



UFC 300 V2 Supplementary Instructions

Signal converter for ultrasonic clamp-on flowmeters

Description of Foundation Fieldbus interface

Electronic Revision: ER 4.1.3_



The documentation is only complete when used in combination with the relevant documentation for the flow sensor.

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1.1 Scope of the document

These instructions are supplementary to the standard product documentation of the signal converter. The details depicted therein, in particular the safety information are valid and should be adhered to. The present supplementary instructions provide additional information for the devices when being operated and connected to a Foundation Fieldbus.



INFORMATION!

The present supplementary instruction for the signal converter with Foundation Fieldbus interface, plus the software with the DD and CCF files are included in our scope of supply, in addition to those items delivered for the standard device.

1.2 Device description

The ultrasonic clamp-on flowmeter can be fitted on the outside of piping to measure the flow rate of liquids. The device is a combination of the flow sensor(s) and an ultrasonic signal converter.

2.1 Foundation Fieldbus data

Description

Type	Ultrasonic flowmeter
Physical layer	Foundation Fieldbus protocol that agrees with IEC 61158-2 types 1 and 2 and FISCO model; galvanically isolated
Communication standard	H1
ITK version	6.3.1
NAMUR 107	Supported within FF field diagnostics (FF-891)

Data blocks

Function blocks	1 x Enhanced Resource Block (RB)
	1 x Customer Flow Transducer Block (FLOWTB)
	4 x Analog Input Block (AI)
	2 x Integrator Block (IT)
	1 x Proportional Integral Derivate Block (PID)
Execution time	Analog Input Block: 10 ms
	Integrator Block: 15 ms
	Proportional Integral Derivate Block: 25 ms

Electrical connections

Device power supply	Not intrinsically safe: 9...32 VDC
	Intrinsically safe: 9...24 VDC
Basic current	10.5 mA
Maximum error current	16.5 mA (= basic current + error current = 10.5 mA + 6 mA)
Start current after 10 ms	14 mA
Polarity sensitivity	No
Minimum cycle time	250 ms

Table 2-1: Foundation Fieldbus data

3.1 Cable types

The cable types are specified according to IEC 61158-2. Shielded cables offer the advantage of malfunction-free operation with adequate protection against electromagnetic influences, and make it possible to employ the full performance of the Foundation Fieldbus system.

Core cross-section	0.8 mm ² or AWG 18	0.32 mm ² or AWG 22	0.13 mm ² or AWG 26	1.25 mm ² or AWG 16
Cable type	A	B	C	D
	twisted pair, individually shielded	individual or multiple twisted pairs with overall shield	multiple twisted pairs, without shielding	multiple non- twisted cables, without shielding
Max. length incl. branch line	1900 m / 6200 ft	1200 m / 3900 ft	400 m / 1300 ft	200 m / 650 ft

Table 3-1: Specification of cable types

In non-hazardous locations, a maximum of 32 field devices can be connected to the network. For more data, refer to the table that follows.

Number of devices	Cable lengths for number of devices per branch line			
	1 device	2 devices	3 devices	4 devices
25...32	1 m / 3.3 ft	1 m / 3.3 ft	1 m / 3.3 ft	1 m / 3.3 ft
19...24	30 m / 100 ft	1 m / 3.3 ft	1 m / 3.3 ft	1 m / 3.3 ft
15...18	60 m / 200 ft	30 m / 100 ft	1 m / 3.3 ft	1 m / 3.3 ft
13...14	90 m / 300 ft	60 m / 200 ft	30 m / 100 ft	1 m / 3.3 ft
1..12	120 m / 400 ft	90 m / 300 ft	60 m / 200 ft	30 m / 100 ft

Table 3-2: Cable lengths for number of devices per branch line

All bus segments must be fitted with a terminator at both ends.

3.2 Shielding and grounding

- For optimum electromagnetic compatibility of systems it is extremely important that the system components, and particularly the bus cables connecting the components, are shielded and that such shields, if possible, form an unbroken cover.
- Hence, it follows that, for use in non-hazardous duty systems, the cable shield should be grounded as often as possible.
- In Ex systems an adequate equipotential bonding in the hazardous and non-hazardous location along the entire Fieldbus installation is strongly recommended. Multiple grounding of the shield is of advantage.
- In explosion-proof systems the shielding must at least be connected at one end of the cable.
- NAMUR NE 21 compliance is given, provided the above recommended cable types are used.



INFORMATION!

The use of twisted and shielded cables is strongly recommended, otherwise EMC protection of the signal converter cannot be assured.

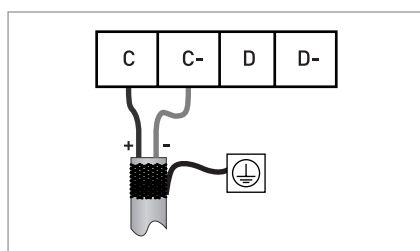
3.3 Electrical connection of Foundation Fieldbus



INFORMATION!

The wiring between the device and the Foundation Fieldbus cable is independent of polarity. The signal converter Foundation Fieldbus interface will operate only if the additional power supply for the device is connected/available.

For a detailed description of the electrical connections please refer to the standard signal converter documentation.



or

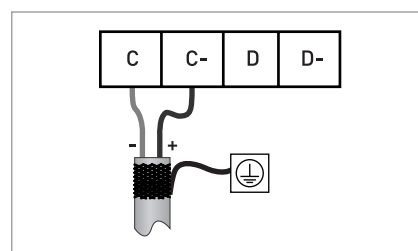
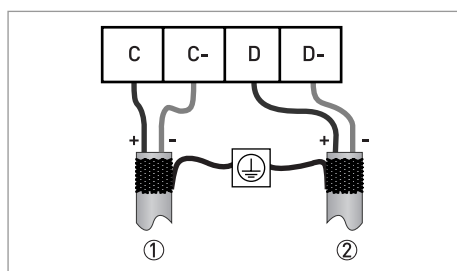


Table 3-3: Connection to a spur



or

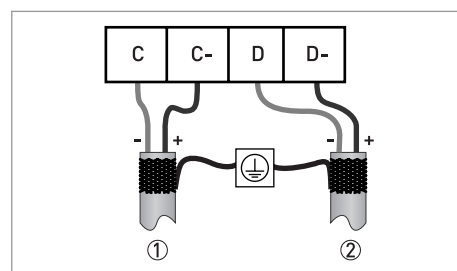


Table 3-4: Connection to a trunk

- ① e.g. incoming data lines
- ② e.g. outgoing data lines

3.4 Topology of FF networks

An example of mixed topology of FF networks is shown in the following example.

Connection is best made via short branch cables and T connectors. This connection type makes it possible to connect and disconnect the devices without interrupting the bus or the communication.

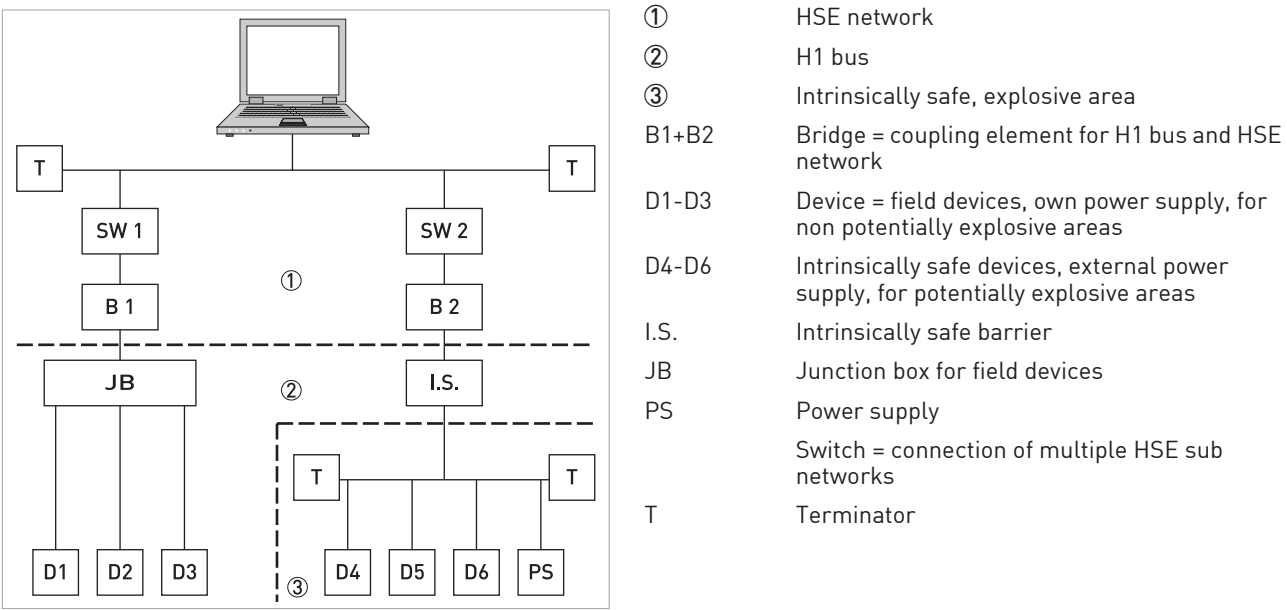


Table 3-5: Topology of FF networks

4.1 Settable functions

- For Foundation Fieldbus the totalizers of the signal converter are not available! Instead the integrator function blocks can be used to totalise mass, volume etc.
- The following table describes only the menus, functions and parameters that are different between the standard signal converter and the Foundation Fieldbus signal converter.
- For the electrical connections of the outputs, inputs and all settings of functions that are not listed in the following table refer to the standard product documentation.

Displayed text	Description and settings
----------------	--------------------------

A Quick Setup

A2 Tag	Identifier for the measurement in a plant, appears in the display header (maximum 8 digits).
	Note: This entry is read-only!

B test

B3.7 Foundation Fieldb	Display the identification information about Foundation fieldbus interface.
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C Setup

C5 I/O Totalizer	Not available for Foundation Fieldbus devices!
C7.1.1 Tag	Identifier for the measurement in a plant, appears in the display header (maximum 8 digits).
	Note: This entry is read-only!
C7.4 2. Meas. Page	In case of Foundation Fieldbus device, the second measurement page is meant to check the output values of the different function blocks. Only Foundation Fieldbus values can be selected here. The analogue inputs are shown with the value seen on the bus system.
C7.4.1 Measurement 1. Line	Select: AI1...4 analog inp. / PID / INT1..2 integrator
C7.4.2 Format 1. Line	Fixed number of digits after the decimal point or automatic, where the number of digits is automatically adjusted to the available space.
C7.4.1 Measurement 2. Line	Select: AI1...4 analog inp. / PID / INT1..2 integrator
C7.4.2 Format 2. Line	Fixed number of digits after the decimal point or automatic, where the number of digits is automatically adjusted to the available space.
C7.4.1 Measurement 3. Line	Select: AI1...4 analog inp. / PID / INT1..2 integrator
C7.4.2 Format 3. Line	Fixed number of digits after the decimal point or automatic, where the number of digits is automatically adjusted to the available space.
C7.8.1 Simulate	Select: disabled / enabled
C7.8.2 Information	Display the identification information about Foundation fieldbus interface.

Table 4-1: Settable functions for Foundation Fieldbus devices

4.2 Description of the Foundation Fieldbus block system

The Foundation Fieldbus is a Local Area Network (LAN) for connecting field devices like sensors and actuators. One of the main benefits of Foundation Fieldbus is line saving in comparison to the traditional 4...20 mA technology.

The different device functions are implemented in a block-based scheme within a user application. In this block scheme, a distinction is made between the Resource Block, Transducer Block and Function Block.

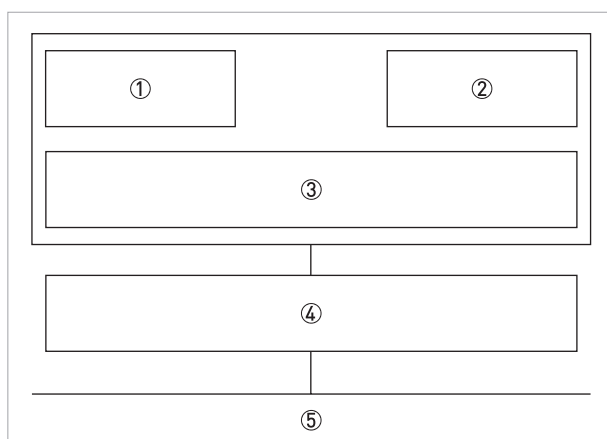


Figure 4-1: Foundation Fieldbus block scheme

- ① Resource Block (RB)
- ② Transducer Block (TB)
- ③ Function Block (FB)
- ④ Device FF communication
- ⑤ Foundation Fieldbus

4.3 Used abbreviations

AI	Analogue Input Block	PID	Proportional Integral Derivate Block
Auto	Automatic mode	PV	Process Value (factory settings)
BLK	Block mode	R	Read
IT	Integrator Block	RB	Resource Block
IV	Initial Value	R/W	Read and Write
MAN	Manual mode	SP	Set Point
OD	Object Directory	TB	Transducer Block
OOS	Out Of Service mode	W	Write

Table 4-2: Used abbreviations

4.4 Resource Block (RB)

The following table lists the Resource Block parameters in alphabetical order.

It describes characteristics of the Fieldbus device (e.g. device name, serial number, etc.) and is not included in the functional tasks of the signal converter for FF.

The following table contains short parameter description, factory settings (Initial Value (IV)) and possible settings.

Parameter Label	Access	Description and settings	Initial Value
ACK_OPTION Acknowledge Option	R/W	Selection of whether alarms associated with the function block will be automatically acknowledged. Setting: • Disc Alm Auto Ack • Blk Alm Auto Ack • Fail Alm Auto Ack • Off Spec Alm Auto Ack • Maint Alm Auto Ack • Check Alm Auto Ack	Uninitialized
ALARM_SUM Alarm Summary	-	The current alert status, unacknowledged states, unreported states and disabled states of the alarms associated with the function block.	-
CURRENT Current	R	The active status of each alarm.	0
UNACKNOWLEDGED Unacknowledged	R	The unacknowledged state of each alarm.	0
UNREPORTED Unreported	R	The unreported status of each alarm.	0
DISABLED Disabled	R/W	The disabled state of each alarm. Setting: • Disc Alm Disabled • Block Alm Disabled • Fail Alm Disabled • Off Spec Alm Disabled • Maint Alm Disabled • Check Alm Disabled	0

Parameter Label	Access	Description and settings	Initial Value
ALERT_KEY Alert Key	R/W	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc. Setting: 1...255	0
BLOCK_ALM Block Alarm	-	The block alarm is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_ERR Block Error	R	This parameter reflects the error status associated with the hardware or software components associated with a block. It is a bit string, so that multiple errors may be shown. Setting: • Other: Non-specific error active • Block Configuration: Error detected in block configuration • Link Configuration: Error detected in link configuration • Simulation Active: Simulation enabled in this block • Local Override: Output tracking of faultstate active • Device Fault State: Device faultstate set • Device Maintenance: Device needs maintenance soon • Sensor Failure: Sensor Failure detected by this block. Process variable has a status of Bad, Sensor Failure • Output Failure: Failure detected in output hardware • Memory Failure: Memory error detected • Lost Static Data: Static parameters cannot be recovered • Lost NV Data: Non-volatile parameters cannot be recovered • Readback Check: Failure detected in READBACK • Maintenance Needed: Device NEEDS maintenance NOW • Power Up: Recovery from power failure • Out Of Service: Block actual mode is out of service	0
BLOCK_ERR_DESC_1 Block Error Description	R	This parameter is used by a device to report more specific details regarding persistent errors that are reported through BLOCK_ERR. Setting: • RB is OOS: RB: MODE_BLK.ACTUAL is OOS • Memory Failure: Memory Failure • Operating System: Operating System problem • GDC Communication problem: GDC Communication problem • Startup GDC error: Startup GDC, data invalid • C-Number error: C-Number doesn't match to FF Software • Data Base error: Data Base doesn't match to FF Software • MODE_PERM not Auto: MODE_BLK.PERMITTED doesn't include Auto • MODE OOS: MODE_BLK.TARGET is set OOS • Write to RB/TB error: Write from GDC to RB/TB doesn't work	0
C_NUM_DETECTED C-Number Device	R	Current C-Number of this Device	-
C_NUM_PRODUCTION C-Number Production	R	Displays the C number of the installed electronics	-

Parameter Label	Access	Description and settings	Initial Value
CLR_FSTATE Clear Fault State	R/W	Writing a Clear to this parameter will clear the device fault state if the field condition, if any, has cleared. Setting: Off / Clear	Off
COMPATIBILITY_REV Compatibility	R	Revision for backward compatibility	1
CONFIRM_TIME Confirm Time	R/W	The minimum time between retries of alert reports. Setting: 0...4294967295 1/32 ms	640000 1/32 ms
CURRENT_INPUT Status Current Input	R/W	Defines the influence of the diagnostic "Process: Current Input" (FD_xx_15) to the TB measurements status (Fct. C1.17.9) Setting: • information • Maintenance Required • checks in progress • Out Of Specification • Failure	Failure
CYCLE_SEL Cycle Selection	R/W	Used to select the block execution method for this resource. Setting: Scheduled / Block Execution / Manuf Specific	0
CYCLE_TYPE Cycle Type	R	Identifies the block execution methods available for this resource.	Scheduled Block execution
DD_RESOURCE DD Resource	R	String identifying the tag of the resource which contains the Device Description for this resource. Setting: ≤32 digits	blanks
DD_REV DD Revision	R	Revision of the DD associated with the resource - used by an interface device to locate the DD file for the resource.	Dependent on device version
DEV_REV Device Revision	R	Manufacturer revision number associated with the resource - used by an interface device to locate the DD file for the resource.	Dependent on device version
DEV_TYPE Device Type	R	Manufacturer's model number associated with the resource - used by interface devices to locate the DD file for the resource.	UFC300V2
DIAGNOSIS Diagnosis	-	Detailed diagnosis of the device	-
MEMORY_SUMMARY Memory summary	R	Summary of self diagnosis	0
FRAM_DIAG FRAM diagnosis	R	Result of FRAM self diagnosis	0
work_LOAD Work load	R	Work load of the processor	0 x 0.1 %
ELECTRONIC_INFO Electronic Revision	-	Displays information of the Electronics Revision	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-

Parameter Label	Access	Description and settings	Initial Value
ELECTRONIC_SN Electronic Serial No.	R		0
EMPTY_PIPE Status Empty Pipe	R/W	Defines the influence of the diagnostic "Process: Empty Pipe" (FD_xx_13) to the TB measurements status (Fct. C1.17.3) Setting: • information • Maintenance Required • checks in progress • Out Of Specification • Failure	Out Of Specification
FAULT_STATE Fault State	R	Condition set by loss of communication to an output block, failure promoted to an output block or a physical contact. When fault state condition is set, then output function blocks will perform their FSTATE actions.	Clear
FD_CHECK_ACTIVE Check Active	R	This parameter reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.	0
FD_CHECK_ALM Check Alarm		This parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	0
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0

Parameter Label	Access	Description and settings	Initial Value
FD_CHECK_MAP Check Map	R/W	This parameter enables or disables conditions to be detected as active for this alarm category.	(24) C Process (25) C Configuration (26) C Electronics (27) C Sensor
		Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	

Parameter Label	Access	Description and settings	Initial Value
FD_CHECK_MASK Check Mask	R/W	This parameter allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	0
FD_CHECK_PRI Check Priority	R/W	This parameter allows the user to specify the priority of this alarm category. Setting: 0...15	0
FD_EXTENDED_ACTIVE_1 FD_EXTENDED_ACTIVE_1	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_2 FD_EXTENDED_ACTIVE_2	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_9 FD_EXTENDED_ACTIVE_9	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_11 FD_EXTENDED_ACTIVE_11	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_12 FD_EXTENDED_ACTIVE_12	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_13 FD_EXTENDED_ACTIVE_13	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_14 FD_EXTENDED_ACTIVE_14	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0

Parameter Label	Access	Description and settings	Initial Value
FD_EXTENDED_ACTIVE_15 FD_EXTENDED_ACTIVE_15	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_17 FD_EXTENDED_ACTIVE_17	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_18 FD_EXTENDED_ACTIVE_18	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_19 FD_EXTENDED_ACTIVE_19	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_20 FD_EXTENDED_ACTIVE_20	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_21 FD_EXTENDED_ACTIVE_21	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_22 FD_EXTENDED_ACTIVE_22	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_25 FD_EXTENDED_ACTIVE_25	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_29 FD_EXTENDED_ACTIVE_29	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_ACTIVE_30 FD_EXTENDED_ACTIVE_30	R	An optional parameter to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameter.	0
FD_EXTENDED_MAP_1 FD_EXTENDED_MAP_1	R/W	Field Diagnostics of 'Electronics: Operation Info' Setting: - Optical Interf. Active - Disp. 2 Overrange - Disp. 1 Overrange - Zero Cal. running pipe 2 - RB is set to OOS - Fieldbus No Connection - Status Out B Active - Status Out A Active - Control In B Active - Control In A Active - Sensor Starting up - Zero Calibr. Running	Optical Interf. Active Disp. 2 Overrange Disp. 1 Overrange Zero Cal. running pipe 2 Status Out B Active Status Out A Active Control In B Active Control In A Active Sensor Starting up Zero Calibr. Running
FD_EXTENDED_MAP_2 FD_EXTENDED_MAP_2	R/W	Field Diagnostics of 'Config: No Meas.Value' Setting: - Disp. 2 no measure values - Disp. 1 no measure values - IO B No Value for Binary Output - IO B No Value for Current Output - IO A No Value for Binary Output - IO A No Value for Current Output	Disp. 2 no measure values Disp. 1 no measure values IO B No Value for Binary Output IO B No Value for Current Output IO A No Value for Binary Output IO A No Value for Current Output

Parameter Label	Access	Description and settings	Initial Value
FD_EXTENDED_MAP_9 FD_EXTENDED_MAP_9	R/W	Field Diagnostics of 'Installation required'	Installation required
		Setting: Installation required	
FD_EXTENDED_MAP_11 FD_EXTENDED_MAP_11	R/W	Field Diagnostics of 'Process: Signal Unreliable'	Unreliable pipe 2 Time of Flight Unreliable pipe 1, path 2 Unreliable pipe 1, path 1
		Setting: - Unreliable pipe 2 - Time of Flight - Unreliable pipe 1, path 2 - Unreliable pipe 1, path 1	
FD_EXTENDED_MAP_12 FD_EXTENDED_MAP_12	R/W	Field Diagnostics of 'Process: Signal Lost'	Signal lost pipe 2 Signal lost pipe 1, path 2 Signal lost pipe 1, path 1
		Setting: - Signal lost pipe 2 - Signal lost pipe 1, path 2 - Signal lost pipe 1, path 1	
FD_EXTENDED_MAP_13 FD_EXTENDED_MAP_13	R/W	Field Diagnostics of 'Process: Empty Pipe'	Empty Pipe 2 Empty Pipe 1
		Setting: Empty Pipe 2 / Empty Pipe 1	
FD_EXTENDED_MAP_14 FD_EXTENDED_MAP_14	R/W	Field Diagnostics of 'Electronics: IO Connection'	IO B Connect. Control Input IO B Connect. Current In-/Output IO A Connect. Control Input IO A Connect. Current In-/Output
		Setting: - IO B Connect. Control Input - IO B Connect. Current In-/Output - IO A Connect. Control Input - IO A Connect. Current In-/Output	
FD_EXTENDED_MAP_15 FD_EXTENDED_MAP_15	R/W	Field Diagnostics of 'Process: Current input'	IO B Error Current IO A Error Current
		Setting: IO B Error Current / IO A Error Current	
FD_EXTENDED_MAP_17 FD_EXTENDED_MAP_17	R/W	Field Diagnostics of 'M Configuration'	Backup 2 Data Faulty Backup 1 Data Faulty
		Setting: Backup 2 Data Faulty / Backup 1 Data Faulty	
FD_EXTENDED_MAP_18 FD_EXTENDED_MAP_18	R/W	Field Diagnostics of 'M Electronics'	Backplane Difference Factory Data Faulty Backplane Data Faulty
		Setting: Backplane Difference / Factory Data Faulty / Backplane Data Faulty	
FD_EXTENDED_MAP_19 FD_EXTENDED_MAP_19	R/W	Field Diagnostics of 'M Sensor'	Crossed Cabling
		Setting: Crossed Cabling	
FD_EXTENDED_MAP_20 FD_EXTENDED_MAP_20	R/W	Field Diagnostics of 'S Process'	Vel Out of Range pipe 2 Velocity Out of Range
		Setting: Vel Out of Range pipe 2 / Velocity Out of Range	
FD_EXTENDED_MAP_21 FD_EXTENDED_MAP_21	R/W	Field Diagnostics of 'S Configuration'	IO B Overrange Binary Output IO B Overrange Current Output IO B Overrng. Current In-/Output IO A Overrange Binary Output IO A Overrange Current Output IO A Overrng. Current In-/Output VoS Difference
		Setting: - IO B Overrange Binary Output - IO B Overrange Current Output - IO B Overrng. Current In-/Output - IO A Overrange Binary Output - IO A Overrange Current Output - IO A Overrng. Current In-/Output - VoS Difference	

Parameter Label	Access	Description and settings	Initial Value
FD_EXTENDED_MAP_22 FD_EXTENDED_MAP_22	R/W	Field Diagnostics of 'S Electronics' Setting: Conv. Zero too large	Conv. Zero too large
FD_EXTENDED_MAP_25 FD_EXTENDED_MAP_25	R/W	Field Diagnostics of 'C Configuration' Setting: - IO B Sim. Binary Output - IO B Sim. Current In-/Output - IO B Sim. Limit Sw./Current Out - IO A Sim. Binary Output - IO A Sim. Current In-/Output - IO A Sim. Limit Sw./Current Out - Fieldbus Sim. Active - Flow simulation pipe 2 - VoS Simulation pipe 2 on - VoS Simulation Active - Flow Simulation Active	IO B Sim. Binary Output IO B Sim. Current In-/Output IO B Sim. Limit Sw./Current Out IO A Sim. Binary Output IO A Sim. Current In-/Output IO A Sim. Limit Sw./Current Out Fieldbus Sim. Active Flow simulation pipe 2 VoS Simulation pipe 2 on VoS Simulation Active Flow Simulation Active
FD_EXTENDED_MAP_29 FD_EXTENDED_MAP_29	R/W	Field Diagnostics of 'F Configuration' Setting: - IO B Binary Output Config - IO B Current In-/Output Config - IO A Binary Output Config - IO A Current In-/Output Config. - IO2 Configuration - IO1 Configuration - Display Config. - Fieldbus Config. - Process Input Config. - DM Configuration - BM Configuration	IO B Binary Output Config IO B Current In-/Output Config IO A Binary Output Config IO A Current In-/Output Config. IO2 Configuration IO1 Configuration Display Config. Fieldbus Config. Process Input Config. DM Configuration BM Configuration
FD_EXTENDED_MAP_30 FD_EXTENDED_MAP_30	R/W	Field Diagnostics of 'F Electronics' Setting: - IO B Failure - IO A Failure - IO 2 Failure - IO 1 Failure - Fieldbus Failure - Sensor Driver Failure - DSP Failure - uProc. Failure - FrontEnd Failure - DM Failure - BM Failure - HW Combination Error - System Error	IO B Failure IO A Failure IO 2 Failure IO 1 Failure Fieldbus Failure Sensor Driver Failure DSP Failure uProc. Failure FrontEnd Failure DM Failure BM Failure HW Combination Error System Error
FD_FAIL_ACTIVE Fail Active	R	This parameter reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.	0

Parameter Label	Access	Description and settings	Initial Value
FD_FAIL_ALM Fail Diagnostic Alarm	-	This parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed.	Uninitialized
		Setting: Uninitialized / Acknowledged / Unacknowledged	
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	0
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
FD_FAIL_MAP Fail Map	R/W	This parameter enables or disables conditions to be detected as active for this alarm category. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	(15) Process: Current input (28) F Process (29) F Configuration (30) F Electronics (31) F Sensor

Parameter Label	Access	Description and settings	Initial Value
FD_FAIL_MASK Fail Mask	R/W	This parameter allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	0
FD_FAILK_PRI Fail Priority	R/W	This parameter allows the user to specify the priority of this alarm category. Setting: 0...15	0
FD_MAINT_ACTIVE Maintenance Active	R	This parameter reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown. See section 2.9.	0
FD_MAINT_ALM Maintenance Alarm	-	This parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an update occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-

Parameter Label	Access	Description and settings	Initial Value
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	0
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
FD_MAINT_MAP Maintenance Map	R/W	This parameter enables or disables conditions to be detected as active for this alarm category. Thus the same condition may be active in all, some, or none of the 3 alarm categories. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	(09) Installation required (16) M Process (17) M Configuration (18) M Electronics (19) M Sensor

Parameter Label	Access	Description and settings	Initial Value
FD_MAINT_MASK Maintenance Mask	R/W	This parameter allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	0
FD_MAINT_PRI Maintenance Priority	R/W	This parameter allows the user to specify the priority of this alarm category. Setting: 0...15	0
FD_OFFSPEC_ACTIVE Offspec Active	R	This parameter reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.	0
FD_OFFSPEC_ALM Offspec Alarm	-	This parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-

Parameter Label	Access	Description and settings	Initial Value
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	0
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
FD_OFFSPEC_MAP Offspec Map	R/W	This parameter enables or disables conditions to be detected as active for this alarm category. Thus the same condition may be active in all, some, or none of the 3 alarm categories. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	(11) Process: Signal Unreliable (12) Process: Signal Lost (13) Process: Empty Pipe (20) S Process (21) S Configuration (22) S Electronics (23) S Sensor

Parameter Label	Access	Description and settings	Initial Value
FD_OFFSPEC_MASK Offspec Mask	R/W	This parameter allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	0
FD_OFFSPEC_PRI Offspec Priority	R/W	This parameter allows the user to specify the priority of this alarm category. Setting: 0...15	Not Initialized
FD_RECOMMEN_ACT Recommended Action	R	This parameter is a device enumerated summarization of the most severe condition or conditions detected. The DD help should describe by enumerated action, what should be done to alleviate the condition or conditions.	Uninitialized
FD_SIMULATE Field Diagnostic Simulate	-	Used as the field diagnostic condition when the simulation is enabled.	-

Parameter Label	Access	Description and settings	Initial Value
DIAGNOSTIC_SIMULATE_VALUE Diagnostic Simulate Value	R/W	Allows the conditions to be manually supplied when simulation is enabled. The simulate jumper is required for simulation to be enabled. Setting: • (00) Check • (01) Electronics: Operation Info • (02) Config: No Meas.Value • (09) Installation required • (11) Process: Signal Unreliable • (12) Process: Signal Lost • (13) Process: Empty Pipe • (14) Electronics: IO Connection • (15) Process: Current input • (16) M Process • (17) M Configuration • (18) M Electronics • (19) M Sensor • (20) S Process • (21) S Configuration • (22) S Electronics • (23) S Sensor • (24) C Process • (25) C Configuration • (26) C Electronics • (27) C Sensor • (28) F Process • (29) F Configuration • (30) F Electronics • (31) F Sensor	0
DIAGNOSTIC_VALUE Diagnostic Value	R	Current field diagnostic condition.	0
ENABLE_DISABLE Simulate En/Disable	R/W	Enable/disable simulation. Setting: Uninitialized / Disabled / Active	Disabled
FD_VER FD Revision	R	The major version of the Field Diagnostics specification used for the development of this device.	1
FEATURES_SEL Features Selection	R/W	Used to select resource block options. Setting: • Unicode • Reports • Faultstate • Soft W Lock • Hard W Lock • Out Readback • Direct Write • Change Bypass in Auto • MVC Report Distribution supported • MVC Publishing/Subscribing supported • Multi-bit Alarm (Bit-Alarm) Support • Restart/Relink after FB_Action • Defer Inter-Parameter Write Checks	Reports Faultstate Soft W Lock

Parameter Label	Access	Description and settings	Initial Value
FEATURES Features	R	Used to shows supported resource block options.	Reports Faultstate Soft W Lock Multi-bit Alarm (Bit-Alarm) Support
FIELD BUS_INFO Foundation Fieldb	-	-	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-
FORMAT_2P_1L Form. 2.Page 1.Line	R/W	No. of decimal places for 2nd line of 2nd page (Fct. C7.4.4) Setting: • #X. • #X.X • #X.XX • #X.XXX • #X.XXXX • #X.XXXXX • #X.XXXXXX • #X.XXXXXXX • #X.XXXXXXXX • automatic	X.X
FORMAT_2P_2L Form. 2.Page 2.Line	R/W	No. of decimal places for 2nd line of 2nd page (Fct. C7.4.4) Setting: • #X. • #X.X • #X.XX • #X.XXX • #X.XXXX • #X.XXXXX • #X.XXXXXX • #X.XXXXXXX • #X.XXXXXXXX • automatic	X.X
FORMAT_2P_3L Form. 2.Page 3.Line	R/W	No. of decimal places for 3rd line of 2nd page (Fct. C7.4.6) Setting: • #X. • #X.X • #X.XX • #X.XXX • #X.XXXX • #X.XXXXX • #X.XXXXXX • #X.XXXXXXX • #X.XXXXXXXX • automatic	X.X
FREE_SPACE Free Space	R	Percent of memory available for further configuration. Zero in a preconfigured device..	0.0 %

Parameter Label	Access	Description and settings	Initial Value
FREE_TIME Free Time	R	Percent of the block processing time that is free to process additional blocks.	0.0 %
GRANT_DENY Grant Deny	-	Options for controlling access of host computers and local control panels to operating, tuning and alarm parameters of the block.	-
GRANT Grant	R/W	Depending on the philosophy of the plant, the operator or a higher level device (HLD), or a local operator's panel (LOP) in the case of Local, may turn on an item of the Grant attribute - Program, Tuning, Alarm, or Local. Setting: Program / Tune / Alarm / Local / Operate / Service / Diagnostic	0
DENY Deny	R/W	The Denied attribute is limited for use by a monitoring application in an interface device and may not be changed by an operator. Setting: • Program Denied • Tune Denied • Alarm Denied • Local Denied • Operate Denied • Service Denied • Diagnostic Denied	0
HARD_TYPES Hard Types	R	The types of hardware available as channel numbers.	Scalar Input
IO_CONNECTION Status IO Connection	R/W	Defines the influence of the diagnostic "Electronic: IO Connection" (FD_xx_14) to the TB measurements status (Fct. C1.17.7) Setting: • information • Maintenance Required • checks in progress • Out Of Specification • Failure	Out Of Specification
ITK_VER ITK Version	R	Major revision number of the interoperability test case used to register this device.	6
LIM_NOTIFY Limit Notify	R/W	Maximum number of unconfirmed alert notify messages allowed. Setting: 0...MAX_NOTIFY	20
MAIN_SW_INFO Sw.rev. Ms	-	-	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-
MANUFAC_ID Manufacturer Id	R	Manufacturer identification number - used by an interface device to locate the DD file for the resource.	KROHNE
MAX_NOTIFY Max Notify	R	Maximum number of unconfirmed alert notify messages possible.	20

Parameter Label	Access	Description and settings	Initial Value
MEMORY_SIZE Memory Size	R	Available configuration memory in the empty resource. To be checked before attempting a download.	0 Kbytes
MIN_CYCLE_T Minimum Cycle Time	R	Time duration of the shortest cycle interval of which the resource is capable.	6400 x 1/32 ms
MODE_BLK Block Mode	-	The actual, target, permitted, and normal modes of the block.	-
TARGET Target	R/W	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested. Setting: R0ut / RCas / Cas / Auto / Man / OOS	Auto
ACTUAL Actual	R	This is the current mode of the block, which may differ from the target based on operating conditions. Its value is calculated as part of block execution.	OOS
PERMITTED Permitted	R/W	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement. Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto OOS
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions. Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto
NV_CYCLE_T Nonvolatile Cycle Time	R	Interval between writing copies of NV parameters to non-volatile memory. Zero means never.	256000 x 1/32 ms
OPERATION_HOUR Operation Hours	R	Operation Hour since first power up	-
PASSWRD Password	R/W	Password to activate access rights to restricted parameters Setting: 0...65535	0
PROTECT_INFO Access Protection	R	Current protection level to restricted parameters	0
RESTART Restart	R/W	Allows a manual restart to be initiated. Several degrees of restart are possible. They are 1: Run, 2: Restart resource, 3: Restart with defaults and 4: Restart processor. Setting: • Uninitialized • Run • Resource • Defaults • Processor • Pre-configure AI blocks • Factory Defaults	Run
RS_STATE Resource State	R	State of the function block application state machine.	Standby
SERIAL_NUMBER Serial Number	R	Device serial number, serial number of the system	-
SET_FSTATE Set Fault State	R/W	Allows the fault state condition to be manually initiated by selecting Set. Setting: Off / Set	Off

Parameter Label	Access	Description and settings	Initial Value
SHED_RCAS Shed Remote Cascade	R/W	Time duration at which to give up on computer writes to function block RCas locations.	640000 1/32 ms
		Setting: 0...4294967295 1/32 ms	
SHED_ROUT Shed Remote Out	R/W	Time duration at which to give up on computer writes to function block ROut locations.	640000 1/32 ms
		Setting: 0...4294967295 1/32 ms	
SIGNAL_LOST Status Signal Lost	R/W	Defines the influence of the diagnostic "Process: Signal Lost" (FD_xx_12) to the TB measurements status (Fct. C1.17.4)	Out Of Specification
		Setting: • information • Maintenance Required • checks in progress • Out Of Specification • Failure	
SIGNAL_UNRELIABLE Status Signal Unreliable	R/W	Defines the influence of the diagnostic "Process: Signal Unreliable" (FD_xx_11) to the TB measurements status (Fct. C1.17.5)	Out Of Specification
		Setting: • information • Maintenance Required • checks in progress • Out Of Specification • Failure	
ST_REV Static Revision	R	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.	0
STRATEGY Strategy	R/W	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.	0
		Setting: 0...65535	
SW_SIMULATE SW simulate	R/W	Enable/disable simulation like simulate Hardware jumper (Fct. C7.8.2).	disable
		Setting: disable / active	
TAG_DESC Tag Description	R/W	The user description of the intended application of the block.	blanks
		Setting: ≤32 digits	
TEST_RW Test Read Write	-	Read/write test parameter - used only for conformance testing.	-
UPDATE_EVT Update Event	-	This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an update occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm has been noticed.	Uninitialized
		Setting: Uninitialized / Acknowledged / Unacknowledged	

Parameter Label	Access	Description and settings	Initial Value
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	Uninitialized
STATIC_REVISION Static Revision	R	The static revision of the block whose static parameter was changed and is being reported. It is possible for the present value of static revision to be greater than this because static can be changed at any time.	0
RELATIVE_INDEX Relative Index	R	The OD index of the static parameter whose change caused this alert, minus the FB starting index. If the update event was caused by a write to multiple parameters at the same time, then this attribute will be zero.	0
USER_INTERFACE Sw.rev. Uis	-	-	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-
VARIABLE_2P_1L Disp. 2.Page 1.Line	R/W	Select the Function Block output value to display at 2nd page 1st line (Fct. C7.4.1).	AI1
		Setting: AI1 / AI2 / AI3 / AI4 / PID / IT1 / IT2	
VARIABLE_2P_2L Disp. 2.Page 2.Line	R/W	Select the Function Block output value to display at 2nd Page 2nd line (Fct. C7.4.3).	AI2
		Setting: AI1 / AI2 / AI3 / AI4 / PID / IT1 / IT2	
VARIABLE_2P_3L Disp. 2.Page 3.Line	R/W	Select the Function Block output value to display at 2nd Page 3rd line (Fct. C7.4.5).	AI3
		Setting: AI1 / AI2 / AI3 / AI4 / PID / IT1 / IT2	
WRITE_ALM Write Alarm	-	This alert is generated if the write lock parameter is cleared.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed.	Uninitialized
		Setting: Uninitialized / Acknowledged / Unacknowledged	
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-

Parameter Label	Access	Description and settings	Initial Value
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Discrete Value	R	The value of the associated parameter at the time the alert was detected.	State 0
WRITE_LOCK Write Lock	R/W	If set, no writes from anywhere are allowed, except to clear WRITE_LOCK. Block inputs will continue to be updated. Setting: Not Locked / Locked	Not Locked
WRITE_PRI Write Priority	R	Priority of the alarm generated by clearing the write lock. Setting: 0...15	0

Table 4-3: Description of Resource Block parameters

4.5 Analog Input Block (AI 1...4)

The following table lists the Analog Input Block parameters in alphabetical order.

It describes characteristics of the measurement values obtained from the Transducer Block in a user defined way and to deliver it to the control system. There are also some parameters in the Analog Input Block, that can be configured to get a measurement value quality as desired by the user.

The following table contains short parameter description, factory settings (Initial Value (IV)) and possible settings.

Parameter Label	Access	Description and settings	Initial Value
ACK_OPTION Acknowledge Option	R/W	Selection of whether alarms associated with the function block will be automatically acknowledged. Setting: • HiHi Alm Auto Ack • Hi Alm Auto Ack • LoLo Alm Auto Ack • Lo Alm Auto Ack • Blk Alm Auto Ack	0
ALARM_HYS Alarm Hysteresis	R/W	Amount the PV must return within the alarm limits before the alarm condition clears. Alarm hysteresis is expressed as a percent of the PV span. Setting: 0...50 %	0.5 %
ALARM_SUM Alarm Summary	-	The current alert status, unacknowledged states, unreported states and disabled states of the alarms associated with the function block.	-
CURRENT Current	R	The active status of each alarm.	0
UNACKNOWLEDGED Unacknowledged	R	The unacknowledged state of each alarm.	0
UNREPORTED Unreported	R	The unreported states of each alarm.	0

Parameter Label	Access	Description and settings	Initial Value
DISABLED Disabled	R/W	The disabled state of each alarm Setting: • HiHi Alm Disabled • Hi Alm Disabled • LoLo Alm Disabled • Lo Alm Disabled • Block Alm Disabled	0
ALERT_KEY Alert Key	R/W	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc. Setting: 1...255	0
BLOCK_ALM Block Alarm	-	The block alarm is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_ERR Block Error	R	This parameter reflects the error status associated with the hardware or software components associated with a block. It is a bit string, so that multiple errors may be shown. Setting: • Other: Non-specific error active • Block Configuration: Error detected in block configuration • Link Configuration: Error detected in link configuration • Simulation Active: Simulation enabled in this block • Local Override: Output tracking of faultstate active • Device Fault State: Device faultstate set • Device Maintenance: Device needs maintenance soon • Sensor Failure: Sensor Failure detected by this block. Process variable has a status of Bad, Sensor Failure • Output Failure: Failure detected in output hardware • Memory Failure: Memory error detected • Lost Static Data: Static parameters cannot be recovered • Lost NV Data: Non-volatile parameters cannot be recovered • Readback Check: Failure detected in READBACK • Maintenance Needed: Device NEEDS maintenance NOW • Power Up: Recovery from power failure • Out Of Service: Block actual mode is out of service	Other
BLOCK_ERR_DESC_1 Block Error Description	R	This parameter is used by a device to report more specific details regarding persistent errors that are reported through BLOCK_ERR. Setting: • RB is OOS: RB: MODE_BLK.ACTUAL is OOS • Memory Failure: Memory Failure • No Schedule: No Schedule • ExecTime small: Block Execution Time too small • ExecTime large: Block Execution Time too large • MODE OOS: MODE_BLK.TARGET is set OOS • CHANNEL setting: CHANNEL is uninitialized • XD UNIT setting: XD UNIT can't be converted from TB UNIT • XD_SCALE small delta: XD_SCALE: range of EU_100 and EU_0 is too small • OUT_SCALE small delta: OUT_SCALE: range of EU_100 and EU_0 is too small • L_TYPE setting: L_TYPE is uninitialized • XD_SCALE unequal to OUT_SCALE: L_TYPE is direct but scaling of XD_SCALE is unequal to OUT_SCALE • IO_OPTS setting: no unit conversion at IO_OPTS but XD UNIT is unequal to TB UNIT	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_WARN_DESC Block warning description	R	Reason why OUT.status is not GOOD Setting: - MODE_PERM not Auto: MODE_BLK.PERMITTED doesn't include Auto - MODE MAN: MODE_BLK.TARGET is set MAN - MODE.ACTUAL MAN: MODE_BLK.ACTUAL is MAN - Simulation active: Simulation is active . sim value not good: SIMULATE_STATUS is not Good, Simulation is active - sim value is limited: SIMULATE_STATUS limited, STATUS_OPTS is set, simulation active - TB is OOS: Transducer Block MODE_BLK.ACTUAL is OOS - TB value is Bad: CHANNEL selected TB.prim_val.status is Bad - TB value is limited: TB.prim_val.status is limited, STATUS_OPTS is set - TB value is uncertain: CHANNEL selected TB.prim_val.status is Uncertain - OUT exceeds OUT_SCALE: OUT.value exceeds OUT_SCALE - unknown reason: unknown reason	0
CHANNEL Channel	R/W	The number of the logical hardware channel that is connected to this I/O block. This information defines the transducer to be used going to or from the physical world. Note: W = Writeable only by setting "OOS" in MODE_BLK Setting: 0 Uninitialized 1 Volume Flow 2 Mass Flow 3: Flow Speed 4: Heat Flow 5: Cold Flow 6: Volume Flow 2 7: Volume Flow 12 8: Velocity of Sound 9: Gain 10: SNR 11: Gain 1 12: SNR 1 13: Gain 2 14: SNR 2 15: Electronic Temperature	Uninitialized
FIELD_VAL Field Value	-	Raw value of the field device in % of PV range, with a status reflecting the Transducer condition, before signal characterization (L_TYPE) or filtering (PV_FTIME).	-
STATUS Status	R	Digital transducers, unlike their analogue versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
GRANT_DENY Grant Deny	-	Options for controlling access of host computers and local control panels to operating, tuning and alarm parameters of the block.	-

Parameter Label	Access	Description and settings	Initial Value
GRANT Grant	R/W	Depending on the philosophy of the plant, the operator or a higher level device (HLD), or a local operator's panel (LOP) in the case of Local, may turn on an item of the Grant attribute - Program, Tuning, Alarm, or Local. Setting: Program / Tune / Alarm / Local / Operate / Service / Diagnostic	Uninitialized
DENY Deny	R/W	The Denied attribute is provided for use by a monitoring application in an interface device and may not be changed by an operator. Setting: Program Denied / Tune Denied / Alarm Denied / Local Denied / Operate Denied / Service Denied / Diagnostic Denied	Uninitialized
HI_ALM High Alarm	-	The status for High Alarm and its associated time stamp. Settings of 5 subelements see in the following part.	-
HI_HI_ALM High High Alarm	-	The status for High High Alarm and its associated time stamp. Settings of 5 subelements see in the following part.	-
Settings of 5 subelements for previous 2 parameters High Alarm and High High Alarm:			
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
HI_HI_LIM High High Limit	R/W	The setting for High High Alarm in engineering units.	+INF
HI_LIM High Limit	R/W	The setting for High Alarm in engineering units.	+INF
HI_HI_PRI High High Priority	R/W	Priority of the High High Alarm. Setting see in the following part.	0

Parameter Label	Access	Description and settings	Initial Value
HI_PRI High Priority	R/W	Priority of the High Alarm. Setting: 0: The associated alert may clear when the priority is changed to 0, but it will never occur. 1: The associated alert is not send as a notification. If the priority is above 1, then the alert must be reported. 2: Reserved for alerts that do not require the attention of a plant operator, e.g. diagnostic and system alerts. Block alarm, error alarm and update event have a fixed priority of 2. 3...7: Increasing higher priorities - advisory alarms. 8...15: Increasing higher priorities - critical alarms.	0
IO_OPTS I/O Options	R/W	Options which the user may select to alter input and output block processing. Setting: - Low Cutoff: The AI low cutoff algorithm is enabled. - Units Conversion: Device will perform unit conversion on the channel value so that it will match the units set in XD_SCALE. If the unit of XD_SCALE is set to a value that is not convertible from TB unit, then the block will remain in OOS after being configured.	Units Conversion
L_TYPE Linearization Type	R/W	Determines if the values passed by the transducer block to the AI block may be used directly (Direct) or if the value is in different units and must be converted linearly (Indirect) , or with square root (Ind Sqr Root), using the input range defined for the transducer and the associated output range. Setting: - Uninitialized: The block will remain in OOS - Direct: Use FIELD_VAL as output after filtering - Indirect: Convert FIELD_VAL to output scale linearly - Indirect Sq Root: Convert FIELD_VAL to output scale after taking square root	Indirect
LO_ALM Low Alarm	-	The setting for Low Alarm in engineering units. Setting range see in the following part.	-
LO_LO_ALM Low Low Alarm	-	The setting for Low Low Alarm in engineering units. Setting range see in the following part.	-
Settings of 5 subelements for previous 2 parameters Low Alarm and Low Low Alarm:			
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-

Parameter Label	Access	Description and settings	Initial Value
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
LO_LIM Low Limit	R/W	The setting for the low alarm in engineering units.	-INF
LO_LO_LIM Low Low Limit	R/W	The setting of the low low alarm in engineering units.	-INF
LO_LO_PRI Low Low Priority	R/W	Priority of the low low alarm. Setting see in the following part.	0
LO_PRI Low Priority	R/W	Priority of the low alarm. Setting: 0: The associated alert may clear when the priority is changed to 0, but it will never occur. 1: The associated alert is not send as a notification. If the priority is above 1, then the alert must be reported. 2: Reserved for alerts that do not require the attention of a plant operator, e.g. diagnostic and system alerts. Block alarm, error alarm and update event have a fixed priority of 2. 3...7: Increasing higher priorities - advisory alarms. 8...15: Increasing higher priorities - critical alarms.	0
LOW_CUT Low Cutoff	R/W	Limit used in square root processing. A value of zero percent of scale is used in block processing if the transducer value falls below this limit, in % of scale. This feature may be used to eliminate noise near zero for a flow sensor. Setting: 0.0...+INF	0.0
MODE_BLK Block Mode	-	The actual, target, permitted, and normal modes of the block.	-
TARGET Target	R/W	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested. Setting: ROut / RCas / Cas / Auto / Man / OOS	OOS
ACTUAL Actual	R	This is the current mode of the block, which may differ from the target based on operating conditions. Its value is calculated as part of block execution.	OOS
PERMITTED Permitted	R/W	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement. Setting: ROut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto Man OOS
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions. Setting: ROut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto
OUT Output	-	The primary analog value calculated as a result of executing the function block.	-

Parameter Label	Access	Description and settings	Initial Value
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm.	0.0
OUT_SCALE Output Scale	-	The high and low scale values, engineering units code and number of digits to the right of the decimal point to be used in displaying the OUT parameter and parameters which have the same scaling as OUT.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	Specific to block instance
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	Specific to block instance
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: All units are possible.	Specific to block instance
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter. Setting: -128...127	Specific to block instance
PV Process Value	-	Either the primary analog value for use in executing the function, or a process value associated with it. May also be calculated from the READBACK value of an AO block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
PV_FTIME Process Value Filter Time	R/W	Time constant of a single exponential filter for the PV, in seconds. Setting: 0.0...60.0 s	0.0 s
SIMULATE Simulate	-	Allows the transducer analog input or output to the block to be manually supplied when simulate is enabled. When simulate is disabled, the simulate value and status track the actual value and status.	-
SIMULATE_STATUS Simulate Status	R/W	Used for the transducer status when simulation is enabled.	Bad Non Specific Not Limited
SIMULATE_VALUE Simulate Value	R/W	Used for the transducer value when simulation is enabled.	0.0
TRANSDUCER_STATUS Transducer Status	R	Status of value supplied by the transducer.	Bad Non Specific Not Limited

Parameter Label	Access	Description and settings	Initial Value
TRANSDUCER_VALUE Transducer Value	R	Current value supplied by the transducer.	0.0
ENABLE_DISABLE Simulate En/Disable	R/W	The parameter SW_SIMULATE in RB Block must be enabled. Setting: Uninitialized / Disabled / Active	Disabled
ST_REV Static Revision	R	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.	0
STATUS_OPTS Status Options	R/W	Options which the user may select in the block processing of status. Setting: • Propagate Fault Forward • Uncertain if limited • BAD if limited • Uncertain if Man.	0
STRATEGY Strategy	R/W	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block. Setting: 0...65535	0
TAG_DESC Tag Description	R/W	The user description of the intended application of the block. Setting: ≤32 digits	blanks
UPDATE_EVT Update Event		This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an update occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
STATIC_REVISION Static Rev	R	The static revision of the block whose static parameter was changed and is being reported. It is possible for the present value of static revision to be greater than this because static can be changed at any time.	0
RELATIVE_INDEX Relative Index	R	The OD index of the static parameter whose change caused this alert, minus the FB starting index. If the update event was caused by a write to multiple parameters at the same time, then this attribute will be zero.	0
XD_SCALE Transducer Scale	-	The high and low scale values, engineering units code and number of digits to the right of the decimal point used with the value obtained from the transducer for a specified channel.	-

Parameter Label	Access	Description and settings	Initial Value
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	Specific to block instance
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	Specific to block instance
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. The value could effect a unit conversion. For details refer to chapter "Appendix".	Specific to block instance
		Temperature units: 1001: °C / 1002: °F / 1000: K	
		Volume flow units: 1347: m³/s / 1348: m³/min / 1349: m³/h / 1350: m³/d / 1351: L/s / 1352: L/min / 1353: L/h / 1354: L/d / 1362: gal/s / 1363: GPM / 1364: gal/h / 1365: gal/d / 1450: kgal/s / 1454: kgal/min / 1458: kgal/h / 1462: kgal/d / ...	
		Mass flow units: 1322: kg/s / 1323: kg/min / 1324: kg/h / 1325: kg/d / 1326: t/s / 1327: t/min / 1328: t/h / 1329: t/d / 1330: lb/s / 1331: lb/min / 1332: lb/h / 1333: lb/d / 1644: klb(US)/s / 1643: klb(US)/min / 1642: klb(US)/h / 1641: klb(US)/d / 1334: STon/s / 1335: STon/min / 1336: STon/h / 1337: STon/d / 1338: LTon/s / 1339: LTon/min / 1340: LTon/h / 1341: LTon/d	
		Velocity units: 1061: m/s / 1062: mm/s / 1063: m/h / 1064: km/h / 1067: ft/s / 1070: ft/min / 1073: ft/h / 1066: in/s / 1069: in/min / 1072: in/h / 1068: yd/s / 1071: yd/min / 1074: yd/h	
		Power units: 1186: W / 1190: kW / 1189: MW / 1188: GW / 1187: TW / 1438: kJ/s / 1439: kJ/min / 1440: kJ/h / 1441: kJ/d / 1442: MJ/s / 1443: MJ/min / 1196: MJ/h / 1444: MJ/d / 1431: kcal/s / 1432: kcal/min / 1433: kcal/h / 1434: kcal/d / 1435: Mcal/s / 1436: Mcal/min / 1437: Mcal/d / 1195: Mcal/h / 1445: Btu/s / 1446: Btu/min / 1447: Btu/day / 1197: Btu/h	
		Gain units: 1383: dB	
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	Specific to block instance
		Setting: -128...127	

Table 4-4: Description of Analog Input Block parameters

4.6 FLOWTB (Flow Transducer Block)

The following table lists the Flow Transducer Block parameters in alphabetical order with short parameter descriptions, factory settings (Initial Value (IV)) and possible settings.

Parameter Label	Access	Description and settings	Initial Value
ADVANCED_MEASUREMENTS Advanced measurements	R/W	Disable/Enable display of advanced measurements (REYNOLDS_NUMBER, VELOCITY_OF_SOUND_1/2, etc.) at fieldbus interface. For stability reasons it is recommended to have this option disabled while process control is active. Setting: disable / enable	disable
ALERT_KEY Alert Key	R/W	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc. Setting: 1...255	0
BLOCK_ALM Block Alarm	-	The block alarm is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_ERR Block Error	R	This parameter reflects the error status associated with the hardware or software components associated with a block. It is a bit string, so that multiple errors may be shown. Setting: • Other: Non-specific error active • Block Configuration: Error detected in block configuration • Link Configuration: Error detected in link configuration • Simulation Active: Simulation enabled in this block • Local Override: Output tracking of faultstate active • Device Fault State: Device faultstate set • Device Maintenance: Device needs maintenance soon • Sensor Failure: Sensor Failure detected by this block. Process variable has a status of Bad, Sensor Failure • Output Failure: Failure detected in output hardware • Memory Failure: Memory error detected • Lost Static Data: Static parameters cannot be recovered • Lost NV Data: Non-volatile parameters cannot be recovered • Readback Check: Failure detected in READBACK • Maintenance Needed: Device NEEDS maintenance NOW • Power Up: Recovery from power failure • Out Of Service: Block actual mode is out of service	0
BLOCK_ERR_DESC_1 Block Error Description	R	This parameter is used by a device to report more specific details regarding persistent errors that are reported through BLOCK_ERR. Setting: • TB is OOS: TB: MODE_BLK.ACTUAL is OOS	0
COLD_FLOW_RANGE Cold Flow Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-

Parameter Label	Access	Description and settings	Initial Value
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1186: W / 1190: kW / 1189: MW / 1188: GW / 1187: TW / 1438: kJ/s / 1439: kJ/min / 1440: kJ/h / 1441: kJ/d / 1442: MJ/s / 1443: MJ/min / 1196: MJ/h / 1444: MJ/d / 1431: kcal/s / 1432: kcal/min / 1433: kcal/h / 1434: kcal/d / 1435: Mcal/s / 1436: Mcal/min / 1437: Mcal/d / 1195: Mcal/h / 1445: Btu/s / 1446: Btu/min / 1447: Btu/day / 1197: Btu/h	W
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	0
COLD_FLOW_VALUE Cold Flow	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
COLLECTION_DIRECTORY Collection Directory	-	A directory that specifies the number, starting indices and DD Item IDs of the data collections in each transducer within a Transducer Block.	-
COUNTER_DECREASE_1 Counter Decrease 1	R/W	C1.7.2 Setting: 1...99	1
COUNTER_DECREASE_2 Counter Decrease 2	R/W	C2.7.2 Setting: 1...99	1
COUNTER_LIMIT_1 Counter Limit 1	R/W	C1.7.3 Setting: 0...999	1
COUNTER_LIMIT_2 Counter Limit 2	R/W	C2.7.3 Setting: 0...999	1
CURRENT_IN_A Current in A	R	Current in A	0.0 mA
CURRENT_IN_B Current in B	R	Current in B	0.0 mA
CURRENT_INPUTS Current Inputs	R/W	C1.14 Setting: A: supply B:return / A:return B:supply	A: supply B:return
DENSITY_1 Density 1	R/W	C1.3.10 Setting: 0.1...5.0 kg/L	1.0 kg/L
DENSITY_2 Density 2	R/W	C2.3.10 Setting: 0.1...5.0 kg/L	1.0 kg/L

Parameter Label	Access	Description and settings	Initial Value
DYN_VISCOSITY_1 Dynamic Viscosity 1	R/W	C1.3.12	1.0 cP
		Setting: 0.1...5000.0 cP	
DYN_VISCOSITY_2 Dynamic Viscosity 2	R/W	C2.3.12	1.0 cP
		Setting: 0.1...5000.0 cP	
ELECTRONIC_TEMPERATURE_RANGE Electronic Temperature Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value.	°C
		Setting: 1001: °C / 1002: °F / 1000: K	
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
ELECTRONIC_TEMPERATURE_VALUE Electronic Temperature	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
ERROR_LIMIT_1 Error Limit 1	R/W	C1.7.1	10.0
		Setting: 0.0...100.0	
ERROR_LIMIT_2 Error Limit 2	R/W	C2.7.1	10.0
		Setting: 0.0...100.0	
FLOW_DIRECTION_1 Flow Direction 1	R/W	C1.6.2	normal direction
		Setting: normal direction / reverse direction	
FLOW_DIRECTION_2 Flow Direction 2	R/W	C2.6.2	normal direction
		Setting: normal direction / reverse direction	
FLOW_MODE Flow Mode	R/W	C1.10	standard
		Setting: standard / heat / cold	

Parameter Label	Access	Description and settings	Initial Value
FLOW_SENSOR Flow Sensor	R/W	C1.15	At supply side
		Setting: At supply side / At return side	
FLOW_SPEED_RANGE Flow Speed Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value.	m/s
		Setting: 1061: m/s / 1062: mm/s / 1063: m/h / 1064: km/h / 1067: ft/s / 1070: ft/min / 1073: ft/h / 1066: in/s / 1069: in/min / 1072: in/h / 1068: yd/s / 1071: yd/min / 1074: yd/h	
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	0
FLOW_SPEED_VALUE Flow Speed	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
FLUID_C_1 VoS Fluid 1	R/W	C1.3.9	1485.0 m/s
		Setting: 500.0...2500.0 m/s	
FLUID_C_2 VoS Fluid 2	R/W	C2.3.9	1485.0 m/s
		Setting: 500.0...2500.0 m/s	
FLUID_SELECT_1 Fluid 1	R/W	C1.3.8	water
		Setting: • water • water/glycol • alkanes • oil • acids • CxHx refined • CxHx light • alcohols • caustic soda • refrigerant • solvents • other	

Parameter Label	Access	Description and settings	Initial Value
FLUID_SELECT_2 Fluid 2	R/W	C2.3.8 Setting: • water • water/glycol • alkanes • oil • acids • CxHx refined • CxHx light • alcohols • caustic soda • refrigerant • solvents • other	water
GAIN_1_RANGE Gain Range 1	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1383: dB	dB
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
GAIN_1_VALUE Gain 1	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
GAIN_2_RANGE Gain 2 Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1383: dB	dB

Parameter Label	Access	Description and settings	Initial Value
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
GAIN_2_VALUE Gain 2	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
GAIN_RANGE Gain Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1383: dB	dB
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
GAIN_VALUE Gain	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
GK_VALUE_1 GK 1	R/W	C1.5.2 Setting: 0.5...2.0	1.0
GK_VALUE_2 GK 2	R/W	C2.5.2 Setting: 0.5...2.0	1.0
GLYCOL_PERCENT_VOL_1 Glycol % Vol. 1	R/W	C1.3.11 Setting: 0.0...100.0 %	25.0 %
GLYCOL_PERCENT_VOL_2 Glycol % Vol. 2	R/W	C2.3.11 Setting: 0.0...100.0 %	25.0 %

Parameter Label	Access	Description and settings	Initial Value
HEAT_FLOW_RANGE Heat Flow Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1186: W / 1190: kW / 1189: MW / 1188: GW / 1187: TW / 1438: kJ/s / 1439: kJ/min / 1440: kJ/h / 1441: kJ/d / 1442: MJ/s / 1443: MJ/min / 1196: MJ/h / 1444: MJ/d / 1431: kcal/s / 1432: kcal/min / 1433: kcal/h / 1434: kcal/d / 1435: Mcal/s / 1436: Mcal/min / 1437: Mcal/d / 1195: Mcal/h / 1445: Btu/s / 1446: Btu/min / 1447: Btu/day / 1197: Btu/h	W
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	0
HEAT_FLOW_VALUE Heat Flow	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
HYSTERESIS_1 LFC Hysteresis 1	R/W	C1.6.4 Setting: 0.0...10.0 m/s	0.0 m/s
HYSTERESIS_2 LFC Hysteresis 2	R/W	C2.6.4 Setting: 0.0...10.0 m/s	0.0 m/s
INSTALL_FACTOR_1 Install Factor 1	R	Install Factor 1	0.0
INSTALL_FACTOR_2 Install Factor 2	R	Install Factor 2	0.0
LIMITATION_MAX_1 Upper Limit 1	R/W	C1.6.1 Setting: 0.001...100.0 m/s	20.0 m/s
LIMITATION_MAX_2 Upper Limit 2	R/W	C2.6.1 Setting: 0.001...100.0 m/s	20.0 m/s
LIMITATION_MIN_1 Lower Limit 1	R/W	C1.6.1 Setting: -100.0...-0.001 m/s	-20.0 m/s

Parameter Label	Access	Description and settings	Initial Value
LIMITATION_MIN_2 Lower Limit 2	R/W	C2.6.1	-20.0 m/s
		Setting: -100.0...-0.001 m/s	
LINEARIZATION_1 Linearization 1	R/W	C1.5.4	off
		Setting: off / on	
LINEARIZATION_2 Linearization 2	R/W	C2.5.4	off
		Setting: off / on	
LINER_MATERIAL_1 Liner Material 1	R/W	C1.3.5	none
		Setting: none / LDPE / PTFE / HDPE / rubber / epoxy / cement / other	
LINER_MATERIAL_2 Liner Material 2	R/W	C2.3.5	none
		Setting: none / LDPE / PTFE / HDPE / rubber / epoxy / cement / other	
LINER_MATERIAL_C_1 VoS Liner Material 1	R/W	C1.3.6	1000.0 m/s
		Setting: 1000.0...4500.0 m/s	
LINER_MATERIAL_C_2 VoS Liner Material 2	R/W	C2.3.6	1000.0 m/s
		Setting: 1000.0...4500.0 m/s	
LINER_THICKNESS_1 Liner Thickness 1	R/W	C1.3.7	0.5 mm
		Setting: 0.1...20.0 mm	
LINER_THICKNESS_2 Liner Thickness 2	R/W	C2.3.7	0.5 mm
		Setting: 0.1...20.0 mm	
LOW_FLOW_CUTOFF_1 Low Flow Cutoff 1	R/W	C1.6.4	0.0 m/s
		Setting: 0.0...10.0 m/s	
LOW_FLOW_CUTOFF_2 Low Flow Cutoff 2	R/W	C2.6.4	0.0 m/s
		Setting: 0.0...10.0 m/s	
MASS_FLOW_RANGE Mass Flow Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-

Parameter Label	Access	Description and settings	Initial Value
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1322: kg/s / 1323: kg/min / 1324: kg/h / 1325: kg/d / 1326: t/s / 1327: t/min / 1328: t/h / 1329: t/d / 1330: lb/s / 1331: lb/min / 1332: lb/h / 1333: lb/d / 1644: klb(US)/s / 1643: klb(US)/min / 1642: klb(US)/h / 1641: klb(US)/d / 1334: STon/s / 1335: STon/min / 1336: STon/h / 1337: STon/d / 1338: LTon/s / 1339: LTon/min / 1340: LTon/h / 1341: LTon/d	kg/h
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	0
MASS_FLOW_VALUE Mass Flow	-	-	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
MODE_BLK Block Mode	-	The actual, target, permitted, and normal modes of the block.	-
TARGET Target	R/W	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested. Setting: R0ut / RCas / Cas / Auto / Man / OOS	Auto
ACTUAL Actual	R	This is the current mode of the block, which may differ from the target based on operating conditions. Its value is calculated as part of block execution.	OOS
PERMITTED Permitted	R/W	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement. Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto OOS
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions. Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto
NUM_PATHS Number of paths	R	C1.2/C2.2	1 path
NUM_PIPES Number Of Pipes	R	C1.1/C2.1	1 pipe
NUM_TRAVERSES_1 Numb. Traverses 1	R/W	C1.4.2 Setting: 1 traverse / 2 traverses / 4 traverses	2 traverses
NUM_TRAVERSES_2 Numb. Traverses 2	R/W	C1.4.5/C2.4.2 Setting: 1 traverse / 2 traverses / 4 traverses	2 traverses

Parameter Label	Access	Description and settings	Initial Value
PIPE_1_TEMP Pipe 1 Temperature	R/W	C1.3.13	20.0 °C
		Setting: -200.0...700.0 °C	
PIPE_2_TEMP Pipe 2 Temperature	R/W	C2.3.13	20.0 °C
		Setting: -200.0...700.0 °C	
PIPE_DIAMETER_1 Pipe 1 Diameter	R/W	C1.3.1	100.0 mm
		Setting: 3.0...4300.0 mm	
PIPE_DIAMETER_2 Pipe 2 Diameter	R/W	C2.3.1	100.0 mm
		Setting: 3.0...4300.0 mm	
PIPE_MATERIAL_1 Pipe Material 1	R/W	C1.3.2	carbon steel
		Setting: • carbon steel • stainless steel • cast iron • aluminum • asbestos cement • concrete • acrylics • PP/PVC • polyamide • GRP/FRP • other	
PIPE_MATERIAL_2 Pipe Material 2	R/W	C2.3.2	carbon steel
		Setting: • carbon steel • stainless steel • cast iron • aluminum • asbestos cement • concrete • acrylics • PP/PVC • polyamide • GRP/FRP • other	
PIPE_MATERIAL_C_1 VoS Pipe Material 1	R/W	C1.3.3	3230.0 m/s
		Setting: 1000.0...4500.0 m/s	
PIPE_MATERIAL_C_2 VoS Pipe Material 2	R/W	C2.3.3	3230.0 m/s
		Setting: 1000.0...4500.0 m/s	
PIPE_WALL_THICKNESS_2 Pipe 2 Wall Thickness	R/W	C1.3.4	5.0 mm
		Setting: 1.0...200.0 mm	
PIPE_WALL_THICKNESS_1 Pipe 1 Wall Thickness	R/W	C2.3.4	5.0 mm
		Setting: 1.0...200.0 mm	
PROTECT_INFO Access Protection	R	Current protection level to restricted parameters.	0

Parameter Label	Access	Description and settings	Initial Value
RETURN_TEMPERATURE Return Temperature	R/W	C1.13 Setting: -200.0...800.0 °C	40.0 °C
REYNOLDS_CORRECT_1 Reynolds Correction 1	R/W	C1.5.3 Setting: off / on	on
REYNOLDS_CORRECT_2 Reynolds Correction 2	R/W	C2.5.3 Setting: off / on	on
REYNOLDS_NUMBER Reynolds number	R	Actual Reynolds number	0.0
REYNOLDS_NUMBER_2 Reynolds number 2	R	Actual Reynolds number 2	0.0
SELECTOR_DIAGNOSIS_1 Diagnostics 1	R/W	C1.17.1 Setting: none / gain 1 / SNR 1	none
SELECTOR_DIAGNOSIS_2 Diagnostics 2	R/W	C1.17.2/C2.10.1 Setting: none / gain 1 / SNR 1	none
SENSOR_CPU_INFO Sensor Cpu	-	Displays information of the sensor CPU software	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-
SENSOR_DRIVER_INFO Sensor Driver	-	Displays information of the sensor driver hardware	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-
SENSOR_DSP_INFO Sensor Dsp	-	Displays information of the sensor DSP software	-
IDENT_NUMBER ID-No. Board	R	ID No. of the circuit board	-
SOFTWARE_VER Software version	R	Software version	-
PRODUCT_DATE Production date	R	Production date	-
SENSOR_SN Sensor Serial Number	R	The sensor serial number.	-
SENSOR_TYPE Sensor Type	R	The type of sensor.	Ultrasonic (time of travel)
SNR_1_RANGE SNR 1 Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-

Parameter Label	Access	Description and settings	Initial Value
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1383: dB	dB
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
SNR_1_VALUE SNR 1	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
SNR_2_RANGE SNR 2 Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1383: dB	dB
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
SNR_2_VALUE SNR 2	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
SNR_RANGE SNR Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-

Parameter Label	Access	Description and settings	Initial Value
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1383: dB	dB
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
SNR_VALUE SNR	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
SPECIFIC_HEAT Specific Heat	R/W	C1.16 Setting: 0.0...10000.0 J/(kg-K)	4195.0 J/(kg-K)
ST_REV Static Revision	R	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.	0
STRATEGY Strategy	R/W	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block. Setting: 0...65535	0
SUPPLY_TEMPERATURE Supply Temperature	R/W	C1.12 Setting: -40.0...200.0 °C	90.0 °C
TA_CALIB_NO Ta Calibration No.	R	C3.2	0
TA_SERIAL_NO Ta Serial No.	R	C3.1	-
TAG_DESC Tag Description	R/W	The user description of the intended application of the block. Setting: ≤32 digits	blanks
TB_CALIB_NO Tb Calibration No.	R	C3.4	0
TB_SERIAL_NO Tb Serial No.	R	C3.3	-
TC_CALIB_NO Tc Calibration No.	R	C3.6	0
TC_SERIAL_NO Tc Serial No.	R	C3.5	-

Parameter Label	Access	Description and settings	Initial Value
TEMPERATURE_A Temperature A	R	Temperature A	0.0 °C
TEMPERATURE_B Temperature B	R	Temperature B	0.0 °C
TEMPERATURE_INPUTS Temperature Inputs	R/W	C1.11 Setting: automatic / fixed	automatic
TIME_CONSTANT_1 Time Constant 1	R/W	C1.6.3 Setting: 0.0...100.0 s	0.0 s
TIME_CONSTANT_2 Time Constant 2	R/W	C2.6.3 Setting: 0.0...100.0 s	0.0 s
TRANSDUCER_DIRECTORY Transducer Directory Entry	-	A directory that specifies the number and starting indices of the data collections in the transducer block.	-
TRANSDUCER_DIST_1 Actual Distance 1	R/W	C1.4.3 Setting: -10.0...9999.0 mm	100.0 mm
TRANSDUCER_DIST_2 Actual Distance 2	R/W	C1.4.6/C2.4.3 Setting: -10.0...9999.0 mm	100.0 mm
TRANSDUCER_SET_1 Transducer Set 1	R/W	C1.4.1 Setting: Ta / Tb / Tc / none	none
TRANSDUCER_SET_2 Transducer Set 2	R/W	C1.4.4/C2.4.1 Setting: Ta / Tb / Tc / none	none
TRANSDUCER_TYPE Transducer Type	R	Identifies the transducer that follows.	KROHNE - Flow
TRANSDUCER_TYPE_VER Transducer Type Version	R	Identifies the version of the transducer that follows. Format is XXYY where XX is the major spec revision and YY is the manufacturer revision.	0
UPDATE_EVT Update Event	-	This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an update occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-

Parameter Label	Access	Description and settings	Initial Value
STATIC_REVISION Static Rev	R	The static revision of the block whose static parameter was changed and is being reported. It is possible for the present value of static revision to be greater than this because static can be changed at any time.	0
RELATIVE_INDEX Relative Index	R	The OD index of the static parameter whose change caused this alert, minus the FB starting index. If the update event was caused by a write to multiple parameters at the same time, then this attribute will be zero.	0
V_NO_SENSOR V No. Sensor	R	V No. Sensor	-
VELOCITY_OF_SOUND_1 Velocity of Sound 1	R	Velocity of Sound 1	0.0 m/s
VELOCITY_OF_SOUND_2 Velocity of Sound 2	R	Velocity of Sound 2	0.0 m/s
VOLUME_FLOW_12 Volume Flow Sum	R/W	C2.9 Setting: off / volume flow 1+2 / volume flow 1-2 / volume flow 2-1	off
VOLUME_FLOW_12_RANGE Volume Flow 12 Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1347: m³/s / 1348: m³/min / 1349: m³/h / 1350: m³/d / 1351: L/s / 1352: L/min / 1353: L/h / 1354: L/d / 1362: gal/s / 1363: GPM / 1364: gal/h / 1365: gal/d / 1450: kgal/s / 1454: kgal/min / 1458: kgal/h / 1462: kgal/d / ...	m³/h
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	0
VOLUME_FLOW_12_VALUE Volume Flow 12	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
VOLUME_FLOW_2_RANGE Volume Flow 2 Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-

Parameter Label	Access	Description and settings	Initial Value
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1347: m ³ /s / 1348: m ³ /min / 1349: m ³ /h / 1350: m ³ /d / 1351: L/s / 1352: L/min / 1353: L/h / 1354: L/d / 1362: gal/s / 1363: GPM / 1364: gal/h / 1365: gal/d / 1450: kgal/s / 1454: kgal/min / 1458: kgal/h / 1462: kgal/d / ...	m ³ /h
VOLUME_FLOW_2_VALUE Volume Flow 2	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
VOLUME_FLOW_RANGE Volume Flow Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1347: m ³ /s / 1348: m ³ /min / 1349: m ³ /h / 1350: m ³ /d / 1351: L/s / 1352: L/min / 1353: L/h / 1354: L/d / 1362: gal/s / 1363: GPM / 1364: gal/h / 1365: gal/d / 1450: kgal/s / 1454: kgal/min / 1458: kgal/h / 1462: kgal/d / ...	m ³ /h
VOLUME_FLOW_VALUE Volume Flow	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
VOS_RANGE Velocity of Sound Range	-	The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point to be used to display the Primary Value.	-

Parameter Label	Access	Description and settings	Initial Value
EU_100 max value	R	The engineering unit value which represents the upper end of range of the associated block parameter.	-
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	-
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: 1061: m/s / 1062: mm/s / 1063: m/h / 1064: km/h / 1067: ft/s / 1070: ft/min / 1073: ft/h / 1066: in/s / 1069: in/min / 1072: in/h / 1068: yd/s / 1071: yd/min / 1074: yd/h	m/s
DECIMAL Decimal	R	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	2
VOS_VALUE Velocity of Sound	-	The measured value and status available to the Function Block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
XD_ERROR Transducer Error	R	One of the transducer error codes defined in the FF Transducer Specifications in section "4.7 Block Alarm Subcodes".	No errors

Table 4-5: Description of Flow Transducer Block parameters

4.7 Integrator Block (IT)

The following table lists the 2 Integrator Block parameters in alphabetical order.

It describes characteristics of the signal converter measurements for forward (positive) and reverse (negative) flow at the same time. Both integrators were intended to totalize the forward flow Integrator 1 (+ Flow Totalizer) on the one hand and the reverse flow Integrator 2 (- Flow Totalizer) on the other. The configuration of these blocks is almost the same, unless stated differently.

The following table contains short parameter description, factory settings (Initial Value (IV)) and possible settings.

Parameter Label	Access	Description and settings	Initial Value
ALERT_KEY Alert Key	R/W	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc. Setting: 1...255	0
BLOCK_ALM Block Alarm	-	The block alarm is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_ERR Block Error	R	This parameter reflects the error status associated with the hardware or software components associated with a block. It is a bit string, so that multiple errors may be shown. Setting: • Other: Non-specific error active • Block Configuration: Error detected in block configuration • Link Configuration: Error detected in link configuration • Simulation Active: Simulation enabled in this block • Local Override: Output tracking of faultstate active • Device Fault State: Device faultstate set • Device Maintenance: Device needs maintenance soon • Sensor Failure: Sensor Failure detected by this block. Process variable has a status of Bad, Sensor Failure • Output Failure: Failure detected in output hardware • Memory Failure: Memory error detected • Lost Static Data: Static parameters cannot be recovered • Lost NV Data: Non-volatile parameters cannot be recovered • Readback Check: Failure detected in READBACK • Maintenance Needed: Device NEEDS maintenance NOW • Power Up: Recovery from power failure • Out Of Service: Block actual mode is out of service	Actual measured value
BLOCK_ERR_DESC_1 Block Error Description	R	This parameter is used by a device to report more specific details regarding persistent errors that are reported through BLOCK_ERR. Setting: • RB is OOS: RB: MODE_BLK.ACTUAL is OOS • Memory Failure: Memory Failure • No Schedule: No Schedule • ExecTime small: Block Execution Time too small • ExecTime large: Block Execution Time too large • MODE OOS: MODE_BLK.TARGET is set OOS • INTEG_TYPE setting: INTEG_TYPE is uninitialized • CLOCK_PER setting: CLOCK_PER <= period of execution • TIME_UNIT1 setting: TIME_UNIT1 is uninitialized • TIME_UNIT2 setting: TIME_UNIT2 is uninitialized	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_WARN_DESC Block warning description	R	Reason why OUT.status is not GOOD Setting: • MODE_PERM not Auto: MODE_BLK.PERMITTED doesn't include Auto • MODE MAN: MODE_BLK.TARGET is set MAN • MODE.ACTUAL MAN: MODE_BLK.ACTUAL is MAN • IN_x not connected: IN_1 and IN_2 are not connected • IN_1 is Bad: IN_1.status is Bad . IN_2 is Bad: IN_2.status is Bad • IN_1.value: IN_1.value is NaN or INF • IN_2.value: IN_2.value is NaN or INF • PCT_INCL < UNCERT_LIM: PCT_INCL < UNCERT_LIM • PCT_INCL < GOOD_LIM: PCT_INCL < GOOD_LIM • PULSE_VALx setting: PULSE_VAL1 and PULSE_VAL2 are 0 • TOTAL_SP setting: TOTAL_SP is 0: cyclic reset • unknown reason: unknown reason	0
CLOCK_PER Clock Period	R/W	Establishes the period for periodic reset, in seconds. Setting: ≥ 0	0.0 Sec
GOOD_LIM Good Limit	R/W	Sets the limit for PCT_INCL. Below this limit OUT receives the status good. Setting: 0...100 %	0.0 %
GRANT_DENY Grant Deny	-	Options for controlling access of host computers and local control panels to operating, tuning and alarm parameters of the block.	-
GRANT Grant	R/W	Depending on the philosophy of the plant, the operator or a higher level device (HLD), or a local operator's panel (LOP) in the case of Local, may turn on an item of the Grant attribute - Program, Tune, Alarm or Local. Setting: Program / Tune / Alarm / Local / Operate / Service / Diagnostic	0
DENY Deny	R/W	The Denied attribute is provided for use by a monitoring application in an interface device and may not be changed by an operator. Setting: • Program Denied • Tune Denied • Alarm Denied • Local Denied • Operate Denied • Service Denied • Diagnostic Denied	0
IN_1 Input 1	-	Auxiliary input value to the block, used for other values than the PV.	-

Parameter Label	Access	Description and settings	Initial Value
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0
IN_2 Input 2	-	Input required by the characterizer.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0
INTEG_OPTS Integration Options	R/W	INTEG_OPTS is to be used to specify several integration options as type of input used in each input, flow direction to be considered in the totalization, status to be considered in the totalization and if the totalization residue shall be used in the next batch after a reset. The following INTEG_OPTS are possible (see also INTEG_TYPE): • Input 1 accumulate: IN_1 is used as pulse (otherwise as rate) • Input 2 accumulate: IN_2 is used as pulse (otherwise as rate) • Flow forward: only positive net flow will be taken into account for totalization • Flow reverse: only negative net flow will be taken into account for totalization • Use Uncertain: IN_1 and IN_2 input will be taken into account even if their states are "Uncertain" (otherwise the value with the last "Good" status will be taken) • Use BAD Input: IN_1 or IN_2 with "Bad" status will be interpreted as "Good" (Note: only the status is interpreted as "Good", the value isn't used for totalization, but the good one, i.e. RTOTAL isn't affected with this setting. • Carry: integration after a reset starts with the init value, but with the residual after the trip value. • Add zero if Bad: if one of the input (IN_1 or IN_2) statuses are "Bad", not the last "Good" value is used for totalization, but zero (0). • Confirm reset: after a manual reset of totalization, the next manual reset must be preceded by a reset confirmation by the control system.	0

Parameter Label	Access	Description and settings	Initial Value
INTEG_TYPE Integration Type	R/W	Defines the type of counting (up or down) and the type of resetting (demand or periodic). Setting: • Uninitialized • UP_AUTO • UP_DEM • DN_AUTO • DN_DEM • PERIODIC • DEMAND • PER&DEM	Uninitialized
MODE_BLK Block Mode	-	The actual, target, permitted, and normal modes of the block.	-
TARGET Target	R/W	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested. Setting: R0ut / RCas / Cas / Auto / Man / OOS	OOS
ACTUAL Actual	R	This is the current mode of the block, which may differ from the target based on operating conditions. Its value is calculated as part of block execution.	OOS
PERMITTED Permitted	R/W	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement. Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto Man OOS
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions. Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	Auto
N_RESET Number of Reset	R	Counts the number of resets. It can not be written nor reset.	0.0
OP_CMD_INT Operator Command Integration	R/W	Operator command. Resets the totalizer. Setting: Off / Reset	Off
OUT Output	-	The primary analog value calculated as a result of executing the function block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Out Of Service Not Limited
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm.	0.0
OUT_PTRIP Output Pre Trip	-	The second discrete output.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Out Of Service Not Limited

Parameter Label	Access	Description and settings	Initial Value
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm. Setting: Off / On	Off
OUT_RANGE Output Range	-	This is the display scaling for the output. It has no effect on the block. It is used by many blocks.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: All units are possible.	Uninitialized
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter. Setting: -128...127	0
OUT_TRIP Output Trip	-	The first discrete output.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Out Of Service Not Limited
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm. Setting: Off / On	Off
OUTAGE_LIM Outage Limit	R/W	The maximum tolerated duration for power failure.	0.0 Sec
PCT_INCL Percentage Included	R	Indicates the percentage of inputs with good status compared to the ones with bad or uncertain and bad status.	0.0 %
PRE_TRIP Pre Trip	R/W	Adjusts the amount of mass, volume or energy that should set OUT_PTRIP when the integration reaches (TOTAL_SP - PRE_TRIP) when counting up or PRE_TRIP when counting down.	0.0
PULSE_VAL1 Pulse Val1	R/W	Determines the mass, volume or energy per pulse.	0.0
PULSE_VAL2 Pulse Val2	R/W	Determines the mass, volume or energy per pulse.	0.0
RESET_CONFIRM Reset Confirm	-	Momentary discrete value which can be written by a host to enable further resets, if the option confirm reset in INTEG_OPTS is chosen.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited

Parameter Label	Access	Description and settings	Initial Value
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked. Setting: Off / Confirm	Off
RESET_IN Reset Input	-	Resets the totalizers.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	Value Setting: Off / Reset	Off
REV_FLOW1 Reverse Flow 1	-	Indicates reverse flow when true.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked. Setting: Forward / Reverse	Forward
REV_FLOW2 Reverse Flow 2	-	Indicates reverse flow when true.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked. Setting: Forward / Reverse	Forward
RTOTAL Rejected Total	R/W	Indicates the totalization of bad or bad and uncertain inputs, according to INTEG_OPTS.	0.0
SRTOTAL Snapshot of Rejected Total	R	The snapshot of RTOTAL, just before a reset.	0.0
SSP Snapshot of Setpoint	R	The snapshot of TOTAL_SP.	0.0
ST_REV Static Revision	R	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.	0

Parameter Label	Access	Description and settings	Initial Value
STATUS_OPTS Status Option	R/W	Options which the user may select in the block processing of status.	0
		Setting: Uncertain if Man	
STOTAL Snapshot of Total	R	Indicates the Snapshot of OUT just before a reset.	0.0
STRATEGY Strategy	R/W	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.	0
		Setting: 0...65535	
TAG_DESC Tag Description	R/W	The user description of the intended application of the block.	blanks
		Setting: ≤32 digits	
TIME_UNIT1 Time Unit 1	R/W	Converts the rate time units in seconds.	Uninitialized
		Setting: 1: seconds / 2: minutes / 3: hour / 4: days	
TIME_UNIT2 Time Unit 2	R/W	Converts the rate time units in seconds.	Uninitialized
		Setting: 1: seconds / 2: minutes / 3: hour / 4: days	
TOTAL_SP Total Setpoint	R/W	The SP for a batch totalization. Not just SP because SP has PV units and other special properties not used in this application.	0.0
UNCERT_LIM Uncertain Limit	R/W	Sets the limit for PCT_INCL. Below this limit OUT receives the status uncertain.	0.0 %
UNIT_CONV Unit Conversion	R/W	Factor to convert the engineering units of input 2 into the engineering units of input 1.	1.0
UPDATE_EVT Update Event	-	This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	R	A discrete enumeration which is set to Unacknowledged when an update occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm has been noticed.	Uninitialized
		Setting: Uninitialized / Acknowledged / Unacknowledged	
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs. Time stamp records the time when parameter was updated.	-
STATIC_REVISION Static Revision	R	The static revision of the block whose static parameter was changed and is being reported. It is possible for the present value of static revision to be greater than this because static can be changed at any time.	0

Parameter Label	Access	Description and settings	Initial Value
RELATIVE_INDEX Relative Index	R	The OD index of the static parameter whose change caused this alert, minus the FB starting index. If the update event was caused by a write to multiple parameters at the same time, then this attribute will be zero.	0

Table 4-6: Description of Integrator Block parameters

4.8 Proportional Integral Derivative Block (PID)

The following table lists the PID Block parameters in alphabetical order.

The following table contains short parameter description, factory settings (Initial Value (IV)) and possible settings.

Parameter Label	Access	Description and settings	Initial Value
ACK_OPTION Acknowledge Option	R/W	Selection of whether alarms associated with the function block will be automatically acknowledged. Setting: • HiHi Alm Auto Ack • Hi Alm Auto Ack • LoLo Alm Auto Ack • Lo Alm Auto Ack • DevHi Alm Auto Ack • DevLo Alm Auto Ack • Blk Alm Auto Ack • Fail Alm Auto Ack • Off Spec Alm Auto Ack • Maint Alm Auto Ack • Check Alm Auto Ack	0
ALARM_HYS Alarm Hysteresis	R/W	Amount the PV must return within the alarm limits before the alarm condition clears. Alarm hysteresis expressed as a percent of the span of the PV. Setting: 0.0...50.0 %	0.5 %
ALARM_SUM Alarm Summary	-	The current alert status, unacknowledged states, unreported states and disabled states of the alarms associated with the function block.	-
CURRENT Current	R	The active status of each alarm.	0
UNACKNOWLEDGED Unacknowledged	R	The unacknowledged state of each alarm.	0
UNREPORTED Unreported	R	The unreported status of each alarm.	0
DISABLED Disabled	R/W	The disabled state of each alarm. Setting: • HiHi Alm Disabled • Hi Alm Disabled • LoLo Alm Disabled • Lo Alm Disabled • DevHi Alm Disabled • DevLo Alm Disabled • Block Alm Disabled	0

Parameter Label	Access	Description and settings	Initial Value
ALERT_KEY Alert Key	R/W	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc. Setting: 1...255	0
BAL_TIME Balance Time	R/W	This specifies the time for the internal working value of bias or ratio to return to the operator set bias or ratio, in seconds. In the PID block, it may be used to specify the time constant at which the integral term will move to obtain balance when the output is limited and the mode is Auto, Cas or RCas. Setting: 0.0...+INF Sec	0.0 Sec
BKCAL_HYS Back Calculation Hysteresis	R/W	Limits the minimum output value for modes other than "Manual". The limit status is turned off, expressed as a percent of the span of the output. Setting: 0.0...50.0 %	0.5 %
BKCAL_IN Back Calculation Input	-	The value and status used for backwards tracking of the output, provided by a link to the back calculation output parameter of a downstream block.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0
BKCAL_OUT Back Calculation Output	-	The output value and status provided to an upstream block for output tracking when the loop is broken or limited, as determined by the status bits. This information is used to provide bumpless transfer to closed loop control and to prevent windup under limited conditions when that becomes possible.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
BLOCK_ALM Block Alarm	-	The block alarm is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.	-

Parameter Label	Access	Description and settings	Initial Value
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
BLOCK_ERR Block Error	R	This parameter reflects the error status associated with the hardware or software components associated with a block. It is a bit string, so that multiple errors may be shown. Setting: • Other: Non-specific error active • Block Configuration: Error detected in block configuration • Link Configuration: Error detected in link configuration • Simulation Active: Simulation enabled in this block • Local Override: Output tracking of faultstate active • Device Fault State: Device faultstate set • Device Maintenance: Device needs maintenance soon • Sensor Failure: Sensor Failure detected by this block. Process variable has a status of Bad, Sensor Failure • Output Failure: Failure detected in output hardware • Memory Failure: Memory error detected • Lost Static Data: Static parameters cannot be recovered • Lost NV Data: Non-volatile parameters cannot be recovered • Readback Check: Failure detected in READBACK • Maintenance Needed: Device NEEDS maintenance NOW • Power Up: Recovery from power failure • Out Of Service: Block actual mode is out of service	0

Parameter Label	Access	Description and settings	Initial Value
BLOCK_ERR_DESC_1 Block Error Description	R	This parameter is used by a device to report more specific details regarding persistent errors that are reported through BLOCK_ERR. Setting: • RB is OOS: RB: MODE_BLK.ACTUAL is OOS • Memory Failure: Memory Failure • No Schedule: No Schedule • ExecTime small: Block Execution Time too small • ExecTime large: Block Execution Time too large • MODE OOS: MODE_BLK.TARGET is set OOS • BYPASS Setting: BYPASS is uninitialized • SHED_OPT Setting: SHED_OPT is uninitialized • PV_SCALE Setting: PV_SCALE: EU_100 <= EU_0 • OUT_SCALE Setting: OUT_SCALE: EU_100 <= EU_0 • TRK_SCALE Setting: TRK_SCALE: EU_100 <= EU_0 • FF_SCALE Setting: FF_SCALE: EU_100 <= EU_0 • SP_LIM Setting: SP_HI_LIM < SP_LO_LIM • OUT_LIM Setting: OUT_HI_LIM < OUT_LO_LIM	0
BLOCK_WARN_DESC Block warning description	R	Reason why OUT.status is not GOOD Setting: • MODE_PERM not Auto: MODE_BLK.PERMITTED doesn't include Auto • MODE MAN: MODE_BLK.TARGET is set MAN • MODE.ACTUAL MAN: MODE_BLK.ACTUAL is MAN • xCAS_IN not connected: CAS_IN or RCAS_IN are not connected • CAS_IN is Bad: CAS_IN.status is Bad • RCAS_IN is Bad: RCAS_IN.status is Bad • CAS_IN.value: CAS_IN.value is NaN or INF • RCAS_IN.value: RCAS_IN.value is NaN or INF • unknown reason: unknown reason	0
BYPASS Bypass	R/W	The normal control algorithm may be bypassed through this parameter. When bypass is set, the setpoint value (in percent) will be directly transferred to the output. To prevent a bump on transfer to/from bypass, the setpoint will automatically be initialized to the output value or process variable, respectively, and the path broken flag will be set for one execution. Setting: • ON: normal control algorithm bypassed, output based on setpoint • OFF: normal control	Uninitialized
CAS_IN Cascade Input	-	This parameter is the remote setpoint value, which must come from another Fieldbus block or a DCS block through a defined link.	-
STATUS Status	R/W	Digital transducers, unlike their analogue versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0

Parameter Label	Access	Description and settings	Initial Value
CONTROL_OPTS Control Options	R/W	Options which the user may select to alter the calculations done in a control block. Setting: • Bypass Enable: This parameter, if true, allows BYPASS to be set. Some control algorithms cannot provide closed loop control if bypassed. • SP-PV Track Man: Permits the setpoint to track the process variable when the block mode is "Man". • SP-PV Track ROut: Permits the setpoint to track the process variable when the block mode is "ROut". • SP-PV Track LO-IMan: Permits the setpoint to track the process variable when the block mode is "LO or IMan". • SP Track retain: Permits the setpoint to track the RCas or Cas parameter based on the retained target mode when the actual mode of the block is "Man, LO, Man, or Rout". • Direct acting: Defines the relationship between changes in PV and changes to output - when direct is selected, an increase in PV results in an increase in the output. • Track enable: This enables the external tracking function – when TRK_ENA is 1, the preset value in TRK_VAL is output if TRK_IN_D becomes true. • Track in manual: This is used only if TRK_ENA is YES (1) - when the block mode is Man, TRK_IN_D will be acted on only if the TRK_OVMAN control option is set. • PV for BKCal_Out: The BKCAL_OUT value may be selected as the working SP or the PV - normally, BKCAL_OUT is the working SP. • Restrict SP to limits in Cas and RCas: If this option is selected, the setpoint will be restricted to the setpoint absolute and rate limits in Cas and Rcas modes. • No output limits in Man: Do not apply OUT_HI_LIM or OUT_LO_LIM when target and actual modes are "Man".	0
DV_HI_ALM Deviation High Alarm	-	The status and time stamp associated with the high deviation alarm.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized

Parameter Label	Access	Description and settings	Initial Value
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	Uninitialized
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
DV_HI_LIM Deviation High Limit	R/W	The setting of the high deviation alarm limit in engineering units.	+INF
DV_HI_PRI Deviation High Priority	R/W	Priority of the high deviation alarm. Setting: 0...15	0
DV_LO_ALM Deviation Low Alarm	-	The status and time stamp associated with the low deviation alarm.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	The value of the associated parameter at the time the alert was detected.	0.0
DV_LO_LIM Deviation Low Limit	R/W	The setting of the low deviation alarm limit in engineering units.	-INF
DV_LO_PRI Deviation Low Priority	R/W	Priority of the low deviation alarm. Setting: 0...15	0
FF_GAIN Feed Forward Gain	R/W	The gain that the feed forward input is multiplied by before it is added to the calculated control output.	0.0
FF_SCALE Feed Forward Scale	-	The feed forward input high and low scale values, engineering units code and number of digits to the right of the decimal point.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0

Parameter Label	Access	Description and settings	Initial Value
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: All units are possible.	Uninitialized
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter. Setting: -128...127	0
FF_VAL Feed Forward Value	-	The feed forward value and status.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0
GAIN Gain	R/W	Dimensionless value used by the block algorithm in calculating the block output.	0.0
GRANT_DENY Grant Deny	-	Options for controlling access of host computers and local control panels to operating, tuning and alarm parameters of the block.	-
GRANT Grant	R/W	Depending on the philosophy of the plant, the operator or a higher level device (HLD), or a local operator's panel (LOP) in the case of Local, may turn on an item of the Grant attribute - Program, Tuning, Alarm or Local. Setting: Program / Tune / Alarm / Local / Operate / Service / Diagnostic	0
DENY Deny	R/W	The Denied attribute is provided for use by a monitoring application in an interface device and may not be changed by an operator. Setting: • Program Denied • Tune Denied • Alarm Denied • Local Denied • Operate Denied • Service Denied • Diagnostic Denied	0
HI_ALM High Alarm	-	The status for high alarm and its associated time stamp.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized

Parameter Label	Access	Description and settings	Initial Value
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	The value of the associated parameter at the time the alert was detected.	0.0
HI_HI_ALM High High Alarm	-	The status for high high alarm and its associated time stamp.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	Uninitialized
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	The value of the associated parameter at the time the alert was detected.	0.0
HI_HI_LIM High High Limit	R/W	The setting for high high alarm in engineering units.	+INF
HI_HI_PRI High High Priority	R/W	Priority of the high high alarm. Setting: 0...15	0
HI_LIM High Limit	R/W	The setting for high alarm in engineering units.	+INF
HI_PRI High Priority	R/W	Priority of the high alarm. Setting: 0...15	0
IN Input	-	Primary input value of the block, required for blocks that filter the input to get the PV.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0

Parameter Label	Access	Description and settings	Initial Value
LO_ALM Low Alarm	-	The status for low alarm and its associated time stamp.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
LO_LIM Low Limit	R/W	The setting for low alarm in engineering units.	-INF
LO_LO_ALM Low Low Alarm	-	The status of the Low Low Alarm and its associated time stamp.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an alarm occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm/event has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported.	Uninitialized
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	Uninitialized
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
VALUE Float Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
LO_LO_LIM Low Low Limit	R/W	The setting for low low alarm in engineering units.	-INF
LO_LO_PRI Low Low Priority	R/W	Priority of the low low alarm. Setting: 0...15	0
LO_PRI Low Priority	R/W	Priority of the low alarm. Setting: 0...15	0
MODE_BLK Block Mode	-	The actual, target, permitted, and normal modes of the block.	-

Parameter Label	Access	Description and settings	Initial Value
TARGET Target	R/W	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested.	OOS
		Setting: R0ut / RCas / Cas / Auto / Man / OOS	
ACTUAL Actual	R	This is the current mode of the block, which may differ from the target based on operating conditions. Its value is calculated as part of block execution.	OOS
PERMITTED Permitted	R/W	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement.	R0ut RCas Cas Auto Man OOS
		Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions.	Auto
		Setting: R0ut / RCas / Cas / Auto / Man / LO / IMan / OOS	
OUT Output	-	The primary analog value calculated as a result of executing the function block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Out Of Service Not Limited
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm.	0.0
OUT_HI_LIM Output High Limit	R/W	Limits the maximum output value for modes other than Manual.	100.0
OUT_LO_LIM Output Low Limit	R/W	Limits the minimum output value for modes other than Manual.	0.0
OUT_SCALE Output Scale	-	The high and low scale values, engineering units code and number of digits to the right of the decimal point to be used in displaying the OUT parameter and parameters which have the same scaling as OUT.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value.	Uninitialized
		Setting: All units are possible.	
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	0
		Setting: -128...127	
PV Process Value	-	This alert is generated by any change to the static data.	-

Parameter Label	Access	Description and settings	Initial Value
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
PV_FTIME Process Value Filter Time	R/W	Time constant of a single exponential filter for the PV, in seconds. Setting: 0.0...60.0 s	0.0 s
PV_SCALE Process Value Scale	-	The high and low scale values, engineering units code and number of digits to the right of the decimal point to be used in displaying the PV parameter and parameters which have the same scaling as PV.	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: All units are possible.	Uninitialized
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter. Setting: -128...127	0
RATE Rate	R/W	Defines the derivative time constant, in seconds.	0.0 Sec
RCAS_IN Remote Cascade Input	-	Target setpoint and status provided by a supervisory host to a analog control or output block.	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Out Of Service Not Limited
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm.	0.0
RCAS_OUT Remote Cascade Output	-	Block setpoint and status after ramping - provided to a supervisory host for back calculation and to allow action to be taken under limiting conditions or mode change.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0

Parameter Label	Access	Description and settings	Initial Value
RESET Reset	R/W	The integral time constant, in seconds per repeat.	+INF Sec
ROUT_IN Remote Out Input	-	Target output and status provided by a host to the control block for use as the output (ROut mode).	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Out Of Service Not Limited
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm.	0.0
ROUT_OUT Remote Out Output	-	Block output and status - provided to a host for back calculation in ROut mode and to allow action to be taken under limited conditions or mode change.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Non Specific Not Limited
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
SHED_OPT Shed Options	R/W	Defines action to be taken on remote control device timeout. Setting: - Uninitialized - NormalShed_NormalReturn: Actual mode changes to next lowest priority non-remote mode permitted, but returns to target remote mode after communications are re-established - NormalShed_NoReturn: Target mode changes to next lowest priority non-remote mode permitted - ShedToAuto_NormalReturn: Actual mode changes to "Auto", but returns to target remote mode after communications are re-established - ShedToAuto_NoReturn: Target mode changes to "Auto" - ShedToManual_NormalReturn: Actual mode changes to "Manual", but returns to target remote mode after communications are re-established - NormalShed_NoReturn: Target mode changes to next lowest priority non-remote mode permitted - ShedToRetainedTarget_NormalReturn: Shed to previous target mode and return target remote mode after communications are re-established - ShedToRetainedTarget_NoReturn: Target mode changes to target retained mode	Uninitialized
SP Setpoint	-	The analog setpoint of this block.	-
STATUS Status	R	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Good_Cascade Non Specific NotLimited

Parameter Label	Access	Description and settings	Initial Value
VALUE Value	R/W	A numerical quantity entered by a user or calculated by the algorithm.	0.0
SP_HI_LIM Setpoint High Limit	R/W	The setpoint high limit is the highest setpoint operator entry that can be used for the block.	100.0
SP_LO_LIM Setpoint Low Limit	R/W	The setpoint low limit is the lowest setpoint operator entry that can be used for the block.	0.0
SP_RATE_DN Setpoint Rate Down	R/W	Ramp rate at which downward setpoint changes are acted on in Auto mode, in PV units per second. If the ramp rate is set to zero or the block is in a mode other than Auto, then the setpoint will be used immediately.	+INF PV/Sec
		Setting: 0.0...+INF PV/Sec	
SP_RATE_UP Setpoint Rate Up	R/W	Ramp rate at which upward setpoint changes are acted on in Auto mode, in PV units per second. If the ramp rate is set to zero or the block is in a mode other than Auto, then the setpoint will be used immediately.	+INF PV/Sec
		Setting: 0.0...+INF PV/Sec	
ST_REV Static Revision	R	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.	0
STATUS_OPTS Status Options	R/W	Options which the user may select in the block processing of status.	0
		Setting: • IFS if Bad IN: Set Initiate Fault State status in OUT if the status of IN is "Bad". • IFS if Bad CAS_IN: Set Initiate Fault State status in OUT if the status of CAS_IN is "Bad". • Use Uncertain as Good: If the status of IN is "Uncertain", treat it as "Good" otherwise treat it as "Bad". • Target to Man if Bad IN: Set the target mode to "Man" if the status of the IN parameter is "Bad". This latches a PID block into the "Man" state of the input ever goes "Bad". • Target to next permitted mode if BAD CAS_IN • Target to Man if BAD TRK_IN_D: Set the target to Man if the current target mode is not Out-of-Service and Man mode is permitted. This latches a control block into Man if the status goes bad. • IFS if BAD TRK_IN_D: Set Initiate Fault State Status in the OUT parameter if the status of the TRK_IN_D parameter is BAD.	
STRATEGY Strategy	R/W	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.	0
		Setting: 0...65535	
TAG_DESC Tag Description	R/W	The user description of the intended application of the block.	blanks
		Setting: ≤32 digits	

Parameter Label	Access	Description and settings	Initial Value
TRK_IN_D Tracking Input Discrete	-	This discrete input is used to initiate external tracking of the block output to the value specified by TRL_VAL .	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	An on or off received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked. Setting: Off / On	Off
TRK_SCALE Tracking Scale	-	The high and low scale values, engineering units code and number of digits to the right of the decimal point associated with TRK_VAL .	-
EU_100 EU at 100%	R/W	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	R/W	Device Description units code index for the engineering unit descriptor for the associated block value. Setting: All units are possible.	Uninitialized
DECIMAL Decimal	R/W	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter. Setting: -128...127	0
TRK_VAL Tracking Value	-	This input is used as the track value when external tracking is enabled by TRK_IN_D .	-
STATUS Status	R/W	Digital transducers, unlike their analog versions, can detect faults that make the measurement bad or prevent the actuator from responding. This additional, valuable information will be passed along with each transmission of a data value in the form of a status attribute.	Bad Not Connected Not Limited
VALUE Value	R/W	A numerical quantity received by the block parameter from another block parameter to which this block is linked. Or a default or user entered value if the parameter has not been linked.	0.0
UPDATE_EVT Update Event	-	This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	R/W	A discrete enumeration which is set to Unacknowledged when an update occurs, and set to Acknowledged by a write from a human interface device or other entity which can acknowledge that the alarm has been noticed. Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized

Parameter Label	Access	Description and settings	Initial Value
TIME_STAMP Time Stamp	R	The time when evaluation of the block was started and a change in alarm/event state was detected that is unreported. The time stamp value will be maintained constant until alert confirmation has been received - even if another change of state occurs.	-
STATIC_REVISION Static Revision	R	The static revision of the block whose static parameter was changed and is being reported. It is possible for the present value of static revision to be greater than this because static can be changed at any time.	0
RELATIVE_INDEX Relative Index	R	The OD index of the static parameter whose change caused this alert, minus the FB starting index. If the update event was caused by a write to multiple parameters at the same time, then this attribute will be zero.	0

Table 4-7: Description of PID Block parameters

5.1 Appendix A - Basic AI block configuration

The following description specifies the recommended procedure for putting an AI function block of the device into a correct operational state for the output of internal measurements:

1. Configure the AI block:

- a) Set the block target mode to OOS.
- b) At the CHANNEL parameter select the appropriate internal channel.
- c) Adjust scaling (XD_SCALE, OUT_SCALE).

Note: By default the unit conversion option at the IO_OPTS parameter is not enabled.

If this setting is not adapted the unit selection at the XD_SCALE parameter must generally be identical to the unit set for the channel at the respective transducer block!

- d) Select a linearization type (L_TYPE).
- e) If required adjust further block settings (filtering, alarms etc.).
- f) Set the block target mode to Auto.

2. Set the Resource Block target mode to Auto

3. Create a network schedule:

The schedule must involve the configured AI block. Though (e.g. for testing purposes) it is permissible to have the AI block not linked to any other function block.

The AI block actual mode should be checked after these steps. If it does not switch to its target mode please turn to the BLOCK_ERR and BLOCK_ERR_DESC_1 parameter of the AI block for troubleshooting.

5.2 Appendix B - Relationship between TB and AI Block

Transducer Block (TB) measurement values:

There are various measurement values `nnn_VALUE` offered by the Transducer Blocks. A corresponding `nnn_RANGE` (e.g. `VOLUME_FLOW_RANGE`, `MASS_FLOW_RANGE`) exists for each measurement value `nnn_VALUE` (`VOLUME_FLOW_RANGE`, `MASS_FLOW_RANGE`). `nnn_RANGE` includes the high and low limits of the value and the engineering unit code.

AI Block channel selection:

The `CHANNEL` parameter of the AI block selects the TB measurement value the AI block should process and forward. At the `CHANNEL` a valid measurement must be selected, otherwise the AI Block will stay in OOS mode.

Engineering unit conversion:

The AI Block checks the unit code of `XD_SCALE` against the unit code of the TB measurement value range `nnn_RANGE` which is selected by `CHANNEL`. Three cases are possible:

1. The unit codes are equal: The AI Block can be executed without error. The value from TB `nnn_VALUE` is the input of the AI scaling defined by `XD_SCALE` and `OUT_SCALE`.
2. The unit codes are unequal and belong to a different physical unit family (e.g. m^3/h and kg/L): The unit codes do not match and cannot be converted. The AI Block will stay in OOS mode; at `BLOCK_ERR` the bit "Block Configuration" is set.
3. The unit codes are unequal but belonging to the same physical unit family (e.g. m^3/h and L/s): The behavior depends on the AI parameter `IO_OPTS`:
 - a) The bit "Unit Conversion" is NOT set: The behavior is the same as at case 2.
 - b) The bit "Unit Conversion" is set: The `nnn_VALUE` from the TB is converted to the unit code of `XD_SCALE` (e.g. $18.9 \text{ m}^3/\text{h}$ will be $5.25 \text{ L}/\text{s}$) and this value is the input of the AI scaling `XD_SCALE` and `OUT_SCALE`.

AI Block scaling:

The AI Block linearization type (`L_TYPE`) parameter defines how scaling in the AI Block is being performed. Two cases are possible:

1. `L_TYPE` is "Direct":
The AI scaling is switched off. The scaling of `XD_SCALE` and `OUT_SCALE` does not influence the OUT value. Though it is recommended to set `XD_SCALE` and `OUT_SCALE` with correct values to prevent confusion.
2. `L_TYPE` is set "Indirect" or "Indirect Sq Root": The AI scaling is switched on. A unit conversion can be realized by `XD_SCALE` and `OUT_SCALE`. Example for lin. type "Indirect":
`XD_SCALE: EU_0 = 0.0; EU_100 = +20.0; UNITS_INDEX = m³/h;`
`OUT_SCALE: EU_0 = 0.0; EU_100 = +5.56; UNITS_INDEX = L/s;`
`TB VOLUME_FLOW_VALUE = 18.9 m³/h -> AI OUT is 5.25 L/s.`

Abstract:

There are three ways of unit conversion. All are independent and can be combined.

- Selection of a unit at TB `nnn_RANGE`.
- Selection of a unit at AI `XD_SCALE` and setting of "Units Conversion" at `IO_OPTS`.
- Free user conversion at AI with `XD_SCALE` and `OUT_SCALE`.

5.3 Appendix C - Troubleshooting

- **I want to configure an Analog Input block for output of a measurement value but the block mode stays in "OOS".**
The problem may be caused by a misconfiguration of the AI block.
Please refer to "Appendix A – Basic AI block configuration" for recommended configuration steps.
- **I would like to set the "Units Conversion" option at the IO_OPTS parameter of an AI block but I can't find it.**
This is a problem of some (older) host systems which do not display this option. Only an update of the system might fix it. If this solution is not applicable the unit settings at the AI XD_SCALE parameter and the transducer block must match for the selected channel.
- **I have changed the unit settings in the device display but the transducer block units do not seem to change accordingly.**
Changes of the unit settings in the device display have generally no influence on the transducer block unit settings and vice versa.
- **I have a problem not described here which I am unable to solve. Whom shall I contact?**
Please send a description of the problem to com-support@krohne.com. Note that a detailed and complete description can help to speed up the handling of your request dramatically.
As a minimum of information the serial number of the device should be provided.





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Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
47058 Duisburg (Germany)
Tel.: +49 203 301 0
Fax: +49 203 301 10389
info@krohne.de

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com

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