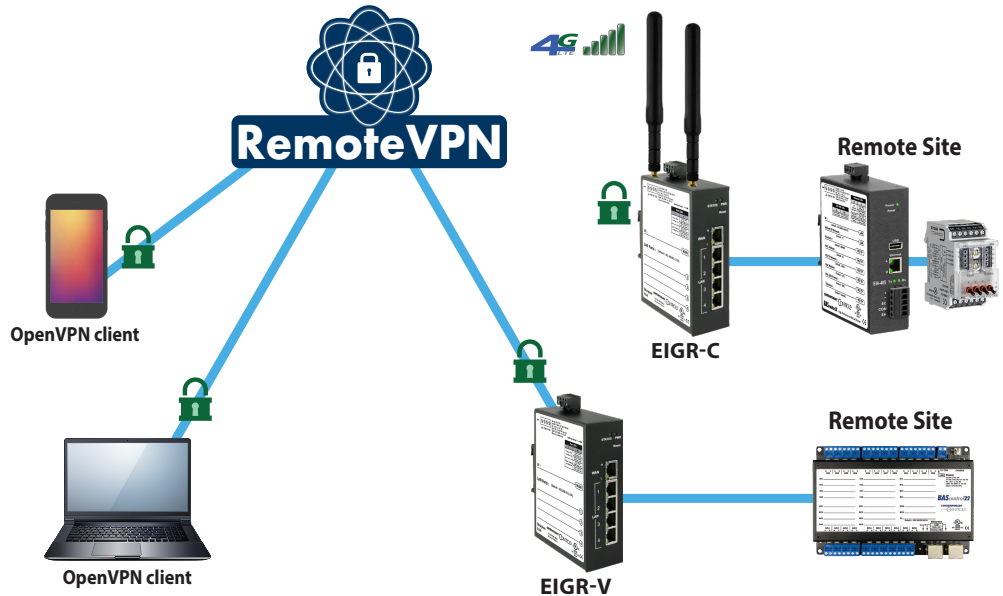


RemoteVPN Simplified Secure Remote Communication

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 virtual private network (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. OpenVPN clients are available for workstations and mobile devices (iOS, Android, etc.). An OpenVPN router installed at the job site completes the connection. Communications pass through firewalls up to the RemoteVPN server. 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, Google Play for Android devices, or the Apple App Store for iOS devices.

CTRLink VPN routers such as the EIPR-V, EIGR-V and EIGR-C provide OpenVPN client communication at the job site (of which there can be multiple). These routers have four 10/100/1000 Mbps Ethernet LAN ports and a single WAN port for connection to the Internet. The EIPR-V is a 10/100 Mbps Ethernet router, while the EIGR-V extends the range to 10/100/1000 Mbps. The EIGR-C uses a built-in LTE cellular modem for sites without wired Internet access. 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.

Features and Benefits

- Wired or wireless operation over the Internet
- Secure communication tunnels with encryption
- No investment in cloud-VPN servers
- Free download of OpenVPN client software
- Applicable to both permanent and temporary remote access
- Flexible man-machine and machine-machine applications
- Quick realization of a remote access project

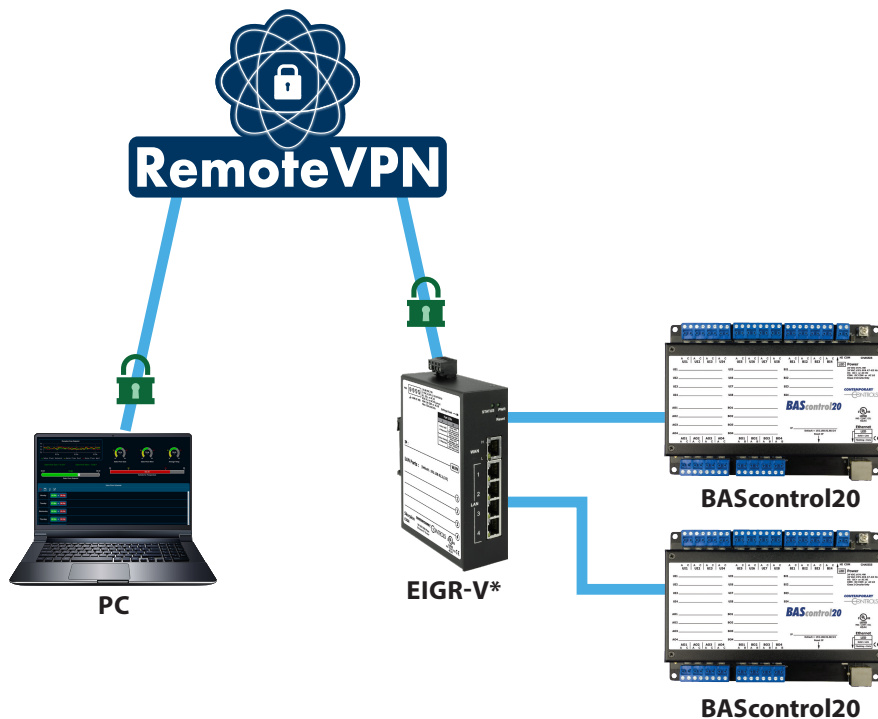


RemoteVPN is a set of devices and services from Contemporary Controls that offers VPN connectivity. The EIPR-V and EIGR-V merely need some way of accessing the Internet, while the EIGR-C provides cellular VPN communication. The Internet-hosted RemoteVPN server allows RemoteVPN devices to communicate. Any Windows, Mac, Linux, Android or iOS device can run the open-source OpenVPN client software. OpenVPN client software – running behind the scenes – allows any program to communicate via RemoteVPN. The OpenVPN client can be downloaded from OpenVPN.net, via Google Play store (for Android devices), or via the Apple App store (for iOS devices).



Application 1 – Automation System using Wired Remote Access

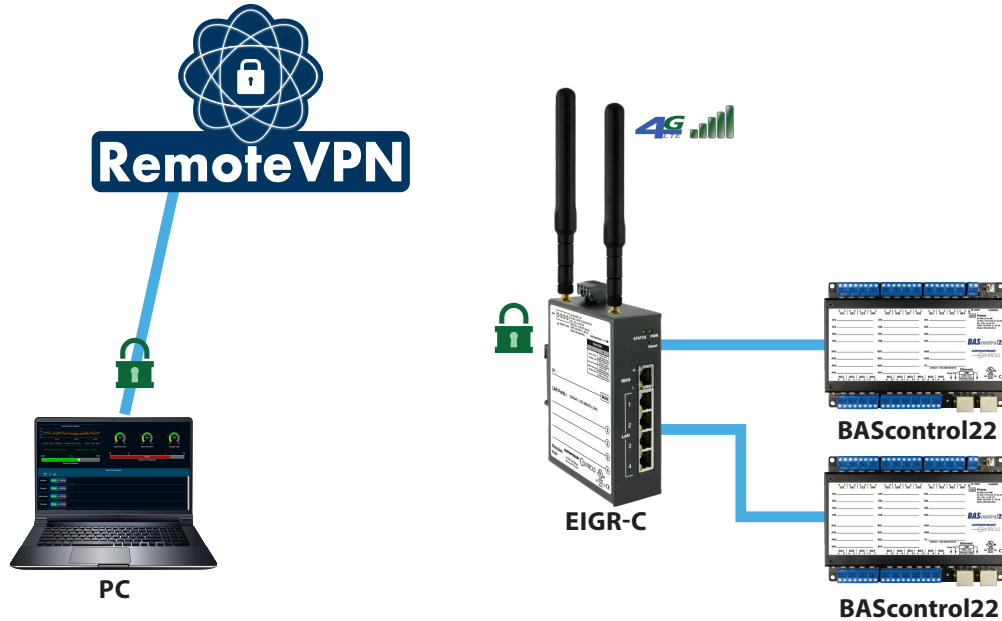
Here we have a PC sitting in your office running OpenVPN client software behind a firewall. It connects to our RemoteVPN server over the Internet. At the remote site is an EIPR-V or EIGR-V VPN client with its WAN port connected to the Internet as well via an existing Internet router. It can communicate via its LAN ports to many BAS devices. Ethernet switches can be added to add more devices. It also is connected to our RemoteVPN server. The two clients communicate through the existing Internet infrastructure without the need for port forwarding or firewall modification at either site.



*Also works with EIPR-V

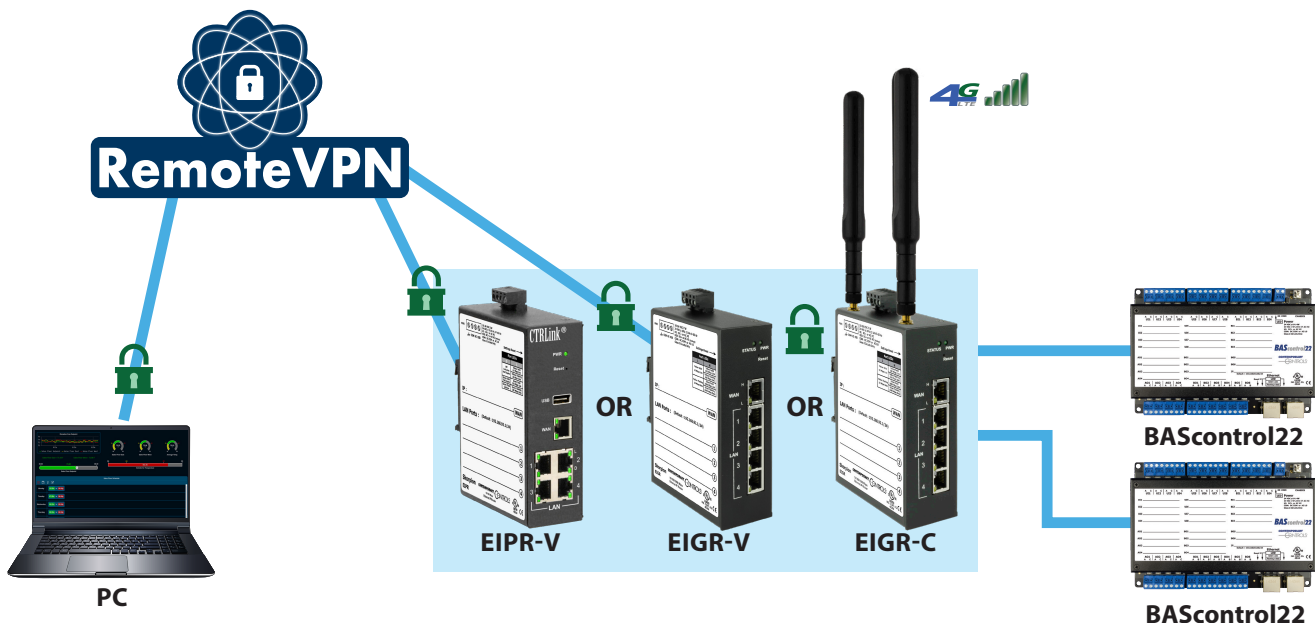
Application 2 – Automation System using Cellular Remote Access

This application is almost the same as Application 1. The difference is that an EIGR-C is utilized to connect to the Internet is via its internal cellular modem. All communication occurs with secure VPN connections even though an Ethernet link to the Internet at the remote site is not being utilized.



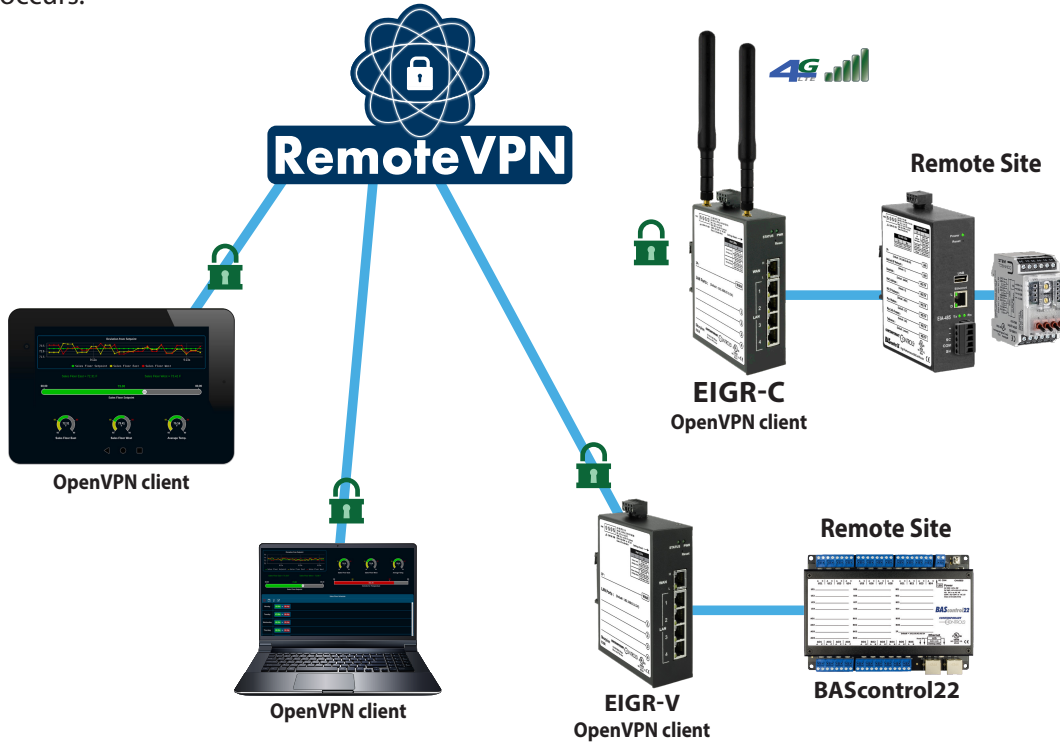
Application 3 – Remote Site Startup Before the Infrastructure is Completed

This application is similar to Application 2. Remote equipment startup is desired before an on-site Ethernet link is completed. The EIGR-C is utilized to establish secure equipment communication and then it is swapped out for an EIPR-V or EIGR-V when the Ethernet infrastructure becomes available. The EIGR-C can then be reused for startup at future locations.



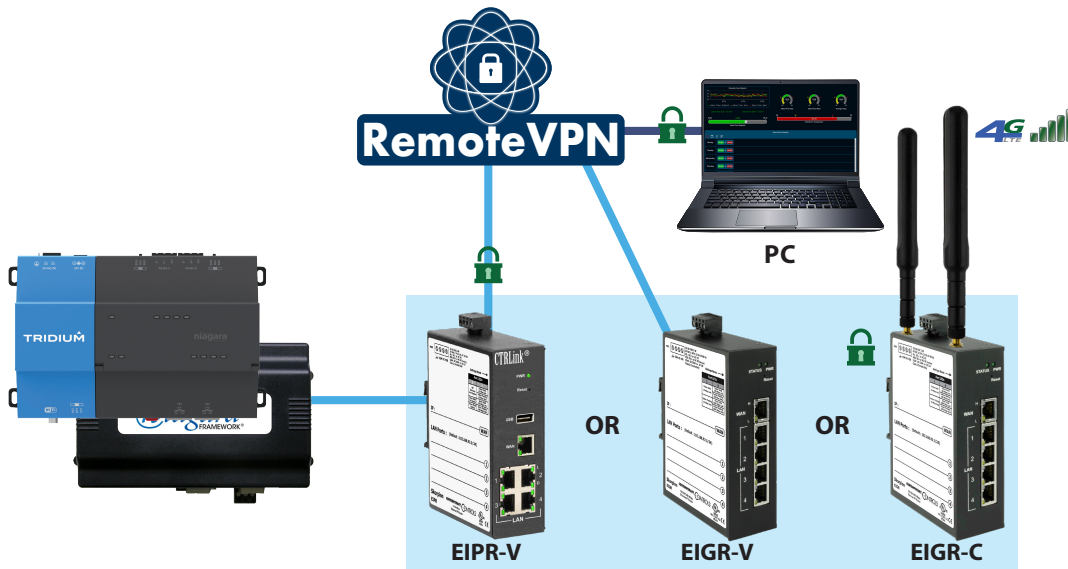
Application 4 – Cellular Access at Multiple Sites

In this application, you have an OpenVPN application on your cellular device (your phone or tablet) and an EIGR-C at the job site. Both devices communicate directly to our cloud based RemoteVPN server via the Internet and secure VPN communication occurs.



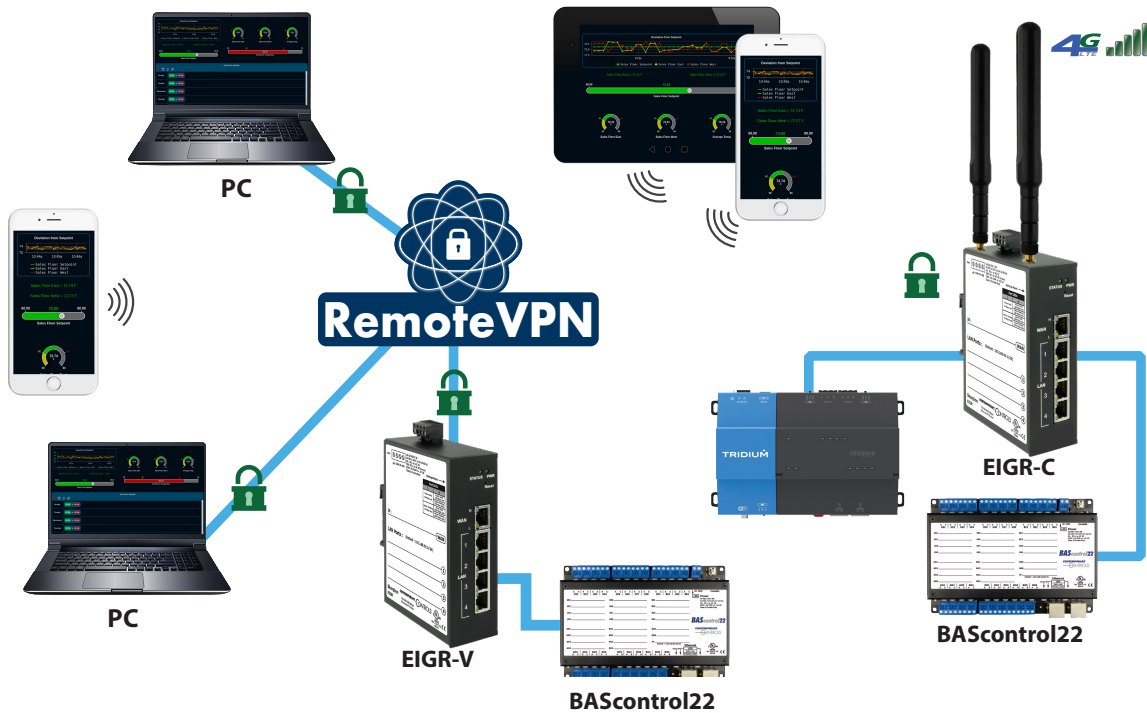
Application 5 – Remote Access to an Existing Automation System such as a JACE

Here we can isolate our remote communications to one device in an automation system such as a JACE®, which is frequently used in building automation systems. In this example you can have all the automation devices connected to one port of the JACE while the EIPR or EIGR connects to another JACE port. Either wired or wireless communication can be utilized. Remote access, even though it is encrypted and secure, can thus be isolated to one device for an added layer of security. RemoteVPN also supports the ability to communicate to the JACE using its secondary port if the JACE primary port is communicating to an existing network on a different subnet.



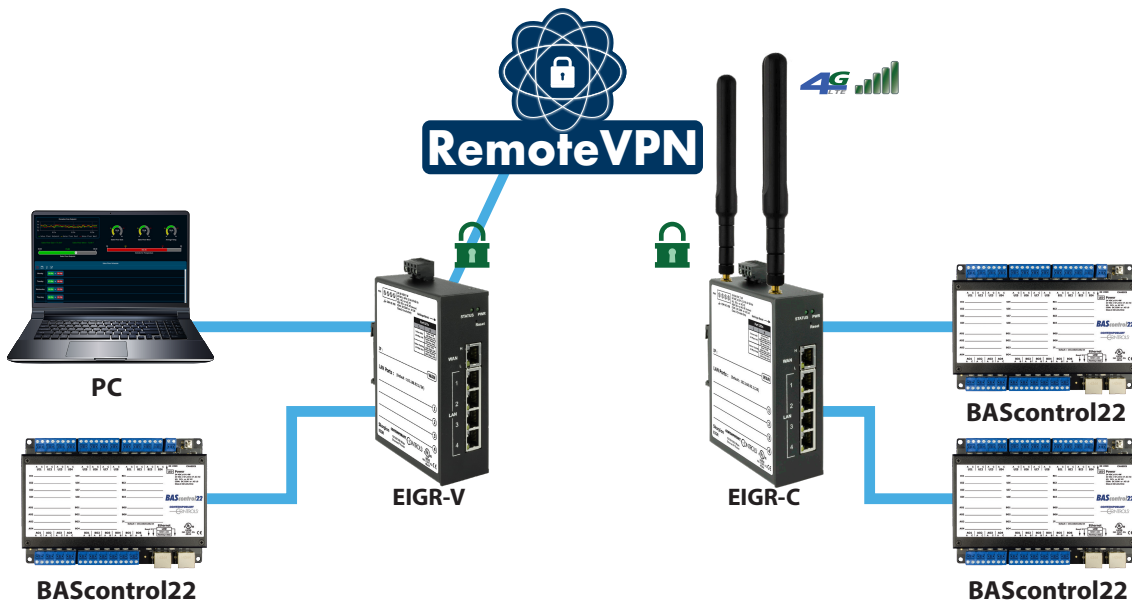
Application 6 – Varied Clients

In the previous examples we only showed one EIPR-V, EIGR-V or EIGR-C being used at a time with one workstation or mobile device. With RemoteVPN you can interconnect multiple clients and communicate to all the connected systems from all your devices. As in previous examples, many control devices can connect to the LAN ports of an EIPR or EIGR. All of these can then be accessed within the VPN.



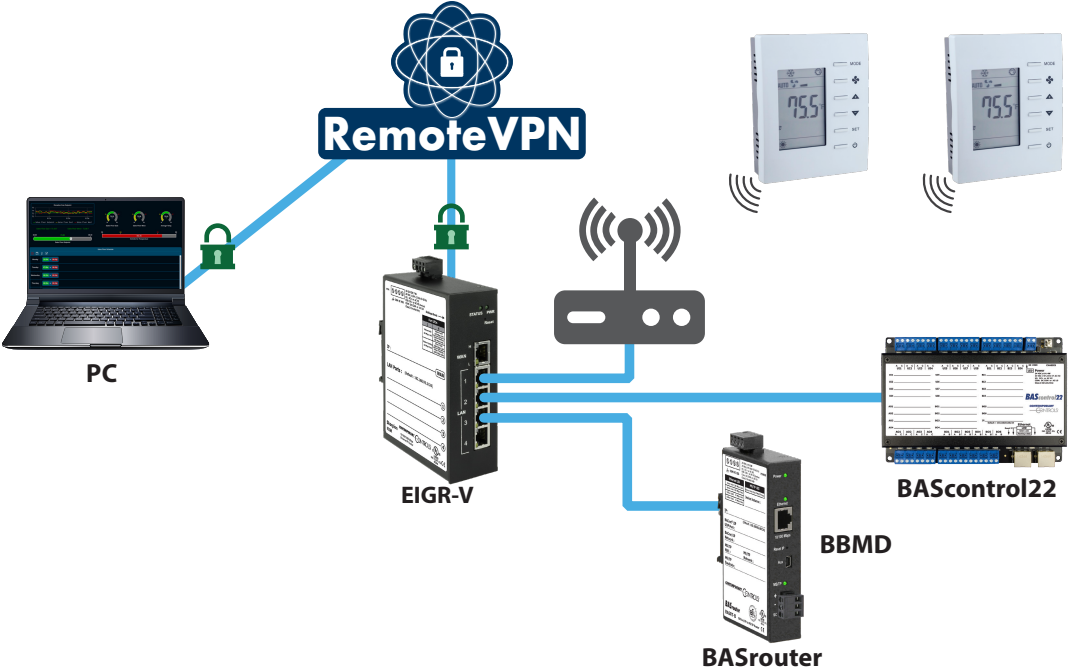
Application 7 – Interconnect Multiple Facilities

Mostly we have shown RemoteVPN being used to provide remote access to sites. However, you could use the RemoteVPN infrastructure to allow multiple facilities to communicate together over the Internet in a secure manner. Here we are showing an EIGR-C using a cellular connection to the Internet and an EIGR-V using a wired connection.



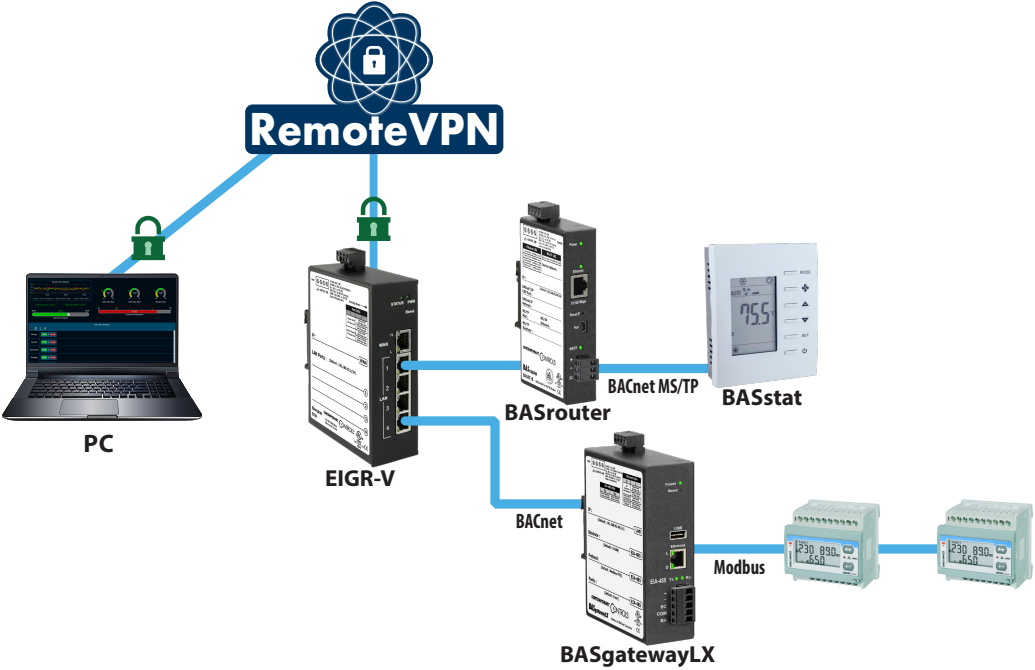
Application 8 – Using Wi-Fi With Wired or Wireless Internet Connections

Wi-Fi enabled devices, such as our BASstat, can communicate within a Wi-Fi infrastructure that in turn communicates with our Skorpion router via a LAN port. Our router then communicates securely via the Internet or wirelessly to your office, device, or alternate location as discussed in previous applications. This allows Wi-Fi devices to communicate via RemoteVPN.



Application 9 – Interconnect to Other Topologies

There are numerous data communication protocols that utilize Ethernet, but we focus our efforts on BACnet. In this application we utilize a BASrouter to interconnect BACnet Ethernet to a BACnet MS/TP network and a BASgatewayLX to interconnect BACnet to a Modbus serial network. The EIPR-V, EIGR-V or EIGR-C located on the Ethernet side of these networks allows secure Internet access to these devices using RemoteVPN.



What is Different Between RemoteVPN and What I have Today?

If you have Internet access through a firewall and you want to achieve remote access to a facility without using RemoteVPN you will need to enable port forwarding in your firewall for the ports used in your communications.

Opening Ports

Typically port 80 is used for web browsers and port 47808 is used for BACnet communications. In this case you would need to set up your firewall to do port forwarding for these ports. When you open a port, you must indicate which device is to receive this communication. Each port typically only allows you to remotely access one device so multiple ports will be required. Plus, you have now exposed these devices to malicious Internet activities. With RemoteVPN there is no need to change firewall configurations and you do not need to expose your devices to the Internet. Your devices remain safe and can easily communicate with the Internet using our secure RemoteVPN service.

Fixed IP Address

Also, many internet connections have changing IP addresses. You might need to configure your firewall to use DynDNS – giving you a permanent public IP address for your Internet-exposed devices. With RemoteVPN you do not need to change the firewall configuration and you do not need to expose your devices to the Internet.

Security Exposure

Many wireless providers are offering wireless routers to their customers. These devices may offer Wi-Fi or wired connections. However, in most cases when using these devices your own devices will still be behind a firewall and you won't be able to reach them remotely over the Internet. In rare cases the wireless provider will offer a fixed public IP address (usually for an extra fee). In this case your devices are now directly exposed to the internet. With RemoteVPN your devices are always secure from the Internet using VPN technology and no fixed IP addresses are required.

Computer Emulation

Some people tell us they have a PC on-site at the remote location and they just use an application like TeamViewer or GoToMyPC to access the site. There are a couple of issues with this arrangement. One is that you are relying on this device to be running when you need it to perform your remote access. You need to keep it up to date with security patches, anti-virus programs, etc. This PC must also contain all the tools you use when troubleshooting your network. This could be very expensive with licensing requirements for these programs. With RemoteVPN you only have an EIPR or EIGR onsite (mounted securely in a control panel) and you can have all your tools installed on your access devices back at the office.

RemoteVPN Setup Screens

Login at
<https://www.remotevpnserver.com/vpn/>

Dashboard LEDs
 online/offline status for each connection

Pencil Icon
 click to edit a connection

Connection List

Name	group	VPN Addr.	LAN Addr.
ccsi-router01	ccsi-test01	10.0.2.0/24	192.168.92.0/24
ccsi-router02	ccsi-test01	10.0.3.0/24	192.168.92.0/24
ccsiroadwarrior01	ccsi-test01		
ccsiroadwarrior02	ccsi-test01		
ccsiroadwarrior03	ccsi-test01		

Connection Log
 for connection history

Copy File to PC

Download OpenVPN Client Software

Road Warrior List

Router List

Road Warrior Edit Screen
 for connection detail

Set Road Warrior Permissions
 to access routers.

Copy File to PC
 for later upload to Router

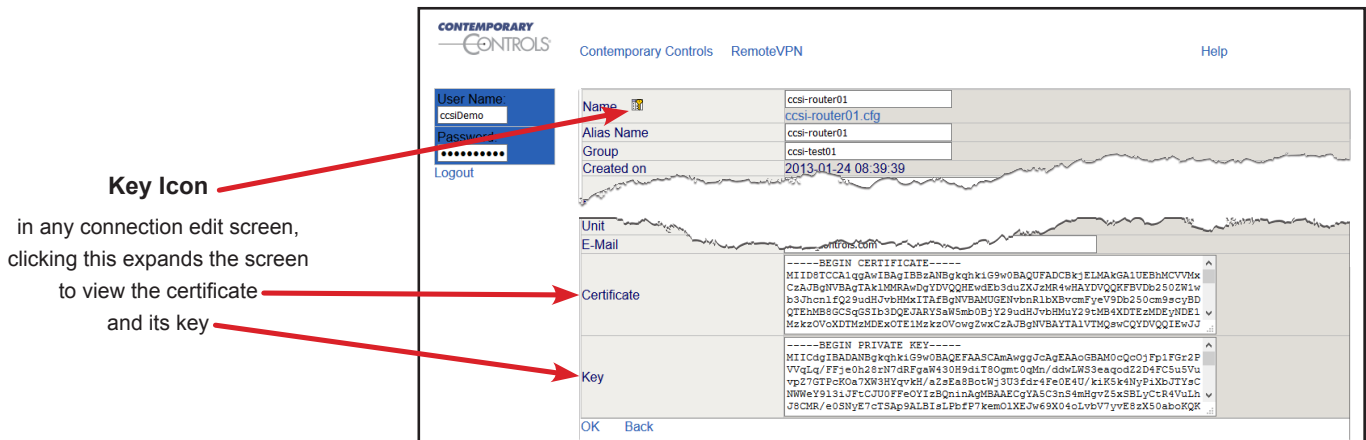
Router Edit Screen
 for connection detail

Set Router Permissions
 each router can access devices behind the other

RemoteVPN Certificates

A certificate is a file that contains a security key used to encrypt and sign digital information. This is also used for authentication purposes. RemoteVPN supports authentication using certificates. This means that – before mutual trust is established – the EIPR-V, EIGR-V or EIGR-C and your devices must authenticate using the RemoteVPN certificate and RemoteVPN must authenticate the certificates contained in these devices.

Certificates needed for RemoteVPN communication are generated on the RemoteVPN server. After logging into your RemoteVPN account, you can download the configuration to your device for subsequent uploading to your Skorpion router. This file has the certificates embedded within it. Road Warrior certificates, those used by a PC, are contained in a zip file. If you are a Road Warrior, you must download this file to your PC.



Ordering Information

Model	Description
REMOTEPVN-R	RemoteVPN Subscription 1 Router and 2 Clients
REMOTEPVN-C	RemoteVPN Subscription 1 Additional Client

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