



Smart Pump Range

xylem

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1 Introduction and Safety

1.1 Purpose of this manual

This manual shows and discusses the BACnet® addresses implemented in Smart Pump Range products.

The managed data consist of:

- Parameters: read & write, used to set modes, activate functions and write on the drive
- Information: read only, to acquire values from the drive.



CAUTION:

Before using the unit make, sure to read and fully understand the Smart Pump Range Use and Maintenance Manual.

1.2 Acronyms

MIN	Minimum
MAX	Maximum
DEF	Default
R	Read only
R/W	Read & Write
UM	Unit of measurement
LSW/MSW	Least Significant Word / Most Significant Word
MS/TP	Master-slave token passing
N.A.	Not accessible through the user interface

2 Protocol Implementation Conformance Statement (PICS)

2.1 BACnet Protocol Implementation Conformance Statement

Date	23 February 2018
Vendor name	Lowara PUMP
Product name	SMART PUMP RANGE
Product model number	SMART PUMP RANGE
Application software version	101 open loop, 151 close loop
Firmware revision	07 open loop, 01 close loop
BACnet® protocol version	1

2.2 BACnet® standard device profile (Annex L)

<input type="checkbox"/>	BACnet® Advanced Workstation	(B-AWS)
<input type="checkbox"/>	BACnet® Operator Workstation	(B-OWS)
<input type="checkbox"/>	BACnet® Operator Display	(B-OD)
<input type="checkbox"/>	BACnet® Building Controller	(B-BC)
<input type="checkbox"/>	BACnet® Advanced Application Controller	(B-AAC)
<input type="checkbox"/>	BACnet® Application Specific Controller	(B-ASC)
<input type="checkbox"/>	BACnet® Smart Sensor	(B-SS)
<input checked="" type="checkbox"/>	BACnet® Smart Actuator	(B-SA)

2.3 BACnet® interoperability blocks (Annex K)

2.3.1 Data exchange

<input type="checkbox"/>	Data Sharing - Read Property-A	DS-RP-A
<input checked="" type="checkbox"/>	Data Sharing - Read Property-B	DS-RP-B
<input type="checkbox"/>	Data Sharing - Read Property Multiple-A	DS-RPM-A
<input type="checkbox"/>	Data Sharing - Read Property Multiple-B	DS-RPM-B
<input type="checkbox"/>	Data Sharing - Write Property-A	DS-WP-A
<input checked="" type="checkbox"/>	Data Sharing - Write Property-B	DS-WP-B
<input type="checkbox"/>	Data Sharing - Write Property Multiple-A	DS-WPM-A
<input type="checkbox"/>	Data Sharing - Write Property Multiple-B	DS-WPM-B
<input type="checkbox"/>	Data Sharing - Change of Value-A	DS-COV-A
<input type="checkbox"/>	Data Sharing - Change of Value-B	DS-COV-B
<input type="checkbox"/>	Data Sharing - Change of Value Property-A	DS-COVP-A
<input type="checkbox"/>	Data Sharing - Change of Value Property-B	DS-COVP-B
<input type="checkbox"/>	Data Sharing - Change of Value Unsolicited-A	DS-COVU-A
<input type="checkbox"/>	Data Sharing - Change of Value Unsolicited-B	DS-COVU-B
<input type="checkbox"/>	Data Sharing - View-A	DS-V-A
<input type="checkbox"/>	Data Sharing - Advanced View-A	DS-AV-A
<input type="checkbox"/>	Data Sharing - Modify-A	DS-M-A
<input type="checkbox"/>	Data Sharing - Advanced Modify-A	DS-AM-A

2.3.2 Alarm and event management

Not present.

2.3.3 Scheduling and programming

Not present.

2.3.4 Capability of handling logs (trending)

Not present.

2.3.5 Network device management

<input type="checkbox"/>	Device Management - Dynamic Device Binding-A	DM-DDB-A
<input checked="" type="checkbox"/>	Device Management - Dynamic Device Binding-B	DM-DDB-B
<input type="checkbox"/>	Device Management - Dynamic Object Binding-A	DM-DOB-A
<input type="checkbox"/>	Device Management - Dynamic Object Binding-B	DM-DOB-B
<input type="checkbox"/>	Device Management - Device Communication Control-A	DM-DCC-A
<input type="checkbox"/>	Device Management - Device Communication Control -B	DM-DCC-B
<input type="checkbox"/>	Device Management - Private Transfer-A	DM-PT-A
<input type="checkbox"/>	Device Management - Private Transfer-B	DM-PT-B
<input type="checkbox"/>	Device Management - Text Message-A	DM-TM-A
<input type="checkbox"/>	Device Management - Text Message-B	DM-TM-B
<input type="checkbox"/>	Device Management - Time Synchronization-A	DM-TS-A
<input type="checkbox"/>	Device Management - Time Synchronization-B	DM-TS-B
<input type="checkbox"/>	Device Management - UTC Time Synchronization-A	DM-UTC-A
<input type="checkbox"/>	Device Management - UTC Time Synchronization-B	DM-UTC-B
<input type="checkbox"/>	Device Management - Reinitialize Device-A	DM-RD-A
<input type="checkbox"/>	Device Management - Reinitialize Device-B	DM-RD-B
<input type="checkbox"/>	Device Management - Backup and Restore-A	DM-BR-A
<input type="checkbox"/>	Device Management - Backup and Restore-B	DM-BR-B
<input type="checkbox"/>	Device Management - Restart-A	DM-R-A
<input type="checkbox"/>	Device Management - Restart-B	DM-R-B
<input type="checkbox"/>	Device Management - List Manipulation-A	DM-LM-A
<input type="checkbox"/>	Device Management - List Manipulation-B	DM-LM-B
<input type="checkbox"/>	Device Management - Object Creation and Deletion-A	DM-OCD-A
<input type="checkbox"/>	Device Management - Object Creation and Deletion-B	DM-OCD-B
<input type="checkbox"/>	Device Management - Virtual Terminal-A	DM-VT-A
<input type="checkbox"/>	Device Management - Virtual Terminal-B	DM-VT-B
<input type="checkbox"/>	Device Management - Automatic Network Mapping-A	DM-ANM-A
<input type="checkbox"/>	Device Management - Automatic Device Mapping-A	DM-ADM-A
<input type="checkbox"/>	Device Management - Automatic Time Synchronization-A	DM-ATS-A
<input type="checkbox"/>	Device Management - Manual Time Synchronization-A	DM-MTS-A

2.3.6 Network management

Not present.

2.4 Supported standard objects

Object	Supported	Created / deleted dynamically	Optional properties supported	Writing properties
Analog Input	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Description	
Analog Value	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Description	
Device	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Description, Max_Master, Max_Info_Frames	Object_Identifier

2.5 Segmentation capabilities

Not present.

2.6 Data link level

<input type="checkbox"/>	BACnet IP, (Annex J)	
<input type="checkbox"/>	BACnet IP, (Annex J), Foreign Device	
<input type="checkbox"/>	ISO 8802-3, Ethernet (Clause 7)	
<input type="checkbox"/>	ANSI/ATA 878.1, 2,5 Mb ARCNET (Clause 8)	
<input type="checkbox"/>	ANSI/ATA 878.1, 2,5 Mb ARCNET (Clause 8), baud rate(s)	
<input checked="" type="checkbox"/>	MS/TP master (Clause 9), baud rate(s)	4800 9600 14400 19200 38400 56000 57600
<input type="checkbox"/>	MS/TP slave (Clause 9), baud rate(s)	
<input type="checkbox"/>	Point-To-Point, EIA 232 (Clause 10), baud rate(s)	
<input type="checkbox"/>	Point-To-Point, modem (Clause 10), baud rate(s)	
<input type="checkbox"/>	LonTalk (Clause 11), medium	
<input type="checkbox"/>	Other	

2.7 Device Address Binding

Is static device binding supported? This is currently necessary for two-way communication with MS/TP slaves and certain other devices.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
--	------------------------------	--

2.8 Network options

Not present.

2.9 Network safety options

Not present.

2.10 Set of supported characters

Not present.

3 BACnet® Device e BACnet® Device Object Identifier

The Smart Pump Range unit is a BACnet® Device, as it supports digital communication through the BACnet® protocol.

Each BACnet® Device contains a Device Object. This is a standard object whose properties represent the characteristics that can be viewed from the outside.

Smart Pump Range units connected to the local MS/TP network are localised through:

- a Device Object Identifier, or
- a MAC address.

3.1 BACnet® Device Object Identifier

The factory set value is **84002**.

To change value, use the **Write Property** service in the **Object_Identifier** property of the **Device Object**, or the specific parameter available on the display. See the Smart Pump Range manual.

3.2 MAC address

The factory set value is **1**.

Check that each Smart Pump Range unit connected to the MS/TP network is identified with a different address. See the Smart Pump Range manual.

4 BACnet® data management

The data managed by Smart Pump Range can be accessed considering the BACnet® virtual memory, consisting of:

- Analog_Values [R/W]
- Analog_Inputs [R].

4.1 Analog_Values

Group of objects with Read & Write **Present_Value** property.

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object Identifier	Object_Name	Unit of measurement	Present_Value			Description
					MIN	MAX	DEF	
On display	On display	0	STOP START	-	0	1	0	Start/Stop command 0 = START 1 = STOP
P25	P25	1	CONTROL MODES	-	0	3	1	Control mode 0 = [ACT] 1 = [CPP/HCS] 2 = [PPP/MSE] 3 = [MSY]
On display	On display	2	RPM SETPOINT	rpm	min	max	Depending on the type of pump unit	Speed set in ACT mode
P41	P41	3	BAR PSI SELECT	-	0	1	0	Pressure Sensor Unit Of Measure 0 = [BAR] 1 = [PSI]
On display	On display	4	CONST HEAD S.P	bar/psi	0	Depending on the type of pump unit	Depending on the type of pump unit	Pressure setting for HCS/MSE/MSY/PPP
P42	P42	5	4_20 PROBE FS	bar/psi	0	25 bar / 363 psi	Depending on the type of pump unit	Full scale value for pressure sensor 1
P26	P26	6	ABS MAX RPM	rpm	ACT set	3600	Depending on the type of pump unit	Max RPM set
P27	P27	7	ABS MIN RPM	rpm	800	ACT set	Depending on the type of pump unit	Min. speed
N.A.	N.A.	8	LOG IDX SEL.	-	0	7	0	Datalog selection index
P68	P68	9	RESET DEFAULT	-	0	1	0	Default values reset 0 = [No] 1 = [Res]
P48	P48	10	LOW BEHAV	-	0	2	0	Lack water input 0 = [dis] 1 = [ALR] 2 = [err]

Menu Index e- HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object Identifier	Object_Name	Unit of measurement	Present_Value			Description
					MIN	MAX	DEF	
P22	P22	11	HMI PASSWORD	-	1	999	66	System password
P23	P23	12	HMI PAR LOCK	-	0	1	1	Parameter lock 0 = [OFF] 1 = [ON]
P69	P69	13	AVOID EEP SAV	-	0	1	0	Avoid Frequent Parameters Saving 0 = [no] 1 = [yes]
P65	P65	14	TST RUN START	h	0	100	100	Test Run - Start
P66	P66	15	TST RUN RPM	rpm	Min rpm	Max rpm	2000	Test Run - Speed
P67	P67	16	TST RUN TIME	s	0	180	10	Test Run - Duration
P04	P40	17	AUTOSTART	-	0	1	1	Automatic start for version e-HME, e-SVE, VME 0 = [OFF] 1 = [ON]
			SENSOR CONFIG.	-	0	2	1	Sensor selection for version LNEEE, LNESE 0 = [No sensor] 1 = [Two individual sensors] 2 = [One differential sensor]
P28	P43	18	RAMP 1	s	1	250	3	Ramp 1 for version e-HME, e-SVE, VME
			SCND PROBE FS	bar/psi	0	25 bar / 363 psi	Depending on the type of pump unit	Full scale value for pressure sensor 2 Version LNEEE, LNESE
P29	N.A.	19	RAMP 2	s	1	250	3	Ramp 2 for version e-HME, e-SVE, VME
			PROP HEAD S.P.	bar/psi	Depending on the type of pump unit	Depending on the type of pump unit	Depending on the type of pump unit	Proportional pressure setting for version LNEEE, LNESE
P30	N.A.	20	RAMP 3	s	1	999	35	Ramp 3 for version e-HME, e-SVE, VME

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object Identifier	Object Name	Unit of measurement	Present Value			Description
					MIN	MAX	DEF	
P31	N.A.	21	RAMP 4	s	1	999	35	Ramp 4 for version e-HME, e-SVE, VME
P32	N.A.	22	RAMP SMIN A	s	2	25	2	Acceleration ramp at startup for version e-HME, e-SVE, VME
P33	N.A.	23	RAMP SMIN D	s	2	25	2	Deceleration ramp at shutdown for version e-HME, e-SVE, VME
P34	N.A.	24	CONF SMIN	-	0	1	1	Minimum speed configuration for version e-HME, e-SVE, VME 0 = [STP] 1 = [SMI]
P35	N.A.	25	SMIN TIME	s	0	100	0	Minimum speed - Duration for version e-HME, e-SVE, VME
P36	N.A.	26	% RPM WINDOW	%	0	100	10	Adjustment window for version e-HME, e-SVE, VME
P37	N.A.	27	% RPM HYSTER	%	0	100	80	Adjustment hysteresis for version e-HME, e-SVE, VME
P03	N.A.	28	% RESTART VAL	%	0	100	100	Restart adjustment value for version e-HME, e-SVE, VME
P45	N.A.	29	MIN THRESH LIM	bar/psi	0	Max	0	Pressure minimum threshold for version e-HME, e-SVE, VME
P46	N.A.	30	TH LIM DELAY	s	1	100	2	Pressure minimum threshold - Delay Time for version e-HME, e-SVE, VME
P47	N.A.	31	TH LIM ERR RES	0	0	1	1	Pressure minimum threshold - Automatic error reset for version e-HME, e-SVE, VME 0 = [dis] 1 = [enb]
P57	N.A.	32	SWC OVER INTER	h	0	250	24	Multipump - Switch Interval for version e-HME, e-SVE, VME
P61	N.A.	33	SYNC RPM LIM	rpm	Min	3600	Depending on the type of pump unit	Multipump Synchronous - Shutdown speed for version e-HME, e-SVE, VME
P62	N.A.	34	SYNC WINDOW	rpm	0	1000	150	Multipump Synchronous - Window for version e-HME, e-SVE, VME
P58	N.A.	35	ACT VAL INC	bar/psi	0	25/363	0.35	Multipump - Actual Value Increase for version e-HME, e-SVE, VME

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object _Identifier	Object_Name	Unit of measure- ment	Present_Value			Description
					MIN	MAX	DEF	
P59	N.A.	36	ACT VAL DEC	bar/psi	0	25/363	0.15	Multipump - Actual Value Decrease for version e-HME, e-SVE, VME
P60	N.A.	37	ENABLE SPEED	rpm	0	Max	Depending on the type of pump unit	Multipump - Enable Speed for version e-HME, e-SVE, VME
P56	N.A.	38	MP MAX UNIT	-	1	3	3	Multipump - Max Units for version e-HME, e-SVE, VME
P38	N.A.	39	SPEED LIFT	rpm	0	3600	Min	Speed Lift for version e-HME, e-SVE, VME
P39	N.A.	40	LIFT AMOUNT	%	0	200	0	Lift Amount for version e-HME, e-SVE, VME

4.2 Analog_Inputs

Group of objects with Read Only **Present_Value** property.

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object _Identifier	Object_Name	Unit of measurement	Present_Value			Description
					MIN	MAX	DEF	
P16	P16	0	MEASURED RPM	rpm	-	-	-	Motor Speed
On display	On display	1	MEASURED HEAD	bar/psi	0	-	-	Current pressure
P14	P14	2	QUAD CURRENT	A	0	-	-	Inverter Current
P15	P15	3	GRID VOLTAGE	V	0	-	-	Inverter Voltage
N.A.	N.A.	4	INPUT POWER	W	0	-	-	Current power
N.A.	N.A.	5	W1 TEMP	°C	0	255	-	Temperature of winding 1
N.A.	N.A.	6	W2 TEMP	°C	0	255	-	Temperature of winding 2
N.A.	N.A.	7	W3 TEMP	°C	0	255	-	Temperature of winding 3
P13	P13	8	POWER MOD TEMP	°C	0	255	-	Power Module Temperature
On display	On display	9	ERROR CODE	-	-	-	-	Current error

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object Identifier	Object_Name	Unit of measurement	Present_Value			Description
					MIN	MAX	DEF	
N.A.	N.A.	10	ERROR B.F. MSW	-	0	65535	0	Error bitField MSW bit 0: E12 Both sensors faulty bit 1: E13 Pressure sensor configuration error bit 2: E30 Multi-pump protocol error bit 3: E14 Low pressure error bit 4: E31 Pressure sensor error 1 bit 5: E32 Pressure sensor error 2 bit 6: E15 Loss of phase error bit 7: E05 Motor selection error
N.A.	N.A.	11	ERROR B.F. LSW	-	0	65535	0	Error bitField LSW bit 0: E01 Internal communication error bit 1: E02 Motor overload error bit 2: E03 DC-bus overvoltage error bit 3: E04 Motor step loss bit 4: E05 EEPROM Data memory error bit 5: E06 Grid voltage error bit 6: E07 Motor winding temperature error bit 7: E08 Power module temperature error bit 8: E05 Corrupted factory data bit 9: E05 Corrupted memory password bit 10: E09 NTC probe overtemperature bit 11: E10 Dry run bit 12: E09 NTC probe error bit 13: E04 Locked rotor bit 14: E09 Motor not connected bit 15 = E11 Error LOW
On display	On display	12	ALARM CODE	-	-	-	0	Current alarm
N.A.	N.A.	13	ALARM 1 B.F.	-	0	65535	0	Alarm bitField LSW bit 0: A15 EEPROM write failure bit 1: Incomplete factory data bit 2: A03 Derating bit 3: Invalid eeprom parameter bit 4: A06 LOW alarm bit 5: A30 Multi-pump connection alarm bit 6: A31 Loss of multi-pump connection bit 7: A05 Data memory alarm bit 9: A12 Both sensors faulty

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object Identifier	Object_Name	Unit of measurement	Present_Value			Description
					MIN	MAX	DEF	
N.A.	N.A.	14	ALARM 2 B.F.	-	0	65535	0	Alarm bitField MSW bit 0: A20 Internal alarm bit 1: A20 Internal alarm bit 2: A20 Internal alarm bit 3: A20 Internal alarm bit 4: A20 Internal alarm bit 5: A20 Internal alarm bit 6: A20 Internal alarm
P05-P06	P05-P06	15	LIFE TIMER	s	-	-	-	Time of use
P07-P08	P07-P08	16	RUNNING TIMER	s	-	-	-	Motor time of use
N.A.	N.A.	17	LOG ACT ERR	-	-	-	-	Error code when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	18	LOG ERR STAT	s	-	-	-	Error start time when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	19	LOG ERR END T	s	-	-	-	Error end time when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	20	LOG ERR B.F.	-	-	-	-	Error bitField LSW when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	21	LOG ERR COUNT	-	-	-	-	Counter of how many times the error occurred when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	22	LOG RPM SET	rpm	-	-	-	RPM set when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	23	LOG RPM VALUE	rpm	-	-	-	RPM measured when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	24	LOG PHASE CURR	A	-	-	-	Phase current when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	25	LOG AL 1 B.F.	-	-	-	-	BitField alarms 1 when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	26	LOG AL 2 B.F.	-	-	-	-	BitField alarms 2 when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	27	LOG B.F. IO	-	-	-	-	BitField status I/O when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	28	LOG PWR	W	-	-	-	Power when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	29	N. A.	m	-	-	-	Zero
N.A.	N.A.	30	LOG H	bar/psi	-	-	-	Pressure when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	31	LOG PWR.M. T.	°C	-	-	-	Temperature of the power module when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	32	LOG STOP START	-	-	-	-	Value AV0 when AV8 (LOG IDX SEL.) takes a value from 0 to 7
N.A.	N.A.	33	RESERVED	-	-	-	-	Reserved

Menu Index e-HME, e-SVE, VME	Menu Index LNEEE, LNESE	Object _Identifier	Object_Name	Unit of measurement	Present_Value			Description
					MIN	MAX	DEF	
N.A.	N.A.	34	N. A.	-	-	-	-	Not used
N.A.	N.A.	35	N. A.	-	-	-	-	Not used
N.A.	N.A.	36	N. A.	-	-	-	-	Not used

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) A leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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