

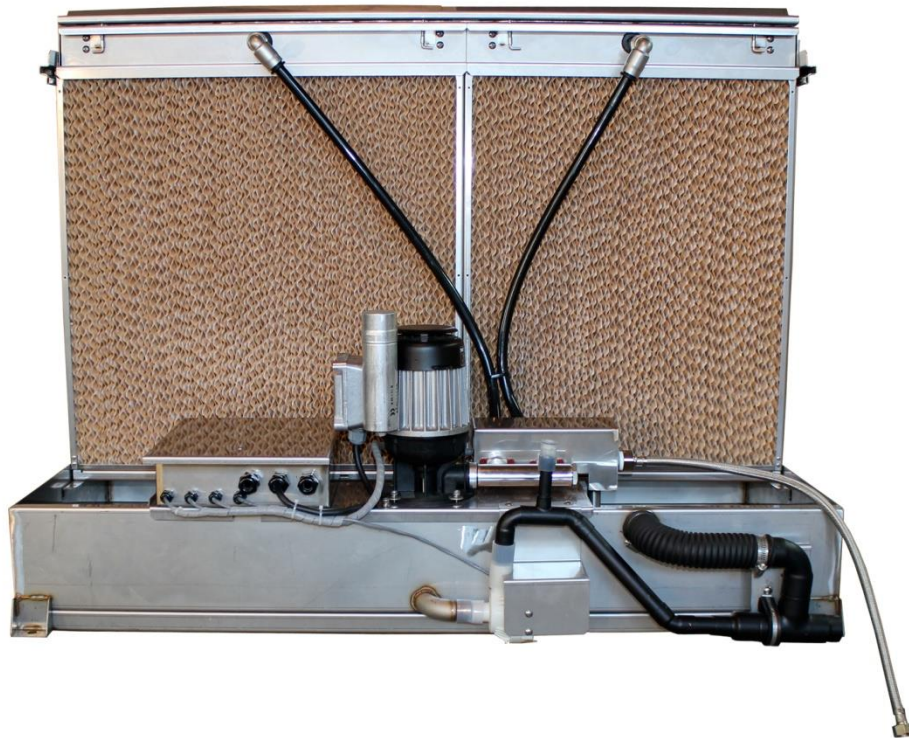


neptronic®

# SKV

Evaporative Humidifier

BACnet User Guide





# Contents

- Introduction.....1
- Pre-requisites.....1
- Advantages of BACnet.....1
- BACnet Supported Humidifier Features.....1
- BACnet Properties Configuration .....2
- Configuration Options.....3
- Quick Setup.....3
- Manual Setup.....3
- Mac Address and Max\_Master.....3
- Device Object Properties.....4
- Object Types Supported.....6
- Object Table Information.....7
- Analog Input (AI).....7
- Analog Value (AV).....7
- Binary Value (BV).....10
- Binary Input (BI).....18
- Multi State Value (MSV).....19
- Program Value (PRG).....21
- File (File) .....22
- Schedule (SCH) .....22

## Introduction

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The SKV manual provides information about using the SKV Evaporative Humidifier with the BACnet communications feature. The BACnet communication protocol for building automation and control networks enables communication between client devices within a network. The SKV Evaporative Humidifier provides a BACnet<sup>®</sup> network interface between BACnet client devices and Neptronic humidifiers. It uses the BACnet Master Module/Token Passing (MS/TP) protocol at the BACnet MAC layer.

## Pre-requisites

The SKV manual assumes that you are familiar with the concepts of BACnet and its terminology.

## Advantages of BACnet

BACnet enabled humidifiers have the following advantages:

- *Quick Message Transmission.* The humidifier 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 humidifier supports a Full Master Node state machine for MS/TP. All parameters are configured via the **BACnet WriteProperty** service. The changes made via the WriteProperty take place immediately and do not require a restart of the humidifier. For more information about the WriteProperty, refer to [Table 3 - Object Types Supported](#).
- *BIBB Support.* The humidifier is the same as the B-ASC type profile server in its functioning and supports the specific BIBB as per their relevant definitions.
  - DS-RP-B
  - DS-WP-B
  - DM-DCC-B
  - DM-DDB-B
  - DM-DOB-B
- *Object Support.* The humidifier 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 humidifier supports indication of various alarm conditions through value changes in properties of several objects. However, it does not generate BACnet event notifications.

## BACnet Supported Humidifier Features

The following BACnet supported features are available with the SKV BACnet Evaporative Humidifier:

- *Auto Baud Rate Detection.* The humidifier configures its baud rate automatically as soon as it detects the network speed upon connection.
- *Auto Device Instance Configuration.* The humidifier configures its device instance automatically to 153,000.

## 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	000	<ul style="list-style-type: none"> <li>• Can be set to a value between 000 and 254 via the menu.</li> <li>• The values from 128-254 represent MS/TP non-token passing Module devices.</li> </ul>
Device Instance	Auto	<ul style="list-style-type: none"> <li>• The humidifier automatically configures its device instance to 153,000.</li> <li>• The value can be set manually via the menu.</li> <li>• The value can be set manually through the <b>WriteProperty</b> service to <b>Device Object.Object_Identifier</b>.</li> <li>• The device's <b>Object_Identifier</b> is a combination of the <b>Device Object_Type</b> (8) and the <b>Device_Instance</b> (0-4194302), therefore its decimal or hexadecimal representation tends to be incomprehensible.</li> <li>• For example, the <b>Device_Instance</b>=1000 has an equivalent <b>Object_Identifier</b> of 0x020003E8 hexadecimal or 33555432 decimal.</li> </ul>
Baud Rate	0 = Auto	<ul style="list-style-type: none"> <li>• The humidifier configures its baud rate automatically by detecting the network upon connection.</li> <li>• The value can be set manually via the menu from the available values of Auto, 9600, 19200, 38400, 76800.</li> </ul>
Max_Master	127	<ul style="list-style-type: none"> <li>• Configure <b>Max_Master</b> value to increase network efficiency when there are less than 127 devices on the network.</li> <li>• The <b>Max_Master</b> value can be configured through WriteProperty service to the Device <b>Object.Max_Master</b>.</li> </ul> <p>For more information, refer to the Mac Address and Max_Master section.</p>
Device Object.Object_Name	Name of the device	<ul style="list-style-type: none"> <li>• Configure the name of the device through WriteProperty service to the <b>Device Object.Object_Name</b>. For example, SKV.</li> </ul>

# Configuration Options

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

## Quick Setup

Configure the humidifier's baud rate and device instance without programming.

1. Set a unique MAC address using the menu.
2. Connect the humidifier to the network and power it up.
3. The humidifier automatically configures the baud rate and device instance.
4. Repeat the steps for each humidifier.

## Manual Setup

To use a **Device\_Instance** other than 153,000 and /or if your site has more than one controller network, go to the SKV menu.

1. Press menu and select the Controls menu item.
2. Enter the password (637).
3. Select the BACnet menu item to configure the MAC address, Device Instance, and Baud Rate manually.
4. Disconnect the power to the humidifier, connect the humidifier to the network, and connect the power again.

Configure the **Max\_Master** value through the **WriteProperty** service to the **Device Object.Max\_Master** to increase network efficiency or if there are less than 127 devices on the network. For more information, refer to the Mac Address and Max\_Master section.

## 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 humidifier 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 humidifier. The Max\_Master default value of 127 was selected to ensure that any master, specifically a BACnet client can be found when the humidifier 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 has to 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 slower. 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. 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.

## 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	<ul style="list-style-type: none"> <li>• Programmable where the instance part of the Object_Identifier is in the range of 0-41,94,302</li> <li>• The device instance must be unique system-wide</li> <li>• The default value for the device instance=1,53,000 (Vendor_Identifier*1,000)</li> </ul>	W
Object_Name	<ul style="list-style-type: none"> <li>• Programmable up to 32 characters</li> <li>• The device name must be unique system-wide</li> <li>• The default value is Model_Name</li> </ul>	W
Description	<ul style="list-style-type: none"> <li>• Programmable up to 32 characters</li> <li>• The default value is SKV Evaporative/Cooling Humidifier</li> </ul>	W
Object_Type	8	
System_Status	Always OPERATIONAL (0)	
Vendor_Identifier	Always 153	
Vendor_Name	Always Neptronic	
Model_Name	Example, SKV	
Firmware_Revision	currently, 0.23	
Application_Software_Version	currently, 0.35, ROM version.	



Property	Value	Writable
Protocol_Version	Always 1	
Protocol_Revision	Always 14	
DataBase_Revision	Default = 0, will be incremented if Object_Name and/or Object_Identifier is modified or objects added or removed as per configuration.	
Max_APDU_Length_Accepted	491	
Segmentation_Supported	(3) = No Segmentation	
APDU_Timeout	60,000	
Number_of_APDU_Retries	Always 0	
Protocol_Services_Supported	<ul style="list-style-type: none"> <li>Always 0x00, 0x0B, 0xC0, 0x02, 0x60 (a bitstring in BACnet order)</li> <li>atomicWriteFile, atomicReadFile</li> <li>writeProperty, readProperty</li> <li>writePropertyMultiple, readPropertyMultiple</li> <li>deviceCommunicationControl</li> <li>unconfirmedPrivateTransfer</li> <li>who-Is, who-Has</li> <li>timeSynchronization, utcTimeSynchronization</li> </ul>	
Protocol_Object_Types_Supported	<ul style="list-style-type: none"> <li>Always 0x00, 0xB4, 0x80, 0x10 (a bitstring in BACnet order)</li> <li>analog-input, analog-value, binary-input, binary-value, device, file, multi-state value, program, and schedule</li> </ul>	
Object_List	Per the standard. Because of restrictions on the size of the transmit buffers, the entire <b>Object_List</b> cannot be returned at once, rather the <b>Object_List</b> must be read, one-at-a-time. Depends on number of objects.	
Device_Address_Binding	Always empty	
Max_Master	<ul style="list-style-type: none"> <li>Programmable in the range of 1-127</li> <li>Default value=127</li> </ul>	W
Priority_for_writing	<ul style="list-style-type: none"> <li>1 to 16</li> </ul>	W for BTL conformance
Max_Info_Frames	Always 1	
Local_Time	hh:mm:ss (e.g. 14:53:03). Depends on user client.	W
Local_Date	yy/mm/dd/ww [e.g. 14/02/18/01 = 2014, Feb 18 (Monday)]. Depends on user client.	W
UTC_Offset	-12 to +14	W
Daylight_Savings_Status	On or Off	W
Proprietary property #1000	<ul style="list-style-type: none"> <li>This proprietary property represents the MS/TP MAC unsigned address in the range of 0-254</li> <li>Unsigned</li> </ul>	W
Proprietary property #1001	<ul style="list-style-type: none"> <li>Programmable</li> <li>This proprietary property represents the MS/TP baud rate</li> <li>9,600, 19,200, 38,400, 76,800</li> <li>Unsigned</li> </ul>	W if not Auto Baud.
Proprietary property #1002	<ul style="list-style-type: none"> <li>Programmable</li> <li>This proprietary property represents the period of time that an object in/out of service will automatically return to normal. Range = 0-120 minutes (unsigned type)</li> <li>Writing 0 means no automatic return to normal</li> <li>Default is 15 minutes</li> <li>Unsigned</li> </ul>	W

## 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	Supports	Optional Properties Supported
Analog Input	<input checked="" type="checkbox"/>	Reliability Description Min_Present_Value Max_Present_Value Resolution
Analog Value	<input checked="" type="checkbox"/>	Reliability Description
Binary Input	<input checked="" type="checkbox"/>	Reliability Active_Text Inactive_Text Description
Binary Value	<input checked="" type="checkbox"/>	Reliability Active_Text Inactive_Text Description
Multi-State Value	<input checked="" type="checkbox"/>	Description Reliability States_Text
File	<input checked="" type="checkbox"/>	Description
Program	<input checked="" type="checkbox"/>	Reliability Description
Schedule	<input checked="" type="checkbox"/>	Weekly_Schedule



## Object Table Information

The humidifiers use 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)

ID	Name	Description	W?	Notes
AI.1	ExternalDemand	External demand signal measurement.	Present Value	0 to 10,560 mV
AI.2	ExternalSetpoint	External setpoint signal measurement.	Present Value	0 to 10,560 mV
AI.3	RoomTempSensor	Room temperature sensor signal measurement.	Present Value	0 to 10,560 mV
AI.4	RoomRHSensor	Room relative humidity sensor signal measurement.	Present Value	0 to 10,560 mV
AI.5	DuctSensor	Duct relative humidity sensor signal measurement.	Present Value	0 to 10,560 mV
AI.6	Module1WaterLevelSensor	Module 1 water level sensor signal measurement.	Present Value	0 to 65,535 Hz
AI.7	Module2WaterLevelSensor	Module 2 water level sensor signal measurement.	Present Value	0 to 65,535 Hz
AI.8	Module3WaterLevelSensor	Module 3 water level sensor signal measurement.	Present Value	0 to 65,535 Hz
AI.9	Module4WaterLevelSensor	Module 4 water level sensor signal measurement.	Present Value	0 to 65,535 Hz
AI.10	Module1WaterTempSensor	Module 1 water temperature sensor signal measurement.	Present Value	0 to 3,300 mV
AI.11	Module2WaterTempSensor	Module 2 water temperature sensor signal measurement.	Present Value	0 to 3,300 mV
AI.12	Module3WaterTempSensor	Module 3 water temperature sensor signal measurement.	Present Value	0 to 3,300 mV
AI.13	Module4WaterTempSensor	Module 4 water temperature sensor signal measurement.	Present Value	0 to 3,300 mV

### Analog Value (AV)

ID	Name	Description	W?	Notes
AV.1	SystOutput	System output in percent.	Present Value	0.0 to 100.0%
AV.2	SystOutput	System output in Mass Flow units.	Present Value	0 to SystemCapacity
AV.3	SystCapacity	Total system output capacity.	Present Value	Units as per Mass Flow Units
AV.4	NumOfModules	Number of humidifier modules.	Present Value	1 to 4
AV.5	SystDemand	System demand.	Present Value	0.0 to 100.0%
AV.6	SystLimit	System output limit as per high limit signals.	Present Value	0.0 to 100.0%
AV.7	SystOutputLockOn	System output lock or limit for load shedding.	Present Value	50 to 100%
AV.8	SystFeedback	System output feedback signal.	Present Value	0 to 10,000 mV
AV.9	SimDemand	Simulation mode demand.	Present Value	0 to 100%



ID	Name	Description	W?	Notes
AV.10	SimDuration	Simulation mode duration.	Present Value	5 to 60 minutes
AV.11	SimCountdown	Simulation mode countdown.	Present Value	3,600 to 0 seconds
AV.12	AnalogDemand	Analog system demand.	Present Value	0.0 to 100.0%
AV.13	RoomRH	Room relative humidity.	Present Value	0.0 to 100.0%RH
AV.14	RoomTemp	Room temperature.	Present Value	Minimum room temperature to maximum room temperature. See Control menu. Units as per Temperature Units
AV.15	DuctRH	Duct relative humidity.	Present Value	0.0 to 100.0%RH
AV.16	SetpointRH	External relative humidity setpoint.	Present Value	0.0 to 100.0%RH
AV.17	SetpointTemp	External temperature setpoint.	Present Value	Minimum room temperature to maximum room temperature. See Control menu. Units as per Temperature Units
AV.18	InternalSetpointOccupied	Internal %RH setpoint during occupancy.	Present Value	10 to 90%
AV.19	InternalSetpointOccupied	Internal temperature setpoint during occupancy.	Present Value	10.0 to 40.0°C or 50.0 to 104°F Units as per Temperature Units
AV.20	InternalSetpointUnoccupied	Internal %RH setpoint during occupancy.	Present Value	10 to 90%
AV.21	InternalSetpointUnoccupied	Internal temperature setpoint during occupancy.	Present Value	10.0 to 40.0°C or 50.0 to 104°F Units as per Temperature Units
AV.22	InternalSetpointVacant	Internal %RH setpoint during vacancy.	Present Value	10 to 90%
AV.23	InternalSetpointVacant	Internal temperature setpoint during vacancy.	Present Value	10.0 to 40.0°C or 50.0 to 104°F Units as per Temperature Units
AV.24	ProportionalRamp	Proportional ramp for %RH.	Present Value	1.0 to 20.0%RH
AV.25	ProportionalRamp	Proportional ramp for temperature.	Present Value	0.5 to 5.0°C or 32.9 to 41°F Units as per Temperature Units
AV.26	IntegralRamp	Integral ramp for %RH.	Present Value	1.0 to 20.0%RH
AV.27	IntegralRamp	Integral ramp for temperature.	Present Value	0.5 to 5.0°C or 32.9 to 41°F Units as per Temperature Units
AV.28	Deadband	Deadband for %RH.	Present Value	0.0 to 10.0%RH
AV.29	Deadband	Deadband for temperature.	Present Value	0.0 to 2.0°C or 32 to 35.6°F Units as per Temperature Units
AV.30	HighLimitSetpoint	Analog high limit setpoint value.	Present Value	10 to 90 %RH
AV.31	HighLimitProportionalRamp	Analog high limit proportional ramp.	Present Value	0.0 to 20.0%RH
AV.32	DilutionInterval	Water dilution interval.	Present Value	30 to 1,500 minutes
AV.33	DilutionCycles	Number of water dilution cycles.	Present Value	0 to 255
AV.34	CleaningInterval	Cleaning interval.	Present Value	3 to 12 months
AV.35	AutoDrainInterval	Automatic drain interval.	Present Value	1 to 24 hours
AV.36	UVLampInterval	UV lamp replacement interval.	Present Value	1,500 to 3,000 hours
AV.37	InactivityDelay	System inactivity delay.	Present Value	4 to 72 hours
AV.38	NetworkFallbackTimeout	Network fallback timeout. Use when at least one control input value has Network as its source.	Present Value	1 to 15 minutes
AV.39	NetworkTimeoutCountdown	Network fallback timeout countdown.	Present Value	Maximum 900 to 0 seconds
AV.40	InactivityCounter	System inactivity down counter.	Present Value	Maximum 2,59,200 to 0 seconds
AV.41	Module1DrainTimeoutCountdown	Module 1 drain timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.42	Module2DrainTimeoutCountdown	Module 2 drain timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.43	Module3DrainTimeoutCountdown	Module 3 drain timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.44	Module4DrainTimeoutCountdown	Module 4 drain timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.45	Module1FillTimeoutCountdown	Module 1 fill timeout countdown.	Present Value	Maximum 1,800 to 0 seconds



ID	Name	Description	W?	Notes
AV.46	Module2FillTimeoutCountdown	Module 2 fill timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.47	Module3FillTimeoutCountdown	Module 3 fill timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.48	Module4FillTimeoutCountdown	Module 4 fill timeout countdown.	Present Value	Maximum 1,800 to 0 seconds
AV.49	Module1InactivityCountdown	Module 1 inactivity countdown.	Present Value	Maximum 2,59,200 to 0 seconds
AV.50	Module2InactivityCountdown	Module 2 inactivity countdown.	Present Value	Maximum 2,59,200 to 0 seconds
AV.51	Module3InactivityCountdown	Module 3 inactivity countdown.	Present Value	Maximum 2,59,200 to 0 seconds
AV.52	Module4InactivityCountdown	Module 4 inactivity countdown.	Present Value	Maximum 2,59,200 to 0 seconds
AV.53	Module1StateCountdown	Module 1 state countdown.	Present Value	Depends on module's state
AV.54	Module2StateCountdown	Module 2 state countdown.	Present Value	Depends on module's state
AV.55	Module3StateCountdown	Module 3 state countdown.	Present Value	Depends on module's state
AV.56	Module4StateCountdown	Module 4 state countdown.	Present Value	Depends on module's state
AV.57	Module1Demand	Module 1 demand.	Present Value	0.0 to 100.0%
AV.58	Module2Demand	Module 2 demand.	Present Value	0.0 to 100.0%
AV.59	Module3Demand	Module 3 demand.	Present Value	0.0 to 100.0%
AV.60	Module4Demand	Module 4 demand.	Present Value	0.0 to 100.0%
AV.61	Module1Output	Module 1 output.	Present Value	0.0 to 100.0%
AV.62	Module2Output	Module 2 output.	Present Value	0.0 to 100.0%
AV.63	Module3Output	Module 3 output.	Present Value	0.0 to 100.0%
AV.64	Module4Output	Module 4 output.	Present Value	0.0 to 100.0%
AV.65	Module1Capacity	Module 1 total capacity.	Present Value	0 to 65,535 Units as per Mass Flow Units
AV.66	Module2Capacity	Module 2 total capacity.	Present Value	0 to 65,535 Units as per Mass Flow Units
AV.67	Module3Capacity	Module 3 total capacity.	Present Value	0 to 65,535 Units as per Mass Flow Units
AV.68	Module4Capacity	Module 4 total capacity.	Present Value	0 to 65,535 Units as per Mass Flow Units
AV.69	Module1WaterLevel	Module 1 water level.	Present Value	0.0 to 100.0%
AV.70	Module2WaterLevel	Module 2 water level.	Present Value	0.0 to 100.0%
AV.71	Module3WaterLevel	Module 3 water level.	Present Value	0.0 to 100.0%
AV.72	Module4WaterLevel	Module 4 water level.	Present Value	0.0 to 100.0%
AV.73	Module1WaterTemp	Module 1 water temperature.	Present Value	0.0 to 125.0°C or 32 to 257°F Units as per Temperature Units
AV.74	Module2WaterTemp	Module 2 water temperature.	Present Value	0.0 to 125.0°C or 32 to 257°F Units as per Temperature Units
AV.75	Module3WaterTemp	Module 3 water temperature.	Present Value	0.0 to 125.0°C or 32 to 257°F Units as per Temperature Units
AV.76	Module4WaterTemp	Module 4 water temperature.	Present Value	0.0 to 125.0°C or 32 to 257°F Units as per Temperature Units
AV.77	Module1PumpStageWeight	Module 1 pump's stage weight relative to module's full capacity.	Present Value	0 to 100%
AV.78	Module2PumpStageWeight	Module 2 pump's stage weight relative to module's full capacity.	Present Value	0 to 100%
AV.79	Module3PumpStageWeight	Module 3 pump's stage weight relative to module's full capacity.	Present Value	0 to 100%
AV.80	Module4PumpStageWeight	Module 4 pump's stage weight relative to module's full capacity.	Present Value	0 to 100%
AV.81	Module1Valve1StageWeight	Stage weight of Module 1, valve 1 relative to module's full capacity.	Present Value	0 to 100%



ID	Name	Description	W?	Notes
AV.82	Module2Valve1StageWeight	Stage weight of Module 2, valve 1 relative to module's full capacity.	Present Value	0 to 100%
AV.83	Module3Valve1StageWeight	Stage weight of Module 3, valve 1 relative to module's full capacity.	Present Value	0 to 100%
AV.84	Module4Valve1StageWeight	Stage weight of Module 4, valve 1 relative to module's full capacity.	Present Value	0 to 100%
AV.85	Module1Valve2StageWeight	Stage weight of Module 1, valve 2 relative to module's full capacity.	Present Value	0 to 100%
AV.86	Module2Valve2StageWeight	Stage weight of Module 2, valve 2 relative to module's full capacity.	Present Value	0 to 100%
AV.87	Module3Valve2StageWeight	Stage weight of Module 3, valve 2 relative to module's full capacity.	Present Value	0 to 100%
AV.88	Module4Valve2StageWeight	Stage weight of Module 4, valve 2 relative to module's full capacity.	Present Value	0 to 100%
AV.89	Module1Valve3StageWeight	Stage weight of Module 1, valve 3 relative to module's full capacity.	Present Value	0 to 100%
AV.90	Module2Valve3StageWeight	Stage weight of Module 2, valve 3 relative to module's full capacity.	Present Value	0 to 100%
AV.91	Module3Valve3StageWeight	Stage weight of Module 3, valve 3 relative to module's full capacity.	Present Value	0 to 100%
AV.92	Module4Valve3StageWeight	Stage weight of Module 4, valve 3 relative to module's full capacity.	Present Value	0 to 100%
AV.93	Module1Valve4StageWeight	Stage weight of Module 1, valve 4 relative to module's full capacity.	Present Value	0 to 100%
AV.94	Module2Valve4StageWeight	Stage weight of Module 2, valve 4 relative to module's full capacity.	Present Value	0 to 100%
AV.95	Module3Valve4StageWeight	Stage weight of Module 3, valve 4 relative to module's full capacity.	Present Value	0 to 100%
AV.96	Module4Valve4StageWeight	Stage weight of Module 4, valve 4 relative to module's full capacity.	Present Value	0 to 100%
AV.97	Module1TotalDuty	Total duty of Module 1 (in hours) at 100% output.	Present Value	0 to 4,294,967,295 hours
AV.98	Module2TotalDuty	Total duty of Module 2 (in hours) at 100% output.	Present Value	0 to 4,294,967,295 hours
AV.99	Module3TotalDuty	Total duty of Module 3 (in hours) at 100% output.	Present Value	0 to 4,294,967,295 hours
AV.100	Module4TotalDuty	Total duty of Module 4 (in hours) at 100% output.	Present Value	0 to 4,294,967,295 hours

## Binary Value (BV)

ID	Name	Description	W?	Notes
BV.1	Module1DrainRequest	Drain request for Module 1.	Present Value	0 = OFF 1 = ON
BV.2	Module2DrainRequest	Drain request for Module 2.	Present Value	0 = OFF 1 = ON
BV.3	Module3DrainRequest	Drain request for Module 3.	Present Value	0 = OFF 1 = ON
BV.4	Module4DrainRequest	Drain request for Module 4.	Present Value	0 = OFF 1 = ON
BV.5	Module1Inactivity	Inactivity state for Module 1.	Present Value	0 = True 1 = False



ID	Name	Description	W?	Notes
BV.6	Module2Inactivity	Inactivity state for Module 2.	Present Value	0 = True 1 = False
BV.7	Module3Inactivity	Inactivity state for Module 3.	Present Value	0 = True 1 = False
BV.8	Module4Inactivity	Inactivity state for Module 4.	Present Value	0 = True 1 = False
BV.9	Module1SilverIonChangeDue	Date on w hich Silver Ion cartridge change is due for Module 1.	Present Value	0 = True 1 = False
BV.10	Module2SilverIonChangeDue	Date on w hich Silver Ion cartridge change is due for Module 2.	Present Value	0 = True 1 = False
BV.11	Module3SilverIonChangeDue	Date on w hich Silver Ion cartridge change is due for Module 3.	Present Value	0 = True 1 = False
BV.12	Module4SilverIonChangeDue	Date on w hich Silver Ion cartridge change is due for Module 4.	Present Value	0 = True 1 = False
BV.13	Module1UVLampChangeDue	Date on w hich UV lamp change is due for Module 1.	Present Value	0 = True 1 = False
BV.14	Module2UVLampChangeDue	Date on w hich UV lamp change is due for Module 2.	Present Value	0 = True 1 = False
BV.15	Module3UVLampChangeDue	Date on w hich UV lamp change is due for Module 3.	Present Value	0 = True 1 = False
BV.16	Module4UVLampChangeDue	Date on w hich UV lamp change is due for Module 4.	Present Value	0 = True 1 = False
BV.17	Module1CleaningChangeDue	Date on w hich cleaning is due for Module 1.	Present Value	0 = True 1 = False
BV.18	Module2CleaningChangeDue	Date on w hich cleaning is due for Module 2.	Present Value	0 = True 1 = False
BV.19	Module3CleaningChangeDue	Date on w hich cleaning is due for Module 3.	Present Value	0 = True 1 = False
BV.20	Module4CleaningChangeDue	Date on w hich cleaning is due for Module 4.	Present Value	0 = True 1 = False
BV.21	Module1Dilution	Water dilution cycle for Module 1.	Present Value	0 = Waiting 1 = In Progress
BV.22	Module2Dilution	Water dilution cycle for Module 2.	Present Value	0 = Waiting 1 = In Progress
BV.23	Module3Dilution	Water dilution cycle for Module 3.	Present Value	0 = Waiting 1 = In Progress
BV.24	Module4Dilution	Water dilution cycle for Module 4.	Present Value	0 = Waiting 1 = In Progress
BV.25	Module1ServiceWarning	Upcoming cleaning for Module 1. Warning displays w hen cleaning is due in 100 hours or less. Module w orks normally. Reset manually by resetting cleaning date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.26	Module2ServiceWarning	Upcoming cleaning for Module 2. Warning displays w hen cleaning is due in 100 hours or less. Module w orks normally. Reset manually by resetting cleaning date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON



ID	Name	Description	W?	Notes
BV.27	Module3ServiceWarning	Upcoming cleaning for Module 3. Warning displays when cleaning is due in 100 hours or less. Module works normally. Reset manually by resetting cleaning date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.28	Module4ServiceWarning	Upcoming cleaning for Module 4. Warning displays when cleaning is due in 100 hours or less. Module works normally. Reset manually by resetting cleaning date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.29	Module1ServiceAlarm	Alarm for Module 1 when cleaning, UV lamp change or Silver Ion cartridge change is due. See RunWhileServiceAlarm.present_value for module operation. Reset manually by resetting cleaning, UV lamp change or Silver Ion change date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.30	Module2ServiceAlarm	Alarm for Module 2 when cleaning, UV lamp change or Silver Ion cartridge change is due. See RunWhileServiceAlarm.present_value for module operation. Reset manually by resetting cleaning, UV lamp change or Silver Ion change date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.31	Module3ServiceAlarm	Alarm for Module 3 when cleaning, UV lamp change or Silver Ion cartridge change is due. See RunWhileServiceAlarm.present_value for module operation. Reset manually by resetting cleaning, UV lamp change or Silver Ion change date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.32	Module4ServiceAlarm	Alarm for Module 4 when cleaning, UV lamp change or Silver Ion cartridge change is due. See RunWhileServiceAlarm.present_value for module operation. Reset manually by resetting cleaning, UV lamp change or Silver Ion change date. See Diagnostic menu.	Present Value	0 = OFF 1 = ON
BV.33	Module1DrainFault	Drain fault alarm for Module 1 when drain countdown reaches 0. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.34	Module2DrainFault	Drain fault alarm for Module 2 when drain countdown reaches 0. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.35	Module3DrainFault	Drain fault alarm for Module 3 when drain countdown reaches 0. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON



ID	Name	Description	W?	Notes
BV.36	Module4DrainFault	Drain fault alarm for Module 4 w hen drain countdown reaches 0. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.37	Module1WaterInletFault	Inlet fault for Module 1 w hen fill countdown n reaches 0. Module keeps filling. Automatic reset w hen module is able to fill the tank.	Present Value	0 = OFF 1 = ON
BV.38	Module2WaterInletFault	Inlet fault for Module 2 w hen fill countdown n reaches 0. Module keeps filling. Automatic reset w hen module is able to fill the tank.	Present Value	0 = OFF 1 = ON
BV.39	Module3WaterInletFault	Inlet fault for Module 3 w hen fill countdown n reaches 0. Module keeps filling. Automatic reset w hen module is able to fill the tank.	Present Value	0 = OFF 1 = ON
BV.40	Module4WaterInletFault	Inlet fault for Module 4 w hen fill countdown n reaches 0. Module keeps filling. Automatic reset w hen module is able to fill the tank.	Present Value	0 = OFF 1 = ON
BV.41	Module1WaterLevelDefect	Water level defect for Module 1 w hen both capacitive sensor and float are defective. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.42	Module2WaterLevelDefect	Water level defect for Module 2 w hen both capacitive sensor and float are defective. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.43	Module3WateLevelDefect	Water level defect for Module 3 w hen both capacitive sensor and float are defective. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.44	Module4WaterLevelDefect	Water level defect for Module 4 w hen both capacitive sensor and float are defective. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.45	Module1WaterTempDefect	Water temperature sensor defect for Module 1. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.46	Module2WaterTempDefect	Water temperature sensor defect for Module 2. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.47	Module3WaterTempDefect	Water temperature sensor defect for Module 3. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON



ID	Name	Description	W?	Notes
BV.48	Module4WaterTempDefect	Water temperature sensor defect for Module 4. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.49	Module1WaterLevelFault	Water level fault for Module 1 when capacitive level sensor is not calibrated. Module works with float only. No water dilution, no water level upkeep. Automatic reset when module is able to calibrate the capacitive sensor.	Present Value	0 = OFF 1 = ON
BV.50	Module2WaterLevelFault	Water level fault for Module 2 when capacitive level sensor is not calibrated. Module works with float only. No water dilution, no water level upkeep. Automatic reset when module is able to calibrate the capacitive sensor.	Present Value	0 = OFF 1 = ON
BV.51	Module3WaterLevelFault	Water level fault for Module 3 when capacitive level sensor is not calibrated. Module works with float only. No water dilution, no water level upkeep. Automatic reset when module is able to calibrate the capacitive sensor.	Present Value	0 = OFF 1 = ON
BV.52	Module4WaterLevelFault	Water level fault for Module 4 when capacitive level sensor is not calibrated. Module works with float only. No water dilution, no water level upkeep. Automatic reset when module is able to calibrate the capacitive sensor.	Present Value	0 = OFF 1 = ON
BV.53	Module1HighWaterTemp	High water temperature for Module 1 when water temperature equals 25°C (77°F) or more. Module starts an auto drain cycle.	Present Value	0 = OFF 1 = ON
BV.54	Module2HighWaterTemp	High water temperature for Module 2 when water temperature equals 25°C (77°F) or more. Module starts an auto drain cycle.	Present Value	0 = OFF 1 = ON
BV.55	Module3HighWaterTemp	High water temperature for Module 3 when water temperature equals 25°C (77°F) or more. Module starts an auto drain cycle.	Present Value	0 = OFF 1 = ON
BV.56	Module4HighWaterTemp	High water temperature for Module 4 when water temperature equals 25°C (77°F) or more. Module starts an auto drain cycle.	Present Value	0 = OFF 1 = ON
BV.57	Module1HighWaterTempFault	High water temperature fault for Module 1 when Water temperature keeps at 25°C (77°F) or above after 2 auto drain cycles. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.58	Module2HighWaterTempFault	High water temperature fault for Module 2 when Water temperature keeps at 25°C (77°F) or above after 2 auto drain cycles. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON





ID	Name	Description	W?	Notes
BV.59	Module3HighWaterTempFault	High water temperature fault for Module 3 when Water temperature keeps at 25°C (77°F) or above after 2 auto drain cycles. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.60	Module4HighWaterTempFault	High water temperature fault for Module 4 when Water temperature keeps at 25°C (77°F) or above after 2 auto drain cycles. Module stops operation. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.61	Module1FloatFault	Water float of Module 1 is in a fault condition. Module works with capacitive sensor only. Automatic reset when fault condition is gone.	Present Value	0 = OFF 1 = ON
BV.62	Module2FloatFault	Water float of Module 2 is in a fault condition. Module works with capacitive sensor only. Automatic reset when fault condition is gone.	Present Value	0 = OFF 1 = ON
BV.63	Module3FloatFault	Water float of Module 3 is in a fault condition. Module works with capacitive sensor only. Automatic reset when fault condition is gone.	Present Value	0 = OFF 1 = ON
BV.64	Module4FloatFault	Water float of Module 4 is in a fault condition. Module works with capacitive sensor only. Automatic reset when fault condition is gone.	Present Value	0 = OFF 1 = ON
BV.65	Module1CirculationPump	Circulation pump status of Module 1.	Present Value	0 = OFF 1 = ON
BV.66	Module2CirculationPump	Circulation pump status of Module 2.	Present Value	0 = OFF 1 = ON
BV.67	Module3CirculationPump	Circulation pump status of Module 3.	Present Value	0 = OFF 1 = ON
BV.68	Module4CirculationPump	Circulation pump status of Module 4.	Present Value	0 = OFF 1 = ON
BV.69	Module1FillValve	Fill valve status of Module 1.	Present Value	0 = OFF 1 = ON
BV.70	Module2FillValve	Fill valve status of Module 2.	Present Value	0 = OFF 1 = ON
BV.71	Module3FillValve	Fill valve status of Module 3.	Present Value	0 = OFF 1 = ON
BV.72	Module4FillValve	Fill valve status of Module 4.	Present Value	0 = OFF 1 = ON
BV.73	Module1Drain	Drain status of Module 1.	Present Value	0 = OFF 1 = ON
BV.74	Module2Drain	Drain status of Module 2.	Present Value	0 = OFF 1 = ON
BV.75	Module3Drain	Drain status of Module 3.	Present Value	0 = OFF 1 = ON
BV.76	Module4Drain	Drain status of Module 4.	Present Value	0 = OFF 1 = ON
BV.77	Module1StageValve1	Status of Module 1's stage valve 1.	Present Value	0 = OFF 1 = ON



ID	Name	Description	W?	Notes
BV.78	Module2StageValve1	Status of Module 2's stage valve 1.	Present Value	0 = OFF 1 = ON
BV.79	Module3StageValve1	Status of Module 3's stage valve 1.	Present Value	0 = OFF 1 = ON
BV.80	Module4StageValve1	Status of Module 4's stage valve 1.	Present Value	0 = OFF 1 = ON
BV.81	Module1StageValve2	Status of Module 1's stage valve 2.	Present Value	0 = OFF 1 = ON
BV.82	Module2StageValve2	Status of Module 2's stage valve 2.	Present Value	0 = OFF 1 = ON
BV.83	Module3StageValve2	Status of Module 3's stage valve 2.	Present Value	0 = OFF 1 = ON
BV.84	Module4StageValve2	Status of Module 4's stage valve 2.	Present Value	0 = OFF 1 = ON
BV.85	Module1StageValve3	Status of Module 1's stage valve 3.	Present Value	0 = OFF 1 = ON
BV.86	Module2StageValve3	Status of Module 2's stage valve 3.	Present Value	0 = OFF 1 = ON
BV.87	Module3StageValve3	Status of Module 3's stage valve 3.	Present Value	0 = OFF 1 = ON
BV.88	Module4StageValve3	Status of Module 4's stage valve 3.	Present Value	0 = OFF 1 = ON
BV.89	Module1StageValve4	Status of Module 1's stage valve 4.	Present Value	0 = OFF 1 = ON
BV.90	Module2StageValve4	Status of Module 2's stage valve 4.	Present Value	0 = OFF 1 = ON
BV.91	Module3StageValve4	Status of Module 3's stage valve 4.	Present Value	0 = OFF 1 = ON
BV.92	Module4StageValve4	Status of Module 4's stage valve 4.	Present Value	0 = OFF 1 = ON
BV.93	SimMode	Simulation mode state.	Present Value	0 = OFF 1 = ON
BV.94	SystInactivity	System inactivity state.	Present Value	0 = True 1 = False
BV.95	SystResetAlarms	Manual system reset alarm request.	Present Value	0 = OFF 1 = ON
BV.96	AirFlow Cutout	Status is On when no air flow (AirFlow Input = opened).	Present Value	0 = OFF 1 = ON
BV.97	HighLimitCutout	Status is On when too much humidity is present inside duct (HighLimitInput = opened).	Present Value	0 = OFF 1 = ON
BV.98	InterlockCutout	Status is On when InterlockInput = opened.	Present Value	0 = OFF 1 = ON
BV.99	RoomTempSensorDefect	Status is On when room temperature sensor is defective. System inhibits demand. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON



ID	Name	Description	W?	Notes
BV.100	RoomRHSensorDefect	Status is On when room relative humidity sensor is defective. System inhibits demand. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.101	DuctSensorDefect	Status is On when duct's relative humidity is defective. System inhibits demand. Reset manually using reset alarm function in Diagnostic menu or SystResetAlarms.present_value.	Present Value	0 = OFF 1 = ON
BV.102	Module1CommTimeout	Status is On when communication is lost with Module 1. System dispatches demand normally to any other ready modules. Automatic reset when communication is back.	Present Value	0 = OFF 1 = ON
BV.103	Module2CommTimeout	Status is On when communication is lost with Module 2. System dispatches demand normally to any other ready modules. Automatic reset when communication is back.	Present Value	0 = OFF 1 = ON
BV.104	Module3CommTimeout	Status is On when communication is lost with Module 3. System dispatches demand normally to any other ready modules. Automatic reset when communication is back.	Present Value	0 = OFF 1 = ON
BV.105	Module4CommTimeout	Status is On when communication is lost with Module 4. System dispatches demand normally to any other ready modules. Automatic reset when communication is back.	Present Value	0 = OFF 1 = ON
BV.106	SystOutputLimited	Status is On when output is limited by any high limit signals.	Present Value	0 = OFF 1 = ON
BV.107	RunWhileServiceAlarm	When ON, modules will continue demand output even when their service alarm is on. Otherwise, they stop normal operation.	Present Value	0 = OFF 1 = ON
BV.108	TempUnits	Available temperature unit options, °C and °F.	Present Value	0 = °C 1 = °F
BV.109	Massflow Units	Available mass flow units, percent and mass flow.	Present Value	0 = kg/h 1 = lb/h
BV.110	OutputDisplay	Display of output in percent or mass flow units.	Present Value	0 = Percent 1 = MassFlow
BV.111	AlarmBeep	When the alarm beep is ON, any alarm sets the buzzer output to ON.	Present Value	0 = OFF 1 = ON
BV.112	KeyBeep	When the key beep is ON, the buzzer will beep to confirm any key push event.	Present Value	0 = OFF 1 = ON
BV.113	OccupancySchedule	When the Occupancy Schedule status is ON and is in any internal control mode, system will evaluate the occupancy schedule for correct setpoint selection.	Present Value	0 = OFF 1 = ON
BV.114	TimeFormat	Available time format, 12 and 24 hours.	Present Value	0 = 24hr 1 = 12hr
BV.115	SilverIonNotif	When ON, the modules will notify when Silver Ion cartridge is due for maintenance.	Present Value	0 = OFF 1 = ON



ID	Name	Description	W?	Notes
BV.116	SystemPower	System normal operation when ON, produces humidity as per demand. System inhibits demand when OFF.	Present Value	0 = OFF 1 = ON
BV.117	WaterLevelCalibration	When ON, water level capacitive sensor will be automatically calibrated each time the tank becomes full from empty.	Present Value	0 = OFF 1 = ON
BV.118	AlarmRelay	Closed when any alarm is on but AirFlow Cutout and ServiceWarning.	Present Value	0 = Opened 1 = Closed
BV.119	MaintenanceRelay	Closed when ServiceAlarm or ServiceWarning is on.	Present Value	0 = Opened 1 = Closed
BV.120	Buzzer	ON when a key push event is acknowledge and KeyBeep is on or when AlarmRelay is closed and AlarmBeep is on.	Present Value	0 = OFF 1 = ON
BV.121	NetworkFallbackAlarm	ON during a network fallback alarm	Present Value	0 = OFF 1 = ON

## Binary Input (BI)

ID	Name	Description	W?	Notes
Bl.1	AirflowInput	Air flow switch input.	Present Value	0 = Opened 1 = Closed
Bl.2	HighLimitInput	High limit switch input.	Present Value	0 = Opened 1 = Closed
Bl.3	InterlockInput	Interlock cutout input.	Present Value	0 = Opened 1 = Closed
Bl.4	DemandInput	Binary demand (all or nothing) input.	Present Value	0 = Opened 1 = Closed
Bl.5	MemoryCard	Mounted when card is physically detected.	Present Value	0 = Unmounted 1 = Mounted
Bl.6	Module1Low Float	Low water level float state input for Module 1, closed when the water level is low.	Present Value	0 = Opened 1 = Closed
Bl.7	Module2Low Float	Low water level float state input for Module 2, closed when the water level is low.	Present Value	0 = Opened 1 = Closed
Bl.8	Module3Low Float	Low water level float state input for Module 3, closed when the water level is low.	Present Value	0 = Opened 1 = Closed
Bl.9	Module4Low Float	Low water level float state input for Module 4, closed when the water level is low.	Present Value	0 = Opened 1 = Closed
Bl.10	Module1HighFloat	High water level float state input for Module 1, closed when the water level is high.	Present Value	0 = Opened 1 = Closed
Bl.11	Module2HighFloat	High water level float state input for Module 2, closed when the water level is high.	Present Value	0 = Opened 1 = Closed
Bl.12	Module3HighFloat	High water level float state input for Module 3, closed when the water level is high.	Present Value	0 = Opened 1 = Closed
Bl.13	Module4HighFloat	High water level float state input for Module 4, closed when the water level is high.	Present Value	0 = Opened 1 = Closed

## Multi State Value (MSV)

ID	Name	Description	W?	Notes
MSV.1	HighLimitSource	Analog high limit source.	Present Value	1 = None 2 = Analog Input 1 3 = Analog Input 2 4 = Analog Input 3 5 = Network
MSV.2	RoomTempSource	Room temperature source.	Present Value	1 = None 2 = Analog Input 1 3 = Analog Input 2 4 = Analog Input 3 5 = Network
MSV.3	RoomRHSource	Room relative humidity source.	Present Value	1 = None 2 = Analog Input 1 3 = Analog Input 2 4 = Analog Input 3 5 = Network
MSV.4	ControlMode	Control mode.	Present Value	1 = Analog Input 1 2 = Analog Input 2 3 = Analog Input 3 4 = Internal Temperature 5 = Internal %RH 6 = Network
MSV.5	SetpointSource	Setpoint source.	Present Value	1 = None 2 = Analog Input 1 3 = Analog Input 2 4 = Analog Input 3 5 = Internal 6 = Network
MSV.6	RoomTempSignal	Analog room temperature signal configuration.	Present Value	1 = 0-10Vdc 2 = 2-10Vdc 3 = 0-20mA 4 = 4-20mA
MSV.7	RoomRHSignal	Analog room relative humidity signal configuration.	Present Value	1 = 0-10Vdc 2 = 2-10Vdc 3 = 0-20mA 4 = 4-20mA
MSV.8	HighLimitSignal	Analog high limit signal configuration.	Present Value	1 = 0-10Vdc 2 = 2-10Vdc 3 = 0-20mA 4 = 4-20mA
MSV.9	ControlSignal	External control signal configuration.	Present Value	1 = 0-10Vdc 2 = 2-10Vdc 3 = 0-20mA 4 = 4-20mA
MSV.10	SetpointSignal	External setpoint signal configuration.	Present Value	1 = 0-10Vdc 2 = 2-10Vdc 3 = 0-20mA 4 = 4-20mA
MSV.11	FeedbackSignal	Output feedback signal configuration.	Present Value	1 = 0-10Vdc 2 = 2-10Vdc 3 = 0-20mA 4 = 4-20mA



ID	Name	Description	W?	Notes
MSV.12	SystemLanguage	Available language options, English and Francais.	Present Value	1 = English 2 = Français
MSV.13	OccupancyState	Status of the Occupancy Schedule.	Present Value	1 = Occupied 2 = Unoccupied 3 = Vacancy 4 = Off
MSV.14	AutoDrainState	Status of Auto Drain function.	Present Value	1= Wait 2= Start 3= Stop
MSV.15	AutoDrainConfig	Status of Auto Drain configuration.	Present Value	1= Interval 2= Schedule
MSV.16	Module1State	Status of Module 1.	Present Value	1= Stand-by 2= Drain Cycle 3= Disinfection Cycle 4= Filling 5= Ready 6= Alarm
MSV.17	Module2State	Status of Module 2.	Present Value	1= Stand-by 2= Drain Cycle 3= Disinfection Cycle 4= Filling 5= Ready 6= Alarm
MSV.18	Module3State	Status of Module 3.	Present Value	1= Stand-by 2= Drain Cycle 3= Disinfection Cycle 4= Filling 5= Ready 6= alarm
MSV.19	Module4State	Status of Module 4.	Present Value	1= Stand-by 2= Drain Cycle 3= Disinfection Cycle 4= Filling 5= Ready 6= Alarm

## Program Value (PRG)

ID	Name	Description	W?	Notes
PRG.1	ControllerUpdate	<p>Represents the firmw are upgrade process available for the controller.</p> <p><b>Read to program_status</b></p> <ul style="list-style-type: none"> <li>PS_LOADING: Firmw are update request is pending.</li> <li>PS_WAITING: Firmw are update is available and firmw are update request is not pending.</li> <li>PS_HALTED: Firmw are update is not available.</li> </ul> <p><b>Read to program_change</b></p> <ul style="list-style-type: none"> <li>PR_READY: Ready to update.</li> <li>PR_HALT: Not ready to update, you can run a firmw are file validation (PR_RUN).</li> </ul> <p><b>Write to program_change</b></p> <ul style="list-style-type: none"> <li>PR_LOAD: If firmw are update is ready (validated), request an update.</li> <li>PR_RUN: Request firmw are file validation.</li> <li>PR_RESTART: Reboot controller.</li> </ul>	Program Change	<p><b>program_state:</b></p> <p>PS_IDLE = 0          PS_LOADING = 1          PS_RUNNING = 2          PS_WAITING = 3          PS_HALTED = 4          PS_UNLOADING = 5</p> <p><b>program_change:</b></p> <p>PR_READY = 0          PR_LOAD = 1          PR_RUN = 2          PR_HALT = 3          PR_RESTART = 4          PR_UNLOAD = 5</p>
PRG.2	Module1Update	<p>Represents the firmw are upgrade process available for Module 1.</p> <p><b>Read to program_status</b></p> <ul style="list-style-type: none"> <li>PS_LOADING: Firmw are update request is pending.</li> <li>PS_WAITING: Firmw are update is available and firmw are update request is not pending.</li> <li>PS_HALTED: No firmw are update available.</li> </ul> <p><b>Read to program_change</b></p> <ul style="list-style-type: none"> <li>PR_READY: Ready to update.</li> <li>PR_HALT: Not ready to update, you can run a firmw are file validation (PR_RUN).</li> </ul> <p><b>Write to program_change</b></p> <ul style="list-style-type: none"> <li>PR_LOAD: If firmw are update is ready (validated), request an update.</li> <li>PR_RUN: Request firmw are file validation.</li> </ul>	Program Change	<p><b>program_state:</b></p> <p>PS_IDLE = 0          PS_LOADING = 1          PS_RUNNING = 2          PS_WAITING = 3          PS_HALTED = 4          PS_UNLOADING = 5</p> <p><b>program_change:</b></p> <p>PR_READY = 0          PR_LOAD = 1          PR_RUN = 2          PR_HALT = 3          PR_RESTART = 4          PR_UNLOAD = 5</p>
PRG.3	Module2Update	<p>Represents the firmw are upgrade process available for Module 2.</p> <p><b>Read to program_status</b></p> <ul style="list-style-type: none"> <li>PS_LOADING: Firmw are update request is pending.</li> <li>PS_WAITING: Firmw are update is available and firmw are update request is not pending.</li> <li>PS_HALTED: No firmw are update is available.</li> </ul> <p><b>Read to program_change</b></p> <ul style="list-style-type: none"> <li>PR_READY: Ready to update.</li> <li>PR_HALT : Not ready to update, you can run a firmw are file validation (PR_RUN).</li> </ul> <p><b>Write to program_change</b></p> <ul style="list-style-type: none"> <li>PR_LOAD: If firmw are update is ready (validated), request an update.</li> <li>PR_RUN: Request firmw are file validation.</li> </ul>	Program Change	<p><b>program_state:</b></p> <p>PS_IDLE = 0          PS_LOADING = 1          PS_RUNNING = 2          PS_WAITING = 3          PS_HALTED = 4          PS_UNLOADING = 5</p> <p><b>program_change:</b></p> <p>PR_READY = 0          PR_LOAD = 1          PR_RUN = 2          PR_HALT = 3          PR_RESTART = 4          PR_UNLOAD = 5</p>
PRG.4	Module3Update	<p>Represents the firmw are upgrade process available for module 3.</p> <p><b>Read to program_status</b></p> <ul style="list-style-type: none"> <li>PS_LOADING: Firmw are update request is pending.</li> <li>PS_WAITING: Firmw are update is available and firmw are update request is not pending.</li> <li>PS_HALTED: No firmw are update is available.</li> </ul> <p><b>Read to program_change</b></p> <ul style="list-style-type: none"> <li>PR_READY: Ready to update.</li> </ul>	Program Change	<p><b>program_state:</b></p> <p>PS_IDLE = 0          PS_LOADING = 1          PS_RUNNING = 2          PS_WAITING = 3          PS_HALTED = 4          PS_UNLOADING = 5</p>

ID	Name	Description	W?	Notes
		<ul style="list-style-type: none"> <li>PR_HALT: Not ready to update, you can run a firmw are file validation (PR_RUN).</li> </ul> <b>Write to program_change</b> <ul style="list-style-type: none"> <li>PR_LOAD: If firmw are update is ready (validated), request an update.</li> <li>PR_RUN: Request firmw are file validation.</li> </ul>		<b>program_change:</b> PR_READY = 0 PR_LOAD = 1 PR_RUN = 2 PR_HALT = 3 PR_RESTART = 4 PR_UNLOAD = 5
PRG.5	Module4Update	Represents the firmw are upgrade process available for module 4. <b>Read to program_status</b> <ul style="list-style-type: none"> <li>PS_LOADING: Firmw are update request is pending.</li> <li>PS_WAITING: Firmw are update is available and firmw are update request is not pending.</li> <li>PS_HALTED: No firmw are update available.</li> </ul> <b>Read to program_change</b> <ul style="list-style-type: none"> <li>PR_READY: Ready to update.</li> <li>PR_HALT: Not ready to update, you can run a firmw are file validation (PR_RUN).</li> </ul> <b>Write to program_change</b> <ul style="list-style-type: none"> <li>PR_LOAD: If firmw are update is ready (validated), request an update.</li> <li>PR_RUN: Request firmw are file validation.</li> </ul>	Program Change	<b>program_state:</b> PS_IDLE = 0 PS_LOADING = 1 PS_RUNNING = 2 PS_WAITING = 3 PS_HALTED = 4 PS_UNLOADING = 5  <b>program_change:</b> PR_READY = 0 PR_LOAD = 1 PR_RUN = 2 PR_HALT = 3 PR_RESTART = 4 PR_UNLOAD = 5

## File (File)

ID	Name	Description	W?	Notes
File.1	ControllerUpdate	File object of the controller firmw are upgrade.	File Size	Stream access method via atomicWriteFile and atomicReadFile.
File.2	ControllerBootloaderUpdate	File object of the controller bootloader firmw are upgrade.	File Size	Stream access method via atomicWriteFile and atomicReadFile.
File.3	ModuleUpdate	File object of the modules firmw are upgrade.	File Size	Stream access method via atomicWriteFile and atomicReadFile.
File.4	ModuleBootloaderUpdate	File object of the modules bootloader firmw are upgrade.	File Size	Stream access method via atomicWriteFile and atomicReadFile.

## Schedule (SCH)

ID	Name	Description	W?	Notes
SCH.1	DrainSchedule	Weekly auto-drain schedule to specify when to manage auto-drain cycles.	Weekly Schedule	Result is w ritten into AutoDrainState's present value (MSV.14). See AutoDrainState for the list of valid event values.
SCH.2	OccupancySchedule	Weekly occupancy schedule to specify which occupancy state is active during specific periods of day.	Weekly Schedule	Result is w ritten into OccupancyState's present value (MSV.13). See OccupancyState for the list of valid event values.