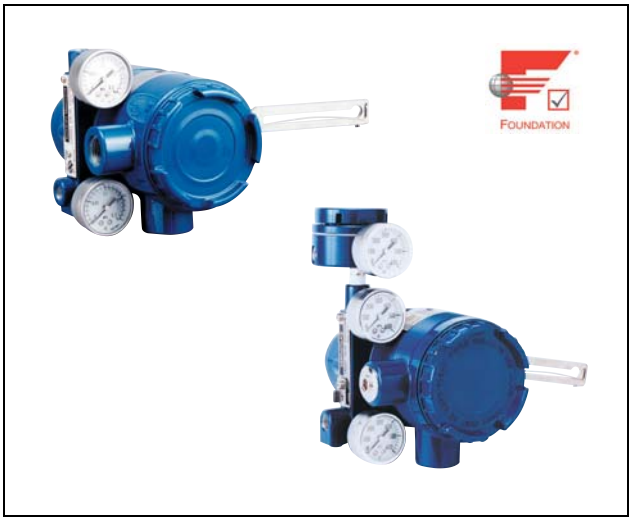
Device Description and Capability File for Smart valve positioner with FOUNDATION™ fieldbus SVP3000 Alphaplus Model AVP303

OVERVIEW

The SVP3000 Alphaplus model AVP303 is a FOUNDATION™ fieldbus equipped smart valve positioners.
The model AVP303 controls and manages the valve through Fieldbus.
The various diagnostic functions and the automatic configuration function of the SVP3000 Alphaplus, as well as PID function blocks, bring out real fieldbus advantage.
This document includes the DD and CF of SVP3000 Alphaplus model AVP303.



DD and CF

DD (Device Description)

- A critical characteristic required of fieldbus device is interoperability.
- For interoperability, DD technology is used in addition to standard function block parameter and behavior definitions.
- DD provides information needed for a control system or host to understand the meaning of the data in the VFD (Virtual Field Device) including the human interface for functions such as calibration and diagnostics. DD can be thought of as a driver for the device, which are similar to printer drivers for your computer.

DD is written in a standardized programming language and could not be read then the table of parameter is provided for the definition.

CF (Capability File)

- The purpose of a capability file is to hold a human-readable document which contains some or all of the information that can be read from a fieldbus device over the wire.
- It consists of headings that organize the data, and assignment statement lines of the form Parameter (or variable name) = Value, where Value has the format required by Parameter (as defined by the Device Description), and may be expressed as a range of values.

Parameter List

The SVP includes two PID function blocks as well as the following blocks: a resource block, an AO transducer block, an AO function block and a diagnostic function block. Other than the transducer and diagnostic function blocks, all blocks support the Fieldbus standard. In addition to the standard parameters, the transducer blocks have added parameters that are unique to those devices.

The table below describes the items mentioned in the parameter tables for each block.

Item	Description
Parameter	A standard parameter name as stipulated by the Fieldbus Foundation. Parameters that are unique to Yamatake are assigned unique names.
Description	Describes the corresponding parameter.
Subparameter	Some parameters have a hierarchical structure. Parameters at a lower level are shown as subparameters.
Access attributes	The following symbols are used to indicate attributes related to parameter access. S: Static data - Indicates that the parameter value cannot be overwritten during the execution of a block to which it belongs. (Data such as fixed data for individual device types and various configuration data) D: Dynamic data - Indicates that the parameter value can be modified by the block itself or by the user during the execution of a block to which it belongs. These are parameters that are changed occasionally or continuously according to the system state, device, or process that is in progress. These values are lost if a power outage occurs. (Data such as process measurement values and device execution status parameters) N: Nonvolatile data - These parameters, like dynamic data, may change during system operation. However, they are stored in nonvolatile memory and their most recent value is not lost if a power outage occurs. (This includes data such as PID setpoint values that must be restarted from the most recent value after a power outage occurs.) R : Parameters can only be read out. R/W: Parameters can be read out and modified.
Size	Indicates the size of the block in bytes.
Range	Range (upper limit, lower limit) of values that can be taken by each parameter. Note that these values are for the standard specifications, and are not all the values that can be taken at any time according to the state of the device or block. Rather, these are values that may be subject to other limitations within these ranges.
Initial value	Indicates the initial value when shipped from the factory.
Unit	The engineering units for the parameter. When a parameter name, e.g. “PV”, is entered in this column, it indicates that the units follow those of the indicated parameter.

Resource Block Parameters (Base Index: 1000)

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
1	ST_REV	Indicates the revision number of the static data that belongs to the block. If a parameter for which the access attribute is “S-” is modified, it is incremented by 1 (0x0001) each modification.	---	S-R	2	0~0 × *FFFF*	0	Absolute No.
2	TAG_DESC	Tag name for the user-defined resource block. This is used for reference by the host, and is unrelated to the operation or execution of the resource block itself.	---	S-R/W	32	----	32 space characters	Absolute No.
3	STRATEGY	An arbitrary group number for the resource block. (This parameter is unrelated to device operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	2	0~0 × *FFFF*	0	Absolute No.
4	ALERT_KEY	Identification number for the related plant-internal devices. (This parameter is unrelated to device operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	1	1~0 × *FF*	0	Absolute No.
5	MODE_BLK	Resource block mode parameter set. MODE_BLK has the following structure. • Target: Parameter for the mode set by the host. • Actual: Indicates the value of the current mode. • Permitted: Indicates the value of the mode used by the resource block. • Normal: Indicates the value of the mode that should be the normal state.	Target	N-R/W	1	AUTO (processing execution) or O/S (executing or stopped) " MODE_BLK Parameter"		Absolute No.
			Actual	D-R	1			
			Permitted	S-R/W	1			
			Normal	S-R/W	1			
6	BLOCK_ERR	Indicates the error status concerning the resource block.	Bit string	D-R	2			Absolute No.
7	RS_STATE	Indicates the device operating state.	Unsigned8	D-R	1	0=Undefined (undefined) 1=Start/Restart (start processing in progress) 2=Initialization (initialization in progress) 3=Online Linking (connection confirmation in progress) 4=Online (operating) 5=Standby (standby state) 6=Failure (A failure occurred)		Absolute No.
8	TEST_RW	Parameter used for applicability testing of communication software. This parameter is not used by users.	---	D-R/W	112	----	Arbitrary	Absolute No.
9	DD_RESOURCE	(Unused)	---	S-R	32	----	-----	Absolute No.
10	MANUFAC_ID	Unique identification number for manufacturers registered with the Fieldbus Foundation.	---	S-R	4	----	0x000DFC96 (YAMATAKE)	Absolute No.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
11	DEV_TYPE	Identification number that indicates the model of the device as defined by the manufacturer.	---	S-R	2	0~0 × $FFFF$	0x0203 (AVP303)	Absolute No.
12	DEV_REV	Revision number of the device as defined by the manufacturer.	---	S-R	1	0~0 × FF	Differs depending on the device.	Absolute No.
13	DD_REV	Revision number of the DD file that applies to this device.	---	S-R	1	0~0 × FF	Differs depending on the device.	Absolute No.
14	GRANT_DENY	Parameter that enables/disables access to the parameters in this block from the human interface or the host. Whether or not this parameter is used depends on settings in the host.	Grant (Enable)	D-R/W	1	0 or 1	All bits set to 0.	Absolute No.
			Deny (Disable)	D-R/W	1	0 or 1	All bits set to 0.	Absolute No.
15	HARD_TYPES	Indicates the type of the hardware in which this resource block exists.	---	S-R	2	Fixed at 0x4000 (continuous variable output) by the SVP.	0x4000	Absolute No.
16	RESTART	Restarts the device manually. In the specifications, there are several types of restart which the user can select from.	---	D-R/W	1	1: RUN 2: Restart resource 3: Restart with defaults 4: Restart processor		Absolute No.
17	FEATURES	Indicates the current operating state based on the content set with FEATURE_SEL in the option settings for device usage.	---	S-R	2	" Parameters"	0 × $F500$	Absolute No.
18	FEATURE_SEL	Sets the device usage options.	---	S-R/W	2	" Parameters"	0	Absolute No.
19	CYCLE_TYPE	Indicates the current operating state based on the content set with CYCLE_SEL for the function block execution method. (The SVP only supports “scheduled” Function.)	---	S-R	2	0x8000: Scheduled (Follows the LAS schedule) 0x4000: Completion of block (When the block that was executing immediately before completes) 0x2000: Manufacturer specific	0 × 8000	Absolute No.
20	CYCLE_SEL	Sets the function block execution method.	---	S-R/W	2	As above	0	Absolute No.
21	MIN_CYCLE_T	Indicates the minimum period for which a function block can be executed.	---	S-R	4	0~2^{32}-1	4000 (125ms)	1/32 msec
22	MEMORY_SIZE	Indicates a memory capacity that enables the addition of function blocks as a guideline. (Unused)	---	S-R	2	0~65535		Kbytes
23	NV_CYCLE_T	Indicates the minimum required time to write “N-” type parameters to nonvolatile memory.	---	S-R	4	0~2^{32}-1	0	1/32 msec
24	FREE_SPACE	Indicates a memory capacity that enables the configuration addition as a guideline. (Unused)	---	D-R	4	0~100.0	0	%

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
25	FREE_TIME	Indicates the load state as how much available time there is compared with the function block execution time. (Unused)	---	D-R	4	0~100.0	0	%
26	SHED_RCAS	Sets the write timeout time for a setpoint value change (SPC) from the host connected by the RCAS_IN parameter when the function block mode is RCAS. If the write of the setpoint value is not performed within the time specified by this parameter, the function block automatically switches to the mode set in advance with the SHED_OPT parameter in the function block.	---	S-R/W	4	0 or a positive value	640000 (20sec)	1/32 msec
27	SHED_ROUT	Sets the write timeout time for a output value change (DDC) from the host connected by the ROUT_IN parameter when the function block mode is ROUT.If the write of the output value is not performed within the time specified by this parameter, the function block automatically switches to the mode set in advance with the SHED_OPT parameter in the function block.	---	S-R/W	4	0 or a positive value	640000 (20sec)	1/32 msec
28	FAULT_STATE	Indicates the current fault state (the output state when a fault has occurred in the function block) in the AO block. The value of this parameter can be set either in PID block execution or from the SET_FSTATE parameter of the next item.	---	N-R	1	1: Clear (The normal state) 2: Active (The abnormal state)	1	Absolute No.
29	SET_FSTATE	Forcibly sets the AO block to the fault state. The FAULT_STATE parameter is set to Active.	---	D-R/W	1	1: Off 2: Set	1	Absolute No.
30	CLR_FSTATE	Clears the FAULT_STATE parameter. The FAULT_STATE parameter is cleared as long as there are no specific conditions for transitioning to the fault state in a SET_FAULT state parameter or function block execution.	---	D-R/W	1	1: Off 2: Clear	1	Absolute No.
31	MAX_NOTIFY	In alert transmission operations due to an alert object, indicates the maximum capacity of the device in terms of the maximum number of alarms that can be sent when confirmations are not performed by the host.	---	S-R	1	0~3	3	Absolute No.
32	LIM_NOTIFY	Limit value for the actual use of the alert transmissions described above as stipulated by user settings.	---	S-R/W	1	0~3	3	Absolute No.
33	CONFIRM_TIME	The maximum wait time for a confirmation for an alert transmission from a device. The alert will be resent if this time is exceeded without receiving a confirmation.	---	S-R/W	4	$0 \sim 2^{32}-1$	640000 (20sec)	1/32 msec.
34	WRITE_LOCK	This parameter disables writes to all parameters within the device other than this parameter itself.	---	S-R/W	1	1: Unlocked (write enabled), 2: Locked (Write disabled)	1	Absolute No.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
35	UPDATE_EVT	Alert parameter issued when a change occurs in resource block fixed data (items that have an access attribute of "S-" or "N-"). It has the following structure. • Unacknowledged: The acknowledgement state • Update state: The update state • Time stamp: The time changed • Static revision: The revision number after the update Relative index: Parameter identification number for the parameter changed	Unac-knowl-edged	D-R	1	"Unacknowledged": 0=Undefined (no change) 1=Acknowledged (acknowledged) 2=Unacknowledged (unacknowledged) "Update state": 0=Undefined (no change) 1=Update reported (The update was reported.) 2=Update not reported (The update was not reported.)		Absolute No.
			Update State	D-R	1			
			Time stamp	D-R	8			
			Static Revision	D-R	2			
			Relative Index	D-R	2			
36	BLOCK_ALM	Parameter that indicates the configuration of the resource block and error states during execution. It has the following structure. • Unacknowledged: Occurrence verification state • Alarm state: State in which an alarm has occurred • Time stamp: Time of alarm occurrence/recovery • Subcode: Alarm content subcode Value: Alarm value	Unac-knowl-edged	D-R	1			Absolute No.
			Alarm State	D-R	1			
			Time stamp	D-R	8			
			Subcode	D-R	2			
			Value	D-R	1			
37	ALARM_SUM	Parameter that summarizes the state of the resource block BLOCK_ALM • Current: The currently occurring state • Unacknowledged: Alarm verification state • Unreported: The state of reporting to the host. • Disabled: Alarm detection disablement state	Current	D-R	2	In the resource block, only the state of the block alarm is the object of this parame-ter.		Absolute No.
			Unac-knowl-edged	D-R	2			
			Unre-ported	D-R	2			
			Disabled	S-R/W	2			
38	ACK_OPTION	Enables or disables automatic confirmation on the occurrence of a block alarm (BLOCK_ALM) for a resource block. Automatic confirmation refers to confir-mation over the communication system without any operator actions, and is seen as equivalent.	---	S-R/W	2	0: Disabled, 1: Enabled	0 × 0000	Absolute No.
39	WRITE_PRI	Defines the priority of the warning issued when a WRITE_LOCK is set to the write enabled (unlocked) state.	---	S-R/W	1	0~15	0	Absolute No.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
40	WRITE_ALM	Alarm parameter that is issued when the resource block WRITE_LOCK parameter is unlocked.	Unacknowledged	D-R	1			Absolute No.
			Alarm State	D-R	1			
			Time stamp	D-R	8			
			Subcode	D-R	2			
			Value	D-R	1			
41	ITK_VER	Version number of the mutual operability test tool.	---	D-R	1	SVP	4	Absolute No.
42	SOFTWARE_REV	Indicate the software revision of the device.	---	S-R	4			Absolute No.
43	SIM_ACTIVE_SW	Activate or inactivate the simmulation function.	---	D-R/W	2	0: Inactive 1: Active	0	Absolute No.

AO Transducer Block Parameters (Base INDEX: 1100)

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
1	ST_REV	Indicates the revision number of the static data that belongs to the block. If a parameter for which the access attribute is “S-” is modified, it is incremented by 1 (0x0001) each modification.	---	S-R	2	0~65535	0	Absolute No.
2	TAG_DESC	Tag name for the user-defined transducer block. This is used for reference by the host, and is unrelated to the operation or execution of the function block itself.	---	S-R/W	32		32 space characters	Absolute No.
3	STRATEGY	An arbitrary group number for the transducer block. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	2	0~65535	0	Absolute No.
4	ARERT_KEY	Identification number for the related plant-internal devices. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	1	1~255	0	Absolute No.
5	MODEL_BLK	Transducer block mode parameter set. MODE_BLK has the following structure. • Target: Parameter for the mode set from the host. • Actual: Indicates the value of the current mode. • Permitted: Indicates the value of the mode used by the function block. • Normal: Indicates the value of the mode that should be the normal state.	Target	S-R/W	1	AUTO (processing is executed) or O/S (execution is disabled) " MODE_BLK Parameter".	O/S	Absolute No.
			Actual	S-R	1			
			Permitted	S-R/W	1			
			Normal	S-R/W	1			
6	BLOCK_ERR	Indicates the error status for the transducer block.	----	D-R	2			Absolute No.
7	UPDATE_EVT	Alert parameter issued when a change occurs in transducer block fixed data (items that have an access attribute of “S-” or “N-”). It has the following structure. • Unacknowledged: The acknowledgement state • Update state: The update state • Time stamp: The time changed • Static revision: The revision number after the update • Relative index: Parameter identification number for the parameter changed	Unacknowledged	D-R	1	“Unacknowledged”: 0=Undefined (no change) 1=Acknowledged (acknowledged) 2=Unacknowledged (unacknowledged) “Update state”: 0=Undefined (no change) 1=Update reported (The update was reported.) 2=Update not reported (The update was not reported.)		Absolute No.
			Update Status	D-R	1			
			Time Stamp	D-R	8			
			Static Revision	D-R	2			
			Relative Index	D-R	2			

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
8	BLOCK_ALM	Parameter that indicates the configuration of the transducer block and error states during execution. It has the following structure. • Unacknowledged: Occurrence verification state • Alarm state: State in which an alarm has occurred • Time stamp: Time of alarm occurrence/recovery • Subcode: Alarm content subcode • Value: Alarm value	Unacknowledged	D-R	1			Absolute No.
			Alarm State	D-R	1			
			Time Temp	D-R	8			
			Subcode	D-R	2			
			Value	D-R	1			
9	TRANSDUCER_DIRECTORY	The transducer block header information. The user does not use this parameter directly.	---	S-R	2n			Absolute No.
10	TRANSDUCER_TYPE	Indicates the type (e.g., pressure, temperature, or valve positioner) of the device.	---	N-R	2	100~107, 65535	106 (advanced valve positioner)	Absolute No.
11	XD_ERROR	Indicates the I/O Failure when an error occurs related to a transducer block.		D-R	1	0=Good 22=I/O Failure		Absolute No.
12	COLLECTION_DIRECTORY	Parameter set definition information provided so that the host can access the parameters that have the same attributes efficiently. (Unused for SVP)	---	N-R	2n			Absolute No.
13	FINAL_VALUE	Most recent value of the final output value sent to an actuator such as a control valve or damper.	Status	N-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.
			Value	N-R	4			FINAL_VALUE_RANGE
14	FINAL_VALUE_RANGE	Range of the SVP control final output parameter FINAL_VALUE. This must be set to the same value as the XD_SCALE parameter in the AO function block. In the SVP, the standard range is 0 to 100%.	EU_100	S-R	4	100	100	XD_SCALE
			EU_0	S-R	4	0	0	XD_SCALE
			Unit Index	S-R	2	" UNIT_INDEX Parameter"	%	Absolute No.
			Decimal Point	S-R	1	0~255	1	Absolute No.
15	FINAL_VALUE_CUTOFF_HI	Forced fully open setpoint value of position control output.	---	S	4	FINAL_VALUE_RANGE, +∞	109	FVR
16	FINAL_VALUE_CUTOFF_LO	Forced fully closed setpoint value of position control output.	---	S	4	FINAL_VALUE_RANGE, -∞	0.5	FVR
17	FINAL_POSITION_VALUE	Most recent value of the final output value sent to an actuator such as a control valve or damper.	Status	N-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.
			Value	N-R	4			FINAL_VALUE-RANGE
18	SERVO_GAIN	The PID gain for position control of the positioner in control valves or similar devices.	---	S-R	4		0.0	Absolute No.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
19	SERVO_RESET	The PID integration constant for position control of the positioner in control valves or similar devices.	-----	S-R	4		0.0	Sec.
20	SERVO_RATE	The PID differentiation constant for position control of the positioner in control valves or similar devices.	-----	S-R	4		0.0	Sec.
21	ACT_FAIL_ACTION	Unused	-----	S-R	1			
22	ACT_MAN_ID	Unused	-----	N-R	4			
23	ACT_MODEL_NUM	Unused	----	N-R	32			
24	ACT_SN	Unused	----	N-R	32			
25	VALVE_MAN_ID	Unused	----	N-R	4			
26	VALVE_MODEL_NUM	Unused	----	N-R	32			
27	VALVE_SN	Unused	----	N-R	32			
28	VALVE_TYPE	Unused	----	N-R	1			
29	XD_CAL_LOC	Parameter that holds the location where positioner calibration was performed most recently.	----	S-R/W	32			
30	XD_CAL_DATE	Parameter that holds the date and time where positioner calibration was performed most recently.	----	S-R/W	7			
31	XDCAL_WHO	Parameter that records the ID number of the person who performed positioner calibration most recently.	----	S-R/W	32			
32	CAL_CMD	The SVP calibrate command. Calibration, or resetting the calibration value, is performed by writing the appropriate value as shown in the Range column to this parameter. Calibration and configuration tools that support DD (device description) display the character strings for the values shown in the Range column and support the above operations by selection of the corresponding character string.	----	D-R/W	1	0: No operation 1: Open set (Start span calibration) 2: Shut set (start zero calibration) 110: Auto set-up 250: IO reset 253: User save 255: Correct reset	0	
			----	D-R/W	4	(Unused)	0.0	Absolute No.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
33	CAL_STATUS	Indicates the calibration status.	----	D-R	1	0: No operation 1: Open set success (span calibration finished) 2: Zero set access (zero caliibration finished) 11: Open set failed (span calibration failure) 12: Zero set failed (zero calibration failure) 110: Auto set-up success 111: Auto set-up failed 220: IO reset failed 221: User saved failed 222: Correct reset	0	Absolute No.
34	MEASUREMENT_STATUS	Indicates the results of the individual items in the SVP self diagnostics. This parameter has a multi-byte structure. Byte 1 (the first byte) includes diagnostic results for failures related to device operation itself. Bytes 2 and later include results for warnings and adjustment and operating status items.	Byte1	D-R	1	Bit 0 = 1: Position sensor (VTD) error Bits 1 to 3: Unused. Bit 4 = 1: Nonvolatile memory (NVM) error Bit 5 = 1: RAM error Bit 6 = 1: ROM error Bit 7 = 1: A/D converter error	All bits set to 0.	Absolute No.
			Byte2	D-R	1	Bit 0 = 1: Positioner internal temperature error Bit 1: Unused. Bit 2 = 1: Automatic setup execution in progress Bit 3 = 1: Automatic setup execution in progress Bit 4 = 1: Automatic setup execution in progress Bits 5 to 7: Unused.	All bits set to 0.	Absolute No.
			Byte3	D-R	1	Bit 0: Unused. Bit 1 = 1: External zero or span adjustment allowed state Bit 2 = 1: Electro-pneumatic conversion module error Bit 3 = 1: Actuator forcible opened or forcible closed state Bits 4 to 7: Unused.	All bits set to 0.	Absolute No.
			Byte4	D-R	1	Bits 0 to 7: Unused.	All bits set to 0.	Absolute No.
35	ELECT_TEMP	SVP electrical circuit block temperature	----	D-R	4		-----	°c

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
36	PID_PARAM Note 1: The set of parameters listed here is used to control the position of a positioner such as a control valve or a damper, and differ from the parameters used for process control, that is, the PID function block parameters. Note 2: This set of parameters is for the "PID with GAP" provided for SVP use. Available only for "0: User specific" for ACTUATOR_SIZE. Note 3: When GE=0, GP, GI and GD are not used.	The control gain within the differential (PV - SP) gap used for control valve position control by the SVP.	P	S-R/W	4		1.2	Absolute No.
		Integration constant for the differential gap mentioned above.	I	S-R/W	4		4	Sec.
		Differentiation constant for the differential gap mentioned above.	D	S-R/W	4		0.5	Sec.
		Number that indicates the width of the differential gap as a percentage.	GE	S-R/W	4		0.0	%
		The control gain outside of the differential gap.	GP	S-R/W	4		0.7	Absolute No.
		Integration constant outside of the differential gap mentioned above.	GI	S-R/W	4		4	Sec.
		Differentiation constant outside of the differential gap mentioned above.	GD	S-R/W	4		0.5	Sec.
37	EPM_DUTY	Electro-pneumatic conversion module load current expressed as a percentage. If positive numbers are written, the MODE will change to "Manual", when negative numbers are written, the MODE will be released.	----	D-R	4		-----	%
38	POSITIONER_ID	Eight-digit ID number that can be stored in the SVP.	ID	S-R/W	8		XXXXXXX	Absolute No.
39	SCRATCH_PAD	Note or comment with up to 32 characters.	SCRPD	S-R/W	32		XXXX...XX XX	Absolute No.
40	PACKING_TYPE	The friction type of the gland packing.	HYS	S-R/W	1	0: Heavy 1: Medium 2: Light	0	Absolute No.
41	ACTUATOR_SIZE	The size of the actuator	PARAM	S-R/W	1	0: User specific 1~9: PARAM 1~2	1	Absolute No.
42	POSITIONER_ACTION	The operating direction of the position (Direct or reverse)	----	S-R/W	1		0	Absolute No.
43	ACTUATOR_ACTION	The operating direction of the actuator (Direct or reverse)	----	S-R/W	1		1	Absolute No.
44	POSITIONER_TYPE	Unused	----	S-R/W	1		0	Absolute No.
45	VALVE_ACTION	The operating direction of the valve (Flow to open or flow to close)	----	S-R/W	1		0	Absolute No.
46	VALVE_MOTION	Unused	----	S-R/W	1		0	Absolute No.
47	FLOW_CHARACTERISTIC	Positioner I/O characteristics (linear, EQ%, QO, USER)	----	S-R/W	1		0	
48	CAL_OPEN	The angle when open	----	S-R/W	4		60.001	
49	CAL_SHUT	The angle when shut	----	S-R/W	4		-60.001	
50	CONVERSION_INPUT	The 16 points of input data used when USER is selected as the positioner I/O characteristics.	----	S-R/W	4X16			

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units
51	CONVERSION_OUTPUT	The 16 points of output data (position) used when USER is selected as the positioner I/O characteristics.	----	S-R/W	4X16			
52	VTD_DEGREE	Indicate the angle of value travel detector.		D-R	4			deg.

~Note *The writable parameters can be written into the memory, but only if the mode is out of service.*

AO Function Block Parameters (Base INDEX: 1200)

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
1	ST_REV	Indicates the revision number of the static data that belongs to the block. If a parameter for which the access attribute is "S-" is modified, it is incremented by 1 (0x0001) each modification.	---	S-R	2	0~65535	0	Absolute No.	
2	TAG_DESC	Tag name for the user-defined function block. This is used for reference by the host, and is unrelated to the operation or execution of the function block itself.	---	S-R/W	32		32 space characters	Absolute No.	
3	STRATEGY	An arbitrary group number for the function block. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	2	0~65535	0	Absolute No.	
4	ALERT_KEY	Identification number for the related plant-internal devices. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	1	1~255	0	Absolute No.	
5	MODE_BLK	Function block mode parameter set. MODE_BLK has the following structure. • Target: Parameter for the mode set from the host. • Actual: Indicates the value of the current mode. • Permitted: Indicates the value of the mode used by the function block. • Normal: Indicates the value of the mode that should be the normal state.	Target	N-R/W	1	ROUT, RCAS, CAS, AUTO, MAN, or O/S. " MODE_BLK Parameter"		Absolute No.	
			Actual	D-R	1				
			Permitted	S-R/W	1				
			Normal	S-R/W	1				
6	BLOCK_ERR	Indicates the error status for the function block.	---	D-R	2			Absolute No.	
7	PV	Value that has been converted to engineering units based on the range set in PV_SCALE for the value in the AO block READBACK parameter. When has position feedback from, for example, a control valve, that value (the transducer block FINAL_POSITION_VALUE) is reflected.	Status	D-R	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Value	D-R	4			PV	
8	SP	The value, expressed in engineering units, of the setpoint value (target value) from the upstream function block that is performing AO output.	Status	N-R	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Value	N-R	4	PV_SCALE +/-10%		PV	
9	OUT	The AO block output, which is output to a transducer block. The units are the same as those used in the transducer block. (For the SVP, the units will be percent.)	Status	N-R/W	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Value	N-R/W	4	XD_SCALE +/-10%		XD	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
10	SIMULATE	Simulate the read-back value from the AO block to a transducer block downstream from the AO block can be set manually. • Simulate status: Status of the read-back value. • Simulate value: The read-back value. • Transducer status: Read-back value status within the transducer block. • Transducer value: Read-back value within the transducer block. • Enable/disable: Control switch for the simulation function. (enable/disable)	Simulate Status	D-R/W	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Simulate Value	D-R/W	4	Same value as “FINAL_POSITION_VALUE” in " AO Transducer Block Parameters (Base INDEX: 1100)"		XD	
			Transducer Status	D-R	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Transducer Value	D-R	4	See AO Transducer block		XD	
			Enable/disable	S-R/W	1	0 (not initialized) 1 (disable) 2 (enabled)	1: disable	Absolute No.	
11	PV_SCALE	Range used for converting a value in engineering units output from an upstream control block (such as a PID block) to a percentage. For normal PID control, this parameter is set to the same value as the PID block OUT_SCALE.	EU_100	S-R/W	4		100	PV	Can only be changed when the mode is MAN.
			EU_0	S-R/W	4		0	PV	
			Unit Index	S-R/W	2	" UNIT_INDEX Parameter"	%	Absolute No.	
			Decimal Point	S-R/W	1	0~255	1	Absolute No.	
12	XD_SCALE	Range used for converting to a value in engineering units for output to a downstream transducer block. For normal use, the range 0.0 to 100.0% is used for this range.	EU_100	S-R/W	4	Same as XD	100	XD	Can only be changed when the mode is MAN.
			EU_0	S-R/W	4	Same as XD	0	XD	
			Unit Index	S-R/W	2	" UNIT_INDEX Parameter"	%	Absolute No.	
			Decimal Point	S-R/W	1	0~255	1	Absolute No.	
13	GRANT_DENY	Parameter that enables/disables access to the parameters in this block from the human interface or the host. Whether or not this parameter is used depends on settings in the host. This parameter has no effect on block operation.	Grant	D-R/W	1	0 or 1	All bits set to 0.	Absolute No.	
			Deny	D-R/W	1	0 or 1	All bits set to 0.	Absolute No.	
14	IO_OPT	Parameter that sets the options for an output function.	---	S-R/W	2	0 (invalid) or 1 (valid). " IO_OPTS Parameter"	All bits set to 0.	Absolute No.	Can only be changed when the mode is O/S.
15	STATUS_OPTS	Controls various option settings provided in relation to the OUT (PID output) parameter status information.	---	S-R/W	2	0 (invalid) or 1 (valid). " STATUS_OPTS Parameter"	All bits set to 0.	Absolute No.	Can only be changed when the mode is O/S.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
16	READBACK	The read back position of the actuator (FINAL_POSITION_VALUE of the transducer block) converted to the XD_SCALE (the range conversion factor between the AO block and the transducer block). For the SVP, this will be in units of percent for control valve and damper positions.	Status	D-R	1	Good: Good value Uncertain: Unknown Bad: Unusable	Absolute No.	16	READBACK
			Value	D-R	4	---	XD		
17	CAS_IN	Input value of a setpoint output to the AO block. This parameter is normally connected to the OUT parameter (output value) of a control block such as a PID block. This value is used as the AO block setpoint (SP) when the AO block mode is CAS.	Status	N-R/W	1	Good: Good value Uncertain: Unknown Bad: Unusable	Absolute No.	17	CAS_IN
			Value	N-R/W	4	---	PV		
18	SP_RATE_DN	Rate of change limit values for SP (output setpoint values from higher level blocks). Individual settings are provided for changes in the upward and downward directions. These rate of change limits are valid when the mode is AUTO, CAS, or RCAS.	---	S-R/W	4	0 or a positive value	$+\infty$	PV/Sec.	
19	SP_RATE_UP		---	S-R/W	4	0 or a positive value	$+\infty$	PV/Sec.	
20	SP_HI_LIM	Upper and lower setpoint value limits for SP (output setpoint values from higher level blocks).	---	S-R/W	4	PV_SCALE (EU_100) +10%	100	PV	
21	SP_LO_LIM		---	S-R/W	4	PV_SCALE (EU_0) -10%	0	PV	
22	CHANNEL	Specifies the number of hardware units (transducer blocks) that are the objects of control of AO block output.	---	S-R/W	2	1	1	Absolute No.	Can only be changed when the mode is O/S. Always 1 for the SVP.
23	FSTATE_TIME	Failsafe processing is performed when a fault occurs in either a value or communication either between field devices, or in an AO block output setpoint (CAS_IN) connection from the host. This parameter sets (in seconds) the time interval in which the settings must be updated once a fault is detected. Failsafe processing based on the IO_OPTS and FSTATE_VAL settings is performed at the timeout time. (For example, the mode is set to MAN and the final value is retained.)	---	S-R/W	4	A Positive value	0	Sec.	
24	FSTATE_VAL	In the fault state processing described above under FSTATE_TIME, if the safety value is a fixed value of either fully open or fully closed, then the value is stored in this parameter. Note that specification with the IO_OPTS parameter that this parameter be used is required at the same time.	---	S-R/W	4	PV_SCALE +/-10%	0	PV	
25	BKCAL_OUT	Value that is fed back to the BKCAL_IN parameter of an upstream block (PID or other calculation) for use in the upstream calculation. Either the post-limiter SP or PV value (that is, the actuator position readback value after conversion to engineering units) in the AO block is connected to the BLCAL_OUT parameter. This is specified with the IO_OPTS parameter.	Status	D-R	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Value	D-R	4	---		PV	
26	RCAS_IN	Input value used when control is performed directly through the AO block output from the host. When the mode is RCAS, this value is used as the AO block SP (output setpoint value).	Status	N-R/W	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		PV	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
27	SHED_OPT	In remote output from the host specifies the processing when a write of the setpoint value (RCAS_IN) times out. The time at which a timeout is detected is set separately using the block SHED_RCAS.	---	S-R/W	1	" SHED_OPT Parameter"	0	Absolute No.	
28	RCAS_OUT	Output for use with output limit conditions or initialization when changing modes. This parameter is output to the host when control is performed directly through the AO block output from the host. The setpoint value after rate of change or HILO limits have been applied is connected to RCAS_OUT within the AO block.	Status	D-R	1	Good: Good value Uncertain: Unknown Bad: Unusable		Absolute No.	
			Value	D-R	4	---		PV	
29	UPDATE_EVT	Alert parameter issued when a change occurs in function block fixed data (items that have an access attribute of "S-"). It has the following structure. • Unacknowledged: The acknowledgement state • Update state: The update state • Time stamp: The time changed • Static revision: The revision number after the update • Relative index: Parameter identification number for the parameter changed	Unacknowledged	D-R	1	"Unacknowledged": 0=Undefined (no change) 1=Acknowledged (acknowledged) 2=Unacknowledged (unacknowledged) "Update state": 0=Undefined (no change) 1=Update reported (The update was reported.) 2=Update not reported (The update was not reported.)		Absolute No.	
			Update State	D-R	1				
			Time Stamp	D-R	8				
			Static Revision	D-R	2				
			Relative Index	D-R	2				
30	BLOCK_ALM	Parameter that indicates the configuration of the function block and error states during execution. It has the following structure. • Unacknowledged: Occurrence verification state • Alarm state: State in which an alarm has occurred • Time stamp: Time of alarm occurrence/recovery • Subcode: Alarm content subcode • Value: Alarm value	Unacknowledged	D-R	1			Absolute No.	
			Alarm State	D-R	1				
			Time Stamp	D-R	8				
			Subcode	D-R	2				
			Value	D-R	1				

PID Function Block Parameters (PID1 Base INDEX:1300, PID2 Base INDEX:1400)

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
1	ST_REV	Indicates the revision number of the static data that belongs to the function block. If a parameter for which the access attribute is “S-” is modified, it is incremented by 1 (0x0001) each modification.	---	S-R	2	0~65535	0	Absolute No.	
2	TAG_DESC	Tag name for the user-defined function block. This is used for reference by the host, and is unrelated to the operation or execution of the function block itself.	---	S-R/W	32		32 space characters	Absolute No.	
3	STRATEGY	An arbitrary group number for the function block. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	2	0~65535	0	Absolute No.	
4	ALERT_KEY	Identification number for the related plant-internal devices. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later data-base search operations.)	---	S-R/W	1	1~255	0	Absolute No.	
5	MODE_BLK	Function block mode parameter set. MODE_BLK has the following structure. • Target: Parameter for the mode set from the host. • Actual: Indicates the value of the current mode. • Permitted: Indicates the value of the mode used by the function block. • Normal: Indicates the value of the mode that should be the normal state.	Target	N-R/W	1	ROUT, RCAS, CAS, AUTO, MAN, or O/S " MODE_BLK Parameter"		Absolute No.	
			Actual	D-R	1				
			Permitted	S-R/W	1				
			Normal	S-R/W	1				
6	BLOCK_ERR	Indicates the error status for the function block.	---	D-R	2			Absolute No.	
7	PV	The value after application of the primary delay filter based on the time constant set with PV_FTIME for in IN parameter (input value from another block) to the PID block. Inputs to PID calculations are expressed in engineering units.	Status	D-R	1	Good: Good value, Uncertain: Unknown, Bad: Unus-able		Absolute No.	
			Value	D-R	4	---		PV	
8	SP	Value that indicates, in engineering units, the setpoint value (target value) used in PID control calculations.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unus-able		Absolute No.	
			Value	N-R/W	4	PV_SCALE +/-10%		PV	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
9	OUT	Parameter that indicates the PID calculation output in engineering units.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unus-able		Absolute No.	
			Value	N-R/W	4	OUT_SCALE +/-10%		OUT	
10	PV_SCALE	PV value range in engineering units (PID input) • EU_100: Value in engineering units corresponding to 100% input. • EU_0: Value in engineering units corresponding to 0% input. • Unit index: Engineering units index (identification number) • DP: Position of the decimal point in the display (the number of digits below the decimal point)	EU_100	S-R/W	4		100	PV	Can only be changed when the mode is MAN.
			EU_0	S-R/W	4		0	PV	
			Unit Index	S-R/W	2	" UNIT_INDEX Parameter".	%	Absolute No.	
			DP	S-R/W	1	0~255	0	Absolute No.	
11	OUT_SCALE	OUT value range in engineering units (PID output) • EU_100: Value in engineering units corresponding to 100% input. • EU_0: Value in engineering units corresponding to 0% input. • Unit index: Engineering units index (identification number) • DP: Position of the decimal point in the display (the number of digits below the decimal point)	EU_100	S-R/W	4		100	OUT	Can only be changed when the mode is MAN.
			EU_0	S-R/W	4		0	OUT	
			Unit Index	S-R/W	2	" UNIT_INDEX Parameter"	%	Absolute No.	
			DP	S-R/W	1	0~255	0	Absolute No.	
12	GRANT_DENY	Parameter that enables/disables access to the parameters in this block from the human interface or the host. Whether or not this parameter is used depends on settings in the host. This parameter has no effect on block operation.	Grant	D-R/W	1	0 or 1	All bits set to 0.	Absolute No.	
			Deny	D-R/W	1	0 or 1	All bits set to 0.	Absolute No.	
13	CONTOL_OPTS	Controls various option settings for the control function.	---	S-R/W	2	0 (invalid) or 1 (valid). " CONTROL_OPTS Parameter"	All bits set to 0.	Absolute No.	Can only be changed when the mode is O/S.
14	STATUS_OPTS	Controls various option settings provided in relation to the OUT (PID output) parameter status information.	---	S-R/W	2	0 (invalid) or 1 (valid). " STATUS_OPTS Parameter"	All bits set to 0.	Absolute No.	Can only be changed when the mode is O/S.

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
15	IN	The input value to the PID block. This value acquires the output value from another function block, such as an AI block, directly with no modification. The value is expressed as an value in engineering units, and the units are those set in both this PID block's PV_SCALE (EU_INDEX) parameter and the upstream block's OUT_SCALE (EU_INDEX) parameter.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable	Absolute No.	15	IN
			Value	N-R/W	4	---	PV		
16	PV_FTIME	Temporary delay filter time constant used for PV (PID input).	---	S-R/W	4	0 or a positive value	0	Sec.	
17	BYPASS	Switch provided for bypassing PID calculation. When this switch is off, the calculation is performed, and when on, SP (setpoint value) is directly connected to OUT (the output).	---	S-R/W	1	1: Off 2:On	0	Absolute No.	Can only be changed when the mode is O/S.
18	CAS_IN	Input value used in cascade control. When the PID block mode is CAS, this value is used as a setpoint value for PID calculation.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		PV	
19	SP_RATE_DN	Limit values for the rate of change of SP (setpoint value). Individual settings are provided for changes in the upward and downward directions. These rate of change limits are value when the mode is AUTO, CAS, or RCAS.	---	S-R/W	4	0 or a positive value	$+\infty$	PV/Sec.	
20	SP_RATE_UP		---	S-R/W	4	0 or a positive value	$+\infty$	PV/Sec.	
21	SP_HI_LIM	Upper and lower limit values for SP (setpoint value).	---	S-R/W	4	Pv_SCALE (Eu_100) +10%	100	PV	
22	SP-LO_LIM		---	S-R/W	4	Pv_SCALE (Eu_0) -100%	0	PV	
23	GAIN	PID gain parameter.	---	S-R/W	4	Positive value		Absolute No.	
24	RESET	PID integration constant.	---	S-R/W	4	0 or a positive value		Sec.	
25	BAL_TIME	Sets the time for which the integration term is calculated continuously when OUT (output value) has exceeded a limit set with either OUT_HI_LIM or OUT_LO_LIM. In other words, in cases where, after a limit has been exceeded, the calculation is working in the direction of resolving the limit, this parameter sets the time until the value of the integration term reaches the output limit. If this parameter is set to 0, windup of the integration term will be performed at the output limit value.	---	S-R/W	4	Positive value	0	Sec.	
26	RATE	PID differentiation constant.	---	S-R/W	4	0 or a positive value		Sec.	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
27	BKCAL_IN	Value fed back through a downstream block (such as and AO or PID block) BKCAL_OUT parameter for use in PID calculation.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		OUT	
28	OUT_HI_LIM	Upper and lower limit values provided for the OUT parameter.	---	S-R/W	4	OUT_SCALE (EU_100) +10%	100	OUT	
29	OUT_LO_LIM		---	S-R/W	4	OUT_SCALE (EU_0) -10%	0	OUT	
30	BKCAL_HYS	Sets the hysteresis when recovering from the OUT value reaching the upper or lower limit. For example, if OUT_HI_LIM is 100% and BKCAL_HYS is 0.5, then while the limit function will be applied when the value reaches 100%, recovery will not be performed until the value falls under 99.5%.	---	S-R/W	4	0 ~ 50%	0.5%	%	Expressed as a percentage of the full scale of the output.
31	BKCAL_OUT	Value fed back to the BKCAL_IN parameter of an upstream block (PID or other calculation) to be used in the upstream block's calculation. Either the post-limiter SP or PV value in this block is connected to the BLCAL_OUT parameter. This is specified with the CONTROL_OPTS parameter.	Status	D-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	D-R	4	---		PV	
32	RCAS_IN	Input value connected from the host for performing SPC (set point control). This value is used as the PID setpoint value when the mode is RCAS.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		PV	
33	ROUT_IN	Input value connected from the host for DDC (Direct Digital Control). Used as the PID setpoint value when the mode is ROUT.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		OUT	
34	SHED_OPT	In remote output or remote cascade control (SPC or DDC) from the host, specifies the processing when a write of the setpoint value (RCAS_IN) or output value (ROUT_IN) times out. The time at which a timeout is detected is set separately using the block SHED_RCAS and SHED_ROUT.	---	S-R/W	1		0	Absolute No.	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
35	RCAS_OUT	Output (to the host) used for initialization and other purposes when the output limit conditions or mode changes when performing SPC. The post-limit setpoint value is connected to RCAS_OUT within the PID block.	Status	D-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	D-R	4	---		PV	
36	ROUT_OUT	Output (to the host) used for initialization and other purposes when the output limit conditions or mode changes when performing DDC. The post-limit setpoint value is connected to ROUT_OUT within the PID block.	Status	D-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	D-R	4	---		OUT	
37	TRK_SCALE	The engineering units range of the TRK_VAL (external feedback input) parameter. • EU_100: Value in engineering units corresponding to 100% output. • EU_0: Value in engineering units corresponding to 0% output. • Unit index: Engineering units index (identification number) • DP: Position of the decimal point in the display (the number of digits below the decimal point)	EU_100	S-R/W	4		100	TRK	Can only be changed when the mode is MAN.
			EU_0	S-R/W	4		0	TRK	
			Unit Index	S-R/W	2	"UNIT_INDEX Parameter".	%	Absolute No.	
			DP	S-R/W	1	0~255	0	Absolute No.	
38	TRK_IN_D	Parameter that specifies whether or not to use the TRK_VAL (external feedback input value) to the PID block for the calculated value. An on/off type output (such as the output value of a DI block) from an external device is connected to this parameter.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	1	0 (false: feedback off) or 1 (true: feedback on)		Absolute No.	
39	TRK_VAL	External feedback value to the PID block. An AI block output value or similar value from an external device is connected to this parameter.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		TRK	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
40	FF_VAL	Feed forward input value to the PID block. An AI block output value or similar value from an external device is connected to this parameter.	Status	N-R/W	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R/W	4	---		FF	
41	FF_SCALE	FF_VAL value range in engineering units (external feed forward input) parameter. • EU_100: Value in engineering units corresponding to 100% output. • EU_0: Value in engineering units corresponding to 0% output. • Unit index: Engineering units index (identification number) • DP: Position of the decimal point in the display (the number of digits below the decimal point)	EU_100	S-R/W	4		100	FF	Can only be changed when the mode is MAN.
			EU_0	S-R/W	4		0	FF	
			Unit Index	S-R/W	2	" UNIT_INDEX Parameter"	%	Absolute No.	
			DP	S-R/W	1	0~255	0	Absolute No.	
42	FF_GAIN	Gain applied to the FF_VAL (feed forward input) parameter.	---	S-R/W	4		0	Absolute No.	Can only be changed when the mode is MAN.
43	UPDATE_EVT	Alert parameter issued when a change occurs in function block fixed data (items that have an access attribute of “S-” or “N-”). It has the following structure. • Unacknowledged: The acknowledgement state • Update state: The update state • Time stamp: The time changed • Static revision: The revision number after the update • Relative index: Parameter identification number for the parameter changed	Unacknowledged	D-R	1	“Unacknowledged”: 0=Undefined (no change) 1=Acknowledged (acknowledged) 2=Unacknowledged (unacknowledged) “Update state”: 0=Undefined (no change) 1=Update reported (The update was reported.) 2=Update not reported (The update was not reported.)		Absolute No.	
			Update State	D-R	1				
			Time Stamp	D-R	8				
			Static Revision	D-R	2				
			Relative Index	D-R	2				

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
44	BLOCK_ALM	Parameter that indicates the configuration of the function block and error states during execution. It has the following structure. • Unacknowledged: Occurrence verification state • Alarm state: State in which an alarm has occurred • Time stamp: Time of alarm occurrence/recovery • Subcode: Alarm content subcode • Value: Alarm value	Unac-knowl-edged	D-R	1			Absolute No.	
			Alarm State	D-R	1				
			Time Stamp	D-R	8				
			Subcode	D-R	2				
			Value	D-R	1				
45	ALARM_SUM	Parameter that summarizes the state of the function block BLOCK_ALM • Current: The currently occurring state • Unacknowledged: Alarm verification state • Unreported: The state of reporting to the host. • Disabled: Alarm detection disablement state	Current	D-R	2	Bit1: High high alarm Bit2: High alarm Bit3: Low low alarm Bit4: Low alarm Bit5: Deviation high alarm Bit6: Deviation low alarm Bit7: Block alarm		Absolute No.	
			Unac-knowl-edged	D-R	2				
			Unre-ported	D-R	2				
			Disabled	S-R/W	2				
46	ACK_OPTION	Enables or disables automatic confirmation on the occurrence of a block alarm (BLOCK_ALM) for a Function block. Automatic confirmation refers to confirmation over the communication system without any operator actions, and is seen as equivalent.	---	S-R/W	2	0: Disabled 1: Enabled	0x0000	Absolute No.	
47	ALARM_HYS	Sets the hysteresis for recovery from a PV alarm (HI_HI, HI, LO, LOLO).	---	S-R/W	4	0~50%	0.5%	%	Expresses as a percent of the PV full scale.
48	HI_HI_PRI	These parameters set the priorities of the various alarms. • PV alarm priorities	---	S-R/W	1	0~15	0	Absolute No.	
49	HI_HI_LIM	Alarm setting values in engineering units. • Used for detecting the HI_HI_ALM.	---	S-R/W	4	PV_SCALE, +∞		PV	
50	HI_PRI	These parameters set the priorities of the various alarms. • PV alarm priorities							
51	HI_LIM	Alarm setting values in engineering units. • Used for detecting the HI_ALM.	---	S-R/W	4	PV_SCALE, +∞		PV	
52	LO_PRI	These parameters set the priorities of the various alarms. • PV alarm priorities							

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
53	LO_LIM	Alarm setting values in engineering units. • Used for detecting the LO_ALM.	---	S-R/W	4	-∞ , PV_SCALE		PV	
54	LO_LO_PRI	These parameters set the priorities of the various alarms. • PV alarm priorities							
55	LO_LO_LIM	Alarm setting values in engineering units. • Used for detecting the LO_ LO_ALM.	---	S-R/W	4	-∞ , PV_SCALE		PV	
56	DV_HI_PRI	These parameters set the priorities of the various alarms. • Deviation alarm priorities							
57	DV_HI_LIM	Alarm setting values in engineering units. • Used to detect the DV_HI_ALM (deviation HI) state.	---	S-R/W	4	0~ PV span, +∞		PV	
58	DV_LO_PRI	These parameters set the priorities of the various alarms. • Deviation alarm priorities							
59	DV_LO_LIM	Alarm setting values in engineering units. • Used to detect the DV_LO_ALM (deviation HI) state.	---	S-R/W	4	-∞ , PV span ~0		PV	
60	HI_HI_ALM	Parameters that indicate the process alarms output by the function block. These have the following structure. • Unacknowledged: Occurrence verification state • Alarm state: State in which an alarm has occurred • Time stamp: Time of alarm occurrence/recovery • Subcode: Alarm content subcode • Value: Alarm value	Unac-knowl-edged	D-R	1			Absolute No.	
61	HI_ALM								
62	LO_ALM		Alarm State	D-R	1				
63	LO_LO_ALM		Time Stamp	D-R	8				
64	DV_HI_ALM		Subcode	D-R	2				
65	DV_LO_ALM		Value	D-R	4			PV	

Diagnostics Function Block Parameters (Base INDEX: 1500)

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
1	ST_REV	Indicates the revision number of the static data that belongs to the block. If a parameter for which the access attribute is "S-" is modified, it is incremented by 1 (0x0001) each modification.	---	S-R	2	0~65535	0	Absolute No.	
2	TAG_DESC	Tag name for the user-defined transducer block. This is used for reference by the host, and is unrelated to the operation or execution of the function block itself.	---	S-R/W	32		32 space characters	Absolute No.	
3	STRATEGY	An arbitrary group number for the transducer block. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	2	0~65535	0	Absolute No.	
4	ALERT_KEY	Identification number for the related plant-internal devices. (This parameter is unrelated to block operation. It is provided so that the different types of blocks can be grouped arbitrarily so that they can be identified more easily in later database search operations.)	---	S-R/W	1	1~255	0	Absolute No.	
5	MODE_BLK	Transducer block mode parameter set. MODE_BLK has the following structure. • Target: Parameter for the mode set from the host. • Actual: Indicates the value of the current mode. • Permitted: Indicates the value of the mode used by the function block. • Normal: Indicates the value of the mode that should be the normal state.	Target	S-R/W	1	AUTO (processing is executed) or O/S (execution is disabled) " MODE_BLK Parameter"	O/S	Absolute No.	
			Actual	S-R	1				
			Permitted	S-R/W	1				
			Normal	S-R/W	1				
6	BLOCK_ERR	Indicates the error status for the transducer block.	---	D-R	2			Absolute No.	
7	DEVICE_STATUS	Indicates the SVP status.		D-R	4	bit 0: ROM error bit 1: RAM bit 2: Non-volatile memory (NVM) writing count alarm bit 3: I/O error	All bits set to 0.	Absolute No.	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
8	MEASUREMENT_STATUS	Indicates the results of the individual items in the SVP self diagnostics. This parameter has a multi-byte structure. Byte 1 (the first byte) includes diagnostic results for failures related to device operation itself. Bytes 2 and later include results for warnings and adjustment and operating status items.	Byte1	D-R	1	Bit 0 = 1: Position sensor (VTD) error Bits 1 to 3: Unused. Bit 4 = 1: Nonvolatile memory (NVM) error Bit 5 = 1: RAM error Bit 6 = 1: ROM error Bit 7 = 1: A/D converter error	All bits set to 0.	Absolute No.	
			Byte2	D-R	1	Bit 0 = 1: Positioner internal temperature error Bit 1: Unused. Bit 2 = 1: Automatic setup execution in progress Bit 3 = 1: Automatic setup execution in progress Bit 4 = 1: Automatic setup execution in progress Bits 5 to 7: Unused.	All bits set to 0.	Absolute No.	
			Byte3	D-R	1	Bit 0: Unused. Bit 1 = 1: External zero or span adjustment allowed state Bit 2 = 1: Electro-pneumatic conversion module error Bit 3 = 1: Actuator forcible opened or forcibly closed state Bits 4 to 7: Unused.	All bits set to 0.	Absolute No.	
			Byte4	D-R	1	Bits 0 to 7: Unused.	All bits set to 0.	Absolute No.	
9	OPERATING_TIME	Indicates operating time		N-R/W	4			Hour	
10	FINAL_VALUE	The latest value of the final output value sent to a control valve, damper, or other actuator.	Status	N-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R	4			FINAL_VALUE_RANGE	

Index	Parameter	Description	Sub-parameter	Access attribute	Size (bytes)	Range	Initial value	Units	Remarks
11	FINAL_POSITION_VALUE	The latest value of the final output value sent to a control valve, damper, or other actuator.	Status	N-R	1	Good: Good value, Uncertain: Unknown, Bad: Unusable		Absolute No.	
			Value	N-R	4			FINAL_VALUE_RANGE	
12	ELECT_TEMP	SVP electrical circuit block temperature	----	D-R	4		-----	°C	
13	EPM_DUTY	Electro-pneumatic conversion module load current expressed as a percentage.	----	D-R	4		-----	%	
14	STICK_SLIP_N	Defines the number of data samples for stick diagnostics.	N	S-R/W	2	100 ~ 65535	1000	Absolute No.	
15	STICK_SLIP_XY	Processed data for stick diagnostics	X, Y	D-R	8		0	Absolute No.	
16	FLOW_FORCE_N	(Unused.)		S-US	2				
17	FLOW_FORCE_XY	(Unused.)		D-R	8			Absolute No.	
18	AUTO_SETUP_SPEED	Operating speed from full closed to full open during auto setup.		D-R	4		0	sec.	
19	AUTO_SETUP_ERROR	Valve friction coefficient value during auto setup.		D-R	4		0	%	
20	TOTAL_STROKE			N-R/W	4	Positive numbers	0	%	
21	TOTAL_STROKE_DEADMAND			S-R/W	4	0~100	0.5	%	
22	CUTOFF_LO_COUNT			N-R/W	4		0	Absolute No.	
23	TRAVEL_RATE_VALUE			S-R/W	4x16	Positive numbers	0, 10, 2, 0.....150	Absolute No.	
24	TRAVEL_RATE_RATIO			N-R/W	4x16	Positive numbers	0	%	
25	MAX_SPEED_P			D-R	4		0	%/40ms	
26	MAX_SPEED_M			D-R	4		0	%/40ms	
27	LIMIT_CYCLE_COUNT			N-R/W	4	Positive numbers	0	Absolute No.	
28	LIMIT_CYCLE_HI			S-R/W	4		+∞	%	
29	LIMIT_CYCLE_LO			S-R/W	4		-∞	%	
30	SHUT_ERR_TIME			S-R/W	4	Positive numbers	+∞	s	
31	SHUT_ERR_P			S-R/W	4	Positive numbers	+∞	%	
32	SHUT_ERR_M			S-R/W	4	Negative numbers	-∞	%	
33	VALVE_DIAG_STATUS			D-R	4	Bit 0: SHUT_ERR_ALM	0	Absolute No.	

Description of the parameter range

Parameters

Bit	Function	Description
0	Unicode strings	Specifies Unicode (2-byte encoding) support for character string parameters such as PD_TAG and TAGNAME. This bit is set according to which is required by the host system. When configured for alphanumerics only, ASCII (that is, a setting of FALSE) can be used.
1	Reports supported	Selects whether or not the alert notification and trend notification functions are used. If this bit is FALSE, report notifications are not performed, regardless of the alert object and trend object settings. This is set according to the requirements of the host system.
2	Fault State supported	This is a bit that is meaningful to AO and DO function blocks. It selects whether or not the Fault State function of these function blocks is used. Fault State refers to operation when, for example, it becomes impossible to update the CAS_IN data for an AO function block and either the output value is held constant, or the output value is forcibly switched to a preset value. This is set according to the requirements of the application.
3	Soft Write lock supported	Selects whether or not the function that disables writes of the various static data within the device with the WRITE_LOCK parameter in the resource block is used. This should normally be set to the write enabled (FALSE) value.
4	Hard write lock supported	Function that selects whether or not that function is used when the hardware switch based write protect function can be implemented. Since the SVP does not have a hardware write protect function, this bit is not used.
5	Output readback supported	Selects whether or not the position feedback function, such as that for the valve position, is used. If this bit is FALSE, the READBACK value will reflect the same value as that of the position setpoint. The SVP supports the position readback function, and this bit should be set to TRUE if it is used.
6	Direct write to output hardware	Selects whether or not the function that directly modifies the final output value with a special procedure even if it is not possible for the device to continue normal operation due to a fault in the fieldbus itself is used. This output modification procedure has not been standardized under FF. The SVP does not support this function.
7	Change of BYPASS in an automatic mode	Selects whether or not switching to the bypass function included in the PID function block can be performed in auto mode as well. Since the use of this function is thought to be a special case, we recommend using the FALSE setting for this bit.

MODE_BLK Parameter

Bit	Function	Description
0	Remote-Output (ROut)	Remote output mode from the host (DDC)
1	Remote-Cascade (RCas)	Remote setting mode from the host (SPC)
2	Cascade (Cas)	Cascade mode
3	Automatic (Auto)	Indicates automatic mode for function blocks and block execution for resource blocks and transducer blocks.
4	Manual (Man)	Manual mode
5	Local Override (LO)	Control mode based on external feedback input of the TRACK_VALUE
6	Initialization Manual (IMan)	Output initialization mode (For example, if a block connected downstream is in manual operation)
7	Out of service (O/S)	Operation stopped mode (For example, when modifying the configuration data)

SHED_OPT Parameter

Bit	Function	Description
0	Undefined	Undefined
1	Normal shed, normal return	When a fault occurs in the host, the block sheds to the mode with the next priority, and when the host recovers, the block automatically recovers to either ROut or RCas.
2	Normal shed, no return	When a fault occurs in the host, the block sheds to the mode with the next priority, and when the host recovers, the block does not automatically recover
3	Shed to Auto, normal return	When a fault occurs in the host, the block sheds to auto mode, and when the host recovers, the block automatically recovers to either ROut or RCas.
4	Shed to Auto, no return	When a fault occurs in the host, the block sheds to auto mode, and when the host recovers, the block does not automatically recover.
5	Shed to Manual, normal return	When a fault occurs in the host, the block sheds to manual mode, and when the host recovers, the block automatically recovers to either ROUT or RCAS.
6	Shed to Manual, no return	When a fault occurs in the host, the block sheds to manual mode, and when the host recovers, the block does not automatically recover.
7	Shed to Retained target, normal return	When a fault occurs in the host, the block sheds to the mode it was in immediately prior to switching to Rout or Rcas, and when the host recovers, the block automatically recovers to either ROut or RCas.
8	Shed to Retained target, no return	When a fault occurs in the host, the block sheds to the mode it was in immediately prior to switching to Rout or Rcas, and when the host recovers, the block does not automatically recover.

CONTROL_OPTS Parameter

Bit	Function	Description (When set to 1: True)	PID
0	Bypass Enable	Enables the control function block bypass function.	✔
1	SP-PV Track in Man	SP tracks PV when the function block mode (target value) is manual.	✔
2	SP-PV Track in ROut	SP tracks PV when the function block mode (target value) is ROut.	✔
3	SP-PV Track in LO or IMan	SP tracks PV when the function block mode (actual value) is LO (local override) or Iman (initialization manual).	✔
4	SP Track in retained target	Specifies the function that tracks according to the MODE (Target) that retains SP when the function block MODE (Actual) is IMan, LO, Man, or ROut. The object of the value retained here in the MODE (Target) will be either RCas or Cas. This specification takes priority over the above SP-PV tracking function specifications.	✔
5	Direct Acting	Performs direct acting (the output increases when PV increases) control.	✔
6	Reserved	Unused.	
7	Track Enable	Enables the external feedback optional function. That is, when this parameter is true, under conditions where the TRK_IN_D parameter is ON and the mode is not manual, the TRK_VAL is output to the OUT parameter. At this time, the value of MODE (Actual) will be LO.	✔
8	Track in Manual	When the external feedback optional function is enabled, under conditions where the TRK_IN_D parameter is ON and the mode is manual, the TRK_VAL is output to the OUT parameter. Similarly, the value of MODE (Actual) will be LO.	✔
9	Use PV for BKCAL_OUT	When this control function block is operating in the Cas or RCas mode, it outputs PV for the BKCAL_OUT and RCAS_OUT outputs, which are output parameters for initialization for the higher level block. When this bit is set to False, the SP value is output.	✔
10	Act on IR (Unused in PID blocks)	Adjusts SP to be within the setpoint limit range and stops the valve on initialization request recovery on an initialization request for a calculation initialization input that is input to BKCAL_IN. If the result of the reverse calculation for the SP that will stop the valve falls outside the setpoint limit range, this adjustment will be performed according to BAL_TIME set time. This parameter is valid for PD and ratio operation.	
11	Use BKCAL_OUT with IN_1	Normally, the object parameter that is initialized and output to the upstream side of the cascade connection with BKCAL_OUT is input to the downstream block CAS_IN. However, depending on the type of the control block, e.g. for ratio or bias/gain blocks, there are cases where the parameter connected to IN_1 is the object of that. In such cases, set this bit to True.	
12	Obey SP limits if Cas or RCas	Makes the setpoint limits valid in Cas and RCas modes as well. When this bit is False, the SP limit is only valid in auto and manual modes.	✔
13	No OUT limits in Manual	Makes the OUT_HI_LIM and OUT_LO_LIM limits invalid in manual mode.	✔
14	Reserved	Unused.	
15	Reserved	Unused	

STATUS_OPTS Parameter

Bit	Function	Description (When set to 1: True)	AI	AO	PID
0	IFS if BAD IN	Turns on the OUT parameter fault status (and starts fault status processing) if the IN parameter status is BAD.			✔
1	IFS if BAD CAS_IN	Turns on the OUT parameter fault status (and starts fault status processing) if the CAS_IN parameter status is BAD.			✔
2	Use Uncertain as Good	Sees the IN parameter status as GOOD when that status is actually Uncertain. (When this bit is false, the uncertain status is handled as though it were a BAD status.)			✔
3	Propagate Fault Forward	This is an option that causes the block to not issue an alarm but rather to propagate the fault to the down-stream function block for fault states such as sensor input errors, sensor faults, and faults in the field device itself. For example, in a system where the control loop is formed from only field devices and the assumption is that faults will be reported with, for example, block alarms, this function can be effective in cases where the AI blocks will be used as structural elements in the control loop and alarms will be reported through downstream PID blocks.	✔		
4	Propagate Fault Backward	This function is similar to the above, but here, actuator errors and LO mode and other alarms are reported through upstream blocks.		✔	
5	Target to Manual if BAD IN	Locks the block in manual mode if the status of the IN parameter is BAD.			✔
6	Uncertain if Limited	Sets the OUT parameter status to Uncertain of a range is exceeded by an input parameter or an intermediate value in a calculation.	✔		
7	BAD if Limited	Sets the OUT parameter status to BAD of a range is exceeded by an input parameter or an intermediate value in a calculation.	✔		
8	Uncertain in Man mode	Sets the status of the OUT parameter to Uncertain if the MODE (Actual) is Manual.	✔		
9	Target to next permitted mode if BAD CAS_IN	Automatically transitions to the next permitted mode that has priority if the status of CAS_IN goes to BAD during control in Cas mode. Mode transition permissions can be set for each function block using the MODE (Permitted) parameter.			✔
10	Reserved	Unused			
11	Reserved	Unused			
12	Reserved	Unused			
13	Reserved	Unused			
14	Reserved	Unused			
15	Reserved	Unused			

IO_OPTS Parameter

Bit	Function	Description (When set to 1: True)	AI	AO
0	Invert	Inverts I/O in digital I/O blocks		
1	SP-PV Track in Man	SP tracks PV when the output block MODE (Target) is manual.		✔
2	Reserved	Unused		
3	SP-PV Track in LO	SP tracks PV when the output block MODE (Target) is LO.		✔
4	SP Track retained target	Specifies the function for tracking according to the MODE (Target) in which SP is retained when the function block MODE (Actual) is either LO or Man. The object values retained by MODE (Target) here are RCas or Cas. This specification takes priority over any of the previously mentioned SP-PV tracking functions.		✔
5	Increase to close	Specifies reverse specification of the display of analog outputs. (When the displayed output increases, the actual output will decrease.)		✔
6	Fault State to value	Determines the output operation when a fault state occurs. (0: Last value hold, 1: preset value) The AO function block FSTATE_VAL parameter is used to set the preset value.		✔
7	Use Fault State value on restart	The device uses the FSTATE_VAL as the initial output value on restart. When this parameter is set to 0:False, the device restarts control from the final output value stored in nonvolatile memory.		✔
8	Target to Man if Fault State activated	Locks the mode to manual when a fault state occurs.		✔
9	Use PV for BKCAL_OUT	When this output block is operating in Cas mode, it outputs the PV value to the BKCAL_OUT output, which is the initialization output parameter to the higher level block. When set to 0:False, the SP value is output		✔
10	Low cutoff	Enables the AI block low cutoff (constant flow cutoff) function.	✔	
11	Reserved	Unused		
12	Reserved	Unused		
13	Reserved	Unused		
14	Reserved	Unused		
15	Reserved	Unused		

UNIT_INDEX Parameter

The Fieldbus Foundation has determined descriptors and their indices (identification numbers) for the engineering units specified for each parameter. Since there are a large number of these, we have omitted them from this document. Use the specification method stipulated by the configuration tool you are using to specify these units.

Capability File

```
//---------------------------------------------------------------------//
//          Capabilities File of AVP303/203                                                    //
//                                                                                             //
//          History   : Rev.01  02/05/23   initial issue                                       //
//                                                                                             //
//          Copyright 2002 Yamatake Co., Ltd. all rights reserved.                             //
//---------------------------------------------------------------------//

//=====================================================================
// File Header
//=====================================================================
[File Header]
Description ="This is a Capabilities File of the AVP"
FileType    = CapabilitiesFile
FileDate    = 2002,05,23              // 23 May, 2002
CffVersion  = 1,5                     // FF-103-FS1.5
//=====================================================================
// Device Header
//=====================================================================
[Device Header]
DeviceName  = "AVP"
DeviceClass = BASIC                   // The device Class: BASIC

// The following 3 parameters describe the Communication Profile
// A device may exist within several classes in the same group.

CommGroup    = 3
CommClass    = Class31
CommSubClass  = Class3Publisher+Class3Subscriber

[Device VFD 1]          // Management VFD
VendorName    = "Yamatake Corporation"
ModelName     = "AVP"                                   //
Revision      = "Rev.0.01"                              //
//DeviceClass   = BASIC                                 // The device Class: BASIC
VersionOD     = 0x01
ProfileNumber = 0x4d47

[Device VFD 2]          // FB VFD
VendorName    = "Yamatake Corporation"
ModelName     = "AVP"                                   //
Revision      = "Rev.0.01"                              //
VersionOD     = 0x01
ProfileNumber = 0x0000

//=====================================================================
// NM section
//=====================================================================
[NM OD Directory]
DirectoryRevisionNumber                 = 1
NumberOfDirectoryObjects                = 1
TotalNumberOfDirectoryEntries           = 9
DirectoryIndexOfFirstCompositeListReference   = 21
```

```
NumberOfCompositeListReferences                 = 1
StackMgtOdIndex                                 = 1400
NumberOfObjectsInStackManagement                = 1
VcrListOdIndex                                  = 1500
NumberOfObjectsInVcrList                        = 18
DlmeBasicOdIndex                                = 1900
NumberOfObjectsInDllBasic                       = 3
DlmeLinkMasterOdIndex                           = 0
NumberOfObjectsInDllLme                         = 0
LinkScheduleListOdIndex                         = 0
NumberOfObjectsInDllLinkSchedule                = 0
DlmeBridgeOdIndex                               = 0
NumberOfObjectsInDllBridge                      = 0
PlmeBasicOdIndex                                = 2200
NumberOfObjectsInPhyLme                         = 3
ListOfMmeReferences                             = 23
NumberOfMmeComposites                           = 1
MmeComposit1                                    = 2300
NumberOfObjectsMmeComposite1                    = 1

//=========================================================================
// NM Restrictions
//=========================================================================
[NM Restrictions]

//-------------------------------------------------------------------------
// Basic Info
//-------------------------------------------------------------------------
MaximumResponseDelaySlotTime   = 20              // V (MRD) * V (SlotTime)
MinimumInterPduDelay           = 10              // V (MID)
SlotTime  = 5
//-------------------------------------------------------------------------
// Basic Characteristics
//-------------------------------------------------------------------------
Version = 1
BasicStatisticsSupportedFlag = TRUE
DlOperatFunctionalClass      = BASIC
DlDeviceConformance          = 0x00000000
//-------------------------------------------------------------------------
// Stack Capabilities
//-------------------------------------------------------------------------
FasArTypesAndRolesSupported    = QUB_SERVER+QUU_SOURCE+BNU_PUBLISHER+BNU_SUBSCRIBER
MaxDlsapAddressSupported       = 15
MaxDlcepAddressSupported       = 16
DlcepDeliveryFeaturesSupported                                                  =
S_ORDERED+S_UNORDERED+R_DISORDERED+R_ORDERED+R_UNORDERED
VersionOfNmSpecSupported       = 0x0104
AgentFunctionsSupported                                                         =
LAS_SCHEDULES_SUPPORTED+INDIVIDUAL_VCR_ENTRY_DOWNLOADABLE+LAS_SCHEDULE_DOWNL
OADABLE+VCR_LIST_DOWNLOADABLE
FmsFeaturesSupported                                                            =
INFO_REPORT+EVENT,GET_OD+UPLOAD+READ+WRITE+INFO_REPORT+ACK_EVENT+GEN_DOWNLOA
D
//-------------------------------------------------------------------------
// VCR Capabilities
```

```
//---------------------------------------------------------------------

// The number of VCRs in the device including a permanent SM VCR

MaxEntries = 16

// The Number of Totally Permanent and Partially Configurable VCRs
// MaxEntries ? NumPermanentEntries  = Number of Fully Configurable VCRs.

NumPermanentEntries   = 1
DynamicsSupportedFlag = TRUE
StatisticsSupported   = 0x07

MaximumNumberOfClientVcrs     = 0
MaximumNumberOfServerVcrs     = 15
MaximumNumberOfSourceVcrs     = 15
MaximumNumberOfSinkVcrs       = 0
MaximumNumberOfSubscriberVcrs = 15
MaximumNumberOfPublisherVcrs  = 15

//---------------------------------------------------------------------
// Physical Layer
//---------------------------------------------------------------------
PowerRequired             = 20                    // in milliamps
ChannelStatisticsSupported  = 0x01
MediumAndDataRatesSupported = 0x4900000000000000                                                    //
WIRE_MEDIUM+VOLTAGE_MODE+SPEED_31KBS
IecVersion                = 0x0001       // 31.25 half duplex
NumberOfChannels          = 1
PowerMode                 = BUS_POWERED
InterfaceMode             = HALF_DUPLEX

//-------------------------------------------------------------------------------
// Partially configurable and fully configurable VCRs may be further restricted.
//-------------------------------------------------------------------------------
[Server Restrictions]
FmsMaxOutstandingServicesCalling  = 0
FmsMaxOutstandingServicesCalled   = 1

[NM VCR Usage 1]
// This section describes the actual configuration for the permanent or the not fully configurable VCRs.
// If a VCR Static Entry attribute is not entered, then that attribute is fully configurable using
// the constraints found in Restriction sections.

// For partially configurable VCRs, the host configuration device must remember which attributes of
// the VCR are configurable.

// The fully configurable VCRs are not listed here.

//Permanent Management VCR
FasArTypeAndRole              = NOBYPASS+QUB+SERVER
FasDllLocalAddr               = 0xF8
FasDllConfiguredRemoteAddr    = FREE
FasDllSDAP                    = NONSCHEDULED+DISORDERED+AUTH_SOURCE+TIMEAVAILABLE
FasDllMaxConfirmDelayOnConnect    = 60000
```

```
FasDllMaxConfirmDelayOnData       = 60000
FasDllMaxDlsduSize                = 128
FasDllResidualActivitySupported   = RESIDUAL
FasDllTimelinessClass             = NONE+NODUPLICATION+NONE
FasDllPublisherTimeWindowSize     = 0
FasDllPublisherSynchronizingDlcep = 0
FasDllSubscriberTimeWindowSize    = 0
FasDllSubscriberSynchronizingDlcep = 0
FmsVfdID                          = 1
FmsMaxOutstandingServicesCalling  = 0
FmsMaxOutstandingServicesCalled   = 1
FmsFeaturesSupported              = NONE, GET_OD+UPLOAD+READ+WRITE+GEN_DOWNLOAD

// An example of partially configurable Server VCR
// Missing attributes are fully configurable within the limits of the VCR Restrictions sections.

//[NM VCR Usage 2]
//FasArTypeAndRole  = QUB+SERVER+NOBYPASS
// A partially configurable SOURCE VCR
// Missing attributes are fully configurable within the limits of the VCR Restrictions sections.

//[NM VCR Usage 3]
//FasArTypeAndRole  = QUU+SOURCE+NOBYPASS

// Other VCRs are fully configurable.

//============================================================================
// SM section
//============================================================================
[SM OD Directory]
DirectoryRevisionNumber                 = 1
NumberOfDirectoryObjects                = 1
TotalNumberOfDirectoryEntries           = 5
DirectoryIndexOfFirstCompositeListReference = 0
NumberOfCompositeListReference          = 0
SmAgentStartingOdIndex                  = 600
NumberOfSmAgentObjects                  = 4
SyncAndSchedulingStartingOdIndex        = 700
NumberOfSyncAndSchedulingObjects        = 8
AddressAssignmentStartingOdIndex        = 800
NumberOfAddressAssignmentObjects        = 3
VfdListStartingOdIndex                  = 900
NumberOfVfdListObjects                  = 2
FbScheduleStartingOdIndex               = 1000
NumberOfFbScheduleObjects               = 9

[SM VFD 1]
VFD_REF = 0x1
VFD_TAG = "MG_VFD"

[SM VFD 2]
VFD_REF  = 0x2
VFD_TAG  = "FB_VFD"

[SM Capability]
```

```
Sm_Support = SET_PDTAG_AGENT+SET_ADDR_AGENT+CLR_ADDR_AGENT+IDENTIFY_AGENT+\
        LOC_FB_AGENT+FMS_SERVER+TIME_SLAVE+SCHEDULE_FB

//=============================================================================
// Application section
//=============================================================================
[VFD 2 OD Directory]
DirectoryRevisionNumber                     = 1
NumberOfDirectoryObjects                    = 1
TotalNumberOfDirectoryEntries               = 14                    // 8+(number of blocks)
DirectoryIndexOfFirstCompositeListReference  = 17
NumberOfCompositeListReference               = 3
OdIndexForStartingActionObject               = 0
NumberOfActionObjects                       = 0
OdIndexOfTheStartingLinkObjectInTheVfd      = 700
NumberOfLinkObjectsInTheVfd                  = 10
OdIndexOfTheStartingAlertObjectInTheVfd      = 800
NumberOfAlertObjectsInTheVfd                = 3
OdIndexOfTheStartingTrendObjectInTheVfd     = 900
NumberOfTrendObjectsInTheVfd                = 3
OdIndexOfTheStartingDomainObjectInTheVfd    = 0
NumberOfDomainObjectsInTheVfd                = 0
DirectoryIndexForTheResourceBlock           = 23
NumberOfResourceBlocksInTheVfd              = 1
DirectoryIndexForTheFirstTransducerBlockPointer = 25
NumberOfTransducerBlocksInTheVfd            = 1
DirectoryIndexForTheFirstFunctionBlockPointer = 27
NumberOfFunctionBlocksInTheVfd              = 4
MaximumNumberOfLinkagObjects                = 10
MaximumNumberOfTrendObjects                 = 3
MaximumNumberOfDomainObjects                = 0

[VFD 2 Channels]
Channel1  = "Position Set Point Value"

[VFD 2 Resource Block]
Block_Type      = RESOURCE
Block_Index     = 1000
DD_Item         = 0x80020AF0
Profile         = 0x0133
Profile_Revision = 0x0101
Num_Of_Parms    = 44
Views_Index     = 6001
Number_View_3   = 1
Number_View_4   = 1

[VFD 2 Resource Block Defaults]
ST_REV=0
TAG_DESC=0x2020202020202020202020202020202020202020202020202020202020202020
STRATEGY=0
ALERT_KEY=0
MODE_BLK=0x01,0x01,0x11,0x10
BLOCK_ERR=0x0000
RS_STATE=0
TEST_RW=0,0,0,0,0,0,0,0,"",0x2020202020202020202020202020202020202020202020202020202020202020,0x0000
```

```
0000000000,0x000000000000,0x000000000000,0x0000,0x0000000000000000
DD_RESOURCE=""
MANUFAC_ID=0x0dfc96
DEV_TYPE=0x0203                                    // AVP303
DEV_REV=0x01
DD_REV=0x02
GRANT_DENY=0x00,0x00
HARD_TYPES=0x4000
RESTART=0
FEATURES=0xf500
FEATURE_SEL=0x0000
CYCLE_TYPE=0x8000
CYCLE_SEL=0x0000
MIN_CYCLE_T=4000
MEMORY_SIZE=0
NV_CYCLE_T=0
FREE_SPACE=0
FREE_TIME=0
SHED_RCAS=640000
SHED_ROUT=640000
FAULT_STATE=1
SET_FSTATE=1
CLR_FSTATE=1
MAX_NOTIFY=3
LIN_NOTIFY=3
CONFIRM_TIME=640000
WRITE_LOCK=1
//UPDATE_EVT=0,0,0,0,0
//BLOCK_ALM=0,0,0,0,0
ALARM_SUM=0x0100,0x0000,0x0000,0x0000
ACK_OPTION=0x0000
WRITE_PRI=0
WRITE_ALM=0,0,0x0000000000000000,0,0
ITK_VER=4
//SOFTWARE_REV=0x00000000
SIM_ACTIVE_SW=0

[VFD 2 Function Block 1]
Block_Type      = AO
Block_Index     = 1200
DD_Item         = 0x800201F0
Profile         = 0x0102                //standard AO block
Profile_Revision = 0x0001
Execution_Time  = 2400
Num_Of_Parms    = 31
Views_Index     = 6201
Number_View_3   = 1
Number_View_4   = 1

[VFD 2 Function Block 1 Defaults]
ST_REV=0
TAG_DESC=0x2020202020202020202020202020202020202020202020202020202020202020
STRATEGY=0
ALERT_KEY=0
MODE_BLK=0x01,0x01,0x79,0x30
```

BLOCK_ERR=0x0000
PV=28,0
SP=28,0
OUT=28,0
SIMULATE=0,0,0,0,1
PV_SCALE=100,0,1342,1
XD_SCALE=100,0,1342,1
GRANT_DENY=0x00,0x00
IO_OPTS=0x0000
STATUS_OPTS=0x0000
READBACK=28,0
CAS_IN=28,0
SP_RATE_DN=+INF
SP_RATE_UP=+INF
SP_HI_LIM=100
SP_LO_LIM=0
CHANNEL=1
FSTATE_TIME=0
FSTATE_VAL=0
BKCAL_OUT=28,0
RCAS_IN=0,0
SHED_OPT=0
RCAS_OUT=0,0
//UPDATE_EVT=0,0,0,0,0
//BLOCK_ALM=0,0,0,0,0

[VFD 2 Function Block 2]
Block_Type = PID
Block_Index = 1300
DD_Item = 0x800202B0
Profile = 0x0108 //standard PID block
Profile_Revision = 0x0001
Execution_Time = 4000
Num_Of_Parms = 66
Views_Index = 6301
Number_View_3 = 1
Number_View_4 = 1

[VFD 2 Function Block 2 Defaults]
ST_REV=0
TAG_DESC=0x2020202020202020202020202020202020202020202020202020202020202020
STRATEGY=0
ALERT_KEY=0
MODE_BLK=0x01,0x01,0xF9,0x10
BLOCK_ERR=0x0000
PV=28,0
SP=28,0
OUT=28,0
PV_SCALE=100,0,1342,1
OUT_SCALE=100,0,1342,1
GRANT_DENY=0x00,0x00
CONTROL_OPTS=0x0000
STATUS_OPTS=0x0000
IN=28,0
PV_FTIME=0

BYPASS=0
CAS_IN=28,0
SP_RATE_DN=+INF
SP_RATE_UP=+INF
SP_HI_LIM=100
SP_LO_LIM=0
GAIN=0
RESET=+INF
BAL_TIME=0
RATE=0
BKCAL_IN=28,0
OUT_HI_LIM=100
OUT_LO_LIM=0
BKCAL_HYS=0.5
BKCAL_OUT=28,0
RCAS_IN=0,0
ROUT_IN=0,0
SHED_OPT=0
RCAS_OUT=0,0
ROUT_OUT=0,0
TRK_SCALE=100,0,1342,0
TRK_IN_D=28,0
TRK_VAL=28,0
FF_VAL=28,0
FF_SCALE=100,0,1342,0
FF_GAIN=0
//UPDATE_EVT=0,0,0,0,0
//BLOCK_ALM=0,0,0,0,0
ALARM_SUM=0x0100,0x0000,0x0000,0x0000
ACK_OPTION=0x0000
ALARM_HYS=0.5
HI_HI_PRI=0
HI_HI_LIM=+INF
HI_PRI=0
HI_LIM=+INF
LO_PRI=0
LO_LIM=-INF
LO_LO_PRI=0
LO_LO_LIM=-INF
DV_HI_PRI=0
DV_HI_LIM=+INF
DV_LO_PRI=0
DV_LO_LIM=-INF
//HI_HI_ALM=0,0,0,0,0
//HI_ALM=0,0,0,0,0
//LO_ALM=0,0,0,0,0
//LO_LO_ALM=0,0,0,0,0
//DV_HI_ALM=0,0,0,0,0
//DV_LO_ALM=0,0,0,0,0

[VFD 2 Function Block 3]
Block_Type = PID
Block_Index = 1400
DD_Item = 0x800202B0
Profile = 0x0108 //standard PID block

Profile_Revision = 0x0001
Execution_Time = 4000
Num_Of_Parms = 66
Views_Index = 6401
Number_View_3 = 1
Number_View_4 = 1

[VFD 2 Function Block 3 Defaults]
ST_REV=0
TAG_DESC=0x2020202020202020202020202020202020202020202020202020202020202020
STRATEGY=0
ALERT_KEY=0
MODE_BLK=0x01,0x01,0xF9,0x10
BLOCK_ERR=0x0000
PV=28,0
SP=28,0
OUT=28,0
PV_SCALE=100,0,1342,1
OUT_SCALE=100,0,1342,1
GRANT_DENY=0x00,0x00
CONTROL_OPTS=0x0000
STATUS_OPTS=0x0000
IN=28,0
PV_FTIME=0
BYPASS=0
CAS_IN=28,0
SP_RATE_DN=+INF
SP_RATE_UP=+INF
SP_HI_LIM=100
SP_LO_LIM=0
GAIN=0
RESET=+INF
BAL_TIME=0
RATE=0
BKCAL_IN=28,0
OUT_HI_LIM=100
OUT_LO_LIM=0
BKCAL_HYS=0.5
BKCAL_OUT=28,0
RCAS_IN=0,0
ROUT_IN=0,0
SHED_OPT=0
RCAS_OUT=0,0
ROUT_OUT=0,0
TRK_SCALE=100,0,1342,0
TRK_IN_D=28,0
TRK_VAL=28,0
FF_VAL=28,0
FF_SCALE=100,0,1342,0
FF_GAIN=0
//UPDATE_EVT=0,0,0,0,0
//BLOCK_ALM=0,0,0,0,0
ALARM_SUM=0x0100,0x0000,0x0000,0x0000
ACK_OPTION=0x0000
ALARM_HYS=0.5

HI_HI_PRI=0
HI_HI_LIM=+INF
HI_PRI=0
HI_LIM=+INF
LO_PRI=0
LO_LIM=-INF
LO_LO_PRI=0
LO_LO_LIM=-INF
DV_HI_PRI=0
DV_HI_LIM=+INF
DV_LO_PRI=0
DV_LO_LIM=-INF
//HI_HI_ALM=0,0,0,0,0
//HI_ALM=0,0,0,0,0
//LO_ALM=0,0,0,0,0
//LO_LO_ALM=0,0,0,0,0
//DV_HI_ALM=0,0,0,0,0
//DV_LO_ALM=0,0,0,0,0

[VFD 2 Function Block 4]
Block_Type = DIAG
Block_Index = 1500
DD_Item = 0x00020035
Profile = 0x8003 //custom DIAG block
Profile_Revision = 0x0001
Execution_Time = 6400 //TBD
Num_Of_Parms = 34
Views_Index = 6501
Number_View_3 = 1
Number_View_4 = 1

[VFD 2 Function Block 4 Defaults]
ST_REV=0
TAG_DESC=0x2020202020202020202020202020202020202020202020202020202020202020
STRATEGY=0
ALERT_KEY=0
MODE_BLK=0x01,0x01,0x11,0x10
BLOCK_ERR=0x0000
DEVICE_STATUS=0x00000000
MEASUREMENT_STATUS=0x00000000
OPERATING_TIME=0
FINAL_VALUE=28,0
FINAL_POSITION_VALUE=28,0
ELECT_TEMP=0
EPM_DUTY=0
STICK_SLIP_N=1000
STICK_SLIP_XY=0,0
FLOW_FORCE_N=1000
FLOW_FORCE_XY=0,0
AUTO_SETUP_SPEED=0
AUTO_SETUP_ERROR=0
TOTAL_STROKE=0
TOTAL_STROKE_DEADBAND=0.5
CUTOFF_LO_COUNT=0
TRAVEL_RATE_VALUE=0,10,20,30,40,50,60,70,80,90,100,110,120,130,140,150

TRAVEL_RATE_RATIO=0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
MAX_SPEED_P=0
MAX_SPEED_M=0
LIMIT_CYCLE_HI=+INF
LIMIT_CYCLE_LO=-INF
SHUT_ERR_TIME=+INF
SHUT_ERR_P=+INF
SHUT_ERR_M=-INF
VALVE_DIAG_STATUS=0x00000000

// Transducer Block. This is always manufacturer-specific.

[VFD 2 Transducer Block 1]
Block_Type = TRANSDUCER
Block_Index = 1100
DD_Item = 0x00020003 // AOTB
Profile = 0x8004
Profile_Revision = 0x0001
Num_Of_Parms = 53
Views_Index = 6101
Number_View_3 = 2
Number_View_4 = 3

[VFD 2 Transducer Block 1 Defaults]
ST_REV=0
TAG_DESC=0x2020202020202020202020202020202020202020202020202020202020202020
STRATEGY=0
ALERT_KEY=0
MODE_BLK=0x01,0x01,0x11,0x10
BLOCK_ERR=0x0000
//UPDATE_EVT=0,0,0,0,0
//BLOCK_ALM=0,0,0,0,0
TRANSDUCER_DIRECTORY=1,1110
TRANSDUCER_TYPE=65535
XD_ERROR=0
CORRECTION_DIRECTORY=1,13,0
FINAL_VALUE=28,0
FINAL_VALUE_RANGE=100,0,1342,1
FINAL_VALUE_CUTOFF_HI=109.0
FINAL_VALUE_CUTOFF_LO=0.5
FINAL_POSITION_VALUE=28,0
SERVO_GAIN=1.2
SERVO_RESET=4.0
SERVO_RATE=0.5
ACT_FAIL_ACTION=0
ACT_MAN_ID=0
ACT_MODEL_NUM=0x00000000000000000000000000000000000000000000000000000000000000000000000000000000
ACT_SN=0x00000000000000000000000000000000000000000000000000000000000000000000000000000000
VALVE_MAN_ID=0
VALVE_MODEL_NUM=0x00000000000000000000000000000000000000000000000000000000000000000000000000000000
VALVE_SN=0x00000000000000000000000000000000000000000000000000000000000000000000000000000000
VALVE_TYPE=0
XD_CAL_LOC=0x00000000000000000000000000000000000000000000000000000000000000000000000000000000
XD_CAL_DATE=0x00000000000000
XD_CAL_WHO=0x00000000000000000000000000000000000000000000000000000000000000000000000000000000

CAL_CMD=0,0
CAL_STATUS=0
MEASUREMENT_STATUS=0x00000000
ELECT_TEMP=0
POSITIONER_ID=0x2020202020202020
SCRATCH_PAD=0x20202020202020202020202020202020202020202020202020202020202020202020202020202020
PACKING_TYPE=0
ACTUATOR_SIZE=1
POSITIONER_ACTION=0
ACTUATOR_ACTION=1
POSITIONER_TYPE=0
VALVE_ACTION=0
VALVE_MOTION=0
FLOW_CHARACTERISTIC=0
CAL_OPEN=60.001
CAL_SHUT=-60.001
CONVERSION_INPUT=0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
CONVERSION_OUTPUT=0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
VTD_DEGREE=0

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