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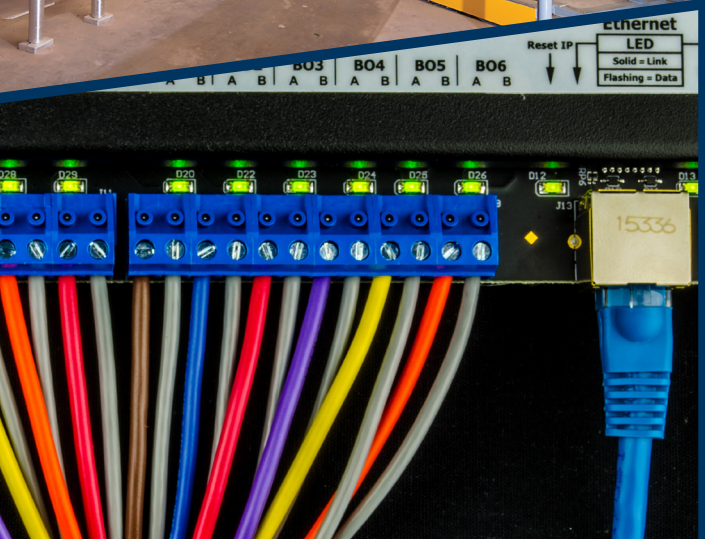
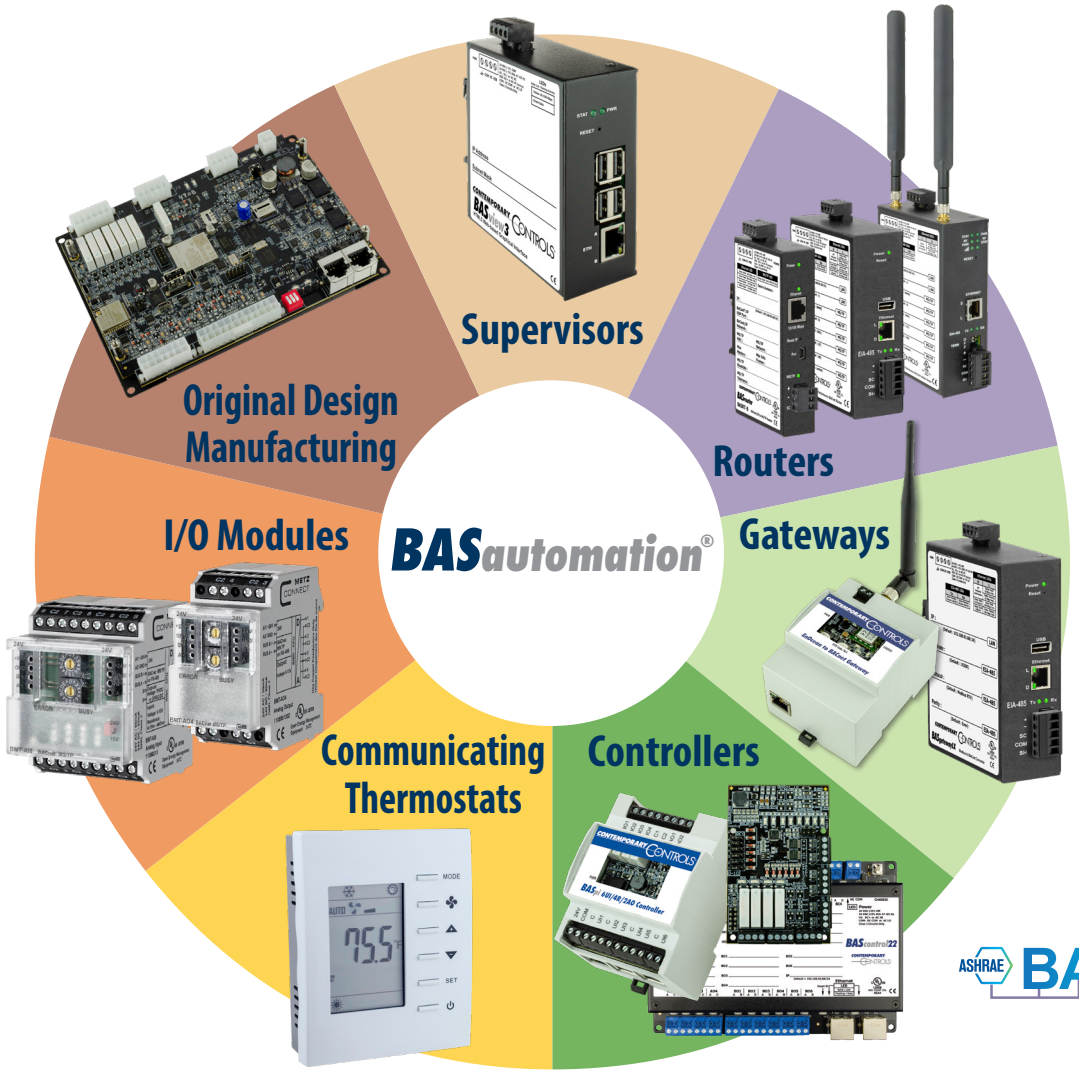
BASautomation®

Building on BACnet®

Supervisors • Routers • Gateways
Controllers • Thermostats • I/O Modules



CONTEMPORARY CONTROLS®



Building on BACnet®

BACnet (Building Automation and Control Network), developed by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), is the most popular open protocol found in building automation and energy management systems. The intent of this open standard is to allow building owners and systems integrators the opportunity to pick and choose BACnet-compliant equipment from various vendors. Contemporary Controls endorses the "open control" concept and its BASautomation line of BACnet products offers open solutions when implementing networked controls in buildings.

BACnet client devices initiate commands while BACnet server devices respond to commands. BACnet devices communicate to one another over a network. The more popular networks include the Internet Protocol (BACnet/IP) and the Master-Slave Token-Passing network (BACnet MS/TP). Interconnecting BACnet networks requires BACnet routers while connecting non-compliant BACnet devices, such as Modbus®, to a BACnet network requires a gateway. Supervisors typically reside at the IP level functioning as clients while I/O modules and communicating thermostats reside at the MS/TP level functioning as servers. Controllers can be found at either level functioning as servers or in some cases as client/servers.

Whatever the product need, the BASautomation line has a solution.

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Supervisors

Supervisors provide both BACnet/IP client functionality and control in one package. Besides BACnet MS/TP and Modbus to BACnet integration, supervisors provide head-end capabilities such as alarming, trending, scheduling and graphics.

Routers

The BASrouters are multi-network routers used to route messages between BACnet/IP, BACnet Ethernet and BACnet MS/TP networks. Three versions are available—DIN rail or panel mounted units for fixed installations and a USB powered portable unit for commissioning and troubleshooting.

Gateways

The BASgateways are used to integrate Modbus or EnOcean devices to BACnet systems. Suitable for retrofits and newly constructed buildings, BASgateways help system integrators achieve BACnet compliance.

Controllers

The BAScontrol and BASpi Open Control Series utilize BACnet/IP as an open communications protocol, Sedona function block programming, and the free BAScontrol Toolset for unrestricted use in program development and archiving. Thanks to their rugged design and outdoor temperature operation, the BAScontrol series are ideal for unitary control of air-handlers (AHUs), fan coils (FCUs), and rooftop units (RTUs). The BASpi-IO series of daughterboards for Raspberry Pi allow enthusiasts and professionals to create their own BACnet-networked, Sedona programmable controller. The powerful BASpi-Edge series offer next generation controller features such as Azure IoT Central cloud connectivity, graphical dashboards, weather station, scheduling, email alarms/notifications, Wi-Fi connectivity, etc. Both BAScontrol and BASpi-Edge series of controllers are freely-programmable or simply configured and ready to deploy out of the box by use of pre-programmed/canned applications for variety of applications provided as free downloads.

Communicating Thermostats

The BASstat line of BACnet Communicating Thermostats feature BACnet functionality over MS/TP or Wi-Fi. Models exist for multi-staged heating/cooling of rooftop units (RTUs) and 4-pipe fan coils (FCUs). These devices can easily be supervised by BACnet clients.

I/O Modules

For those installations that support a fieldbus solution such as Modbus RTU or BACnet MS/TP, Contemporary Controls provides solutions for expanding the number of I/O points in the field. Cost-effective Cube I/O modules are available with analog and digital inputs and outputs in varying combinations.

Original Design Manufacturing

Contemporary Controls designs and manufacturers networking and control products used in various automation industries where performance and reliability are essential. These products, along with our comprehensive design experience, allow us to offer original design manufacturing (ODM) services where we provide the product you require under your brand.

BASview3 – Web-based Graphical Interface for Buildings

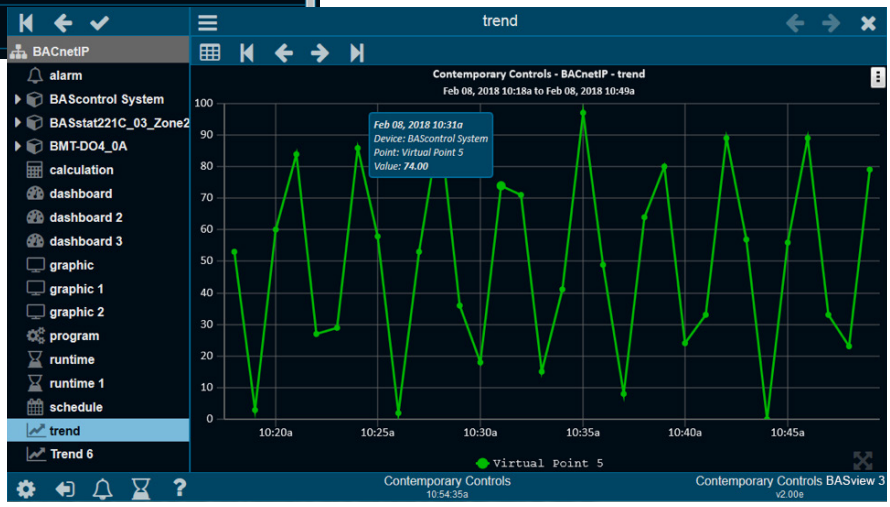
BASview3 is a stand-alone, embedded, web-based graphical interface for building automation and process automation systems. It can be accessed from any web browser providing client functionality to any BACnet/IP or Modbus TCP system. By using BASrouter or BASgateway products, additional protocols such as BACnet MS/TP and Modbus RTU can be integrated. Supervisory features include animated graphic screens, scheduling, historical trending, runtime accumulation and email alarms/notifications. The BASview3 is totally self-contained, requiring no external PC or application for its use. Multiple web browser users can access the device simultaneously. It is ideal for medium-sized buildings or processes that require an easy and intuitive to use graphical interface with no licensing requirements. Animated graphics are available from 3rd parties and can be uploaded to the BASview.

Features

- BACnet/IP and Modbus TCP network supervisor
- Animated graphics & dashboards
- Schedules with sunrise/sunset offsets
- Trend collection, display and export
- Runtime accumulation with email notification
- Alarm condition monitoring with email notification
- Calculated point values (average, min, max, etc.)
- Simple scripting language for light control logic
- Database of up to 100 users and 100 user groups
- Multiple user permission levels
- Activity log for tracking important user actions
- Template system for quickly cloning points and graphics
- Support for up to 1,000 points
- No licensing requirements
- Convenient Installation – 24VAC/VDC powered and DIN rail mountable
- Real time clock for time retention during power loss

Dashboard Graphics

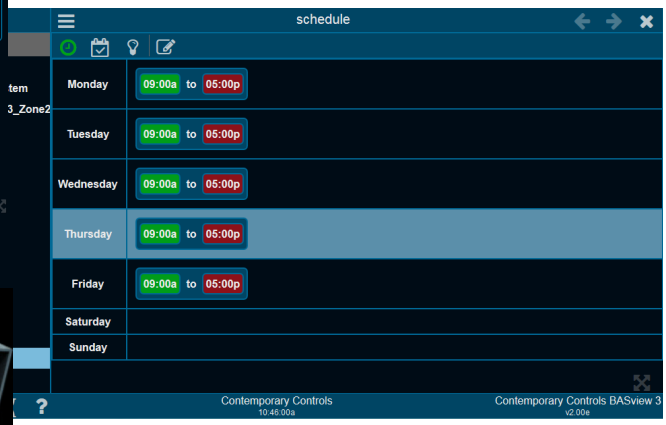
Trends



Supervisors

Dashboard Graphics

Schedules



Animated Graphics

Works on Tablets and Smart Phones

BASview3 – Web-Based Graphical Interface

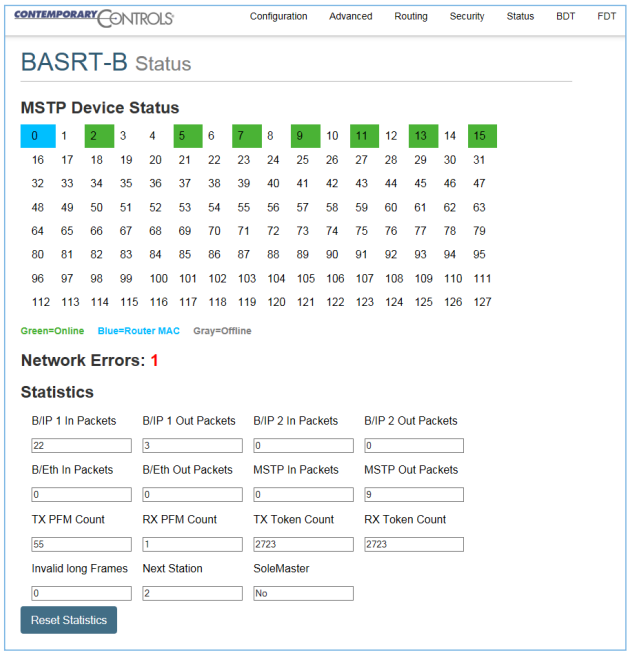
BASview3

The BASview3 is housed in a compact metal enclosure that is DIN rail mounted. Powered by a 24VAC/VDC power source for convenience, and it can retain time in the event of power loss thanks to capacitor-backed RTC. Internally powered by a 1.2GHz quad-core CPU, it has 1GB RAM and 8GB of Flash memory for data storage. Simply connect the device to a BACnet/IP or Modbus TCP 10/100 Mbps Ethernet network to access both BACnet and Modbus compliant equipment.

Model	Description
BASV-3	BACnet/IP Supervisor HTML5 Graphical Interface

BACnet Multi-Network Routing

Our compact BASrouter series of BACnet multi-network routers provides stand-alone routing between BACnet/IP, BACnet Ethernet, and BACnet MS/TP, thereby allowing the system integrator to mix BACnet network technologies within a single BACnet internetwork. New features include built-in BACnet diagnostic capabilities with visual analytics MS/TP status table, routing status table, network errors count, and traffic statistics. This allows the integrator to easily install robust BACnet networks and drastically speed up troubleshooting. Our compact BACnet routers come in two distinct models—the BASrouter is DIN rail mounted and powered from a 24 VAC/VDC source while the Portable BASrouter is USB powered for portable use.



Flexible Communications

- 10/100 Mbps Ethernet with auto-negotiation and Auto-MDIX
- Optically isolated MS/TP port
- MS/TP baud rates range from 9.6-76.8 kbps

IP Network Support

- Web server for commissioning and troubleshooting
- Communication diagnostic web page
- BACnet/IP Broadcast Management Device (BBMD)
- Foreign Device Registration (FDR)

BASrouter – BACnet Multi-Network Router

BASrouter

The BASrouter routes messages between BACnet/IP and BACnet MS/TP and BACnet Ethernet networks. There are two physical communication ports. One is a 10/100 Mbps Ethernet port and the other an isolated MS/TP port. DIN rail mounted and 24 VAC/VDC powered.

Model	Description
BASRT-B	BASrouter BACnet/IP to MS/TP to Ethernet DIN rail Mount

Portable BASrouter – Portable BACnet Multi-Network Router

Portable BASrouter

The Portable BASrouter routes messages between BACnet/IP and BACnet MS/TP networks. There are two physical communication ports. One is a 10/100 Mbps Ethernet port and the other an isolated MS/TP port. For power, the BASRTP-B attaches to the USB port of a laptop computer.

Model	Description
BASRTP-B	BASrouter Portable BACnet/IP to MS/TP to Ethernet

BACnet Multi-Network Routing and Wireshark® Capture

The BASrouterLX is a high-performance BACnet router providing stand-alone routing between BACnet networks such as BACnet/IP, BACnet Ethernet (ISO 8802-3), and BACnet MS/TP. Besides its high-speed processor, it has advanced features such as MS/TP Backbone, Backward Routing, Allowlist option for enhanced security, MS/TP slave proxy support (allowing auto-discovery of MS/TP slaves) and MS/TP frame capture and storage for use with Wireshark®. As a BBMD, up to 50 BDT and 147 FDR entries can be supported. The BASrouterLX has two physical communication ports—a 10/100 Mbps BACnet/IP Ethernet port and an optically-isolated EIA-485 port for MS/TP. Router configuration is accomplished via web pages.

Versatile Routing Between …

- BACnet/IP and BACnet MS/TP
- BACnet Ethernet and BACnet MS/TP
- BACnet/IP and BACnet Ethernet
- BACnet/IP and BACnet Ethernet and BACnet MS/TP
- Two BACnet/IP networks (between two UDP ports)

IP Network Support

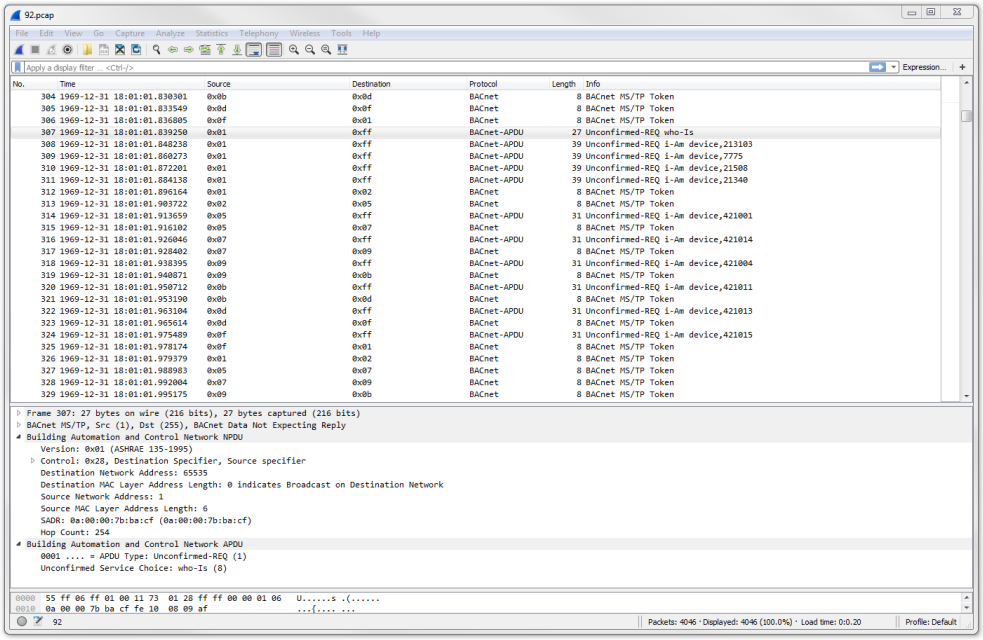
- Web server for commissioning and troubleshooting
- MS/TP capture using Wireshark
- BACnet/IP Broadcast Management Device (BBMD)
- Foreign Device Registration (FDR)

Flexible Communications

- 10/100 Mbps Ethernet with auto-negotiation and Auto-MDIX
- Supports MS/TP slave auto-discovery and proxy
- MS/TP Backbone
- Backward Routing
- Allowlist
- Optically-isolated MS/TP port
- MS/TP baud rates range from 9.6–115.2 kbps

Convenient Installation

- 24 VAC/VDC (± 10%), 47–63 Hz input voltage
- DIN rail mount (BASRTLX-B) or panel mount (BASRTLX-B/P)



BASrouterLX – High Performance BACnet Router

BASrouterLX

The BASrouterLX high-performance router routes messages between BACnet/IP and BACnet MS/TP and BACnet Ethernet networks. There are two physical communication ports. One is a 10/100 Mbps Ethernet port and the other an isolated MS/TP port. The product features Wireshark capture. DIN rail mounted and 24 VAC/VDC powered.

Model	Description
BASRTLX-B	BASrouterLX High Performance BACnet Router DIN rail Mount
BASRTLX-B/P	BASrouterLX High Performance BACnet Router Panel Mount

High-Performance BACnet Cellular Router

The BASrouterCX is a high-performance BACnet cellular router providing the combined functionality of a BACnet router with stand-alone routing between BACnet/IP, BACnet Ethernet, and BACnet MS/TP networks, as well as a cellular VPN remote access router. Thanks to its built-in cellular modem, it can communicate over cellular networks and provide a remote VPN client connection, creating a secure tunnel for remote access communication to BACnet networks. This combined functionality allows for local BACnet routing as well as secure remote access to sites where a wired Internet connection is not an option. The BASrouterCX can be used with Contemporary Controls' RemoteVPN service, as well as Self-HostedVPN which requires no monthly subscriptions. Powered by a high-performance processor, the BASrouterCX has advanced features such as BACnet MS/TP slave proxy support (allowing auto-discovery of MS/TP slaves), MS/TP backbone, enhanced security features such as a stateful firewall, allowlist, broadcast I-Am blocking, and encrypted VPN tunnel. As a BACnet Broadcast Management Device (BBMD), up to 50 BDT and 147 FDR entries are supported. The BASrouterCX has a 10/100 Mbps Ethernet port, a cellular port, and an opto-isolated EIA-485 port for BACnet MS/TP. Wide temperature operation makes the BASrouterCX suitable for indoor and outdoor installations.

Versatile Routing Between…

- BACnet/IP and BACnet MS/TP
- BACnet Ethernet and BACnet MS/TP
- BACnet/IP and BACnet Ethernet
- BACnet/IP and BACnet Ethernet and BACnet MS/TP
- Two BACnet/IP UDP ports
- Two BACnet/IP networks – local and cellular

IP Network Support

- Web page for commissioning, troubleshooting and firmware updates
- BACnet/IP Broadcast Management Device (BBMD)
- Foreign Device Registration (FDR)
- Stateful firewall
- Broadcast I-Am blocking
- Allowlist
- VPN client

Flexible Communications

- 10/100 Mbps Ethernet with auto-negotiation and Auto-MDIX
- LTE cellular communication
- Supports BACnet MS/TP slave auto-discovery and proxy
- Opto-isolated EIA-485 port
- MS/TP baud rates range from 9.6–115.2 kbps

Convenient Installation

- 24 VAC/VDC (± 10%), 47–63 Hz input voltage
- DIN rail mounted
- Wide temperature operation -40 to +75 °C

BASrouterCX – High-Performance BACnet Cellular Router

BASrouterCX

The BASrouterCX BACnet cellular router provides the combined functionality of a BACnet router with stand-alone routing between BACnet/IP, BACnet Ethernet, and BACnet MS/TP networks, as well as a cellular VPN remote access router. Thanks to its built-in cellular modem, it can communicate over cellular networks and provide a remote VPN client connection, creating a secure tunnel for remote access communication to BACnet networks.

Model	Description
BASRTCX-B3	BACnet Cellular Router Verizon 4G LTE CAT1

Modbus to BACnet Gateway

Modbus remains a popular network interface and is commonly found on jobs such as boiler control, variable speed drives, and metering applications, but these devices lack BACnet compliance. To make Modbus devices appear as individual BACnet devices, a BASgatewayLX is used. This device has one 10/100 Mbps Modbus TCP and BACnet/IP Ethernet port and an opto-isolated Modbus EIA-485 serial port for Modbus RTU or Modbus ASCII devices. Up to 100 Modbus serial devices represented by up to 1,000 polled points can share the single Modbus EIA-485 port on the BASgatewayLX. BACnet COV notification is supported on 200 points (100 Analog and 100 Binary points). The virtual routing feature in the BASgatewayLX allows each connected Modbus device to appear as an individual BACnet compliant device. A device profile is needed for each Modbus type device. Contemporary Controls maintains a library of freely-available device profiles available for download. If the device profile is not available, Contemporary Controls will provide it upon request. Custom Modbus device profiles can also be uploaded to the BASgatewayLX using a web page. Modbus data points from Modbus Serial or Modbus TCP/IP devices can be mapped to BACnet objects.

Using web pages and a resident database of common Modbus device profiles, Modbus data points from Modbus Serial or Modbus TCP devices can be mapped to BACnet objects.

Over 100 pre-built devices are available from the Contemporary Controls device profiles library.

BASgatewayLX – Modbus to BACnet Gateway

BASgatewayLX

The BASgatewayLX is housed in a metal case that mounts on 35-mm DIN rail and it is powered from a 24 VAC/VDC (± 10%) source. Its half-wave rectified power supply allows sharing of power with other half-wave devices. The optically-isolated serial port allows for connection to either 2-wire or 3-wire EIA-485 networks using a removable 5-pin terminal block. Up to 100 EIA-485 Modbus devices can share the serial bus at data rates between 2.4 and 115.2 kbps. Internal jumpers allow flexible bias and termination options. They can be removed for mid-span installations. A resident web server allows for commissioning and troubleshooting via a standard web browser.

Model	Description
BASGLX-M1	BASgatewayLX Modbus to BACnet Gateway DIN rail Mount
BASGLX-M1/P	BASgatewayLX Modbus to BACnet Gateway Panel Mount

EnOcean to BACnet Gateway

Contemporary Controls' EnOcean to BACnet Gateway allows users to easily integrate their EnOcean sensors and actuators to a BACnet/IP building automation network. Each EnOcean device appears as a virtual BACnet device to aid integration, and EnOcean output devices can be controlled via BACnet.

EnOcean to BACnet Gateway is a versatile gateway and control device that provides:

- Bidirectional gateway functionality between EnOcean Wireless and BACnet/IP
- EnOcean device discovery
- Remote commissioning of link tables and configuration settings
- Built-in EnOcean Device Profiles for seamless integration
- Webpage configuration—no external tools or software required
- Webpage-based remote commissioning of EnOcean devices

The EnOcean to BACnet Gateway allows users to discover and select EnOcean devices on their network. Then, the gateway will create new virtual BACnet devices (with the appropriate BACnet objects) for the BACnet network. The process begins by selecting the appropriate EnOcean Equipment Profile (EEP) for the EnOcean device. This provides the gateway with enough information to know which BACnet objects to create for this virtual BACnet device and how to map the received EnOcean data to these objects. This virtual device will have the properties of the EnOcean device contained in its BACnet objects and will update this data whenever the EnOcean device transmits new data. As more EnOcean devices are added to the gateway, more virtual BACnet devices will be created. All of these BACnet devices exist in their own virtual network. This allows BACnet head-ends to easily discover these devices and receive the EnOcean data via BACnet.

For multiple EnOcean devices of the same type, many BACnet head-ends provide the ability to copy/paste these virtual BACnet devices, including their objects, schedules, trends, graphics, and alarms, to simplify integration. For example, you could configure the head-end with the objects from the first virtual BACnet device along with its selected features and copy/paste it for each identical EnOcean device in your facility, thus saving considerable effort.

The bidirectional feature allows the gateway to control EnOcean output devices. The gateway will create virtual BACnet devices that the BACnet head-end can control. The virtual device will have a designated destination address which can be one real EnOcean device or a broadcast address for all EnOcean devices. The gateway will transmit EnOcean messages based on these BACnet object writes from the head-end. These can be used to control many EnOcean devices or a single device. The user can enter many virtual EnOcean output devices.

The gateway can be used to set or change link table entries and to modify configuration settings on remote commissionable EnOcean devices (when a DDF file is provided).

BASgatewayEO – EnOcean to BACnet Gateway

EnOcean to BACnet Gateway

The BASgatewayEO is housed in a compact 4U (70mm wide) DIN rail mounted enclosure and can be powered by 24 VAC/VDC power input. Configuration is done using a web browser via the 10/100Mbps Ethernet port. An SMA connector is provided to connect an external antenna. Two models corresponding to 868 MHz and 902 MHz are available.

Model	Description
BASGE-EN868	EnOcean to BACnet Gateway 868 MHz
BASGE-EN902	EnOcean to BACnet Gateway 902 MHz

The Advantages of a BAScontrol Open Controller

Contemporary Controls has always supported open protocols like BACnet, but BACnet does not provide control, only a standardized method for communications. Having BACnet is not sufficient when you are locked out of a job due to a proprietary programming language, licensing restrictions, or a proprietary programming tool only available to "partners." The BAScontrol Series is Contemporary Controls' way of providing a truly open controller by having:

- An open communications network in IP Ethernet
- An open industry supported building automation protocol in BACnet
- An open control language that is license-free in Sedona
- A free programming tool that is available to all without restriction in the Sedona Application Editor

The BAScontrol series utilizes a powerful 32-bit ARM7 processor with 512 KB of flash memory plus a 16 Mbit serial flash file system for storing configuration data and an application program. By operating at the BACnet/IP level, the BAScontrol20/22 can share the same Ethernet network with supervisory controllers and operator workstations. Each unit can be configured for a fixed IP address or can operate as a DHCP client receiving its IP address from a DHCP server. A real-time clock with a super-cap backup allows for creating local schedules. A 10/100 Mbps Ethernet port supports protocols such as BACnet/IP, Sedona SOX, HTTP and FTP. Configuration of universal inputs and virtual points can be accomplished using web pages. Type II and type III 10 kΩ thermistor curves and a 20 kΩ thermistor curve are resident in the unit. Current inputs can be measured using external resistors. Contact closures require a voltage-free source. Binary inputs and outputs as well as analog outputs require no configuration. The unit is powered from a 24 VAC/VDC source.

Versatile Control Device

- BACnet/IP compliant with a B-ASC device profile
- Resident Sedona Virtual Machine (SVM)
- Programmable via Sedona Application Editor
- Configurable with a common web browser
- Direct connection to Ethernet network
- NTP or manually-settable real-time clock
- COV subscriptions – 14 binary and 2 analog
- Outdoor temperature operation -40°C to +75°C

Flexible Input/Output

- Eight configurable universal inputs: thermistor, resistance, analog voltage, binary input, pulse inputs (4 max)
- Four contact closure inputs
- Four analog voltage outputs
- Four triac outputs
- 24 virtual points communicate with a BACnet client
- 48 web components communicate with web browser

BAScontrol20 – 20-Point BACnet/IP Sedona Unitary Controller

BAScontrol20

The BAScontrol20 is a 20-point BACnet/IP, Sedona-programmable unitary controller with direct connection to an Ethernet network. The unit complies with the B-ASC device profile having a convenient mix of 8 universal inputs, 4 binary inputs, 4 analog outputs and 4 triac outputs. The controller is fully web page configurable using a common web browser, and freely-programmable using Contemporary Controls' free Sedona Application Editor (SAE). Rugged metal design, low profile, and wide temperature operation make it suitable for indoor or outdoor use.

Model	Description
BASC-20T	BAScontrol20 BACnet Server 20-Point 4 Triacs

Client/Server Operation

All BAScontrol series models have B-ASC device profiles meaning they are BACnet server devices that respond to commands initiated by BACnet clients. However, there is one model in the BAScontrol22 series that also provides BACnet client functionality at a slight cost in wire sheet memory usage. The BASC-22CR uses a NetV Sedona component that can initiate a read or write operation to a point on another BACnet device within the BACnet inter-network. There is a configuration page on the BASC-22CR to identify the BACnet server devices to be accessed. Once device configuration is completed, a NetV component can be placed on the wire sheet and configured for each object point and type to be accessed on the server devices. With client capability, a BAScontrol can supervise points on other BACnet/IP controllers or BACnet MS/TP controllers using a BACnet router without the need of a BACnet head-end.

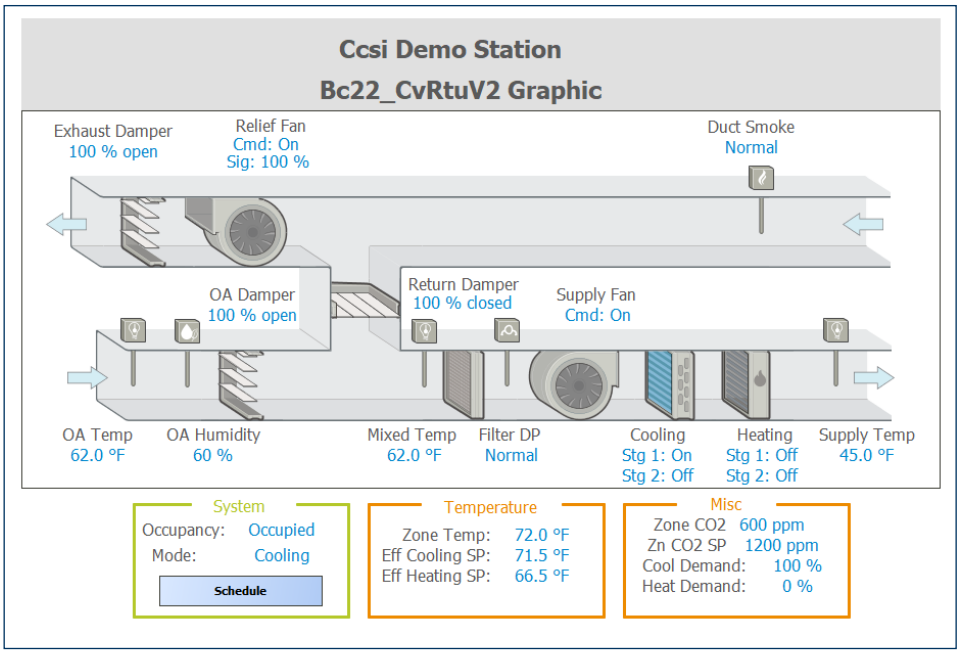
BAScontrol22 – 22-Point BACnet/IP Sedona Unitary Controller

BAScontrol22

The BAScontrol22 is a 22-point BACnet/IP, Sedona-programmable unitary controller with a 2-port Ethernet switch for connection to an Ethernet network. The unit complies with the B-ASC device profile having a convenient mix of 8 universal inputs, 4 binary inputs, 4 analog outputs and 6 relay outputs. The controller is fully web page configurable using a common web browser, and freely-programmable using Contemporary Controls' free Sedona Application Editor (SAE). Rugged metal design, low profile, and wide temperature operation make it suitable for indoor or outdoor use.

Model	Description
BASC-22CR	BAScontrol22 BACnet Client/Server 22-Point 6 Relays
BASC-22R	BAScontrol22 BACnet Server 22-Point 6 Relays 2xRJ45 Switch

Pre-Built Constant Volume RTU Sedona Applications make it easy to utilize a Contemporary Controls' BAScontrol22 BACnet/IP Sedona Unitary controller in constant volume air-handling (AHU) or constant volume rooftop unit (RTU) applications. Although the BAScontrol22 is a freely-programmable controller using Sedona as the control language, it can be made into a configurable controller by installing one of five versions (CvRTUv1-CvRTUv5) of constant volume AHU/RTU applications into the controller from the CvRTU Application Series.



Creating the Next Generation Controller

The mass popularity of powerful micro PCs such as the Raspberry Pi brings low-cost computing power to technical professionals and hobbyists alike. Suitable for most field installations, they also provide an excellent training and experimental platform for individuals interested in controls and automation. Contemporary Controls, committed to open controls, is contributing to this effort by offering controller products under the BASpi name which are powered by the Raspberry Pi. The BASpi-I/O series offers the option of purchasing just I/O daughterboards, also called "hats" which can be mounted on Raspberry Pi and combined with our firmware image to create a powerful DDC controller. BASpi free downloads include the firmware image providing web server for monitoring and configuration, BACnet communication, function block programmable sequence of operation using Sedona, as well as free programming tools—the BAScontrol Toolset. Individuals can develop applications for their unique needs and are encouraged to share them with Contemporary Controls' community.

BASpi-I/O – Board-Level Controllers

The BASpi I/O daughterboards are 12-point expansion boards for the Raspberry Pi with models that differ only in the makeup of their outputs. An I/O board, plus the downloaded firmware image provided by Contemporary Controls turn your Raspberry Pi into a BACnet connected, Sedona programmable controller with 6 universal inputs and 6 relay outputs or 4 relay outputs and 2 analog outputs (model dependent). The universal inputs can be configured for binary input, analog input, thermistor, resistance or pulse. In addition to 12 physical I/O points there are 24 virtual points—all configurable as BACnet points. A total of 48 web components are usable for configuration points accessible through a common web browser. The BASpi communicates over 10/100 Mbps Ethernet or Wi-Fi.

To create a BASpi controller, download the free firmware image from Contemporary Controls' website, burn a micro SD card with the image, mount it into your Raspberry Pi micro SD slot, place one of the BASpi I/O daughterboards on the Raspberry Pi, and boot your new DDC controller. This simple process makes a powerful 12-point BACnet/IP Sedona programmable controller.

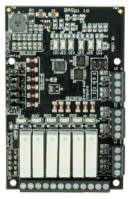
Versatile Control Device

- BACnet/IP server over 10/100 Mbps Ethernet or Wi-Fi
- Resident Sedona Virtual Machine (SVM)
- Web page configurable over Ethernet or Wi-Fi
- Email alarms/notifications
- NTP server or manually settable clock
- Free BAScontrol Toolset
  - Sedona Applications Editor (SAE)
  - BASemulator – BASpi controller emulation on PC
  - BASbackup – BASpi project utility

Flexible Input/Output – 12-points of physical I/O

- Six configurable universal inputs: analog input (0-10V), binary input, resistance, thermistor (10kT2, 10kT3, 20k), pulse input (40Hz max)
- Four or six relay outputs (30 V @ 2A max current)
- Two or zero analog outputs (0-10V)
- 24 Virtual Points (VT) communicate with BACnet clients and supervisory workstations
- 48 Web Components (WC) communicate with web browser for monitoring and configuration

BASpi-I/O Series – Board-Level Controllers



BASpi I/O

The BASpi I/O daughterboards do not include a Raspberry Pi or a micro SD card. Free firmware must be downloaded from the Contemporary Controls' website to create a BASpi controller.

Model	Description
BASPI-IO6U6R	Raspberry Pi Daughterboard 6UI/6 Relay
BASPI-IO6U4R2A	Raspberry Pi Daughterboard 6UI/4 Relay/2 Analog Out

BASpi-Edge – Cloud Connected BACnet Controllers

The BASpi-Edge series are hardened controllers with enhanced features and data processing at the Edge functionality, powered by Raspberry Pi. Housed in a compact 4U (70mm wide) DIN rail mounted enclosure with 24 VAC/VDC power input and a resilient pSLC 8GB micro SD card gives them performance and convenience advantages, making them suitable for a wide array of applications. BACnet client/server communication over Ethernet or Wi-Fi, function block programmable control, and data processing at the Edge using Sedona come standard.

The BASpi-Edge are fully web page configurable with quick and easy cloud connectivity to Azure IoT Central (SaaS) cloud solution. Additional features such as email alarms/notifications, schedules with holidays/exceptions, weather web service, as well as graphical dashboards served over Ethernet, Wi-Fi, or directly out of the resident HDMI port, make the BASpi-Edge ideal for standalone or BACnet supervised automation applications. These Edge controllers can communicate with the local operational network and supervisory stations or other Edge controllers using the industry standard protocol—BACnet.

By leveraging open IoT protocols such as MQTT, proven security mechanisms such as Transport Layer Security (TLS), and robust and easy to use software as a service cloud solutions (SaaS) such as Azure IoT Central, BASpi-Edge controllers can easily and securely connect to the cloud, effectively making any attached equipment a cloud connected asset. Cloud connectivity is optional, but it provides excellent global asset management and supervision capabilities in multi-site building applications, or multi-branch store or retail chains.

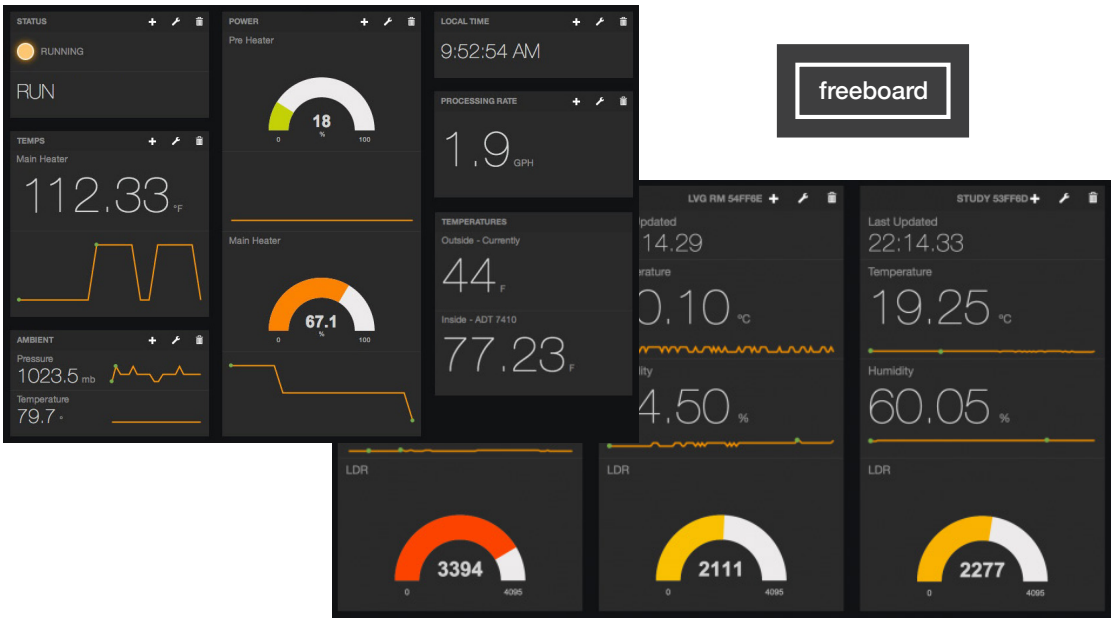
Versatile Control Device

- BACnet/IP client/server over 10/100 Mbps Ethernet or Wi-Fi
- BACnet MS/TP connection using external USB to RS-485 dongle
- Resident Sedona Virtual Machine (SVM)
- Web page configurable over Ethernet or Wi-Fi
- Schedules with holidays/exceptions
- Email alarms/notifications
- Weather web service
- Azure IoT Central (SaaS) cloud connected
- Graphical dashboard served over Ethernet, Wi-Fi, or direct HDMI output
- NTP server or manually settable clock
- Free BAScontrol Toolset
  - Sedona Applications Editor (SAE)
  - BASemulator – BASpi controller emulation on PC
  - BASbackup – BASpi project utility

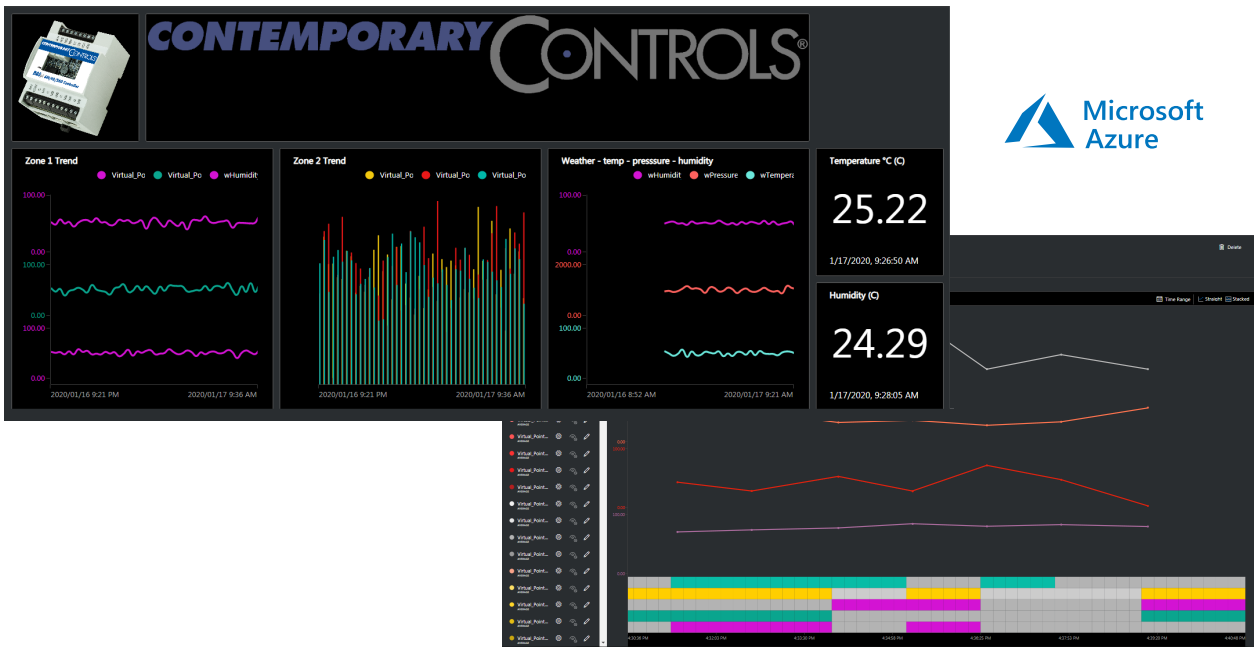
Flexible Input/Output – 12-points of physical I/O

- Six configurable universal inputs: analog input (0-10V), binary input, resistance, thermistor (10kT2, 10kT3, 20k), pulse input (40Hz max with retention to non-volatile memory)
- Four or six relay outputs (30 V @ 2A max current)
- Two or zero analog outputs (0-10V)
- 48 Virtual Points (VT) communicate with BACnet clients and supervisory workstations
- 48 Web Components (WC) communicate with web browser for monitoring and configuration
- 24 VAC/VDC power and DIN rail mounted

Local graphical dashboards



Azure IoT Central cloud dashboard



BASpi-Edge Series – Cloud Connected BACnet Controllers

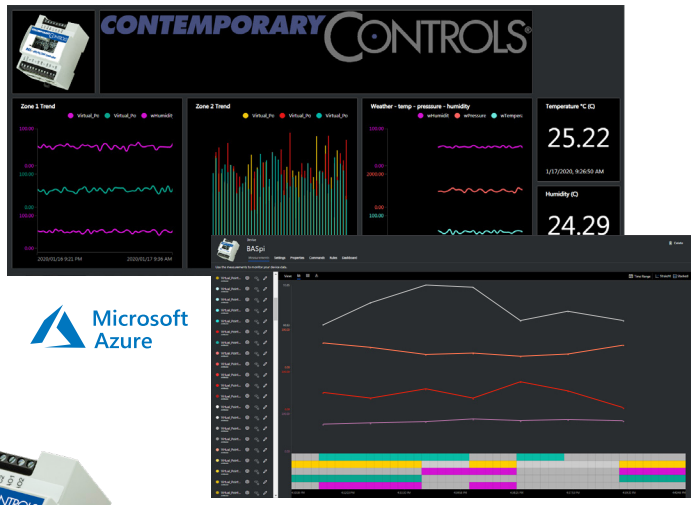
BASpi-Edge

The BASpi-Edge series are hardened controllers with enhanced features and data processing at the Edge functionality, powered by Raspberry Pi. Housed in a compact 4U (70mm wide) DIN rail mounted enclosure with 24 VAC/VDC power input and a resilient pSLC 8 GB micro SD card.

Microsoft Azure · ASHRAE BACnet™ · Sedona PROGRAMMABLE

Model	Description
BASPI-E6U6R	BACnet Edge Controller with 6UI/6 Relay
BASPI-E6U4R2A	BACnet Edge Controller with 6UI/4 Relay/2 Analog Out

Controllers



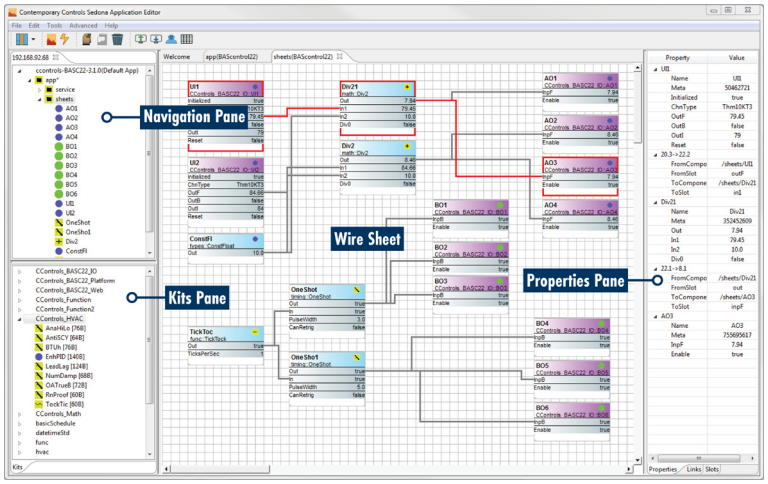
Microsoft Azure

ASHRAE BACnet™

BAScontrol Toolset

Contemporary Controls has developed the BAScontrol Toolset, which simplifies controller programming and project archiving for the BAScontrol Series and the BASpi. The following tools are included in the free BAScontrol Programming Toolset.

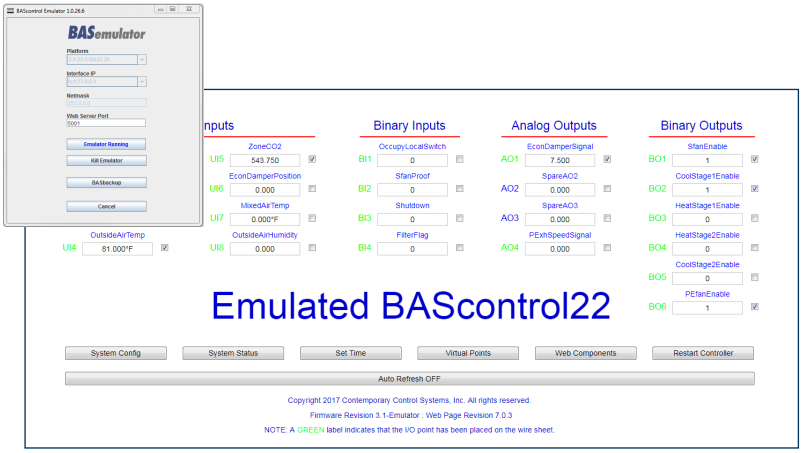
Sedona Application Editor (SAE) is used to connect to Sedona devices (SVM), write/edit function block Sedona wire sheet control applications and to make local wire sheet application (SAX file) backups to a Windows PC or laptop.



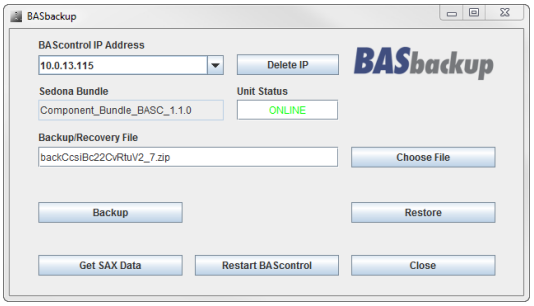
- Powerful drag-and-drop function block programming methodology
- Fast and easy to learn
- Pre-assembled components for quick and easy program development
- Continuously growing library of components
- Program changes execute immediately
- Programs run stand-alone and can interact with BACnet clients and supervisory controllers

Sedona

BASemulator is the next best thing to a real controller. It is a full controller emulator for the BAScontrol and BASpi series which runs on Windows computers and works in conjunction with Sedona Application Editor and BASbackup Project Utility. This controller emulator allows you to write your Sedona wiresheet application and fully configure all parameters such as Network Settings, I/O Channel Configuration, and BACnet Settings before deploying onto real controllers. The emulator can also be used for training and education purposes because it runs on any standard Windows PC.



BASbackup allows you to quickly and easily backup and restore both a Sedona wiresheet application, as well as complete device configuration to a single project file – making a comprehensive copy of your BAScontrol or BASpi project. This file is transferable between real controllers or emulated controllers (using BASemulator). In addition, BASbackup allows you to clone controllers or reproduce controllers with the ability to alter device configuration settings such as IP address and BACnet device instance during the process which is useful for quick and easy device commissioning in the field.



The BAScontrol Toolset is available as a free download and supports the BAScontrol and BASpi series.

BACnet-Compliant Thermostats

The BASstat line of BTL-listed BACnet Communicating Thermostats feature BACnet server functionality over MS/TP or Wi-Fi for multi-staged heating/cooling of rooftop units (RTUs) and for analog 4-pipe fan coils (FCUs). These BACnet-compliant wired or wireless communicating thermostats ensure effortless integration into BACnet/IP (Wi-Fi) or BACnet MS/TP (EIA-485) networks.

All models feature an attractive wall-mounted enclosure with a large LCD display that can be set for °C or °F, with icons to indicate setpoint, space temperature, occupancy status, and modes of operation. Three sensing options are available: built in temperature sensor, input for a remote 3 kΩ NTC thermistor, or temperature override network command from Building Automation System.

Units are configurable using its display or via a network connection to a BACnet client. Occupancy status can be set from thermostat buttons or over the BACnet network. Controller algorithm parameters, such as deadband, proportional gain, integral rate, stage trip points, stage widths, short cycle delay, and maximum cycles per hour, are all configurable. Operator control is accomplished with six buttons—mode, fan, raise, lower, set and power. Thermostat buttons are optionally lockable to prevent unauthorized control or configuration changes. Digital display with graphical icons is easy to read and understand.

Common Features

- Large back-lit LCD display in °C or °F with informative icons
- Local or network configurable from a BACnet client
- Ventilation, heating, cooling modes with manual or automatic changeover
- Automatic single-speed or continuous fan control
- Occupied and unoccupied setpoints with temporary override
- Remote sensor option
- 24 VAC powered

Staged Heating/Cooling Models

- Single- or dual-stage heating/cooling
- Adjustable deadband, stage-differential and stage width settings
- Short-cycle protection

Wired Model Features

- BACnet MS/TP
- Baud rates from 9.6–76.8 kbps

Wireless Model Features

- BACnet/IP
- Wi-Fi (IEEE 802.11 b/g/n)

Model/Description	Analog and Binary Inputs				Binary Outputs					Analog Outputs		Comm
	Space Temp	Remote Temp	Energy Savings	Humid Sensor	Stage 1 Heating	Stage 2 Heating	Stage 1 Cooling	Stage 2 Cooling	1-Speed Fan	Analog Heating	Analog Cooling	
BAST-221C-B2 BACnet MS/TP Thermostat 2-Heat, 2-Cool, 1-Fan, Wired	X	X	X		X	X	X	X	X			MS/TP
BAST-221C-BW2 BACnet/IP Thermostat 2-Heat, 2-Cool, 1-Fan, Wi-Fi	X	X	X		X	X	X	X	X			Wi-Fi
BAST-221CH-B2 BACnet MS/TP Thermostat 2-Heat, 2-Cool, 1-Fan, RH, Wired	X	X	X	X	X	X	X	X	X			MS/TP
BAST-221CH-BW2 BACnet/IP Thermostat 2-Heat, 2-Cool, 1-Fan, RH, Wi-Fi	X	X	X	X	X	X	X	X	X			Wi-Fi
BAST-421C-B2 BACnet MS/TP FCU 4-pipe, single-speed Fan, Wired	X	X	X						X	0-10V	0-10V	MS/TP
BAST-421C-BW2 BACnet/IP FCU 4-pipe, single-speed Fan, Wi-Fi	X	X	X						X	0-10V	0-10V	Wi-Fi

BACnet Communicating Thermostat for Multi-Stage Heating/ Cooling/Ventilation

BAST-221 Thermostats are suited for single or multi-stage heating, cooling, and ventilation binary output control applications such as RTUs or AHUs. A configurable control algorithm allows adaptability to the specific application. This adaptive control algorithm applied to multi-stage on/off control saves energy and ensures seamless comfort for the occupants. A built-in relative humidity sensor (in 221CH models) allows the thermostat to display relative humidity on the screen as well as serve it as a BACnet object, dew point calculation is also served as a BACnet object (no control action is taken based on humidity).

BASstat – BACnet Communicating Thermostat

BASstat

The BASstat series of BACnet-compliant communicating thermostats are BTL listed and capable of controlling single- and dual-stage rooftop units or 2-pipe or 4-pipe fan coils. These units can be configured locally or over the network. The wired models are BACnet MS/TP compliant while the wireless model is BACnet/IP compliant over Wi-Fi.

Model	Description
BAST-221C-B2	BACnet MS/TP Thermostat 2-Heat/2-Cool/1-Fan Wired
BAST-221C-BW2	BACnet/IP Thermostat 2-Heat/2-Cool/1-Fan Wi-Fi
BAST-221CH-B2	BACnet MS/TP Thermostat 2-Heat, 2-Cool, 1-Fan, RH, Wired
BAST-221CH-BW2	BACnet/IP Thermostat 2-Heat, 2-Cool, 1-Fan, RH, Wi-Fi

BACnet Communicating Thermostat for Modulating Fan Coil Operation

The BAST-421 Modulating thermostats are suited for modulated heating, cooling, and ventilation with analog output control in 4-pipe applications such as FCUs or air handlers. A configurable control algorithm allows adaptability to the specific application. This adaptive algorithm applied to the modulated valve control saves energy and ensures comfort for the occupants.

NOTE: This unit is designed for 4-pipe HVAC systems and not recommended for 2-pipe HVAC systems.

BASstat – BACnet Modulating Thermostat

BASstat

The BASstat series of modulating thermostats are BACnet compliant with a B-ASC device profile and are suited for modulated heating, cooling, and ventilation with analog output control in 4-pipe applications such as FCUs or air handlers. Wired models are BACnet MS/TP compliant and BTL Listed, while the wireless model is BACnet/IP compliant over Wi-Fi.

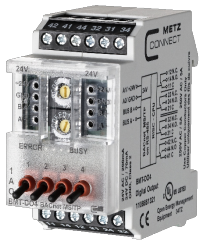
Model	Description
BAST-421C-B2	BACnet MS/TP FCU 4-pipe, single-speed Fan, Wired
BAST-421C-BW2	BACnet/IP FCU 4-pipe, single-speed Fan, Wi-Fi

I/O Modules – Expanding the Number of Points in the Field

For those installations that require that field input/output devices must be distributed away from the central controller or simply that more points are needed in Class 2 field installations, Contemporary Controls has a solution for both BACnet MS/TP and Modbus RTU systems. Cost-effective Configurable I/O or Cube I/O modules are available with analog and digital inputs and outputs in varying combinations.

Cube I/O modules are available with varying configurations of analog and digital inputs and outputs. Digital input modules can be configured to support either "wet or dry" contacts up to 10 points. There are also analog input modules to measure voltage and resistance, analog output modules that output voltage, relay output modules and mixed digital input/output modules. All modules operate from a 24 VAC/VDC supply.

Cube I/O BACnet MS/TP

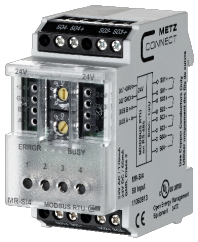


Input Models	Description
BMT-DI4	BACnet MS/TP 4 Digital Inputs
BMT-DI10	BACnet MS/TP 10 Digital Inputs
BMT-SI4	BACnet MS/TP 4 Retentive Pulse Counting Inputs
BMT-AI8	BACnet MS/TP 8 Resistance or Voltage Inputs

Output Models	Description
BMT-DO4	BACnet MS/TP 4 Digital Relay Outputs w/ HOA
BMT-AO4	BACnet MS/TP 4 Analog Outputs 0 to 10 VDC

Mixed Models	Description
BMT-DIO4/2	BACnet MS/TP 4 Digital Inputs & 2 Relay Outputs w/ HOA

Cube I/O Modbus RTU



Input Models	Description
MR-DI4	Modbus RTU 4 Digital Inputs
MR-DI10	Modbus RTU 10 Digital Inputs
MR-SI4	Modbus RTU 4 Retentive Pulse Counting Inputs
MR-AI8	BACnet MS/TP 4 Digital Inputs & 2 Relay Outputs w/ HOA

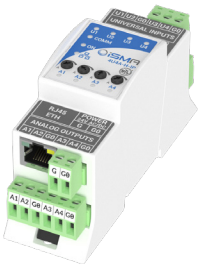
Output Models	Description
MR-DO4	Modbus RTU 4 Digital Relay Outputs w/ HOA
MR-AO4	Modbus RTU 4 Analog Outputs 0 to 10 VDC

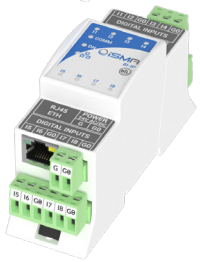
Mixed Models	Description
MR-DIO4/2	BACnet MS/TP 4 Digital Inputs & 2 Relay Outputs w/ HOA

I/O Modules

Configurable I/O modules provide universal inputs that support temperature, analog, resistance and binary in a single module. For applications not requiring universal inputs there are modules with discrete inputs that support contact closure and retentive pulse counting at 100Hz. Additional modules supply a mix of universal inputs and/or discrete with relay outputs and analog outputs. A single module supports BACnet MS/TP or Modbus RTU/ASCII with a simple dip switch selection.

Configurable I/O BACnet MS/TP or Modbus RTU



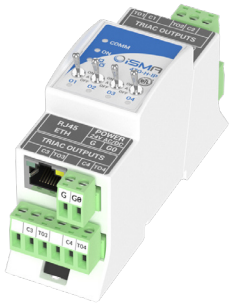


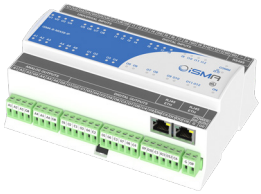
Input Models	Description
iSMA-B-8I	8DI - Serial with BACnet and Modbus
ISMA-B-8U	8UI - Serial with BACnet and Modbus

Output Models	Description
iSMA-B-4O-H	4DO relay NC/NO 8 A @ 30V AC or DC with HOA - Serial with BACnet & Modbus
ISMA-B-4TO-H	4TO triac outputs- .5 A @ 30 V AC with HOA - Serial with BACnet & Modbus

Mixed Models	Description
iSMA-B-4I4O-H	4DI and 4DO with HOA - Serial with BACnet and Modbus
iSMA-B-4U4O-H	4UI and 4DO with hand operation - Serial with BACnet and Modbus
iSMA-B-4U4A-H	UI and 4AO with HOA - Serial with BACnet and Modbus
iSMA-B-MIX18	5DI, 5UI, 4AO, 4DO - Serial with BACnet and Modbus
iSMA-B-MIX38	12DI, 8UI, 6AO, 12DO - Serial with BACnet and Modbus

Configurable I/O BACnet/IP or Modbus TCP





Input Models	Description
iSMA-B-8I-IP	8DI - Serial with BACnet and Modbus
ISMA-B-8U-IP	8UI - Serial with BACnet and Modbus

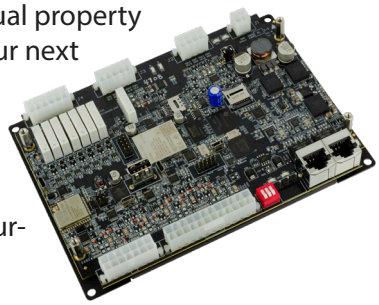
Output Models	Description
iSMA-B-4O-H-IP	4DO relay NC/NO 8 A @ 30V AC or DC with HOA - Serial with BACnet & Modbus
ISMA-B-4TO-H-IP	4TO triac outputs- .5 A @ 30 V AC with HOA - Serial with BACnet & Modbus

Mixed Models	Description
iSMA-B-4I4O-H-IP	4DI and 4DO with HOA - Serial with BACnet and Modbus
iSMA-B-4U4O-H-IP	4UI and 4DO with hand operation - Serial with BACnet and Modbus
iSMA-B-4U4A-H-IP	UI and 4AO with HOA - Serial with BACnet and Modbus
iSMA-B-MIX18-IP	5DI, 5UI, 4AO, 4DO - Serial with BACnet and Modbus
iSMA-B-MIX38-IP	12DI, 8UI, 6AO, 12DO - Serial with BACnet and Modbus

High Value Solutions for Unique Projects

Contemporary Controls designs and manufacturers networking and control products used in various automation industries where performance and reliability are essential. These products, along with our comprehensive design experience, allow us to offer original design manufacturing (ODM) services where we provide the product you require under your brand.

With more than 40 years of experience in electronics design, development and manufacturing, we have a rich inventory of intellectual property that can be tapped for your next project. Two design and manufacturing locations provide private-label and ODM services. Leverage our design and manufacturing resources to reduce your costs and time-to-market.

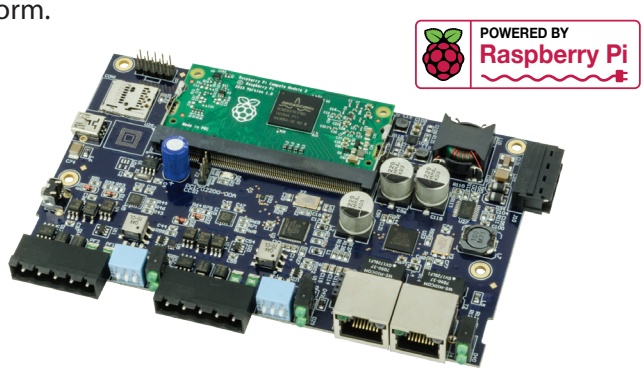


RTU38 Advanced RTU Controller

Case Study: Application Ready Platform Automation Platform

The Automation Platform is a robust and powerful hardware platform ready to run any application software compliant with the Raspberry Pi. Intended for non-stop automation projects, the Automation Platform builds upon the high-speed Raspberry Pi Compute Module by including two isolated EIA-485 serial ports suitable for BACnet MS/TP, Modbus RTU or other serial protocols, and two Ethernet ports.

If your application software can run on a Raspberry Pi, it will most likely run on our Automation Platform. Use our hardware expertise to bring your software application to market faster under your brand with the Automation Platform.



Raspberry Pi compliant Automation Platform

What We Design, We Make

Contemporary Controls has two manufacturing locations, one in Downers Grove, Illinois and the other in Suzhou, PRC. Both operations are ISO9001:2015 registered and are under Underwriters Laboratories (UL) surveillance. In addition to self-manufacturing, Contemporary Controls sources complementary networking and control products for the convenience of our customers. The US operation has modern Panasonic multi-function, surface-mount technology (SMT) process lines that produce sophisticated, lead-free, high-density printed circuit board assemblies (PCBAs) that incorporate ball-grid-array (BGA) components. These PCBAs are then installed into their enclosures, tested and stored in their final packaging in an environmentally-controlled warehouse ready for worldwide shipment.

While the US operation is ideal for prototyping, and producing high-mix, low-volume and Made in USA products, the China operation with its sourcing partners are better suited for high-volume, low-mix production. In either location, intellectual property is protected.

Both plants adhere to ISO9001 quality procedures and follow IPC workmanship standards recognized in the electronics industry. Both plants are under Underwriters Laboratories (UL) surveillance.

Quality Policy

Contemporary Controls develops, manufactures and markets innovative networking and control products to the benefit of our automation customers worldwide. We are committed to delivering products and services that meet customer requirements and strive to exceed their expectations through our continuous improvement efforts.

Application Ready Platforms

APPI

- Raspberry Pi CM3+ (1.2 GHz)
- 1 GB RAM
- pSLC eMMC Flash (5/10 GB)
- Linux Operating System
- 2 Individual 10/100 Mbps Ethernet ports
- Optically Isolated EIA-485 ports
- Optional daughter boards for Wi-Fi (802.11 b/g/n), or LTE/4G cellular
- FCC, CE and EMC compliance

APTI

- 1 GHz TI AM3352 CPU
- 512 MB RAM
- pSLC eMMC Flash (5/10 GB)
- Linux Operating System
- 10/100 Mbps Ethernet ports
- Optically Isolated EIA-485 ports
- Optional daughter boards for Wi-Fi (802.11 b/g/n), or LTE/4G cellular
- FCC, CE and EMC compliance
- -40°C to +75°C wide-temp operation

Potential Applications:

- Protocol converter
- Router or gateway
- Edge Controller
- Supervisor
- IoT/Edge cloud gateway

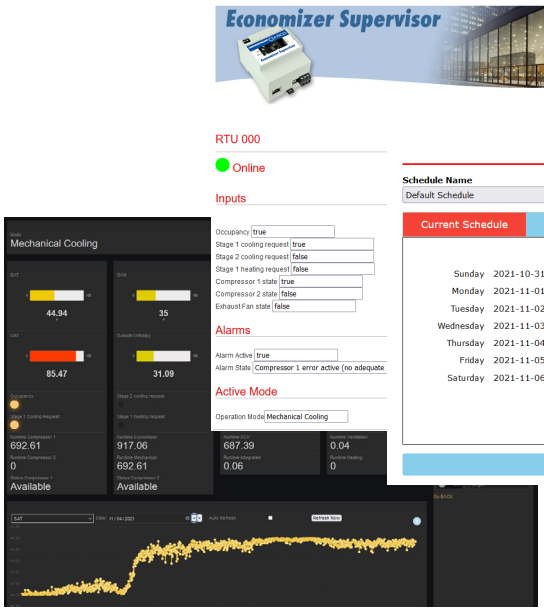
Made in USA

APPI-12 APTI-2

Economizer Supervisor

BACnet/IP and BACnet MS/TP supervisor

- BACnet/IP and BACnet MS/TP supervisor
- Centralized alarm and status reporting
- Trend multiple economizer points
- Manual and scheduled remote purge
- Accommodates up to 6 Belimo ZIP economizers
- Economizer webpage configuration



Unmanaged Switches

Diagnostic Switches

Media Converters

IP Routers

Power over Ethernet (PoE)

CTRLink®

Ethernet Built for Buildings

Whatever the Ethernet infrastructure need, a solution is available from CTRLink. For simple systems, plug-and-play unmanaged switches can be put into service without adjustments and provide a simple, cost-effective method for expanding Ethernet networks. Most models include features such as auto-MDIX and auto-negotiation.

For troubleshooting, the diagnostic switch retains all the virtues of a switch with one exception – no address learning. All messages – directed, multicast, broadcast – are flooded to all ports on the switch allowing a protocol analyzer tool such as Wireshark the ability to observe all traffic on the network.

If no fiber optic ports are available on equipment to be connected, a media converter will do the trick. Media converters offer the lowest latency because they are pure media converters and not 2-port switches. Conversion from copper to fiber optic cabling is possible without the loss of auto-negotiation features.

While Ethernet switches can expand a single Ethernet network, IP routers connect two Internet Protocol (IP) networks together, passing appropriate traffic while blocking all other traffic. One of the networks is designated the local-area-network and the other the wide-area-network. IP routers are used to isolate traffic and for gaining access to remote equipment. CTRLink provides several secure wired and wireless network solutions.

Power over Ethernet (PoE) provides data and power over one cable, thereby eliminating the need for additional power supplies for Ethernet-enabled devices placed in challenging locations, such as wireless access points or IP cameras on a ceiling or outdoors.

Smoke and Fire UL 864

The CTRLink product line includes products that comply with the requirements of Underwriters Laboratories (UL) 864 Control Units and Accessories for Fire Alarm Systems 10th Edition. A UL recognized component has already been evaluated and tested in accordance with UL's component safety standards, streamlining the qualification process for the system supplier.

Simplified Remote Access Minimizes Site Visits

A VPN can provide secure access to remote job sites while giving systems integrators the flexibility to monitor and maintain systems from the convenience of their home or office. Contemporary Controls offers three VPN solutions to meet your remote access needs—our **RemoteVPN subscription service**, and our **Self-HostedVPN** and **BridgeVPN solutions**.

Contemporary Controls' EIPR-V, EIGR-V series, and EIGR-C series Skorpion IP routers support OpenVPN® client functionality and can be used with our RemoteVPN subscription service. Our EIGR-V and EIGR-VB routers can be configured as VPN servers for our Self-HostedVPN and BridgeVPN solutions.

RemoteVPN for Simplified Secure Remote Communication

Contemporary Controls' RemoteVPN subscription service provides secure communication and the convenience of remote access without having to maintain the VPN server.

Utilizing the Internet for remote commissioning provides convenience while saving time and money. However, accessing equipment at remote sites can be difficult because firewalls block messages that originate from the Internet. Although it is possible to open ports in firewalls using port forwarding, IT professionals are often reluctant to compromise the security of their networks and usually decline this type of request. Without support from the IT department, the system integrator is usually left with very few options.

One solution is to incorporate a VPN. A simple VPN can exist between two end points, called clients. One client is you at your office, and the other client is the remote job site. Communication is encrypted, so only authorized devices can communicate over the VPN. Contemporary Controls RemoteVPN subscription service incorporates a cloud-based OpenVPN® server. OpenVPN is open-source and incorporates SSL/TLS security with encryption. Any IP program (TCP or UDP) can communicate via RemoteVPN. Once the VPN connection is established messages can originate from either side—eliminating the need for port-forwarding.

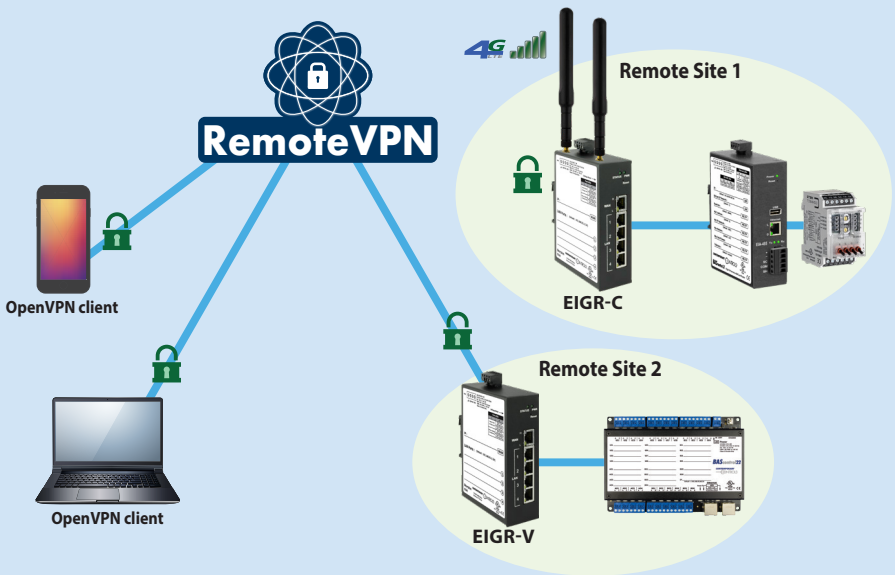
How It Works

The RemoteVPN server, hosted on the Internet and maintained by Contemporary Controls, allows OpenVPN client devices to communicate together. Communication initiated by OpenVPN clients pass through firewalls up to the RemoteVPN server which completes the client connections. All that is needed is an account on the server to utilize the RemoteVPN service. OpenVPN clients are easy to obtain and can be downloaded from OpenVPN.net, or via Google Play for Android devices, or via the Apple App Store for iOS devices.

RemoteVPN is an easy and cost-effective remote access solution that allows you to proactively review and communicate with job site automation systems, resulting in valuable time and money savings.

RemoteVPN Service

The RemoteVPN service provides remote access without concern for intervening firewalls. This cloud-based VPN server provides secure encrypted connections between VPN clients installed on the systems integrator's PC or mobile device and the other permanently installed on our VPN router located at the job sites. This approach provides the creation of two secure VPN tunnels with no concern for intervening firewalls. Connections can be wired or wireless. Multiple remote sites can be accessed simultaneously using the RemoteVPN service.

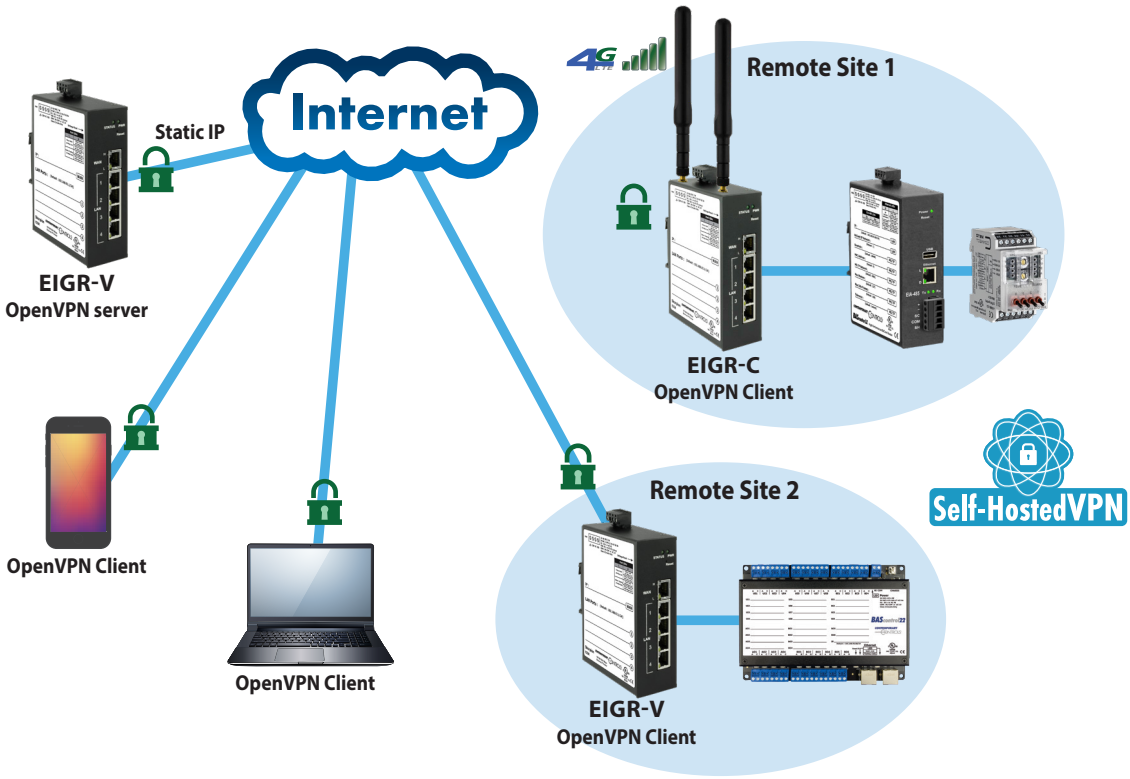


Host Your Own OpenVPN Server and Eliminate Subscription Fees

The RemoteVPN subscription service provides security and convenience. However, for network-savvy customers wishing to avoid subscription fees, the EIGR-V IP router can be configured to operate in OpenVPN server mode, thereby eliminating the cloud service and related fees. Setting up an OpenVPN server on your own is not trivial. It typically involves setting up a root certificate authority and generating certificates and keys for the OpenVPN server and for each client device that intends to connect to this server. However, the EIGR-V's built-in webpages facilitate the tasks without requiring downloaded software to generate certificates or keys. One EIGR-V set to OpenVPN server mode and assigned a fixed public IP address resides at the client site or any other convenient site and uses the Internet for communicating to OpenVPN clients without any cloud service involved.

With Self-HostedVPN, one EIGR-V in OpenVPN server mode can support up to 15 IP routers in OpenVPN client mode, allowing access to 15 remote sites via cellular (EIGR-C) or wired VPN routers (EIGR-V /EIPR-V). Additionally, 15 PC/tablet/ phone OpenVPN clients with access control permissions configurable via the EIGR-V's built-in webpage are supported. These PC clients can be located anywhere that has Internet connectivity. With this arrangement, PC/tablet/cell phone clients and client routers in remote locations can communicate securely using the services of this one EIGR-V OpenVPN server. There is no additional requirement to setup NAT or Port Forwarding on the client routers as they initiate outbound connections to the OpenVPN server. Furthermore, the OpenVPN client devices only require internet access—there is no requirement for a static public IP address. The only requirement for a public IP is for the OpenVPN server router. The OpenVPN server router itself can be connected behind an existing firewall/router with a public IP and have the OpenVPN port forwarded to it.

An additional benefit is that each PC/tablet/cell phone client can be configured to communicate with one or more router clients independent of each other. The EIGR-V provides the ideal solution for secure remote access across multiple locations without subscription fees or cloud service dependencies.



Host Your Own OpenVPN Server for Single-Site Access

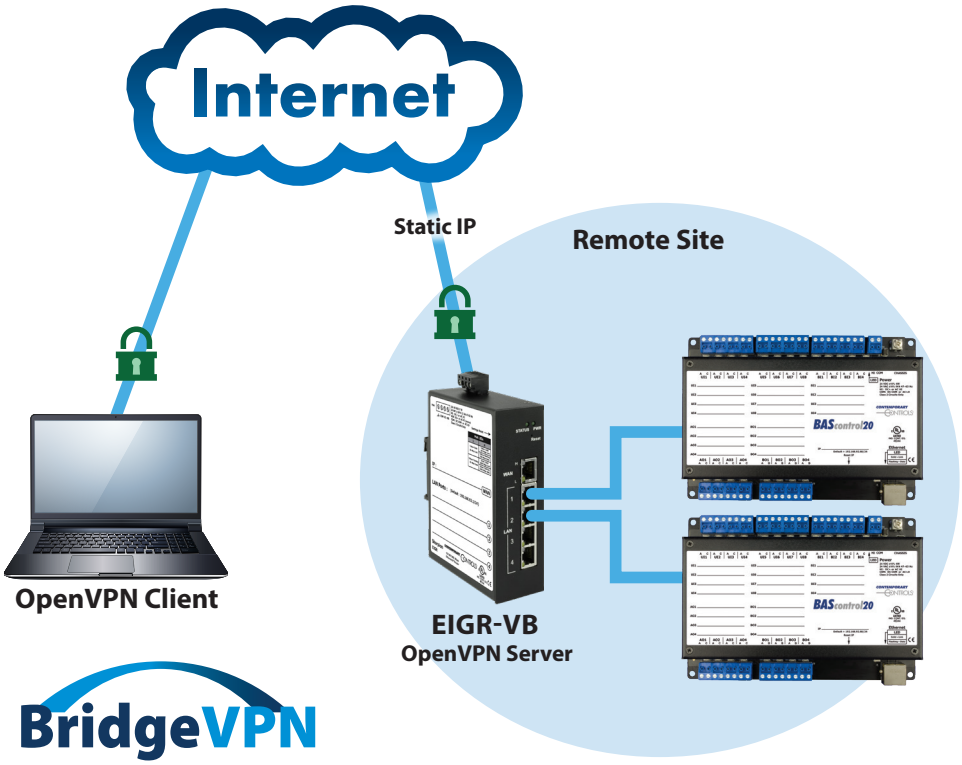
Utilizing the Internet for remote commissioning provides convenience while saving time and money. For single-site, remote access solutions, the EIGR-VB IP router can be configured to operate in OpenVPN server mode as a wired bridge VPN server. With this configuration, users set up and maintain their own secure remote access without subscription fees and without the need for a cloud-based VPN server.

This BridgeVPN solution can support up to 10 OpenVPN clients on PC/tablet/phone. Note: Though OpenVPN client software is available from the Google Store for Android devices, it doesn't support TAP adapter required for bridge mode, and hence Android clients are not supported.

These clients are bridged to the router's LAN-side and assigned an IP address from the LAN subnet.

This provides the same application experience as if the client devices were part of the EIGR-VB's LAN and allows passage of multicast and broadcast messages through the VPN tunnel without the need for a BACnet/IP Broadcast Management Device (BBMD). Although the EIGR-VB has many of the same features found in high-end routers, it is simpler to install and commission. A resident DHCP server on the LAN-side will provide IP addresses to LAN-side clients, while a DHCP client on the WAN-side will accept IP address assignments from the attached network. Static addressing is accommodated as well. Configuration is via a web browser using authentication.

The EIGR-VB provides the ideal solution for secure, single-site, remote access without subscription fees or cloud service dependencies.



About BASautomation Building on BACnet

Contemporary Controls is unique in the industry by supplying products that maximize the benefits of both BACnet and Ethernet. BACnet, an internationally recognized building automation standard, can take you from the field level to the Internet. With buildings pre-wired for Ethernet, BACnet/IP is the ideal choice for building automation systems. Ethernet is everywhere and understood by many. With BASautomation—Building on BACnet and CTRlink—Ethernet Built for Buildings, Contemporary Controls provides the system building blocks for networking, integrating and controlling your building.

BASautomation products have provided solutions worldwide

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