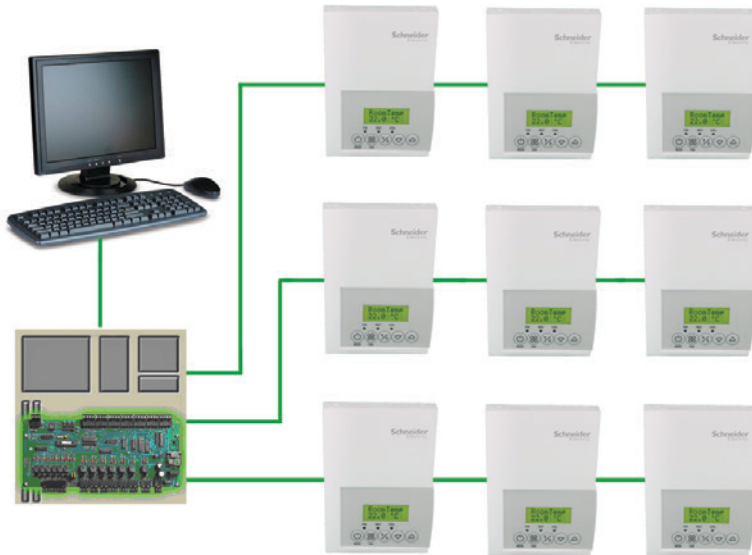


BACnet® Integration Manual

PIR Ready SE76xx Series
With & Without Scheduling Controllers
For Commercial HVAC Applications



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PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)

Vendor Name: Schneider Electric

Supported BACnet® Services: The BACnet® communicating controller meets all requirements for designation as an Application Specific Controller (B-ASC). The BACnet® controller series supports the following BACnet® Interoperability Building Blocks (BIBBs).

| Application Service | Designation |
|--|-------------|
| Data Sharing – Read Property - B | DS-RP-B |
| Data Sharing – Read Property Multiple - B | DS-RPM-B |
| Data Sharing – Write Property - B | DS-WP-B |
| Device Management - Device Communication Control - B | DM-DCC-B |
| Device Management – Dynamic Device Binding - B | DM-DDB-B |
| Device Management – Dynamic Object Binding - B | DM-DOB-B |

Note 1: The controller does not support segmented requests or responses.

Note 2: Time synchronization can be made through a network even if the controller does not support the full date. Therefore, the device cannot claim conformance to the DeviceManagement – TimeSynchronization - B (DM-TS-B) service. The device object does not have the Local_Time or Local_Date properties.



SE7600 Series

OBJECTS TABLE

| Object Name | Type and Instance | Object Property | Controller Parameter |
|--------------|-------------------|---|---|
| SE76xxX5x45B | Device | Object_Identifier Property 75 (R,W) | Unique ID number of a device on a network |
| | | Object_Name Property 77 (R,W) | Unique name of a Device on a network |
| | | Model Name Property 70 (R) | Controller Model number |
| | | Firmware Revision Property 44 (R) | Current BACnet® firmware revision used by the controller |
| | | Protocol Version Property 98 (R) | Current BACnet® firmware protocol version Default is Version 1 |
| | | Protocol Revision Property 139 (R) | Current BACnet® firmware protocol revision Default is Version 2 |
| | | Max ADPU Length Property 62 (R) | Maximum ADPU Length accepted Default is 244 |
| | | ADPU Timeout Property 10 (R) | ADPU timeout value Default is 60 000 ms |
| | | Application-Software-Version Property 12 (R) | Controller base application software version Default is based on current released version |
| | | Max_Master (R,W) | Maximum master devices allowed to be part of the network. 0 to 127, default is 127 |
| | | MS/TP_Address Property 1001 (R,W) | BACnet® MS/TP MAC Address. Proprietary attribute. Default is as assigned by configuration. |
| | | MS/TP_Baud_Rate Property 1002 (R,W) | BACnet® MS/TP Baud-Rate. Proprietary attribute. Range is: 1 = 9.6 Kbps, 2 = 19.2 Kbps, 3 = 38.4 Kbps, 4 = 76.8 Kbps and 5 = Auto Baud Rate. Index 5 is <i>Write only</i> . Reading attribute will state current Baud rate used. Writing index 1 to 4 will fix the Baud rate to the desired value. |

OBJECTS TABLE

| Object Name | Type and Instance | Object Property | SE7600A5x45B | SE7652A5x45B | SE7600B5x45B | SE7652B5x45B | SE7605B5x45B | SE7656B5x45B | SE7607B5x45B | SE7657B5x45B | SE7600H5x45B | SE7652H5x45B | SE7600W5x45B | SE7652W5x45B | SE7606E5x45B | SE7656E5x45B | SE7600F5x45B | SE7652F5x45B |
|------------------------|-------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Room Temperature | AV 7 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Room Temp Override | BV 8 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Outdoor Temperature | AV 9 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Outdoor Temp Override | BV 10 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Room Humidity | AV 11 | Present_Value (R,W) | | | | | | | √ | √ | | | √ | √ | | | | |
| Room Humidity Override | BV 13 | Present_Value (R,W) | | | | | | | | | | | √ | √ | | | | |
| Occupancy Command | MV 12 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| System Mode HP | MV 13 | Present_Value (R,W) | | | | | | | | | √ | √ | | | | | | |
| System Mode RTU | MV 14 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ |
| Fan Mode | MV 15 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Supply Temperature | AI 16 | Present_Value (R) | √ | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ | √ | √ |
| Supply RH | AV 17 | Present_Value (R) | | | | | | | √ | √ | | | | | | | | |
| Water Temperature | AV 17 | Present_Value (R,W) | | | | | | | | | | | √ | √ | | | | |
| Keypad Lockout | MV 18 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Fresh Air Level | AI 46 | Present_Value (R) | | | | | | | | | | | | | √ | √ | | |
| Control Output | GR 19 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PI Heating Demand | AV 20 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PI Cooling Demand | AV 21 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| AI1 Value | AI 23 | Present_Value (R) | | | | | | | | | | | | | √ | √ | | |
| Economizer Output | AV 22 | Present_Value (R) | | | | | | √ | √ | | | | | | √ | √ | | |
| Analog Heat Output | AV 35 | Present_Value (R) | | | | | | | | | | | | | √ | √ | √ | √ |
| Controller Status | GRP 23 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| AUX | BI 24 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| G Fan | BI 25 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Y1 Cool | BI 26 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Y2 Cool | BI 27 | Present_Value (R) | | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| W1 Heat | BI 28 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | | |
| W2 Heat | BI 29 | Present_Value (R) | | | √ | √ | √ | √ | √ | √ | | | | | √ | √ | | |
| Reversing Valve | BI 30 | Present_Value (R) | | | | | | | | | √ | √ | √ | √ | | | | |
| DI 1 Status | BI 31 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| DI 2 Status | BI 32 | Present_Value (R) | √ | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ |
| Local Motion | BI 33 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Effective Occupancy | MV 34 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Controller Alarms | GRP 35 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Analog Heat Output | AV 35 | Present_Value (R) | | | | | | | | | | | | | √ | √ | √ | √ |
| Frost Alarm | BI 36 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Clock Alarm | BI 37 | Present_Value (R) | | √ | | √ | | √ | | √ | | √ | | √ | | √ | | √ |
| Filter Alarm | BI 38 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| Service Alarm | BI 39 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| Fan Lock Alarm | BI 40 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Temperature Setpoints | GRP 41 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

OBJECTS TABLE

| Object Name | Type and Instance | Object Property | SE7600A5x45B | SE7652A5x45B | SE7600B5x45B | SE7652B5x45B | SE7605B5x45B | SE7656B5x45B | SE7607B5x45B | SE7657B5x45B | SE7600H5x45B | SE7652H5x45B | SE7600W5x45B | SE7652W5x45B | SE7606E5x45B | SE7656E5x45B | SE7600F5x45B | SE7652F5x45B |
|---|-------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | | | | | | | | | | | | | | | | |
| Occupied Heat Setpoint | AV 42 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Occupied Cool Setpoint | AV 43 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Unoccupied Heat Setpoint | AV 44 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Unoccupied Cool Setpoint | AV 45 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Fresh Air Level | AI 46 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| General Options 1- | GRP 46 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Temperature Scale | BV 47 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Heating Setpoint Limit | AV 48 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Cooling Setpoint Limit | AV 49 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Heating Lockout Temperature | AV 50 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Cooling Lockout Temperature | AV 51 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Deadband | AV 52 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Heating CPH | MV 53 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | | |
| Cooling CPH | MV 54 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Frost Protection | BV 55 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Aux Contact | BV 56 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | | √ | √ |
| Menu Scroll | BV 57 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Supply Heat Lockout Status | BV 58 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | √ | √ |
| General Options 2- | GRP 58 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Password Value | AV 59 | Present_Value (R) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Power-up Delay | AV 60 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Temporary Occ. Time | MV 61 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Fan Control | BV 62 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Anticycle | MV 63 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Fan Purge Delay | BV 64 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| DI 1 Configuration | MV 65 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| DI 2 Configuration | MV 66 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ |
| Proportional Band | MV 67 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Unoccupied Time | AV 68 | Present_Value (R,W) | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| CO2 Level | AI 69 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| With schedule Model Configuration Options | GRP 69 | Present_Value (R,W) | | √ | | √ | | √ | | √ | | √ | | √ | | √ | | √ |
| Progressive Recovery | BV 70 | Present_Value (R,W) | | √ | | √ | | √ | | √ | | √ | | √ | | √ | | √ |
| Event Display | MV 71 | Present_Value (R,W) | | √ | | √ | | √ | | √ | | √ | | √ | | √ | | √ |
| Stages Configuration Options | GRP 72 | Present_Value (R,W) | | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Discharge Air Alarm | BI 72 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | √ | √ |

OBJECTS TABLE

| Object Name | Type and Instance | Object Property | SE7600A5x45B | SE7652A5x45B | SE7600B5x45B | SE7652B5x45B | SE7605B5x45B | SE7656B5x45B | SE7607B5x45B | SE7657B5x45B | SE7600H5x45B | SE7652H5x45B | SE7600W5x45B | SE7652W5x45B | SE7606E5x45B | SE7656E5x45B | SE7600F5x45B | SE7652F5x45B |
|--|-------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Heating Stages | MV 73 | Present_Value (R,W) | | | √ | √ | √ | √ | √ | √ | | | | | √ | √ | | |
| Cooling Stages | MV 74 | Present_Value (R,W) | | | √ | √ | √ | √ | √ | √ | | | | | √ | √ | √ | √ |
| Heatpump Stages | MV 75 | Present_Value (R,W) | | | | | | | | | √ | √ | √ | √ | | | | |
| Economizer Model Configuration Options | GRP 76 | Present_Value (R) | | | | | √ | √ | | | | | | | √ | √ | | |
| Fresh Air Max Range | AV 76 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| Economizer Changeover Setpoint | AV 77 | Present_Value (R,W) | | | | | √ | √ | | | | | | | √ | √ | | |
| Economizer Minimum Position | AV 78 | Present_Value (R,W) | | | | | √ | √ | | | | | | | √ | √ | | |
| Mechanical Cooling Enabled | BV 79 | Present_Value (R,W) | | | | | √ | √ | | | | | | | √ | √ | | |
| Mixed Air Setpoint | AV 80 | Present_Value (R,W) | | | | | √ | √ | | | | | | | √ | √ | | |
| Heatpump Model Configuration Options | GRP 81 | Present_Value (R) | | | | | | | | | √ | √ | | | | | | |
| Economizer Max Position | AV 81 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| High Balance Point | AV 82 | Present_Value (R,W) | | | | | | | | | √ | √ | | | | | | |
| Discharge High Limit Setpoint | AV 82 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | √ | √ |
| Low Balance Point | AV 83 | Present_Value (R,W) | | | | | | | | | √ | √ | | | | | | |
| Discharge Low Limit Setpoint | AV 83 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | √ | √ |
| Comfort Mode | BV 84 | Present_Value (R,W) | | | | | | | | | √ | √ | | | | | | |
| High CO2 Alarm | BI 84 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| Reversing Valve Configuration | BV 85 | Present_Value (R,W) | | | | | | | | | √ | √ | √ | √ | | | | |
| Compressor Interlock | BV 86 | Present_Value (R,W) | | | | | | | | | √ | √ | | | | | | |
| Fresh Air Alarm | BI 86 | | | | | | | | | | | | | | √ | √ | | |
| Dehumidification Model Configuration Options | GRP 87 | Present_Value (R) | | | | | | | √ | √ | | | | | | | | |
| RH Display | BV 88 | Present_Value (R,W) | | | | | | | √ | √ | | | √ | √ | | | | |
| Dehumidification RH Setpoint | AV 89 | Present_Value (R,W) | | | | | | | √ | √ | | | √ | √ | | | | |
| Dehumidification Hysterisys | AV 90 | Present_Value (R,W) | | | | | | | √ | √ | | | √ | √ | | | | |
| Dehumidification Low OA Lockout | AV 91 | Present_Value (R,W) | | | | | | | √ | √ | | | √ | √ | | | | |
| Dehumidification Lockout Functions | BV 92 | Present_Value (R,W) | | | | | | | √ | √ | | | | | | | | |
| Dehumidification Lockout Functions | MV 92 | Present_Value (R,W) | | | | | | | | | | | √ | √ | | | | |
| Dehumidification Output Status | BI 93 | Present_Value (R) | | | | | | | √ | √ | | | √ | √ | | | | |
| Humidification Model Configuration Options | GRP 94 | Present_Value (R) | | | | | | | √ | √ | | | | | | | | |
| A11 Config | BV 94 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| Humidification RH Setpoint | AV 95 | Present_Value (R,W) | | | | | | | √ | √ | | | | | | | | |
| Minimum Supply Heat Setpoint | AV 95 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | √ | √ |

OBJECTS TABLE

| Object Name | Type and Instance | Object Property | SE7600A5x45B | SE7652A5x45B | SE7600B5x45B | SE7652B5x45B | SE7605B5x45B | SE7656B5x45B | SE7607B5x45B | SE7657B5x45B | SE7600H5x45B | SE7652H5x45B | SE7600W5x45B | SE7652W5x45B | SE7606E5x45B | SE7656E5x45B | SE7600F5x45B | SE7652F5x45B |
|--|-------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | | | | | | | | | | | | | | | | |
| Eff (Effective) Reset Humidification RH Spt (Setpoint) | AV 96 | Present_Value (R) | | | | | | | √ | √ | | | | | | | | |
| Supply Heat Lockout temperature | AV 96 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | √ | √ |
| Humidification High Limit Spt (Setpoint) | AV 97 | Present_Value (R,W) | | | | | | | √ | √ | | | | | | | | |
| Supply PI Heat Demand | AV 97 | Present_Value (R) | | | | | | | | | | | | | √ | √ | √ | √ |
| Low RH Setpoint | AV 98 | Present_Value (R,W) | | | | | | | √ | √ | | | | | | | | |
| Minimum Fresh Air | AV 98 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| Low Temp Reset RH Setpoint | AV 99 | Present_Value (R,W) | | | | | | | √ | √ | | | | | | | | |
| Maximum Fresh Air | AV 99 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| High Temp Reset RH Setpoint | AV 100 | Present_Value (R,W) | | | | | | | √ | √ | | | | | | | | |
| Minimum CO2 Level | AV 100 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| Humidifier Output | AV 101 | Present_Value (R) | | | | | | | √ | √ | | | | | | | | |
| Maximum CO2 Level | AV 101 | Present_Value (R,W) | | | | | | | | | | | | | √ | √ | | |
| Local Schedule | SCH 102 | Present_Value (R,W) | | √ | | √ | | √ | | √ | | √ | | √ | | √ | | √ |

STANDARD OBJECT TYPES SUPPORTED*

| Object Type | Supported Objects | Dynamically Creatable | Dynamically Deletable | Optional Properties Supported | Writable Properties |
|-------------------|-------------------------------------|--------------------------|--------------------------|---|---|
| Analog Input | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability | Out_of_Service |
| Analog Value | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability | Present_Value ^a Out_of_Service ^a Object_Name ^b |
| Binary Input | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability Active_Text Inactive_Text | Out_of_Service |
| Binary Value | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability Active_Text Inactive_Text | Present_Value Out_of_Service |
| Device | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Max_Master Max_Info_frames | Object_Identifier Object_name Max_Master |
| Group | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | N/A | N/A |
| Multi-state Value | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability States_Text | Present_Value ^d Out_of_Service ^d |
| Schedule | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Weekly_schedule | Present_Value Weekly_Schedule |

Notes

a : The following AV's are defined as read only. When Out_of_Service properties is set to true, the Present_Value if written is not derived to the application level of the controller.

- Room Humidity (AV11)
- PI Heating Demand (AV20)
- PI Cooling Demand (AV21)
- Economizer Output (AV22)
- Eff Reset Humidification RH Spt (AV96)
- Humidifier Output (AV101)

b: Object_Name property is writable for 1 object only :

- Room_Temperature (AV7)

PROPRIETARY PROPERTIES

| Property name | ID | BACnet® Data type | Description |
|-----------------|------|-------------------|---|
| Major_Version | 1045 | CharacterString | The version number of the BACnet® communications module. This is the hardware version number. |
| MS/TP_Address | 1001 | Unsigned | Display the MAC layer address of the module. |
| MS/TP_Baud_Rate | 1002 | Unsigned | Display the communication baud rate of the module. |
| Sensor_Offset | 1005 | REAL | Display the temperature or humidity calibration value. The range is -5.0 deg F to 5.0 deg F for temperature and -15% to 15% for humidity. |

* Note: Please note that some object type and instant numbers have the same object name.

Therefore please make sure to see the table above for more detailed information on each controller model

PROPERTY VALUE RANGE RESTRICTIONS FOR AI AND AV OBJECTS

| Object name | Object Type and instance | Under range value | Over range value | Default value |
|--------------------------------|--------------------------|-------------------|------------------|---------------|
| Room Temperature | AV 7 | -40°F (-40°C) | 122°F (50°C) | N/A |
| Outdoor Temperature | AV 9 | -40°F (-40°C) | 122°F (50°C) | N/A |
| Room Humidity | AV 11 | 0% | 100% | N/A |
| Supply Temp | AI 16 | -40°F (-40°C) | 122°F (50°C) | N/A |
| Supply RH | AV 17 | 0% | 100% | N/A |
| Water Temperature | AV 17 | -40°F (-40°C) | 122°F (50°C) | N/A |
| PI Heating Demand | AV 20 | 0% | 100% | N/A |
| PI Cooling Demand | AV 21 | 0% | 100% | N/A |
| Economizer Output | AV 22 | 0% | 100% | N/A |
| AI1 Value | AI 23 | 0 VDC | 10 VDC | N/A |
| Analog Heat Output | AV 35 | 0% | 100% | N/A |
| Occupied Heat Setpoint | AV 42 | 40°F (4.5°C) | 90°F (32°C) | 72°F (22°C) |
| Occupied Cool Setpoint | AV 43 | 54°F (12°C) | 100°F (37.5°C) | 75°F (24°C) |
| Unoccupied Heat Setpoint | AV 44 | 40°F (4.5°C) | 90°F (32°C) | 62°F (16.5°C) |
| Fresh Air Level | AI 46 | 0 CFM | 20000 CFM | N/A |
| Unoccupied Cool Setpoint | AV 45 | 54°F (12°C) | 100°F (37.5) | 80°F (26.5°C) |
| Heating Setpoint Limit | AV 48 | 40°F (4.5°C) | 90°F (32°C) | 90°F (32°C) |
| Cooling Setpoint Limit | AV 49 | 54°F (12°C) | 100°F (37.5) | 54°F (12°C) |
| Heating Lockout Temperature | AV 50 | -15°F (-26°C) | 120°F (49°C) | 120°F (49°C) |
| Cooling Lockout Temperature | AV 51 | -40°F (-40°C) | 95°F (35°C) | -40°F (-40°C) |
| Deadband | AV 52 | 2°F (1°C) | 4°F (2°C) | 2°F (1°C) |
| Password Value | AV 59 | 0 | 1000 | 0 |
| Power-up Delay | AV 60 | 10 sec | 120 sec | 10 sec |
| Unoccupied Time | AV 68 | 0.5 hrs | 24.0. hrs | 0.5 hrs |
| CO2 Level | AI 69 | 0 PPM | 2000 PPM | N/A |
| Fresh Air Max Range | AV 76 | 0 CFM | 20000 CFM | N/A |
| Economizer Changeover Setpoint | AV 77 | 14°F (-10°C) | 70°F (21°C) | 55°F (13°C) |
| Economizer Minimum Position | AV 78 | 0% | 100% | 0% |
| Mixed Air Setpoint | AV 80 | 50°F (10°C) | 90°F (32°C) | 55°F (13°C) |
| Economizer Max Position | AV 81 | 0% | 100% | N/A |
| High Balance Point | AV 82 | 34°F (1°C) | 90°F (32°C) | 90°F (32°C) |
| Discharge High Limit Setpoint | AV 82 | 70°F (21°C) | 150°F (65°C) | 120°F (49°C) |
| Discharge Low Limit Setpoint | AV 83 | 35°F (2C) | 65°F(19C) | 65°F (7°C) |
| Low Balance Point | AV 83 | -40°F (-40°C) | 30°F (-1°C) | -12°F (-24°C) |
| Dehumidification RH Setpoint | AV 89 | 30% | 95% | 50% |
| Dehumidification RH Setpoint | AV 89 | 20% | 100% | 50% |

PROPERTY VALUE RANGE RESTRICTIONS FOR AI AND AV OBJECTS (CONT'D)

| Object name | Object Type and instance | Under range value | Over range value | Default value |
|--|--------------------------|-------------------|------------------|---------------|
| Dehumidification Hysterisys | AV 90 | 2% | 20% | 5% |
| Dehumidification Low OA Lockout | AV 91 | -40°F (-40°C) | 122°F (50°C) | 32°F (0°C) |
| Humidification RH Setpoint | AV 95 | 10% | 90% | 50% |
| Minimum Supply Heat Setpoint | AV 95 | 50°F(10°C) | 72°F(20°C) | 64°F(18°C) |
| Eff (Effective) Reset Humidification RH Spt (Setpoint) | AV 96 | 0% | 100% | N/A |
| Supply Heat Lockout Temperature | AV 96 | -15°F(-26°C) | 120°F(49°C) | 32°F(0°C) |
| Humidification High Limit Spt (Setpoint) | AV 97 | 50% | 90% | 85% |
| Supply PI Heat Demand | AV 97 | 0% | 100% | N/A |
| Low RH Setpoint | AV 98 | 10% | 90% | 20% |
| Minimum Fresh Air | AV 98 | 0 CFM | 20000 CFM | N/A |
| Low Temp Reset RH Setpoint | AV 99 | -40°F (-40°C) | 15°F (-9.5°C) | -20°F (-29°C) |
| Maximum Fresh Air | AV 99 | 0 CFM | 20000 CFM | N/A |
| High Temp Reset RH Setpoint | AV 100 | 20°F (-6.5°C) | 55°F (13°C) | 32°F (0.0°C) |
| Minimum CO2 Level | AV 100 | 0 PPM | 2000 PPM | 800 PPM |
| Humidifier Output | AV 101 | 0% | 100% | N/A |
| Maximum CO2 Level | AV 101 | 0 PPM | 2000 PPM | 1200 PPM |

PROPERTY ENUMERATION SETS FOR BV OBJECTS AND BI OBJECTS

| Object Name | Object Type and instance | Inactive_Text | Active_Text | Default value |
|------------------------|--------------------------|---------------|-------------|---------------|
| Room Temp Override | BV 8 | Normal | Override | Normal |
| Outdoor Temp Override | BV 10 | Normal | Override | Normal |
| Room Humidity Override | BV 13 | Normal | Override | Normal |
| AUX | BI 24 | Off | On | Off |
| | BI 23 | | | |
| G Fan | BI 25 | Off | On | Off |
| Y1 Cool | BI 26 | Off | On | Off |
| Y2 Cool | BI 27 | Off | On | Off |
| W1 Heat | BI 28 | Off | On | Off |
| W2 Heat | BI 29 | Off | On | Off |
| Reversing Valve | BI 30 | Off | On | Off |
| DI 1 Status | BI 31 | Not Activated | Activated | Not Activated |
| DI 2 Status | BI 32 | Not Activated | Activated | Not Activated |
| Local Motion | BI 33 | No Motion | Motion | No Motion |
| Frost Alarm | BI 36 | Off | On | Off |
| Clock Alarm | BI 37 | Off | On | Off |

PROPERTY ENUMERATION SETS FOR BV OBJECTS AND BI OBJECTS (CONT'D)

| Object Name | Object Type and instance | Inactive_Text | Active_Text | Default value |
|------------------------------------|--------------------------|------------------------------------|------------------------------------|------------------------------------|
| Room Temp Override | BV 8 | Normal | Override | Normal |
| Room Humidity Override | BV 11 | Normal | Override | Normal |
| Dehumidification Lockout | BV 13 | Disabled | Enabled | Enabled |
| AUX Command | BV 14 | Off | On | Off |
| Dehumidification Status | BI 23 | Off | On | Off |
| Aux Status | BI 25 | Off | On | Off |
| BI 1 Status | BI 29 | Deactivated | Activated | Deactivated |
| BI 2 Status | BI 30 | Deactivated | Activated | Deactivated |
| UI 3 Status(*) | BI 31 | Deactivated | Activated | Deactivated |
| Local Motion | BI 32 | No Motion | Motion | No Motion |
| Window Alarm | BI 35 | Off | On | Off |
| Filter Alarm | BI 36 | Off | On | Off |
| Filter Alarm | BI 38 | Off | On | Off |
| Service Alarm | BI 39 | Off | On | Off |
| Fan Lock Alarm | BI 40 | Off | On | Off |
| Temperature Scale | BV 47 | °C | °F | °F |
| Frost Protection | BV 55 | Off | On | Off |
| Aux Contact | BV 56 | N.O. | N.C. | N.O. |
| Menu Scroll | BV 57 | No Scroll | Scroll Active | Scroll Active |
| Supply Heat Lock Status | BI 58 | Off | On | Inactive |
| Fan Control | BV 62 | Off | On | On |
| Fan Purge Delay | BV 64 | Off | On | Off |
| Progressive Recovery | BV 70 | Off | Active | Off |
| Discharge Air Alarm | BI 72 | Off | On | Off |
| Mechanical Cooling Enabled | BV 79 | Off | On | Off |
| Comfort Mode | BV 84 | Comfort | Economy | Comfort |
| High CO2 Alarm | BI 84 | Off | On | Off |
| Reversing Valve Configuration | BV 85 | Normally Cool Energized in Heating | Normally Heat Energized in Cooling | Normally Heat Energized in Cooling |
| Compressor Interlock | BV 86 | Off | On | Off |
| Fresh Air Alarm | BI 86 | Off | On | Off |
| RH Display | BV 88 | Disabled | Enabled | Disabled |
| Dehumidification Lockout Functions | BV 92 | Disabled | Enabled | Enabled |
| Dehumidification Output Status | BI 93 | Off | On | N/A |
| AI1 Configuration | BV 94 | None | CO2 | None |

(*) This object will be linked to the value of the 'UI 3 Configuration' object. When the 'UI 3 Configuration' object value is 0, 3 or 4, the value will be set to 'Deactivated'

PROPERTY ENUMERATION SETS FOR MV OBJECTS

| Object Name | Object Type and Instance | BACnet® Index | Text | Default Value |
|--------------------------|--------------------------|---------------|--------------------|----------------------------|
| Occupancy Command | MV 12 | 1 | Local Occupancy | Local Occupancy |
| | | 2 | Occupied | |
| | | 3 | Unoccupied | |
| System Mode HPU | MV 13 | 1 | Off | Auto |
| | | 2 | Auto | |
| | | 3 | Cool | |
| | | 4 | Heat | |
| | | 5 | Emergency | |
| System Mode RTU | MV 14 | 1 | Off | Auto |
| | | 2 | Auto | |
| | | 3 | Cool | |
| | | 4 | Heat | |
| Fan Mode | MV 15 | 1 | On | Smart |
| | | 2 | Auto | |
| | | 3 | Smart | |
| Keypad Lockout | MV 18 | 1 | Level 0 | Level 0 |
| | | 2 | Level 1 | |
| | | 3 | Level 2 | |
| Effective Occupancy | MV 34 | 1 | Occupied | Depends on local occupancy |
| | | 2 | Unoccupied | |
| | | 3 | Temporary Occupied | |
| Heating CPH | MV 53 | 1 | 3 CPH | 4 CPH |
| | | 2 | 4 CPH | |
| | | 3 | 5 CPH | |
| | | 4 | 6 CPH | |
| | | 5 | 7 CPH | |
| | | 6 | 8 CPH | |
| Cooling CPH | MV 54 | 1 | 3 CPH | 4 CPH |
| | | 2 | 4 CPH | |
| Temporary Occupancy Time | MV 16 | 1 | 0 hour | 3 Hours |
| | | 2 | 1 hour | |
| | | 3 | 2 hours | |
| | | 4 | 3 hours | |
| | | 5 | 4 hours | |
| | | 6 | 5 hours | |
| | | 7 | 6 hours | |
| | | 8 | 7 hours | |
| | | 9 | 8 hours | |
| | | 10 | 9 hours | |
| | | 11 | 10 hours | |
| | | 12 | 11 hours | |
| | | 13 | 12 hours | |

PROPERTY ENUMERATION SETS FOR MV OBJECTS

| Object Name | Object Type and Instance | BACnet® Index | Text | Default Value |
|------------------------------------|--------------------------|---------------|-------------------|---------------|
| Anticycle | MV 63 | 1 | 0 minute | 2 minutes |
| | | 2 | 1 minute | |
| | | 3 | 2 minutes | |
| | | 4 | 3 minutes | |
| | | 5 | 4 minutes | |
| | | 6 | 5 minutes | |
| DI1 Configuration | MV 65 | 1 | None | None |
| | | 2 | RemNSB | |
| | | 3 | RemOVR | |
| | | 4 | Filter | |
| | | 5 | Service | |
| | | 6 | Fan lock | |
| DI2 Configuration | MV 66 | 1 | None | None |
| | | 2 | RemNSB | |
| | | 3 | RemOVR | |
| | | 4 | Filter | |
| | | 5 | Service | |
| | | 6 | Fan lock | |
| Proportional Band | MV 67 | 1 | 2 2 F 0.6 C | 2 |
| | | 2 | 3 3 F 1.2 C | |
| | | 3 | 4 4 F 1.7 C | |
| | | 4 | 5 5 F 2.2 C | |
| | | 5 | 6 6 F 2.8 C | |
| | | 6 | 7 7 F 3.3 C | |
| | | 7 | 8 8 F 3.9 C | |
| Event Display | MV 71 | 1 | 2 Events | 2 Event |
| | | 2 | 4 Events | |
| Heating Stages | MV 73 | 1 | Analog Heat | 2 Stages |
| | | 2 | 1 Stage | |
| | | 3 | 2 Stages | |
| Cooling Stages | MV74 | 1 | 1 Stage | 2 Stages |
| | | 2 | 2 Stages | |
| Heat Pump Stages | MV75 | 1 | 1 Stage | 2 Stages |
| | | 2 | 2 Stages | |
| Dehumidification Lockout Functions | MV 92 | 1 | Disabled | N/A |
| | | 2 | Restricted | |
| | | | Enabled | |

INTEGRATION – GLOBAL COMMANDS

The following figure shows which objects from the controller can be monitored and commanded from the BAS front-end.

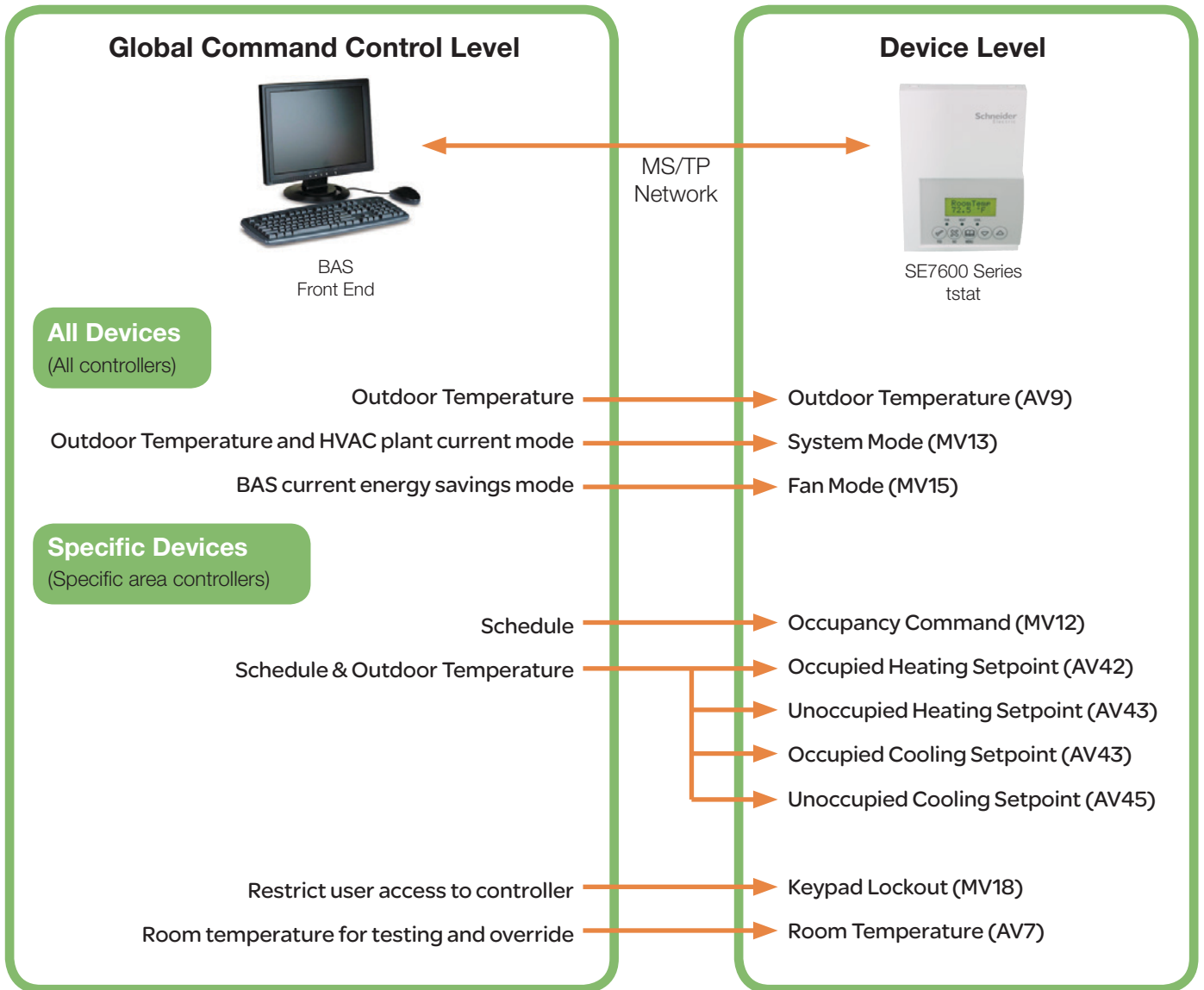


Figure 1: Global commands from a BAS front-end to a typical SE76xx series controller

SE7600X INTEGRATION – GRAPHICAL USER INTERFACE (GUI) OBJECTS

Objects that should typically be used in a GUI:

- Room Temperature (AV7)
- Occupied and Unoccupied Heat Setpoints (AV 42 and AV44)
- Occupied and Unoccupied Cool Setpoints (AV 43 and AV45)
- Outdoor Temperature (AV9)
- Supply Temperature (AI16) (If available)
- Occupancy Command (MV12)
- Effective Occupancy (MV34)
- System Mode RTU (MV14) or System Mode HPU (MV13)
- G Fan (BI25)
- Y1 Cool (BI26)
- Y2 Cool (BI27)
- W1 Heat (BI28)
- W2 Heat (BI29) or Reversing Valve (BI30);
- Economizer Output (AV22) (if available)
- Aux (BI24)
- DI 1 Status (BI31)
- DI 2 Status (BI 32)
- Frost Alarm (BI36) (if available)
- Filter Alarm (BI38) (if available)
- Service Alarm (BI39) (if available)
- Fan Lock Alarm (BI40) (if available)

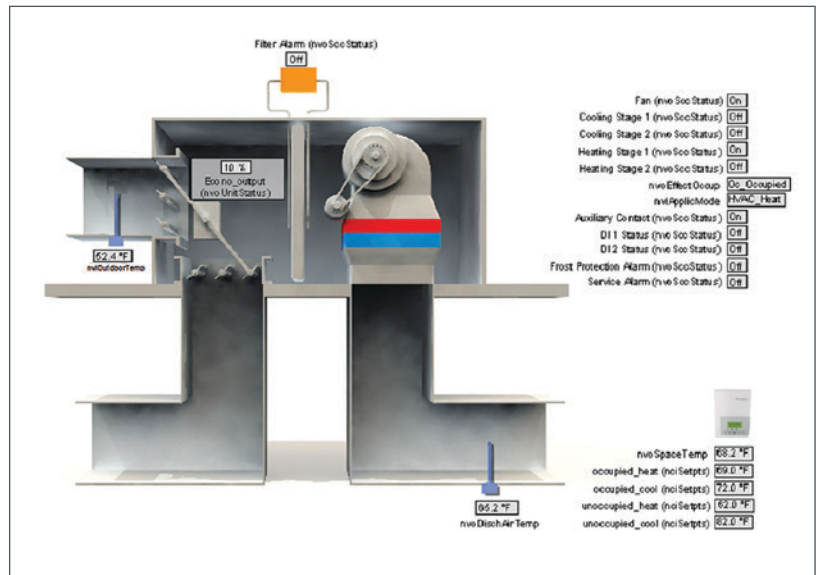


Figure-1 GUI Example - SE7600X

CONFIGURATION OBJECTS

The following objects and group objects should be typically used for configuration purposes:

- General Options 1 Group GRP 46 and its complete list of objects
- General Options 2 Group GRP 58 and its complete list of objects
- With schedule Model Configuration Options Group GRP 69 and its complete list of objects
- Stages Configuration Options Group GRP 72 and its complete list of objects
- Economizer Model Configuration Option Group GRP 76 and its complete list of objects
- Heatpump Model Configuration Option Group GRP 81 and its complete list of objects
- Dehumidification Model Configuration Option Group GRP 87 and its complete list of objects
- Humidification Model Configuration Option Group GRP 94 and its complete list of objects

If your BAS allows you to remove objects from your database, Schneider Electric recommends removing all configuration objects once your setup is complete. This will prevent unnecessary polling of non used objects and will help speed up the network.

WIRING GUIDE

Overview

Schneider Electric uses EIA-485 as the physical layer between their devices and supervisory controllers.

For clarity we will use the term “Device” to represent any product with an active EIA-485 network connection, including Schneider Electric and non-Schneider Electric controllers.

A summary of network specifications are listed below.

Summary Specifications

| Parameter | Details |
|-------------------------------------|---|
| Media | Twisted pair 22 AWG–24 AWG, shielded recommended |
| Characteristic Impedance | 100-130 ohms |
| Distributed capacitance | Less than 100 pF per meter (30 pF per foot) |
| Maximum length per segment | 1200 meters (4000 feet) Note: AWG 18 cable |
| Polarity | Polarity sensitive |
| Multi-drop | Daisy-chain (no T connections) |
| Terminations | <ol style="list-style-type: none"> Schneider Electric devices are installed at both ends of the MS/TP network: 120 Ohms resistor should be installed at each end. A Schneider Electric device is installed at one end of the MS/TP network and a third-party device is installed at the other end: Install an End-Of-Line resistor value that matches the third-party device instruction regarding the End-Of-Line resistors. Third-party devices are installed at both ends of the MS/TP network: Follow the third-party device instructions regarding the End-Of-Line resistors. |
| Network Bias Resistors | 510 ohms per wire (max. of two sets per segment) |
| Maximum number of nodes per segment | 64 (Schneider Electric devices only) |
| Maximum number of nodes per network | 128 |
| Baud rate | 9600, 19200, 38400, 76800 (Auto detect) |

Table 1: Summary of Specifications for a Schneider Electric EIA-485 Network

Cable Type

Schneider Electric recommends the use of balanced 22-24 AWG twisted pair with characteristic impedance of 100-130 ohms, capacitance of 30 pF/ft or lower. A braided shield is also recommended.

Impedance

A value based on the inherent conductance, resistance, capacitance and inductance that represent the impedance of an infinitely long cable. The nominal impedance of the cable should be between 100Ω and 120Ω. However using 120Ω will result in a lighter load on the network.

Capacitance (pF/ft)

The amount of equivalent capacitive load of the cable, typically listed in a per foot basis. One of the factors limiting total cable length is the capacitive load. Systems with long lengths benefit from using low capacitance cable (i.e. 17pF/ft or lower).

NETWORK CONFIGURATION

EIA-485 networks use a daisy chain configuration. A daisy chain means that there is only one main cable and every network device is connected directly along its path.

Figure 3 illustrates two improper network configurations and the proper daisy chain configuration.

Other methods of wiring an EIA-485 network may give unreliable and unpredictable results. There are no troubleshooting methods for these types of networks. Therefore, a great deal of site experimentation may have to be done, making this a difficult task with no guarantee of success. Schneider Electric will only support daisy chain configurations.

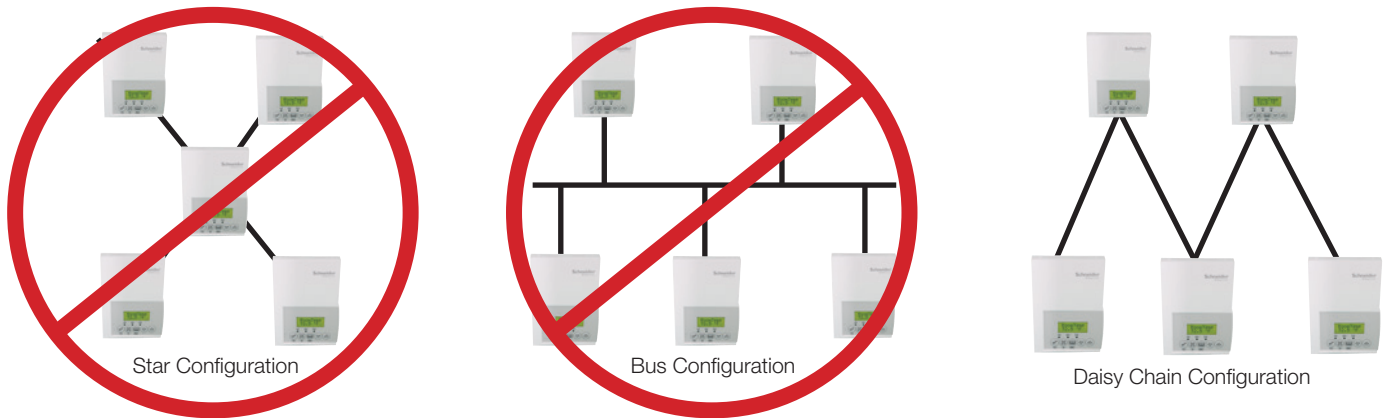


Figure 3: Three different network configurations: star, bus, and daisy chain. Only the daisy chain configuration is correct for an EIA-485 network

Maximum Number of Devices

A maximum of 64 nodes are allowed on a single daisy-chain segment. A node is defined as any device (Panel, Zone, Repeater, etc.) connected to the RS485 network. Terminators do not count as a node.

To determine the number of nodes on a network, add the following:

- One node for each device, including main panels
- One node for each repeater on the chain

For the example, in Figure 4 there is one node for the main SC panel, plus 4 for the controllers; for a total of 5 nodes.

If there are more than 64 devices, install repeaters to extend the network.

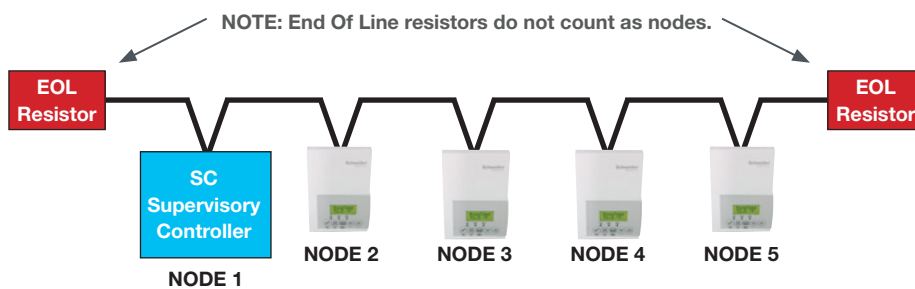


Figure 4: Example Network - 5 Nodes

Maximum Cable Length

The maximum length of a chain is related to its transmission speed. The longer the chain, the slower the speed. Using proper cable, the maximum length of an EIA-485 daisy chain is 4000-ft (1200 m). This will only work reliably for data rates up to 100,000 bps. Schneider Electric's maximum data rate is 76,800 bps.

If you require a maximum network length of more than 4000 feet, then repeaters are required to extend the network.

EIA-485 Repeaters

If you have more than 64 devices, or require a maximum network length of more than 4000 feet, then repeaters are required to extend the network. The best configuration is to daisy chain the repeaters to the main panel. From each of these repeaters, a separate daisy chain will branch off. Figure 5 demonstrates a valid use of repeaters in an EIA-485 network.

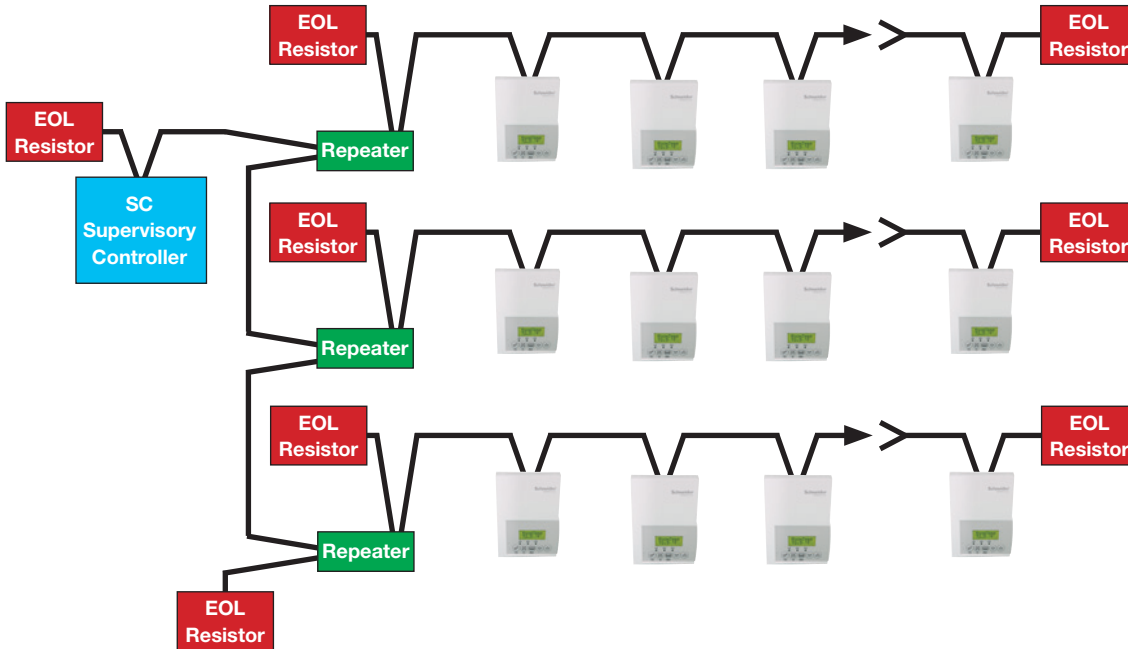


Figure-5 Correct Repeater Use in an EIA-485 Network

Do not install repeaters in series, as this may result in network reliability problems. Incorrect use of a repeater in an EIA-485 network is illustrated below in Figure-6.

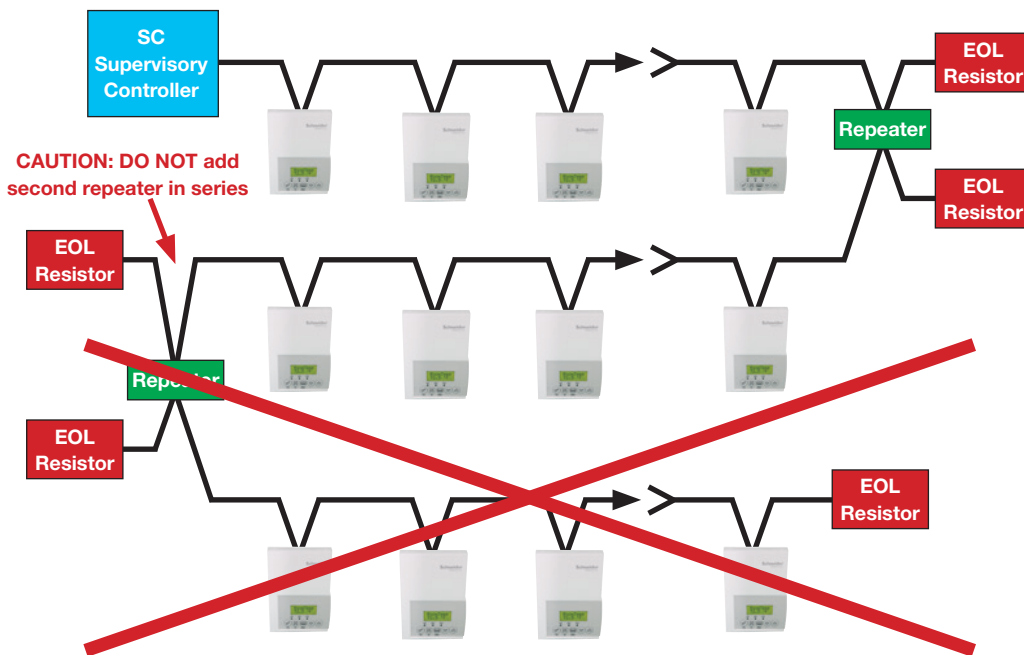


Figure-6 Incorrect Repeater Use in an EIA-485 Network

End Of Line (EOL) Resistors

MS/TP network must be properly terminated. For daisy chain configurations, you must install an EOL resistor at each end of the daisy chain. Depending on your MS/TP network configuration, the resistance value of the EOL resistor may change:

- Schneider Electric's devices are installed at both ends of the MS/TP network: 120 Ohms resistor should be installed at each end.
- A Schneider Electric device is installed at one end of the MS/TP network and a 3rd party device is installed at the other end:
Install an End-Of-Line resistor value that matches the 3rd party devices instructions regarding its EOL resistor value;
- 3rd party devices are installed at both ends of the MS/TP network:
Follow the 3rd party devices instructions regarding its EOL resistor value.

Network Adapter

The polarity of the connection to the cable is important. From one module to the other it is important that the same coloured wire be connected to “plus” or “+” and the other coloured wire be connected to the “minus” or “-“. Figures 7 shows the proper MS/TP connections and the location of the Status LED. This Status LED may help to troubleshoot network problems.

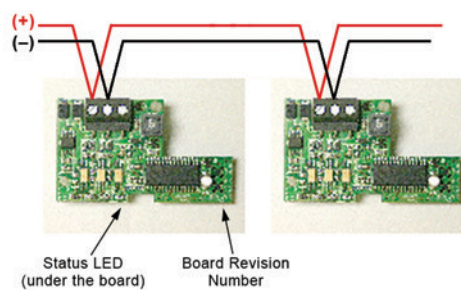


Figure-7 BACnet® Network Module Details

IMPORTANT NOTE: The Ref terminal should NEVER be used to wire shields. The 2 shields from each feed of the network connection to a controller should be wired together in the back of the controller and properly protected to prevent any accidental connection to the ground.

The joined shield connection should then be grounded at a SINGLE point on the whole segment. More than one ground connection to a shielded wire may induce ground loop noises and affect communication.

Table 2: Status LED condition and possible solutions

| Status LED Action | Possible Cause | Solution |
|---|---|---|
| 1 short blink | BACnet® communication NOT active at default MAC address = 254 | Change MAC address to another value from 0 to 127 |
| | BACnet module is not compatible with the SE7600 controller | Install a SE7600 BACnet® module on the controller |
| 2 short blinks (no wires connected to the module) | The right module has been installed on the right controller model | N/A |
| 2 short blinks (wires connected to the module) | Module is not at the same baud rate as the network | Power off and on the controller |
| 2 short blinks and a longer blink (wires connected to the module) | The module has detected the presence of a network | N/A |
| Right after power is applied: 2 long blinks and then no blinking | Polarity has been reversed at the module | Reverse polarity at the module |

DEFAULT DEVICE NAME AND ID

Default **Device Name** is set to: Model number – MAC:

- Where MAC is the current MAC address of the device.
- Where Model number is Schneider Electric part number.

The device name will be upgraded as soon as there is a change to the device MAC address.

The Device Name and Device ID properties are writable. Both properties can be renamed from any BACnet® network management tool as long as the tool itself can write to these properties.

SE76xxX Models

Default **Device ID** is set to: Model number + MAC

- Where MAC is the current MAC address of the device.
- Where model number is the Schneider Electric part number.

The device ID will also be upgraded as soon as there is a change to the device's MAC address.

For example, when a SE7600B5x45B controller with a MAC address of 63 is connected to a network, its default Device Name will be SE7600B5x45B-63 and its default Device ID will be 76063.

Device Name and Device ID properties are writable in Schneider Electric's device object. Both properties can be renamed from any BACnet® network management tool as long as the tool itself can write to these properties.

INTEGRATING SCHNEIDER ELECTRIC DEVICES ON AN MS/TP NETWORK

Before doing any BACnet® integration, make sure to obtain a Schneider Electric PICS document (Protocol Implementation Conformance Statement).

This PICS document lists all the BACnet® Services and Object types supported by a device and can be found at www.Schneider-Electric.com.

Graphical Interfaces

For example, some graphic interface might poll every data linked to the graphic page on a COV basis. If the 3rd party device does not support COV, the graphic interface then relies on a pre-configured polling interval, which is usually in hundredths of milliseconds. Any device containing a monitored object could be subject to network traffic congestion if such a polling interval is used. Schneider Electric strongly recommend a polling interval of 5 seconds minimum for any graphic interface. This becomes even more critical in area graphics where a single representation might poll many devices. If proper poll rate is not respected, devices may be reported offline by certain front end by saturating the traffic handling capacity of BACnet MS/TP without COV subscription.

Free Programmed Object or Loops

As for the application program, you might want to read and write MS/TP data on an "If Once" basis or a "Do Every Loop" basis instead of reading or writing to a third-party device's object directly in the program. Otherwise, any read or write request will occur at the Supervisory Controller's program scan rate, which might be in hundredths of milliseconds. This can easily bog down a network as single commands can be sent to **all** ASC devices down the MS/TP trunks every hundredths of milliseconds

Programs writing to the devices should have a structure similar to the following:

| | | |
|-----------------------------|----|-----------------------|
| If Once Schedule = On then | | Do Every 5min |
| MV11 = Occupied | | If Schedule = On Then |
| End If | | MV11= Occupied |
| If Once Schedule = Off Then | OR | Else |
| MV11 = Unoccupied | | MV11 = Unoccupied |
| End If | | End If |
| | | End Do |

Retries and Timeouts

Another thing to look for in BACnet® integration is the device object of the Supervisory Controller (and the Operator's Workstation). This object contains the two following required properties:

- 1) Retry Timeout
- 2) Number of APDU Retries

1) The Retry Timeout property specifies the time between re-transmissions if the acknowledgement has not been received. When you are experiencing problems with controllers dropping off line, increasing this value may help.

2) The Number of APDU Retries property specifies the number of times unsuccessful transmissions will be repeated. If the receiving controller has not received the transmission successfully after this many attempts, no further attempts will be made.

For example, if one of the controllers does not reply to a Supervisory Controller (SC) request, and the SC's Retry Timeout is set to 2000 milliseconds and the Number of APDU Retries is set to 1 (still at the SC level), then the SC will send one other request 2 seconds later. If the MS/TP device does not reply, it will be considered off line by the workstation.

Having a Retry Timeout value of 10450 milliseconds and a Number of APDU Retries property set to 3 at the SC level may prevent the device from dropping off line. These properties should also be changed at the workstation level since the workstation will likely issue requests to any MS/TP devices when the graphics are used.

TIPS AND THINGS YOU NEED TO KNOW

- Each controller is delivered from the factory with the default MAC address set at 254. At this value, the BACnet® communication is **not** active and the device will not participate in the token pass either. The local LED status for the communication adapter at this point is one short flash only. To enable the BACnet® communication, set the local MAC address configuration property of the controller to any valid value from 0 to 127.
- After the initial configuration of your device and if your BAS allows you to remove objects, we suggest that you remove all the configuration objects to prevent unnecessary polling of unused objects and to help speed up the network.
- Please refer to the appropriate Technical Manual for more details.
 - PIR Ready SE76xxA,B,H Series
 - PIR Ready SE76xxF Series
 - PIR Ready SE76xxE Series
 - PIR Ready SE76xxW Series
 - PIR Ready SE76x7B Series
- In default mode of operation, the device will automatically match its baud rate to the baud rate of the network. Automatic baud rate detection will occur when the MS/TP communication port is initialized (on power up). If the network speed is changed, the device will keep listening at the previously detected speed for 10 minutes before resuming auto-baud. Re-powering the devices will force the auto-baud.

- If the device should go off line, the following binded controller parameters will be released:
 - Room Temperature
 - Outdoor Temperature
 - Occupancy
- The BACnet® Data Link layer has two key parameters: the device object name and the device object ID. The device object name must be unique from any other BACnet® device object name on the BACnet® network (i.e. not just the MS/TP sub-network). The device object ID must be unique from any other BACnet® device object ID on the entire BACnet® network (i.e. not just the MS/TP sub-network).
- Time synchronization can be made through a network even if the controller does not support the full date. Therefore, the device cannot claim conformance to the DeviceManagement – TimeSynchronization - B (DM-TS-B) service. The device object does not have the Local_Time or Local_Date properties.
- Device Name and Device ID properties are writable in Schneider Electric device objects. Both properties can be renamed from any BACnet® network management tool as long as the tool itself gives access to write to these properties.

TROUBLESHOOTING

Table-4 Troubleshooting

| Error / Fault | Possible Cause | Solution |
|---------------------------------|--|---|
| Controller does not come online | Two or more controllers have the same MAC address. | Modify each duplicate address to a unique number. |
| | The MS/TP network has too many devices. | Do not exceed the maximum number of devices and maximum length allowed by the EIA-485 specifications. |
| | Too many devices were installed without any repeaters. | Repeaters need to be installed as specified in this document. |
| | The MS/TP cable runs are broken | Locate the break and correct the wiring. |
| | MS/TP connections at the module are reversed | Respect polarity of the wires on a MS/TP network. |
| | The controller does not have power | Apply power to the controller |