Self-Hosted VPN – Secure, Remote Communication over the Internet

Accessing machines at remote sites over the Internet can be a challenge since firewalls block messages that originate from the Internet. Although it is possible to open up ports in the firewall by using Port Forwarding, IT professionals are reluctant to compromise the security of their network and usually decline this type of request. Without permission from the IT department, the systems integrator is left with few options. One solution to this problem is to incorporate a Virtual Private Network (VPN) service, such as Contemporary Controls' RemoteVPN subscription service.

While the RemoteVPN service provides security and the convenience of remote access without the burden of maintaining the VPN server, Contemporary Controls' Skorpion EIGR Gigabit VPN router provides a Self-Hosted VPN Solution which allows network-savvy users to setup and maintain secure, remote access to multiple locations without subscription fees or cloud service dependencies.

The EIGR-V IP router can be configured to operate in OpenVPN server mode which allows the router to act as the VPN server with the ability to support Contemporary Control's wired and cellular routers as VPN clients. OpenVPN is a well-supported open-source VPN technology that incorporates SSL/TLS security with encryption. In addition to OpenVPN PC clients for Windows/Linux machines, OpenVPN clients are available for iOS and Android mobile devices for greater flexibility in accessing sites remotely.

Features and Benefits

- Wired or wireless operation over the Internet
- Secure encrypted communication tunnels
- Free download of OpenVPN client software for Windows, Linux, iOS and Android
- Internet communication to clients at remote site or any convenient site with Internet connectivity without cloud service
- Support for up to 15 Cellular/VPN routers and 15 clients on PC/tablet/cell phone
- Secure remote accessibility to any IP device using its VPN IP address and without NAT or Port Forwarding on individual devices
- Static or public IP address not required for client devices
- Accessible behind firewall/router with a public IP
- Independent client communication with one or more router
- Applicable to both permanent and temporary remote access
- Flexible man-machine and machine-machine applications
- Quick realization of a remote access project
- Simultaneous access to multiple, remote sites

Self-HostedVPN

Self-HostedVPN — How it Works

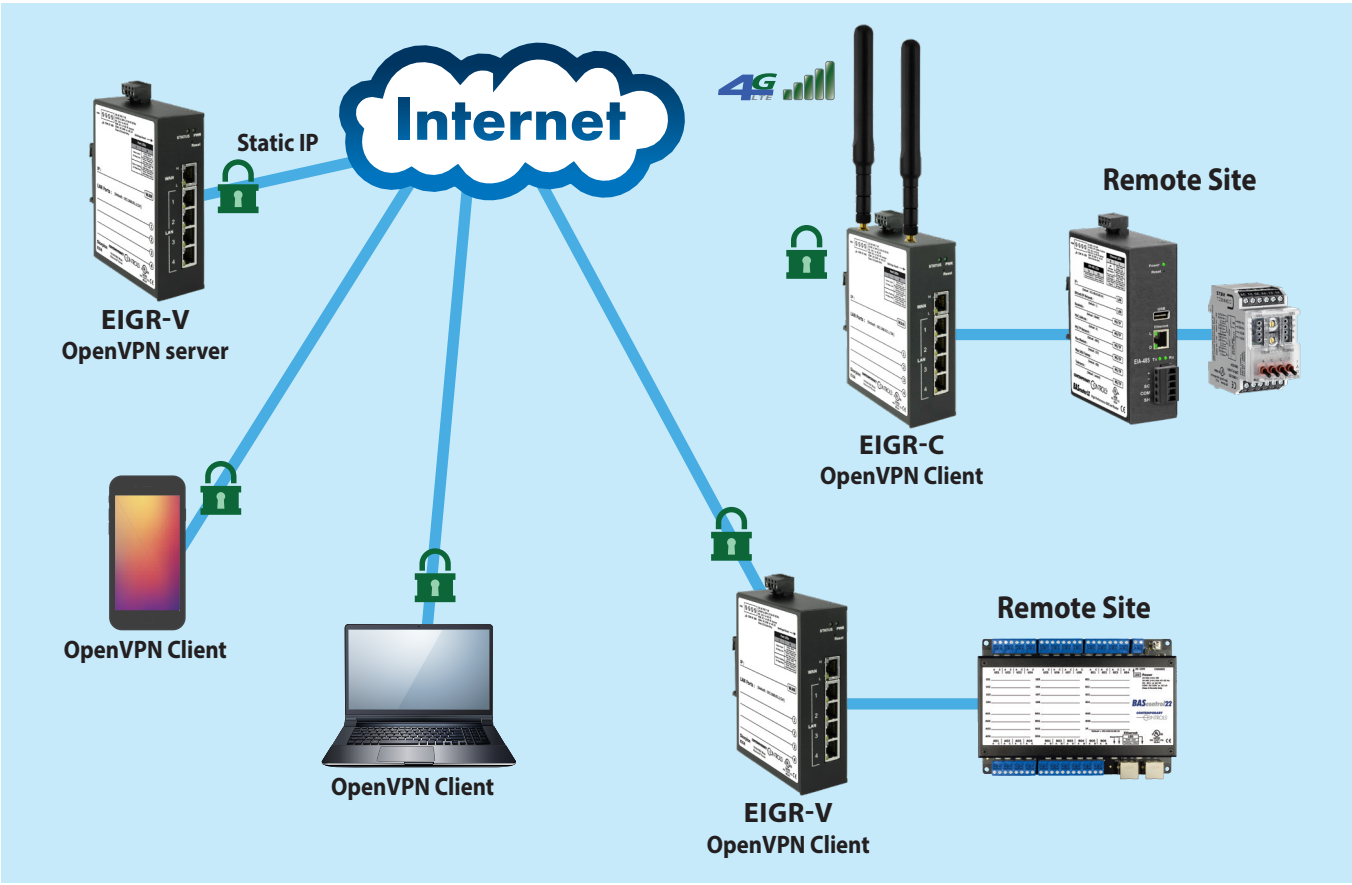
Setting up an OpenVPN server on your own is not trivial. It typically involves setting up a root certificate authority and generating certificates and keys for the OpenVPN server and for each client device that intends to connect to this server. However, the EIGR-V router has a built-in webpage interface to generate certificates and keys for VPN client devices, without requiring users to download software or having to learn the complexities of setting up a VPN. One EIGR VPN router 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.

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.

The Self-HostedVPN solution provides secure, remote access to any IP device by just using the VPN IP address for a device. There is no additional requirement to setup Network Address Translation (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 or public IP address. Only the EIGR-V router running the OpenVPN server needs to be publicly accessible on a single IP port.

The OpenVPN server router itself can be connected behind an existing firewall/router with a public IP and use port forwarding to access the OpenVPN server. An additional benefit is that each PC client can be configured to communicate with one or more router clients independent of each other.

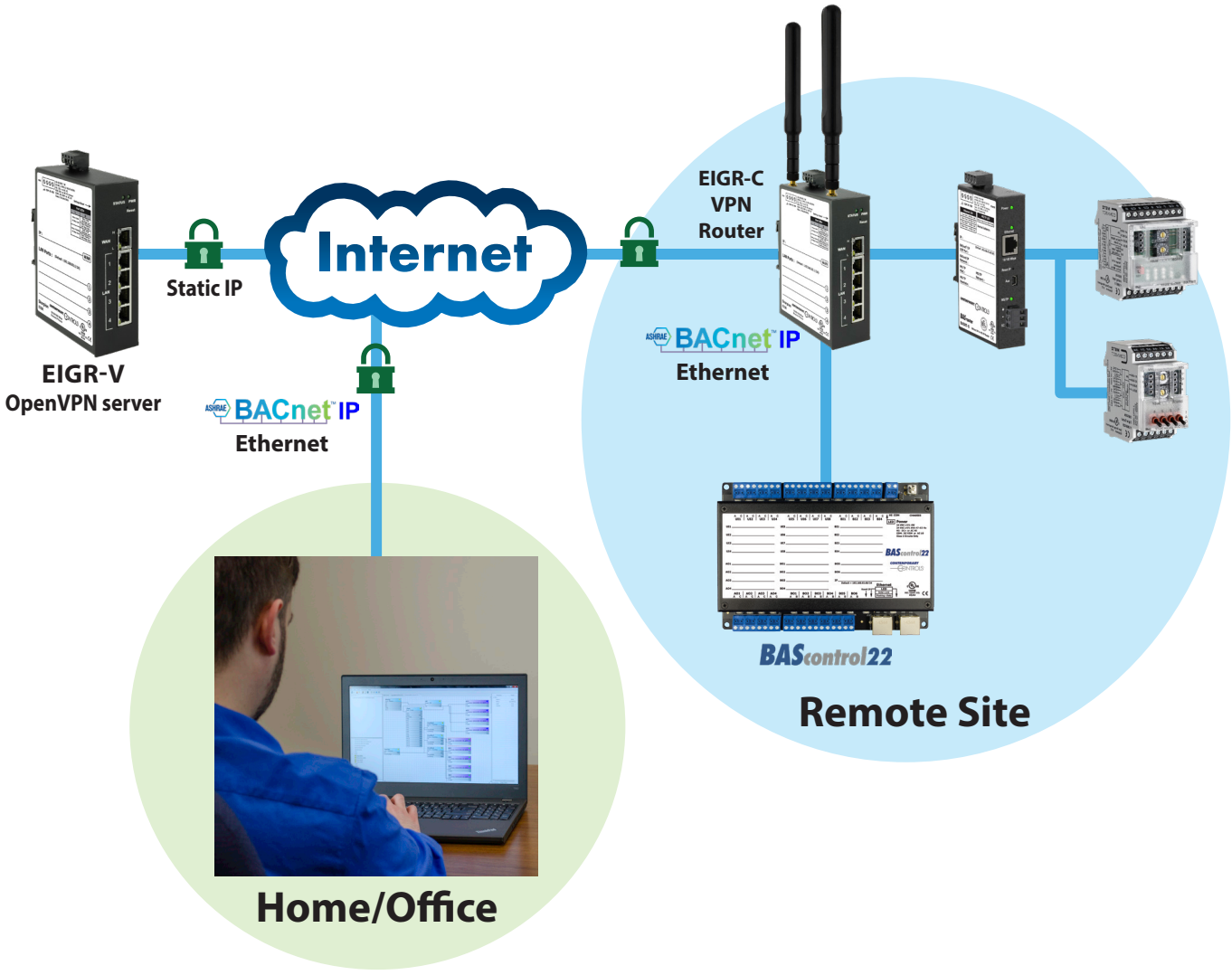


Self-HostedVPN — System Overview Example

The figure below shows an example of remote monitoring with BridgeVPN. A systems integrator (SI) working from the office must view a recently installed building automation site at the client's location. The SI accesses this remote site with BridgeVPN which consists of an EIGR-VB router set to OpenVPN server mode and connected to the Internet.

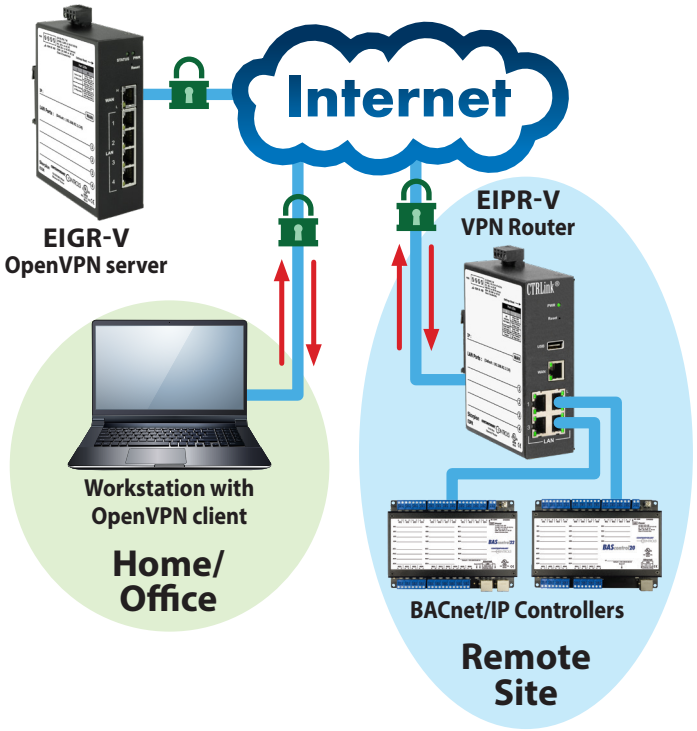
Using the local Internet service, the SI first opens up VPN client software (OpenVPN client) on the Windows or Linux PC to provide a VPN tunnel connection to the EIGR-V router functioning as an OpenVPN server. A similar VPN tunnel connection to the EIGR-V router already exists at the remote site between the EIGR-V router and Contemporary Controls' EIGR-C Cellular VPN Router. With the Sedona Application Editor (SAE), the SI can access a Sedona controller at the remote site to examine a temperature point of interest. The EIGR-V router makes the required connection between the two VPN tunnels. Once this connection is made, the SI can service the remote equipment – as if they were physically onsite. In this example, the remote site accesses the EIGR-V router via a cellular network using Contemporary Controls' EIGR-C VPN Router while the systems integrator accesses the Internet via a wired connection. Self-HostedVPN provides an effective, secure means of remote access, using the Internet to communicate with clients at multiple locations without subscription fees or cloud service requirements.

Remote Monitoring via Self-HostedVPN



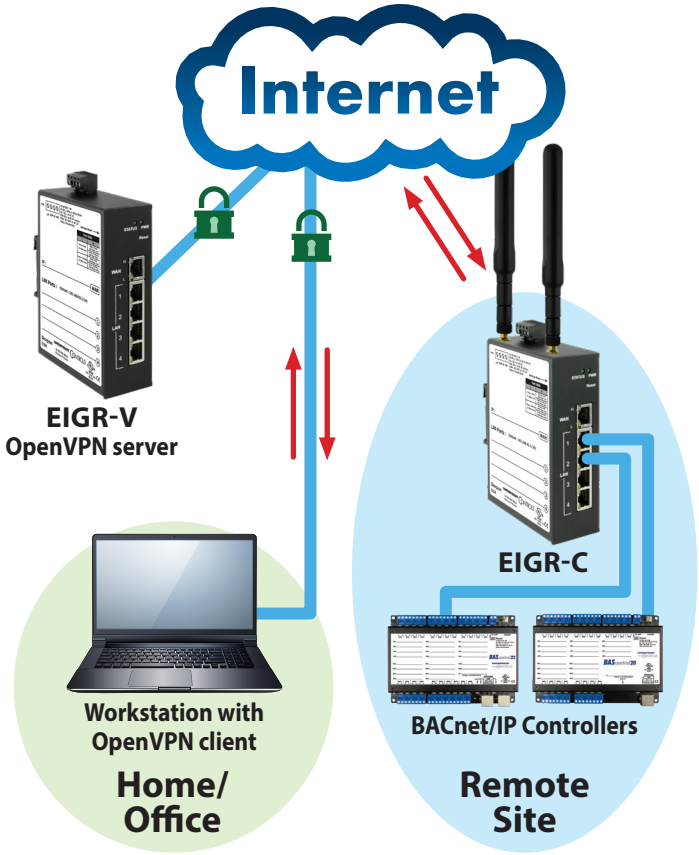
Wired Connection with Self-Hosted VPN

The EIGR-V IP router can be configured to operate in OpenVPN server mode which allows the router to act as the VPN server with the ability to support Contemporary Control's wired and cellular routers as VPN clients.
At the remote site there is another OpenVPN client which is permanently installed in the EIPR-V, or EIGR-V VPN router and is always connected to the Self-HostedVPN via an encrypted connection. The LAN-side of the VPN Router connects to the building automation equipment. The Self-HostedVPN will route between the two VPN tunnels thus created.



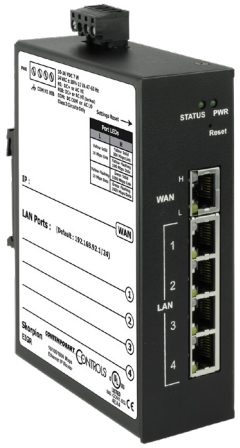
Cellular Connection with Self-Hosted VPN

Utilizing cellular networks for data communications can sometimes be easier to setup than other forms of Internet communications — especially if these connections are temporary. The EIGR-C will connect to cellular networks using a built-in cellular modem. By using the cellular network, the main Internet connection to the remote site is not affected and IT personnel at the remote site need not get involved.



EIGR-V Series —Skorpion Gigabit IP Router

The EIGR-V series consists of high-speed routers that link two 10/100/1000 Mbps Internet Protocol (IPv4) networks — passing appropriate traffic while blocking all other traffic. One network is the local-area-network (LAN); the other is the wide-area-network (WAN). The built-in stateful firewall passes communication initiated on the LAN-side while blocking WAN-side initiated communication. With Port Address Translation (PAT), LAN-side clients can access the Internet. Network Address Translation (NAT) allows a one-to-one translation between LAN-side and WAN-side devices. With Port Forwarding, LAN-side devices can be accessed from the Internet. The EIGR-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. DSL modems connect via the PPPoE protocol. The EIGR-V series includes real-time clock and OpenVPN client/server functionality. As a VPN Server, up to 15 router clients and 15 PC clients can be supported. The EIGR-V operates over 0 to 60°C temperature range and the EIGR-VX operates over –40 to +75°C range.



The Skorpion VPN Routers have pre-installed OpenVPN software

Ordering Information

Model	*Description*
EIGR-C	Skorpion GigE IP Router with Cellular 0 to 60°C
EIGR-V	Skorpion GigE IP Router with VPN 0 to 60°C
EIGR-VX	Skorpion GigE IP Router with VPN -40 to +75°C
EIPR-V	Skorpion 10/100Mbps IP Router with VPN

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