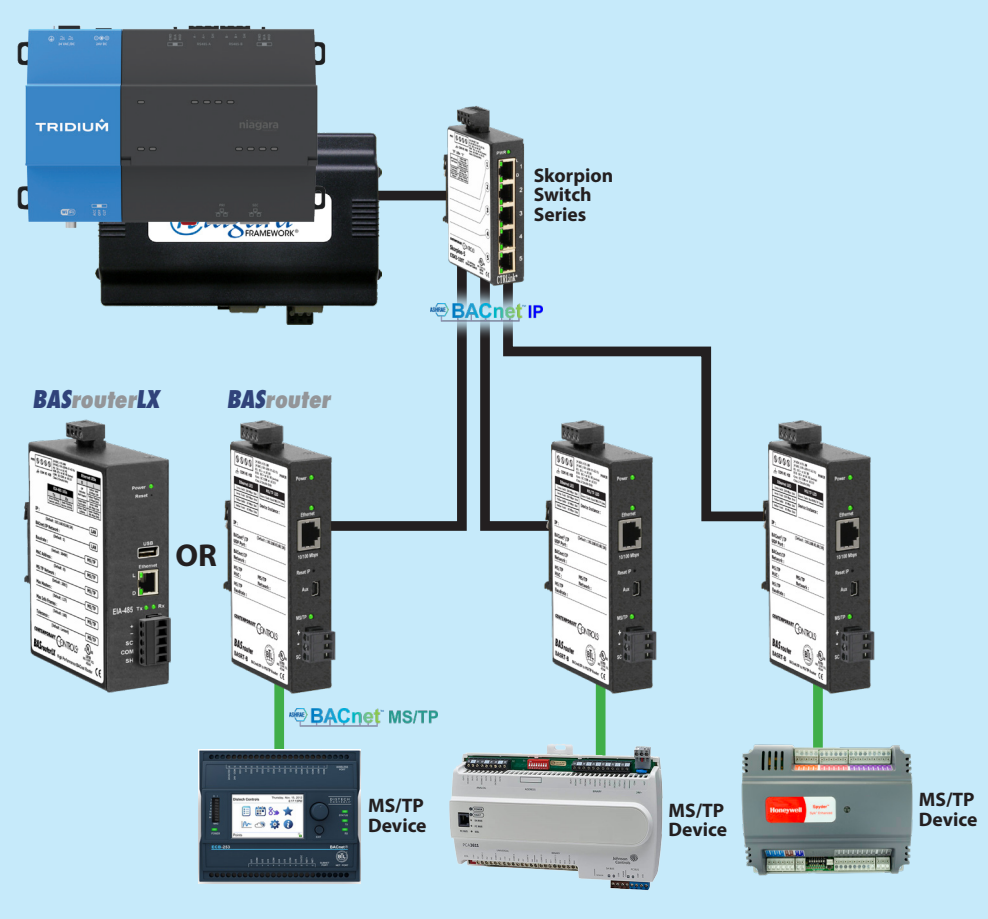
Enhance Your Niagara JACE

Offload and Segment JACE BACnet MS/TP Traffic

While the JACE can receive or route MS/TP traffic over one of its serial ports, handling the intensive overhead of the BACnet MS/TP token passing protocol burdens the JACE's CPU and reduces its performance. This results in increased system resource usage that could be used for other functions such as trending, alarming, and graphics/dashboards.

The JACE CPU resource usage can be improved by offloading the task of MS/TP token passing to external BACnet MS/TP to BACnet/IP routers. This is especially important if you require the JACE to be connected to multiple MS/TP segments, where signal quality issues may arise. The use of BASrouter or BASrouterLX routers allows you to segment your BACnet network by using a router on each MS/TP segment and routing the traffic to IP. Use an Ethernet switch to interconnect the BACnet routers. The JACE then receives all traffic from all MS/TP segments through its Ethernet port.

Contemporary Control's BASrouters — BACnet® Multi-Network Router and BASrouterLX — High-Performance BACnet® Router, provides the solution. These routers offer stand-alone routing between BACnet/IP, BACnet Ethernet, and BACnet MS/TP networks — allowing the system integrator to mix BACnet network technologies within a single BACnet inter-network.

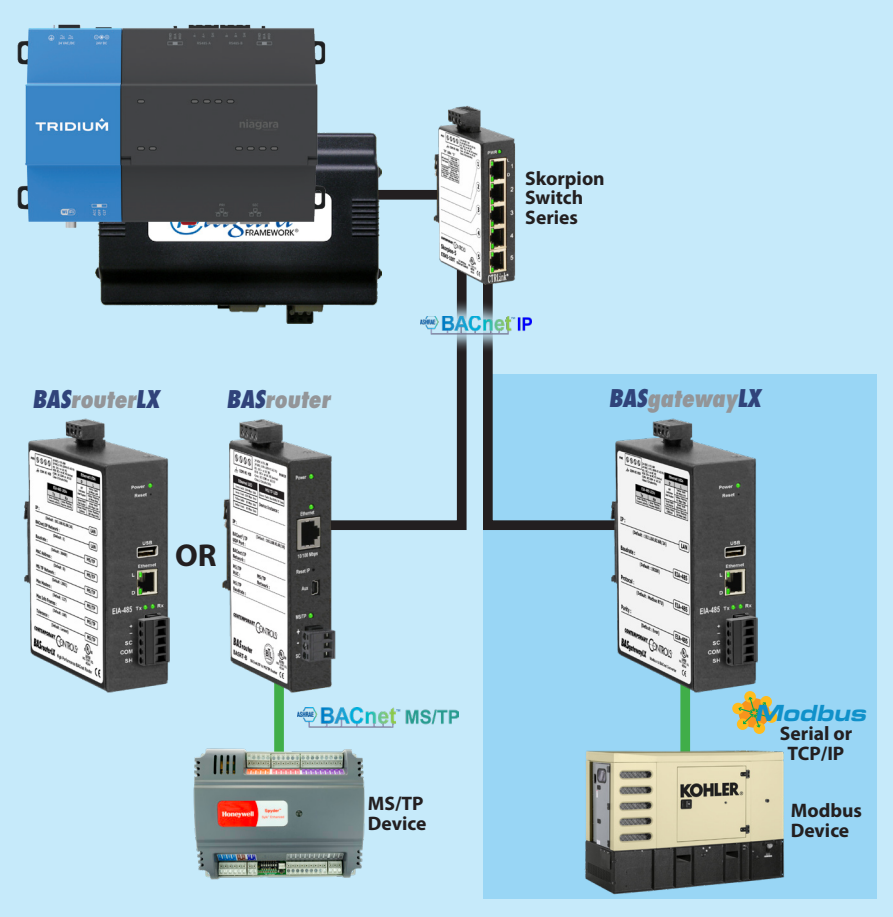


The BASrouter's field-proven circuit design and up-to-date ANSI/ASHRAE BACnet operation with BTL (BACnet Testing Laboratories) certification provides outstanding reliability. Enhanced BASrouter features (version 3.0 and newer) provide built-in BACnet diagnostic capabilities with visual MS/TP status table, routing status table, network errors count, and traffic statistics. This allows robust BACnet networks to be installed with ease.

The BASrouterLX is a high-performance BACnet router with advanced features including 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 a protocol analyzer tool such as Wireshark®. As a BACnet/IP Broadcast Management Device (BBMD), up to 50 Broadcast Distribution Table (BDT) and 147 Foreign Device Registration (FDR) entries can be supported.

Simplify Modbus Integration to the JACE

Although the JACE can communicate Modbus Serial over one of its serial ports, the Modbus protocol does not allow points to be discovered like BACnet points, which requires manual configuration of each Modbus register. This can be difficult and very time consuming. By using the BASgatewayLX - Modbus to BACnet/IP gateway, with pre-defined Modbus device profiles, configuration of Modbus device registers is just as quick as configuring BACnet points. This allows for greatly reducing the time to configure Modbus devices in the field. Modbus Serial or Modbus TCP/IP points appear to the JACE's Ethernet port as BACnet/IP discoverable points.

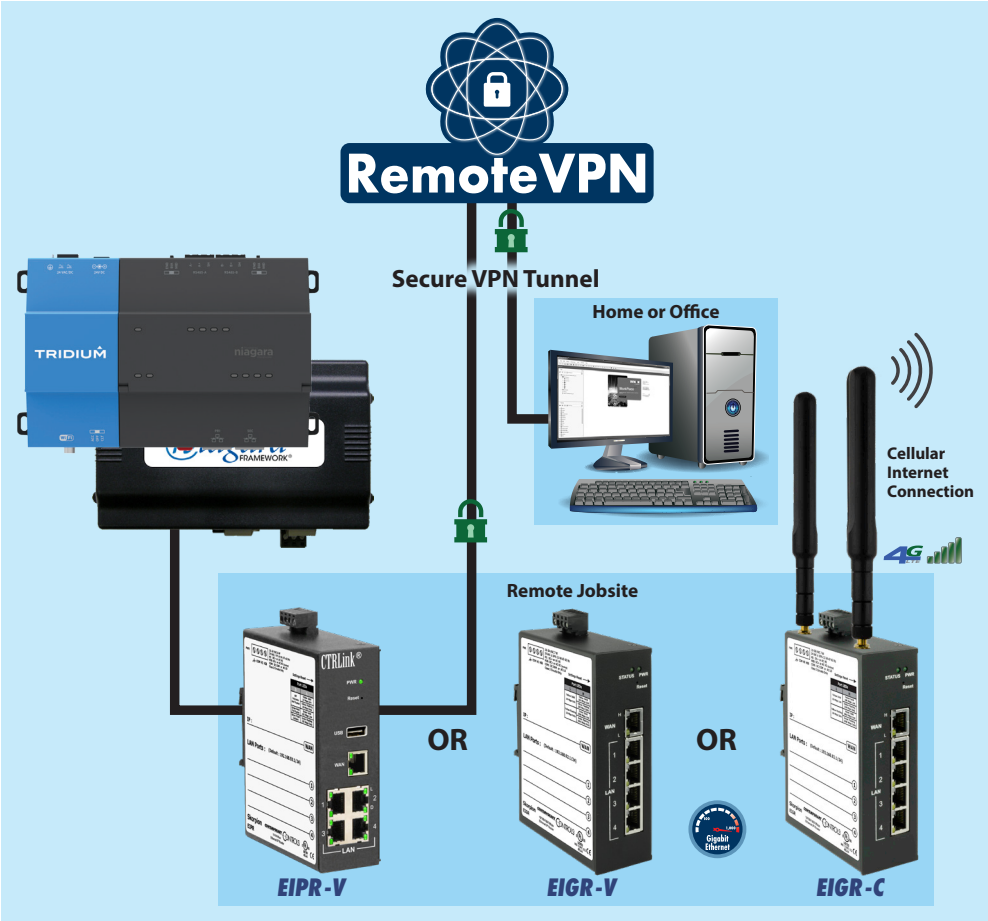


The BASgatewayLX — Modbus to BACnet® Gateway provides a 10/100 Mbps BACnet/IP and Modbus TCP/IP Ethernet port and an opto-isolated Modbus EIA-485 serial port for Modbus RTU or Modbus ASCII devices. Up to 100 Modbus serial devices (represented by up to 1000 polled points) can share the single Modbus port on the BASgatewayLX. BACnet Change of Value (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. Configuration time is drastically reduced with a library of pre-defined Modbus device profiles available for most equipment manufacturers. This is especially useful when using multiple identical Modbus devices in similar applications. Contemporary Controls maintains a profile library of most common Modbus devices. If one is not available, we will be glad to provide it upon request. Configuration and uploading of custom device profiles to the BASgatewayLX is easily done using its web page.

Remotely Access Your JACE

Traveling to a job site to conduct a service call can be expensive, time consuming, and counterproductive, especially when the problem could be resolved remotely. Remote access to the JACE can reduce travel time and improve troubleshooting responsiveness. There are several ways this can be accomplished with either wired (Ethernet) or wireless (Cellular) IP router solutions which do not compromise network security thanks to advanced VPN (Virtual Private Network) technology.

Contemporary Control's EIPR-V – 10/100Mbps Wired VPN IP Router, EIGR-V – 10/100/1000Mbps Wired VPN IP Router, EIGR-C – 3G/4G Wireless Cellular VPN IP Router, and RemoteVPN – Secure Cloud Server products provide an array of secure remote monitoring solution options for your JACE, or any IP network. The JACE has two Ethernet ports – Primary and Secondary. The Primary port can be utilized for the local building control network and the Secondary port for remote communications. Connecting the Secondary port to one of our VPN IP routers establishes a secure connection to our RemoteVPN cloud service and provides access to the JACE from an office or other remote location without compromising security. When using more than one JACE, all the Secondary JACE ports can be networked together to create a remote access network that can be accessed through the VPN IP router.



RemoteVPN is a cloud service offered by Contemporary Controls which allows systems integrators remote access to systems from the convenience of their home or office. A cloud-based secure VPN server hosted by Contemporary Controls provides the critical connection between two VPN clients - one installed on the systems integrator's PC and the other permanently installed on the EIPR or EIGR VPN IP router at the remote location. Using this approach, two secure, encrypted VPN tunnels are created with no concern for intervening firewalls. In addition to VPN PC clients for Windows machines, VPN clients are available for iOS and Android mobile devices for greater flexibility. The use of RemoteVPN service, along with the EIPR / EIGR VPN routers, eliminates the need for a Static Public IP address providing considerable savings on Internet Service Provider (ISP) fees. RemoteVPN allows access to devices where it is not possible to change the Gateway IP address—either because the Gateway IP setting is used for a separate subnet or is missing (JACE Secondary Ethernet port).

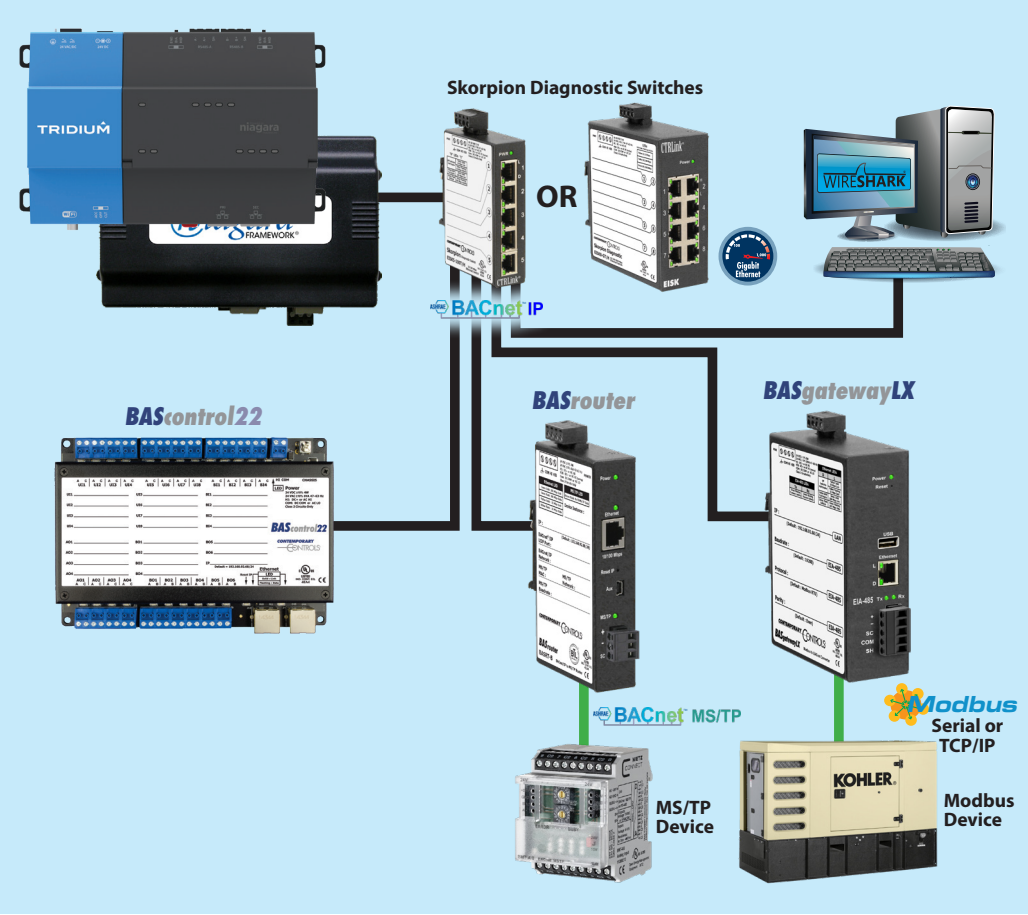
The EIPR-V is a wired VPN IP router with 24 VAC/VDC power input and DIN-rail mounting which links two 10/100Mbps Internet Protocol (IPv4) networks — passing appropriate traffic while blocking all other traffic. The EIPR-V also provides a secure VPN connection to the JACE in conjunction with our secure RemoteVPN cloud service. The EIPR-V incorporates a four-port Ethernet switch for multiple LAN-side connections. An external Ethernet-based modem — cable or DSL — can be used to connect to the Internet.

The EIGR-V is a Gigabit wired VPN IP router which links two 10/100/1000Mbps Internet Protocol (IPv4) networks for higher bandwidth applications. The EIGR-V provides a secure VPN connection to the JACE in conjunction with our secure RemoteVPN cloud service. The EIGR-V incorporates a four-port Gigabit Ethernet switch for multiple LAN-side high-bandwidth IP connections. An optional, more advanced network configuration of an EIGR-V VPN Client and a second EIGR-V VPN set up as a Server allow for hosting your own secure VPN tunnel between the two devices without the need of RemoteVPN cloud connection. The EIGR-V is available for commercial or wide temperature operation (-40°C and +75°C in the VX model).

The EIGR-C is a Gigabit wireless 3G/4G LTE cellular VPN IP router which links a 10/100/1000Mbps Internet Protocol (IPv4) network with a 3G/4G LTE Cellular network for remote access at sites with no Internet connectivity — passing appropriate traffic while blocking all other traffic. The EIGR-C provides a secure VPN connection to the JACE in conjunction with our secure RemoteVPN cloud service. The EIGR-C incorporates a four-port Gigabit Ethernet switch for multiple LAN-side high-bandwidth IP connections. A selection of models is available for different cellular service providers based on regional cellular coverage availability.

Diagnose Your JACE IP Network

You may be experiencing IP network errors, communication issues with your JACE, or you cannot discover a device on the IP network. It would be difficult to troubleshoot these issues without access to a network protocol analyzer such as Wireshark®, which works by capturing all network traffic and decoding the packets for analysis of the conversation between devices. Mounting a diagnostic switch next to your JACE allows you to easily perform IP network troubleshooting.



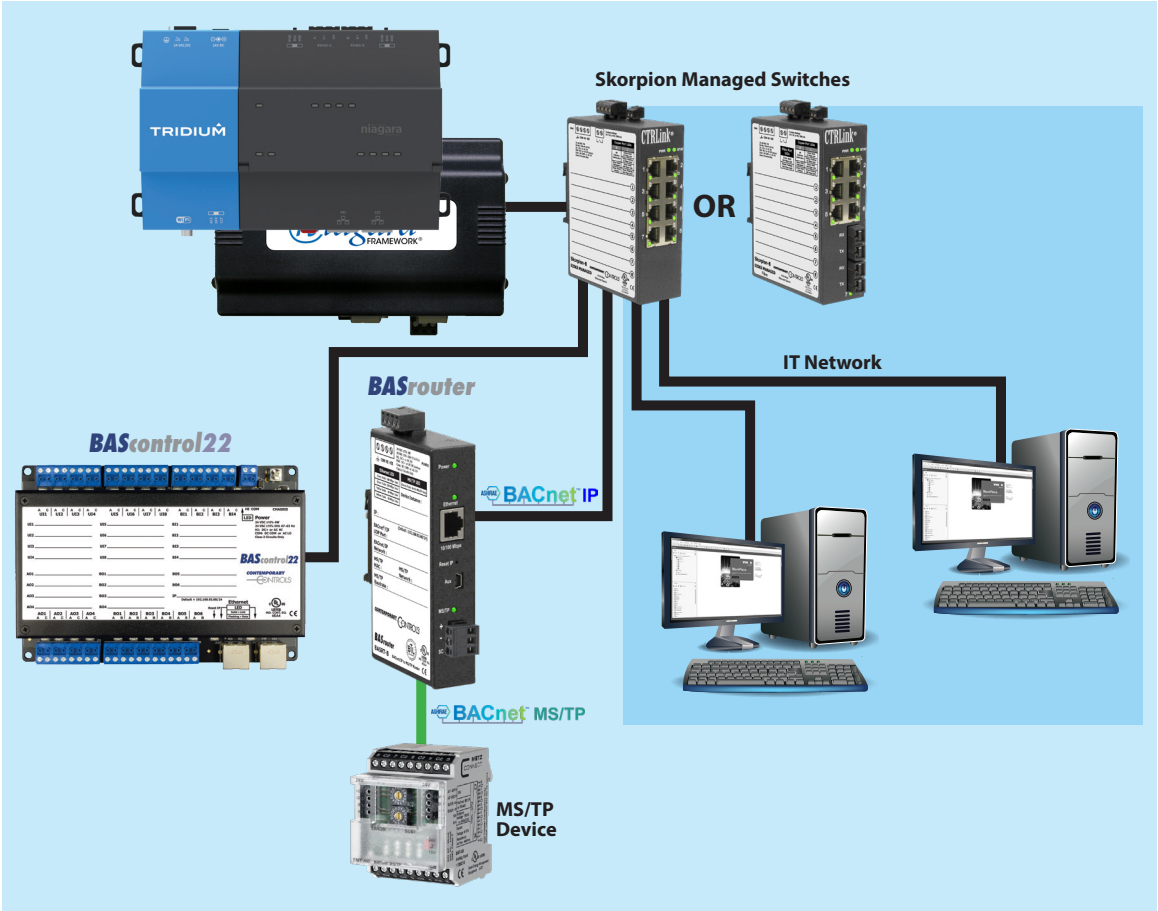
Skorpion® Diagnostic Switches assist in troubleshooting Ethernet networks by allowing a network protocol analyzer such as Wireshark® to attach to an unused port on the switch and observe all traffic on the network. Skorpion Diagnostic Switches retain all the features of an unmanaged switch but perform like a repeating hub where all received messages are flooded to all other ports. There are two models of 5-port diagnostic switches with 24VAC/VDC power input and DIN rail mounting in the series which differ only by the highest data rate supported. The EISK5-100T/H supports 10/100 Mbps networks while the EISK5-GT/H can additionally support gigabit speed traffic. The EISK8-GT/H supports up to eight ports at 10/100/1000 Mbps speeds. All messages-directed, multicast, and broadcast-are flooded to all ports on the switch, providing the ability to observe all traffic on the network. This eliminates the need for a managed switch and setting up mirroring to do diagnostics – replacing it will be simple with the plug-and-play operation of the diagnostic switch. The Skorpion Diagnostic Switch can be permanently mounted next to a JACE installation or replaced with a regular Skorpion switch once the system is commissioned.

Virtually Partition Your JACE Control Network and IT Network

If your JACE network is sharing the main information network, you are likely to get some pushback from the IT department. Your automation network tends to generate more broadcast and multicast messages, while also requiring fixed IP address assignments. These attributes are not usually welcomed by IT departments.

Virtual Local Area Networks (VLANs) enable Ethernet connected systems to be divided into logical groups at the data link layer. VLANs make it easy for network administrators to partition a single switched IP network to match the functional and security requirements of their systems without having to run new cables or make major changes in their current network infrastructure. Without VLANs, grouping IP connected devices according to their resource or functionality necessitates the labor of relocating nodes, rewiring data links or adding more switches or routers. In addition, VLANs provide ease of administration, confinement of broadcast domains, reduced broadcast traffic, and enforcement of security policies. By confining broadcast domains, end-stations on a VLAN are prevented from listening to or receiving broadcasts not intended for them which optimizes overall network performance.

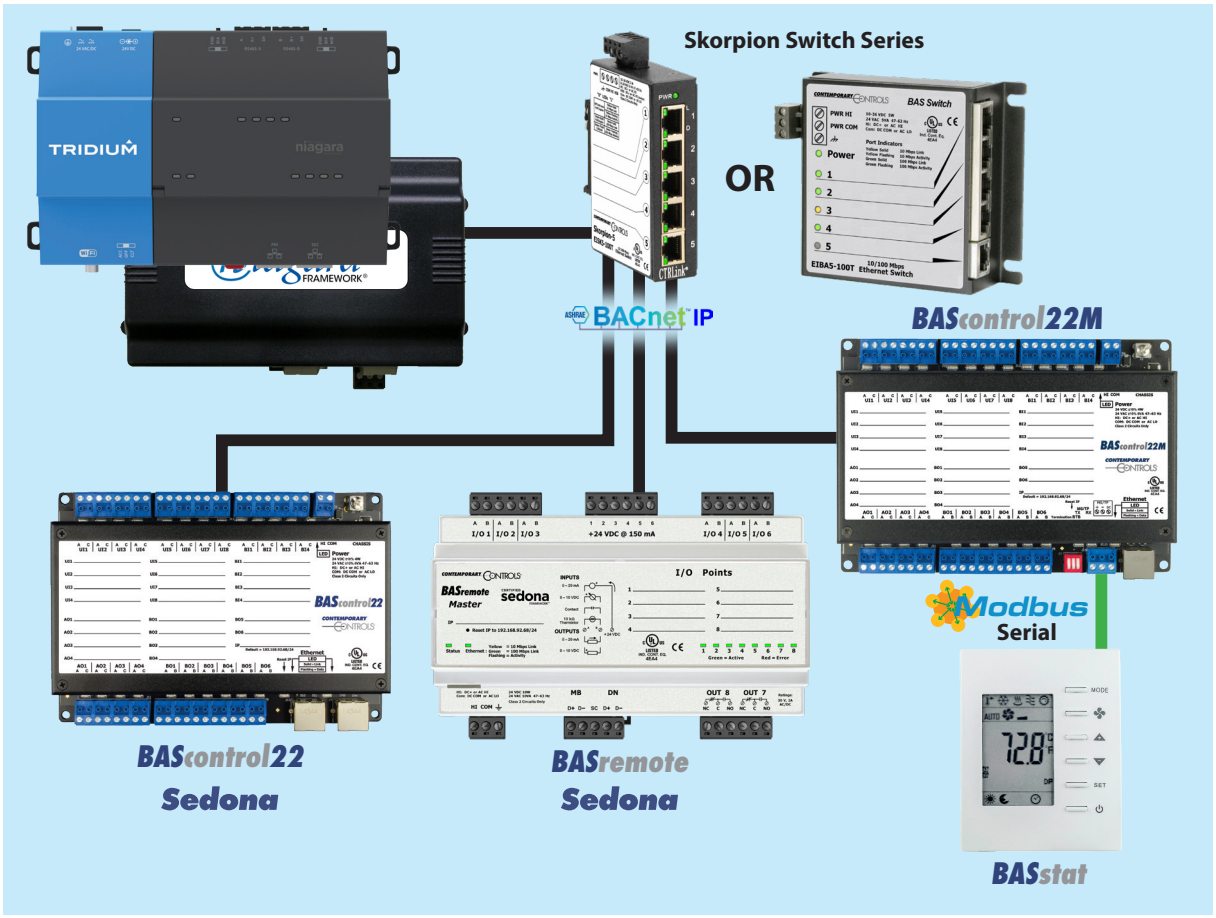
The EISK8M Series offers a compact rugged managed 10/100 Mbps Ethernet switch for IP network management and efficiency with a choice of eight copper ports or a mix of six copper and two fiber ports - with fiber optic ring redundancy. Rapid Spanning Tree Protocol (RSTP) is also supported providing greater redundancy over mesh configuration. Intended for cost-effective Simple Network Management Protocol (SNMP) applications, the unit is rated over the industrial temperature range. Fiber optic distances up to 15 km are possible with the single-mode option.

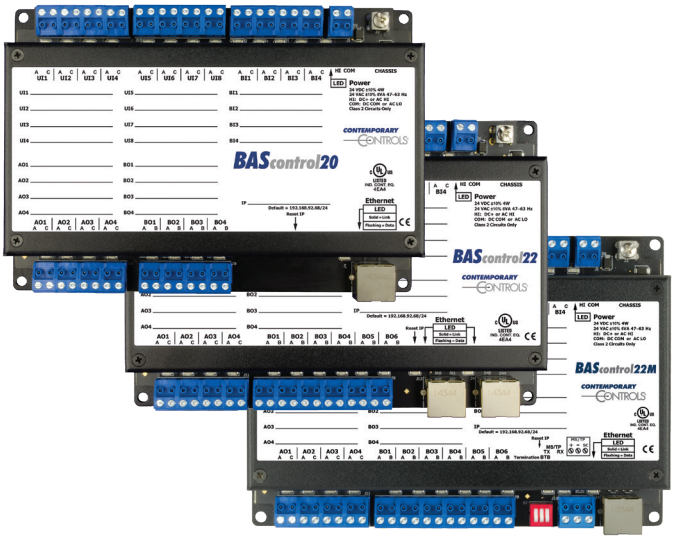


The EISK8M Series provides standard plug-and-play features allowing for quick and simple installation. These features plus managed features can be individually set for each copper port. Three models offer a selection of two fiber port types. Single-mode transceivers with SC connectors (providing 15 km cable distance) or multimode transceivers with either SC or ST connectors. The copper ports can auto-negotiate 10Mbps, 100Mbps, half- or full-duplex. With Auto-MDIX, either straight-through or crossover cables may be used to connect any of the copper ports to similar ports on another switch. In addition to one power LED and one CPU status LED, each port has diagnostic LEDs showing link/activity/data rate by color. The EISK8M Series features DIN-rail mounting and 24 VAC/VDC power input. Provisions for redundant power connections are also provided.

Standalone Control or Remote I/O for Your JACE

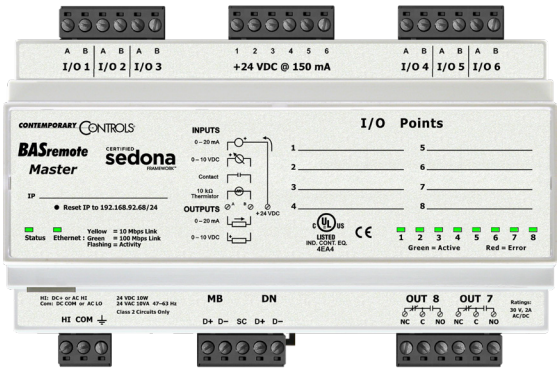
Niagara Workbench™ is an indispensable solution for programming and maintaining a Niagara system however, it is seldom used with field controllers because the controllers do not incorporate Niagara. Contemporary Control's line of Sedona controllers - the BAScontrol series and the BASremote controller/gateway - can be programmed using Niagara Workbench™ 3.7 and 3.8 tools, meaning that the tool can be used with both Niagara and Sedona controllers, thereby greatly simplifying commissioning/programming. This makes the Niagara Workbench™ a one-tool solution. The controllers utilize a direct 10/100Mbps Ethernet connection, utilize a web server for configuration, and are freely programmable Sedona standalone controllers. They can optionally be used as remote I/O with JACE supervision over BACnet/IP.



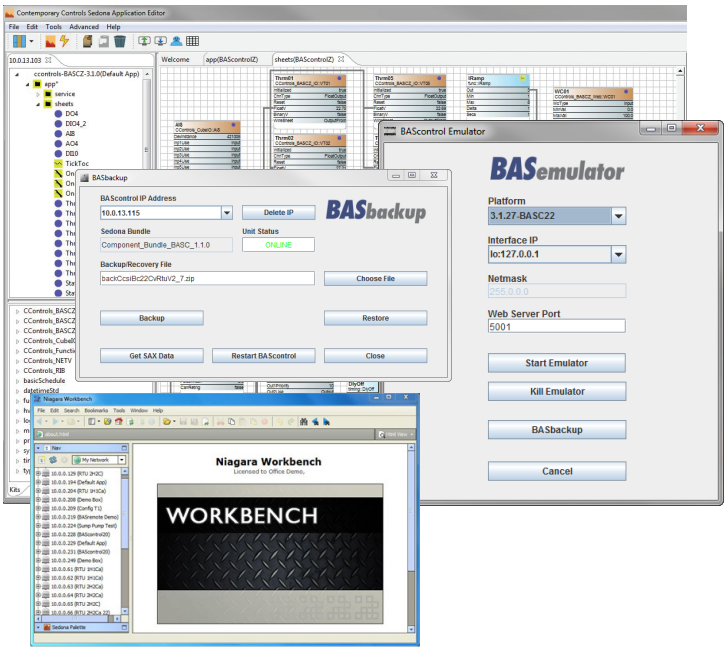


The BAScontrol series of freely programmable controllers are housed in rugged, low-profile panel-mount metal enclosure with 24VAC/VDC power input and wide temperature operation between -40°C and +75°C. These controllers are suitable for indoor or outdoor use. The BAScontrol provides a direct 10/100Mbps connection to an Ethernet IP network. The perfect solution for structured wiring systems, the BAScontrol series are BACnet/IP compliant with a B-ASC device profile. Having a resident Sedona Virtual Machine (SVM), the unit is freely programmable using Niagara Workbench 3.7 and 3.8 (learn how to set up Workbench tool here) or the free Sedona Application Editor (part of the BAScontrol Toolset). The BAScontrol is fully web page configurable using a common web browser. The web page allows for easy configuration, live monitoring, and override of physical points, virtual points, and web components. The BAScontrol Pre-Built Applications CvRTU series provides five pre-built Sedona applications for constant volume rooftop units (RTUs) that will execute on a Contemporary Controls' BAScontrol22 BACnet/IP Sedona controller. Application versions address multi-staged or analog heating/cooling, fixed or variable speed exhaust fan, dual dry-bulb or enthalpy economizer, wall-setter or network occupied/ unoccupied setpoints. These applications come with pre-assigned BACnet points list, sequence of operation, system schematic and suggested device list saving valuable time in commissioning. Sequences can be modified using the Sedona Application Editor.

Pre-Built Sedona applications make it easy to utilize a Contemporary Controls' BASC22 BACnet/IP Sedona Unitary controller in constant volume air-handling (AHU) or constant volume rooftop unit (RTU) applications.



In addition to standalone control, the BASremote — BACnet/IP Sedona Controller/ Modbus Gateway provides the system integrator a flexible building block when integrating Modbus Serial protocols or when expanding the number of points in a building automation system thanks to its Expansion Module capability. The BASremote supports BACnet/IP and Sedona for control as well as a resident EIA-485 port for Modbus Serial connections. For small systems, it can operate stand-alone. For larger systems, it can communicate BACnet/IP to supervisory controllers over its direct Ethernet connection. The BASremote can also act as a gateway for Modbus-RTU/ Modbus TCP devices to BACnet/IP. BASremote I/O can be expanded with up to three BASremote Expansion modules.



Ordering Information

Model	*Description*
BASRT-B	BASrouter BACnet/IP to MS/TP to Ethernet DIN-Rail Mount
BASRTLX-B	BASrouterLX High Performance BACnet Router DIN-Rail Mount
BASRTLX-B/P	BASrouterLX High Performance BACnet Router Panel Mount
BASGLX-M1	BASgatewayLX Modbus to BACnet Gateway DIN-Rail Mount
BASGLX-M1/P	BASgatewayLX Modbus to BACnet Gateway Panel Mount
EIPR-V	Skorpion 10/100Mbps IP Router with VPN
EIGR-V	Skorpion GigE IP Router with VPN 0 to 60°C
EIGR-VX	Skorpion GigE IP Router with VPN -40 to +75°C
EIGR-C	Skorpion GigE Cellular IP Router with VPN 0 to 60°C
REMOTEVPN-R	RemoteVPN Subscription 1 Router and 2 Clients
REMOTEVPN-C	RemoteVPN Subscription 1 Additional Client
EISK5-100T/H	Skorpion 5-Port 10/100Mbps Diagnostic Switch
EISK5-GT/H	Skorpion 5-Port GigE Diagnostic Switch
EISK8-GT/H	Skorpion 8-Port GigE Diagnostic Switch
EISK8M-100T	Skorpion 8-Port 10/100Mbps Managed Switch
EISK8M-100T/FC	Skorpion 6-Pt 10/100Mbps 2-Port MM SC-fiber Managed Switch
EISK8M-100T/FCS	Skorpion 6-Pt 10/100Mbps 2-Port SM SC-fiber Managed Switch
EISK8M-100T/FT	Skorpion 6-Pt 10/100Mbps 2-Port MM ST-fiber Managed Switch
BASC-20R	BAScontrol20 BACnet Server 20-Point 4 Relays
BASC-20T	BAScontrol20 BACnet Server 20-Point 4 Triacs
BASC-22R	BAScontrol22 BACnet Server 22-Point 6 Relays 2xRJ45 Switch
BASR-8M	BASremote I/O Master 6 Universal 2 Relay I/O
BASR-8X	BASremote I/O Expansion 6 Universal 2 Relay I/O

United States
Contemporary Control Systems, Inc.
2431 Curtiss Street
Downers Grove, IL 60515
USA

Tel: +1 630 963 7070
Fax:+1 630 963 0109

info@ccontrols.com

China
Contemporary Controls (Suzhou) Co. Ltd
19F, Metropolitan Towers,
No.199 Shishan Road,
Suzhou New District,
215009 China

Tel: +86 512 68095866
Fax: +86 512 68093760

info@ccontrols.com.cn

United Kingdom
Contemporary Controls Ltd
14 Bow Court
Fletchworth Gate
Coventry CV5 6SP
United Kingdom

Tel: +44 (0)24 7641 3786
Fax:+44 (0)24 7641 3923

ccl.info@ccontrols.com

Germany
Contemporary Controls GmbH
Fuggerstraße 1 B
04158 Leipzig
Germany

Tel: +49 341 520359 0
Fax: +49 341 520359 16

ccg.info@ccontrols.com

www.ccontrols.com