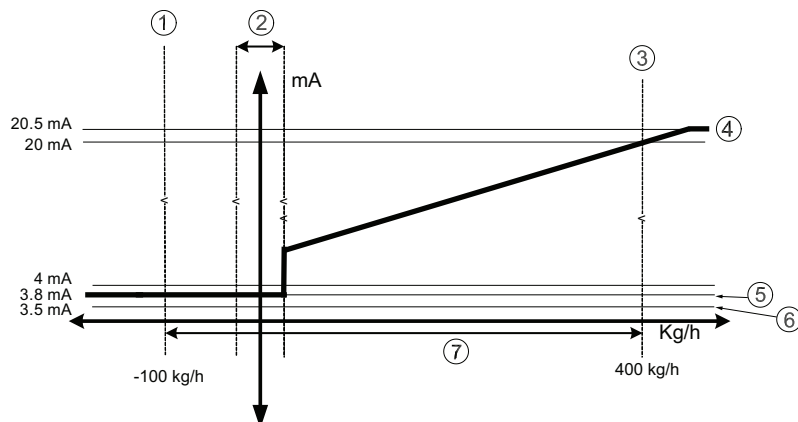


- ① Low flow cut-off
- ② Upper range value
- ③ Maximum output current
- ④ Upper fault current
- ⑤ Lower range value
- ⑥ Lower saturation limit
- ⑦ Span

Current output setting

- Process value = Mass flow
- Direction = Positive
- Loop current scale = 4-20 mA (maximum 25 mA)
- Upper range value = 100 kg/h
- Lower range value = 400 kg/h
- Fail-safe behaviour = Upper fault current
- Low flow cut-off = 25 kg/h

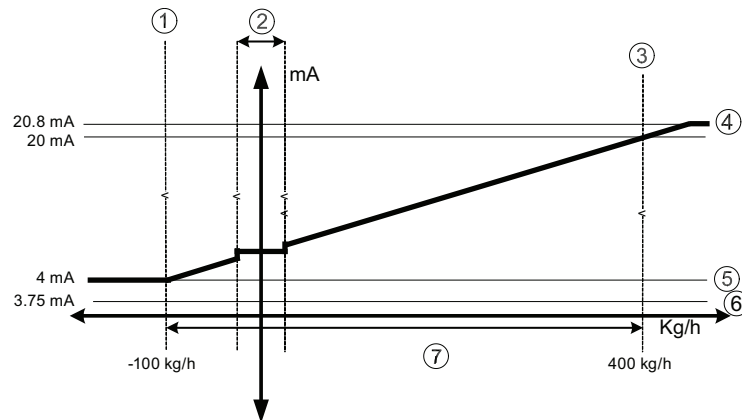
Positive flow across zero with positive scaling



- ① Lower range value
- ② Low flow cut-off
- ③ Upper range value
- ④ Upper saturation limit
- ⑤ Lower saturation limit
- ⑥ Lower fault current
- ⑦ Span

Current output setting

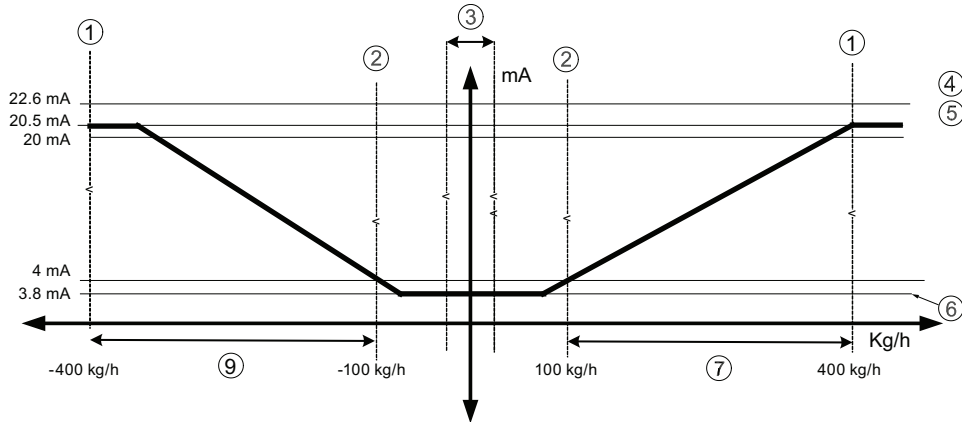
- Process value = Mass flow
- Direction = Bidirectional
- Loop current scale = 4-20 mA NAMUR
- Upper range value = 400 kg/h
- Lower range value = -100 kg/h
- Fail-safe behaviour = Upper fault current
- Low flow cut-off = 25 kg/h

Bidirectional flow across zero with positive scaling

- ① Lower range value
- ② Low flow cut-off
- ③ Upper range value
- ④ Upper saturation limit
- ⑤ Lower saturation limit
- ⑥ Lower fault current
- ⑦ Span

Current output setting

- Process value = Mass flow
- Direction = Bidirectional
- Loop current scale = 4-20 mA US
- Upper range value = 400 kg/h
- Lower range value = -100 kg/h
- Fail-safe behaviour = Minimum current
- Low flow cut-off = 25 kg/h

Bidirectional flow with symmetrical scaling

- ① Upper range value
- ② Lower range value
- ③ Low flow cut-off
- ④ Upper fault current
- ⑤ Upper saturation limit
- ⑥ Lower saturation limit
- ⑦ Span

Current output setting

- Process value = Mass flow
- Direction = Bidirectional (Symmetric)
- Loop current scale = 4-20 mA NAMUR
- Upper range value = 400 kg/h
- Lower range value = 100 kg/h
- Fail-safe behaviour = Upper fault current
- Low flow cut-off = 25 kg/h

Pulse output

The pulse output function supplies pulses equivalent to a configured amount of accumulated volume or mass. The pulse width is configured and the pulse repetition is proportional to the selected flow rate.

Pulse repetition

Pulse repetition is calculated as follows:

$$\text{Pulse repetition} = \frac{\text{Amount per pulse}}{\text{Measured flow rate}}$$

FC0026.01

Example

- Pulse output configuration (channels 2 to 4)
 - Operation mode = Pulse output
 - Process value = Mass flow
 - Amount per pulse = 1 kg
 - Pulse width = 1 ms
- Measured mass flow value = 10 kg/s (constant)

Result:

- Pulse repetition = 100 ms
- Output frequency = 10 pulses per second with a pulse width of 1 ms
- Remaining time between pulses is 99 ms

$$\text{Pulse repetition} = \frac{\text{Amount per pulse}}{\text{Measured flow rate}} \quad \text{FC0026.01}$$

Note

Pulse width must be selected with the view that remaining time is always greater than pulse width at the highest measured flow.

Frequency output

The frequency output function supplies a frequency (50% duty cycle) proportional to the selected process value.

Frequency is calculated as follows:

$$\text{Frequency} = \frac{\text{Measured mass flow value}}{\text{Upper range value} - \text{Lower range value}} \times (\text{Frequency value high} - \text{Frequency value low})$$

Example

This example shows how to calculate the output frequency for any measured flowrate:

Frequency output configuration:

- Operation mode = Frequency output (Channel 2 to 4)
- Process value = Mass flow
- Direction = Positive
- Frequency value high = 12 kHz
- Frequency value low = 2 kHz
- Upper range value = 15 kg/s
- Lower range value = 5 kg/s

Measured mass flow value = 7.5 kg/s (constant)

Result:

- Frequency = 4.5 kHz

Note

The connected equipment must be capable of registering the full range of frequencies configured.

Status output

The status output can be used to show alarm status and it can be signaled on Status output or Relay output.

Note**Flow direction warning**

The limit function for the current output can be used to signal the flow direction by setting the Lower warning limit for the Process value to 0. A warning will occur in case of negative flow.

This warning can be output on the status output if Status mode is set to Alarm item and the Process alarms (1) [relevant process value] below warning limit is selected.

Depending on the Status mode setting, multiple alarms can be signaled on the output and selected from the alarm class or the alarm item lists.

- Alarm class: Alarm will be signaled if alarm within the selected alarm class occurs.
 - Alarm item: Alarm will be signaled if selected alarm item occurs. It is possible to select multiple alarms to be signaled.
-

Note**Alarm class / NAMUR status signals**

The options depend on the setting selected in **Status icons**, either NAMUR status signals or Alarm class (Siemens Standard).

Redundancy mode (frequency)

If both channel 2 and channel 3 are configured as frequency outputs, channel 3 can be configured for redundancy mode to follow channel 2 shifted by 90° or 180°. If set to redundancy mode, channel 3 inherits all channel 2 settings. The flow direction will determine whether channel 3 is shifted before or after channel 2 at 90° shift.

The following examples describe the frequency functionalities for channel 2 and 3 in redundancy mode:

Channel 2 configured as positive and negative direction and channel 3 set to redundancy mode 90°

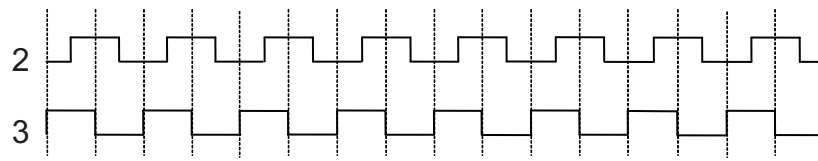


Figure 2-4 Positive flow - channel 3 leads by 90°

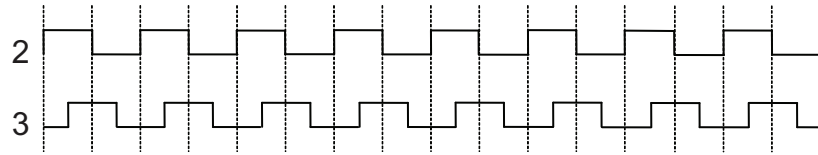


Figure 2-5 Negative flow - channel 3 lags by 90°

Channel 2 configured as positive direction and channel 3 set to redundancy mode 180°

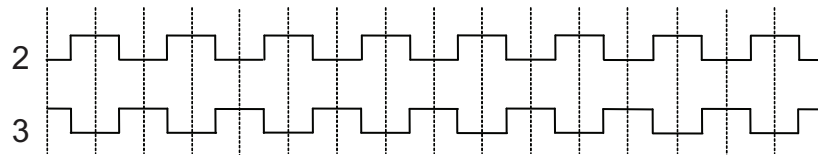


Figure 2-6 Positive/negative flow - channel 3 lags by 180°

Redundancy mode (pulse)

If both channel 2 and channel 3 are configured as pulse outputs, channel 3 can be configured for redundancy mode to follow channel 2 shifted by 90° or 180° of the functional width of the pulse. If set to redundancy mode, channel 3 inherits all channel 2 settings. The functional width of the pulse is two times the pulse "On" duration. The flow direction will determine whether channel 3 is shifted before or after channel 2.

The following examples describe the pulse functionalities for channel 2 and 3 in redundancy mode:

Channel 2 configured as positive and negative direction and channel 3 set to redundancy mode 90°

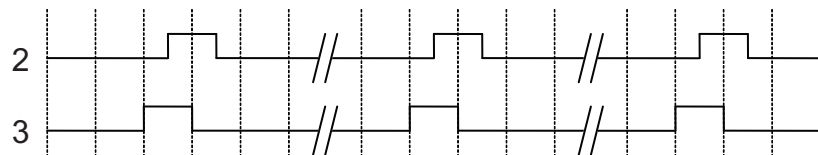


Figure 2-7 Positive flow - channel 3 leads by 90°

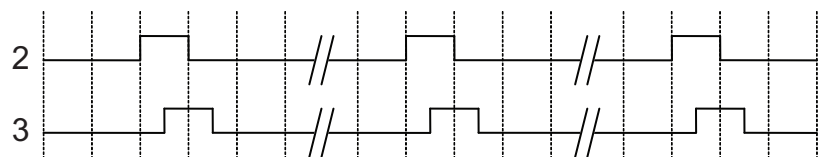


Figure 2-8 Negative flow - channel 3 lags by 90°

Channel 2 configured as positive direction and channel 3 set to redundancy mode 180°

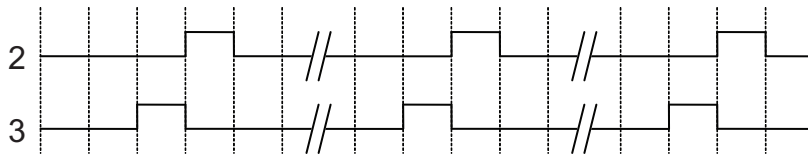


Figure 2-9 Positive flow - channel 3 leads by 180°

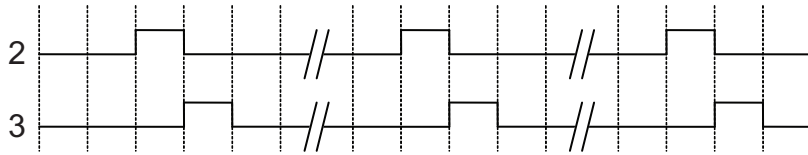


Figure 2-10 Negative flow - channel 3 lags by 180°

Current input

The current input allows to provide an additional process value to the device for compensation purposes.

The following current input options are available:

- Off
 - Disables the diagnosis of the current input channel.
- Pressure
 - Allocates the input current to the Process value Pressure.
- Medium temperature
 - Allocates the input current to the Process value Medium temperature
- Density
 - Allocates the input current to the Process value Density
- Kinematic viscosity
 - Allocates the input current to the Process value Kinematic viscosity
- Sensor temperature
 - Allocates the input current to the Diagnostic value Sensor temperature
- Auxiliary temperature
 - Allocates the input current to the Diagnostic value Auxiliary temperature

Digital input

If the input signal is activated with a logical signal (15 to 30 V DC) and the Polarity is set to Active high level, the meter carries out an activity selected in the menu Input function:

- Zero point adjustment
 - Starts the automatic zero point adjustment. This function employs the existing configurations and presumes that the process conditions are prepared for the zero point adjustment routine
- Reset totalizer
 - Resets one of the internal totalizers 1, 2 or 3 (depending on configuration)
- Reset all totalizers simultaneously
- Freeze process values
 - Freezes all currently measured values in the display and outputs
- Force process values
 - Forces all outputs to adopt the value selected in the menu. If the value 100% is selected, the current output will show 20 mA and the frequency output will show 10.000 kHz when the external output is activated

Note

Changing polarity

Changing the polarity triggers the signal input to execute the set functionality.

2.4.1 Channel 1 - output with HART

2.4.1.1 Loop current mode

Description

Sets operation of loop current. Only available with HART option.

Setting	Off; Loop current, 4..20 mA; Multidrop mode, 4 mA
Default	Loop current, 4..20 mA

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Loop current mode
------	---

2.4.1.2 Active operation (read only)

Description

Shows application possibilities.

Setting	Active operation not possible, use passive wiring; Active operation possible, hardware is able to drive the current loop
Default	-

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Active operation
------	--

2.4.1.3 PV selection**Description**

Primary value - Sets a process value as primary variable. Loop current represents the primary variable.

Setting	Volume flow; Mass flow; Standard volume flow (only hydrocarbon and gas applications); Flow velocity; Sound velocity; Liquident (only hydrocarbon applications); Density; Kinematic viscosity; Pressure; Medium temperature; Standard density (only hydrocarbon and gas applications); Standard kinematic viscosity (only hydrocarbon applications); API gravity (only hydrocarbon applications); Standard API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Standard specific gravity (only hydrocarbon and gas applications); Auxiliary temperature; Sensor temperature; Standardizing factor (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → PV selection
------	--

2.4.1.4 Direction**Description**

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Direction
------	---

2.4.1.5 Loop current scale**Description**

Sets current output scaling according to desired measurement range.

Format:

<Nominal range> (<lower fault current>) <lower saturation limit> to <upper saturation limit> (<upper fault current>) [<Description>]

Setting	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US
Default	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Current mode
------	--

2.4.1.6 Upper range value

Description

Sets value at 100% of measuring span and corresponds to a loop current of 20 mA.

Setting and Default are sensor specific, depending on the setting in PV selection and depending on the Units setting.

Setting	-10800000000.00 kg/h to +10800000000.00 kg/h
Default	21600000000.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Upper range value
------	---

2.4.1.7 Lower range value

Description

Sets value at 0% of measuring span and corresponds to a loop current of 0/4 mA.

Setting and Default are sensor specific, depending on the setting in PV selection and depending on the Units setting.

Setting	-10800000000.00 kg/h to +10800000000.00 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Lower range value
------	---

2.4.1.8 Fail-safe activation condition

Description

Defines the condition the fail-safe behaviour of the channel becomes active and determines the channel availability.

Setting	Invalid process value; Maintenance alarm or Failure (NAMUR)
Default	Maintenance alarm or Failure (NAMUR)

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Fail-safe activation condition
------	--

2.4.1.9 Damping value**Description**

Sets the Damping (filtering) to smooth out response to sudden changes in measurement.

An increase to Damping value increases response time of device, and affects digital value and loop current. If output values are noisy, increase Damping value. For faster response time, decrease Damping value. Find a value that meets requirements of signal stability and response time.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Damping value
------	---

2.4.1.10 Fail-safe behaviour**Description**

Defines behaviour when Fail-safe is initiated.

Setting	Lower fault current; Upper fault current; Last valid value; Current value; Fail-safe value
Default	Lower fault current

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Fail-safe behaviour
------	---

2.4.1.11 Fail-safe value**Description**

Output value in case of a fault and when fail safe mode configured to Fail-safe value.

Note**Important**

Values are specific to Channel 1.

Setting	3.5 mA to 25.0 mA
Default	3.5 mA

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Fail-safe value
------	---

2.4.1.12 Fail-safe minimum time**Description**

Minimum time the output stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 1 - output with HART → Fail-safe minimum time
------	--

2.4.2 Channel 2 - output**2.4.2.1 Operation mode****Description**

Operation mode - Sets the output functionality for channel operation.

Setting	Off; Current output; Frequency output; Pulse output; Status output
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Operation mode
------	--

2.4.2.2 Not available

menu is hidden

2.4.2.3 Active operation (read only)**Description**

Shows application possibilities. If the active operation is not possible, use passive wiring. If the active operation is possible, the hardware is able to drive the current loop.

Setting	Active operation not possible; Active operation possible
Default	

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Active operation
------	--

2.4.2.4 Fail-safe activation condition**Description**

Defines the condition the fail-safe behaviour of the channel becomes active and determines the channel availability.

Setting	Invalid process value; Maintenance alarm or Failure (NAMUR)
Default	Maintenance alarm or Failure (NAMUR)

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Fail-safe activation condition
------	--

2.4.2.5 Current output**2.4.2.5.1 Process value****Description**

Select process value for the current output.

Setting	Volume flow; Mass flow; Standard volume flow (only hydrocarbon and gas applications); Flow velocity; Sound velocity; Liquident (only hydrocarbon applications); Density; Kinematic viscosity; Pressure; Medium temperature; Standard density (only hydrocarbon and gas applications); Standard kinematic viscosity (only hydrocarbon applications); API gravity (only hydrocarbon applications); Standard API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Standard specific gravity (only hydrocarbon and gas applications); Auxiliary temperature; Sensor temperature; Standardizing factor (only hydrocarbon and gas applications)
Default	Mass flow

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Process value
------	--

2.4.2.5.2 Direction**Description**

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Direction
------	--

2.4.2.5.3 Loop current scale**Description**

Sets current output scaling according to desired measurement range.

Format:

<Nominal range> (<lower fault current>) <lower saturation limit> to <upper saturation limit>
(<upper fault current>) [<Description>]

Setting	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US 4 to 20 mA (0.00) 4.0 to 20.5 (22.0) 4 to 20 mA (2.00) 4.0 to 24.0 (25.0) 0 to 20 mA (0.00) 0.0 to 20.5 (22.0) 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Loop current scale
------	---

2.4.2.5.4 Upper range value**Description**

Sets value at 100% of measuring span and corresponds to a loop current of 20 mA.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	3682800.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Upper range value
------	--

2.4.2.5.5 Lower range value

Description

Sets value at 0% of measuring span and corresponds to a loop current of 0/4 mA.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Lower range value
------	--

2.4.2.5.6 Damping value

Description

Sets the Damping (filtering) to smooth out response to sudden changes in measurement.

An increase to Damping value increases response time of device, and affects digital value and loop current. If output values are noisy, increase Damping value. For faster response time, decrease Damping value. Find a value that meets requirements of signal stability and response time.

Setting	0.00 s to 100.00 s
Default	0.00 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Damping value
------	--

2.4.2.5.7 Fail-safe behaviour

Description

Current output reaction in case of a fault.

Setting	Lower fault current; Upper fault current; Last valid value; Current value; Fail-safe value
Default	Lower fault current

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Fail-safe behaviour
------	--

2.4.2.5.8 Fail-safe value

Description

Output value in case of a fault and when fail-safe behaviour configured to fail-safe value.

Setting	0.0 mA to 25.0 mA
Default	0.0 mA

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Fail-safe value
------	--

2.4.2.5.9 Fail-safe minimum time**Description**

Minimum time the output stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Current output → Fail-safe minimum time
------	---

2.4.2.6 Frequency output**2.4.2.6.1 Process value****Description**

Select process value for the frequency output.

Setting	Volume flow; Mass flow; Standard volume flow (only hydrocarbon and gas applications); Flow velocity; Sound velocity; Liquident (only hydrocarbon applications); Density; Kinematic viscosity; Pressure; Medium temperature; Standard density (only hydrocarbon and gas applications); Standard kinematic viscosity (only hydrocarbon applications); API gravity (only hydrocarbon applications); Standard API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Standard specific gravity (only hydrocarbon and gas applications); Auxiliary temperature; Sensor temperature; Standardizing factor (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Process value
------	--

2.4.2.6.2 Direction**Description**

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirection; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 2 -output → Frequency output → Direction
------	---

2.4.2.6.3 Frequency value high**Description**

Upper frequency value. Upper nominal output range boundary.

Setting	0.0 Hz to 12500.0 Hz
Default	10000.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Frequency value high
------	---

2.4.2.6.4 Frequency value low**Description**

Lower frequency value. Lower nominal output range boundary.

Setting	0.0 Hz to 12500.0 Hz
Default	0.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Frequency value low
------	--

2.4.2.6.5 Upper range value**Description**

Sets value at 100% of measuring span and corresponds to Frequency value high.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	+3682800.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Upper range value
------	--

2.4.2.6.6 Lower range value

Description

Sets value at 0% of measuring span and corresponds to Frequency value low.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	0.00 kg/h to +3682800.00 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Lower range value
------	--

2.4.2.6.7 Damping value

Description

Time constant of damping filter for frequency output signal.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Damping value
------	--

2.4.2.6.8 Fail-safe behaviour

Description

Frequency output reaction in case of a fault.

Setting	Minimum frequency; Maximum frequency; Last valid value; Current value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Fail-safe behaviour
------	--

2.4.2.6.9 Fail-safe value

Description

Output value in case of a fault and when fail-safe mode configured to Fail-safe value.

Setting	0.0 Hz to 12500.0 Hz
Default	0.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Fail-safe value
------	--

2.4.2.6.10 Fail-safe minimum time**Description**

Minimum time the output stays in fail safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Frequency output → Fail-safe minimum time
------	---

2.4.2.7 Pulse output**2.4.2.7.1 Process value****Description**

Select process value for the pulse output.

Setting	Mass flow; Volume flow; Standard volume flow rate (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Process value
------	--

2.4.2.7.2 Direction**Description**

Flow direction filter.

Setting	Positive; Negative; Bidirectional
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Direction
------	--

2.4.2.7.3 Pulse units

Description

Units of pulse duration values of Ch2 in pulse mode.

Setting	Volume: l; hl; m ³ ; gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush; Mass: g; kg; t; STon; T; oz; lb; Standard volume: NI; Nm ³ ; SI; Sft ³ ; Sm ³ ; custom units (see Custom units / Custom conversion factor)
Default	l

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Pulse units
------	--

2.4.2.7.4 Amount per pulse

Description

Amount of value to generate an output pulse.

Setting	0.0 l to 99999997952 l
Default	1.00 l

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Amount per pulse
------	---

2.4.2.7.5 Pulses per amount

Description

Number of pulses which will be output when configured amount is reached.

Setting	1 to 65535
Default	1

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Pulses per amount
------	--

2.4.2.7.6 Pulse width units

Description

Units of pulse duration value used to configure Ch2 pulse width.

Setting	s (seconds); ms (milliseconds); μs (micro seconds)
Default	s (seconds)

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Pulse width units
------	--

2.4.2.7.7 Pulse width**Description**

Pulse duration.

Setting	0.00 s to 4.00 s
Default	0.10 s

Related

Path	Setup → Inputs and outputs → Channel 2 - outputs → Pulse output → Pulse width
------	---

2.4.2.7.8 Polarity**Description**

Logical polarity of pulse output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Polarity
------	---

2.4.2.7.9 Fail-safe behaviour**Description**

Current output reaction in case of a fault.

Setting	Last valid value; Hold; Current value; Fail-safe value; Maximum pulses/s (only if CH3 operation mode is configured to Pulse output and CH3 redundancy mode is set to 90° or 180°. In case of a fault CH3 will output 0 pulses/s)
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Fail-safe behaviour
------	--

2.4.2.7.10 Fail-safe value**Description**

Output value in case of a fault and when fail-safe behaviour configured to fail-safe value.

Setting	0.0 pulses/s to 12500.0 pulses/s
Default	1.0 pulses/s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Fail-safe value
------	--

2.4.2.7.11 Fail-safe minimum time**Description**

Minimum time the output stays in fail-safe mode. Short events will be prolonged.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Pulse output → Fail-safe minimum time
------	---

2.4.2.8 Status output**2.4.2.8.1 Status mode****Description**

Select the functionality for the status output.

Setting	Alarm class; Alarm item
Default	Alarm class

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Status mode
------	---

2.4.2.8.2 Sensor alarms (1)**Description**

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	05 DSL voltages; 06 DSL Storage; 07 Flow measurement; 08 DSL internal; 14 Path 1: No signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 28 Configuration 1
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Sensor alarms (1)
------	---

2.4.2.8.3 Sensor alarms (2)**Description**

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Sensor alarms (2)
------	---

2.4.2.8.4 Process alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density above alarm limit; 105 Density above warning limit; 106 Density below warning limit; 107 Density below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Process alarms (1)
------	--

2.4.2.8.5 Process alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	132 Std. vol. flow above alarm limit; 133 Std. vol. flow above warning limit; 134 Std. vol. flow below warning limit; 135 Std. vol. flow below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Process alarms (2)
------	--

2.4.2.8.6 Process alarms (3)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. viscosity above alarm limit; 253 Standard kin. viscosity above warning limit; 254 Standard kin. viscosity below warning limit; 255 Standard kin. viscosity below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Process alarms (3)
------	--

2.4.2.8.7 Process alarms (4)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity above warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec. grav. above alarm limit; 273 Std. spec. grav. above warning limit; 274 Std. spec. grav. below warning limit; 275 Std. spec. grav. below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Process alarms (4)
------	--

2.4.2.8.8 Totalizer alarms

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	136 Totalizer 1 above alarm limit; 137 Totalizer 1 above warning limit; 138 Totalizer 1 - below warning limit; 139 Totalizer 1 below alarm limit; 140 Totalizer 2 - above alarm limit; 141 Totalizer 2 above warning limit; 142 Totalizer 2 below warning limit; 143 Totalizer 2 below alarm limit; 144 Totalizer 3 above alarm limit; 145 Totalizer 3 above warning limit; 146 Totalizer 3 below warning limit; 147 Totalizer 3 below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Totalizer alarms
------	--

2.4.2.8.9 Channel 1 - alarms

Description

Channel 1 - alarms

Setting	153 CH1 loop cur. in lower saturation; 154 CH1 loop cur. in upper saturation; 155 CH1 loop current deviation; 158 CH1 cable break
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Channel 1 - alarms
------	--

2.4.2.8.10 Device alarms

Description

Device alarms - If one of the selected events appears this affects the status icon, the related status output, and the alarm on the communication interface.

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disrupted; 159 Internal error in transmitter
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Device alarms
------	---

2.4.2.8.11 Input/output alarms (1)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Availability of certain settings depends on Hardware and Software configuration.

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Input/output alarms (1)
------	---

2.4.2.8.12 Input/output alarms (2)

Description

Input/output alarms (2)

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Input/output alarms (2)
------	---

2.4.2.8.13 Simulation alarms (1)

Description

Selection of alarm items that impact the output. Mainly simulation alarms. Applicable if Status mode = Alarm item.

Setting	160 Mass flow simulated; 161 Volume flow simulated; 162 Density simulated; 163 Medium temp. simulated; 167 Totalizer 1 simulated; 168 Totalizer 2 simulated; 169 Totalizer 3 simulated; 170 Loop current simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Simulation alarms (1)
------	---

2.4.2.8.14 Simulation alarms (2)

Description

Simulation alarms (2)

Setting	289 Sound velocity simulated; 290 Flow velocity simulated; 291 Pressure simulated; 292 Kin. viscosity simulated; 293 Aux. temperature simulated; 294 Sensor temperature simulated; 296 CH5 simulated; 297 CH6 simulated; 298 Std. volume flow simulated; 299 Standardizing factor simulated; 300 Std. kin. viscosity simulated; 301 Std. density simulated; 303 API gravity simulated; 304 Std. API gravity simulated; 305 Specific gravity simulated; 306 Std. spec. grav. simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Simulation alarms (2)
------	---

2.4.2.8.15 Alarm class

Description

Selection of alarm classes which impact the status output. Each diagnostic event is allocated to an alarm class. Applicable if Status mode = Alarm class and status icons = Standard

Setting	Maintenance alarm; Function check; Process value alarm; Process value warning; Maintenance demanded; Maintenance required
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Alarm class
------	---

2.4.2.8.16 NAMUR status signal

Description

Selection of NAMUR status signals which impact the status output. Each diagnostic event is allocated to a NAMUR status signal. Application if Status mode = Alarm class and Status icons = NAMUR

Setting	Failure; Function check; Out of specification; Maintenance required
Default	None

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → NAMUR status signal
------	---

2.4.2.8.17 Polarity

Description

Logical polarity of status output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Polarity
------	--

2.4.2.8.18 On delay

Description

Sets the time delay between alarm condition and activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → On delay
------	--

2.4.2.8.19 Off delay

Description

Set the time delay between resetting alarm condition and de-activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 2 - output → Status output → Off delay
------	---

2.4.3 Channel 3 - input/output

2.4.3.1 Operation mode

Description

Shows the configured Operation mode. Use Change operation mode to set the mode.

Read only.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Operation mode
------	--

2.4.3.2 Change operation mode**Description**

Sets operation mode.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Change operation mode
------	---

2.4.3.3 Active operation (read only)**Description**

Shows application possibilities.

Setting	Active operation not possible, use passive wiring; Active operation possible, hardware is able to drive the current loop
Default	-

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Active operation
------	--

2.4.3.4 Fail-safe activation condition**Description**

Defines the condition the fail-safe behaviour of the channel becomes active and determines the channel availability.

Setting	Invalid process value; Maintenance alarm or Failure (NAMUR)
Default	Maintenance alarm or Failure (NAMUR)

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Fail safe activation condition
------	--

2.4.3.5 Current output

2.4.3.5.1 Process value

Description

Select process value for the current output.

Process value - settings

Setting	Mass flow; Volume flow; Process density; Process media temperature; Sound velocity; Flow velocity; Process pressure; Process viscosity; RTD temperature 1; RTD temperature 2; Medium concentration; Measured current (Channel 5); Measured current (Channel 6); Standard volume flow rate (only hydrocarbon and gas applications); Standardizing factor (only hydrocarbon and gas applications); Base viscosity (only hydrocarbon applications); Base density (only hydrocarbon applications); Liquident (only hydrocarbon applications); API gravity (only hydrocarbon applications); Base API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Base specific gravity (only hydrocarbon applications); Rate of change (ROC) (only hydrocarbon applications); Auxiliary temperature; Sensor temperature; Measured current CH5; Measured current CH6; Standardizing factor (only hydrocarbon and gas applications)
Default	-

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Process value
------	--

2.4.3.5.2 Direction

Description

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Direction
------	--

2.4.3.5.3 Loop current scale

Description

Sets current output scaling according to desired measurement range. Format: <Nominal range> (<lower fault current>) <lower saturation limit> to <upper saturation limit> (<upper fault current>) [<Description>]

Setting	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US 4 to 20 mA (0.00) 4.0 to 20.5 (22.0) 4 to 20 mA (2.00) 4.0 to 24.0 (25.0) 0 to 20 mA (0.00) 0.0 to 20.5 (22.0) 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Loop current scale
------	---

2.4.3.5.4 Upper range value**Description**

Sets value at 100% of measuring span and corresponds to a loop current of 20 mA.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	+3682800.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Upper range value
------	--

2.4.3.5.5 Lower range value**Description**

Sets value at 0% of measuring span and corresponds to a loop current of 0/4 mA.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-10800000000.0 kg/h to +10800000000.0 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Lower range value
------	--

2.4.3.5.6 Damping value**Description**

Sets the Damping (filtering) to smooth out response to sudden changes in measurement.

An increase to Damping value increases response time of device, and affects digital value and loop current. If output values are noisy, increase Damping value. For faster response time, decrease Damping value. Find a value that meets requirements of signal stability and response time.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Damping value
------	--

2.4.3.5.7 Fail-safe behaviour

Description

Current output reaction in case of a fault.

Setting	Lower fault current; Upper fault current; Last valid value; Current value; Fail-safe value
Default	Lower fault current

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Fail-safe behaviour
------	--

2.4.3.5.8 Fail-safe value

Description

Output value in case of a fault and when fail-safe behaviour configured to Fail-safe value.

Setting	0.0 mA to 25.0 mA
Default	0.0 mA

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Fail-safe value
------	--

2.4.3.5.9 Fail-safe minimum time

Description

Minimum time the output stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current output → Fail-safe minimum time
------	---

2.4.3.6 Frequency output**2.4.3.6.1 Redundancy mode****Description**

Sets the Redundancy mode. The frequency on channel 3 will follow frequency on channel 2 with 90° or 180° shift.

Setting	Off. Channel 3 runs in independently; 90°. Channel 3 follows frequency on channel 2 with a 90° shift; 180°. Channel 3 follows frequency on channel 2 with a 180° shift
Default	Off. Channel 3 runs in independently

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Redundancy mode
------	--

2.4.3.6.2 Process value**Description**

Select process value for the frequency output.

Setting	Mass flow; Volume flow; Process density; Process media temperature; Sound velocity; Flow velocity; Process pressure; Process viscosity; RTD temperature 1; RTD temperature 2; Medium concentration; Measured current (Channel 5); Measured current (Channel 6); Standard volume flow rate (only hydrocarbon and gas applications); Standardizing factor (only hydrocarbon and gas applications); Base viscosity (only hydrocarbon applications); Base density (only hydrocarbon applications); Liquident (only hydrocarbon applications); API gravity (only hydrocarbon applications); Base API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Base specific gravity (only hydrocarbon applications); Rate of change (ROC) (only hydrocarbon applications); Auxiliary temperature; Sensor temperature; Measured current CH5; Measured current CH6; Standardizing factor (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Process value
------	--

2.4.3.6.3 Direction

Description

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Direction
------	--

2.4.3.6.4 Frequency value high

Description

Upper frequency value. Upper nominal output range boundary.

Setting	0.0 Hz to 12500.0 Hz
Default	10000.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Frequency value high
------	---

2.4.3.6.5 Frequency value low

Description

Lower frequency value. Lower nominal output range boundary.

Setting	0.0 Hz to 12500.0 Hz
Default	0.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Frequency value low
------	--

2.4.3.6.6 Upper range value

Description

Sets value at 100% of measuring span and corresponds to Frequency value high.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-10800000000.00 kg/h to +10800000000.00 kg/h
Default	+10800000000.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Upper range value
------	--

2.4.3.6.7 Lower range value**Description**

Sets value at 0% of measuring span and corresponds to Frequency value low.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-1080000000.00 kg/h to +10800000000.00 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Lower range value
------	--

2.4.3.6.8 Damping value**Description**

Time constant of damping filter for frequency output signal.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Damping value
------	--

2.4.3.6.9 Fail-safe behaviour**Description**

Frequency output reaction in case of a fault.

Setting	Minimum frequency; Maximum frequency; Last valid value; Current value; fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 3 -input/output → Frequency output → Fail-safe behaviour
------	---

2.4.3.6.10 Fail-safe value**Description**

Output value in case of a fault and when fail-safe mode configured to fail-safe value.

Setting	0.0 Hz to 12500.0 Hz
Default	0.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Fail-safe value
------	--

2.4.3.6.11 Fail-safe minimum time**Description**

Minimum time the output stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Frequency output → Fail-safe minimum time
------	---

2.4.3.7 Pulse output**2.4.3.7.1 Redundancy mode****Description**

Sets the redundancy mode. The pulses on channel 3 will follow pulses on channel 2 with 90° or 180° shift.

Setting	Off. Channel 3 runs in independently; 90°. Channel 3 follows pulses on channel 2 with a 90° shift; 180°. Channel 3 follows pulses on channel 2 with a 180° shift
Default	Off. Channel 3 runs in independently

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Redundancy mode
------	--

2.4.3.7.2 Process value

Description

Select process value for the pulse output.

Setting	Mass flow; Volume flow; Standard volume flow rate (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Process value
------	--

2.4.3.7.3 Direction

Description

Flow direction filter.

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Direction
------	--

2.4.3.7.4 Pulse units

Description

Units of pulse duration values of Ch3 in pulse mode.

Setting	Volume: l; hl; m ³ ; gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush; Mass: g; kg; t; STon; T; oz; lb; Standard volume: NI; Nm ³ ; Sl; Sft ³ ; Sm ³ ; custom units (see Custom units / Custom conversion factor)
Default	l

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Pulse units
------	--

2.4.3.7.5 Amount per pulse

Description

Amount of value to generate an output pulse.

Setting	0.0 l to 99999997952 l
Default	1.00 l

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Amount per pulse
------	---

2.4.3.7.6 Pulses per amount**Description**

Number of pulses which will be output when configured amount is reached.

Setting	1 to 65535
Default	1

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Pulses per amount
------	--

2.4.3.7.7 Pulse width units**Description**

Units of pulse duration value used to configure Ch3 pulse width.

Setting	s (seconds); ms (milliseconds); μ s (micro seconds)
Default	s (seconds)

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Pulse width units
------	--

2.4.3.7.8 Pulse width**Description**

Pulse duration.

Setting	0.00 s to 4.00 s
Default	0.10 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Pulse width
------	--

2.4.3.7.9 Polarity**Description**

Logical polarity of pulse output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Polarity
------	---

2.4.3.7.10 Fail-safe behaviour**Description**

Pulse output reaction in case of a fault.

Setting	Last valid value; Hold; Current value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Fail-safe behaviour
------	--

2.4.3.7.11 Fail-safe value**Description**

Output value in case of a fault and when fail-safe behaviour configured to Fail-safe value.

Setting	0.0 pulses/s to 12500.0 pulses/s
Default	1.0 pulses/s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Fail-safe value
------	--

2.4.3.7.12 Fail-safe minimum time**Description**

Minimum time the output stays in fail safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Fail-safe minimum time
------	---

2.4.3.8 Status output

2.4.3.8.1 Status mode

Description

Select the functionality for the status output.

Setting	Alarm class; Alarm item
Default	Alarm class

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Status mode
------	---

2.4.3.8.2 Sensor alarms (1)

Description

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	05 DSL voltages; 06 DSL Storage; 07 Flow measurement; 08 DSL internal; 09 Oil Density; 10 Oil Viscosity; 11 Oil spec. gravity; 14 Path 1: No signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 28 Configuration 1
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Sensor alarms (1)
------	---

2.4.3.8.3 Sensor alarms (2)

Description

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Sensor alarms (2)
------	---

2.4.3.8.4 Process alarms (1)

Description

Selection of alarm items that impact the output. Applicable if Stats mode = Alarm item.

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density above alarm limit; 105 Density above warning limit; 106 Density below warning limit; 107 Density below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Process alarms (1)
------	--

2.4.3.8.5 Process alarms (2)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	132 Std. vol. flow above alarm limit; 133 Std. vol. flow above warning limit; 134 Std. vol. flow below warning limit; 135 Std. vol. flow below alarm limit
Default	None

Related

Path	Setup → Inputs & outputs → Channel 3 - input/output → Status output → Process alarms (2)
------	--

2.4.3.8.6 Process alarms (3)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. viscosity above alarm limit; 253 Standard kin. viscosity above warning limit; 254 Standard kin. viscosity below warning limit; 255 Standard kin. viscosity below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Process alarms (3)
------	--

2.4.3.8.7 Process alarms (4)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.
For hydrocarbon and gas applications only.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec. grav. above alarm limit; 273 Std. spec. grav. above warning limit; 274 Std. spec. grav. below warning limit; 275 Std. spec. grav. below alarm limit; 276 Liquident above alarm limit; 277 Liquident above warning limit; 278 Liquident below warning limit; 279 Liquident below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Process alarms (4)
------	--

2.4.3.8.8 Totalizer alarms**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.
For hydrocarbon and gas applications only.

Setting	136 Totalizer 1 above alarm limit; 137 Totalizer 1 above warning limit; 138 Totalizer 1 - below warning limit; 139 Totalizer 1 below alarm limit; 140 Totalizer 2 above alarm limit; 141 Totalizer 2 above warning limit; 142 Totalizer 2 below warning limit; 143 Totalizer 2 below alarm limit; 144 Totalizer 3 above alarm limit; 145 Totalizer 3 above warning limit; 146 Totalizer 3 below warning limit; 147 Totalizer 3 below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Totalizer alarms
------	--

2.4.3.8.9 Device alarms**Description**

Device alarms - If one of the selected events appears this affects the status icon, the related status output, and the alarm on the communication interface.

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disrupted; 159 Internal error in transmitter
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Device alarms
------	---

2.4.3.8.10 Channel 1 alarms**Description**

Channel 1 alarms - The output is active when one of the alarm items occurs.

Setting	153 CH1 loop cur. in lower saturation; 154 CH1 loop cur. in upper saturation; 155 CH1 loop current deviation; 158 CH1 cable break
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output - Channel 1 alarms
------	--

2.4.3.8.11 Input/output alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item. Availability of certain settings depends on Hardware and Software configuration.

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Input/output alarms (1)
------	---

2.4.3.8.12 Input/output alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Availability of certain settings depends on Hardware and Software configuration.

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Input/output alarms (2)
------	---

2.4.3.8.13 Simulation alarms (1)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	160 Mass flow simulated; 161 Volume flow simulated; 162 Density simulated; 163 Medium temp. simulated; 166 Std. volume flow simulated; 167 Totalizer 1 simulated; 168 Totalizer 2 simulated; 169 Totalizer 3 simulated; 170 Loop current simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Simulation alarms (1)
------	---

2.4.3.8.14 Simulation alarms (2)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	289 Sound velocity simulated; 290 Flow velocity simulated; 291 Pressure simulated; 292 Kin. viscosity simulated; 293 Aux. temperature simulated; 294 Sensor temperature simulated; 296 CH5 simulated; 297 CH6 simulated; 288 Std. volume flow simulated; 299 Standardizing factor simulated; 300 Std. Kin. viscosity simulated; 301 Std. density simulated; 302 Liquident simulated; 303 API gravity simulated; 304 Std. API gravity simulated; 305 Specific gravity simulated; 306 Std. spec. grav. simulated; 307 Rate of change simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Simulation alarms (2)
------	---

2.4.3.8.15 Alarm class

Description

Selection of alarm classes which impact the status output. Each diagnostic event is allocated to an alarm class. Applicable if Status mode = Alarm class and Status icons = Standard.

Setting	Maintenance alarm; Function check; Process value alarm; Process value warning; Maintenance demanded; Maintenance required; None
Default	

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Alarm class
------	---

2.4.3.8.16 NAMUR status signal

Description

Selection of NAMUR status signals which impact the status output. Each diagnostic event is allocated to a NAMUR status signal. The menu is only visible if the parameter Status icons is set to NAMUR. The parameter Status icons can be found under Setup → Local display → Status Icons.

Setting	Failure; Function check; Out of specification; Maintenance required
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → NAMUR status signal
------	---

2.4.3.8.17 Polarity

Description

Logical polarity of status output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Polarity
------	--

2.4.3.8.18 On delay

Description

Sets the time delay between alarm condition and activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → On delay
------	--

2.4.3.8.19 Off delay**Description**

Set the time delay between resetting alarm condition and de-activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Status output → Off delay
------	---

2.4.3.9 Digital input**2.4.3.9.1 Input function****Description**

Sets the input functionality.

Setting	Off; Reset totalizer 1; Reset totalizer 2; Reset totalizer 3; Reset all totalizers; Zero point adjustment; Force outputs; Freeze process values
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Digital input → Input function
------	--

2.4.3.9.2 Forced value (Ch1)**Description**

Forced value when forcing is active. Only applicable for HART option when configured for Loop current, 4...20 mA mode (Not available for Multi-drop mode).

Setting	3.50 mA to 25.00 mA
Default	4.00 mA

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Digital input → Forced value (Ch1)
------	--

2.4.3.9.3 Forced value (Ch2)**Description**

Forced value when forcing is active.

Setting	3.50 mA to 25.00 mA
Default	4.00 mA

Current output

Setting	0.0 Hz to 12500.00 Hz
Default	1.00 Hz

Frequency output

Setting	0.00 pulses/s to 12500.00 pulses/s
Default	1.00 pulses/s

Pulse output

Setting	0; 1
Default	0

Status output

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Digital input → Forced value (Ch2)
------	--

2.4.3.9.4 Forced value (Ch4)**Description**

Forced value when forcing is active.

Setting	3.50 mA to 25.00 mA
Default	4.00 mA

Current output

Setting	0.0 Hz to 12500.00 Hz
Default	1.00 Hz

Frequency output

Setting	0.00 pulses/s to 12500.00 pulses/s
Default	1.00 pulses/s

Pulse output

Setting	0; 1
Default	0

Status output

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Digital input → Forced value (Ch4)
------	--

2.4.3.9.5 Delay time

Description

The debounce time used to delay the hardware input signal can be configured.

Setting	0.0 ms; 0.5 ms; 1 ms; 1.5 ms; 2 ms; 2.5 ms; 3 ms; 3.5 ms; 4 ms; 4.5 ms; 5 ms; 5.5 ms; 6 ms; 6.5 ms; 7 ms; 7.5 ms
Default	0.0 ms

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Digital input → Delay time
------	--

2.4.3.9.6 Polarity

Description

Logical polarity of discrete input signal.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Digital input → Polarity
------	--

2.4.3.10 Current input

2.4.3.10.1 Process value

Description

Assignment of the current input value to a process value.

Read only.

Setting	Off; Pressure; Density; Kinematic viscosity; Medium temperature; Sensor temperature (current input) Auxiliary temperature (current input)
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Process value
------	---

2.4.3.10.2 Change process value

Description

Change process value - selection enable the changing of the process value

Setting	Off; Pressure; Medium temperature; Density; Kinematic viscosity; Sensor temperature; Auxiliary temperature
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Change process value
------	--

2.4.3.10.3 Loop current scale

Description

Loop current scale - Selects current input scaling according to desired measurement range and fail-safe mode.

Setting	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR; 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US; 4 to 20 mA (0.00) 4.0 to 20.5 (22.0); 4 to 20 mA (2.00) 4.0 to 24.0 (25.0); 0 to 20 mA (0.00) 0.0 to 20.5 (22.0); 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Loop current scale
------	--

2.4.3.10.4 Upper range value

Description

Upper value that is mapped to the upper nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	-
Default	100000.0 Pa; 100.0 °C; 10000 kg/m ³ ; 1 m ² /s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Upper range value
------	---

2.4.3.10.5 Lower range value**Description**

Lower value that is mapped to the lower nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	-
Default	0.0 Pa; -3.0 °C; 0.08 kg/m ³ ; 0 m ² /s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Lower range value
------	---

2.4.3.10.6 Fail-safe behaviour**Description**

Reaction in case of a fault at the current input.

Setting	Last valid value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Fail-safe behaviour
------	---

2.4.3.10.7 Fail-safe value**Description**

Input value in case of a fault and when fail-safe behaviour is configured to Fail-safe value. Applicable if process value = Fail-safe value.

Setting	-
Default	0.0 Pa

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Fail-safe value
------	---

2.4.3.10.8 Fail-safe minimum time**Description**

Minimum time the input stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Current input → Fail-safe minimum time
------	--

2.4.4 Channel 3 - relay**2.4.4.1 Operation mode****Description**

Select the operation mode for the relay output.

Setting	Alarm class; Alarm item
Default	Alarm class

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Operation mode
------	---

2.4.4.2 Status mode**Description**

Select the functionality for the status output.

Setting	Alarm class; Alarm item
Default	Alarm class

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Status mode
------	--

2.4.4.3 Sensor alarms (1)**Description**

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	05 DSL voltages; 06 DSL Storage; 07 Flow measurement; 08 DSL internal; 09 Oil Density; 10 Oil Viscosity; 11 Oil spec. gravity; 14 Path 1: No signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 28
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Sensor alarms (1)
------	--

2.4.4.4 Sensor alarms (2)**Description**

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Sensor alarms (2)
------	--

2.4.4.5 Process alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density above alarm limit; 105 Density above warning limit; 106 Density below warning limit; 107 Density below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Process alarms (1)
------	---

2.4.4.6 Process alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	132 Std. vol. flow above alarm limit; 133 Std. vol. flow above warning limit; 134 Std. vol. flow below warning limit; 135 Std. vol. flow below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Process alarms (2)
------	---

2.4.4.7 Process alarms (3)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. viscosity above alarm limit; 253 Standard kin. viscosity above warning limit; 254 Standard kin. viscosity below warning limit; 255 Standard kin. viscosity below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Process alarms (3)
------	---

2.4.4.8 Process alarms (4)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec. grav. above alarm limit; 273 Std. spec. grav. above warning limit; 274 Std. spec. grav. below warning limit; 275 Std. spec. grav. below alarm limit; 276 Liquident above alarm limit; 277 Liquident above warning limit; 278 Liquident below warning limit; 279 Liquident below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Process alarms (4)
------	---

2.4.4.9 Totalizer alarms**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	136 Totalizer 1 above alarm limit; 137 Totalizer 1 above warning limit; 138 Totalizer 1 - below warning limit; 139 Totalizer 1 below alarm limit; 140 Totalizer 2 above alarm limit; 141 Totalizer 2 above warning limit; 142 Totalizer 2 below warning limit; 143 Totalizer 2 below alarm limit; 144 Totalizer 3 above alarm limit; 145 Totalizer 3 above warning limit; 146 Totalizer 3 below warning limit; 147 Totalizer 3 below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Totalizer alarms
------	---

2.4.4.10 Device alarms**Description**

Device alarms - If one of the selected events appears this affects the status icon, the related status output, and the alarm on the communication interface.

2.4.4.11 Device alarms - settings

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disrupted; 159 Internal error in transmitter
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Device alarms
------	--

2.4.4.12 Channel 1 alarms**Description**

Channel 1 alarms - The output is active when one of the alarm items occurs.

Setting	153 CH1 loop cur. in lower saturation; 154 CH1 loop cur. in upper saturation; 155 CH1 loop current deviation; 158 CH1 cable break
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Channel 1 alarms
------	---

2.4.4.13 Input/output alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Availability of certain settings depends on Hardware and Software configuration.

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Input/output alarms
------	--

2.4.4.14 Input/output alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Availability of certain settings depends on Hardware and Software configuration.

2.4.4.15 Input/output alarms (2) - settings

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Input/output alarms (2)
------	--

2.4.4.16 Simulation alarms (1)**Description**

Selection of alarm items that impact the output. Mainly simulation alarms. Applicable if Status mode = Alarm item.

Setting	160 Mass flow simulated; 161 Volume flow simulated; 162 Density simulated; 163 Medium temp. simulated; 166 Std. volume flow simulated; 167 Totalizer 1 simulated; 168 Totalizer 2 simulated; 169 Totalizer 3 simulated; 170 Loop current simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Simulation alarms (1)
------	--

2.4.4.17 Simulation alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	289 Sound velocity simulated; 290 Flow velocity simulated; 291 Pressure simulated; 292 Kin. viscosity simulated; 293 Aux. temperature simulated; 294 Sensor temperature simulated; 296 CH5 simulated; 297 CH6 simulated; 288 Std. volume flow simulated; 299 Standardizing factor simulated; 300 Std. Kin. viscosity simulated; 301 Std. density simulated; 302 Liquident simulated; 303 API gravity simulated; 304 Std. API gravity simulated; 305 Specific gravity simulated; 306 Std. spec. grav. simulated; 307 Rate of change simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Simulation alarms (2)
------	--

2.4.4.18 Alarm class**Description**

Selection of alarm classes which impact the status output. Each diagnostic event is allocated to an alarm class. Applicable if Status mode = Alarm class and Status icons = Standard.

Setting	Maintenance alarm; Function check; Process value alarm; Process value warning; Maintenance demanded; Maintenance required; None
Default	

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Alarm class
------	--

2.4.4.19 NAMUR status signal**Description**

Selection of NAMUR status signals which impact the status output. Each diagnostic event is allocated to a NAMUR status signal. The menu is only visible if the parameter Status icons is set to NAMUR. The parameter Status icons can be found under Setup → Local display → Status Icons.

Setting	Failure; Function Check; Out of specification; Maintenance Required
Default	None

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → NAMUR status signal
------	--

2.4.4.20 Polarity**Description**

Logical polarity of status output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Polarity
------	---

2.4.4.21 On delay**Description**

Sets the time delay between alarm condition and activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → On delay
------	---

2.4.4.22 Off delay**Description**

Set the time delay between resetting alarm condition and de-activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 3 - relay → Off delay
------	--

2.4.5 Channel 4 - input/output**2.4.5.1 Operation mode****Description**

Shows the configured Operation mode. Use Change operation mode to set the mode.

Read only.

Setting	Off; Current output; Frequency output; Pulse output; Signal output; Discrete input; Analog input
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Operation mode
------	--

2.4.5.2 Change operation mode**Description**

Sets operation mode.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Change operation mode
------	---

2.4.5.3 Active operation (read only)**Description**

Shows application possibilities.

Setting	Active operation not possible, use passive wiring; active operation possible, hardware is able to drive the current loop
Default	-

Related

Path	Setup → Inputs and outputs → Channel 4 -input/output → Active operation
------	---

2.4.5.4 Fail-safe activation condition**Description**

Defines the condition the fail-safe behaviour of the channel becomes active and determines the channel availability.

Setting	Invalid process value; Maintenance alarm or Failure (NAMUR)
Default	Maintenance alarm or Failure (NAMUR)

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Fail safe activation condition
------	--

2.4.5.5 Current output**2.4.5.5.1 Process value****Description**

Select process value for the current output.

Setting	Volume flow; Mass flow; Standard volume flow (only hydrocarbon and gas applications); Flow velocity; Sound velocity; Liquident (only hydrocarbon applications); Density; Kinematic viscosity; Pressure; Medium temperature; Standard density (only hydrocarbon and gas applications); Standard kinematic viscosity (only hydrocarbon applications); API gravity (only hydrocarbon applications); Standard API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Standard specific gravity (only hydrocarbon and gas applications); Rate of change; Auxiliary temperature; Sensor temperature; Measured current CH5; Measured current CH6; Standardizing factor (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Process value
------	--

2.4.5.5.2 Direction

Description

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Direction
------	--

2.4.5.5.3 Loop current scale

Description

Sets current output scaling according to desired measurement range. Format: <Nominal range> (<lower fault current>) <lower saturation limit> to <upper saturation limit> (<upper fault current>) [<Description>]

Setting	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US 4 to 20 mA (0.00) 4.0 to 20.5 (22.0) 4 to 20 mA (2.00) 4.0 to 24.0 (25.0) 0 to 20 mA (0.00) 0.0 to 20.5 (22.0) 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Loop current scale
------	---

2.4.5.5.4 Upper range value

Description

Sets value at 100% of measuring span and corresponds to a loop current of 20 mA.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-3682800.00 kg/h to +3682800.00 kg/h
Default	+3682800.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Upper range value
------	--

2.4.5.5.5 Lower range value

Description

Sets value at 0% of measuring span and corresponds to a loop current of 0/4 mA.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-10800000000.0 kg/h to +10800000000.0 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Lower range value
------	--

2.4.5.5.6 Damping value

Description

Sets the Damping (filtering) to smooth out response to sudden changes in measurement.

An increase to Damping value increases response time of device, and affects digital value and loop current. If output values are noisy, increase Damping value. For faster response time, decrease Damping value. Find a value that meets requirements of signal stability and response time.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Damping value
------	--

2.4.5.5.7 Fail-safe behaviour

Description

Current output reaction in case of a fault.

Setting	Lower fault current; Upper fault current; Last valid value; Current value; Fail-safe value
Default	Lower fault current

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Fail-safe behaviour
------	--

2.4.5.5.8 Fail-safe value

Description

Output value in case of a fault and when fail-safe mode configured to Fail-safe value.

Setting	0.0 mA to 25.0 mA
Default	0.0 mA

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Fail-safe value
------	--

2.4.5.5.9 Fail-safe minimum time**Description**

Minimum time the output stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current output → Fail-safe minimum time
------	---

2.4.5.6 Frequency output**2.4.5.6.1 Process value****Description**

Select process value for the frequency output.

Setting	Volume flow; Mass flow; Standard volume flow (only hydrocarbon and gas applications); Flow velocity; Sound velocity; Liquident (only hydrocarbon applications); Density; Kinematic viscosity; Pressure; Medium temperature; Standard density (only hydrocarbon and gas applications); Standard kinematic viscosity (only hydrocarbon applications); API gravity (only hydrocarbon applications); Standard API gravity (only hydrocarbon applications); Specific gravity (only hydrocarbon applications); Standard specific gravity (only hydrocarbon and gas applications); Rate of change; Auxiliary temperature; Sensor temperature; Measured current CH5; Measured current CH6; Standardizing factor (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output (4) → Frequency output → Process value
------	--

2.4.5.6.2 Direction

Description

Flow direction filter applicable for process values mass flow/volume flow/flow velocity/standard volume flow rate (only hydrocarbon and gas applications).

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Direction
------	--

2.4.5.6.3 Frequency value high

Description

Upper frequency value. Upper nominal output range boundary.

Setting	0.0 Hz to 12500.0 Hz
Default	10000.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Frequency value high
------	---

2.4.5.6.4 Frequency value low

Description

Lower frequency value. Lower nominal output range boundary.

Setting	0.0 Hz to 12500.0 Hz
Default	0.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Frequency value low
------	--

2.4.5.6.5 Upper range value

Description

Sets value at 100% of measuring span and corresponds to Frequency value high.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-10800000000.00 kg/h to +10800000000.00 kg/h
Default	+10800000000.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Upper range value
------	--

2.4.5.6.6 Lower range value**Description**

Sets value at 0% of measuring span and corresponds to Frequency value low.

Setting and Default are sensor specific, depending on the setting in Process value and depending on the Units setting.

Setting	-108000000.00 kg/h to +10800000000.00 kg/h
Default	0.00 kg/h

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Lower range value
------	--

2.4.5.6.7 Damping value**Description**

Time constant of damping filter for frequency output signal.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Damping value
------	--

2.4.5.6.8 Fail-safe behaviour**Description**

Frequency output reaction in case of a fault.

Setting	Minimum frequency; Maximum frequency; Last valid value; Current valid; fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Fail-safe behaviour
------	--

2.4.5.7.9 Fail-safe minimum time**Description**

Minimum time the output stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Fail-safe minimum time
------	---

2.4.5.6.10 Fail-safe value**Description**

Output value in case of a fault and when fail-safe mode configured to fail-safe value.

Setting	0.0 Hz to 12500.0 Hz
Default	0.0 Hz

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Frequency output → Fail-safe value
------	--

2.4.5.7 Pulse output**2.4.5.7.1 Process value****Description**

Select process value for the pulse output.

Setting	Mass flow; Volume flow; Standard volume flow rate (only hydrocarbon and gas applications)
Default	Volume flow

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Process value
------	--

2.4.5.7.2 Direction

Description

Flow direction filter.

Setting	Positive; Negative; Bidirectional; Bidirectional (symmetric)
Default	Positive

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Direction
------	--

2.4.5.7.3 Pulse units

Description

Units of pulse duration values of Ch4 in pulse mode.

Pulse units - settings

Setting	Volume: l; hl; m ³ ; gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush; Mass: g; kg; t; STon; T; oz; lb; Standard volume: NI; Nm ³ ; SI; Sft ³ ; Sm ³ ; custom units (see Custom units / Custom conversion factor)
Default	l

Related

Path	Setup → Inputs and outputs → Channel 3 - input/output → Pulse output → Pulse units
------	--

2.4.5.7.4 Custom units

Description

User specific string to define custom pulse units.

Setting	-
Default	-

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Custom units
------	---

2.4.5.7.5 Custom conversion factor

Description

Conversion factor for user specific pulse values.

Setting	-
Default	-

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse outputs → Custom conversion factor
------	--

2.4.5.7.6 Amount per pulse**Description**

Amount of value to generate an output pulse.

Setting	0.0 l to 99999997952 l
Default	1.00 l

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Amount per pulse
------	---

2.4.5.7.7 Pulses per amount**Description**

Number of pulses which will be output when configured amount is reached.

Setting	1 to 65535
Default	1

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Pulses per amount
------	--

2.4.5.7.8 Pulse width units**Description**

Units of pulse duration value used to configure Ch4 pulse width.

Setting	s (seconds); ms (milliseconds); μ s (micro seconds)
Default	s (seconds)

Related

Path	Setup → Inputs & outputs → Channel 4 - input/output → Pulse output → Pulse width units
------	--

2.4.5.7.9 Polarity

Description

Logical polarity of pulse output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Polarity
------	---

2.4.5.7.10 Fail-safe behaviour

Description

Current output reaction in case of a fault.

Setting	Last valid value; Hold; Current value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Fail safe behaviour
------	--

2.4.5.7.11 Fail-safe value

Description

Output value in case of a fault and when fail-safe behaviour configured to Fail-safe value.

Setting	0.0 pulses/s to 12500.0 pulses/s
Default	1.0 pulses/s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Fail-safe value
------	--

2.4.5.7.12 Fail-safe minimum time

Description

Minimum time the output stays in fail safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Pulse output → Fail-safe minimum time
------	---

2.4.5.8 Status output**2.4.5.8.1 Status mode****Description**

Select the functionality for the status output.

Setting	Alarm class; Alarm item
Default	Alarm class

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Status mode
------	---

2.4.5.8.2 Sensor alarms (1)**Description**

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	05 DSL voltages; 06 DSL Storage; 07 Flow measurement; 08 DSL internal; 09 Oil Density; 10 Oil Viscosity; 11 Oil spec. gravity; 14 Path 1: No signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 28 Configuration 1
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Sensor alarms (1)
------	---

2.4.5.8.3 Sensor alarms (2)**Description**

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Sensor alarms (2)
------	---

2.4.5.8.4 Process alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Stats mode = Alarm item.

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density above alarm limit; 105 Density above warning limit; 106 Density below warning limit; 107 Density below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Process alarms (1)
------	--

2.4.5.8.5 Process alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon applications only.

Setting	132 Std. vol. flow above alarm limit; 133 Std. vol. flow above warning limit; 134 Std. vol. flow below warning limit; 135 Std. vol. flow below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Process alarms (2)
------	--

2.4.5.8.6 Process alarms (3)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. viscosity above alarm limit; 253 Standard kin. viscosity above warning limit; 254 Standard kin. viscosity below warning limit; 255 Standard kin. viscosity below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Process alarms (3)
------	--

2.4.5.8.7 Process alarms (4)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.
For hydrocarbon applications only.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity above warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec. grav. above alarm limit; 273 Std. spec. grav. above warning limit; 274 Std. spec. grav. below warning limit; 275 Std. spec. grav. below alarm limit; 276 Liquident above alarm limit; 277 Liquident above warning limit; 278 Liquident below warning limit; 279 Liquident below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Process alarms (4)
------	--

2.4.5.8.8 Totalizer alarms**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	136 Totalizer 1 above alarm limit; 137 Totalizer 1 above warning limit; 138 Totalizer 1 - below warning limit; 139 Totalizer 1 below alarm limit; 140 Totalizer 2 above alarm limit; 141 Totalizer 2 above warning limit; 142 Totalizer 2 below warning limit; 143 Totalizer 2 below alarm limit; 144 Totalizer 3 above alarm limit; 145 Totalizer 3 above warning limit; 146 Totalizer 3 below warning limit; 147 Totalizer 3 below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Totalizer alarms
------	--

2.4.5.8.9 Device alarms**Description**

Device alarms - If one of the selected events appears this affects the status icon, the related status output, and the alarm on the communication interface.

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disrupted; 159 Internal error in transmitter
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Device alarms
------	---

2.4.5.8.10 Channel 1 alarms**Description**

Channel 1 alarms - The output is active when one of the alarm items occurs.

Setting	153 CH1 loop cur. in lower saturation; 154 CH1 loop cur. in upper saturation; 155 CH1 loop current deviation; 158 CH1 cable break
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output - Channel 1 alarms
------	--

2.4.5.8.11 Input/output alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Input/output alarms (1)
------	---

2.4.5.8.12 Input/output alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Input/output alarms (2)
------	---

2.4.5.8.13 Simulation alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	160 Mass flow simulated; 161 Volume flow simulated; 162 Density simulated; 163 Medium temp. simulated; 166 Std. volume flow simulated; 167 Totalizer 1 simulated; 168 Totalizer 2 simulated; 169 Totalizer 3 simulated; 170 Loop current simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Simulation alarms (1)
------	---

2.4.5.8.14 Simulation alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	289 Sound velocity simulated; 290 Flow velocity simulated; 291 Pressure simulated; 292 Kin. viscosity simulated; 293 Aux. temperature simulated; 294 Sensor temperature simulated; 296 CH5 simulated; 297 CH6 simulated; 288 Std. volume flow simulated; 299 Standardizing factor simulated; 300 Std. Kin. viscosity simulated; 301 Std. density simulated; 302 Liquident simulated; 303 API gravity simulated; 304 Std. API gravity simulated; 305 Specific gravity simulated; 306 Std. spec. grav. simulated; 307 Rate of change simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Simulation alarms (2)
------	---

2.4.5.8.15 Alarm class**Description**

Selection of alarm classes which impact the status output. Each diagnostic event is allocated to an alarm class. Applicable if Status mode = Alarm class and Status icons = Standard.

Setting	Maintenance alarm; Function check; Process value alarm; Process value warning; Maintenance demanded; Maintenance required; None
Default	

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Alarm class
------	---

2.4.5.8.16 NAMUR status signal**Description**

Selection of NAMUR status signals which impact the status output. Each diagnostic event is allocated to a NAMUR status signal. Application if Status mode = Alarm class and Status icons = NAMUR

Setting	Failure; Function check; Out of specification; Maintenance required
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → NAMUR status signal
------	---

2.4.5.8.17 Polarity**Description**

Logical polarity of status output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Polarity
------	--

2.4.5.8.18 On delay**Description**

Sets the time delay between alarm condition and activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs & outputs → Channel 4 - input/output → Status output → On delay
------	--

2.4.5.8.19 Off delay**Description**

Set the time delay between resetting alarm condition and de-activating the output.

Setting	0.0 s to 100.0 s
Default	0.0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Status output → Off delay
------	---

2.4.5.9 Digital input**2.4.5.9.1 Input function****Description**

Sets the input functionality.

Setting	Off; Reset totalizer 1; Reset totalizer 2; Reset totalizer 3; Reset all totalizers; Zero point adjustment; Force outputs; Freeze process values
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Digital input → Input function
------	--

2.4.5.9.2 Forced value (Ch1)**Description**

Forced value when forcing is active. Only applicable for HART option when configured for Loop current, 4...20 mA mode (Not available for Multi-drop mode).

Setting	3.50 mA to 25.00 mA
Default	4.00 mA

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Digital input → Forced value (Ch1)
------	--

2.4.5.9.3 Forced value (Ch2)**Description**

Forced value when forcing is active.

Setting	3.5 mA to 25 mA
Default	4.0 mA

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Digital input → Forced value (Ch2)
------	--

2.4.5.9.4 Forced value (Ch3)**Description**

Forced value when forcing is active.

Setting	3.5 mA to 25 mA
Default	4.0 mA

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Digital input → Forced value (Ch3)
------	--

2.4.5.9.5 Delay time**Description**

The debounce time used to delay the hardware input signal can be configured.

Setting	0.0 ms; 0.5 ms; 1 ms; 1.5 ms; 2 ms; 2.5 ms; 3 ms; 3.5 ms; 4 ms; 4.5 ms; 5 ms; 5.5 ms; 6 ms; 6.5 ms; 7 ms; 7.5 ms
Default	0.0 ms

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Digital input → Delay time
------	--

2.4.5.9.6 Polarity

Description

Logical polarity of discrete input signal.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Digital input → Polarity
------	--

2.4.5.10 Current input

2.4.5.10.1 Process value

Description

Assignments of the current input value to a process value.
Read only.

Setting	Off; Pressure; Density; Kinematic viscosity; Medium temperature; Sensor temperature (current input) Auxiliary temperature (current input)
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Process value
------	---

2.4.5.10.2 Change process value

Description

Change process value - selection enable the changing of the process value

Setting	Off; Pressure; Medium temperature; Density; Kinematic viscosity; Sensor temperature; Auxiliary temperature
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Change process value
------	--

2.4.5.10.3 Loop current scale

Description

Loop current scale - Selects current input scaling according to desired measurement range and fail-safe mode.

Setting	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR; 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US; 4 to 20 mA (0.00) 4.0 to 20.5 (22.0); 4 to 20 mA (2.00) 4.0 to 24.0 (25.0); 0 to 20 mA (0.00) 0.0 to 20.5 (22.0); 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.50) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Loop current scale
------	--

2.4.5.10.4 Upper range value**Description**

Upper value that is mapped to the upper nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	-
Default	100000.0 Pa; 300.0 °C; 10000 kg/m ³ ; 1000000 cSt

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Upper range value
------	---

2.4.5.10.5 Lower range value**Description**

Lower value that is mapped to the lower nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	-
Default	0.0 Pa; 0.0 °C; 0.08 kg/m ³ ; 0 cSt

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Lower range value
------	---

2.4.5.10.6 Fail-safe behaviour**Description**

Reaction in case of a fault at the current input.

Setting	Last valid value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Fail-safe behaviour
------	---

2.4.5.10.7 Fail-safe value**Description**

Input value in case of a fault and when fail-safe behaviour is configured to Fail-safe value.
Applicable if process value = Fail-safe value.

Setting	-
Default	0.0 Pa

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Fail-safe value
------	---

2.4.5.10.8 Fail-safe minimum time**Description**

Minimum time the input stays in fail-safe mode.

Setting	0 s to 100 s
Default	0 s

Related

Path	Setup → Inputs and outputs → Channel 4 - input/output → Current input → Fail-safe minimum time
------	--

2.4.6 Channel 4 - relay**2.4.6.1 Operation mode****Description**

Select the operation mode for the relay output.

Setting	Off; Status output
Default	Status output

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Operation mode
------	---

2.4.6.2 Status mode

Description

Select the functionality for the status output.

Setting	Alarm class; Alarm item
Default	Alarm class

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Status mode
------	--

2.4.6.3 Sensor alarms (1)

Description

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	05 DSL voltages; 06 DSL Storage; 07 Flow measurement; 08 DSL internal; 09 Oil Density; 10 Oil Viscosity; 11 Oil spec. gravity; 14 Path 1: No signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 28 Configuration 1
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Sensor alarms (1)
------	--

2.4.6.4 Sensor alarms (2)

Description

Selection of alarm items that impact the output. Mainly sensor alarms. Applicable if Status mode = Alarm item.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Sensor alarms (2)
------	--

2.4.6.5 Process alarms (1)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density above alarm limit; 105 Density above warning limit; 106 Density below warning limit; 107 Density below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Process alarms (1)
------	---

2.4.6.6 Process alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon applications only.

Setting	132 Std. vol. flow above alarm limit; 133 Std. vol. flow above warning limit; 134 Std. vol. flow below warning limit; 135 Std. vol. flow below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Process alarms (2)
------	---

2.4.6.7 Process alarms (3)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. viscosity above alarm limit; 253 Standard kin. viscosity above warning limit; 254 Standard kin. viscosity below warning limit; 255 Standard kin. viscosity below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Process alarms (3)
------	---

2.4.6.8 Process alarms (4)

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec. grav. above alarm limit; 273 Std. spec. grav. above warning limit; 274 Std. spec. grav. below warning limit; 275 Std. spec. grav. below alarm limit; 276 Liquident above alarm limit; 277 Liquident above warning limit; 278 Liquident below warning limit; 279 Liquident below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Process alarms (4)
------	---

2.4.6.9 Totalizer alarms

Description

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	136 Totalizer 1 above alarm limit; 137 Totalizer 1 above warning limit; 138 Totalizer 1 - below warning limit; 139 Totalizer 1 below alarm limit; 140 Totalizer 2 above alarm limit; 141 Totalizer 2 above warning limit; 142 Totalizer 2 below warning limit; 143 Totalizer 2 below alarm limit; 144 Totalizer 3 above alarm limit; 145 Totalizer 3 above warning limit; 146 Totalizer 3 below warning limit; 147 Totalizer 3 below alarm limit
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Totalizer alarms
------	---

2.4.6.10 Device alarms

Description

Device alarms - If one of the selected events appears this affects the status icon, the related status output, and the alarm on the communication interface.

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disrupted; 159 Internal error in transmitter
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Device alarms
------	--

2.4.6.11 Channel 1 alarms**Description**

Channel 1 alarms - The output is active when one of the alarm items occurs.

Setting	153 CH1 loop cur. in lower saturation; 154 CH1 loop cur. in upper saturation; 155 CH1 loop current deviation; 158 CH1 cable break
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Channel 1 alarms
------	---

2.4.6.12 Input/output alarms (1)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

For hydrocarbon and gas applications only.

2.4.6.13 Input/output alarms (1) - settings

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 213 Invalid dosing configuration; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Input/output alarms (1)
------	--

2.4.6.14 Input/output alarms (2)**Description**

Selection of alarm items that impact the output. Applicable if Status mode = Alarm item.

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Input/output alarms (2)
------	--

2.4.6.15 Simulation alarms (1)**Description**

Selection of alarm items that impact the output. Mainly simulation alarms. Applicable if Status mode = Alarm item.

Setting	160 Mass flow simulated; 161 Volume flow simulated; 162 Density simulated; 163 Medium temp. simulated; 166 Std. volume flow simulated; 167 Totalizer 1 simulated; 168 Totalizer 2 simulated; 169 Totalizer 3 simulated; 170 Loop current simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Simulation alarms (1)
------	--

2.4.6.16 Simulation alarms (2)**Description**

Selection of alarm items that impact the output. Mainly simulation alarms. Applicable if Status mode = Alarm item.

2.4.6.17 Simulation alarms (2) - settings

Setting	289 Sound velocity simulated; 290 Flow velocity simulated; 291 Pressure simulated; 292 Kin. viscosity simulated; 293 Aux. temperature simulated; 294 Sensor temperature simulated; 296 CH5 simulated; 297 CH6 simulated; 298 Std. volume flow simulated; 299 Standardizing factor simulated; 300 Std. Kin. viscosity simulated; 301 Std. density simulated; 302 Liquident simulated; 303 API gravity simulated; 304 Std. API gravity simulated; 305 Specific gravity simulated; 306 Std. spec. grav. simulated; 307 Rate of change simulated
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Simulation alarms (2)
------	--

2.4.6.18 Alarm class**Description**

Selection of alarm classes which impact the status output. Each diagnostic event is allocated to an alarm class. Applicable if Status mode = Alarm class and Status icons = Standard.

Setting	Maintenance alarm; Function check; Process value alarm; Process value warning; Maintenance demanded; Maintenance required; None
Default	

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Alarm class
------	--

2.4.6.19 NAMUR status signal**Description**

Selection of NAMUR status signals which impact the status output. Each diagnostic event is allocated to a NAMUR status signal. Application if Status mode = Alarm class and Status icons = NAMUR

Setting	Failure; Function check; Out of specification; Maintenance required
Default	None

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → NAMUR status signal
------	--

2.4.6.20 Polarity**Description**

Logical polarity of status output.

Setting	Active high level; Active low level
Default	Active high level

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Polarity
------	---

2.4.6.21 On delay**Description**

Sets the time delay between alarm condition and activating the output.

Setting	0.00 s to 100.00 s
Default	0.00 s

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → On delay
------	---

2.4.6.22 Off delay**Description**

Set the time delay between resetting alarm condition and de-activating the output.

Setting	0.00 s to 100.00 s
Default	0.00 s

Related

Path	Setup → Inputs and outputs → Channel 4 - relay → Off delay
------	--

2.4.7 Channel 5 - input**2.4.7.1 Process value****Description**

Assignment of an RTD or current input value to a process value. Current input values are only available with external DSL option.

Setting	Off; Medium temperature (RTD); Sensor temperature (RTD); Auxiliary temperature (RTD); Pressure; Density; Kinematic viscosity; Medium temperature; Sensor temperature (current input); Auxiliary temperature (current input); Auxiliary input
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Process value
------	--

2.4.7.2 Loop current scale**Description**

Available only for FS230 with External DSL.

Loop current scale - Selects current input scaling according to desired measurement range and fail-safe mode.

Setting	4 to 20 mA (3.5) 3.8 to 20.5 (22.6) NAMUR; 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US; 4 to 20 mA (0.00) 4.0 to 20.5 (22.0); 4 to 20 mA (2.00) 4.0 to 24.0 (25.0); 0 to 20 mA (0.00) 0.0 to 20.5 (22.0); 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.5) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Loop current scale
------	---

2.4.7.3 Upper range value**Description**

Available only for FS230 with External DSL.

Upper value that is mapped to the upper nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	
Default	700000.0 Pa; 20.0 °C; 10000 kg/m3; 1 cSt

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Upper range value
------	--

2.4.7.4 Lower range value**Description**

Available only for FS230 with External DSL.

Lower value that is mapped to the Lower nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	
Default	700000.0 Pa; 20.0 °C; 10000 kg/m3; 1 cSt

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Lower range value
------	--

2.4.7.5 Fail-safe behaviour**Description**

Reaction in case of a fault at the current input.

Setting	Last valid value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Fail-safe behaviour
------	--

2.4.7.6 Fail-safe value**Description**

Input value in case of a fault and when fail-safe behaviour is configured to Fail-safe value.
Applicable if process value = Fail-safe value.

Setting	
Default	700000.0 Pa; 20.0 °C; 10000 kg/m3; 1 cSt

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Fail-safe value
------	--

2.4.7.7 RTD configuration**2.4.7.7.1 RTD type****Description**

Type of connected Resistance Temperature Detector (RTD).

Setting	100 ohms RTD; 500 ohms RTD; 1000 ohms RTD
Default	100 ohms RTD

Related

Path	Setup → Inputs and outputs → Channel 5 - input → RTD configuration → RTD type
------	---

2.4.7.7.2 RTD wire configuration**Description**

Wire configuration of connected RTD.

Setting	2-wire RTD; 3-wire RTD; 4-wire RTD
Default	4-wire RTD

Related

Path	Setup → Inputs and outputs → Channel 5 - input → RTD configuration → RTD wire configuration
------	---

2.4.7.7.3 RTD wire resistance

Description

Resistance of cables in a 2-wire RTD system.

Setting	0.0 ohms to 50.0 ohms
Default	0.0 ohms

Related

Path	Setup → Inputs and outputs → Channel 5 - input → RTD configuration → RTD wire resistance
------	--

2.4.7.8 Calibration

2.4.7.8.1 Offset

Description

Calibration offset.

Setting	-100 °C (-148.0 °F) to +100 °C (212.0 °F)
Default	0 °C (32° F)

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Calibration → Offset
------	---

2.4.7.8.2 Slope

Description

Calibration slope.

Setting	-
Default	1.0

Related

Path	Setup → Inputs and outputs → Channel 5 - input → Calibration → Slope
------	--

2.4.8 Channel 6 - input

2.4.8.1 Process value

Description

Assignment of RTD value to a process value. Current input values are only available with external DSL option.

Setting	Off; Medium temperature (RTD); Sensor temperature (RTD); Auxiliary temperature (RTD); Pressure; Density; Kinematic viscosity; Medium temperature; Sensor temperature (current input); Auxiliary temperature (current input); Auxiliary input
Default	Off

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Process value
------	--

2.4.8.2 Loop current scale

Description

Available only for FS230 with External DSL.

Loop current scale - Selects current input scaling according to desired measurement range and fail-safe mode.

Setting	4 to 20 mA (3.5) 3.8 to 20.5 (22.6) NAMUR; 4 to 20 mA (3.75) 4.0 to 20.8 (22.6) US; 4 to 20 mA (0.00) 4.0 to 20.5 (22.0); 4 to 20 mA (2.00) 4.0 to 24.0 (25.0); 0 to 20 mA (0.00) 0.0 to 20.5 (22.0); 0 to 20 mA (0.00) 0.0 to 24.0 (25.0)
Default	4 to 20 mA (3.5) 3.8 to 20.5 (22.6) NAMUR

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Loop current scale
------	---

2.4.8.3 Upper range value

Description

Available only for FS230 with External DSL.

Upper value that is mapped to the upper nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	
Default	700000.0 Pa; 20.0 °C; 10000 kg/m3; 1 cSt

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Upper range value
------	--

2.4.8.4 Lower range value**Description**

Available only for FS230 with External DSL.

Lower value that is mapped to the Lower nominal range boundary selected by current mode. Default values and limits are dependent on selected process value.

Setting	
Default	700000.0 Pa; 20.0 °C; 10000 kg/m3; 1 cSt

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Lower range value
------	--

2.4.8.5 Fail-safe behaviour**Description**

Reaction in case of a fault at the current input.

Setting	Last valid value; Fail-safe value
Default	Last valid value

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Fail-safe behaviour
------	--

2.4.8.6 Fail-safe value**Description**

Input value in case of a fault and when fail-safe behaviour is configured to Fail-safe value. Applicable if process value = Fail-safe value.

Setting	
Default	700000.0 Pa; 20.0 °C; 10000 kg/m3; 1 cSt

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Fail safe value
------	--

2.4.8.7 RTD configuration

2.4.8.7.1 RTD type

Description

Type of connected RTD.

Setting	100 ohms RTD; 500 ohms RTD; 1000 ohms RTD
Default	100 ohms RTD

Related

Path	Setup → Inputs and outputs → Channel 6 - input → RTD configuration → RTD type
------	---

2.4.8.7.2 RTD wire configuration

Description

Wire configuration of connected RTD.

Setting	2-wire RTD; 3-wire RTD; 4-wire RTD
Default	4-wire RTD

Related

Path	Setup → Inputs and outputs → Channel 6 - input → RTD configuration → RTD wire configuration
------	---

2.4.8.7.3 RTD wire resistance

Description

Resistance of cables in a 2-wire RTD system.

Setting	0.0 ohms to 50.0 ohms
Default	0.0 ohms

Related

Path	Setup → Inputs and outputs → Channel 6 - input → RTD configuration → RTD wire resistance
------	--

2.4.8.8 Calibration

2.4.8.8.1 Offset

Description

Calibration offset.

Setting	-100 °C (-148 °F) to +100 °C (212 °F)
Default	0 °C (32 °F)

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Calibration → Offset
------	---

2.4.8.8.2 Slope**Description**

Calibration slope.

Setting	0.5 to 2.0
Default	1.0

Related

Path	Setup → Inputs and outputs → Channel 6 - input → Calibration → Slope
------	--

2.5 Date and time**2.5.1 Current date and time****Description**

Displays the current date and time.

Read only.

Setting	
Default	

Related

Path	Setup → Date and time → Current date and time
------	---

2.5.2 Set date and time**Description**

Sets current date and time for the device. This date and time is used for all timestamps of logged information.

Setting	
Default	

Related

Path	Setup → Date and time → Set date and time
------	---

2.6 Local display

The system can be configured to show up to six different views.

In view 1 only measurement or diagnostic views can be selected. In views 2 to 6 all view types can be selected.

Measurement views

- Single value
- Three values
- 1 value and bargraph
- 1 value and graph
- Six values

Operation view

- Totalizer

Alarm view

- Alarm list

Diagnostic view

- Six diagnostic values

2.6.1 Brightness

Description

Adjust backlight level to improve local display conditions.

Setting	0%; 10%; 20%; 30%; 40%; 50%; 60%; 70%; 80%; 90%; 100%
Default	50%

Related

Path	Setup → Local display → Brightness
------	------------------------------------

2.6.2 Backlight

Description

Select between always on or backlight switch-off after 10 minutes..

Setting	Automatic; Always on
Default	Automatic (30 s)

Related

Path	Setup → Local display → Backlight
------	-----------------------------------

2.6.3 Contrast

Description

Adjust contrast to improve local display conditions.

Setting	0%; 10%; 20%; 30%; 40%; 50%; 60%; 70%; 80%; 90%; 100%
Default	80%

Related

Path	Setup → Local display → Contrast
------	----------------------------------

2.6.4 Damping

2.6.4.1 Damping value

Description

The damping filter time constant.

Setting	0.0 to 100.0
Default	10 s

Related

Path	Setup → Local display → Damping → Damping value
------	---

2.6.4.2 Process values (1)

Description

Available process values for the meter.

Setting	Volume flow; Mass flow; Totalizer 1; Totalizer 2; Totalizer 3; Sound velocity; Flow velocity; Pressure; Kinematic viscosity; Standard volume flow; Standardizing factor; Standard kinematic viscosity; Standard density; Liquident; Density; Medium temperature
Default	

Related

Path	Setup → Local display → Damping → Process values (1)
------	--

2.6.4.3 Process values (2)**Description**

Available process values for the meter.

Setting	API gravity; Standard API gravity; Specific gravity; Standard specific gravity; Rate of change
Default	Specific gravity

Related

Path	Setup → Local display → Damping → Process values (2)
------	--

2.6.5 View 1**2.6.5.1 View****Description**

The display View 1 can be configured.

Setting	Single value; Three values; 1 value and bargraph; 1 value and graph; Six values; Six diagnostic values
Default	Three values

Related

If Single value is selected, **1st process value** must be configured.

If Three values is selected, **1st process value**, **2nd process value** and **3rd process value** must be configured.

If 1 value and bargraph is selected, **1st process value** must be configured.

If 1 value and graph is selected, **1st process value**, **Trend scale mode** and **Trend log time window** must be configured.

If Six values or Six diagnostic values is selected, **1st process value**, **2nd process value**, **3rd process value**, **4th process value**, **5th process value**, and **6th process value** must be configured.

Path	Setup → Local display → View 1 → View
------	---------------------------------------

2.6.5.2 1st value

Description

The display **1st process value** can be selected. This process value is shown in all view types.

Setting	Volume flow; Mass flow; Standard volume flow; Flow velocity; Sound velocity; Liquid identifier; Liquident; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature; Standard density; Standard Kinematic viscosity; API gravity; Standard API gravity; Specific gravity; Standard specific gravity
Default	Volume flow

Related

Path	Setup → Local display → View 1 → 1st value
------	--

2.6.5.3 Graph scale mode

Description

Graph scale mode

Setting	Auto; Fixed
Default	Auto

Related

Path	Setup → Local display → View 1 → Graph scale mode
------	---

2.6.5.4 2nd value

Description

The display **2nd process value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature
Default	Density

Related

This menu is only available if **View 1** is set to Three values, Six values or Six diagnostic values.

Path	Setup → Local display → View 1 → 2nd value
------	--

2.6.5.5 3rd value

Description

The display **3rd process value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature
Default	Medium temperature

Related

This menu is only available if **View 1** is set to Three values, Six values or Six diagnostic values.

Path	Setup → Local display → View 1 → 3rd value
------	--

2.6.5.6 4th process value**Description**

The display **4th process value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Process viscosity; Process pressure; Fluid temperature; Reference density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Sound velocity

Related

This menu is only available if **View 1** is set to Six values or Six diagnostic values.

Path	Setup → Local display → View 1 → 4th process value
------	--

2.6.5.7 5th process value**Description**

The display **5th process value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Process viscosity; Process pressure; Fluid temperature; Reference density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Process pressure

Related

This menu is only available if **View 1** is set to Six values or Six diagnostic values.

Path	Setup → Local display → View 1 → 5th process value
------	--

2.6.5.8 6th process value**Description**

The display **6th process value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Process viscosity; Process pressure; Fluid temperature; Reference density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Fluid temperature

Related

This menu is only available if **View 1** is set to Six values or Six diagnostic values.

Path	Setup → Local display → View 1 → 6th process value
------	--

2.6.5.9 Trend scale mode**Description**

The **Trend scale mode** can be selected with automatic scaling or fixed scaling.

Setting	Auto; Fixed
Default	Auto

Related

This menu is only available if **View** is set to 1 value and graph.

If Fixed is selected, **Trend scale lower limit** and **Trend scale upper limit** must be configured.

Path	Setup → Local display → View 1 → Trend scale mode
------	---

2.6.5.10 Trend log time window**Description**

The **Trend log time window** logging period (time axis length) can be selected.

Setting	1 minute; 5 minutes; 15 minutes; 30 minutes; 1 hour; 2 hours; 3 hours
Default	5 minutes

Related

This menu is only available if **View** is set to 1 value and graph.

Path	Setup → Local display → View 1 → Trend log time window
------	--

2.6.5.11 Trend scale lower limit**Description**

The **Trend scale lower limit** defines the scaling lower limit of the value axis for the fixed mode.

Setting	
Default	0

Related

This menu is only available if **Trend scale mode** is set to Fixed.

Path	Setup → Local display → View 1 → Trend scale lower limit
------	--

2.6.5.12 Trend scale upper limit

Description

The **Trend scale upper limit** defines the scaling upper limit of the value axis for the fixed mode.

Setting options	
Default setting	0

Related

This menu is only available if **Trend scale mode** is set to Fixed.

Path	Setup → Local display → View 1 → Trend scale upper limit
------	--

2.6.6 View 2

2.6.6.1 Enable or disable

Description

In this menu View 2 can be enabled.

Setting	Disabled; Enabled
Default	Enabled

Related

If Enabled is selected, all parameters for View 2 must be configured.

Path	Setup → Local display → View 2 → Enable or disable
------	--

2.6.6.2 View

Description

The display View 2 can be configured.

Setting	Single value; Three values; Totalizer; 1 value and bargraph; 1 value and graph; Six values; Six diagnostic values; Alarm list
Default	Single value

Related

If Single value or Dosing is selected, **1st process value** must be configured.

If Three values is selected, **1st process value**, **2nd process value** and **3rd process value** must be configured.

If Totalizer or 1 value and graph is selected, **1st process value**, **Trend scale mode** and **Trend log time window** must be configured.

If 1 value and bargraph is selected, **1st process value** must be configured.

If Six values or Six diagnostic values is selected, **1st process value**, **2nd process value**, **3rd process value**, **4th process value**, **5th process value**, and **6th process value** must be configured.

Path	Setup → Local display → View 2 → View
------	---------------------------------------

2.6.6.3 1st value

Description

The display **1st Process Value** can be selected. This process value is shown in all view types.

Setting	Volume flow; Mass flow; Standard volume flow; Flow velocity; Sound velocity; Liquid identifier; Liquident; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature; Standard density; Standard Kinematic viscosity; API gravity; Standard API gravity; Specific gravity; Standard specific gravity
Default	Volume flow

Related

Path	Setup → Local display → View 2 → 1st value
------	--

2.6.6.4 2nd process value

Description

The display **2nd Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Density

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 2 → 2nd Process Value
------	--

2.6.6.5 3rd process value

Description

The display **3rd Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Fluid Temperature

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 2 → 3rd Process Value
------	--

2.6.6.6 4th process value**Description**

The display **4th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Volumeflow

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 2 → 4th Process Value
------	--

2.6.6.7 5th process value**Description**

The display **5th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 2 → 5th Process Value
------	--

2.6.6.8 6th process value**Description**

The display **6th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 2

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 2 → 6th Process Value
------	--

2.6.6.9 Trend scale mode**Description**

The **Trend Scale Mode** can be selected with automatic scaling or fixed scaling.

Setting	Auto; Fixed
Default	Auto

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

If Fixed is selected, **Trend Scale Lower Limit** and **Trend Scale Upper Limit** must be configured.

Path	Setup → Display → View 2 → Trend Scale Mode
------	---

2.6.6.10 Trend log time window**Description**

The **Trend log time window** logging period (time axis length) can be selected.

Setting	1 Minute; 5 Minutes; 15 Minutes; 30 Minutes; 1 Hour; 2 Hours; 3 Hours
Default	5 Minutes

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

Path	Setup → Display → View 2 → Trend log time window
------	--

2.6.6.11 Trend scale lower limit**Description**

The **Trend Scale Lower Limit** defines the scaling lower limit of the value axis for the fixed mode.

Setting	
Default	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 2 → Trend Scale Lower Limit
------	--

2.6.6.12 Trend scale upper limit

Description

The **Trend Scale Upper Limit** defines the scaling upper limit of the value axis for the fixed mode.

Setting options	
Default setting	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 2 → Trend Scale Upper Limit
------	--

2.6.7 View 3

2.6.7.1 Enable or disable

Description

In this menu View 3 can be enabled.

Setting	Disabled; Enabled
Default	Enabled

Related

If Enabled is selected, all menus for View 3 must be configured.

Path	Setup → Display → View 3 → Enable or disable
------	--

2.6.7.2 View

Description

The display View 3 can be configured.

Setting	Single value; Three values; Totalizer; Dosing; 1 value and bargraph; 1 value and graph; Six values; Six diagnostic values; Alarm list
Default	1 value and bargraph

Related

If Single value or Dosing is selected, **1st process value** must be configured.

If Three values is selected, **1st process value**, **2nd process value** and **3rd process value** must be configured.

If Totalizer or 1 value and graph is selected, **1st process value**, **Trend scale mode** and **Trend log time window** must be configured.

If 1 value and bargraph is selected, **1st process value** must be configured.

If Six values or Six diagnostic values is selected, **1st process value**, **2nd process value**, **3rd process value**, **4th process value**, **5th process value**, and **6th process value** must be configured.

Path	Setup → Display → View 3 → View
------	---------------------------------

2.6.7.3 1st value

Description

The display **1st Process Value** can be selected. This process value is shown in all view types.

Setting	Volume flow; Mass flow; Standard volume flow; Flow velocity; Sound velocity; Liquid identifier; Liquident; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium Temperature; Standard density; Standard kinematic viscosity; API gravity; Standard API gravity; Specific gravity; Standard specific gravity
Default	Volume flow

Related

Path	Setup → Display → View 3 → 1st Value
------	--------------------------------------

2.6.7.4 Graphic scale mode

Description

Graphic scale mode

Setting	Auto; Fixed
Default	Auto

Related

Path	Setup → Display → View 3 → Graphic scale mode
------	---

2.6.7.5 2nd process value

Description

The display **2nd Process Value** can be selected.

Setting	Volume flow; Mass flow; Standard volume flow; Flow velocity; Sound velocity; Liquid identifier; Liquident; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium Temperature; Standard density; Standard kinematic viscosity; API gravity; Standard API gravity; Specific gravity; Standard specific gravity
Default	Flow velocity

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 2 → 2nd Process Value
------	--

2.6.7.6 3rd process value

Description

The display **3rd Process Value** can be selected.

Setting	Volume flow; Mass flow; Standard volume flow; Flow velocity; Sound velocity; Liquid identifier; Liquident; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium Temperature; Standard density; Standard kinematic viscosity; API gravity; Standard API gravity; Specific gravity; Standard specific gravity
Default	Sound velocity

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 3 → 3rd Process Value
------	--

2.6.7.7 4th process value

Description

The display **4th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Volume flow

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 3 → 4th Process Value
------	--

2.6.7.8 5th process value

Description

The display **5th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 3 → 5th Process Value
------	--

2.6.7.9 6th process value

Description

The display **6th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 2

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 3 → 6th Process Value
------	--

2.6.7.10 Trend scale mode

Description

The **Trend Scale Mode** can be selected with automatic scaling or fixed scaling.

Setting	Auto; Fixed
Default	Auto

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

If Fixed is selected, **Trend Scale Lower Limit** and **Trend Scale Upper Limit** must be configured.

Path	Setup → Display → View 3 → Trend Scale Mode
------	---

2.6.7.11 Trend log time window

Description

The **Trend log time window** logging period (time axis length) can be selected.

Setting	1 Minute; 5 Minutes; 15 Minutes; 30 Minutes; 1 Hour; 2 Hours; 3 Hours
Default	5 Minutes

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

Path	Setup → Display → View 3 → Trend log time window
------	--

2.6.7.12 Trend scale lower limit

Description

The **Trend Scale Lower Limit** defines the scaling lower limit of the value axis for the fixed mode.

Setting	
Default	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 3 → Trend Scale Lower Limit
------	--

2.6.7.13 Trend scale upper limit

Description

The **Trend Scale Upper Limit** defines the scaling upper limit of the value axis for the fixed mode.

Setting options	
Default setting	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 3 → Trend Scale Upper Limit
------	--

2.6.8 View 4

2.6.8.1 Enable or disable

Description

In this menu View 4 can be enabled.

Setting	Disabled; Enabled
Default	Enabled

Related

If Enabled is selected, all menus for View 4 must be configured.

Path	Setup → Display → View 4 → Enable or disable
------	--

2.6.8.2 View

Description

The display View 4 can be configured.

Setting	Single value; Three values; Totalizer; 1 value and bargraph; 1 value and graph; Six values; Six diagnostic values; Alarm list
Default	Six diagnostic values

Related

If Single Value or Dosing is selected, **1st Process Value** must be configured.

If Three Values is selected, **1st Process Value**, **2nd Process Value** and **3rd Process Value** must be configured.

If Totalizer or 1 Value and Graph is selected, **1st Process Value**, **Trend Scale Mode** and **Trend log time window** must be configured.

If 1 Value and Bargraph is selected, **1st Process Value** must be configured.

If Six Values or Six Diagnostic Values is selected, **1st Process Value**, **2nd Process Value**, **3rd Process Value**, **4th Process Value**, **5th Process Value**, and **6th Process Value** must be configured.

Path	Setup → Display → View 4 → View
------	---------------------------------

2.6.8.3 1st value**Description**

The display **1st Process Value** can be selected. This process value is shown in all view types.

Setting	Transmitter internal temperature; DSL temperature; Measured current CH5; Measured current CH6; Ch1 value; Ch3 value; Ch4 value; Auxiliary temperature; Sensor temperature; Reynolds number; RxGain up path 1; RxGain down path 1; SNR up path 1; SNR down path 1; Sound velocity path 1; Flow velocity path 1; Delta time path 1; Travel time up path 1; Travel time down path 1; Correlation factor path 1; Percentage of bursts accepted path1; Peak amplitude up path 1; Peak amplitude down path 1; Min acc travel time path 1; Min acc travel time path 1; Max acc travel time path 1
Default	Flow velocity path 1

Related

Path	Setup → Display → View 4 → 1st value
------	--------------------------------------

2.6.8.4 2nd value**Description**

The display **2nd Process Value** can be selected.

Setting	Transmitter internal temperature; DSL temperature; Measured current CH5; Measured current CH6; Ch1 value; Ch3 value; Ch4 value; Auxiliary temperature; Sensor temperature; Reynolds number; RxGain up path 1; RxGain down path 1; SNR up path 1; SNR down path 1; Sound velocity path 1; Flow velocity path 1; Delta time path 1; Travel time up path 1; Travel time down path 1; Correlation factor path 1; Percentage of bursts accepted path1; Peak amplitude up path 1; Peak amplitude down path 1; Min acc travel time path 1; Min acc travel time path 1; Max acc travel time path 1
Default	Flow velocity path 1

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 4 → 2nd Value
------	--------------------------------------

2.6.8.5 3rd value**Description**

The display **3rd Process Value** can be selected.

Setting	Transmitter internal temperature; DSL temperature; Measured current CH5; Measured current CH6; Ch1 value; Ch3 value; Ch4 value; Auxiliary temperature; Sensor temperature; Reynolds number; RxGain up path 1; RxGain down path 1; SNR up path 1; SNR down path 1; Sound velocity path 1; Flow velocity path 1; Delta time path 1; Travel time up path 1; Travel time down path 1; Correlation factor path 1; Percentage of bursts accepted path1; Peak amplitude up path 1; Peak amplitude down path 1; Min acc travel time path 1; Min acc travel time path 1; Max acc travel time path 1
Default	Sound velocity path 1

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 4 → 3rd Value
------	--------------------------------------

2.6.8.6 4th value**Description**

The display **4th Process Value** can be selected.

Setting	Transmitter internal temperature; DSL temperature; Measured current CH5; Measured current CH6; Ch1 value; Ch3 value; Ch4 value; Auxiliary temperature; Sensor temperature; Reynolds number; RxGain up path 1; RxGain down path 1; SNR up path 1; SNR down path 1; Sound velocity path 1; Flow velocity path 1; Delta time path 1; Travel time up path 1; Travel time down path 1; Correlation factor path 1; Percentage of bursts accepted path1; Peak amplitude up path 1; Peak amplitude down path 1; Min acc travel time path 1; Min acc travel time path 1; Max acc travel time path 1
Default	Flow velocity path 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 4 → 4th Value
------	--------------------------------------

2.6.8.7 5th value**Description**

The display **5th Process Value** can be selected.

Setting	Transmitter internal temperature; DSL temperature; Measured current CH5; Measured current CH6; Ch1 value; Ch3 value; Ch4 value; Auxiliary temperature; Sensor temperature; Reynolds number; RxGain up path 1; RxGain down path 1; SNR up path 1; SNR down path 1; Sound velocity path 1; Flow velocity path 1; Delta time path 1; Travel time up path 1; Travel time down path 1; Correlation factor path 1; Percentage of bursts accepted path1; Peak amplitude up path 1; Peak amplitude down path 1; Min acc travel time path 1; Min acc travel time path 1; Max acc travel time path 1
Default	Peak amplitude up path 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 4 → 5th value
------	--------------------------------------

2.6.8.8 6th value

Description

The display **6th Process Value** can be selected.

Setting	Transmitter internal temperature; DSL temperature; Measured current CH5; Measured current CH6; Ch1 value; Ch3 value; Ch4 value; Auxiliary temperature; Sensor temperature; Reynolds number; RxGain up path 1; RxGain down path 1; SNR up path 1; SNR down path 1; Sound velocity path 1; Flow velocity path 1; Delta time path 1; Travel time up path 1; Travel time down path 1; Correlation factor path 1; Percentage of bursts accepted path1; Peak amplitude up path 1; Peak amplitude down path 1; Min acc travel time path 1; Min acc travel time path 1; Max acc travel time path 1
Default	Flow velocity path 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 4 → 6th value
------	--------------------------------------

2.6.8.9 Trend scale mode

Description

The **Trend Scale Mode** can be selected with automatic scaling or fixed scaling.

Setting	Auto; Fixed
Default	Auto

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

If Fixed is selected, **Trend Scale Lower Limit** and **Trend Scale Upper Limit** must be configured.

Path	Setup → Display → View 4 → Trend Scale Mode
------	---

2.6.8.10 Trend log time window

Description

The **Trend log time window** logging period (time axis length) can be selected.

Setting	1 Minute; 5 Minutes; 15 Minutes; 30 Minutes; 1 Hour; 2 Hours; 3 Hours
Default	5 Minutes

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

Path	Setup → Display → View 4 → Trend log time window
------	--

2.6.8.11 Trend scale lower limit

Description

The **Trend Scale Lower Limit** defines the scaling lower limit of the value axis for the fixed mode.

Setting	
Default	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 4 → Trend Scale Lower Limit
------	--

2.6.8.12 Trend scale upper limit

Description

The **Trend Scale Upper Limit** defines the scaling upper limit of the value axis for the fixed mode.

Setting options	
Default setting	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 4 → Trend Scale Upper Limit
------	--

2.6.9 View 5

2.6.9.1 Enable or disable

Description

In this menu View 5 can be enabled.

Setting	Disabled; Enabled
Default	Enabled

Related

If Enabled is selected, all menus for View 5 must be configured.

Path	Setup → Display → View 5 → Enable or disable
------	--

2.6.9.2 View

Description

The display View 5 can be configured.

Setting	Single value; Three values; Totalizer; Dosing; 1 value and bargraph; 1 value and graph; Six values; Six diagnostic values; Alarm list
Default	Three values

Related

If Single Value or Dosing is selected, **1st Process Value** must be configured.

If Three Values is selected, **1st Process Value**, **2nd Process Value** and **3rd Process Value** must be configured.

If Totalizer or 1 Value and Graph is selected, **1st Process Value**, **Trend Scale Mode** and **Trend log time window** must be configured.

If 1 Value and Bargraph is selected, **1st Process Value** must be configured.

If Six Values or Six Diagnostic Values is selected, **1st Process Value**, **2nd Process Value**, **3rd Process Value**, **4th Process Value**, **5th Process Value**, and **6th Process Value** must be configured.

Path	Setup → Local display → View 5 → View
------	---------------------------------------

2.6.9.3 1st value

Description

The display **1st Process Value** can be selected. This process value is shown in all view types.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature
Default	Totalizer 1

Related

Path	Setup → Display → View 5 → 1st value
------	--------------------------------------

2.6.9.4 2nd value**Description**

The display **2nd Process Value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature
Default	Density

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 5 → 2nd value
------	--------------------------------------

2.6.9.5 3rd value**Description**

The display **3rd Process Value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature
Default	Medium temperature

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 5 → 3rd value
------	--------------------------------------

2.6.9.6 4th process value**Description**

The display **4th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Volume flow

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 5 → 4th Process Value
------	--

2.6.9.7 5th process value

Description

The display **5th Process Value** can be selected.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature
Default	Totalizer 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 5 → 5th value
------	--------------------------------------

2.6.9.8 6th process value

Description

The display **6th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 2

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 5 → 6th Process Value
------	--

2.6.9.9 Trend scale mode

Description

The **Trend Scale Mode** can be selected with automatic scaling or fixed scaling.

Setting	Auto; Fixed
Default	Auto

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

If Fixed is selected, **Trend Scale Lower Limit** and **Trend Scale Upper Limit** must be configured.

Path	Setup → Display → View 5 → Trend Scale Mode
------	---

2.6.9.10 Trend log time window

Description

The **Trend log time window** logging period (time axis length) can be selected.

Setting	1 Minute; 5 Minutes; 15 Minutes; 30 Minutes; 1 Hour; 2 Hours; 3 Hours
Default	5 Minutes

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

Path	Setup → Display → View 5 → Trend log time window
------	--

2.6.9.11 Trend scale lower limit

Description

The **Trend Scale Lower Limit** defines the scaling lower limit of the value axis for the fixed mode.

Setting	
Default	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 5 → Trend Scale Lower Limit
------	--

2.6.9.12 Trend scale upper limit

Description

The **Trend Scale Upper Limit** defines the scaling upper limit of the value axis for the fixed mode.

Setting options	
Default setting	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 5 → Trend Scale Upper Limit
------	--

2.6.10 View 6

2.6.10.1 Enable or disable

Description

In this menu View 6 can be enabled.

Setting	Disabled; Enabled
Default	Enabled

Related

If Enabled is selected, all menus for View 6 must be configured.

Path	Setup → Display → View 6 → Enable or disable
------	--

2.6.10.2 View

Description

The display View 6 can be configured.

Setting	Single value; Three values; Totalizer; Dosing; 1 value and bargraph; 1 value and graph; Six values; Six diagnostic values; Alarm list
Default	Alarm list

Related

If Single Value or Dosing is selected, **1st Process Value** must be configured.

If Three Values is selected, **1st Process Value**, **2nd Process Value** and **3rd Process Value** must be configured.

If Totalizer or 1 Value and Graph is selected, **1st Process Value**, **Trend Scale Mode** and **Trend log time window** must be configured.

If 1 Value and Bargraph is selected, **1st Process Value** must be configured.

If Six Values or Six Diagnostic Values is selected, **1st Process Value**, **2nd Process Value**, **3rd Process Value**, **4th Process Value**, **5th Process Value**, and **6th Process Value** must be configured.

Path	Setup → Local display → View 6 → View
------	---------------------------------------

2.6.10.3 1st process value

Description

The display **1st Process Value** can be selected. This process value is shown in all view types.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Massflow

Related

Path	Setup → Display → View 6 → 1st Process Value
------	--

2.6.10.4 2nd process value**Description**

The display **2nd Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Density

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 6 → 2nd Process Value
------	--

2.6.10.5 3rd process value**Description**

The display **3rd Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Fluid Temperature

Related

This menu is only available if **View** is set to Three Values, Six Values or Six Diagnostic Values.

Path	Setup → Display → View 6 → 3rd Process Value
------	--

2.6.10.6 4th process value**Description**

The display **4th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Volume flow

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 6 → 4th Process Value
------	--

2.6.10.7 5th process value

Description

The display **5th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 1

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 6 → 5th Process Value
------	--

2.6.10.8 6th process value

Description

The display **6th Process Value** can be selected.

Setting	Mass flow; Volume flow; Density; Fluid Temperature; Corrected Volume flow; Reference Density; Totalizer 1; Totalizer 2; Totalizer 3
Default	Totalizer 2

Related

This menu is only available if **View** is set to Six Values or Six Diagnostic Values.

Path	Setup → Display → View 6 → 6th Process Value
------	--

2.6.10.9 Trend scale mode

Description

The **Trend Scale Mode** can be selected with automatic scaling or fixed scaling.

Setting	Auto; Fixed
Default	Auto

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

If Fixed is selected, **Trend Scale Lower Limit** and **Trend Scale Upper Limit** must be configured.

Path	Setup → Display → View 6 → Trend Scale Mode
------	---

2.6.10.10 Trend log time window

Description

The **Trend log time window** logging period (time axis length) can be selected.

Setting	1 Minute; 5 Minutes; 15 Minutes; 30 Minutes; 1 Hour; 2 Hours; 3 Hours
Default	5 Minutes

Related

This menu is only available if **View** is set to Totalizer or 1 Value and Graph.

Path	Setup → Display → View 6 → Trend log time window
------	--

2.6.10.11 Trend scale lower limit

Description

The **Trend Scale Lower Limit** defines the scaling lower limit of the value axis for the fixed mode.

Setting	
Default	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 6 → Trend Scale Lower Limit
------	--

2.6.10.12 Trend scale upper limit

Description

The **Trend Scale Upper Limit** defines the scaling upper limit of the value axis for the fixed mode.

Setting options	
Default setting	0

Related

This menu is only available if **Trend Scale Mode** is set to Fixed.

Path	Setup → Display → View 6 → Trend Scale Upper Limit
------	--

2.6.11 Status icons

Description

Sets the type of status icons used for diagnostic events.

Setting	Standard; NAMUR
Default	Standard

Related

Path	Setup → Local display→ Status icons
------	-------------------------------------

Maintenance and diagnostics

3.1 Identification

3.1.1 Long tag

Description

Sets a unique tag name for device. Limited to 32 characters.

Setting	User-configurable
Default	-----; 32 characters (A, B, C, ... X, Y, Z, /, 1, 2, 3, ... 7, 8, 9)

Related

Path	Maintenance and diagnostics → Identification → Long tag
------	---

3.1.2 Descriptor

Description

Sets a unique description for the measurement point. Limited to 16 characters.

Setting	User-configurable
Default	-----; 16 characters (A, B, C, ... X, Y, Z, /, 1, 2, 3, ... 7, 8, 9)

Related

Path	Maintenance and diagnostics → Identification → Descriptor
------	---

3.1.3 Message

Description

Displays text message (written via engineering system) that can be used in any way. Limited to 32 characters.

Setting	User-configurable
Default	-----; 32 characters (A, B, C, ... X, Y, Z, /, 1, 2, 3, ... 7, 8, 9)

Related

Path	Maintenance and diagnostics → Identification → Message
------	--

3.1.4 Location

Description

Sets device location. Limited to 32 characters.

Setting	User-configurable
Default	-----; 32 characters (A, B, C, ... X, Y, Z, /, 1, 2, 3, ... 7, 8, 9)

Related

Path	Maintenance and diagnostics → Identification → Location
------	---

3.1.5 Installation date

Description

Sets the installation date of the device.

Setting	User-configurable
Default	-----; 16 characters (A, B, C, ... X, Y, Z, /, 1, 2, 3, ... 7, 8, 9)

Related

Path	Maintenance and diagnostics → Identification → Installation date
------	--

3.1.6 Manufacturer

Description

Displays the device manufacturer.

Setting	
Default	SIEMENS

Related

Path	Maintenance and diagnostics → Identification → Manufacturer
------	---

3.1.7 Product name

Description

Displays name of product. Also shown on device nameplate.

Setting	
Default	SITRANS FS230

Related

Path	Maintenance and diagnostics → Identification → Product name
------	---

3.1.8 Version (read only)**Description**

The product **Version** according to order can be viewed.

Setting	Standard; Hydrocarbon standard; Hydrocarbon CT; Gas standard; Gas CT
Default	Standard

Related

Path	Maintenance and diagnostics → Identification → Version
------	--

3.1.9 Order number (read only)**Description**

System order number (MLFB) can be viewed. The system order number consists of three parts. Also shown on the device nameplate.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → System order number
------	--

3.1.10 Serial number**Description**

Displays transmitter serial number. Also shown on the device nameplate.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Serial number
------	--

3.1.11 FW version

Description

Displays the firmware version of the device.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → FW version
------	---

3.1.12 HW version

Description

Displays the electronics hardware version of the device.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → HW version
------	---

3.1.13 Final assembly number

Description

Displays integer that denotes materials and components used in final device assembly.

Setting	0 to 4294967295
Default	0

Related

Path	Maintenance and diagnostics → Identification → Final assembly number
------	--

3.1.14 System type

Description

System type

Setting	SITRANS FUS; SITRANS FUH
Default	SITRANS FUS

Related

Path	Maintenance and diagnostics → Identification → System type
------	--

3.1.15 Transmitter electronics**3.1.15.1 HW version****Description**

Displays the electronics hardware version of the device.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Transmitter electronics → HW version
------	---

3.1.15.2 FW version**Description**

Displays the firmware version of the device.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Transmitter electronics → FW version
------	---

3.1.15.3 Serial number**Description**

Displays transmitter serial number. Also shown on the device nameplate.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Transmitter electronics → Serial number
------	--

3.1 Identification

3.1.15.4 Order number

Description

Displays the order number of the current device configuration.

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Transmitter electronics → Order number
------	---

3.1.15.5 Comm. interface HW version

Description

Communication interface HW version

3.1.15.6 Comm. interface HW version - settings

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Transmitter electronics → Comm. interface HW version
------	---

3.1.15.7 Comm. interface serial number

Description

Communication interface serial number

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Transmitter electronics → Comm. interface serial number
------	--

3.1.16 Local display

Description

Local display

Setting	HW version 1.01.00
Default	
Setting	FW version - 1.04.13-09
Default	
Setting	HMI cfg. version - 1.00.01.39
Default	

Related

Path	Maintenance and diagnostics → Identification → Local display
------	--

3.1.17 I/O electronics**Description**

I/O electronics

Setting	HW version
Default	
Setting	FW version
Default	
Setting	Serial number
Default	

Related

Path	Maintenance and diagnostics → Identification → I/O electronics
------	--

3.1.18 DSL**Description**

Displays DSL versions (for remote variant only).

Setting	HW version
Default	
Setting	FW version
Default	
Setting	Frontend serial number (Expert user only)
Default	
Setting	Order number
Default	

3.1 Identification

Related

Path	Maintenance and diagnostics → Identification → DSL
------	--

3.1.19 Sensor

3.1.19.1 Not available
menu is hidden

3.1.19.2 HW version
read only

3.1.19.3 FW version
read only

3.1.19.4 Frontend serial number (Expert user only)
read only

3.1.19.5 Path 1

Serial number (read only)**Description**

Unique serial number of sensor set path 1 (clamp-on).

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 1 → Serial number
------	--

Sensor type (read only)**Description**

Identification of the sensor type. Used by the transmitter to enable technology-specific functionalities.

Path	Maintenance and diagnostics → Identification → Sensor → Path 1 → Sensor type
------	--

3.1.19.6 Path 2

Serial number (read only)

Description

Unique serial number of sensor set path 2 (clamp-on).

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 2 → Serial number
------	--

Sensor type (read only)

Description

Type of sensor.

Setting	SITRANS FSS200 (Clamp-on); SITRANS FSS600 (Clamp-on)
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 2 → Sensor type
------	--

3.1.19.7 Path 3

Serial number (read only)

Description

Available only for FS230 with External DSL.

Unique serial number of sensor set path 3 (clamp-on).

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 3 → Serial number
------	--

3.1 Identification

Sensor type (read only)**Description**

Available only for FS230 with External DSL.

Type of sensor.

Setting	SITRANS FSS200 (Clamp-on); SITRANS FSS600 (Clamp-on)
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 3 → Sensor type
------	--

3.1.19.8 Path 4**Serial number (read only)****Description**

Available only for FS230 with External DSL.

Unique serial number of sensor set path 4 (clamp-on).

Setting	
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 4 → Serial number
------	--

Sensor type (read only)**Description**

Available only for FS230 with External DSL.

Type of sensor.

Setting	SITRANS FSS200 (Clamp-on); SITRANS FSS600 (Clamp-on)
Default	

Related

Path	Maintenance and diagnostics → Identification → Sensor → Path 4 → Sensor type
------	--

3.2 Diagnostic events

3.2.1 Active diagnostic events

Description

Displays list of active events.

Path	Maintenance and diagnostics → Diagnostic events → Active events
------	---

3.2.2 Diagnostic log

Description

Displays list of logged events.

Path	Maintenance and diagnostics → Diagnostic events → Diagnostic log
------	--

3.2.3 Clear diagnostic log

Description

The diagnostic log can be reset using this menu.

Setting	Cancel; OK
Default	Cancel

Related

When you confirm the reset by selecting OK, the **Diagnostic log** will be cleared.

Path	Maintenance and diagnostics → Diagnostic events → Clear diagnostic log
------	--

3.2.4 Acknowledge mode

Description

The system can be configured to acknowledge the alarms automatically when they are gone (Auto), or it can be configured to require an acknowledgement from the operator (Manual).

Setting	Auto; Manual
Default	Auto

Path	Maintenance and diagnostics → Diagnostic events → Acknowledge mode
------	--

3.2.5 Transmitter detailed events (read only)

Description

Transmitter Detail Alarms menu is only visible in case an alarm with detailed alarm information is pending.

Setting	• DE10 Failed to read any data related page • DE11 Failed to read FATAL_ERROR_PAGE from • DE12 Failed to read SHUT_DOWN_PAGE from • DE21 The EEPROM data is inconsistent • DE22 Inconsistency of totalizer 1 values • DE23 Inconsistency of totalizer 2 values • DE24 Inconsistency of totalizer 3 values • DE26 parameter cache full • DE27 Unsupported sesnor units • De28 Communications module not found • DE29 Incomplete sensor connected • DE30 Invalide sensor type
Default	Communication module not found

Path	Maintenance and diagnostics → Diagnostic events → Transmitter detailed events
------	---

3.2.6 Suppression time

Description

A coming event can be suppressed in order to prevent alarm flooding. An incoming alarm is required to remain active for the set suppression time before alarm is activated.

Setting	0 to 300 s
Default	0 s

Path	Maintenance and diagnostics → Diagnostic events → Suppression time
------	--

3.2.7 Enable alarms

3.2.7.1 Sensor events (1)

Description

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	05 DSL voltages; 06 DSL storage; 07 Flow measurement; 08 DSL internal; 09 Oil density; 10 Oil viscosity; 11 Oil Spec. Gravity; 14 Path 1: No Signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 27 Scraper pig detected; 28 Configuration 1; 31 Sensor temp.
Default	-

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Sensor events (1)
------	---

3.2.7.2 Sensor events (2)**Description**

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	-

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Sensor events (2)
------	---

3.2.7.3 Process events (1)**Description**

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density flow above alarm limit; 105 Density flow above warning limit; 106 Density flow below warning limit; 107 Density flow below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Process events (1)
------	--

3.2.7.4 Process events (2)**Description**

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	132 Std.vol. flow above alarm limit; 133 Std.vol. flow above warning limit; 134 Std.vol. flow below warning limit; 135 Std.vol. flow below alarm limit
Default	-

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Process events (2)
------	--

3.2.7.5 Process events (3)**Description**

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. Viscosity above alarm limit; 253 Standard kin. Viscosity above warning limit; 254 Standard kin. Viscosity below warning limit; 255 Standard kin. Viscosity below alarm limit
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Process events (3)
------	--

3.2.7.6 Process events (4)

Description

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity above warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec grav. above alarm limit; 273 Std. spec grav. above warning limit; 274 Std. spec grav. below warning limit; 275 Std. spec grav. below alarm limit; 276 Liquident above alarm limit; 277 Liquident above warning limit; 278 Liquident below warning limit; 279 Liquident below alarm limit
Default	-

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Process events (4)
------	--

3.2.7.7 Totalizer events

Description

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	136 Totalizer 1 above alarm limit; 137 Totalizer 1 above warning limit; 138 Totalizer 1 below warning limit; 139 Totalizer 1 below alarm limit; 140 Totalizer 2 above alarm limit; 141 Totalizer 2 above warning limit; 142 Totalizer 2 below warning limit; 143 Totalizer 2 below alarm limit; 144 Totalizer 3 above alarm limit; 145 Totalizer 3 above warning limit; 146 Totalizer 3 below warning limit; 147 Totalizer 3 below alarm limit
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Totalizer events
------	--

3.2.7.8 Device events

Description

If one of the selected events appears this affects the status icon, the related status output and the alarm on the communication interface.

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disruption; 159 Internal error in transmitter
Default	

Related

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Device events
------	---

3.2.7.9 Simulation events (1)

Description

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	160 Mass flow simulated; 161 Volume flow simulated; 162 Density simulated; 163 Medium temp. simulated; 166 Std. volume flow simulated; 167 Totalizer 1 simulated; 168 Totalizer 2 simulated; 169 Totalizer 3 simulated; 170 Loop current simulated
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Simulation events (1)
------	---

3.2.7.10 Simulation events (2)

Description

Various sensor alarms can be enabled to show in the display and on the output if they occur.

Setting	289 Sound velocity simulated; 290 Flow velocity simulated; 291 Pressure simulated; 292 Kin. viscosity simulated; 293 Aux. temperature simulated; 294 Sensor temperature simulated; 296 CH5 simulated; 297 CH6 simulated; 298 Std. volume flow simulated; 299 Standardizing factor simulated; 300 Std. Kin. viscosity simulated; 301 Std. density simulated; 302 Liquident simulated; 303 API gravity simulated; 304 Std. API gravity simulated; 305 Specific gravity simulated; 306 Std. spec. grav. simulated; 307 Rate of change simulated
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Simulation events (2)
------	---

3.2.7.11 Input/output events (1)

Description

If one of the selected events appears this affects the status icon, the related status output and the alarm on the communication interface.

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 213 Invalid dosing configuration; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Input/output events (1)
------	---

3.2.7.12 Input/output events (2)

Description

If one of the selected events appears this affects the status icon, the related status output and the alarm on the communication interface.

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	

Related

The selected events will be shown in the display when they occur. Furthermore, they will be indicated on the output if **Output (2)**, **Input/output (3)** and/or **Input/output (4)** is set to Status output and **Status mode** is set to Alarm item.

Path	Maintenance and diagnostics → Diagnostic events → Enable alarms → Input/output events (2)
------	---

3.2.8 Assign alarm class

3.2.8.1 14 - Path 1: No signal

Description

Warning alarms for Path 1

Setting	Process value warning; Maintenance demanded; Maintenance required
Default	Maintenance required

Path	Maintenance and diagnostics → Diagnostic events → Assign alarm class → 14 - Path 1: No signal
------	---

3.2.8.2 15 - Path 2: No signal

Description

Warning alarms for Path 2.

Setting	Process value warning; Maintenance demanded; Maintenance required
Default	Maintenance required

Path	Maintenance and diagnostics → Diagnostic events → Assign alarm class → 15 - Path 2: No signal
------	---

3.2.8.3 16 - Path 3: No signal

Description

Warning alarms for Path 3.

Setting	Process value warning; Maintenance demanded; Maintenance required
Default	Maintenance required

Path	Maintenance and diagnostics → Diagnostic events → Assign alarm class → 16- Path 3: No signal
------	--

3.2.8.4 17 - Path 4: No signal

Description

Warning alarms for Path 4.

Setting	Process value warning; Maintenance demanded; Maintenance required
Default	Maintenance required

Path	Maintenance and diagnostics → Diagnostic events → Assign alarm class → 17- Path 4: No signal
------	--

3.2.8.5 148 - Transm. temp. above alarm limit

Description

This event can be mapped to an alarm class respective NAMUR status signal.

Setting	Process value alarm (PA) resp. Out of specification; Maintenance alarm resp. Failure
Default	Process value alarm (PA) resp. Out of specification

Path	Maintenance and diagnostics → Diagnostic events → Assign alarm class → 148 - Transm. temp. above alarm limit
------	--

3.2.8.6 149 - Transm. temp. below alarm limit

Description

This event can be mapped to an alarm class respective NAMUR status signal.

Setting	Process value alarm (PA) resp. Out of specification; Maintenance alarm resp. Failure
Default	Process alarm (PA) resp. Out of specification

Path	Maintenance and diagnostics → Diagnostic events → Assign alarm class → 149 - Transm. temp. below alarm limit
------	--

3.3 Maintenance

3.3.1 Copy configuration

Description

Copy configuration - copy configurations from the SensorFlash to the device.

Setting	Cancel; OK
Default	Cancel

Path	Maintenance and diagnostics → Maintenance → Copy configuration
------	--

3.3.2 Spare part replacement

3.3.2.1 Transmitter

3.3.2.1.1 Replace transmitter

Description

Only Siemens authorized personnel may replace spare parts.

Access level: Expert user only.

Setting	Cancel; OK
Default	Cancel

Path	Maintenance and diagnostics → Maintenance → Spare part replacement → Transmitter → Replace transmitter
------	--

3.3.2.1.2 Replace transmitter cassette

Description

Replace transmitter cassette. Only Siemens authorized personnel may replace spare parts. This action will restore the data from the SensorFlash on the transmitter cassette module.

Access level: Expert user only.

Setting	Cancel; OK
Default	Cancel

Path	Maintenance and diagnostics → Maintenance → Spare part replacement → Transmitter → Replace transmitter cassette
------	---

3.3.2.1.3 Replace DSL cassette

Description

Replace DSL cassette. Only Siemens authorized personnel may replace spare parts. This action will restore the data from the SensorFlash on the transmitter cassette module.

Access level: Expert user only.

Setting	Cancel; OK
Default	Cancel

Path	Maintenance and diagnostics → Maintenance → Spare part replacement → Transmitter → Replace DSL cassette
------	---

3.3.2.2 Sensor

3.3.2.2.1 Replace DSL (expert)

Description

This will restore the sensor-specific data from the SensorFlash to the external DSL.

Access level: Expert user only.

Replace DSL - settings

Setting	Cancel; OK
Default	Cancel

Path	Maintenance and diagnostics → Maintenance → Spare part replacement → Sensor → Replace DSL
------	---

3.3.2.2.2 Replace sensor (expert)

Description

Only Siemens authorized personnel may replace spare parts.

Access level: Expert user only.

Setting	Cancel; OK
Default	Cancel

Path	Maintenance and diagnostics → Maintenance → Spare part replacement → Sensor → Replace sensor
------	--

3.3.3 Operating time

3.3.3.1 Operating time

Description

Operating time - Indicates the operating time of the transmitter since the last power up.

3.4 Diagnostics

3.3.3.2 Operating time total

Description

Operating time total - Indicates the total operating time of the transmitter since the last power up.

3.3.3.3 Frontend operating time since the power-up

Description

Frontend operating time - Indicates the frontend operating time since the last power up.

3.3.3.4 Frontend total operating time

Description

Frontend total operating time - Indicates the total frontend operating time of the device.

3.4 Diagnostics

3.4.1 Sensor

3.4.1.1 Path states

3.4.1.1.1 Path 1 state (read only)

Description

Bit code indicating the status of path 1.

- 0-0: not active
- 0-1: signal search
- 1-0: frequency search
- 1-1: measurement

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path states → Path 1 state
------	---

3.4.1.1.2 Path 2 state (read only)

Description

Bit code indicating the status of path 2.

- 0-0: not active
- 0-1: signal search
- 1-0: frequency search
- 1-1: measurement

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path states → Path 2 state
------	---

3.4.1.1.3 Path 3 state (read only)

Description

Bit code indicating the status of path 3.

- 0-0: not active
- 0-1: signal search
- 1-0: frequency search
- 1-1: measurement

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path states → Path 3 state
------	---

3.4.1.1.4 Path 4 state (read only)

Description

Bit code indicating the status of path 4.

- 0-0: not active
- 0-1: signal search
- 1-0: frequency search
- 1-1: measurement

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path states → Path 4 state
------	---

3.4.1.2 Receiver signal

Description

Display of the ultrasound receiver signal, with zoom and position functionality. Both upstream and downstream signals are simultaneously displayed.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Receiver signal
------	--

3.4 Diagnostics

3.4.1.3 Reynolds number (read only)

Description

Calculated Reynolds number based on the entered pipe inside diameter, measured path flow velocities and kinematic viscosity.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Reynolds number
------	--

3.4.1.4 Path 1

3.4.1.4.1 RxGain up (read only)

Description

Receive amplifier gain value for the upstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → RxGain up
------	---

3.4.1.4.2 RxGain down (read only)

Description

Receive amplifier gain value for the downstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → RxGain down
------	---

3.4.1.4.3 SNR up (read only)

Description

Signal to noise ratio of upstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → SNR up
------	--

3.4.1.4.4 SNR down (read only)

Description

Signal to noise ratio of downstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → SNR down
------	--

3.4.1.4.5 Sound velocity (read only)

Description

Fluid sound velocity.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Sound velocity
------	--

3.4.1.4.6 Flow velocity (read only)

Description

Represents the measured path flow velocity before flow profile compensation.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Flow velocity
------	---

3.4.1.4.7 Delta time (read only)

Description

The precisely measured time difference between the upstream and downstream receive signals.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Delta time
------	--

3.4.1.4.8 Travel time up (read only)

Description

Measured transit-time from transmission to reception of the upstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Travel time up
------	--

3.4.1.4.9 Travel time down (read only)

Description

Measured transit-time from transmission to reception of the downstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Travel time down
------	--

3.4.1.4.10 Correlation factor (read only)

Description

A dimensionless value indicating how strongly correlated the upstream and downstream signal are to each other. A value of 1 represents the best correlation. Typical range: 0.9 to 1.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Correlation factor
------	--

3.4.1.4.11 %-rate of accepted bursts**Description**

Indicates the percentage of accepted measurement bursts. Under poor measurement conditions (for example aeration or turbulence), some measurement bursts may be rejected.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → %-rate of accepted bursts
------	---

3.4.1.4.12 Actual sensor frequency (read only)**Description**

The actual transmit frequency for the specified path.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Actual sensor frequency
------	---

3.4.1.4.13 Peak amplitude up (read only)**Description**

A digital value representing the peak downstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Peak amplitude up
------	---

3.4.1.4.14 Peak amplitude down (read only)**Description**

A digital value representing the peak upstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Peak amplitude down
------	---

3.4.1.4.15 Not available

menu is hidden

3.4.1.4.16 Min acc travel time (read only)**Description**

The minimum acceptable transit-time for reliable flow measurement. Signals arriving before this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Min acc travel time
------	---

3.4.1.4.17 Max acc travel time (read only)**Description**

The maximum acceptable transit-time for reliable flow measurement. Signals arriving after this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Max acc travel time
------	---

3.4.1.4.18 Lower sound velocity limit (read only)**Description**

The minimum allowed fluid sound velocity for reliable flow measurement. Operation below this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Lower sound velocity limit
------	--

3.4.1.4.19 Upper sound velocity limit (read only)**Description**

The maximum allowed fluid sound velocity for reliable flow measurement. Operation above this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 1 → Upper sound velocity limit
------	--

3.4.1.5 Path 2**3.4.1.5.1 RxGain up (read only)****Description**

Receive amplifier gain value for the upstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → RxGain up
------	---

3.4.1.5.2 RxGain down (read only)**Description**

Receive amplifier gain value for the downstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → RxGain down
------	---

3.4 Diagnostics

3.4.1.5.3 SNR up (read only)

Description

Signal to noise ratio of upstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → SNR up
------	--

3.4.1.5.4 SNR down (read only)

Description

Signal to noise ratio of downstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → SNR down
------	--

3.4.1.5.5 Sound velocity (read only)

Description

Fluid sound velocity.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Sound velocity
------	--

3.4.1.5.6 Flow velocity (read only)

Description

Represents the measured path flow velocity before flow profile compensation.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Flow velocity
------	---

3.4.1.5.7 Delta time (read only)

Description

The precisely measured time difference between the upstream and downstream receive signals.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Delta time
------	--

3.4.1.5.8 Travel time up (read only)

Description

Measured transit-time from transmission to reception of the upstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Travel time up
------	--

3.4.1.5.9 Travel time down (read only)**Description**

Measured transit-time from transmission to reception of the downstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Travel time down
------	--

3.4.1.5.10 Correlation factor (read only)**Description**

A dimensionless value indicating how strongly correlated the upstream and downstream signal are to each other. A value of 1 represents the best correlation. Typical range: 0.9 to 1.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Correlation factor
------	--

3.4.1.5.11 %-rate of accepted bursts (read only)**Description**

Indicates the percentage of accepted measurement bursts. Under poor measurement conditions (for example aeration or turbulence), some measurement bursts may be rejected.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → %-rate of accepted bursts
------	---

3.4.1.5.12 Actual sensor frequency (read only)**Description**

The actual transmit frequency for the specified path.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Actual sensor frequency
------	---

3.4.1.5.13 Peak amplitude up (read only)**Description**

A digital value representing the peak downstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Peak amplitude up
------	---

3.4.1.5.14 Peak amplitude down (read only)**Description**

A digital value representing the peak upstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Peak amplitude down
------	---

3.4.1.5.15 Not available

menu is hidden

3.4.1.5.16 Min acc travel time (read only)

Description

The minimum acceptable transit-time for reliable flow measurement. Signals arriving before this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Min acc travel time
------	---

3.4.1.5.17 Max acc travel time (read only)

Description

The maximum acceptable transit-time for reliable flow measurement. Signals arriving after this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Max acc travel time
------	---

3.4.1.5.18 Lower sound velocity limit (read only)

Description

The minimum allowed fluid sound velocity for reliable flow measurement. Operation below this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Lower sound velocity limit
------	--

3.4.1.5.19 Upper sound velocity limit (read only)

Description

The maximum allowed fluid sound velocity for reliable flow measurement. Operation above this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 2 → Upper sound velocity limit
------	--

3.4.1.6 Path 3

3.4.1.6.1 RxGain up (read only)

Description

Receive amplifier gain value for the upstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → RxGain up
------	---

3.4.1.6.2 RxGain down (read only)

Description

Receive amplifier gain value for the downstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → RxGain down
------	---

3.4.1.6.3 SNR up (read only)

Description

Signal to noise ratio of upstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → SNR up
------	--

3.4.1.6.4 SNR down (read only)

Description

Signal to noise ratio of downstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → SNR down
------	--

3.4.1.6.5 Sound velocity (read only)

Description

Fluid sound velocity.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Sound velocity
------	--

3.4.1.6.6 Flow velocity (read only)**Description**

Represents the measured path flow velocity before flow profile compensation.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Flow velocity
------	---

3.4.1.6.7 Delta time (read only)**Description**

The precisely measured time difference between the upstream and downstream receive signals.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Delta time
------	--

3.4.1.6.8 Travel time up (read only)**Description**

Measured transit-time from transmission to reception of the upstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Travel time up
------	--

3.4.1.6.9 Travel time down (read only)**Description**

Measured transit-time from transmission to reception of the downstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Travel time down
------	--

3.4.1.6.10 Correlation factor (read only)**Description**

A dimensionless value indicating how strongly correlated the upstream and downstream signal are to each other. A value of 1 represents the best correlation. Typical range: 0.9 to 1.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Correlation factor
------	--

3.4.1.6.11 %-rate of accepted bursts (read only)**Description**

Indicates the percentage of accepted measurement bursts. Under poor measurement conditions (for example aeration or turbulence), some measurement bursts may be rejected.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → %-rate of accepted bursts
------	---

3.4.1.6.12 Actual sensor frequency (read only)**Description**

The actual transmit frequency for the specified path.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Actual sensor frequency
------	---

3.4.1.6.13 Peak amplitude up (read only)**Description**

A digital value representing the peak downstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Peak amplitude up
------	---

3.4.1.6.14 Peak amplitude down (read only)**Description**

A digital value representing the peak upstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Peak amplitude down
------	---

3.4.1.6.15 Not available

menu is hidden

3.4.1.6.16 Min acc travel time (read only)**Description**

The minimum acceptable transit-time for reliable flow measurement. Signals arriving before this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Min acc travel time
------	---

3.4.1.6.17 Max acc travel time (read only)**Description**

The maximum acceptable transit-time for reliable flow measurement. Signals arriving after this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Max acc travel time
------	---

3.4.1.6.18 Lower sound velocity limit (read only)**Description**

The minimum allowed fluid sound velocity for reliable flow measurement. Operation below this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Lower sound velocity limit
------	--

3.4.1.6.19 Upper sound velocity limit (read only)**Description**

The maximum allowed fluid sound velocity for reliable flow measurement. Operation above this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 3 → Upper sound velocity limit
------	--

3.4.1.7 Path 4**3.4.1.7.1 RxGain up (read only)****Description**

Receive amplifier gain value for the upstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → RxGain up
------	---

3.4.1.7.2 RxGain down (read only)**Description**

Receive amplifier gain value for the downstream receive signal. Lower gain values indicate a stronger receive signal. Typical range: 0 to 50 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → RxGain down
------	---

3.4.1.7.3 SNR up (read only)**Description**

Signal to noise ratio of upstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → SNR up
------	--

3.4.1.7.4 SNR down (read only)

Description

Signal to noise ratio of downstream signal. A high SNR indicates less baseline noise on the receive signal. Typical range: 25 to 80 dB.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → SNR down
------	--

3.4.1.7.5 Sound velocity (read only)

Description

Fluid sound velocity.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Sound velocity
------	--

3.4.1.7.6 Flow velocity (read only)

Description

Represents the measured path flow velocity before flow profile compensation.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Flow velocity
------	---

3.4.1.7.7 Delta time (read only)

Description

The precisely measured time difference between the upstream and downstream receive signals.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Delta time
------	--

3.4.1.7.8 Travel time up (read only)

Description

Measured transit-time from transmission to reception of the upstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Travel time up
------	--

3.4.1.7.9 Travel time down (read only)

Description

Measured transit-time from transmission to reception of the downstream receive signal.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Travel time down
------	--

3.4.1.7.10 Correlation factor (read only)**Description**

A dimensionless value indicating how strongly correlated the upstream and downstream signal are to each other. A value of 1 represents the best correlation. Typical range: 0.9 to 1.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Correlation factor
------	--

3.4.1.7.11 %-rate of accepted bursts (read only)**Description**

Indicates the percentage of accepted measurement bursts. Under poor measurement conditions (for example aeration or turbulence), some measurement bursts may be rejected.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → %-rate of accepted bursts
------	---

3.4.1.7.12 Actual sensor frequency (read only)**Description**

The actual transmit frequency for the specified path.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Actual sensor frequency
------	---

3.4.1.7.13 Peak amplitude up (read only)**Description**

A digital value representing the peak downstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Peak amplitude up
------	---

3.4.1.7.14 Peak amplitude down (read only)**Description**

A digital value representing the peak upstream signal amplitude within the ADC (analog to digital converter). Typical range: 5397 to 6697.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Peak amplitude down
------	---

3.4.1.7.15 Not available

menu is hidden

3.4.1.7.16 Min acc travel time (read only)**Description**

The minimum acceptable transit-time for reliable flow measurement. Signals arriving before this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Min acc travel time
------	---

3.4.1.7.17 Max acc travel time (read only)**Description**

The maximum acceptable transit-time for reliable flow measurement. Signals arriving after this time will cause the flowmeter to generate a configuration alarm or prevent proper signal detection.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Max acc travel time
------	---

3.4.1.7.18 Lower sound velocity limit (read only)**Description**

The minimum allowed fluid sound velocity for reliable flow measurement. Operation below this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Lower sound velocity limit
------	--

3.4.1.7.19 Upper sound velocity limit (read only)**Description**

The maximum allowed fluid sound velocity for reliable flow measurement. Operation above this limit may impact measurement accuracy or prevent proper signal detection. A configuration alarm will also be generated.

Path	Maintenance and diagnostics → Diagnostics → Sensor → Path 4 → Upper sound velocity limit
------	--

3.4.1.8 Alarm list**3.4.1.8.1 DSL error code 1****Description**

Provide this to service personnel in case of a persistent error.

3.4.1.8.2 DSL error code 2

Description

Provide this to service personnel in case of a persistent error.

3.4.1.8.3 DSL error code 3

Description

Provide this to service personnel in case of a persistent error.

3.4.1.8.4 DSL error code 4

Description

Provide this to service personnel in case of a persistent error.

3.4.1.9 Gas table input/output

Description

Displays the gas table derived compressibility factor (Zactual) and theoretical sound velocity for the indicated process temperature and pressure. The Zfactor, along with pressure and temperature, is used to determine the standard volume flow rate.

Related

Path	Maintenance and diagnostics → Diagnostics → Sensor → Gas table input/output
------	---

3.4.1.9.1 Pressure (read only)

Description

Process pressure used as input for the gas table.

Related

Path	Maintenance and diagnostics → Diagnostics → Sensor → Gas table input/output → Pressure
------	--

3.4.1.9.2 Medium temperature (read only)

Description

Process temperature used as input for the gas table.

Related

Path	Maintenance and diagnostics → Diagnostics → Sensor → Gas table input/output → Medium temperature
------	--

3.4.1.9.3 Theoretical gas sound velocity (read only)

Description

Table derived theoretical gas sound velocity based on the specified gas composition and the process temperature and pressure.

Related

Path	Maintenance and diagnostics → Diagnostics → Sensor → Gas table input/output → Theoretical gas sound velocity
------	--

3.4.1.9.4 Compressibility factor (Zactual) (read only)

Description

The gas table derived compressibility factor for the indicated process pressure and temperature.

Related

Path	Maintenance and diagnostics → Diagnostics → Sensor → Gas table input/output → Compressibility factor (Zactual)
------	--

3.4.2 Temperature monitoring

3.4.2.1 Medium temperature

3.4.2.1.1 Current value (read only)

Description

Current medium temperature

Related

Path	Maintenance and diagnostics → Diagnostic → Temperature monitoring → Medium temperature → Current value
------	--

3.4.2.2 Transmitter electronics temperature

3.4.2.2.1 Current value (read only).

Description

Measured value of transmitter internal temperature.

Path	Maintenance and diagnostics → Diagnostics → Temperature monitoring → Transmitter temperature → Current value
------	--

3.4.2.2.2 Minimum (read only)

Description

Drag indicator of minimum transmitter internal temperature.

Path	Maintenance and diagnostics → Diagnostics → Temperature monitoring → Transmitter electronics temperature → Minimum
------	--

3.4.2.2.3 Timestamp at minimum value (read only)

Description

Shows timestamp of recorded minimum transmitter internal temperature.

Path	Maintenance and diagnostics → Diagnostics → Temperature monitoring → Transmitter electronics temperature → Timestamp at minimum value
------	---

3.4.2.2.4 Maximum (read only)

Description

Drag indicator of maximum transmitter internal temperature.

Path	Maintenance and diagnostics → Diagnostics → Temperature monitoring → Transmitter electronics temperature → Maximum
------	--

3.4.2.2.5 Timestamp at maximum value (read only)

Description

Shows timestamp of recorded maximum transmitter internal temperature.

Path	Maintenance and diagnostics → Diagnostics → Temperature monitoring → Transmitter electronics temperature → Timestamp at maximum value
------	---

3.4.2.3 DSL temperature

3.4.2.3.1 Current value

Description

Measured internal temperature of the DSL Frontend.

Related

Path	Maintenance and diagnostics → Diagnostic → Temperature monitoring → DSL temperature → Current value
------	---

3.4.2.3.2 Minimum**Description**

Drag indicator of minimum DSL internal temperature.

Related

Path	Maintenance and diagnostics → Diagnostic → Temperature monitoring → DSL temperature → Minimum
------	---

3.4.2.3.3 Maximum**Description**

Drag indicator of maximum DSL internal temperature.

Related

Path	Maintenance and diagnostics → Diagnostic → Temperature monitoring → DSL temperature → Maximum
------	---

3.4.3 Inputs and outputs**3.4.3.1 Channel 1 - output with HART****3.4.3.1.1 Loop current (read only)****Description**

Output current value if configured to current output.

Options	Read only
---------	-----------

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 1 - output with HART → Loop current
------	--

3.4.3.1.2 Error status (read only)

Description

Fault status if configured to current output.

Options	Upper saturation; Lower saturation; Fail-safe behaviour active; Cable break; Loop current deviation
---------	---

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 1 - output with HART → Error status
------	--

3.4.3.2 Channel 2 - output

3.4.3.2.1 Operation mode (read only)

Description

The set Operation mode can be viewed in this menu.

Options	Off; Current output; Frequency output; Pulse output; Status output
Default	Current output

Related

In this menu the setting of **Operation mode** is read only.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Operation mode
------	--

3.4.3.2.2 Loop current (read only)

Description

The calculated current output value.

Related

This menu is only available if **Operation mode** is set to Current output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Loop current
------	--

3.4.3.2.2 Output frequency (read only)

Description

The calculated frequency output value.

Related

This menu is only available if **Operation mode** is set to Frequency output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Output frequency
------	--

3.4.3.2.2 Totalized amount (read only)**Description**

The actual totalized amount.

Related

This menu is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Totalized amount
------	--

3.4.3.2.2 Status output signal (read only)**Description**

The calculated status output value (0, 1).

Related

This menu is only available if **Operation mode** is set to Status output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Status output signal
------	--

3.4.3.2.3 Error status (read only)**Description**

The error status of the channel can be viewed in this menu.

Options	Upper saturation; Lower saturation; Fail--safe behaviour active; Cable break; Loop current deviation - Output current cannot be established (read back deviation > 0.1 mA)
---------	--

Operation mode is set to Current output

Options	Upper saturation; Lower saturation; Fail-safe behaviour active
---------	--

Operation mode is set to Frequency output

Options	Upper saturation (The pulse output has reached maximum pulse output frequency); Fail-safe behaviour active
---------	--

Operation mode is set to Pulse output

3.4 Diagnostics

Related

This menu is only available if **Operation mode** is set to Current output, Frequency output or Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Error status
------	--

3.4.3.2.4 Pulse counter (read only)

Description

This menu shows the number of pulses since startup/last reset.

Related

This menu is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Pulse counter
------	---

3.4.3.2.5 Reset pulse counter

Description

The pulse counter can be reset.

Setting	Cancel; OK
Default	Cancel

Related

This menu is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 2 - output → Reset pulse counter
------	---

3.4.3.3 Channel 3 - input/output

3.4.3.3.1 Operation mode (read only)

Description

The set Operation mode can be viewed in this menu.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

In this menu the setting of **Operation mode** is read out.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 -input/output → Operation mode
------	--

3.4.3.3.2 Loop current (read only)**Description**

The calculated current output value.

Related

This menu is only available if **Operation mode** is set to Current output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 - input/output → Loop current
------	---

3.4.3.3.2 Output frequency (read only)**Description**

The calculated frequency output value.

Related

This menu is only available if **Operation mode** is set to Frequency output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 - input/output → Output frequency
------	---

3.4.3.3.2 Totalized amount (read only)**Description**

The actual totalized amount.

Related

This menu is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 - input/output → Totalized amount
------	---

3.4.3.3.2 Status output signal (read only)**Description**

The calculated status output value (0, 1).

3.4 Diagnostics

Related

This menu is only available if **Operation mode** is set to Status output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 - input/output → Status output signal
------	---

3.4.3.3.2 Digital input value (read only)

Description

Digital input value

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 -input/output → Digital input value
------	---

3.4.3.3.2 Current input value (read only)

Description

Current input value

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 -input/output → Current input value
------	---

3.4.3.3.3 Error status (read only)

Description

The error status of the channel can be viewed in this menu.

Options	Upper saturation; Lower saturation; Fail--safe behaviour active; Cable break; Loop current deviation - Output current cannot be established (read back deviation > 0.1 mA)
---------	--

Operation mode is set to Current output

Options	Upper saturation; Lower saturation; Fail-safe behaviour active
---------	--

Operation mode is set to Frequency output

Options	Upper saturation (The pulse output has reached maximum pulse output frequency); Fail-safe behaviour active
---------	--

Operation mode is set to Pulse output

Options	Upper saturation; Lower saturation; Fail-safe behaviour active
---------	--

Operation mode is set to Current input

Related

This menu is only available if **Operation mode** is set to Current output, Frequency output, Pulse output or Current input.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 -input/output → Error status
------	--

3.4.3.3.4 Pulse counter (read only)

Description

This menu shows the number of pulses since startup/last reset.

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 -input/output → Pulse counter
------	---

3.4.3.3.5 Reset pulse counter

Description

The pulse counter can be reset.

Setting	Cancel; OK
Default	Cancel

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 - input/output → Reset pulse counter
------	--

3.4.3.4 Channel 3 - relay

3.4.3.4.1 Status output signal (read only)

Description

The calculated status output value (0, 1).

Related

This parameter is only available if **Operation mode** is set to Status output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 3 - relay → Status output signal
------	--

3.4.3.5 Channel 4 - input/output

3.4.3.5.1 Operation mode (read only)

Description

The set Operation mode can be viewed in this menu.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

In this menu the setting of **Operation mode** is read out.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Operation mode
------	---

3.4.3.5.2 Loop current (read only)

Description

The calculated current output value.

Related

This menu is only available if **Operation mode** is set to Current output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Loop current
------	---

3.4.3.5.2 Output frequency (read only)

Description

The calculated frequency output value.

Related

This menu is only available if **Operation mode** is set to Frequency output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Output frequency
------	---

3.4.3.5.2 Totalized amount (read only)

Description

The actual totalized amount.

Related

This menu is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Totalized amount
------	---

3.4.3.5.2 Status output signal (read only)**Description**

The calculated status output value (0, 1).

Related

This menu is only available if **Operation mode** is set to Status output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Status output signal
------	---

3.4.3.5.2 Digital input value (read only)**Description**

Digital input value

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 -input/output → Digital input value
------	---

3.4.3.5.2 Current input value (read only)**Description**

Current input value

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 -input/output → Current input value
------	---

3.4.3.5.3 Error status (read only)**Description**

The error status of the channel can be viewed in this menu.

Options	Overflow; Underflow; Fail-safe behaviour activated; Cable break; Output current cannot be established (read back deviation > 0.1 mA)
---------	--

Operation mode is set to Current output

3.4 Diagnostics

Options	Overflow; Underflow; Fail-safe behaviour is activated
---------	---

Operation mode is set to Frequency output

Options	The pulse output has reached maximum pulse output frequency; Fail-safe behaviour is activated
---------	---

Operation mode is set to Pulse output

Options	The pulse output has reached maximum pulse output frequency; Fail-safe behaviour is activated
---------	---

Operation mode is set to Pulse output

Options	Loop current too high; Loop current too low; Fail-safe behaviour active
---------	---

Operation mode is set to Current input.

Related

This parameter is only available if **Operation mode** is set to Current output, Frequency output, Pulse output or Current input.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Error status
------	--

3.4.3.5.4 Pulse counter (read only)

Description

This menu shows the number of pulses since startup/last reset.

Related

This parameter is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Pulse counter
------	---

3.4.3.5.5 Reset pulse counter

Description

The pulse counter can be reset.

Setting	Cancel; OK
Default	Cancel

Related

This parameter is only available if **Operation mode** is set to Pulse output.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - input/output → Reset pulse counter
------	--

3.4.3.6 Channel 4 - relay**3.4.3.6.1 Status output signal (read only)****Description**

The calculated status output value (0, 1).

Related

This menu is only available if **Operation mode** is set to On.

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 4 - relay → Status output signal
------	---

3.4.3.7 Channel 5 - input**3.4.3.7.1 Process value (read only)****Description**

Assignment of an RTD or current input value to a process value. Current input values are only available with external DSL option.

Setting	Off; Medium temperature (RTD); Sensor temperature (RTD); Auxiliary temperature (RTD); Pressure; Density; Kinematic viscosity; Medium temperature; Sensor temperature (current input); Auxiliary temperature (current input); Auxiliary input
---------	--

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 5 - input → Process value
------	--

3.4.3.7.2 Current input value (read only)**Description**

Current input value

Only visible when process value corresponds to a current input (mA).

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 5 -input → Current input value
------	---

3.4.3.7.3 Error status (read only)**Description**

The error status of the channel can be viewed in this menu.

Setting	Upper saturation; Lower saturation; Fail-safe behaviour activated; Cable break; ADC failure
---------	---

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 5 - input → Error status
------	---

3.4.3.8 Channel 6 - input**3.4.3.8.1 Process value (read only)****Description**

Assignment of RTD value to a process value. Current input values are only available with external DSL option.

Setting	Off; Medium temperature (RTD); Sensor temperature (RTD); Auxiliary temperature (RTD); Pressure; Density; Kinematic viscosity; Medium temperature; Sensor temperature (current input); Auxiliary temperature (current input); Auxiliary input
Default	Off

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 6 - input → Process value
------	--

3.4.3.8.2 Current input value (read only)**Description**

Current input value

Only visible when process value corresponds to a current input (mA).

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 6 -input → Current input value
------	---

3.4.3.8.3 Error status (read only)

Description

The error status of the channel can be viewed in this menu.

Setting	Upper saturation; Lower saturation; Fail-safe behaviour activated; Cable break; ADC failure
---------	---

Related

Path	Maintenance and diagnostics → Diagnostics → Inputs and outputs → Channel 6 - input → Error status
------	---

3.5 Peak values

3.5.1 Process value 1

3.5.1.1 Process value

Description

Assign the process value to be monitored.

Setting	Disabled; Volume flow; Mass flow; Standard volume flow; Sound velocity; Flow velocity; Liquident; Density; Medium temperature; Pressure; Kinematic viscosity; Sensor temperature (RTD); Auxiliary temperature (RTD); Totalizer 1; Totalizer 2; Totalizer 3
Default	Disabled

Related

If this parameter is set to any other setting than Disabled, menus **Maximum value**, **Timestamp at maximum value**, **Minimum value**, **Timestamp at Minimum value**, and **Reset logging** will be available.

Path	Maintenance and diagnostics → Peak values → Process value 1 → Process value
------	---

3.5.1.2 Minimum

Description

Displays minimum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 1 → Minimum value
------	---

3.5.1.3 Timestamp at minimum value

Description

Displays the timestamp when minimum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 1 → Minimum value timestamp
------	---

3.5.1.4 Maximum

Description

Displays maximum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 1 → Maximum value
------	---

3.5.1.5 Timestamp at maximum value

Description

Displays the timestamp when maximum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 1 → Maximum value timestamp
------	---

3.5.1.6 Reset peak values

Description

This command is used to reset the logging of the recorded maximum and minimum values monitored. The drag pointers will be set to the current value.

Setting	Cancel; Ok
Default	Cancel

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 1 → Reset logging
------	---

3.5.2 Process value 2

3.5.2.1 Process value

Description

Assign the process value to be monitored.

Setting	Disabled; Volume flow; Mass flow; Standard volume flow; Sound velocity; Flow velocity; Liquident; Density; Medium temperature; Pressure; Kinematic viscosity; Sensor temperature (RTD); Auxiliary temperature (RTD); Totalizer 1; Totalizer 2; Totalizer 3
Default	Disabled

Related

If this parameter is set to any other setting than Disabled, menus **Maximum value**, **Maximum value timestamp**, **Minimum value**, **Minimum value timestamp** and **Reset logging** will be available.

Path	Maintenance and diagnostics → Peak values → Process value 2 → Process value
------	---

3.5.2.2 Minimum

Description

Displays minimum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 2 → Minimum value
------	---

3.5.2.3 Timestamp at minimum value

Description

Displays the timestamp when minimum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 2 → Minimum value timestamp
------	---

3.5.2.4 Maximum

Description

Displays maximum measured value.

3.5 Peak values

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 2 → Maximum value
------	---

3.5.2.5 Timestamp at maximum value

Description

Displays the timestamp when maximum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 2 → Maximum value timestamp
------	---

3.5.2.6 Reset peak values

Description

This command is used to reset the logging of the recorded maximum and minimum values monitored. The drag pointers will be set to the current value.

Setting	Cancel; Ok
Default	Cancel

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 2 → Reset logging
------	---

3.5.3 Process value 3

3.5.3.1 Process value

Description

Assign the process value to be monitored.

Setting	Disabled; Volume flow; Mass flow; Standard volume flow; Sound velocity; Flow velocity; Liquident; Density; Medium temperature; Pressure; Kinematic viscosity; Sensor temperature (RTD); Auxilary temperature (RTD); Totalizer 1; Totalizer 2; Totalizer 3
Default	Disabled

Related

If this parameter is set to any other setting than Disabled, menus **Maximum value**, **Maximum value timestamp**, **Minimum value**, **Minimum value timestamp**, and **Reset logging** will be available.

Path	Maintenance and diagnostics → Peak values → Process value 3 → Process value
------	---

3.5.3.2 Minimum**Description**

Displays minimum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 3 → Minimum value
------	---

3.5.3.3 Timestamp at minimum value**Description**

Displays the timestamp when minimum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 3 → Minimum value timestamp
------	---

3.5.3.4 Maximum**Description**

Displays maximum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 3 → Maximum value
------	---

3.5.3.5 Timestamp at maximum value**Description**

Displays the timestamp when maximum value was measured.

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Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 3 → Maximum value timestamp
------	---

3.5.3.6 Reset peak values

Description

This command is used to reset the logging of the recorded maximum and minimum values monitored. The drag pointers will be set to the current value.

Setting	Cancel; Ok
Default	Cancel

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 3 → Reset logging
------	---

3.5.4 Process value 4

3.5.4.1 Process value

Description

Assign the process value to be monitored.

Setting	Disabled; Volume flow; Mass flow; Standard volume flow; Sound velocity; Flow velocity; Liquident; Density; Medium temperature; Pressure; Kinematic viscosity; Sensor temperature (RTD); Auxiliary temperature (RTD); Totalizer 1; Totalizer 2; Totalizer 3
Default	Disabled

Related

If this parameter is set to any other setting than Disabled, menus **Maximum value**, **Maximum value timestamp**, **Minimum value**, **Minimum value timestamp**, and **Reset logging** will be available.

Path	Maintenance and diagnostics → Peak values → Process value 4 → Assign process value
------	--

3.5.4.2 Minimum

Description

Displays minimum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 4 → Minimum value
------	---

3.5.4.3 Timestamp at minimum value**Description**

Displays the timestamp when minimum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 4 → Minimum value timestamp
------	---

3.5.4.4 Maximum**Description**

Displays maximum measured value.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 4 → Maximum value
------	---

3.5.4.5 Timestamp at maximum value**Description**

Displays the timestamp when maximum value was measured.

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 4 → Maximum value timestamp
------	---

3.5.4.6 Reset peak values**Description**

This command is used to reset the logging of the recorded maximum and minimum values monitored. The drag pointers will be set to the current value.

Setting	Cancel; Ok
Default	Cancel

Related

This menu is only available if **Process value** is **not** set to Disabled.

Path	Maintenance and diagnostics → Peak values → Process value 4 → Reset logging
------	---

3.6 Characteristics

3.6.1 Not available

menu is hidden

3.6.2 Not available

menu is hidden

3.6.3 Not available

menu is hidden

3.6.4 Transmitter

3.6.4.1 Design (read only)

Description

Information about the main design features of the transmitter.

Path	Maintenance and diagnostics → Characteristics → Transmitter → Design
------	--

3.6.4.2 Hazardous area approval (read only)

Description

Text describing the hazardous area approval of the transmitter.

Path	Maintenance and diagnostics → Characteristics → Transmitter → Hazardous area approval
------	---

3.6.5 DSL

3.6.5.1 DSL variant (read only)

Description

DSL variant. Wall mount housing with internal DSL.

Setting	Wall mount housing with internal DSL
Default	

Related

Path	Maintenance and diagnostics → Characteristics → DSL → DSL variant
------	---

3.7 SensorFlash

3.7.1 Eject

Description

Eject Sensor Flash card

Setting	Cancel; Ok
Default	Cancel

Related

Path	Maintenance and diagnostics → SensorFlash → Eject
------	---

3.7.2 Installed (read only)

Description

Shows the status of the SD card.

Setting	SensorFlash not installed; SensorFlash installed; SensorFlash used as mass storage device
Default	SensorFlash installed

Related

Path	Maintenance and diagnostics → SensorFlash → Installed
------	---

3.7.3 Capacity total (read only)

Description

Total capacity of installed SensorFlash.

Shows INSERT CARD if card is not installed.

Setting	
Default	GB

Related

Path	Maintenance and diagnostics → SensorFlash → Capacity total
------	--

3.7.4 Capacity available (read only)

Description

Free capacity of installed SensorFlash.

Shows INSERT CARD if card is not installed.

Setting	
Default	GB

Related

Path	Maintenance and diagnostics → SensorFlash → Capacity available
------	--

3.7.5 Data logging

3.7.5.1 Activation (read only)

Description

Activation - indicates the status of the data logging activation

Setting	Off, On
Default	Off

Related

Only when this parameter is set to "Off", then menus "Data logging mode", "Logging interval" and "Logging value 1" through "Logging value 20" can be configured.

Path	Maintenance and diagnostics → SensorFlash → Data logging → Activation
------	---

3.7.5.2 Start / Stop logging

Description

Menu will alternate between "Start logging" and "Stop logging" depending on the current state of "Activation".

Note

The data logger cannot be started while the USB communication is connected as MSD (Mass Storage Device).

A warning will be presented when attempting to start the data logger while in "MSD mode" or when "Auto MSD connect" is enabled, while providing the option to disable either function before proceeding.

Related

Path	Maintenance and diagnostics → SensorFlash → Data logging → Start / Stop logging
------	---

3.7.5.3 Data logging mode

Description

Select between an instantaneous value or an averaged value calculated over one logging interval.

Note

Changes to the "Data logging mode" can only be made when "Data logging" is Off.

Setting	Log instantaneous, Log average value
Default	Log instantaneous

Related

Path	Maintenance and diagnostics → SensorFlash → Data logging → Data logging mode
------	--

3.7.5.4 Logging interval

Description

Defines the interval for logging. Granularity is 10 ms.

Note

Changes to the "Logging interval" can only be made when "Data logging" is Off.

3.7 SensorFlash

Setting	10 ms; 20 ms; 100 ms; 200 ms; 500 ms; 1 s; 5 s; 10 s; 15 s; 30 s; 1 min; 5 min; 15 min; 30 min; 1 h; 2 h; 4 h; 6 h; 12 h; 24 h
Default	5 s

Related

Path	Maintenance and diagnostics → SensorFlash → Data logging → Logging interval
------	---

3.7.5.5 Process values

Logging value 1...20

Description

The process value to be logged can be selected in this menu.

Logged process values are an indicator that you have to stop logging before you can change the logged process values.

Setting	Disabled; Volume flow; Mass flow; Standard volume flow; Sound velocity; Flow velocity; Liquident; Density; Medium temperature; Pressure; Kinematic viscosity; Sensor temperature (RTD); Auxiliary temperature (RTD); Totalizer 1; Totalizer 2; Totalizer 3
Default	Disabled

Related**Note**

Changes to the "Logging values" can only be made when "Data logging" is Off.

Path	Maintenance and diagnostics → SensorFlash → Data logging → Process values → Logging value 1...20
------	--

3.7.5.6 Advanced logging (expert)

Register 1...90

Description

Select the Modbus registers to be logged. Up to 50 can be selected here. With a remote tool (SIMATIC PDM, HART handheld) you can configure up to 90.

Note

Only numeric parameters can be logged.

Setting	0 to 65535
Default	65535 Disabled

Related

This menu is only available if "Data logging" is off. Expert users only.

Path	Maintenance and diagnostics → SensorFlash → Data logging → Advance logging (expert) → Register 1...90
------	---

3.8 Simulation

3.8.1 Simulation inputs and outputs

3.8.1.1 Channel 1 - output with HART

3.8.1.1.1 Simulation

Enable or disable simulation of the current output.

Setting	Disabled; Enabled
Default	Disabled

Related

Only if this parameter is set to Enabled, then the setting of parameter **Simulation value** will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 1 - output with HART → Simulation
------	--

3.8.1.1.2 Simulation value

Sets starting value for ramp or fixed simulation.

Setting	3.5 mA to 25 mA
Default	4.00 mA

Related

This parameter is only available if **Simulation** is enabled.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 1 - output with HART → Simulation value
------	--

3.8.1.2 Channel 2 - output

3.8.1.2.1 Operation mode (read only)

Description

Displays the output functionality for this channel.

Setting	Off; Current output; Frequency output; Pulse output; Status output
Default	Off

Related

The channel output functionality affects the setting options in parameter **Simulation value**.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 2 - output → Operation mode
------	--

3.8.1.2.2 Simulation

Description

Enables or disables simulation of channel 2 output.

Setting	Disabled; Enabled
Default	Disabled

Related

Only if this parameter is set to Enabled, then the setting of parameter **Simulation value** will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 2 - output → Simulation
------	--

3.8.1.2.3 Simulation value

Description

Set the current value to be output on the channel when current output simulation is enabled.

Set the frequency value to be output on the channel when frequency output simulation is enabled.

Set the pulse value to be output on the channel when pulse output simulation is enabled.

Set the signal level to be output on the channel when status output simulation is enabled.

Setting	0 mA to 25 mA
Default	0 mA

Operation mode is set to Current output

Setting	0.0 Hz to 12500.0 Hz
Default	1.0 Hz

Operation mode is set to Frequency output

Setting	0.0 pulses/s to 12500.0 pulses/s
Default	

Operation mode is set to Pulse output

Setting	0; 1
Default	

Operation mode is set to Status output

Related

Only if parameter **Simulation** is set to Enabled, the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 2 - output → Simulation value
------	--

3.8.1.3 Channel 3 - input/output

3.8.1.3.1 Operation mode (read only)

Description

Displays the output functionality for this channel.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

The channel input/output functionality affects the setting options of parameter **Simulation value**.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 3 - input/output → Operation mode
------	--

3.8.1.3.2 Simulation

Description

Enables or disables simulation of channel 3 input/output.

Setting	Disabled; Enabled
Default	Disabled

Related

Only if this parameter is set to Enabled, then the setting of parameter **Simulation value** will be relevant.

Path	Maintenance and diagnostics → Simulate → Simulate inputs and outputs → Channel 3 - input/output → Simulation
------	--

3.8.1.3.3 Simulation value**Description**

Set the current value to be output on the channel when current output or current input simulation is enabled.

Set the frequency value to be output on the channel when frequency output simulation is enabled.

Set the pulse value to be output on the channel when pulse output simulation is enabled.

Set the signal level to be output on the channel when status output simulation is enabled.

Set the signal level to be input on the channel when digital input simulation is enabled.

Setting	0 mA to 25 mA
Default	0 mA

Operation mode is set to Current output or Current input

Setting	0.0 Hz to 12500.0 Hz
Default	1.0 Hz

Operation mode is set to Frequency output

Setting	0.0 pulses/s - 12500.0 pulses/s
Default	0.0

Operation mode is set to Pulse output

Setting	0; 1
Default	0

Operation mode is set to Status output or Digital input

Related

Only if parameter **Simulation** is set to Enabled, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 3 - input/output → Simulation value
------	--

3.8.1.4 Relay (3)

3.8.1.4.1 Simulation

Description

Enables or disables simulation of channel 3 relay output.

Setting	Disabled; Enabled
Default	Disabled

Related

Only if this parameter is set to Enabled, then the setting of parameter **Simulation value** will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 3 - relay → Simulation
------	---

3.8.1.4.2 Simulation value

Description

Relay output value to be output when simulation is enabled.

Setting	0; 1
Default	0

Related

Only if parameter **Simulation** is set to Enabled, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 3 - relay → Simulation value
------	---

3.8.1.5 Channel 4 - Input/output

3.8.1.5.1 Operation mode (read only)

Description

Displays the output functionality for this channel.

Setting	Off; Current output; Frequency output; Pulse output; Status output; Digital input; Current input
Default	Off

Related

The channel input/output functionality affects the setting options of parameter **Simulation value**.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 4 - input/output → Operation mode
------	--

3.8.1.5.2 Simulation**Description**

Enables or disables simulation of Channel 4 input/output.

Setting	Disabled; Enabled
Default	Disabled

Related

Only if this parameter is set to Enabled, then the setting of parameter **Simulation value** will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 4 - input/output → Simulation
------	--

3.8.1.5.3 Simulation value**Description**

Set the current value to be output on the channel when current output or current input simulation is enabled.

Set the frequency value to be output on the channel when frequency output simulation is enabled.

Set the pulse value to be output on the channel when pulse output simulation is enabled.

Set the signal level to be output on the channel when status output simulation is enabled.

Set the signal level to be input on the channel when digital input simulation is enabled.

Setting	0 mA to 25 mA
Default	0 mA

Operation mode is set to Current output or Current input

Setting	0.0 Hz to 12500.0 Hz
Default	1.0 Hz

Operation mode is set to Frequency output

Setting	0.0 pulses/s to 12500.0 pulses/s
Default	0.0

Operation mode is set to Pulse output

Setting	0; 1
Default	0

Operation mode is set to Status output or Digital input

Related

Only if parameter **Simulation** is set to Enabled, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 4 - input/output → Simulation value
------	--

3.8.1.6 Channel 4 - relay

3.8.1.6.1 Simulation

Description

Enables or disables simulation of channel 4 relay output.

Setting	Disabled; Enabled
Default	Disabled

Related

Only if this parameter is set to Enabled, then the setting of parameter **Simulation value** will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 4 - relay → Simulation
------	---

3.8.1.6.2 Simulation value

Description

Relay output value to be output when simulation is enabled.

Setting	0; 1
Default	0

Related

Only if parameter **Simulation** is set to Enabled, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation inputs and outputs → Channel 4 - relay → Simulated value
------	--

3.8.2 Simulation process values

3.8.2.1 Enable simulation

Description

Select the proces value(s) to be simulated.

Setting	Volume flow; Mass flow; Standard volume flow; Flow velocity; Sound velocity; Liquident; Density; Kinematic viscosity; Pressure; Medium temperature; Standard density; Standard kinematic viscosity; API gravity; Specific gravity; Standard specific gravity; Sensor temperature; Auxiliary temperature; Standard API gravity; Standardizing factor; Liquid identifier
Default	None selected

Related

Only for the process values in this parameter that are marked, the setting of **Simulated value** becomes relevant.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Enable simulation
------	--

3.8.2.2 Volume flow

3.8.2.2.1 Simulation value

Description

Set the Volume flow value to be simulated.

Setting	-10800000000.0 m³/h to +10800000000.0 m³/h
Default	0.0 m³/h

Related

Only if Volume flow is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Volume flow → Simulation value
------	---

3.8.2.3 Mass flow

3.8.2.3.1 Simulation value

Description

Set the Mass flow value to be simulated.

Setting	-10800000000.000001 kg/h to +10800000000.000001 kg/h
Default	0.0 kg/h

Related

Only if Mass flow is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Mass flow → Simulation value
------	---

3.8.2.4 Standard volume flow

3.8.2.4.1 Simulation value

Description

Set the Standard volume flow value to be simulated.

Setting	-360000000.0 Nm ³ /h to +360000000.0 Nm ³ /h
Default	0.0 Nm ³ /h

Related

Only if Corrected volume flow is marked in **Enable simulation**, the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Standard volume flow → Simulation value
------	--

3.8.2.5 Flow velocity

3.8.2.5.1 Simulation value

Description

Set the Flow velocity value to be simulated.

3.8 Simulation

Setting	-400 m/s to +400 m/s
Default	0.0 m/s

Related

Only if Flow velocity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Flow velocity → Simulation value
------	---

3.8.2.6 Sound velocity

3.8.2.6.1 Simulation value

Description

Set the Sound velocity value to be simulated.

Setting	100.0 m/s to 25000.0
Default	1500.0 m/s

Related

Only if Sound velocity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Sound velocity → Simulation value
------	--

3.8.2.7 Liquident

3.8.2.7.1 Simulation value

Description

Set the Liquident value to be simulated.

Note

Available with Oil Software option only.

Setting	100.0 m/s to 2500.0 m/s
Default	1500.0 m/s

Related

Only if Liquident is marked in **Enable simulation**, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Liquident → Simulation value
------	---

3.8.2.8 Density

3.8.2.8.1 Simulation value

Description

Set the Density value to be simulated.

Setting	0.0 kg/m ³ - 10000.0 kg/m ³
Default	1000.0 kg/m ³

Related

Only if Density is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Density → Simulation value
------	---

3.8.2.9 Kinematic viscosity

3.8.2.9.1 Simulation value

Description

Set the Kinematic viscosity value to be simulated.

Setting	The range is shown as minimum and maximum values in the HMI.
Default	0.000001 m ² /s

Related

Only if Kinematic viscosity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Kinematic viscosity → Simulation value
------	---

3.8.2.10 Pressure

3.8.2.10.1 Simulation value

Description

Set the Pressure value to be simulated.

Setting	0.0 Pa to 100000000.0 Pa
Default	700000.0 Pa

Related

Only if Pressure is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Pressure → Simulation value
------	--

3.8.2.11 Medium temperature

3.8.2.11.1 Simulation value

Description

Set the Medium temperature value to be simulated.

Setting	-273.0 °C (-459.399994 °F) to +400.0 °C (752.0 °F)
Default	20.0 °C (68 °F)

Related

Only if Medium temperature is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Medium temperature → Simulation value
------	--

3.8.2.12 Standard density

3.8.2.12.1 Simulation value

Description

Set the Standard density value to be simulated.

Setting	0.0 kg/m ³ to 100000.0 kg/m ³
Default	1000.0 kg/m ³

Related

Only if Standard density is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Standard density → Simulation value
------	--

3.8.2.13 Standard kinematic viscosity

3.8.2.13.1 Simulation value

Description

Set the Standard kinematic viscosity value to be simulated.

Setting	0.0 m ² /s to 5000.0 m ² /s
Default	0.000001 m ² /s

Related

Only if Standard kinematic viscosity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Standard kinematic viscosity → Simulation value
------	--

3.8.2.14 API gravity

3.8.2.14.1 Simulation value

Description

Set the API gravity value to be simulated.

Setting	-150.0 °API to +200 °API
Default	0.0 °API

3.8 Simulation

Related

Only if API gravity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation process values → API gravity → Simulation value
------	---

3.8.2.15 Standard API gravity

3.8.2.15.1 Simulation value

Description

Set the Standard API gravity value to be simulated.

Setting	-150.0 °API to +200.0 °API
Default	0.0 °API

Related

Only if Base API gravity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Standard API gravity → Simulation value
------	--

3.8.2.16 Specific gravity

3.8.2.16.1 Simulation value

Description

Set the Specific gravity value to be simulated.

Setting	0.0 °SGU to 10.0 °SGU
Default	0.0 °SGU

Related

Only if Specific gravity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Specific gravity → Simulation value
------	--

3.8.2.17 Standard specific gravity

3.8.2.17.1 Simulation value

Description

Set the Standard specific gravity value to be simulated.

Setting	0.0 °SGU to 10.0 °SGU
Default	0.0 °SGU

Related

Only if Standard specific gravity is marked in **Enable simulation**, then the setting of this parameter will be relevant.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Standard specific gravity → Simulation value
------	---

3.8.2.18 Auxiliary temperature

3.8.2.18.1 Simulation value

Description

Auxiliary temperature - Enter the value used to simulate the process value.

Setting	-273.0 °C (-459.399994 °F) to +400.0 °C (752.0 °F)
Default	20.0 °C (68 °F)

Related

Only if Auxiliary temperature is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Auxiliary temperature → Simulation value
------	---

3.8.2.19 Standardizing factor

3.8.2.19.1 Simulation value

Description

Standardizing factor

Setting	0.0 to 1000000.0
Default	0.0

3.8 Simulation

Related

Only if Standardizing factor is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Standardizing factor → Simulation value
------	--

3.8.2.20 Liquid identifier

3.8.2.20.1 Simulation value

Description

Liquid identifier

Setting	0 to 255
Default	0

Related

Only if Standardizing factor is marked in **Enable simulation**, then the setting of this parameter will be relevant.

The range and default setting are dependent on the selected **Unit**.

Path	Maintenance and diagnostics → Simulation → Simulation process values → Liquid identifier → Simulation value
------	---

3.8.3 Simulate alarms

3.8.3.1 Simulation mode

Description

The alarm simulation mode can be configured in this parameter.

Setting	Off; Simulate alarm (ID number); Simulate alarm class
Default	Off

Related

If **Simulation mode** is set to Simulate alarm (ID number), **Alarms** and its subcategories will be available.

If **Simulation mode** is set to Simulate alarm class, **Alarm class** will be available.

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Simulation mode
------	--

3.8.3.2 Alarms

3.8.3.2.1 Sensor alarms (1)

Description

The simulation of single and multiple **Sensor alarms (1)** can be configured.

Setting	05 DSL voltages; 06 DSL storage; 07 Flow measurement; 08 DSL internal; 09 Oil density; 10 Oil viscosity; 11 Oil Spec. Gravity; 14 Path 1: No Signal; 15 Path 2: No signal; 16 Path 3: No signal; 17 Path 4: No signal; 19 Electronics temp.; 22 Density calculation; 23 Medium temp. calc.; 24 Pressure calculation; 25 Viscosity calculation; 26 Sensor temp. comp.; 27 Scraper pig detected; 28 Configuration 1; 31 Sensor temp.
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Sensor alarms (1)
------	---

3.8.3.2.2 Sensor alarms (2)

Description

The simulation of single and multiple **Sensor alarms (2)** can be configured.

Setting	32 Auxiliary input; 34 Invalid flow meas.; 35 Failure on CH5 or CH6; 36 Configuration 2; 37 DSL system monitor; 38 Path diagnostic alarm limit exceeded
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Sensor alarms (2)
------	---

3.8.3.2.3 Process alarms (1)

Description

The simulation of single and multiple **Process alarms (1)** can be configured.

3.8 Simulation

Setting	96 Mass flow above alarm limit; 97 Mass flow above warning limit; 98 Mass flow below warning limit; 99 Mass flow below alarm limit; 100 Volume flow above alarm limit; 101 Volume flow above warning limit; 102 Volume flow below warning limit; 103 Volume flow below alarm limit; 104 Density flow above alarm limit; 105 Density flow above warning limit; 106 Density flow below warning limit; 107 Density flow below alarm limit; 108 Medium temp. above alarm limit; 109 Medium temp. above warning limit; 110 Medium temp. below warning limit; 111 Medium temp. below alarm limit
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Process alarms (1)
------	--

3.8.3.2.4 Process alarms (2)

Description

The simulation of single and multiple **Process alarms (2)** can be configured.

Setting	132 Std.vol. flow above alarm limit; 133 Std.vol. flow above warning limit; 134 Std.vol. flow below warning limit; 135 Std.vol. flow below alarm limit
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Process alarms (2)
------	--

3.8.3.2.5 Process alarms (3)

Description

The simulation of single and multiple **Process alarms (3)** can be configured.

Setting	228 Sound velocity above alarm limit; 229 Sound velocity above warning limit; 230 Sound velocity below warning limit; 231 Sound velocity below alarm limit; 232 Flow velocity above alarm limit; 233 Flow velocity above warning limit; 234 Flow velocity below warning limit; 235 Flow velocity below alarm limit; 236 Pressure above alarm limit; 237 Pressure above warning limit; 238 Pressure below warning limit; 239 Pressure below alarm limit; 244 Kin. viscosity above alarm limit; 245 Kin. viscosity above warning limit; 246 Kin. viscosity below warning limit; 247 Kin. viscosity below alarm limit; 248 Rate of change above alarm limit; 249 Rate of change above warning limit; 252 Standard kin. Viscosity above alarm limit; 253 Standard kin. Viscosity above warning limit; 254 Standard kin. Viscosity below warning limit; 255 Standard kin. Viscosity below alarm limit
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Process alarms (3)
------	--

3.8.3.2.6 Process alarms (4)**Description**

The simulation of single and multiple **Process alarms (4)** can be configured.

Setting	256 Standard density above alarm limit; 257 Standard density above warning limit; 258 Standard density below warning limit; 259 Standard density below alarm limit; 260 API gravity above alarm limit; 261 API gravity above warning limit; 262 API gravity below warning limit; 263 API gravity below alarm limit; 264 Standard API gravity above alarm limit; 265 Standard API gravity above warning limit; 266 Standard API gravity below warning limit; 267 Standard API gravity below alarm limit; 268 Specific gravity above alarm limit; 269 Specific gravity above warning limit; 270 Specific gravity below warning limit; 271 Specific gravity below alarm limit; 272 Std. spec grav. above alarm limit; 273 Std. spec grav. above warning limit; 274 Std. spec grav. below warning limit; 275 Std. spec grav. below alarm limit; 276 Liquident above alarm limit; 277 Liquident above warning limit; 278 Liquident below warning limit; 279 Liquident below alarm limit
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Process alarms (4)
------	--

3.8.3.2.7 Totalizer alarms**Description**

The simulation of single and multiple **Totalizer alarms** can be configured.

Setting	Totalizer 1 above alarm limit; Totalizer 1 above warning limit; Totalizer 1 below warning limit; Totalizer 1 below alarm limit; Totalizer 2 above alarm limit; Totalizer 2 above warning limit; Totalizer 2 below warning limit; Totalizer 2 below alarm limit; Totalizer 3 above alarm limit; Totalizer 3 above warning limit; Totalizer 3 below warning limit; Totalizer 4 below alarm limit
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Totalizer alarms
------	--

3.8.3.2.8 Device alarms

Description

The simulation of single and multiple **Device alarms** can be configured.

Setting	148 Transm. temp. above alarm limit; 149 Transm. temp. below alarm limit; 150 Sensor signal disruption; 159 Internal error in transmitter
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Device alarms
------	---

3.8.3.2.9 Channel 1 alarms

Description

The simulation of single and multiple **Channel 1 alarms** can be configured.

Setting	CH1 loop current too low; CH1 loop current too high; CH1 current output deviation; Functional safety event; CH1 cable break
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Channel 1 alarms
------	--

3.8.3.2.10 Input/output alarms (1)

Description

The simulation of single and multiple **Input/output alarms (1)** can be configured.

Setting	195 CH2 loop cur. in lower saturation; 196 CH2 loop cur. in upper saturation; 197 CH2 cable break; 198 CH2 output frequency too low; 199 CH2 output frequency too high; 200 CH2 pulse overflow; 201 CH3 loop cur. in lower saturation; 202 CH3 loop cur. in upper saturation; 203 CH3 cable break; 204 CH3 output frequency too low; 205 CH3 output frequency too high; 206 CH3 pulse overflow; 207 CH4 loop cur. in lower saturation; 208 CH4 loop cur. in upper saturation; 209 CH4 cable break; 210 CH4 output frequency too low; 211 CH4 output frequency too high; 212 CH4 pulse overflow; 213 Invalid dosing configuration; 214 Channel 2 simulated; 215 Channel 3 simulated; 216 Channel 4 simulated; 217 Process values frozen; 218 All outputs forced; 219 CH2 loop current deviation; 220 CH3 loop current deviation; 221 CH4 loop current deviation; 222 Invalid register mapping; 223 Invalid coil configuration
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Input/output alarms (1)
------	---

3.8.3.2.11 Input/output alarms (2)**Description**

The simulation of single and multiple **Input/output alarms (2)** can be configured.

Setting	186 CH3 input current too low; 187 CH3 input current too high; 188 CH3 external failure; 189 CH4 input current too low; 190 CH4 input current too high; 191 CH4 external failure
Default	None selected

Related

This parameter is only available if **Simulation mode** is set to Simulate alarm (ID number).

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarms → Input/output alarms (2)
------	---

3.8.3.3 Alarm class**Description**

The Siemens standard alarm class to be simulated can be configured. The alarm status is activated on all outputs.

Setting	Maintenance alarm; Function check; Process value alarm; Process value warning; Maintenance warning; Maintenance required
Default	None selected

Related

This parameter can only be accessed if **Status icons** is set to Standard.

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarm class
------	--

3.8.3.4 Alarm class**Description**

The NAMUR alarm class to be simulated can be configured. The alarm status is activated on all outputs.

Setting	Failure; Function check; Out of specification; Maintenance required
Default	None selected

Related

This parameter can only be accessed if **Status icons** is set to NAMUR.

Path	Maintenance and diagnostics → Simulation → Simulation alarms → Alarm class
------	--

3.9 Audit trail

3.9.1 Parameter change log

Displays list of logged parameter changes. (Log shows parameter value before and after the change.)

Path	Maintenance and diagnostics → Audit trail → Parameter change log
------	--

3.9.2 Clear parameter change log (write only)

Description

The parameter change log can be reset using this parameter.

Setting	Cancel; Ok
Default	Cancel

Related

Path	Maintenance and diagnostics → Audit trail → Clear parameter change log
------	--

3.9.3 Firmware update change log

Description

A list of logged firmware updates can be viewed in this parameter. Up to 20 logs can be listed with timestamp in the format YYYY-MM-DD hh-mm.

Path	Maintenance and diagnostics → Audit trail → Firmware update change log
------	--

3.9.4 Clear FW update change log (expert)

Description

The firmware update log can be reset using this parameter.

Setting	Cancel; Ok
Default	Cancel

Related

Path	Maintenance and diagnostics → Audit trail → Clear FW update change log
------	--

3.10 Self test

3.10.1 Display test

Description

The display can be tested using a wizard..

Path	Maintenance and diagnostics → Self test → Display test
------	--

3.11 Resets

3.11.1 Restore ordered configuration (write only)

Description

Command to set all parameters to their defined default values.

Setting	Cancel; Ok
Default	Cancel

Related

Path	Maintenance and diagnostics → Resets → Set to default
------	---

3.11.2 Device restart (write only)

Description

Command to restart device.

Setting	Cancel; Ok
Default	Cancel

3.12 Firmware update

Related

Path	Maintenance and diagnostics → Resets → Device restart
------	---

3.12 Firmware update

Description

The firmware of the device can be updated using a wizard.

Path	Maintenance and diagnostics → Firmware update
------	---

Communication

4.1 Service channel (USB)

4.1.1 USB mode (read only)

Description

The **USB mode** can be read in this parameter.

Options	USB communication; Mass storage device (MSD)
---------	--

Related

Path	Communications → Service channel (USB) → USB mode
------	---

4.1.2 Auto mode (read only)

Description

The "Auto mode" can be enabled/disabled using the "Change Auto mode" menu. When auto mode is enabled, the SensorFlash will always be considered a MSD (mass storage device) when a computer is connected to the service port via USB cable

Setting	Disabled; Enabled
Default	

Related

Path	Communications → Service channel (USB) → Auto mode
------	--

4.1.3 Change Auto mode

Description

Changes the current setting for "Auto mode".

Warning! Enabling "Auto mode" will interrupt any active data logging function when the Service port is connected to a PC or other device.

Setting	Disabled; Enabled
Default	

Related

Path	Communications → Service channel (USB) → Change Auto mode
------	---

4.1.4 MSD connect (write only)**Description**

This command is used to connect/disconnect the SensorFlash as a MSD (mass storage device).

Note**MSD mode interrupts data logging**

Connecting the service channel in "MSD mode" will interrupt any active data logging function.

Setting	Do nothing; Connect; Disconnect
Default	Do nothing

Related

Path	Communications → Service channel (USB) → MSD connect
------	--

4.2 HART (Channel 1)**4.2.1 Polling address (SW)****Description**

Enter the device HART address. HW device address over writes SW device address.

Setting	0 to 63
Default	0

Path	Communication → HART (Channel 1) → Polling address (SW)
------	---

4.2.2 Polling address (HW) (read only)**Description**

Hardware device address. The HW device address is configured by DIP switch in the device.

Path	Communication → HART (Channel 1) → Polling address (HW)
------	---

4.2.3 TAG

Description

A unique short **TAG** name for the device or measurement point can be entered.

Setting	User-configurable
Default	-----; 8 characters (A, B, C, ... X, Y, Z, /, 1, 2, 3, ... 7, 8, 9)

Path	Communication → HART (Channel 1) → TAG
------	--

4.2.4 HART device type (read only)

Description

The **HART device type** identification can be entered. The ID uniquely identifies the device when combined with the manufacturer identification and device type.

Path	Communication → HART (Channel 1) → HART Device Type
------	---

4.2.5 HART device revision

Description

Displays device revision level defined in HART protocol.

Path	Communication → HART (Channel 1) → HART revision
------	--

4.2.6 Response preambles

Description

The number of response preambles can be defined.

Setting	5 to 20
Default	5

Path	Communication → HART (Channel 1) → Response preambles
------	---

4.2.7 Dynamic variable mapping

Mapping of measured process variables

The assignment of the measured process values to HART device variables (PV - primary variable; SV - secondary variable; TV - tertiary variable; and QV - quaternary variable) can be modified and assigned as desired via local user interface or via HART interface using SIMATIC PDM.

PV

The process value assigned to current output 1 is automatically assigned to PV.

SV, TV, QV

Freely selectable according to the setting options.

4.2.7.1 SV process value

Description

The HART secondary variable represents a configurable process value, the **SV process value**.

Setting	Volume flow; Mass flow; Flow velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature; Auxilliary temperature; Sensor temperature; Measured current (CH5); Measured current (CH6)
Default	Volume flow

Setting options for all system types

Setting	Standard volume flow; Liquident; Standard density; Standard kinematic viscosity; API gravity; Specific gravity; Standard specific gravity; Rate of change; Standardizing factor
Default	Volume flow

Additional setting options for oil system types

Related

Path	Communication → HART (Channel 1) → Dynamic variable mapping → SV process value
------	--

4.2.7.2 TV process value

Description

The HART tertiary variable represents a configurable process value, the **TV process value**.

Setting	Volume flow; Mass flow; Flow velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature; Auxilliary temperature; Sensor temperature; Measured current (CH5); Measured current (CH6)
Default	Volume flow

The connected sensor is a water sensor

Setting	Standard volume flow; Liquident; Standard density; Standard kinematic viscosity; API gravity; Specific gravity; Standard specific gravity; Rate of change; Standardizing factor
Default	Volume flow

The connected sensor is an oil sensor

Related

Path	Communication → HART (Channel 1) → Dynamic variable mapping → TV Process Value
------	--

4.2.7.3 QV process value

Description

The HART quaternary variable represents a configurable process value, the **QV process value**.

Setting	Volume flow; Mass flow; Flow velocity; Density; Kinematic viscosity; Totalizer 1; Totalizer 2; Totalizer 3; Pressure; Medium temperature; Auxilliary temperature; Sensor temperature; Measured current (CH5); Measured current (CH6)
Default	Volume flow

The connected sensor is a water sensor

Setting	Standard volume flow; Liquident; Standard density; Standard kinematic viscosity; API gravity; Specific gravity; Standard specific gravity; Rate of change; Standardizing factor
Default	Volume flow

The connected sensor is an oil sensor

Related

Path	Communication → HART (Channel 1) → Dynamic variable mapping → QV Process Value
------	--

4.2.8 HART units

4.2.8.1 Volume flow units

Description

The volume flow unit for the communication interface (volume/time) can be configured.

4.2 HART (Channel 1)

Setting	Metric:	Litre → L/s; L/min; L/h m ³ → m ³ /s; m ³ /min; m ³ /h; m ³ /d; ML/d
	US:	Gallons → Ugal/s; Ugal/min; Ugal/h; Ugal/d; gal/s; gal/min; gal/h; gal/d; Mgal/d Barrels → BBL31/s; BBL31/min; BBL31/h; BBL31/d; BBL42/s; BBL42/min; BBL42/h; BBL42/d ft ³ → ft ³ /s; ft ³ /min; ft ³ /h; ft ³ /d Imperial gallons → i.gal/s; i.gal/min; i.gal/h; i.gal/d
Default	m ³ /h	

Related

Path	Communications → HART (Channel 1) → HART units → Volume flow units
------	--

4.2.8.2 Mass flow units

Description

The mass flow unit for the communication interface (mass/time) can be configured.

Setting	Metric:	Gram → g/s; g/min; g/h Kilogram → kg/s; kg/min; kg/h; kg/d Tonne → t/min; t/h; t/d
	US:	Short ton → STon/min; STon/h; STon/d Ton (long ton) → T/h; T/d Pound → lb/s; lb/min; lb/h; lb/d
Default	kg/h	

Related

Path	Communication → HART (Channel 1) → HART units → Mass flow units
------	---

4.2.8.3 Standard volume flow unit

Description

The standard volume flow units for the communication interface (volume/time) can be configured.

Setting	Metric:	Normal litre → NL/s; NL/min; NL/h; NL/d Normal m ³ → Nm ³ /s; Nm ³ /min; Nm ³ /h; Nm ³ /d Standard litre → SL/s; SL/min; SL/h; SL/d Standard m ³ → Sm ³ /s; Sm ³ /min; Sm ³ /h; Sm ³ /d
	US:	Standard ft ³ → Sft ³ /s; Sft ³ /min; Sft ³ /h; Sft ³ /d
Default	Nm ³ /h	

Related

Path	Communication → HART (Channel 1) → HART units → Standard volume flow units
------	--

4.2.8.4 Flow velocity units

Description

The flow velocity units for the communication interface (length/time) can be configured.

Setting	Metric:	m → m/s; m/h
	US:	Inches → in/s; in/min Feet → ft/s; ft/min
Default	m/s	

Related

Path	Communication → HART (Channel 1) → HART units → Flow velocity units
------	---

4.2.8.5 Sound velocity units

Description

The sound velocity units for the communication interface (length/time) can be configured.

Setting	Metric:	m → m/s; m/h
	US:	Inches → in/s; in/min Feet → ft/s; ft/min
Default	m/s	

Related

Path	Communication → HART (Channel 1) → HART units → Sound velocity units
------	--

4.2.8.6 Density units

Description

The density units for the communication interface (mass/volume) can be configured.

Setting	Metric:	Microgram → µg/l; µg/m ³ Milligram → mg/l Gram → g/ml; g/cm ³ ; g/l Kilogram → kg/l; kg/m ³
	US:	Pound → lb/in ³ ; lb/gal; lb/ft ³ Short ton → STon/yd ³
Default	kg/m ³	

Related

Path	Communication → HART (Channel 1) → HART units → Density units
------	---

4.2.8.7 Kinematic viscosity units**Description**

The kinematic viscosity units for the communication interface can be configured.

Setting	cSt (centistoke = 1 mm ² /3)
Default	cSt

Related

Path	Communication → HART (Channel 1) → HART units → Kinematic viscosity units
------	---

4.2.8.8 Pressure units**Description**

The pressure units for the communication interface can be configured.

Setting	Metric:	mbar; bar; Pa; kPa; hPa; MPa; kgf/cm ² ; mmH ₂ O (millimeters of water at 68 °F); mmH ₂ O (millimeters of water at 4 °C); mmHg (millimeters of mercury at 0 °C); hPa (hectopascal); atm; torr; cmH ₂ O (centimeters of water at 4 °C); mH ₂ O (meters of water at 4 °C); cmHg (centimeters of mercury at 0 °C); mHg (meters of mercury at 0 °C); gf/cm ² (grams force per square cm); kg/m ² (kilograms per square meter); ftH ₂ O (feet of water at 60 °F)
	US:	psi; lb/ft ² (pounds per square foot); inH ₂ O (inches of water at 4 °C); ftH ₂ O (feet of water at 4 °C); inHg (inches of mercury at 0 °C); inH ₂ O (inches of water at 68 °F); ftH ₂ O (@60 °F); ftH ₂ O (feet of water at 68 °F)
Default	Pa	

Related

Path	Communication → HART (Channel 1) → HART units → Pressure
------	--

4.2.8.9 Temperature units**Description**

The temperature units for the communication interface can be configured.

Setting	°C, °F, °R (degrees Rankine), K (kelvins)
Default	°C

Related

Path	Communication → HART (Channel 1) → HART units → Temperature units
------	---

4.2.8.10 Totalizer 1 units

Description

The totalizer 1 units for the communication interface can be configured. The unit is not applied at the local display.

Setting	Metric:	g (grams) ; kg (kilograms); t (1t = 1000 kg)
	US	STon (1 STon = 2000 lb); T (1T = 2240 lb); oz; (ounces); lb (pounds)
Default	kg	

Totalizer 1 **Process value** is set to Mass flow

Setting	Metric:	l, hl, m ³ ,
	US:	gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush
Default	l	

Totalizer 1 **Process value** is set to Volume flow

Related

Path	Communication → HART (Channel 1) → HART units → Totalizer 1 units
------	---

4.2.8.11 Totalizer 2 units

Description

The totalizer 2 unit for the communication interface can be configured. The unit is not applied at the local display.

Setting	Metric:	g (grams); kg (kilograms); t (1 t = 1000 kg)
	US	STon (1STon = 2000 lb); T (1 T = 2240 lb); oz (ounces); lb (pounds)
Default	kg	

Totalizer 2 **Process value** is set to Mass flow

Setting	Metric:	l, hl, m ³ ,
	US:	gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush
Default	l	

Totalizer 1 **Process value** is set to Volume flow

Related

Path	Communication → HART (Channel 1) → HART units → Totalizer 2 units
------	---

4.2.8.12 Totalizer 3 units

Description

The totalizer 3 units for the communication interface can be configured. The unit is not applied at the local display.

Setting	Metric:	g (grams); kg (kilograms); t (1 t = 1000 kg)
	US	STon (1STon = 2000 lb); T (1 T = 2240 lb); oz (ounces); lb (pounds)
Default	kg	

Totalizer 3 **Process value** is set to Mass flow

Setting	Metric:	l, hl, m ³ ,
	US:	gal; i.gal; BBL31.5; BBL31; BBL42; in ³ ; ft ³ ; yd ³ ; bush
Default	l	

Totalizer 3 **Process value** is set to Volume flow

Related

Path	Communication → HART (Channel 1) → HART units → Totalizer 3 units
------	---

4.2.9 Damping

4.2.9.1 Damping value

Description

The filter time constant can be configured. The constant defines the damping value of the HART communication signal.

Setting	0.0 to 100.0 s
Default	0.0 s

Related

Path	Communication → HART (Channel 1) → Damping → Damping value
------	--

4.2.9.2 Process values (1)

Description

Select the process values.

Setting	Volume flow; Mass flow; Totalizer 1; Totalizer 2; Totalizer 3; Sound velocity; Flow velocity; Pressure; Kinematic viscosity; Standard volume flow; Standardizing factor; Standard kinematic viscosity; Standard density; Liquident; Density; Medium temperature
Default	Volume flow

Related

Path	Communication → HART (Channel 1) → Damping → Process values (1)
------	---

4.2.9.3 Process values (2)**Description**

Select the process values.

Setting	API gravity; Standard API gravity; Specific gravity; Standard specific gravity; Rate of change
Default	API gravity

Related

Path	Communication → HART (Channel 1) → Damping → Process values (2)
------	---

4.3 Modbus (Channel 1)**4.3.1 Slave address (SW)****Description**

The slave address (SW) for the Modbus device can be configured. This address is used if the DIP switch is set to 0.

Setting	1 to 247
Default	

Related

Path	Communication → Modbus (Channel 1) → Slave address (SW)
------	---

4.3.2 Slave address (HW) (read only)**Description**

The slave address (HW) is determined by the DIP switch setting on the transmitter cassette and can be read out in this parameter. This address is used if the DIP switch is set to a value > 0.

Options	Read only
---------	-----------

Related

Path	Communication → Modbus (Channel 1) → Slave address (HW)
------	---

4.3.3 Restart communication

Description

Restarts the communication with configured Parity framing and Baudrate.

Setting	Cancel; OK
Default	Cancel

Related

Path	Communications → Modbus (Channel 1) → Restart communication
------	---

4.3.4 Baud rate

Description

Baud rate of Modbus interface.

Setting	9600 Bit/s; 19200 Bit/s; 115200 Bit/s; 38400 Bit/s; 57600 Bit/s; 76800 Bit/s; 1200 Bit/s; 2400 Bit/s; 4800 Bit/s
Default	

Related

Path	Communication → Modbus (Channel 1) → Baudrate
------	---

4.3.5 Parity and framing

Description

Parity and framing of the Modbus communication interface.

Setting	Even parity, 1 stop; Odd parity, 1 stop; No parity, 2 stop
Default	

Related

Path	Communication → Modbus (Channel 1) → Parity / framing
------	---

4.3.6 Floating point byte order

Description

The floating-point number byte order used within the data field of Modbus messages,

The first mentioned byte is the first byte sent.

Byte 3 corresponds to the left-most byte (MSB) of a 32 bit floating-point number in big endian format, byte 0 to the right-most byte.

Setting	1-0-3-2; 0-1-2-3; 2-3-0-1; 3-2-1-0
Default	

Related

Path	Communication → Modbus (Channel 1) → Floating point byte order
------	--

4.3.7 Integer byte order

Description

The integer byte order used in Modbus messages.

MSB = most significant byte / high byte

LSB = least significant byte / low byte

Setting	MSB to LSB (big endian); LSB to MSB (little endian)
Default	

Related

Path	Communication → Modbus (Channel 1) → Integer byte order
------	---

4.3.8 Register mapping

4.3.8.1 Enable mapping

Description

Activation/deactivation of the register mapping.

Setting	Map register 1...20 Disable; Enable
Default	

Related

Path	Communication → Modbus (Channel 1) → Register mapping → Enable mapping
------	--

4.3.8.2 Source register 1..20

Description

Modbus register that appears within Modbus request is redirected to the parameter specified by Target register 1..20.

Setting	
Default	

Related

Path	Communication → Modbus (Channel 1) → Register mapping → Source register 1..20
------	---

4.3.8.3 Target register 1..20

Description

Register of an existing product parameter to which a Modbus request is redirected.

Setting	
Default	

Related

Path	Communications → Modbus (Channel 1) → Register mapping → Target register 1..20
------	--

4.3.9 Modbus units

4.3.9.1 Mass flow unit

Description

Set the unit for mass flow values.

Setting	Metric:	Gram → g/s; g/min; g/h Kilogram → kg/s; kg/min; kg/h; kg/d Tonne → t/min; t/h; t/d
	US:	Pound → lb/s; lb/min; lb/h; lb/d Short ton → STon/min; STon/h; STon/d Ton (long ton) → T/h; T/d
	Custom unit	
Default	kg/h	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Mass flow unit
------	---

4.3.9.2 Volume flow unit

Description

Set the unit for volume flow values.

Setting	Metric:	Litre → l/s; l/min; l/h; l/d; Ml/d; hl/s; hl/min; hl/h; hl/d m ³ → m ³ /s; m ³ /min; m ³ /h; m ³ /d
	US:	Gallons → Ugal/s; Ugal/min; Ugal/h; Ugal/d; Mgal/d; gal/s; gal/min; gal/h; gal/d Barrels → BBPS; BBPM; BBPH; BBPD; BOPS; BOPM; BOPH; BOPD; BLPS; BLPM; BLPH; BLPD ft ³ → ft ³ /s; ft ³ /min; ft ³ /h; ft ³ /d
	Custom unit	
Default	m ³ /h	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Volume flow unit
------	---

4.3.9.3 Standard volume flow

Description

Set the unit for standard volume flow values.

Setting	Metric:	Normal litre → Nl/s; Nl/min; Nl/h; Nl/d Normal m ³ → Nm ³ /s; Nm ³ /min; Nm ³ /h; Nm ³ /d Standard litre → Sl/s; Sl/min; Sl/h; Sl/d Standard m ³ → Sm ³ /s; Sm ³ /min; Sm ³ /h; Sm ³ /d
	US:	Standard ft ³ → Sft ³ /s; Sft ³ /min; Sft ³ /h; Sft ³ /d
Default	Nm ³ /s	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Standard volume flow
------	---

4.3.9.4 Flow velocity unit

Description

Set the unit for flow velocity values.

Setting	Metric:	Meter → m/s; m/h
	US:	Foot → ft/s; ft/min Inch → in/s; in/min
	Custom unit	
Default	m/s	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Flow velocity unit
------	---

4.3.9.5 Sound velocity unit**Description**

Set the unit for sound velocity values.

Setting	Metric:	Meter → m/s; m/h
	US:	Foot → ft/s; ft/min Inch → in/s; in/min
	Custom unit	
Default	m/s	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Sound velocity unit
------	--

4.3.9.6 Density unit**Description**

Set the unit for density values.

Setting	Metric:	Microgram → µg/l; µg/m ³ Milligram → mg/l Gram → g/ml; g/cm ³ ; g/l Kilogram → kg/l; kg/m ³
	US:	Pound → lb/in ³ ; lb/gal; lb/ft ³ Short ton → STon/yd ³
	Custom unit	
Default	kg/m ³	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Density unit
------	---

4.3.9.7 Kinematic viscosity unit**Description**

Set the unit for kinematic viscosity values.

Setting	cSt
Default	cSt

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Kinematic viscosity unit
------	---

4.3.9.8 Pressure unit**Description**

Set the unit for pressure values.

Setting	Metric:	(0 °C) → mmHg (0 °C); cmHg (0 °C); inHg (0 °C); mHg (0 °C) (4 °C) → mmH2O (4 °C); cmH2O (4 °C); mH2O (4 °C); inH2O (4 °C); ftH2O (4 °C) Pa; kPa; hPa; MPa; atm; bar; mbar; torr; gf/cm ² ; kgf/cm ² ; kg/m ²
	US:	(60 °F) → ftH2O (60 °F) (68 °F) → inH2O (68 °F); ftH2O (68 °F); mmH2O (68 °F) psi; lb/ft ² ;
Default	Pa	

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Pressure unit
------	--

4.3.9.9 Temperature units**Description**

Set the unit for temperature values.

Setting	°C, °F, °R, K
Default	°C

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Temperature units
------	--

4.3.9.10 Totalizer 1 unit**Description**

Set the unit for totalizer 1 quantities.

Setting	Metric:	l; hl; m ³
	US:	Ugal; gal; BBL42; BBL31; BBL31.5; bush; yd ³ ; ft ³ ; in ³
	Custom unit	
Default	m ³	

is set to Volume flow

4.3 Modbus (Channel 1)

Setting	Metric:	g; kg; t
	US:	lb; STon; T; oz
	Custom unit	
Default	kg	

is set to Mass flow

Setting	Metric:	NI; Nm ³ ; SI; Sm ³
	US:	Sft ³
Default	NI	

is set to Corrected volume flow

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Totalizer 1 unit
------	---

4.3.9.11 Totalizer 2 unit

Description

Set the unit for totalizer 2 quantities.

Setting	Metric:	l; hl; m ³
	US:	Ugal; gal; BBL42; BBL31; BBL31.5; bush; yd ³ ; ft ³ ; in ³
	Custom unit	
Default	m ³	

is set to Volume flow

Setting	Metric:	g; kg; t
	US:	lb; STon; T; oz
	Custom unit	
Default	kg	

is set to Mass flow

Setting	Metric:	NI; Nm ³ ; SI; Sm ³
	US:	Sft ³
Default	NI	

is set to Corrected volume flow

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Totalizer 2 unit
------	---

4.3.9.12 Totalizer 3 unit

Description

Set the unit for totalizer 3 quantities.

Setting	Metric:	l; hl; m ³
	US:	Ugal; gal; BBL42; BBL31; BBL31.5; bush; yd ³ ; ft ³ ; in ³
	Custom unit	
Default	m ³	

is set to Volume flow

Setting	Metric:	g; kg; t
	US:	lb; STon; T; oz
	Custom unit	
Default	kg	

is set to Mass flow

Setting	Metric:	NI; Nm ³ ; SI; Sm ³
	US:	Sft ³
Default	NI	

is set to Corrected volume flow

Related

Path	Communications → Modbus (Channel 1) → Modbus units → Totalizer 3 unit
------	---

4.3.10 Damping

4.3.10.1 Damping value

Description

The filter time constant can be configured. The constant defines the damping value of the Modbus communication signal.

Setting	0.0 to 100.0 s
Default	0.0 s

Related

Path	Communication → Modbus (Channel 1) → Damping → Damping value
------	--

4.3.10.2 Process values (1)**Description**

Select the process values.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Viscosity; Fluid temperature; Specific gravity
Default	Volume flow

Related

Path	Communications → Modbus (Channel 1) → Damping → Process values (1)
------	--

4.3.10.3 Process values (2)**Description**

Select the process values.

Setting	Volume flow; Mass flow; Flow velocity; Sound velocity; Density; Viscosity; Fluid temperature; Specific gravity
Default	Volume flow

Related

Path	Communications → Modbus (Channel 1) → Damping → Process values (2)
------	--

5.1 Change user PIN

Description

Used to change PIN code that enables User access level.

Setting	
Default	

Related

Path	Security → Access management → Change user PIN code
------	---

5.2 Change expert PIN code (expert)

Description

The **Change expert PIN code** function can be accessed.

Setting	
Default	

Related

Path	Security → Access management → Change expert PIN code
------	---

5.3 Recovery ID

Description

Displays an ID number required to reset PIN if lost. Record this ID number for use when contacting Siemens customer support.

Setting	
Default	

Related

Path	Security → Access management → Unique ID code
------	---

5.4 PIN recovery

Description

Used to enter PIN unlock key (PUK) which resets device PIN(s) to default. (PUK obtained from Siemens customer support.)

Setting	
Default	

Related

Path	Security → Access management → PUK
------	------------------------------------

5.5 Activate user PIN

Description

The **Enable access level control** function can be configured.

Setting	Disable; Enable
Default	Enable

Related

Path	Security → Access management → Enable access level control
------	--

5.6 Deactivate user PIN

Description

The **Disable access level control** function can be configured.

Setting	Disable; Enable
Default	Enable

Related

Path	Security → Access management → Disable access level control
------	---

5.7 Auto logout

Description

The **Auto logout** function can be configured. When the parameter is set to Off (default), you will **not** be prompted for password for 10 minutes after the last key press. When the parameter is set to On, you will be prompted to enter the password before each HMI operation.

Setting	Off; On
Default	Off

Related

Path	Security → Access management → Auto logout
------	--

5.8 Logout

Description

The **Logout** function can be configured.

Setting	
Default	

Related

Path	Security → Access management → Logout
------	---------------------------------------

Language

6.1 Language

Description

Select the local display language.

Setting	English; Deutsch
Default	English

Related

Language	Language
----------	----------

Product documentation and support

A.1 Product documentation

Process instrumentation product documentation is available in the following formats:

- Certificates (<http://www.siemens.com/processinstrumentation/certificates>)
- Downloads (firmware, EDDs, software) (<http://www.siemens.com/processinstrumentation/downloads>)
- Catalog and catalog sheets (<http://www.siemens.com/processinstrumentation/catalogs>)
- Manuals (<http://www.siemens.com/processinstrumentation/documentation>)
You have the option to show, open, save, or configure the manual.
 - "Display": Open the manual in HTML5 format
 - "Configure": Register and configure the documentation specific to your plant
 - "Download": Open or save the manual in PDF format
 - "Download as html5, only PC": Open or save the manual in the HTML5 view on your PC

You can also find manuals with the Mobile app at Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/sc/2067>). Download the app to your mobile device and scan the device QR code.

Product documentation by serial number

Using the PIA Life Cycle Portal, you can access the serial number-specific product information including technical specifications, spare parts, calibration data, or factory certificates.

Entering a serial number

1. Open the PIA Life Cycle Portal (<https://www.pia-portal.automation.siemens.com>).
2. Select the desired language.
3. Enter the serial number of your device. The product documentation relevant for your device is displayed and can be downloaded.

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

Scanning a QR code

1. Scan the QR code on your device with a mobile device.
2. Click "PIA Portal".

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

A.2 Technical support

Technical support

If this documentation does not completely answer your technical questions, you can enter a Support Request (<http://www.siemens.com/automation/support-request>).

Additional information on our technical support can be found at Technical Support (<http://www.siemens.com/automation/csi/service>).

Service & support on the Internet

In addition to our technical support, Siemens offers comprehensive online services at Service & Support (<http://www.siemens.com/automation/service&support>).

Contact

If you have further questions about the device, contact your local Siemens representative at Personal Contact (<http://www.automation.siemens.com/partner>).

To find the contact for your product, go to "all products and branches" and select "Products & Services > Industrial automation > Process instrumentation".

Contact address for business unit:

Siemens AG

Digital Industries

Process Automation

Östliche Rheinbrückenstr. 50

76187 Karlsruhe, Germany

Unit abbreviations and custom units

B.1 Suggested custom unit labels and conversion factors

Table B-1 Custom volume flow units

Unit label (description)	Conversion factor (out of m ³ /s)	Industry
ACFM (actual cubic feet per minute)	2118.88	Gas
ACFH (actual cubic feet per hour)	127133	Gas
MACFH (thousand actual cubic feet per hour)	127.1328	Gas
MMACFD (million actual cubic feet per day)	3.05119	Gas

Table B-2 Custom standard volume flow units

Unit label (description)	Conversion factor (out of m ³ /s)	Industry
Sgal/min (standard US gallons per minute)	15850.3	Oil/Gas
Sgal/h (standard US gallons per hour)	951019	Oil/Gas
Si.gal/m (standard Imperial gallons per minute)	13198.2	Oil/Gas
Si.gal/h (standard Imperial gallons per hour)	791889	Oil/Gas
Sbbl/min (standard 42 US gal barrels per minute)	377.389	Oil
Sbbl/h (standard 42 US gal barrels per hour)	22643.319	Oil
Sbbl/d (standard 42 US gal barrels per day)	543439.651	Oil
SCFM (standard cubic feet per minute)	2118.88	Gas
SCFH (standard cubic feet per hour)	127132.80	Gas
MSCFH (thousand standard cubic feet per hour)	127.1328	Gas
MMSCFD (million standard cubic feet per day)	3.05119	Gas

Table B-3 Custom volume (totalizer) units

Unit label (description)	Conversion factor (out of m ³ /s)	Industry
kgal (thousand US gallons)	0.264172	General
Mgal (million US gallons)	0.000264172	General
10 ³ m ³ (thousand cubic meters)	0.001	General
Mm ³ (million cubic meters)	0.000001	General
kft ³ (thousand cubic feet)	0.0353147	General
Mft ³ (million cubic feet)	0.0000353147	General
kyd ³ (thousand cubic yards)	0.00130795	General

B.2 Unit abbreviations

Unit label (description)	Conversion factor (out of m ³ /s)	Industry
af (acre-feet)	0.0008107140	General
ACF (actual cubic feet)	35.3147	Gas
MACF (thousand actual cubic feet)	0.0353147	Gas
MMACF (million actual cubic feet)	0.0000353147	Gas
Mbbl (thousand 42 gallon barrels)	0.00628981	Oil
MMbbl (million 42 gallon barrels)	0.00000628981	Oil
kbbl (thousand 42 gallon barrels)	0.00628981	Not Gas
Mbbl (million 42 gallon barrels)	0.00000628981	Not Gas

Table B-4 Custom std. volume (totalizer) units

Unit label (description)	Conversion factor (out of m ³ /s)	Industry
kNm ³ (thousand normal cubic meters)	0.001	General
MNm ³ (million normal cubic meters)	0.000001	General
Sgal (standard US gallons)	264.172	Oil/Gas
kSgal (thousand standard US gallons)	0.264172	Oil/Gas
Si.gal (standard Imperial gallons)	219.969	Oil/Gas
kSi.gal (thousand standard Imperial gallons)	0.219969	Oil/Gas
Sbbl (standard 42 US gal barrels)	6.28981	Oil
MSbbl (thousand standard 42 US gal barrels)	0.00628981	Oil
MMSbbl (million standard 42 US gal barrels)	0.00000628981	Oil
SCF (standard cubic feet)	35.3147	Gas
MSCF (thousand standard cubic feet)	0.0353147	Gas
MMSCF (million standard cubic feet)	0.0000353147	Gas

B.2 Unit abbreviations

Table B-5 Volume totalizer units

Unit abbreviations	Unit descriptions
l	liters
hl	hectoliters
MI	million liters
m ³	cubic meters
Mm ³	million cubic meters
gal	US gallons
Mgal	million US gallons
i.gal	imperial gallons
BBL31	barrels (1 barrel = 31 US gallons)
BBL42	barrels (1 barrel = 42 US gallons)

Unit abbreviations	Unit descriptions
kBBL42	thousand barrels (1 barrel = 42 US gallons)
MBBL42	million barrels (1 barrel = 42 US gallons)
BBL31.5	barrels (1 barrel = 31.5 US gallons)
ft ³	cubic feet
Mft ³	million cubic feet
af	acre-feet
in ³	cubic inches
yd ³	cubic yards
bush	bushels

Table B-6 Standard volume totalizer units

Unit abbreviations	Unit descriptions
NI	normal liters
Nm ³	normal cubic meters
SI	standard liters
Sft ³	standard cubic feet
Sm ³	standard cubic meters

Table B-7 Mass totalizer units

Unit abbreviations	Unit descriptions
g	grams
kg	kilograms
t	tons
STon	short tons
T	long tons
oz	ounces
lb	pounds

Table B-8 Flow rate units

Unit abbreviations	Unit descriptions
[Totalizer unit]/s	per second
[Totalizer unit]/min	per minute
[Totalizer unit]/h	per hour
[Totalizer unit]/d	per day

B.2 Unit abbreviations

Table B-9 Density units

Unit abbreviations	Unit descriptions
$\mu\text{g/l}$	micrograms per liter
$\mu\text{g/m}^3$	micrograms per cubic meter
mg/l	milligrams per liter
g/ml	grams per milliliter
g/cm^3	grams per cubic centimeters
g/l	grams per liter
kg/l	kilograms per liter
kg/m^3	kilograms per cubic meter
lb/in^3	pounds per cubic inch
lb/gal	pounds per US gallon
lb/ft^3	pounds per cubic foot
STon/yd^3	STon per cubic yard (1 STon = 2000 lb)

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