LR01   Free-Space Radar Level Meter

The LevelWave LR01 is designed to perform continuous level measurement in a wide range of industries and applications. We are known for more than 50 years of experience in level measurement as a leading supplier of extremely robust, durable and reliable level measurements. Unaffected by changes in temperature, specific gravity, pressure and with no need to recalibrate, offering a highly available measurement at low maintenance cost. With the LevelWave LR01 you achieve a highly modular system which is designed for the requirements of the modern industry.

FEATURES

- 2-wire Loop powered 10 GHz FMCW technology
- Wave Horn Antenna in PP or PTFE for corrosive media
- 360 ° rotatable housing with snap solution
- Housing and cover with bayonet connectors
- Horizontal or vertical housing position
- Remote electronics (up to 100 m / 328 ft)
- Weather protection cap
- Measuring range up to 30 m / 98.4 ft
- Empty Tank Spectrum (ETS) function

- Foundation Fieldbus Communication
- Configuration via FDT-DTM
- Continuous self-diagnostics, Status and diagnostic messages, acc. to NE 107
- Process temperature from –60 to +250 °C
- Process pressure from –1 to 40 bar
- SIL2-compliant acc. to IEC 61508 for safety related systems
- Local multilingual full graphic LCD, configurable in %, mA, or physical units
- Display with external keypad

Life Is On | **Foxboro**™
by Schneider Electric

Contents

1 Safety instructions

1.1 Scope of the document

These instructions are supplementary to the standard product documentation of the device. 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 network.

INFORMATION!
The present supplementary instructions for the device with a FOUNDATION™ fieldbus interface, plus the software with the DD and CFF files are included in our scope of supply, in addition to those items delivered for the standard device.

DANGER!
If the device is for use in potentially explosive atmospheres, refer to the supplementary instructions for ATEX, IECEx or other Ex applications.

1.2 Device description

The guided radar level meter is designed to measure the distance, level, mass and volume of liquids, pastes, slurries, granulates and powders. Guided radar level meters use a probe to guide a signal to the surface of the measured product. The device has a large choice of probes. Thus, it can measure most products in difficult conditions. For more data about the measuring principle, refer to the handbook.

1.3 Software history

1.3.1 Electronic revision

"Electronic revision" agrees with NAMUR NE 53. It is a number used to record the revision status of the hardware and embedded software (firmware) in the device. It gives data on the type of changes made and the effect that changes have on compatibility. The table that follows records the changes for devices that have the FOUNDATION™ fieldbus option.

Data about the electronic revision is shown in menu 1.1.5 ELECTRO.REV.

Issued [YYYY/MM/DD]	Electronic revision	Hardware revision			Document revision
		Converter	Sensor	HMI (LCD display option)	
2018-02-14	1.00.00	4001858601 g	4001025501 p 4000766101 h	4000487601s	02/2018 ①

① Supplementary Instructions: Description of FOUNDATION™ fieldbus interface

1.3.2 Software revision

"Firmware revision" agrees with NAMUR NE 53. It is a series of numbers used to record the revision status of embedded software (firmware) in electronic equipment assemblies. It gives data on the type of changes made and the effect that changes have on compatibility. The table that follows records the changes for devices that have the FOUNDATION™ fieldbus option.

Data about software revisions is shown in menu 1.1.0 IDENT. For more data refer to the "Operation" chapter in the handbook. If it is not possible to refer to the device menu, record the serial number of the device (given on the device nameplate) and speak to the supplier.

Issued [YYYY/MM/DD]	Firmware revision	PACTware DTM	Document revision
2018-02-14	2.42.50	1.1.6	02/2018 ①

① Supplementary Instructions: Description of FOUNDATION™ fieldbus interface

1.4 Nameplate

Signal converter housing (compact and remote (field) versions)
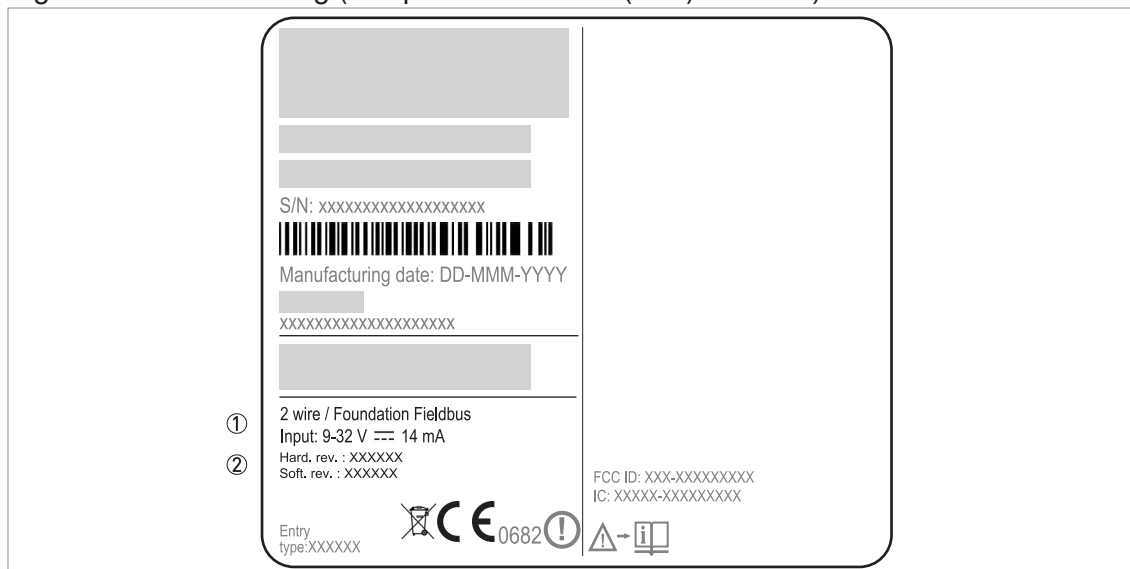

Figure 1-1: Nameplate for a device with the FOUNDATION™ fieldbus option

① Output or communication protocol option
  Input voltage range / Basic current
② Hardware and software versions. These version numbers agree with NAMUR NE 53.

INFORMATION!
If you have the remote (field) version of the device, there is no FOUNDATION™ fieldbus data on the nameplate attached to the probe housing.

2 Technical data

2.1 FOUNDATION™ Fieldbus data

Description

Type	2-wire loop-powered level transmitter; X-band (10 GHz) FMCW radar
Physical layer	FOUNDATION™ fieldbus protocol that agrees with IEC 61158-2 and FISCO model; galvanically isolated
Communication standard	H1
ITK version	6.3
Link Active Scheduler	Supported

Data blocks

Function blocks	1 x Resource Block (RB)
	1 x Level Transducer Block
	1 x Display Transducer Block
	1 x Diagnose Transducer Block
	3 x Analog Input Block (AI)
	1 x Proportional Integral Derivate Block (PID)
Execution time	Analog Input Block: 30 ms
	Proportional Integral Derivate Block: 40 ms
Minimum cycle time	250 ms

Electrical connections

Device power supply	Not intrinsically safe: 9...32 VDC
	Intrinsically safe: 9...24 VDC
Basic current	14 mA
Maximum error current	20.5 mA (= basic current + error current = 14 mA + 6.5 mA)
Error current FDE	Typically 6.5 mA (FDE =Fault Disconnection Electronic)
Polarity sensitivity	No
Minimum cycle time	250 ms

Input and output

Output data	Level, distance, ullage conversion, level conversion
Input data	None

3 Electrical connections

3.1 Cable types

Electrical cable specifications agree with International Standard IEC 61158-2. Shielded cables prevent malfunctions and give protection from electromagnetic interference. We recommend that you follow these specifications to get good system performance.

Core cross-section	0.8 mm² or AWG 18	0.32 mm² or AWG 22	0.13 mm² or AWG 26	1.25 mm² 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

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 on the bus segment	Electrical cable length on the spur			
	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

INFORMATION!
Electrical cable length decreases if the number of devices on the branch line increases.

A terminator must be connected at the two ends of each bus segment.

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.
- We recommend that you connect the two ends of the shield wire insulation (between the device and the distributed control system (DCS)) to ground (PE), as given in the fieldbus specifications.
- NAMUR NE 21 compliance is given, provided the above recommended cable types are used.

i *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

i *INFORMATION!*
The FOUNDATION™ fieldbus interface of the signal converter will operate only if the power supply is connected/available. The device terminal is not sensitive to electrical polarity.
The device can only be connected to a spur. Do a check of the device nameplate to make sure that the device has the FOUNDATION™ fieldbus option. For more data, refer to Nameplate on page 5.
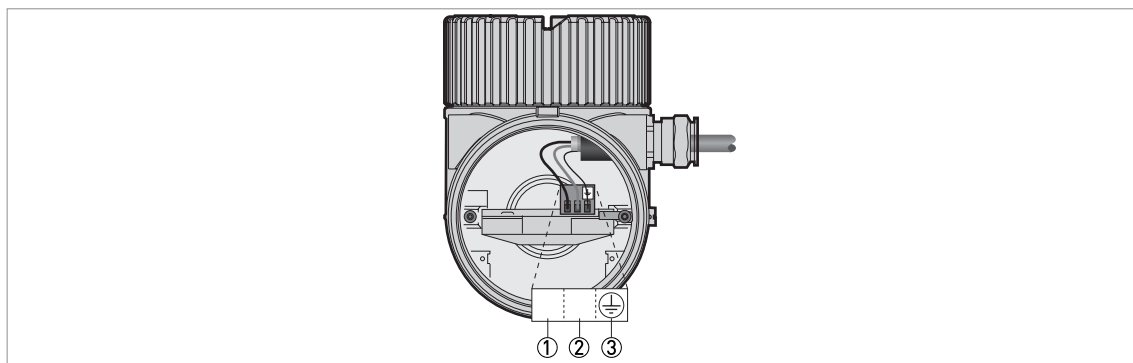
Figure 3-1: Electrical installation: terminals

① Power supply / communication terminal
② Power supply / communication terminal
③ Grounding terminal (converter electronics)

3.4 Write/Protect and Simulation functions

The "Write/Protect" function prevents changes to device settings. The "Simulation" function lets the user test the device and the fieldbus network.

ℹ *INFORMATION!*
The manufacturer sets the "Write/Protect" and the "Simulation" DIP switches to the OFF position in the factory.
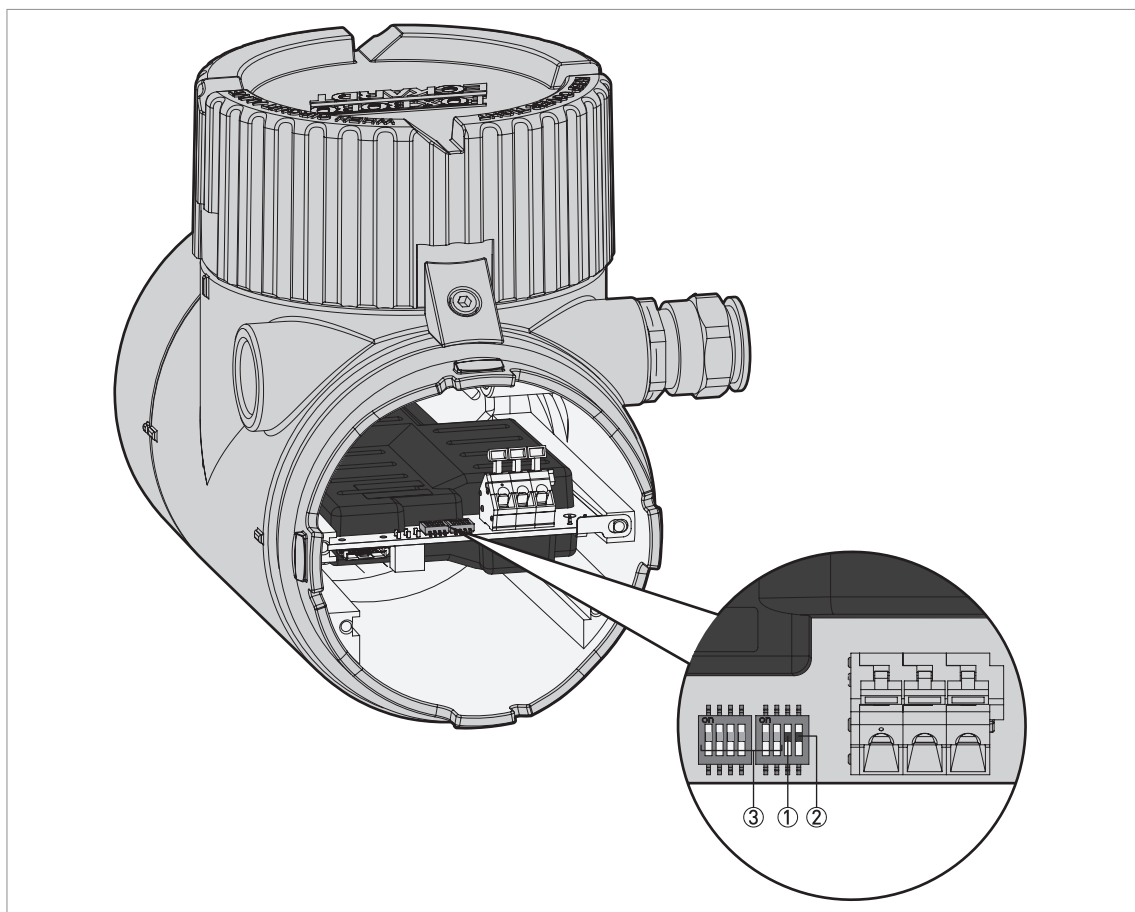
Figure 3-2: DIP switches for "Write/Protect" and "Simulation" functions

① "Write/Protect" DIP switch
  OFF: Device settings can be changed
  ON: Device settings cannot be changed
② "Simulation" DIP switch
  OFF: "NORMAL" mode
  ON: "SIMULATION" mode
③ 6 × DIP switches: not used
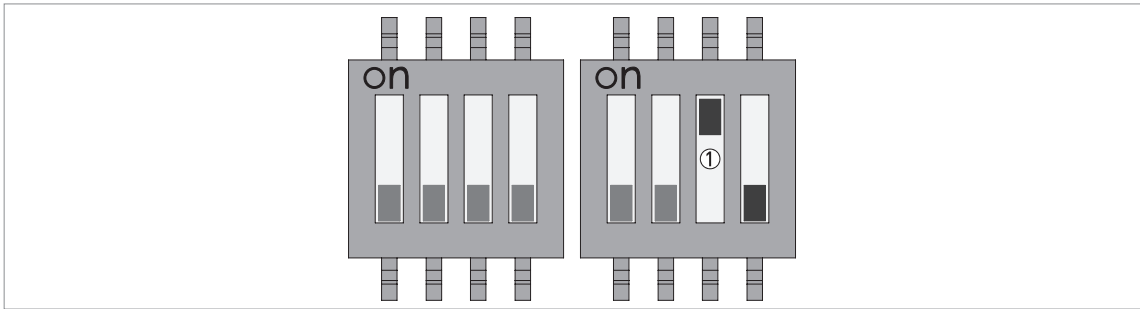
Figure 3-3: How to prevent changes to the device settings

① "Write/Protect" DIP switch: set to the ON position (device settings cannot be changed)

How to prevent changes to the device settings

• Open the terminal compartment cover. For the procedure, refer to "Electrical connections" in the handbook.
• Use the tip of a pencil or small screwdriver to move the "Write/Protect" DIP switch to the ON position.
• Close the terminal compartment cover. For the procedure, refer to "Electrical connections" in the handbook.
➲ You cannot use the LCD display or the FOUNDATION™ fieldbus interface to change the device settings. If it is necessary to change the device settings, move the "Write/Protect" DIP switch to the OFF position.
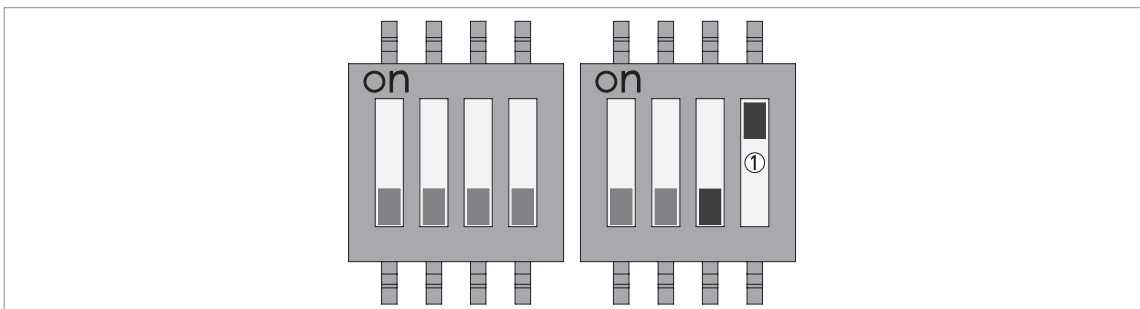
Figure 3-4: How to test the device and the fieldbus network (SIMULATION mode)

① "Simulation" DIP switch: set to the ON position (SIMULATION mode)

How to test the device and the fieldbus network ("SIMULATION" mode)

• Open the terminal compartment cover. For the procedure, refer to "Electrical connections" in the handbook.
• Use the tip of a pencil or small screwdriver to move the "Simulation" DIP switch to the ON position.
• Close the terminal compartment cover. For the procedure, refer to "Electrical connections" in the handbook.
➲ If the DIP switch is set to the ON position, the device is in "SIMULATION" mode. Use the "SIMULATION" mode to test the device and the fieldbus network. Set the DIP switch back to the OFF position to operate the device in "NORMAL" mode in the fieldbus network.

3.5 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.
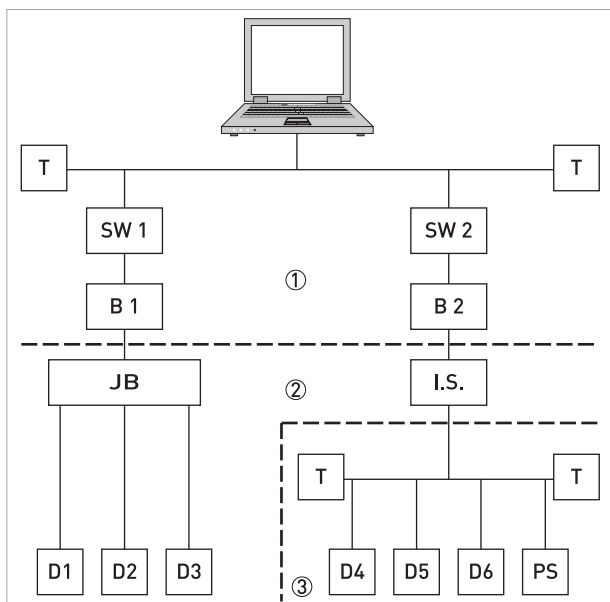
①	HSE network
②	H1 bus
③	Intrinsically safe, explosive area
B1+B2	Bridge = coupling element for H1 bus and HSE network
D1-D3	Device = field devices, own power supply, for non potentially explosive areas
D4-D6	Intrinsically safe devices, external power supply, for potentially explosive areas
I.S.	Intrinsically safe barrier
JB	Junction box for field devices
PS	Power supply
	Switch = connection of multiple HSE sub networks
T	Terminator

4 Operation

4.1 Settable functions

- The following table gives only the menus, functions and parameters which are different between the standard signal converter and the FOUNDATION fieldbus signal converter.
- For the electrical connections and a complete description of all functions, refer to the handbook.

INFORMATION!
If you change device-specific parameters, we recommend that you set device and system length units to millimetres (mm). New settings are rejected if system length units and device length units are different.

1.0.0 Information (Info.) menu

No.	Displayed text	Description and settings

1.0.0 IDENT.

No.	Displayed text	Description and settings
1.1.5	ELECTRO.REV.	Electronic revision. This menu item is specific to fieldbus devices and gives hardware version data. The electronic revision agrees with the NAMUR NE 53 recommendation. Read only.

1.2.0 OUTPUT I

No.	Displayed text	Description and settings
1.2.x	XXXXX	This sub-menu is not available for FOUNDATION™ fieldbus devices.

2.0.0 Supervisor menu

No.	Displayed text	Description and settings

2.1.0 COMMISSION.

No.	Displayed text	Description and settings
2.1.1	PARAMETERS	This procedure is not available for FOUNDATION™ fieldbus devices.

2.2.0 TEST

No.	Displayed text	Description and settings
2.2.1	SET OUTPUT	This menu item is not available for FOUNDATION™ fieldbus devices.

2.3.0 BASIC PARAM.

No.	Displayed text	Description and settings
2.3.10	TAG NAME	This menu item is not available for FOUNDATION™ fieldbus devices. If the customer gives a tag name (max. 16 characters), the manufacturer enters this data in the device software at the factory. The tag name is shown on the top line of the optional LCD display screen. The tag name is also given on the device nameplate and on an optional stainless steel plate option attached to the housing. An FF TAG is available. The FF TAG has a maximum of 32 characters. The manufacturer uses 16 characters (this data is also shown in the DeviceID or in the "S/N" field on the device nameplate). The device supervisor can use a maximum of 16 characters.

2.4.0 OUTPUT I

No.	Displayed text	Description and settings
2.4.x	XXXXX	This sub-menu is not available for FOUNDATION™ fieldbus devices.

2.6.0 COMMUNICAT.

No.	Displayed text	Description and settings
2.6.x	XXXXX	This sub-menu is not available 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.
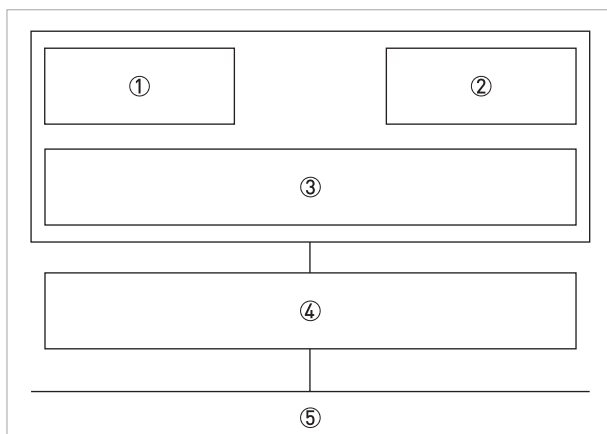
Figure 4-1: Foundation Fieldbus block scheme

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

4.4 Resource Block (RB)

The following tables list 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 tables contain short parameter description, factory settings (Initial Value (IV)) and possible settings.

4.4.1 Foundation Fieldbus parameters for Resource Block

Parameter DD name	Access	Description and settings	Initial Value
ALERT_KEY **Alert Key**	RW	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.	0
		Setting: 1...255	
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.	OOS (Out of Service)
		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 • Input Failure: Process variable has bad status • 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	
MODE_BLK **Block Mode**		The actual, target, permitted and normal modes of the block.	-
TARGET Target	RW	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested.	OOS
		Setting: Auto / 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
		Setting: Auto / OOS	
PERMITTED Permitted	RW	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement.	Auto OOS
		Setting: Auto / OOS	
NORMAL Normal	RW	This is the mode which the block should be set to during normal operating conditions.	Auto
		Setting: Auto / OOS	

Parameter DD name	Access	Description and settings	Initial Value
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 (=uninitialized)
		Setting: 0...65535	
STRATEGY **Strategy**	RW	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	
ACK_OPTION **Acknowledge Option**	RW	Selection of whether alarms associated with the function block will be automatically acknowledged.	Uninitialized
		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	
ALARM_SUM **Alarm Summary**	R	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.	Uninitialized
		Setting: Discrete Alarm / Block Alarm / Fail Alarm / Off Spec Alarm / Maintenance Alarm / Check Alarm	
UNACKNOWLEDGED Unacknowledged	R	The unacknowledged state of each alarm.	Uninitialized
		Setting: Disc Alm Unack / Block Alm Unack / Fail Alm Unack / Off Spec Alm Unack / Maint Alm Unack / Check Alm Unack	
UNREPORTED Unreported	R	The unreported status of each alarm.	Uninitialized
		Setting: Disc Alm Unrep / Block Alm Unrep / Fail Alm Unrep / Off Spec Alm Unrep / Maint Alm Unrep / Check Alm Unrep	
DISABLED Disabled	RW	The disabled state of each alarm.	Uninitialized
		Setting: Disc Alm Disabled / Block Alm Disabled / Fail Alm Disabled / Off Spec Alm Disabled / Maint Alm Disabled / Check Alm Disabled	
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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	

Parameter DD name	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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Other / Block Configuration / Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
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.	Off
		Setting: Uninitialized / Off / Clear	
CONFIRM_TIME **Confirm Time**	RW	The minimum time between retries of alert reports.	640000
		Setting: 0...4294967295 in [1/32 ms]	
CYCLE_SEL **Cycle Selection**	RW	Used to select the block execution method for this resource.	Uninitialized
		Setting: Scheduled / Block execution	
CYCLE_TYPE **Cycle Type**	R	Identifies the block execution methods available for this resource.	Scheduled Block execution
		Setting: Scheduled / Block execution	
DD_RESOURCE **DD Resource**	R	String identifying the tag of the resource which contains the Device Description for this resource.	blanks
		Setting: ≤ 32 digits	
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.
		Setting: 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.
		Setting: 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.	LevelWave LR01 (0xC401)
		Setting: LevelWave LR01 (0xC401)	
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
		Setting: Uninitialized / Clear / Active	

Parameter DD name	Access	Description and settings	Initial Value
FEATURES **Features**	R	Used to shows supported resource block options.	Reports Soft W Lock MVC Report Distribution supported MVC Publishing/Subs- cribing supported Multi-bit Alarm (Bit-Alarm) Support
		Setting: Reports / Faultstate / Soft W Lock / MVC Report Distribution supported / MVC Publishing/Subscribing supported / Multi-bit Alarm (Bit-Alarm) Support	
FEATURES_SEL **Features Selection**	R/W	Used to select resource block options.	Reports Soft W Lock
		Setting: Reports / Faultstate / Soft W Lock / MVC Report Distribution supported / MVC Publishing/Subscribing supported / Multi-bit Alarm (Bit-Alarm) Support	
FREE_SPACE **Free Space**	R	Percent of the memory available for further configuration. Zero in a preconfigured device.	0.0
		Setting: 0.0…100.0	
FREE_TIME **Free Time**	R	Percent of the block processing time that is free to process additional blocks.	0.0
		Setting: 0.0…100.0	
GRANT_DENY **Grant Deny**	R/W	Options for controlling access of host computers and local control panels to operating, tuning and alarm parameters of the block.	-
GRANT Grant	RW	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.	Uninitialized
		Setting: Program / Tune / Alarm / Local / Operate	
DENY Deny	RW	The Denied attribute is limited for use by a monitoring application in an interface device and may not be changed by an operator.	Uninitialized
		Setting: Program denied / Tune denied / Alarm denied / Local denied / Operate denied	
HARD_TYPES **Hardware Types**	R	The types of hardware available as channel numbers.	Scalar input
ITK_VER **ITK Version** (Interoperability Test Kit)	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.	20
		Setting: 0...255	
MANUFAC_ID **Manufacturer ID**	R	Manufacturer identification number - used by an interface device to locate the DD file for the resource.	Foxboro (0x385884)
		Setting: Foxboro (0x385884)	
MAX_NOTIFY **Maximum Notify**	R	Maximum number of unconfirmed alert notify messages possible.	20
		Setting: 0...255	
MEMORY_SIZE **Memory Size**	R	Available configuration memory in the empty resource. To be checked before attempting a download.	0
MIN_CYCLE_T **Minimum Cycle Time**	R	Time duration of the shortest cycle interval of which the resource is capable (in [1/32 ms]).	6400

Parameter DD name	Access	Description and settings	Initial Value
NV_CYCLE_T **Nonvolatile Cycle Time**	R	Interval between writing copies of NV parameters to non-volatile memory. Zero means never (in [1/32 ms]).	256000
RESTART **Restart**	RW	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.	Run
		Setting: Uninitialized / Run / Resource / Defaults / Processor	
RS_STATE **Resource State**	R	State of the function block application state machine.	Standby
		Setting: Uninitialized / StartRestart / Initialization / Online Linking / Online / Standby / Failure	
SET_FSTATE **Set Fault State**	RW	Allows the fault state condition to be manually initiated by selecting "SET".	OFF
		Setting: Unintialized / OFF / SET	
SHED_RCAS **Shed Remote Cascade**	R/W	Time duration at which to give up on computer writes to function block RCAS locations.	640000
		Setting: 0...4294967295 in [1/32 ms]	
SHED_ROUT **Shed Remote Out**	RW	Time duration at which to give up on computer writes to function block ROUT locations.	640000
		Setting: 0...4294967295 in [1/32 ms]	
TEST_RW **Test R Write**		Read/write test parameter - used only for conformance testing. Note: Subelements "1..15" have no function!	-
UPDATE_EVT **Update Event**		This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	RW	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/event has been noticed.	Uninitialized
		Setting: Uninitialized / Acknowledged / Unacknowledged	
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized
		Setting: Uninitialized / Reported / Not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
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
		Setting: 0…65535	
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
		Setting: 0…65535	

Parameter DD name	Access	Description and settings	Initial Value
WRITE_ALM **Write Alarm**		This alert is generated if the write lock parameter is cleared.	-
UNACKNOWLEDGED Unacknowledged	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Other / Block Configuration / Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	
VALUE Discrete Value	R	The value of the associated parameter at the time the alert was detected.	State 0
		Setting: Discrete State 0...16	
WRITE_LOCK **Write Lock**	RW	If set, no writes from anywhere are allowed, except to clear WRITE_LOCK. Block inputs will continue to be updated.	Not locked
		Setting: Uninitialized / Not locked / Locked	
WRITE_PRI **Write Priority**	R	Priority of the alarm generated by clearing the write lock.	0
		Setting: 0...15	

4.4.2 Manufacturer-specific parameters of the signal converter for Resource Block

Parameter DD name	Access	Description and settings	Initial Value
DEV_DESCRIPTION **Device Description**		Describes some characteristics of the device	-
ELECTRONIC_REV electronic revision	R	Electronic Revision of the device	Current electronic revision
FW_CONV_VER FW sensor	R	Firmware version of the converter	Current firmware version of the converter
FW_SENSOR_VER FW sensor	R	Sensor version	Current sensor version

Parameter DD name	Access	Description and settings	Initial Value
FW_HMI_VER FW HMI	R	Version of the human-machine-interface firmware part	Current version of HMI
PRODUCTION_DATE Production date	R	Production date	Current date of production
FF_BOARD _INFO **FF Circuit Board Info**		FF board information	
IDENT_NUMBER identnumber	R	Ident number	Current ident number
SOFTWARE_VER FF software version	R	FF software version	Current version
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. Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • ((07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	
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	RW	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 / Clear - reported / Clear - not reported / Active - reported / Active - not reported	Uninitialized

Parameter DD name	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. Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	Uninitialized
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	
FD_CHECK_MAP **Check Map**	RW	This parameter enables or disables conditions to be detected as active for this alarm category. Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • ((07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	Nothing mapped

Parameter DD name	Access	Description and settings	Initial Value
FD_CHECK_MASK **Check Mask**	RW	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.	Nothing masked
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 disabled • (07) Bad Measurement quality disabled • (08) Signal Strong disabled • (09) Signal Weak disabled • (10) Empty Spectrum invalid disabled • (11) Sensor No Signal • (12) Sensor Microwave Error disabled • (13) Temperature Above +75°C disabled • (14) Temperature Below -35°C disabled • (15) Overfill Warning disabled • (16) Level Lost warning disabled • (17) Temperature out of range (warning) disabled • (18) Local operation disabled • (19) Overfill Error disabled • (20) Level lost error disabled • (21) Temperature out of range Error disabled • (22) Converter Voltage Error disabled • (23) Converter ROM Error disabled • (24) Converter RAM Error disabled • (25) Converter EEPROM Error disabled • (26) Sensor not compatible disabled • (27) Internal Communication Error disabled • (28) Sensor Voltage Error disabled • (29) Sensor ROM Error disabled • (30) Sensor RAM Error disabled • (31) Sensor EEPROM Error disabled	
FD_CHECK_PRI **Check Priority**	RW	This parameter allows the user to specify the priority of this alarm category.	0
		Setting: 0...15	

Parameter DD name	Access	Description and settings	Initial Value
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.	Uninitialized
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	
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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other

Parameter DD name	Access	Description and settings	Initial Value
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	
		Setting: State 0...16	
FD_FAIL_MAP **Fail Map**	RW	This parameter enables or disables conditions to be detected as active for this alarm category.	(00)-(31)
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	

Parameter DD name	Access	Description and settings	Initial Value
FD_FAIL_MASK **Fail Mask**	RW	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.	(0)-(31) masked
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 disabled • (07) Bad Measurement quality disabled • (08) Signal Strong disabled • (09) Signal Weak disabled • (10) Empty Spectrum invalid disabled • (11) Sensor No Signal • (12) Sensor Microwave Error disabled • (13) Temperature Above +75°C disabled • (14) Temperature Below -35°C disabled • (15) Overfill Warning disabled • (16) Level Lost warning disabled • (17) Temperature out of range (warning) disabled • (18) Local operation disabled • (19) Overfill Error disabled • (20) Level lost error disabled • (21) Temperature out of range Error disabled • (22) Converter Voltage Error disabled • (23) Converter ROM Error disabled • (24) Converter RAM Error disabled • (25) Converter EEPROM Error disabled • (26) Sensor not compatible disabled • (27) Internal Communication Error disabled • (28) Sensor Voltage Error disabled • (29) Sensor ROM Error disabled • (30) Sensor RAM Error disabled • (31) Sensor EEPROM Error disabled	
FD_FAIL_PRI **Fail Priority**	RW	This parameter allows the user to specify the priority of this alarm category.	0
		Setting: 0...15	
FD_MAINT_ACTIVE **Maintenance Active**	R	This parameter reflects the error conditions that are being detected as active as selected for the "Maintenance" category. It is a bit string, so that multiple conditions may be shown.	
FD_MAINT_ALM **Fail 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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	

Parameter DD name	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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	
FD_MAINT_MAP **Maintenance Map**	RW	This parameter enables or disables conditions to be detected as active for this alarm category.	Nothing mapped
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	

Parameter DD name	Access	Description and settings	Initial Value
FD_MAINT_MASK **Maintenance Mask**	RW	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.	Nothing masked
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 disabled • (07) Bad Measurement quality disabled • (08) Signal Strong disabled • (09) Signal Weak disabled • (10) Empty Spectrum invalid disabled • (11) Sensor No Signal • (12) Sensor Microwave Error disabled • (13) Temperature Above +75°C disabled • (14) Temperature Below -35°C disabled • (15) Overfill Warning disabled • (16) Level Lost warning disabled • (17) Temperature out of range (warning) disabled • (18) Local operation disabled • (19) Overfill Error disabled • (20) Level lost error disabled • (21) Temperature out of range Error disabled • (22) Converter Voltage Error disabled • (23) Converter ROM Error disabled • (24) Converter RAM Error disabled • (25) Converter EEPROM Error disabled • (26) Sensor not compatible disabled • (27) Internal Communication Error disabled • (28) Sensor Voltage Error disabled • (29) Sensor ROM Error disabled • (30) Sensor RAM Error disabled • (31) Sensor EEPROM Error disabled	
FD_MAINT_PRI **Maintenance Priority**	RW	This parameter allows the user to specify the priority of this alarm category.	0
		Setting: 0...15	

Parameter DD name	Access	Description and settings	Initial Value
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.	
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	
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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
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.	

Parameter DD name	Access	Description and settings	Initial Value
FD_OFFSPEC_MAP **Offspec Map**	RW	This parameter enables or disables conditions to be detected as active for this alarm category.	Nothing mapped
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	

Parameter DD name	Access	Description and settings	Initial Value
FD_OFFSPEC_MASK **Offspec Mask**	RW	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.	Nothing masked
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 disabled • (07) Bad Measurement quality disabled • (08) Signal Strong disabled • (09) Signal Weak disabled • (10) Empty Spectrum invalid disabled • (11) Sensor No Signal • (12) Sensor Microwave Error disabled • (13) Temperature Above +75°C disabled • (14) Temperature Below -35°C disabled • (15) Overfill Warning disabled • (16) Level Lost warning disabled • (17) Temperature out of range (warning) disabled • (18) Local operation disabled • (19) Overfill Error disabled • (20) Level lost error disabled • (21) Temperature out of range Error disabled • (22) Converter Voltage Error disabled • (23) Converter ROM Error disabled • (24) Converter RAM Error disabled • (25) Converter EEPROM Error disabled • (26) Sensor not compatible disabled • (27) Internal Communication Error disabled • (28) Sensor Voltage Error disabled • (29) Sensor ROM Error disabled • (30) Sensor RAM Error disabled • (31) Sensor EEPROM Error disabled	
FD_OFFSPEC_PRI **Offspec Priority**	RW	This parameter allows the user to specify the priority of this alarm category.	0
		Setting: 0...15	

Parameter DD name	Access	Description and settings	Initial Value
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
		Setting: • Uninitialized • The device operates satisfactorily. No action is required. • The "Simulate" jumper is installed. Remove the jumper to go back to normal operation. • The Transducer Block into AUTO mode. Set Transducer Block into AUTO mode. • Make sure that the HART Slave operates satisfactorily • Contact the supplier • Replace the electronics module or contact the supplier • Check the power supply at the device terminals. If the voltage is correct, contact the supplier. • Measure the voltage at the device terminals. Make sure that the internal cable is connected between the front end and the back end. For remote configuration, make sure that that the electrical wires are connected to the terminals. If necessary, contact the supplier. • Temperature is above +85°C / +185°F or below -45°C / -49°F. Process temperature or ambient temperature is above the maximum limit or below the minimum limit. Action: Measure the device temperature. • Firmware incompatibility. Contact the supplier. • Replace the electronics module or contact the supplier • Measure the level signal amplitude of the device. Configure the device. If necessary, contact the supplier. • The level signal is in the blocking distance. Action: Lower the level until it is below the blocking distance. • Make sure that the antenna is attached to the process connection. If necessary, contact the supplier. • Recommended action for Condition 18 • Recommended action for Condition 19 • Recommended action for Condition 20 • Recommended action for Condition 21 • The electronics block is near to its minimum or maximum operating temperature. Action: Measure the device temperature. • Measure the level signal amplitude of the device. Configure the device. If necessary, contact the supplier. • The level signal is in the blocking distance. Action: Lower the level until it is below the blocking distance. • Recommended action for Condition 27 • Recommended action for Condition 28 • Recommended action for Condition 29 • The device is in configuration mode after a user used the local display to enter a menu. Action: Use the local display to go back to normal mode. • Unknown Alarm Event appeared	
FD_SIMULATE **Field Diagnostic** **Simulate**		Used as the field diagnostic condition when the simulation is enabled.	

Parameter DD name	Access	Description and settings	Initial Value
DIAGNOSTIC_SIMULAT E_VALUE Diagnostic Simulate Value	RW	Allows the conditions to be manually supplied when simulation is enabled. The simulate jumper is required for simulation to be enabled.	Uninitialized
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	

Parameter DD name	Access	Description and settings	Initial Value
DIAGNOSTIC_VALUE Diagnostic Value	R	Current field diagnostic condition.	Uninitialized
		Setting: • (00) Check Function • (01) Cond01 • (02) Cond02 • (03) Cond03 • (04) Cond04 • (05) Cond05 • (06) Cond06 • (07) Bad Measurement quality • (08) Signal Strong • (09) Signal Weak • (10) Empty Spectrum invalid • (11) Sensor No Signal • (12) Sensor Microwave Error • (13) Temperature Above +75°C • (14) Temperature Below -35°C • (15) Overfill Warning • (16) Level Lost warning • (17) Temperature out of range (warning) • (18) Local operation • (19) Overfill Error • (20) Level lost error • (21) Temperature out of range Error • (22) Converter Voltage Error • (23) Converter ROM Error • (24) Converter RAM Error • (25) Converter EEPROM Error • (26) Sensor not compatible • (27) Internal Communication Error • (28) Sensor Voltage Error • (29) Sensor ROM Error • (30) Sensor RAM Error • (31) Sensor EEPROM Error	
ENABLE_DISABLE Simulate En/Disable	RW	Enable/disable simulation.	Uninitialized
		Setting: Unintialized / Disabled / Active	
FD_VER Revision	R	The major version of the Field Diagnostics specification used for the development of this device.	1
PASSWRD Password	RW	Password to activate access rights to restricted parameters	0
PROTECT_INFO access protection	R	Setting: bit 5...7: not use / User / Service level / Production / Custody Transfer / Write Lock	Production
SERIAL_NUMBER Serial number	R	Device serial number, serial number of the system.	
SW_SIMULATE SW Simulation	RW	Enable/disable simulation like simulate hardware jumper.	Disabled
		Setting: Disabled / Active	

4.5 Analog Input Block (AI 1...3)

The following tables list 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 tables contain short parameter description, factory settings (Initial Value (IV)) and possible settings.

Parameter DD name	Access	Description and settings	Initial Value
Alert Key	RW	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.	0
		Setting: 1...255	
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.	OOS (Out of Service)
		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 fault state active • Device Fault State: Device fault state set • Device Maintenance: Device needs maintenance soon • Input Failure: Process variable has bad status • 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	
MODE_BLK **Block Mode**		The actual, target, permitted and normal modes of the block.	-
TARGET Target	RW	By setting this parameter to an allowed value (one of the value from permitted modes) user can change the block execution mode. Changing of modes is required to change the access permissions available to various parameters.	OOS
		Setting: Auto / OOS	
ACTUAL Actual	R	This is the current mode of the block, which may differ from the target based on operating conditions. 1st value is calculated as part of block execution.	OOS
		Setting: Auto / OOS	
PERMITTED Permitted	RW	Defines the modes which are allowed for an instance in the block. The permitted mode is configured based on application requirements.	Auto / OOS
		Setting: Auto / OOS	
NORMAL Normal	RW	This is the mode which the block should be set to during normal operating conditions.	Auto
		Setting: Auto / OOS	

Parameter DD name	Access	Description and settings	Initial Value
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
		Setting: 0...65535	
STRATEGY **Strategy**	RW	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**	RW	This is the user description of the intended application of the block.	blanks
		Setting: ≤32 digits	
ACK_OPTION **Acknowledge Option**	RW	Selection of whether alarms associated with the function block will be automatically acknowledged.	Uninitialized
		Setting: HiHi Alm Auto Ack / Hi Alm Auto Ack / LoLo Alm Auto Ack / Lo Alm Auto Ack / Blk Alm Auto Ack / Fail Alm Auto Ack / Off Spec Alm Auto Ack / Maint Alm Auto Ack / Check Alm Auto Ack	
ALARM_HYS **Alarm Hysteresis**	RW	The amount by which the PV must return within the alarm limits before the alarm condition clears. Alarm hysteresis is expressed as a percentage of the PV span.	0.5
		Setting: 0...50%	
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.	Uninitialized
		Setting: HiHi Alarm / Hi Alarm / LoLo Alarm / Lo Alarm / Block Alarm	
UNACKNOWLEDGED Unacknowledged	R	The unacknowledged state of each alarm.	Uninitialized
		Setting: HiHi Alarm Unack / Hi Alarm Unack / LoLo Alarm Unack / Lo Alarm Unack / Block Alarm Unack	
UNREPORTED Unreported	R	The unreported states of each alarm.	Uninitialized
		Setting: HiHi Alarm Unrep / Hi Alarm Unrep / LoLo Alarm Unrep / Lo Alarm Unrep / Block Alarm Unrep	
DISABLED Disabled	R	The disabled state of each alarm	Uninitialized
		Setting: HiHi Alarm Disabled / Hi Alarm Disabled / LoLo Alarm Disabled / Lo Alarm Disabled / Block Alarm Disabled	
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	RW	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	

Parameter DD name	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Other / Block Configuration / Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
CHANNEL **Channel**	RW	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.	0
		Setting: 0. Uninitialized 1. Level 2. Distance 3. Conversion 4. Distance conversion	
FIELD_VAL **Field Value**		Raw value of the field device in percent of the 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.	
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.	
GRANT Grant	RW	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".	Uninitialized
		Setting: Program / Tune / Alarm / Local / Operate	
DENY Deny	RW	The deny attribute is provided for use by a monitoring application in an interface device and may not be changed by an operator.	Uninitialized
		Setting: Program denied / Tune denied / Alarm denied / Local denied / Operate denied	

Parameter DD name	Access	Description and settings	Initial Value
HI_ALM **High Alarm**		The status for High Alarm and its associated time stamp. For settings of the 5 sub-elements, refer to the "Unacknowledged", "Alarm State", "Time Stamp", "Subcode" and "Value" items that follow.	-
HI_HI_ALM **High High Alarm**		The status for High High Alarm and its associated time stamp. For settings of the 5 sub-elements, refer to the "Unacknowledged", "Alarm State", "Time Stamp", "Subcode" and "Value" items that follow.	-
Settings of 5 sub-elements for the parameters "High Alarm" and "High High Alarm":			
UNACKNOWLEDGED Unacknowledged	RW	Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	Uninitialized
TIME_STAMP Time Stamp	R	Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	Uninitialized
SUB_CODE Subcode	R	Setting: Other/ Block Configuration / Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	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**	RW	The setting for High High Alarm in engineering units. For the setting range, refer to the " x_y_LIM" item that follows.	NaN
HI_HI_PRI **High High Priority**	RW	Priority of the High High Alarm. For the setting range, refer to the " x_y_PRI" item that follows.	0
HI_LIM **High Limit**	RW	The setting for High Alarm in engineering units. For the setting range, refer to the " x_y_LIM" item that follows.	NaN
HI_PRI **High Priority**	RW	Priority of the High Alarm. For the setting range, refer to the " x_y_PRI" item that follows.	0
Setting range for the parameters "High High Limit" and "High Limit": x_y_LIM x_y_Limit		-3.39 E38…+3.39 E38 / - INF (- infinite) / + INF (+ infinite)	
Setting range for the parameters "High High Priority" and "High Priority": x_y_PRI x_y_Priority		Setting: 0...15	0
IO_OPTS **IO Options** **(IO = Input/Output)**	RW	Options which the user may select to alter input and output block processing.	Uninitialized
		Setting: Low Cutoff / Units Conversion	
L_TYPE **Linearization Type**	RW	Determines if the values passed by the TB 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.	Uninitialized
		Setting: Uninitialized / Direct / Indirect / Ind Sqr Root	
LO_ALM **Low Alarm**		The status for Low Alarm and its associated time stamp. For settings of the 5 sub-elements, refer to the "Unacknowledged", "Alarm State", "Time Stamp", "Subcode" and "Value" items that follow.	-
LO_LO_ALM **Low Low Alarm**		The status for Low Low Alarm and its associated time stamp. For settings of the 5 sub-elements, refer to the "Unacknowledged", "Alarm State", "Time Stamp", "Subcode" and "Value" items that follow.	-

Parameter DD name	Access	Description and settings	Initial Value
Settings of 5 sub-elements for the parameters "Low Alarm" and "Low Low Alarm":			
UNACKNOWLEDGED Unacknowledged	RW	Setting: Uninitialized / Acknowledged / Unacknowledged	Uninitialized
ALARM_STATE Alarm State	R	Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	Uninitialized
TIME_STAMP Time Stamp	R	Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	Uninitialized
SUB_CODE Subcode	R	Setting: Other/ Block Configuration / Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	Other
VALUE Float Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
LO_LIM **Low Limit**	R	The setting for Low Alarm in engineering units. For the setting range, refer to the " x_y_LIM" item that follows.	(-NaN)
LO_LO_LIM **Low Low Limit**	RW	The setting for Low Low Alarm in engineering units. For the setting range, refer to the " x_y_LIM" item that follows.	(-NaN)
LO_PRI **Low Priority**	RW	Priority of the Low Alarm. For the setting range, refer to the " x_y_PRI" item that follows.	0
LO_LO_PRI **Low Low Priority**	RW	Priority of the Low Low Alarm. For the setting range, refer to the " x_y_PRI" item that follows.	0
Setting range for the parameters "Low Low Limit" and "Low Limit": x_y_LIM x_y_Limit		-3.39 E38…+3.39 E38 / - INF (- infinite) / + INF (+ infinite)	
Setting range for the parameters "Low Low Priority" and "Low Priority": x_y_PRI x_y_Priority		Setting: 0...15	0
LOW_CUT **Low Cutoff**	RW	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	0.0
OUT **Output**	RW	The primary analogue discrete value calculated as a result of executing the function.	
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.	
VALUE Value	RW	A numerical quantity entered by a user or calculated by the algorithm.	0.0
OUT_SCALE **Output Scale**	RW	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%	RW	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	RW	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0

Parameter DD name	Access	Description and settings	Initial Value
UNITS_INDEX Units Index	RW	Device Description units code index for the engineering unit descriptor for the associated block value.	Uninitialized
		Setting: All units are possible.	
DECIMAL Decimal	RW	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
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 RBACK value of an AO block.	-
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.	0
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	0.0
PV_FTIME **Process Value Filter Time**	RW	Time constant of a single exponential filter for the PV, in seconds.	0.0
		Setting: 0.0…60.0	
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	RW	Used for the transducer status when simulation is enabled.	0
SIMULATE_VALUE Simulate Value	RW	Used for the transducer value when simulation is enabled.	0.0
		Setting: -3.39E38…+3.39E38 / -INF (-infinite) / + INF (+infinite)	
TRANSDUCER_ STATUS Transducer Status	R	Status of value supplied by transducer.	0
TRANSDUCER_ VALUE Transducer Value	R	Current value supplied by transducer.	0.0
ENABLE_DISABLE Simulate En/Disable	RW	The parameter "SW_Simulated" in RB Block must be enabled.	Disabled
		Setting: Uninitialized / Disabled / Active	
STATUS_OPTS **Status Option**	RW	Options which the user may select in the block processing of status.	Uninitialized
		Setting: Propagate Fault Forward / Uncertain if limited / BAD if limited / Uncertain if Man.	
UPDATE_EVT **Update Event**		This alert is generated by any change to the static data.	
UNACKNOWLEDGED Unacknowledged	RW	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	
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized
		Setting: Uninitialized / Reported / Not Reported	

Parameter DD name	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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
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**	RW	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.	-
EU_100 EU at 100%	RW	The engineering unit value which represents the upper end of range of the associated block parameter.	100.0
EU_0 EU at 0%	RW	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	RW	Device Description units code index for the engineering unit descriptor for the associated block value.	Depends on the type, the device is calibrated for
		Units: m; cm; mm; ft; in; gal; L; ImpGal; m³; bbl; ft³; kg; t; STon; LTon	
DECIMAL Decimal	RW	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

4.6 Transducer Block (TB)

The following tables list the Transducer Block parameters in alphabetical order.

It describes characteristics of the sensor output functions required to read the measurement value from the Function Blocks.

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

4.6.1 Transducer "Level" Block

Parameter DD name	Access	Description and settings	Initial Value
ALERT_KEY **Alert Key**	RW	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.	0
		Setting: 1...255	
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.	Other
		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 • Input Failure: Process variable has bad status • 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	
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.	Auto
		Setting: Auto / 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.	Auto
		Setting: Auto / 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.	Auto OOS
		Setting: Auto / OOS	
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions.	Auto
		Setting: Auto / OOS	

Parameter DD name	Access	Description and settings	Initial Value
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
		Setting: 0...65535	
STRATEGY **Strategy**	RW	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**	RW	The user description of the intended application of the block.	spaces
		Setting: ≤32 digits	
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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Other / Block Configuration / Link Configuration/ Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
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 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	

Parameter DD name	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
		Setting: Uninitialized / Update reported / Update not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
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
		Setting: 0…65535	
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
		Setting: 0…65535	
ANTENNA_EXT **Antenna extension**	RW	Optional antenna extension. These are attached between the flange and the antenna.	
		Setting: 0...100000 mm	
ANTENNA_TYPE **Antenna type**	RW	Type of antenna.	
		Setting: Wave horn PP / Wave horn PTFE / Metallic horn / Wave stick / Wave guide	
BLOCKING_ DISTANCE **Blocking Distance**	RW	The non-measuring range at the top of the probe. It depends on the probe type and the installation.	
		Setting: 0...TANK_HEIGHT	
CAL_MIN_SPAN **Calibration Minimum Span**	R	The minimum calibration span allowed. Ensures that the two calibrated points (high and low) are not too close together.	
CAL_POINT_HI **Calibration Highest Point**	R	The highest calibrated value.	
CAL_POINT_LO **Calibration Lowest Point**	R	The lowest calibrated value.	
CAL_UNIT **Calibration Units**	R	The Device description engineering units code index for the calibration values.	
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.	-
CORRECTION_ FACTOR	RW	No help available. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 0.4...2.0	
CORRECTION_ OFFSET	RW	No help available. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 0...2000.0 mm	

Parameter DD name	Access	Description and settings	Initial Value
DISTANCE_PIECE **Distance piece**	RW	Optional distance piece between the converter and the process connection. This is for high-temperature applications more than +150°C / +302°F. The distance piece is 120 mm / 4.7¨ long.	
		Setting: 0...30000 mm	
EMPTY_SPECTRUM **Empty spectrum** **On/Off**	RW	This function starts and stops interference signal filter. Interference signals are the result of fixed and moving obstacles inside the tank. If you must do a spectrum analysis, first record an empty spectrum via the device display menu.	
		Setting: Off / On	
EPSILON_R_ **PRODUCT** **Dielectric constant of** **the product**	RW	The device automatically calculates the level based on the dielectric constant of the product. If you select "TBF Partial" or "TBF Full" via parameter MEASURING_MODE, you can change the value manually to adjust readings.	
		Setting:	
LEVEL_OF_POINT_ **1_15** **Level table**	RW	Table entries 1-15 containing level values.	
LEVEL_OF_POINT_ **16_30** **Level table**	RW	Table entries 16-30 containing level values.	
LIN_TYPE **Linearization Type**	R	The linearization type used to describe the behavior of the sensor output.	linear with input
MEASURING_MODE **Measuring mode**	RW	The device uses the dielectric constant Er of the tank contents to monitor level. In direct mode (if the dielectric constant is high), the level signal is a reflection on the surface of the tank contents. If the dielectric constant is low, the device uses TBF mode. The device in TBF mode uses the radar reflection on the bottom of the tank (the signal goes through the tank contents). This menu item is set by default to "Direct" for tank contents with an Er >1.8. If Er is very low (<1.6), use "TBF Full". If Er is low (Er = 1.5...1.7), use "TBF Partial" mode. "TBF Partial" is an automatic mode that lets the device make a selection between "Direct" mode and "TBF" mode. If you use "TBF Full" or "TBF Partial", enter the dielectric constant via the parameter PRODUCT_EPSILON_R.	
		Setting: Direct / TBF Partial / TBF Full	
MAX_AMP_REQ **Maximum amplitude**	RW	No help available. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 0...100	
MAX_SWEEP_ **FREQUENCY** **Maximum Sweep** **Frequency**	RW	Maximum Sweep Frequency. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 8.6...10.4 GHz	
MIN_AMP_REQ **Minimum amplitude** **required**	RW	No help available. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 0...100	
MIN_PEAK_REQ **Minimum peak** **required**	RW	No help available. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 10...10000	

Parameter DD name	Access	Description and settings	Initial Value
MIN_PLAUS_WIN	RW	No help available. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 300 mm...TANK_HEIGHT	
MIN_SWEEP_ FREQUENCY Minimum Sweep Frequency	RW	Minimum Sweep Frequency. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 8.6...10.4 GHz	
MULT_REFLECTION Multiple reflection detection	RW	Multiple reflections will cause the device to display smaller readings. Objects in the tank, sharp corners, installation of the device on a large nozzle or at the center of a dome roof can cause multiple reflections. A very calm surface or a tank with a small convex or flat roof can also cause multiple reflections.	
		Setting: Disabled / Enabled	
OVERFILL_DETECT Overfill detection	RW	If this function is switched on, the device will monitor the level even if it is in the blocking distance. The displayed output stays fixed at the blocking distance. An error is recorded by default.	
		Setting: No / Yes	
OVERFILL_DETECT_ TH Overfill detection threshold	RW	In case that the level has reached the overfill detection threshold with OVERFILL_DETECT enabled an error message will warn the user that the tank is overfilling. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: 0...1600000 mm	
OVERFILL_ERROR Overfill Error	RW	Overfill Error Alarm. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: Warning / Error	
PEAK_LOST Peak Lost Alarm	RW	Peak Lost Alarm. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other).	
		Setting: Warning / Error	
PIPE_DIAMETER Stilling well diameter	RW	The inner diameter of the stilling well. If the device is installed in a stilling well or has a Wave-Guide antenna, enter the diameter. The device will use this data if you set PIPE_ENABLED to "Yes".	
		Setting: 0.022...999.0	
PIPE_ENABLED Stilling well enable	RW	If the device is installed in a stilling well or has a Wave-Guide antenna, set this parameter to "Yes".	
		Setting: No / Yes	
PIPE_HEIGHT Stilling well height	RW	The height of the stilling well. If the device is installed in a stilling well or has a Wave-Guide antenna, enter the height. The device will use this data if you set PIPE_ENABLED to "Yes"	
		Setting: 0.5...30000	
POINTS_NUM Number of table entries	RW	Number of entries in the conversion table for mass/volume.	
		Setting: 0...30	
PRIMARY_VALUE_ TYPE1 Primary Value Type	R	The type of measurement represented by the primary value. For Example: Level, Distance, Conversion, Conversion Distance, ...	level

Parameter DD name	Access	Description and settings	Initial Value
PRIMARY_VALUE_1 **Level**		The measured level value and status of 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.	-
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	-
PRIMARY_VALUE_ **RANGE_1** **Primary Value Range -** **Sensor 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.	100
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	RW	Device Description units code index for the engineering unit descriptor for the associated block value. Settings: m; cm; mm; in; ft	m
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
PRIMARY_VALUE_ **TYPE2** **Primary Value Type**	R	The type of measurement represented by the primary value. For Example: Level, Distance, Conversion, Conversion Distance, ...	distance
PRIMARY_VALUE_2 **Distance**		The measured distance value and status of 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.	-
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	-
PRIMARY_VALUE_ **RANGE_2** **Primary Value Range -** **Sensor 2**		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.	100
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	RW	Device Description units code index for the engineering unit descriptor for the associated block value. Settings: m; cm; mm; in; ft	m
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
PRIMARY_VALUE_ **TYPE_3** **Primary Value Type**	R	The type of measurement represented by the primary value. For Example: Level, Distance, Conversion, Conversion Distance, ...	conversion
PRIMARY_VALUE_3 **Conversion**		The measured conversion value and status of available to the Function Block.	

Parameter DD name	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.	-
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	-
PRIMARY_VALUE_ RANGE_3 Primary Value Range - Sensor 3		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.	100
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	RW	Device Description units code index for the engineering unit descriptor for the associated block value.	
		Settings: kgal; L; ImpGal; m³; bbl; ft³; m; cm; mm; in; ft; kg, t; STon; LTon; ft³/h; 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
PRIMARY_VALUE_ TYPE_4 Primary Value Type	R	The type of measurement represented by the primary value. For Example: Level, Distance, Conversion, Conversion Distance, ...	Conversion Distance
PRIMARY_VALUE_4 Conversion Distance		The measured conversion distance value and status of 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.	-
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	-
PRIMARY_VALUE_ RANGE_4 level 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.	15.0
EU_0 min value	R	The engineering unit value which represents the lower end of range of the associated block parameter.	0.0
UNITS_INDEX Units Index	RW	Device Description units code index for the engineering unit descriptor for the associated block value.	m
		Settings: m; cm; mm; ft; in; yd	
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
SECONDARY_VALUE electronic temperature		The Electronic temperature.	
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.	-0
VALUE Value	R	A numerical quantity entered by a user or calculated by the algorithm.	

Parameter DD name	Access	Description and settings	Initial Value
SECONDARY_VALUE _UNIT **electronic temperature unit**	RW	The engineering units to be used with SECONDARY_VALUE (electronic temperature). Setting: °C	°C
SENSOR_CAL_DATE **Sensor Calibration Date**	R	The date of the last sensor calibration.	-
SENSOR_CAL_LOC **Sensor Calibration Location**	R	The last physical location at which the sensor was calibrated. (ex. Acme Labs)	-
SENSOR_CAL_ METHOD **Sensor Calibration method**	R	The method of last sensor calibration. It could be one of the several standard calibration methods defined by ISO or some other method.	factory trim standard calibration
SENSOR_RANGE **Sensor Range**		The High and Low range limit values, the engineering units code and the number of digits to the right of the decimal point for the sensor.	
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	Device Description units code index for the engineering unit descriptor for the associated block 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
SENSOR_SN **Sensor Serial Number**	R	The sensor serial number.	
SENSOR_TYPE Sensor Type	R	The type of sensor.	Level
SENSOR_CAL_WHO **Sensor Calibration Who**	R	The name of the person responsible for the last sensor calibration.	
TANK_HEIGHT **Tank Height**	RW	The distance from the tank connecting flange face/thread stop down to the tank bottom. Setting: 0…100000 mm	
TANK_TYPE **Tank type**	RW	The conditions in which the device is used. If the surface of the product is flat, select "Storage". If the surface of the product is disturbed, select "Process". If the surface of the product is agitated with vortexes and foam, select "Agitator". Setting: Storage / Process / Agitator	
TEMPERATURE_OUT _OF_RANGE **Temperature Out of Range**	RW	Temperature Out of Range Alarm. It is necessary to enter a password to change this parameter (PASSWRD ResourceBlock/Other). Setting: Warning / Error	
TRACING_VELOCITY **Tracing velocity**	RW	Maximum tracking velocity. This value must agree with the maximum rate of change of the level of the liquid or solid contents in the tank.	
TIME_CONST **Time constant**	RW	Using this function, the device processes several measurement readings to filter out disturbances. Increasing the time constant will smoothen the integrated readings, decreasing will roughen the readings.	
TRANSDUCER_ DIRECTORY **Transducer Directory Entry**		A directory that specifies the number and starting indices of the data collections in the Transducer Block.	

Parameter DD name	Access	Description and settings	Initial Value
TRANSDUCER_TYPE **Transducer Type**	R	Identifies the transducer that follows.	Other
UNIT_CONVERSION **unit conversion**	RW	Unit used for entries in conversion table	
		Setting: gal; L; ImpGal; m³; bbl; ft³; m; cm; mm; in; ft; kg; t; STon; LTon; ft³/h; m³/h	
UNIT_LENGTH **unit length**	RW	Unit used for length parameter	
		Setting: m; cm; mm; in; ft	
VOLUME_OF_POINT_ 1_15 **Mass/volume conversion table**	RW	Mass/volume values 1-15 corresponding to the entries in the level table.	
VOLUME_OF_POINT_ 6_30 **Mass/volume conversion table**	RW	Mass/volume values 16-30 corresponding to the entries in the level table.v	
XD_ERROR **Transducer Error**	R	One of the transducer error codes defined in section 4.7 "Block Alarm Subcodes" of the FF Transducer Specifications.	Uninitialized
		Setting: Unspecified error / General error / Calibration error / Configuration error / Electronics Failure / Mechanical Failure / I/O Failure / Data Integrity Error / Software Error / Algorithm Error	

4.6.2 Transducer "Display" Block

Parameter DD name	Access	Description and settings	Initial Value
ALERT_KEY **Alert Key**	RW	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.	0
		Setting: 1...255	
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.	Other
		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 • Input Failure: Process variable has bad status • 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	
MODE_BLK **Block Mode**		The actual, target, permitted and normal modes of the block.	

Parameter DD name	Access	Description and settings	Initial Value
TARGET Target	RW	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested.	Auto
		Setting: Auto / 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.	Auto
		Setting: Auto / OOS	
PERMITTED Permitted	RW	Defines the modes which are allowed for an instance of the block. The permitted mode is configured based on application requirement.	Auto OOS
		Setting: Auto / OOS	
NORMAL Normal	RW	This is the mode which the block should be set to during normal operating conditions.	Auto
		Setting: Auto / OOS	
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
		Setting: 0...65535	
STRATEGY **Strategy**	RW	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**	RW	The user description of the intended application of the block.	spaces
		Setting: ≤32 digits	
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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	

Parameter DD name	Access	Description and settings	Initial Value
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Other / Block Configuration/ Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
UPDATE_EVT **Update Event**		This alert is generated by any change to the static data.	
UNACKNOWLEDGED Unacknowledged	RW	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 has been reported.	Uninitialized
		Setting: Uninitialized / Update reported / Update not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
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
		Setting: 0…65535	
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
		Setting: 0…65535	
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.	-
DISPLAY_SETTING **Display Setting**		Display Setting	
LANGUAGE Display language	R	Display language of the device display	
		Setting: English / German / French / Italian / Spanish / Portuguese / Japanese / Chinese / Russian	
LENGTH_UNIT Display length unit	R	Length unit for level/distance to be shown on the device display	
		Setting: m; cm; mm; in; ft	

Parameter DD name	Access	Description and settings	Initial Value
CONVERSION_UNIT	R	Length/volume/mass conversion unit for the conversion table and to be shown on the device display	
		Setting: m3; liter; US gal; GB gal; ft3; barrel; kg; metric ton; GB ton; US ton; m; cm; mm; inch; feet; ft3/h; m3/h	
SETTING_SEL **Setting selector**	RW	Parameter to select predefined display setting	
		Setting: None / Setting 1 / Setting 2	
SETTING_1 **Display setting 1**		Display setting 1	
SET_LANGUAGE Display language	RW	Display language of the device display	
		English / German / French / Italian / Spanish / Portuguese / Japanese / Chinese / Russian	
SET_LENGTH_UNIT Display length unit	RW	Length unit for level/distance to be shown on the device display	
		Setting: m; cm; mm; in; ft	
SET_CONVERSION_ UNIT Conversion unit	RW	Length/volume/mass conversion unit for the conversion table and to be shown on the device display	
		Setting: m3; liter; US gal; GB gal; ft3; barrel; kg; metric ton; GB ton; US ton; m; cm; mm; inch; feet; ft3/h; m3/h	
SETTING_2 **Display setting 2**		Display setting 2	
SET_LANGUAGE Display language	RW	Display language of the device display	
		Setting: English / German / French / Italian / Spanish / Portuguese / Japanese / Chinese / Russian	
SET_LENGTH_UNIT Display length unit	RW	Length unit for level/distance to be shown on the device display	
		Setting: m; cm; mm; in; ft	
SET_CONVERSION_ UNIT Conversion unit	RW	Length/volume/mass conversion unit for the conversion table and to be shown on the device display	
		Setting: m3; liter; US gal; GB gal; ft3; barrel; kg; metric ton; GB ton; US ton; m; cm; mm; inch; feet; ft3/h; m3/h	
TRANSDUCER_ **DIRECTORY** **Transducer Directory Entry**		A directory that specifies the number and starting indices of the data collections in the transducer block.	
TRANSDUCER_TYPE **Transducer Type**	R	Identifies the transducer that follows.	Other
XD_ERROR **Transducer Error**	R	One of the transducer error codes defined in section 4.7 "Block Alarm Subcodes" of the FF Transducer Specifications.	Uninitialized
		Setting: Unspecified error / General error / Calibration error / Configuration error / Electronics Failure / Mechanical Failure / I/O Failure / Data Integrity Error / Software Error / Algorithm Error	

4.6.3 Transducer "Diagnose" Block

Parameter DD name	Access	Description and settings	Initial Value
ALERT_KEY **Alert Key**	RW	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.	0
		Setting: 1...255	
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.	Other
		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 • Input Failure: Process variable has bad status • 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	
MODE_BLK **Block Mode**		The actual, target, permitted and normal modes of the block.	-
TARGET Target	RW	This is the mode requested by the operator. Only one mode from those allowed by the permitted mode parameter may be requested.	Auto
		Setting: Auto / 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.	Auto
		Setting: Auto / 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.	Auto OOS
		Setting: Auto / OOS	
NORMAL Normal	R/W	This is the mode which the block should be set to during normal operating conditions.	Auto
		Setting: Auto / OOS	
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
		Setting: 0...65535	
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	

Parameter DD name	Access	Description and settings	Initial Value
TAG_DESC **Tag Description**	R/W	The user description of the intended application of the block.	spaces
		Setting: ≤32 digits	
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	RW	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
		Setting: Uninitialized / Clear - reported / Clear - not reported / Active - reported / Active - not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUB_CODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Other / Block Configuration / Link Configuration / Simulation Active / Local Override / Device Fault State / Device Maintenance / Input Failure / Output Failure / Memory Failure / Lost Static Data / Lost NV Data / Readback Check / Maintenance Needed / Power Up / Out Of Service	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
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 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	
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported.	Uninitialized
		Setting: Uninitialized / Update reported / Update not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	

Parameter DD name	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
		Setting: 0…65535	
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
		Setting: 0…65535	
ANALYSIS_DATA_UP DATE **Analysis Data Update**	RW	No help available	
		Data to update / Start Update / Update in progress	
ANALYSIS_DATA_0 **analysis data 0**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_1 **analysis data 1**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_2 **analysis data 2**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_3 **analysis data 3**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_4 **analysis data 4**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_5 **analysis data 5**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_6 **analysis data 6**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_7 **analysis data 7**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_8 **analysis data 8**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_9 **analysis data 9**	R	The analysis data of the device used in the DTM	
ANALYSIS_DATA_10 **analysis data 10**	R	The analysis data of the device used in the DTM	
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.	-
DIAGNOSIS_INFO **diagnosis info**	R	diagnosis info	
TEMPERATURE temperature	R	temperature	
CURRENT_IN_LOOP current converter	R	Current value measured by the ADC of the converter board	
LOAD_CURRENT current capacitors	R	Current value which is loading the capacitors on the converter board	
VOLTAGE_5_6_V voltage 5.6V	R	Voltage value used by the sensor	
VOLTAGE_ON_C voltage capacitors	R	Voltage value on the capacitors	
VOLTGE_3_3_V voltage 3.3V	R	Voltage value which powers the CPU	
RESET_COUNTER Reset Counter	R	No help available	

Parameter DD name	Access	Description and settings	Initial Value
EMPTY_SPECT_ START empty spectrum start	R	No help available	
EMPTY_SPECT_ STATUS status empty spectrum	R	No help available	
EMPTY_SPECTRUM _0 empty spectrum 0	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _1 empty spectrum 1	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _2 empty spectrum 2	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _3 empty spectrum 3	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _4 empty spectrum 4	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _5 empty spectrum 5	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _6 empty spectrum 6	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _7 empty spectrum 7	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _8 empty spectrum 8	R	Empty spectrum data of the device used in the DTM	
EMPTY_SPECTRUM _9 empty spectrum 9	R	Empty spectrum data of the device used in the DTM	
STATUS_INFO status info		status info	
HARDWARE_ERROR Hardware error	R	Hardware error Setting: Converter EEPROM Error / Converter RAM Error / Converter ROM Error / Sensor EEPROM Error / Sensor RAM Error / Sensor ROM Error / Current Output Drift / Sensor Microwave Error	
VOLTAGE_ERROR Hardware error	R	Hardware error Setting: Converter Voltage Error / Sensor Voltage Error / Measurement old Error / Temperature out of Range / Sensor not compatible / Sensor no Signal / not defined	
PULSE_ERROR Hardware error	R	Hardware error Setting: Peak Lost (Level Lost) Error / Overfill Error / not defined	
WARNING_ MAINTENANCE Warning (Maintenance required)	R	Warning (Maintenance required) Setting: Peak Lost (Level Lost) Warning / Overfill Warning / Empty Spectrum Invalid / Signal Weak / Signal Strong / No Measurement / not defined	

Parameter DD name	Access	Description and settings	Initial Value
WARNING_OUT_OF_ SPEC Warning (Out of Specifications)	R	Warning (Out of Specifications)	
INFORMATIONAL Information	R	Information	
		Setting: First Start / Spectrum Quality Bad / Peak Lost in Tank Bottom / Outside Temperature Operating Range of HMI / not defined	
TRANSDUCER_ DIRECTORY **Transducer Directory Entry**	R	A directory that specifies the number and starting indices of the data collections in the Transducer Block.	
TRANSDUCER_ TYPE **Transducer Type**	R	Identifies the transducer that follows.	Other
XD_ERROR **Transducer Error**	R	One of the transducer error codes defined in section 4.7 "Block Alarm Subcodes" of the FF Transducer Specifications.	Uninitialized
		Setting: Unspecified error / General error / Calibration error / Configuration error / Electronics Failure / Mechanical Failure / I/O Failure / Data Integrity Error / Software Error / Algorithm Error	

4.7 Proportional Integral Derivative Block (PID)

The following tables list the PID Block parameters in alphabetical order.

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

Parameter DD name	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.	1
		Setting: 1...255	
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.	Current Block Error
		Setting: • Other: Non-specific error active • Block Configuration: Error detected in block 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 • Input Failure: Process variable has bad status • 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	
MODE_BLK **Block Mode**	Mix	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.	OOS
		Setting: ROut / 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.	Actual mode
		Setting: ROut / RCas / Cas / Auto / Man / 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.	ROut, RCas, Cas, Auto, Man or OOS
		Setting: ROut / RCas / Cas / Auto / Man / OOS	
NORMAL Normal	R/W	This is the mode the block should be set to during normal operating conditions.	Auto
		Setting: Auto	
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
		Setting: 0...65535	

Parameter DD name	Access	Description and settings	Initial Value
STRATEGY **Strategy**	R/W	This parameter can be used to create groups of blocks by control system. This data is not checked or processed by the block.	0 (=uninitialized)
		Setting: 0...65535	
TAG_DESC **Tag Description**	R/W	The user description of the intended application of the block.	spaces
		Setting: ≤32 digits	
ACK_OPTION **Acknowledge Option**	R/W	Selection of whether alarms associated with the function block will be automatically acknowledged.	No option selected
		Setting: • HiHi Alm Disabled: HiHi alarm disabled • Hi Alm Disabled: Hi alarm disabled • LoLo Alm Disabled: LoLo alarm disabled • Lo Alm Disabled: Lo alarm disabled • DevHi Alm Disabled: Deviation Hi alarm disabled • DevLo Alm Disabled: Deviation Lo alarm disabled • Block Alm Disabled: Block alarm disabled	
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.	0.5
		Setting: 0.0...50.0%	
ALARM_SUM **Alarm Summary**	Mix	The current alert status, unacknowledged states, unreported states and disabled states of the alarms associated with the function block.	-
CURRENT Current	R	Setting: HiHi Alm Active / Hi Alm Active / LoLo Alm Active / Lo Alm Active / DevHi Alarm Active / DevLo Alm Active / Block Alm Active	Uninitialized
UNACKNOWLEDGED Unacknowledged	R	Setting: HiHi Alm Unack / Hi Alm Unack / LoLo Alm Unack / Lo Alm Unack / DevHi Alarm Unack / DevLo Alm Unack / Block Alm Unack	Uninitialized
UNREPORTED Unreported	R	Setting: HiHi Alm Unrep / Hi Alm Unrep / LoLo Alm Unrep / Lo Alm Unrep / DevHi Alarm Unrep / DevLo Alm Unrep / Block Alm Unrep	Uninitialized
DISABLED Disabled	R	Setting: HiHi Alm Disabled / Hi Alm Disabled / LoLo Alm Disabled / Lo Alm Disabled / DevHi Alarm Disabled / DevLo Alm Disabled / Block Alm Disabled	Uninitialized
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.	0
		Setting: 0.0 s	
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.	0.5
		Setting: 0.0...50.0%	
BKCAL_IN **Back Calculation Input**	R/W	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	Status of BKCAL_IN	-

Parameter DD name	Access	Description and settings	Initial Value
VALUE Value	R/W	Value of BKCAL_IN	-
BKCAL_IN **Back Calculation Input**	R	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	Status of BKCAL_OUT	-
VALUE Value	R	Value of BKCAL_OUT	-
BLOCK_ALM **Block Alarm**	R/W	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.	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
		Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: • Other: Non-specific error active • BlockConfiguration: Error detected in block configuration • LinkConfiguration: Error detected in link configuration • SimulationActive: Simulation enabled in this block • LocalOverride: Output tracking or faultstate active • DeviceFaultState: DeviceFaultState • DeviceMaintenance: Device needs maintenance soon • InputFailure: Process variable has bad status • OutputFailure: Failure detected in output hardware • MemoryFailure: Memory error detected • LostStaticData: Static parameters cannot be recovered • LostNVData: Non-Volatile parameters cannot be recovered • ReadbackCheck: Failure detected in READBACK • MaintenanceNeeded: Device NEEDS maintenance NOW • PowerUp: Recovery from power failure • OutOfService: Block actual mode is Out of Service	

Parameter DD name	Access	Description and settings	Initial Value
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
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.	Uninitialized
		Setting: • ON: normal control algorithm bypassed, output based on setpoint • OFF: normal control	
CAS_IN **Cascade Input**	R/W	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	Status of CAS_IN	-
VALUE Value	R/W	Value of CAS_IN	-
CONTROL_OPTS **Control Options**	R/W	Options which the user may select to alter the calculations done in a control block.	No option selected
		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".	
DV_HI_ALM **Deviation High Alarm**	Mix	The status and time stamp associated with the high deviation alarm.	-

Parameter DD name	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.	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
		Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Settings see above parameter "BLOCK_ALM", subelement "Subcode".	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
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.	0
		Setting: 0...15	
DV_LO_ALM **Deviation Low Alarm**	Mix	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.	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
		Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	

Parameter DD name	Access	Description and settings	Initial Value
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Settings see above parameter "BLOCK_ALM", subelement "Subcode".	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
		Setting: 0...255	
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.	0
		Setting: 0...15	
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
FF_SCALE **Feed Forward Scale**	R/W	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
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	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.	
FF_VAL **Feed Forward Value**	R	The feed forward value and status.	-
STATUS Status	R	Status of FF_VAL	-
VALUE Value	R	Value of FF_VAL	-
GAIN **Gain**	R/W	Dimensionless value used by the block algorithm in calculating the block output.	0
GRANT_DENY **Grant Deny**	R/W	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.	No option selected
		Setting: • Program: Host may change mode, setpoint or output of block • Tune: Host may change the tuning parameters of block • Alarm: Host may change the alarm parameters of block • Local: A local panel or handheld device may change the target mode, setpoint or output	
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.	No option selected
		Setting: • Program denied: Granting of program permission has been reset • Tune denied: Granting of tune permission has been reset • Alarm denied: Granting of alarm permission has been reset • Local denied: Granting of local permission has been reset	

Parameter DD name	Access	Description and settings	Initial Value
HI_ALM **High Alarm**	Mix	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
ALARM_STATE Alarm State	R	A discrete enumeration which gives an indication of whether the alert is active and whether it has been reported. Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not 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. Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	Uninitialized
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported. Setting: Settings see above parameter "BLOCK_ALM", subelement "Subcode".	Other
Value	R	The value of the associated parameter at the time the alert was detected.	0
HI_HI_ALM **High High Alarm**	Mix	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. Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not 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. Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	Uninitialized
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported. Setting: Settings see above parameter "BLOCK_ALM", subelement "Subcode".	Other

Parameter DD name	Access	Description and settings	Initial Value
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	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.	0
		Setting: 0...15	
HI_LIM **High Limit**	R/W	The High Limit imposed on the PV compensation term.	+INF
HI_PRI **High Priority**	R/W	Priority of the High Alarm.	0
		Setting: 0...15	
IN **Input**	R/W	Primary input value of the block, required for blocks that filter the input to get the PV.	-
STATUS Status	R/W	Status of IN	-
VALUE Value	R/W	Value of IN	-
LO_ALM **Low Alarm**	Mix	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.	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
		Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Settings see above parameter "BLOCK_ALM", subelement "Subcode".	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	0
LO_LIM **Low Limit**	R/W	The setting for Low Alarm in engineering units.	-INF
LO_LO_ALM **Low Low Alarm**	Mix	The status of the Low Low Alarm and its associated time stamp.	-

Parameter DD name	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.	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
		Setting: • Uninitialized • Clear - reported: Alarm not active and reported • Clear - not reported: Alarm not active and not reported • Active - reported: Alarm active and reported • Active - not reported: Alarm active and not reported	
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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
SUBCODE Subcode	R	An enumeration specifying the cause of the alert to be reported.	Other
		Setting: Settings see above parameter "BLOCK_ALM", subelement "Subcode".	
VALUE Value	R	The value of the associated parameter at the time the alert was detected.	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.	0
		Setting: 0...15	
LO_PRI **Low Priority**	R/W	Priority of the Low Alarm.	1
		Setting: Max. 15	
OUT **Output**	Mix	The primary analog value calculated as a result of executing the function block.	-
STATUS Status	R/W	Status of OUT	-
VALUE Value	R/W	Value of OUT	-
OUT_HI_LIM **Output High Limit**	R/W	Limits the maximum output value for modes other than "Manual".	100
OUT_LO_LIM **Output Low Limit**	R/W	Limits the minimum output value for modes other than "Manual".	0
OUT_SCALE **Output Scale**	R/W	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
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	0

Parameter DD name	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.	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
PV Process Value	R	This alert is generated by any change to the static data.	-
STATUS Status	R	Status of PV	-
VALUE Value	R	Value of PV	-
PV_FTIME PV F Time (Process Value Filter Time Constant)	R/W	Time constant of a single exponential filter for the PV, in seconds.	0
		Setting: 0.0…30.0	
PV_SCALE Process Value Scale	R/W	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
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	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
RATE Rate	R/W	Defines the derivative time constant, in seconds.	0
RCAS_IN Remote Cascade Input	R	Target setpoint and status provided by a supervisory host to an analog control or output block.	-
STATUS Status	R	Status of RCAS_IN	-
VALUE Value	R	Value of RCAS_IN	-
RCAS_OUT Remote Cascade Output	R	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	Status of RCAS_OUT	-
VALUE Value	R	Value of RCAS_OUT	-
RESET Reset	R/W	The integral time constant, in seconds per repeat.	+INF
ROUT_IN Remote Out Input	R	Target output and status provided by a host to the control block for use as the output (ROut mode).	-
STATUS Status	R	Status of ROUT_IN	-
VALUE Value	R	Value of ROUT_IN	-
ROUT_OUT Remote Out Output	R	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.	-

Parameter DD name	Access	Description and settings	Initial Value
STATUS Status	R	Status of ROUT_OUT	-
VALUE Value	R	Value of ROUT_OUT	-
SHED_OPT **Shed Options**	R/W	Defines action to be taken on remote control device timeout.	Uninitialized
		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	
SP **Setpoint**	R/W	Setpoint	0
STATUS Status		Status of SP	
VALUE Value		Value of SP	
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
SP_LO_LIM **Setpoint Low Limit**	R/W	The setpoint low limit is the highest setpoint operator entry that can be used for the block.	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
		Setting: 0.0...+INF	
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
		Setting: 0.0...+INF	

Parameter DD name	Access	Description and settings	Initial Value
STATUS_OPTS **Status Options**	R/W	Options which the user may select in the block processing of status. 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	No option selected
TRK_IN_D **Tracking Input Discrete**	R/W	This discrete input is used to initiate external tracking of the block output to the value specified by TRL_VAL.	-
STATUS Status	R/W	Status of TRK_IN_D	-
VALUE Value	R/W	Value of TRK_IN_D	-
TRK_SCALE **Tracking Scale**	R/W	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
EU_0 EU at 0%	R/W	The engineering unit value which represents the lower end of range of the associated block parameter.	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.	0
TRK_VALUE **Tracking Value**	R/W	This input is used as the track value when external tracking is enabled by TRK_IN_D.	-
STATUS Status	R/W	Status of TRK_VAL	-
VALUE Value	R/W	Value of TRK_VAL	-
UPDATE_EVT **Update Event**	R	This alert is generated by any change to the static data.	-
UNACKNOWLEDGED Unacknowledged	R	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
UPDATE_STATE Update State	R	A discrete enumeration which gives an indication of whether the alert has been reported. Setting: Uninitialized / Reported / Not Reported	Uninitialized

Parameter DD name	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
		Setting: MM / DD / YY (Month / Day / Year) HH:MM:SS (Hour:Minute:Second)	
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

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