neptronic®

SKRO

Reverse Osmosis Water Treatment Unit

BACnet Communication Module User Guide

BACnet

Intertek

4011008

Contents

Introduction

The SKRO BACnet Communication Module User Guide provides information about using the water filtration unit with BACnet communications feature. The BACnet communication protocol for building automation and control networks enables communication between client devices within a network. The water filtration unit provides a BACnet network interface between BACnet client devices and Neptronic water filtration unit. It uses the BACnet Master Slave/Token Passing (MS/TP) protocol and BACnet IP at the BACnet MAC layer.

Pre-requisites

The BACnet communication user guide assumes that you are familiar with the concepts of BACnet and its terminology.

Advantages of BACnet

BACnet enabled units have the following advantages:

- *Quick Message Transmission.* The SKRO uses a synchronous implementation for BACnet messages making it quick and efficient. Each BACnet confirmed service request is answered as quickly as possible without using the **Reply Postponed** frame. The MS/TP implementation is performed within **Tusage_delay** of 15 minutes to ensure a **Tusage_timeout** value within 20 minutes.
- *MS/TP Support.* The SKRO supports a Full Master Node state machine for MS/TP. The Max_Master and the instances are configured to the device object through **BACnet WriteProperty** service or via the device's Programming Mode. The MAC address and the MS/TP baud rate setting of 9600, 19200, 38400, and 76800 are also set through the **BACnet Write Property** service or via the device's Programming Mode. In Programming mode, the device is configured through the device's keypad. For more information about the WriteProperty, refer to Table 3 - Object Types Supported.
- *BIBB Support*. The SKRO functions the same way as the B-ASC type profile server and supports the specific BIBB as per their relevant definitions.
    - DS-RP-B
    - DS-RPM-B
    - DS-WP-B
    - DS-WPM-B
    - DM-DCC-B
    - DM-DDB-B
    - DM-DOB-B
    - DM-RD-B
    - DM-TS-B
    - DM-UTC-B
    - DS-COV-B
    - DS-COVP-B
    - SCHED-WS-I-B
- *Object Support*. The SKRO supports a fixed list of BACnet visible values, which appear as Present_Values of various BACnet standard object types in addition to a device object. For more information, refer to Table 3 - Object Types Supported.
- *Alarms*. The SKRO supports indication of various alarm conditions through value changes in properties of several objects. However, it does not generate BACnet event notifications.

BACnet Properties Configuration

To establish communication on the network and guarantee a unique ID of devices in a BACnet system, the following properties may have to be configured.

Table 1 - BACnet Properties Configuration

Property	Default Value	Configuration
MAC Address	001	• Set to a unique address on the network between 000 and 254. • The value can be set manually via the menu. • The values from 128-254 represent MS/TP non-token passing slave devices.
Device Instance	Auto	• The SKRO automatically configures its device instance to 153,000 + MAC address. • The value can be set manually via the menu. • The value can be set manually through the **WriteProperty** service to **Device Object.Object_Identifier**. • The device's **Object_Identifier** is a combination of the **Device Object_Type** (8) and the **Device_Instance** (0-4194302), therefore its decimal or hexadecimal representation tends to be incomprehensible. • For example, the **Device_Instance**=1000 has an equivalent **Object_Identifier** of 0x020003E8 hexadecimal or 33555432 decimal.
Baud Rate	0 = Auto	• The SKRO configures its baud rate automatically by detecting the network upon connection. • The value can be set manually from the available values of (0) Auto, 9600, 19200, 38400, and 76800.
Max_Master	127	• Configure **Max_Master** value to increase network efficiency when there are less than 127 devices on the network. • The **Max_Master** value can be changed through the **WriteProperty** service to **Device Object.Max_Master**. For more information, refer to the MAC Address and Max_Master section.
Device Object.Object_Name	Name of the device	• Configure the name of the device through the **WriteProperty** service to **Device Object.Object_Name**. For example, SKRO.

Configuration Options

The following Configuration options enable you to configure and run the BACnet features of the SKRO quickly.

Quick Setup

Configure the SKRO for BACnet communication without programming.

1. Ensure that no other device on the network has a MAC address of 1 (the SKRO's default address).
2. Connect the SKRO to the network and power it up.
3. The SKRO automatically configures the baud rate and device instance allowing BACnet Property Configuration through the Write Property service. See Table 1 - BACnet Properties Configuration.
4. Repeat the steps for each SKRO.

Manual Setup

Configure the SKRO for BACnet communication using the SKRO controller, by using the following steps:

1. Press the Enter key.
2. Enter the Integration menu password: **5544**.
3. Select the Network or Communication sub-menus to set appropriate values.
4. Follow the instructions to configure the Device, BACnet Server, BACnet MSTP/IP and so on, manually.
5. Disconnect the power to the SKRO, connect the SKRO to the network, and connect the power again.

MAC Address and Max_Master

The MAC address must be unique on the entire MS/TP network. However, having a unique MAC address and a high baud rate does not guarantee efficient operation of the SKRO and other MS/TP units on the MS/TP network. Some MAC address and Max_Master combinations are more efficient than others. BACnet requires token-passing units to occasionally “poll” for other masters based on the MAC address and Max_Master.

A poor combination of MAC addresses and Max_Master can lead to a slower network due to lost time polling for masters that are not present. Unless there are 126 other units on the MS/TP network, the default Max_Master value of 127 is not the most efficient choice for the SKRO. The Max_Master default value of 127 was selected to ensure that any master, specifically a BACnet client can be found when the SKRO is initially started.

Examples of MAC Address and Max_Master Configurations

The following are some of the examples to indicate the optimum combination of MAC address and Max_Master configurations to ensure a quick and efficient output.

Example 1

- MAC=0. Max_Master=127
- MAC=1, Max_Master=127

This configuration is slow and inefficient because every time either unit is required to find another master unit, it must poll 126 units until it finds the right one to pass the token.

Example 2

- MAC=0. Max_Master=5
- MAC=1 to MAC=4 are not used
- MAC=5, Max_Master=5

This configuration is better than Example 1 but it is still not optimal. The Max_Master is set to the most efficient value but the gap between the two MAC addresses is high. Therefore, each unit must poll four units until it finds the right one to pass the token.

Example 3

- MAC=0, Max_Master=1
- MAC=2, Max_Master=2

This is an incorrect configuration. The MAC=0 will never find MAC=2 because it will never poll for the master MAC address=2.

Example 4

- MAC=0. Max_Master=3
- MAC=1, Max_Master=3
- MAC=2, Max_Master=3
- MAC=3, Max_Master=3

This is an efficient configuration as the units are numbered consecutively and the MAX_Master is set to the most efficient value. As a general guideline, the most efficient setup for an MS/TP network is one in which the units are consecutively numbered starting at MAC address 0 and having Max_Master=the maximum MAC address in the system. If consecutive numbering is not possible, then the next most efficient setup is one in which all units have Max_Master=the maximum MAC address in the system.

IP Port

For IP communication, a port number of **47808 (0xBAC0)** is used by default. Ensure that the BMS accesses the port with which the SKRO communicates. Generally, in situations with multiple networks, different ports may be used such as 47809 (0xBAC1) or 47810 (0xBAC2) to separate traffic.

Network Reset

Reset the SKRO via BACnet using the **Reinitialize Device** service. The Reinitialize Device service can be accessed using the following password: **nep.**
The Reinitialize Device service has two types of reset such as:

- *Warm Reset.* The Warm Reset changes the SKRO to its initial state.
- *Cold Reset.* The Cold Reset restarts the SKRO.

Device Object Properties

The following table lists all the BACnet properties supported for the device object. The W indicates that the property is writable using the BACnet **WriteProperty** service.

Table 2 - Device Object Properties

Property	Value	Writable
Object_Identifier	• Programmable where the instance part of the Object_Identifier is in the range of 0-4194302 • The device instance must be unique system-wide • The default value for the device instance= 153001 (Vendor_Identifier*1000 + MAC)	W
Object_Name	SKRO, programmable up to 32 Bytes	W
Description	Programmable up to 32 Bytes (default: SKRO Controller)	W
Object_Type	Device	
System_Status	Operational	
Vendor_Identifier	Always 153	
Vendor_Name	Always Neptronic	
Model_Name	Example, SKRO	
Firmware_Revision	2.12.202506139736	
Application_Software_Version	1.00.	
Protocol_Version	Always 1	
Protocol_Revision	Always 14	
DataBase_Revision	Default 0; incremented if Object Name, Object List and/or device ID change	
Max_APDU_Length_Accepted	Always 480	
Segmentation_Supported	(3) = No Segmentation	
APDU_Timeout	3,000	W
Number_of_APDU_Retries	Always 3	
Local_Time	00:00:00	W
Local_Date	01-Jan-2015 (Thu)	W
UtC_Offset	-300 minutes	W
Daylight_Savings_Status	False	W
Backup_Failure_Timeout	10	W
Configuration_Files	File-1 through File-17	
Protocol_Services_Supported	• confirmedCOVNotification • subscribeCOV • atomicReadFile • atomicWriteFile • readProperty • readPropertyMultiple • WriteProperty • writePropertyMultiple • deviceCommunicationControl • reinitializeDevice • i-Am • i-Have • unconfirmedCOVNotification • unconfirmedPrivateTransfer • timeSynchronization • who-Has • who-Is • utcTimeSynchronization • subscribeCOVProperty	
Protocol_Object_Types_Supported	• analog-input • analog-output • analog-value • binary-input • binary-output • binary-value • device • file • group • multi-state-input • multi-state-output • program • Schedule • multi-state-value • characterstring-value • date-value • datetime-value • positive-integer-value • time-value	
Object_List	88	
Device_Address_Binding	Depends on configuration	
Max_Master	Programmable in the range of 1 to 127 (default: 127)	W
Max_Info_Frames	Always 1	
Active_COV_Subscription	Empty by default. COV subscription will be lost on a power cycle.	
Property_List	List of properties that exist within the object.	

Object Types Supported

The following table lists all the BACnet properties supported for each object type. Most of the properties are locked. The exception is **Present_Value**, which represents the dynamic operating values of the device, and the Status_Flag, Event_State**,** and Reliability properties, which reflect the availability of the **Present_Value**. Unless otherwise specified, properties are not changeable.

Table 3 - Object Types Supported

Object Type	Enabled	Optional Properties Supported	Writable Properties	Notes
Note: Writable properties are different for some objects. Refer to the respective Object Table information to know the writable property for objects.				
Analog Input	☑	• Reliability • Description • Min_Present_Value • Max_Present_Value • Resolution • COV_Increment	• Out_of_Service • COV_Increment	If "Out_of_Service" is true, Present_Value becomes a writable property. Refer to Out_of_Service Property section on page 7 for more information.
Analog Value	☑	• Reliability • Description • Min_Present_Value • Max_Present_Value • Resolution • COV_Increment • Priority_Array • Relinquish_Default	• Present_Value • Out_of_Service • COV_Increment • Relinquish_Default	Refer to Out_of_Service Property section on page 7 for more information.
Analog Output	☑	• Description • Reliability • Min-Pres-Value • Max-Pres-Value • Resolution • COV_Increment	• Present_Value • COV_Increment • Out_of_Service • Relinquish_Default	
Binary Input	☑	• Reliability • Active_Text • Inactive_Text • Description	• Out_of_Service • Polarity	• If "Out_of_Service" is true, Present_Value becomes a writable property. Refer to Out_of_Service Property section on page 7 for more information.
Binary Value	☑	• Reliability • Active_Text • Inactive_Text • Description • Priority_Array • Relinquish_Default • Minimum_Off_Time • Minimum_On_Time	• Present_Value • Out_of_Service • Relinquish_Default • Minimum_Off_Time • Minimum_On_Time	Refer to Out_of_Service Property section on page 7 for more information.
Binary Output	☑	• Description • Reliability • Inactive-text • Active-text • Minimum_Off_Time • Minimum_On_Time	• Present_Value • Out_of_Service • Polarity • Relinquish_Default • Minimum_Off_Time • Minimum_On_Time	
Device	☑	• Max_Master • Max_Info_Frame • Description • active-COV-subscriptions • Local_Time • Local_Date • UTC_Offset • Daylight_Savings_Status • Backup_Failure_Timeout • Configuration_Files • Last_Restore_Time • Location • Serial_Number • Profile_Name	• Object_Identifier • Object_Name • Max_Master • Description • Local_Time • Local_Date • UTC_Offset • Daylight_Savings_Status • Apdu_Timeout • Backup_Failure_Timeout • Location	
File	☑	• Description	File_Size	Only 0 is the accepted value to be written to the file size.
Group	☐	• Description		
Multi-State Input	☐	• Description • Reliability • State_Text	• Out_of_Service	

Object Type	Enabled	Optional Properties Supported	Writable Properties	Notes
Multi-State Output	☐	• Description • Reliability • State_Text	• Present_Value • Out_of_Service • Relinquish_Default	
Program	☑	• Description • Reliability	• Program_Change • Out_of_Service	Only LOAD and RESTART are supported for program change. Use LOAD to apply the new firmware.
Schedule	☑	• Description • Weekly_Schedule	• Effective_Period • Schedule_Default • List_of_Object_Property _References • Priority_for_Writing • Out_of_Service • Weekly_Schedule	If Out_of_Service is True, Present_Value becomes writable.
Multi-State Value	☑	• Description • Reliability • States_Text • Priority_Array • Relinquish_Default	• Present_Value • Relinquish_Default • Out_of_Service	
Character String Value	☑	• Description	• Present_Value	
Date	☐	• Description • Reliability • Event_State • Out_of_Service	• Present_Value • Out_of_Service	
DateTime	☐	• Description • Reliability • Event_State • Out_of_Service	• Present_Value • Out_of_Service	
Positive-Integer Value	☐	• Description • Reliability • Event_State • Out_of_Service • Priority_Array • Relinquish_Default • Minimum_Present_Value • Maximum_Present_Value	• Present_Value • Units • Out_of_Service • Relinquish_Default	
Time	☐	• Description • Reliability • Event_State • Out_of_Service	• Present_Value • Out_of_Service	

Out_of_Service Property

Neptronic SKRO offers the use of the Out_of_Service writable property. When the value of this property is set to True, it disconnects the object from the physical input, enabling you to input other values. This is useful for special applications or while troubleshooting. For example, you can ignore the temperature read from a sensor and input the desired temperature value to perform specific tests.

Warning: *If the Out_of_Service property is set to* ***True****, Out_of_Service remains true until set to* ***False****.*

Object Table Information

The SKRO uses the following BACnet object tables, categorized based on their ID. The type is the BACnet Object type, the instance is the BACnet Object. Together, the type and instance form the **BACnet Object_Identifier** for an object according to the following C-language algorithm:

- object_identifier= (unsigned long)((unsigned long)type<<22)+instance

Analog Input (AI)

Table 4 - Object Table Information: Analog Input (AI)

ID	Name	List	Description	W?	Notes
AI.1	Inlet Signal	Integrator	Reading value at the inlet of the signal.	Out_of_Service COV_Increment	0V to 10V, Resolution: 0.001
AI.2	Permeate Signal	Integrator	Reading value of the permeate line signal.	Out_of_Service COV_Increment	0V to 10V, Resolution: 0.001
AI.3	Concentrate Signal	Integrator	Reading value of the concentrate line signal.	Out_of_Service COV_Increment	0V to 10V, Resolution: 0.001
AI.9	Permeate Pulse	Integrator	Raw pulse value of the flow meter for permeate.	COV_Increment	0 to 300, Resolution: 1
AI.10	Concentrate Pulse	Integrator	Raw pulse value of the flow meter for concentrate.	COV_Increment	0 to 300, Resolution: 1

Analog Value (AV)

Table 5 - Object Table Information: Analog Value (AV)

ID	Name	List	Description	W?	Notes
AV.10	MCU Load	Integrator	Value of the current microcontroller load.	COV_Increment	0% to 100%, Resolution: 1%
AV.11	Memory Load	Integrator	Value of the current memory load.	COV_Increment	0% to 100%, Resolution: 1%
AV.43	Inlet Pressure	Integrator	Value of the pressure at the inlet of the unit.	Present_Value Out_of_Service COV_Increment Relinquish_Default	0 psi to 500 psi, Resolution: 1 psi
AV.53	Permeate Pressure	Integrator	Value of the pressure of the permeate tank.	Present_Value Out_of_Service COV_Increment	0 psi to 500 psi, Resolution: 1 psi
AV.63	Concentrate Pressure	Integrator	Value of the osmotic pressure on the concentrate side.	Present_Value Out_of_Service COV_Increment	0 psi to 500 psi, Resolution: 1 psi

ID	Name	List	Description	W?	Notes
AV.73	TDS Sensor	Integrator	Value read by the TDS sensor.	Present_Value Out_of_Service COV_Increment	0 PPM to 1000 PPM, Resolution: 1 PPM
AV.150	Runtime	Integrator	Displays the actual run time since the last power up in seconds.	Out_of_Service COV_Increment	0 to 999999999, Resolution: 1
AV.151	HALTicks	Integrator	Number of Hardware ticks. Used as the system heartbeat.	Read Only	0 to 999999999, Resolution: 1
AV.158	Modbus TCP IP Keep Alive Time Out	Integrator	Set the amount of time the Modbus communication stays open before connection is cut out, when no signal is received from the device.	Present_Value Out_of_Service COV_Increment	1 to 1440 min, Resolution: 1min
AV.399	Run Time	Integrator	Displays the total run time of the unit.	COV_Increment	0 hours to 2147483647 hours, Resolution: 1 hour
AV.400	On Time	Integrator	Displays the total operating time of the unit.	COV_Increment	0 to 2147483647 hours, Resolution: 1 hour
AV.401	Regulator Pressure	Integrator	Parameter of the pressure of the regulator. Regulators can be adjusted by hand to set this nominal pressure.	Present_Value Out_of_Service COV_Increment	100 psi to 275 psi, Resolution: 1 psi
AV.402	Pump On Fast Flush Delay	Integrator	Delay after which the pump is turned on during fast flush routine.	Present_Value Out_of_Service COV_Increment	15 sec to 120 secs, Resolution: 1 sec
AV.442	Idle Drain Time	Integrator	Value of the drain time interval.	Present_Value Out_of_Service COV_Increment	0 hours to 24 hours, Resolution: 1 hour
AV.443	Damaged Membrane Delay	Integrator	Time delay before the damaged membranes alarm is activated.	Present_Value Out_of_Service COV_Increment	6 to 200 seconds, Resolution: 1 sec
AV.444	Permeate Flow	Integrator	Value of the flow of the permeate water in liter per minute.	Present_Value Out_of_Service COV_Increment	0 to 50 l/min, Resolution: 1 l/min
AV.445	Concentrate Flow	Integrator	Value of the flow of the concentrate water in liter per minute.	Present_Value Out_of_Service COV_Increment	0 to 50 l/min, Resolution: 1 l/min

Binary Output (BO)

Table 6 - Object Table Information: Binary Output (BO)

ID	Name	List	Description	W?	Notes
BO.1	Motor	Integrator	Status of the motor.	-	0 = Off 1 = On
BO.2	Inlet Valve	Integrator	Status of the inlet valve.	-	0 = Closed 1 = Open
BO.3	Fast Flush Valve	Integrator	Status of the fast flush (drain) valve.	-	0 = Closed 1 = Open
BO.5	Alarm	Integrator	Status of the alarm contact.	Present_Value Out_of_Service Polarity Relinquish_Default Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On
BO.6	Work Signal	Integrator	Status of the work signal contact.	-	0 = Off 1 = On
BO.10	Alarm LED	Integrator	Status of the alarm LED.	-	0 = Off 1 = On
BO.11	Power LED	Integrator	Status of the power LED.	-	0 = Off 1 = On

Binary Value (BV)

Table 7 - Object Table Information: Binary Value (BV)

ID	Name	List	Description	W?	Notes
BV.16	High Level Float	Integrator	Value of the high level float sensor.	-	0 = Off 1 = On
BV.17	Low Level Float	Integrator	Value of the low level float sensor.	-	0 = Off 1 = On
BV.18	Alarm Level Float	Integrator	Value of the alarm level float sensor.	-	0 = Off 1 = On
BV.19	Interlock	Integrator	Displays the status of the interlock. If the switch is Open, it indicates that the SKRO is stopped because of the interlock safety being open.	-	0 = Closed 1 = Open
BV.26	Ethernet enable	Integrator	Displays whether the Ethernet interface is enabled or not.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Disable 1 = Enable
BV.53	AI8 Polarity	Integrator	Select the polarity of the analog input.	Present_Value Out_of_Service Relinquish_Default Minimum_Off_Time Minimum_On_Time	0 = Direct 1 = Reverse
BV.58	SMTP SSL	Integrator	Select whether to use a secure socket layer encrypt the communication between the device and the email server or to use the default socket. If turned to *On*, SMTP Port value must be set to *587* and *SMTP Username* and *SMTP Password* settings must be filled out. If turned to Off, use SMTP Port *25* to use server without login account or SMTP Port *587* if login details for email account have been entered.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On
BV.59	SMTP Port	Integrator	Select the port number to be used for email transfer. If set to *25*, server to server email transfer is enabled (can only be used if SMTP SSL is set to *Off*). If set to *587*, client to server email transfer is enabled.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On
BV.60	Notify Alarm	Integrator	Select whether to get notified of all alarm messages by email.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On
BV.61	Notify Warning	Integrator	Select whether to get notified of all warning messages by email.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On
BV.62	Notify App Msg	Integrator	Select whether to get notified of all event messages by email.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On

ID	Name	List	Description	W?	Notes
BV.68	Network Timeout Failsafe	Integrator	Displays the network timeout fail-safe state.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Ok 1 = Timeout
BV.71	BACnet Network Timeout	Integrator	BACnet Network Timeout value.	Present_Value Out_of_Service Minimum_Off_Time Minimum_On_Time	0 = Off 1 = On
BV.113	Memory Status	Integrator	Displays the memory status.	-	0 = Ok 1 = Fail
BV.116	Inlet Low Pressure Warning	Integrator	Alarm to indicate that the pressure is insufficient at the inlet to supply water for the pump.	-	0 = Off 1 = On
BV.117	Fast Flush Blocked Warning	Integrator	Warning to indicate that the fast flush valve has failed to close.	-	0 = Off 1 = On
BV.118	Inlet Valve Open Warning	Integrator	Warning to indicate that the inlet valve has failed to open.	-	0 = Off 1 = On
BV.119	Insufficient Osmosis Warning	Integrator	Warning to indicate that the water is not being replenished in the holding tank.	-	0 = Off 1 = On
BV.120	Clogged Membrane Service Warning	Integrator	Warning to indicate that the water in the tank is falling to a low level due to a clogged membrane.	-	0 = Off 1 = On
BV.121	TDS Sensor Fail Warning	Integrator	Warning to indicate that the TDS sensor is not working.	-	0 = Off 1 = On
BV.122	Over Usage Warning	Integrator	Warning to indicate that the purifying state has been active for more than 6 hours continuously.	-	0 = Off 1 = On
BV.140	RO Tank Profile	Integrator	Status of the RO tank profile.	Present_Value Out_of_Service	0 = Atmospheric 1 = Pressurized

Character String Value (CV)

Table 8 - Object Table Information: Character String Value (CV)

ID	Name	List	Description	W?	Notes
CV.20	SMTP Server IP Address	Integrator	Configure the server IP address for the email account.	Present_Value	-
CV.21	SMTP Mail From	Integrator	Set the email address that will be sending the SKRO notification messages.	Present_Value	-
CV.22	SMTP Mail To	Integrator	Set the email address that will be receiving the SKRO notification messages.	Present_Value	-
CV.23	SMTP Username	Integrator	Set the login username for the email account.	Present_Value	-

ID	Name	List	Description	W?	Notes
CV.25	SMTP Password	Integrator	Set the login password for the email account.	Present_Value	-
CV.35	EthernetMacAdd	Integrator	Value of the MAC address of the Ethernet interface.	Present_Value	-
CV.75	Database Version	Integrator	Displays the database version.	Present_Value	-

Multi State Value (MSV)

Table 9 - Object Table Information: Multi State Value (MSV)

ID	Name	List	Description	W?	Notes
MSV.5	System Power State	Integrator	Displays whether the system is powered on or off.	Out_of_Service	0 = Off 1 = On
MSV.6	System Log Verbose Level	Integrator	Configuration value to select the type of information to be stored on the log file.	Present_Value Out_of_Service	0 = None 1 = Emergency 2 = Alert 3 = Critical 4 = Error 5 = Warning 6 = Notice 7 = Info 8 = Debug
MSV.8	BACnet Server Language	Integrator	Value of the BACnet server language.	Out_of_Service	1 = English
MSV.9	BACnet Server List Mode	Integrator	Configuration value to select the category of BACnet objects to display.	Out_of_Service	1 = Integrator 2 = Advanced 3 = Factory
MSV.10	BACnet Server Units	Integrator	Configuration value to select the display units for the BACnet server.	Out_of_Service	1 = Metric 2 = Imperial
MSV.139	Update Process Status	Integrator	Configuration value to select the process status.	Out_of_Service	0 = Ok 1 = CRC 2 = Device 3 = Failed
MSV.140	Request	Integrator	Configuration value to select the request for the SKRO.	Out_of_Service	0 = None 1 = ResetAlarms 2 = FastFlush 3 = ResetService
MSV.141	State	Integrator	Configuration value to select the state of the operation of the SKRO.		0 = Off 1 = Idle 2 = Purifying 3 = FastFlush 4 = Alarm

ID	Name	List	Description	W?	Notes
MSV.142	System Alarm	Integrator	Configuration value to set the system alarms.		0 = Normal 1 = InHiPress 2 = DmgMembrane 3 = BlocMembrane 4 = ConcOpen 5 = LoPumpPress 6 = InletClog 7 = PressReg 8 = NoPureWater 9 = TankClosed 10 = FloatOff 11 = InletSensor 12 = PermeatSensor 13 =ConcentSensor

Other

Table 10 - Object Table Information: Other

ID	Name	List	Description	W?	Notes
PGM.1	NSDF Core Program	Advanced	NSDF Core Program.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.2	Module 1	Advanced	Module 1.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.3	Module 2	Advanced	Module 2.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.4	Module 3	Advanced	Module 3.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.5	Module 4	Advanced	Module 4.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.6	Module 5	Advanced	Module 5.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.7	Module 6	Integrator	Module 6.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.8	Module 7	Integrator	Module 7.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.9	Module 8	Integrator	Module 8.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.10	Module 9	Integrator	Module 9.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.11	Module 10	Integrator	Module 10.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.12	Module 11	Integrator	Module 11.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.

ID	Name	List	Description	W?	Notes
PGM.13	Module 12	Integrator	Module 12.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.14	Module 13	Integrator	Module 13.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
PGM.15	NSDF Database	Advanced	NSDF Database.	Program_Change Out_of_Service	Program Change, only LOAD (1) and RESTART (4) are supported.
FIL.2	UpdatePackageFile	Advanced	Update Package file.	File_Size	File size is accepted for 0 value only.
FIL.4	SysLogAlarm	Integrator	System Log Alarm.	File_Size	File size is accepted for 0 value only.
FIL.5	USB System Log File	Integrator	USB System Log file.	File_Size	File size is accepted for 0 value only.
FIL.6	USB System Alarm Log File	Integrator	USB System Alarm Log file.	File_Size	File size is accepted for 0 value only.
FIL.16	System Log File	Integrator	System Log file.	File_Size	File size is accepted for 0 value only.

Notes

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