The BASremote series provide the system integrator a flexible building block when integrating diverse building automation protocols or when expanding the number of points in a building automation system. By supporting open system protocols such as BACnet®, Modbus and Sedona Framework SOX, the BASremote series is easily adaptable. For small systems, it can operate stand-alone. For larger systems, it can communicate to supervisory controllers over Ethernet. Depending upon the model, the BASremote has the flexibility to provide the following:

**Versatile Control Device** — remote I/O, router, gateway and controller

- Web-page configuration
- BACnet/IP Remote I/O
- Modbus TCP Remote I/O
- Modbus Serial to Modbus TCP Router
- Modbus Serial to BACnet/IP Gateway
- Modbus Master to Attached Modbus Slaves
- **Powered by Sedona Framework™** Controller
- Power over Ethernet (PoE)
- Customisable webpages

**Flexible Input/Output** — expandable by adding modules

- Six universal input/output points web-page configurable
- Two relay outputs
- Thermistors, voltage, current, contact closure and pulse inputs
- Voltage, current and relay outputs
- 2-wire Modbus Serial Expansion port
- 2-wire expansion port for up to three expansion I/O modules
The **BASremote Master** provides the ultimate in flexibility. It can be used for expansion I/O at remote locations where an Ethernet connection exists. Its built-in router and gateway capabilities address unique integration needs where more than one communications protocol is involved. It can operate as a function block programmable controller with its resident Sedona Framework Virtual Machine. Powered by a Linux engine, the **BASremote Master** can operate as BACnet/IP and Modbus TCP remote I/O, Sedona Framework controller, Modbus Serial to Modbus TCP router, Modbus Serial to BACnet gateway, and Modbus master to attached Modbus slaves all at the same time. A 10/100 Mbps Ethernet port allows connection to IP networks and popular building automation protocols such as Modbus TCP, BACnet/IP, and Sedona SOX.

Six universal I/O points and two relay outputs can be configured through resident web pages using a standard web browser and without the need of a special programming tool. A 2-wire Modbus serial port can greatly expand the I/O count with built-in routing to Modbus TCP clients. If BACnet mapping is preferred, the unit incorporates a Modbus serial to BACnet/IP gateway. The **BASremote Master** also allows you to install custom web pages so you can view the status of your system in a convenient manner.

Additional universal I/O can be achieved with the simple addition of **BASremote Expansion** modules. The **BASremote PoE** has the same capabilities as the **BASremote Master** except it is powered over the Ethernet connection thereby providing a “One Cable Solution”.

**Universal I/O**

Using web pages, six points can be configured as either inputs or outputs, analog or digital. In addition to being discoverable as BACnet objects, these same points can be assigned Modbus addresses.

- Analog inputs: 0–10 VDC, 0–20 mA but scalable to 0–5 VDC and 4–20 mA
- Temperature inputs: Type II or Type III thermistors
- Contact closure or Pulse inputs: Free-voltage, 40 Hz maximum
- Analog outputs: 0–10 VDC, 0–20 mA

All field connectors are removable.

**Ethernet**

10/100 Mbps Ethernet with auto-negotiation and Auto-MDIX. Protocols supported include HTTP, IP, UDP, TCP, SOAP, BACnet/IP, Modbus TCP, and Sedona SOX.

**Power Input**

24 VAC/VDC 17 VA half-wave regulated allows power sharing with other half-wave devices.

**Modbus Serial Bus**

RTU or ASCII master, 2.4–115.2 kbps, 2-wire non-isolated, up to 31 full-load EIA-485 devices

**Expansion Port**

Proprietary bus supporting up to three expansion modules requiring no configuration.

**Auxiliary Power Output**

24 VDC @ 150 mA for powering field devices such as 4–20 mA transmitters.

** Relay Outputs**

Two form “C” contacts for 30 VAC/VDC 2 A loads. Class 2 circuits only.
Web Page Configuration

Web Server Screen

Typical I/O Point Configuration Screen
Application Guide — BASremote

Application #1 — BACnet/IP or Modbus TCP Remote I/O

Assume that someone forgot to pull MS/TP twisted-pair wiring to a distant part of the building or that the specification calls for only CAT 5 structured wiring cable, a connection can still be made to the BACnet network. Since the BASremote Master is BACnet/IP compliant, a simple 10/100 Mbps Ethernet connection to the IP infrastructure is all that is needed. If the BASremote Master is located on a separate subnet from the other BACnet equipment, the unit can register as a foreign device with a BACnet/IP Broadcast Management Device (BBMD) located on another subnet in order to initiate and receive all BACnet broadcasts. If the Modbus protocol is of more interest, the BASremote Master supports Modbus TCP as well. If more I/O points are required, a BASremote Expansion module can be connected to the BASremote Master DN port. Up to three BASremote Expansion modules can be attached in a daisy-chain wiring fashion.
Application #2 — Modbus Serial to BACnet Gateway for Unifying Data

Although BACnet is quite popular, there is an abundance of Modbus Serial equipment that needs to attach to the building automation system. There are two approaches to the problem. The first is to route Modbus Serial messages from the BASremote Master MB port to Modbus TCP clients residing on Ethernet. This is the simplest approach requiring minimal configuration. The BASremote Master would act as a proxy for a Modbus TCP client, initiating a command to a connected Modbus Serial slave. When the slave responds, the message is forwarded to the Modbus TCP client. The resident BASremote Master I/O can be queried in a similar fashion.

The second approach is to utilize the gateway capability within the BASremote Master. Using an off-line spreadsheet, Modbus registers and slave addresses are mapped alongside BACnet object instances. The spreadsheet creates a CSV file which is downloaded into the BASremote Master for periodic scanning. The result is that attached Modbus Serial devices can be viewed as BACnet objects.
The BASremote Master incorporates Sedona Virtual Machine (SVM) technology developed by Tridium and compatible with their Niagara Framework™. Using established Tridium tools such as Workbench, a system integrator can develop a control application using Workbench’s powerful drag-and-drop visual programming methodology. Once developed, the program remains stored in the BASremote Master and executes by way of the SVM. The application can run standalone in the BASremote Master or interact with a program in a Tridium JACE supervisory controller over Ethernet. The number of potential applications is only limited by the imagination of the system integrator.

Tridium’s Niagara Workbench or a similar tool can be used to program Sedona running in the BASremote.

The BASremote’s Sedona Framework logic can operate on its own I/O as well as that of connected Modbus Serial or TCP devices. Also, a network connected Niagara Framework device can read or modify the operating state of the Sedona Framework function blocks.

**BASremote Services**
- Input Boolean: BASremote binary input
- Input Float: BASremote analog input or value
- Output Boolean: BASremote binary output
- Output Float: BASremote analog output
- Output Float Conditional: BASremote conditional analog output
- Send Email: BASremote email alert

---

**Sedona Components**
- P1Runs: function: P1Runs
- P2Runs: function: P2Runs
- Not1: input: Not1
- Not2: input: Not2
- Not3: input: Not3
- DlyOn: output: DlyOn
- DlyOff: output: DlyOff
- SILatch: output: SILatch
- PLCycle: function: PLCycle
- WaitP1: function: WaitP1
- P1P2Run: function: P1P2Run
- Logic1: output: Logic1
## Common Components Used In Function Block Programming

<table>
<thead>
<tr>
<th>The HVAC Group</th>
<th>The Scheduling Group</th>
<th>The Function Group</th>
<th>The Priority Group</th>
<th>The Types Group</th>
<th>The Logic Group</th>
<th>The Timing Group</th>
<th>The Math Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>operations that</td>
<td>scheduling operations</td>
<td>convenient functions</td>
<td>prioritizing actions</td>
<td>variable types and</td>
<td>logical operations using</td>
<td>extended Boolean logic</td>
<td>operations on Float, Integer and Boolean variables</td>
</tr>
<tr>
<td>facilitate control</td>
<td>based upon time of day</td>
<td>for developing control schemes</td>
<td>of Boolean, Float and Integer variables</td>
<td>comparison between types</td>
<td>with Boolean variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSeq Linear Sequencer — bar graph representation of input value</td>
<td>DailySc Daily Schedule Boolean — two-period Boolean scheduler</td>
<td>PrioritizedBool Prioritized boolean output — highest of sixteen inputs</td>
<td>ADemux2 Analog Demux — Single-input, two-output analog de-multiplexer</td>
<td>Add2 Two-input addition — results in the addition of two floats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ReheatSeq Reheat sequence — linear sequence up to four outputs</td>
<td>DailyS1 Daily Schedule Float — two-period float scheduler</td>
<td>PrioritizedFloat Prioritized float output — highest of sixteen inputs</td>
<td>And2 Two-input Boolean product — two-input AND gate</td>
<td>Add4 Four-input addition — results in the addition of four floats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reset Reset — output scales an input range between two limits</td>
<td>DateTime Time of Day — time, day, month, year</td>
<td>PrioritizedInt Prioritized integer output — highest of sixteen inputs</td>
<td>And4 Four-input Boolean product — four-input AND gate</td>
<td>Avg10 Average of 10 — sums the last ten floats while dividing by ten thereby providing a running average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tstat Thermostat — on/off temperature controller</td>
<td></td>
<td>B2F Binary to float encoder — 16-bit binary to float conversion</td>
<td>ASW Analog switch — selection between two float variables</td>
<td>AvgN Average of N — sums the last N floats while dividing by N thereby providing a running average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ConstBool Boolean constant — a predefined Boolean value</td>
<td>ASW Analog switch — selection between four floats</td>
<td>Div2 Divide two — results in the division of two float variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ConstFloat Float constant — a predefined float variable</td>
<td>B2P Binary to pulse — simple mono-stable oscillator (single-shot)</td>
<td>FloatOffset Float offset — float shifted by a fixed amount</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ConstInt Integer constant — a predefined integer variable</td>
<td>BSW Boolean switch — selection between two Boolean variables</td>
<td>Max Maximum selector — selects the greater of two inputs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hysteresis Hysteresis — setting on/off trip points to an input variable</td>
<td>Demux12B4 Four-output Demux — integer to Boolean de-multiplexer</td>
<td>Min Minimum selector — selects the lesser of two inputs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IRamp IRamp — generates a repeating triangular wave with an integer output</td>
<td>ISW Integer switch — selection between two integer variables</td>
<td>MinMax Min/Max detector — records both the maximum and minimum values of a float</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limiter Limiter — Restricts output within upper and lower bounds</td>
<td>Not Not — inverts the state of a Boolean</td>
<td>Mul2 Multiply two — results in the multiplication of two floats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Linearize Linearize — piecewise linearization of a float</td>
<td>Or2 Two-input Boolean sum — two-input OR gate</td>
<td>Mul4 Multiply four — results in the multiplication of four floats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LP LP — proportional, integral, derivative (PID) loop controller</td>
<td>Or4 Four-input Boolean sum — four-input OR gate</td>
<td>Neg Negate — changes the sign of a float</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ramp Ramp — generates a repeating triangular or sawtooth wave with a float output</td>
<td>Xor Two-input exclusive Boolean sum — two-input XOR gate</td>
<td>Round Round — rounds a float to the nearest N places</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SRLatch Set/Reset Latch — single-bit data storage</td>
<td></td>
<td>Sub2 Subtract two — results in the subtraction of two floats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TickTock Ticking clock — an astable oscillator used as a time base</td>
<td></td>
<td>Sub4 Subtract four — results in the subtraction of four floats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UpDn Float counter — up/down counter with float output</td>
<td></td>
<td>TimeAvg Time average — average value of float over time</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Application Guide — BASremote

Application #4 — Energy Usage Sub-metering

The BASremote Master can be used as a data concentrator for sub-metering applications. With sub-metering, tenants can be billed a portion of the actual energy usage based upon individual usage. Sub-metering can also verify actual energy savings from “green” initiatives. Usually a pulse is generated from natural gas, water, or electrical meters which need to be captured and accumulated in order to determine energy usage. One pulse represents a unit of energy usually requiring a scaling factor to be applied. The BASremote Master can be configured through web pages to handle up to six pulse inputs with independent threshold settings in order to adapt to different styles of meters. For convenience, both pulse rate (power) and accumulation (energy) can be displayed on a BASremote Master web page after applying a meaningful scaling factor to the raw data. Sedona Framework can also be used to calculate beyond simple scaling. Internally, pulses are accumulated indefinitely until reset by a supervisory controller or through a protected web page. Pulse data cannot be lost due to inadvertent power loss because it is stored in nonvolatile memory. If special energy demand monitoring is required, this can be accomplished using a Sedona Framework program in the BASremote Master or with a program in a supervisory controller.

The more sophisticated electrical meters have a Modbus Serial interface which can be attached to the BASremote Master MB port. Using either the router or gateway functionality of the BASremote, energy usage data can be presented to a supervisory controller over Ethernet.

Application #5 — Power over Ethernet (PoE) for a “One Cable Solution”

The Power over Ethernet standard (IEEE 802.3af) gives the system integrator another opportunity to be imaginative. With PoE, both 48 VDC power and Ethernet communication reside on the same cable. PoE power is derived from Power Sourcing Equipment (PSE). This could be an Ethernet switch, a multi-port mid-span PSE, or a single-port PSE commonly referred to as a Power Injector. Regardless of the PSE, the BASremote PoE performs the duties of a Powered Device (PD) in that it can still communicate over Ethernet while powering its own electronics plus any devices connected to its auxiliary 24 VDC power supply. The BASremote PoE has identical capabilities as the BASremote Master but without the need for a power input connection. By using an uninterruptable power supply (UPS) at the PSE source, it is possible to guard the BASremote PoE against any power failures. This arrangement could be attractive in critical control or security applications.

EIPE PoE Injector

Simply make a connection from a PoE compliant device to the Ethernet port on the BASremote

BASremote Master PoE

Both the BASremote and field devices can be powered from the data cable

Saves from purchasing proprietary BAS cabling and the associated cost of installation. May gain you points toward “green certification”.

One-Cable Solution

Data & Power on One Cable

Power Over Ethernet
The new trending feature will allow the trending of the BASremote’s 8 channels, any connected expansion unit’s channels and those of any mapped Modbus devices (RTU or Modbus TCP). The trend data will be stored within the BASremote. You can select the frequency of trending and the frequency of storage. After the trend file is filled, it will discard the oldest trend data. The trend data is available via the BASremote webpage in a simple CSV format. The BASremote can store up to about 150,000 entries. The trend feature also supports an NTP feature for accurately setting the time within the trend.

### Trending

<table>
<thead>
<tr>
<th>Sampling</th>
<th>NTP Time Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td><strong>NTP Server IP Address</strong></td>
</tr>
<tr>
<td>60</td>
<td>64.236.96.53</td>
</tr>
<tr>
<td><strong>Save Interval (Minutes)</strong></td>
<td><strong>NTP Refresh Interval (Hours)</strong></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NTP Enabled</strong></td>
</tr>
<tr>
<td></td>
<td><img src="on-off" alt="NTP Enabled" /></td>
</tr>
</tbody>
</table>

### Object Sample List

- Instance-1 : Name=Default Channel Name
- Instance-2 : Name=Default Channel Name 1
- Instance-3 : Name=Default Channel Name 2
- Instance-4 : Name=Default Channel Name 3
- Instance-5 : Name=Default Channel Name 4
- Instance-6 : Name=Default Channel Name 5
- Instance-7 : Name=Default Channel Name 6
- Instance-8 : Name=Default Channel Name 7
- Instance-#40001 : Name=Default Virtual Point
- Instance-#10001 : Name=Time Set
Application #7 — Email

SendEmail allows the Sedona application to send emails when a specific event has occurred in the Sedona application. This can be a good way to send alarm alerts to the maintenance personal. The email will also carry the value which is passed into the component. The email also contains text which can be used to describe the alarm condition, along with the component input value. Many different emails can be sent by the BASremote to many different email addresses.

Email Server Setup

Individual Email Setup
BACnet Protocol Implementation Conformance Statement (Annex A)

Date: October 24, 2013
Vendor Name: Contemporary Controls
Product Name: BASremote
Product Model Number: BASR-8M
Applications Software Version: 3.7.0  Firmware Revision: 3.7.0  BACnet Protocol Revision: 2
Product Description: BACnet/IP compliant 8-point Sedona Framework controller with Modbus Gateway.

BACnet Standardized Device Profile (Annex L):
- [ ] BAConet Operator Workstation (B-OWS)
- [ ] BAConet Advanced Operator Workstation (B-AWS)
- [ ] BAConet Operator Display (B-OD)
- [ ] BAConet Building Controller (B-BC)
- [ ] BAConet Advanced Application Controller (B-AAC)
- [ ] BAConet Application Specific Controller (B-ASC)
- [ ] BAConet Smart Sensor (B-SS)
- [ ] BAConet Smart Actuator (B-SA)

List all BACnet Interoperability Building Block Supported (Annex K):
- DS-RP-B Data Sharing — ReadProperty — B
- DS-WP-B Data Sharing — WriteProperty — B
- DS-RPM-B Data Sharing — ReadPropertyMultiple — B
- DS-COV-B Data Sharing — ChangeOfValue — B
- DM-DDB-B Device Management — Dynamic Device Binding — B
- DM-DOB-B Device Management — Dynamic Object Binding — B
- DM-DCC-B Device Management — Device Communication Control — B
- DM-TS-B Device Management — Time Synchronization — B

Segmentation Capability:
- [ ] Able to transmit segmented messages
- [ ] Able to receive segmented messages

Standard Object Types Supported:

<table>
<thead>
<tr>
<th>Object Type Supported</th>
<th>Can Be Created Dynamically</th>
<th>Can Be Deleted Dynamically</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Analog Output</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Analog Value</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Binary Input</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Binary Output</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Device</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

No optional properties are supported.

Data Link Layer Options:
- [ ] BAConet IP (Annex J)
- [ ] BAConet IP (Annex J), Foreign Device
- [ ] ISO 8802-3, Ethernet (Clause 7)
- [ ] ATA 878.1, 2.5 Mb, ARCNET (Clause 8)
- [ ] ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s):
- [ ] MS/TP master (Clause 9), baud rate(s):
- [ ] Point-To-Point, EIA 232 (Clause 10), baud rate(s):
- [ ] Point-To-Point, modem, (Clause 10), baud rate(s):
- [ ] LonTalk, (Clause 11), medium:
- [ ] Other:

Device Address Binding:
Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) [ ] Yes [ ] No

Networking Options:
- [ ] Router, Clause 6 – List all routing configurations, e.g., ARCNET-Ethernet-MS/TP, etc.
- [ ] Annex H, BAConet Tunneling Router over IP
- [ ] BAConet/IP Broadcast Management Device (BBMD)
- [ ] Does the BBMD support registrations by Foreign Devices? [ ] Yes [ ] No
- [ ] Does the BBMD support network address translation? [ ] Yes [ ] No

Character Sets Supported:
Indicating support for multiple character sets does not imply that they can all be supported simultaneously.
- [ ] ISO 10646 (UTF-8)
- [ ] IBM®/Microsoft® DBCS
- [ ] ISO 8859-1
- [ ] ISO 10646 (UCS-2)
- [ ] ISO 10646 (UCS-4)
- [ ] JIS X 0208

If this product is a communication gateway, describe the types of non-BACnet equipment/network(s) that the gateway supports:

Network Security Options:
- [ ] Non-secure Device — is capable of operating without BACnet Network Security
- [ ] Secure Device — is capable of using BACnet Network Security (NS-SD BIBB)
- [ ] Key Server (NS-KS BIBB)
Specifications

Universal Inputs/Outputs (Channels 1–6)

**Configured As**

**Characteristics**

- **Analog input**
  - 0–10 VDC or 0–20 mA scalable by user. 10-bit resolution.
  - Input impedance 100 kΩ on voltage and 250 Ω on current.

- **Temperature input**
  - Type II or type III thermistors +40°F to +110°F (+4.4°C to +44°C)

- **Contact closure input**
  - Excitation current 2 mA. Open circuit voltage 24 VDC.
  - Sensing threshold 0.3 VDC. Response time 20 ms.

- **Pulse input**
  - 0–10 VDC scalable by user. User adjustable threshold.
  - 40 Hz maximum input frequency with 50% duty cycle.

- **Analog output**
  - 0–10 VDC or 0–20 mA scalable by user. 12-bit resolution.
  - Maximum burden 750 Ohms when using current output.

Relay Outputs (Channels 7 and 8)

Form “C” contact with both NO and NC contacts. 30 VAC/VDC 2 A. Class 2 circuits only.

 Regulatory Compliance

- CE Mark; CFR 47, Part 15 Class A; RoHS; UL 508, C22.2 No. 142-M1987

Functional Ethernet Modbus Serial

- **Compliance**
  - IEEE 802.3 V1.02

- **Protocols supported**
  - Modbus TCP
  - BACnet/IP
  - SOX
  - RTU master
  - ASCII master

- **Data rate**
  - 10 Mbps, 100 Mbps

- **Physical layer**
  - 10BASE-T, 100BASE-TX

- **Cable length**
  - 100 m (max)

- **Port connector**
  - Shielded RJ-45

- **Flow control**
  - Half-duplex (backpressure)

LEDs

- **Ethernet (master only)**
  - **Green**: 100 Mbps link — **Yellow**: 10 Mbps link — **Flashing**: link activity

- **Status (all units)**
  - **Green solid**: unit operational — **Green flashing**: unit booting — **Red**: unit in fault state

- **I/O channels (all units)**
  - Unlit: channel inactive — **Green**: channel active — **Red**: channel fault (detailed in manual)

- **Network (expansion only)**
  - **Green**: valid link to master — **Flashing**: data exchange with master

Electrical

<table>
<thead>
<tr>
<th>Master</th>
<th>Expansion</th>
<th>Master/PoE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>AC</td>
<td>DC</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>10 W</td>
<td>17 VA</td>
<td>8 W</td>
</tr>
<tr>
<td>N/A</td>
<td>47–63 Hz</td>
<td>N/A</td>
</tr>
<tr>
<td>150 mA (max)</td>
<td>150 mA (max)</td>
<td>150 mA (max)</td>
</tr>
</tbody>
</table>

Environmental/Mechanical

- **Operating temperature**
  - 0°C to 60°C

- **Storage temperature**
  - –40°C to +85°C

- **Relative humidity**
  - 10–95%, noncondensing

- **Protection**
  - IP30

- **Weight**
  - 0.6 lbs. (.27 kg)
### Wiring Diagram

**BASremote Master**
- 3-wire actuator
- 0/2 - 10 V IN
- 0/2 - 10 V OUT
- Built-in 24 VDC loop supply
- 10K Type E or Type E1 thermistor
- Contact closure or pulse input up to 40 Hz

**BASremote Expansion**
- 10/100 Mbps Ethernet BACnet/IP
- Class 2 devices that use hall-effect sensors can share common control transformer if properly isolated

**Ordering Information**

<table>
<thead>
<tr>
<th>Model</th>
<th>RoHS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASR-8M</td>
<td>✔️</td>
<td>BASremote Master with 8 I/O points</td>
</tr>
<tr>
<td>BASR-8X</td>
<td>✔️</td>
<td>BASremote Expansion with 8 I/O points</td>
</tr>
<tr>
<td>BASR-8M/P</td>
<td>✔️</td>
<td>BASremote Master with 8 I/O points and PoE</td>
</tr>
</tbody>
</table>

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