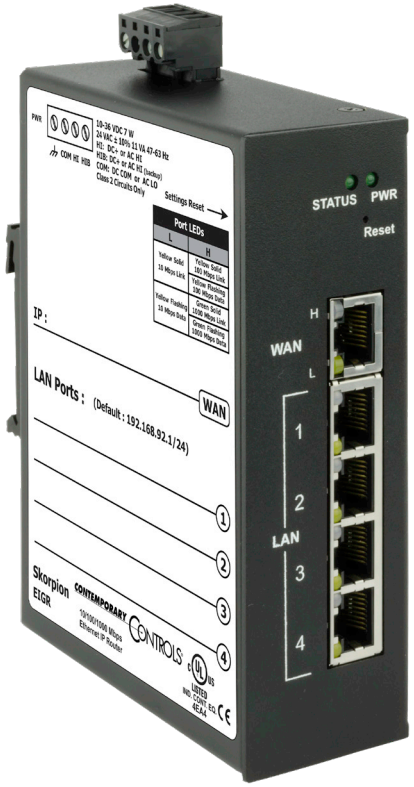
EIGR – Skorpion Gigabit Wired IP Routers

The EIGR series of high-speed routers link two 10/100/1000 Mbps Internet Protocol (IPv4) networks together — passing appropriate traffic while blocking all other traffic. One network is the local-area-network (LAN) and 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. The EIGR incorporates an Ethernet switch for multiple LAN-side connections. An external Ethernet cable or DSL modem attached to the WAN-side can be used to connect to the Internet.

EIGR Skorpion Gigabit IP Router Features …

- Web page configuration
- 10/100/1000 Mbps WAN port
- 4-port 10/100/1000 Mbps Ethernet LAN switch
- PAT, NAT and Port Forwarding and Port Range Forwarding
- NAT Loopback
- Remote Router Access and Allowlist
- Stateful firewall (can be disabled)
- DHCP client (WAN) and DHCP server (LAN)
- DIN-rail mounting
- Diagnostic LEDs
- CE Mark, RoHS, UL 508, C22.2 No. 142-M1987
- 24 VAC/VDC powered
- Operates over 0 to 60°C (EIGR Series)
- Operates over -40 to + 75°C (EIGR-X Series)



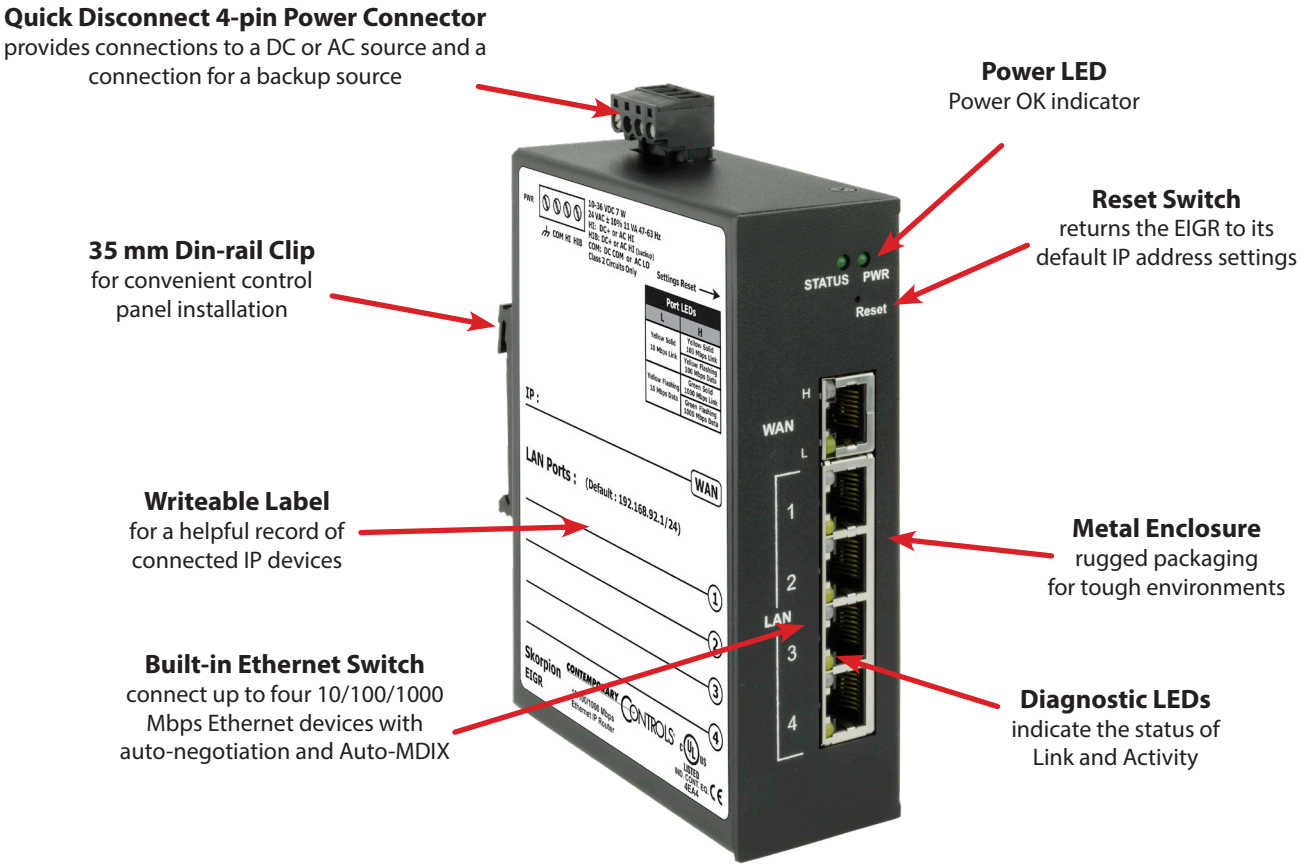
EIGR Series

EIGR – Skorpion Gigabit IP Router

With a DIN-rail mounting clip, rugged metal enclosure and the ability to be powered from a low-voltage power source, the EIGR is ideal for automation systems.

Although the EIGR has many of the same features found in high-end routers, it is simple 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 lower portion of the router connects the local-area-network or the LAN side. The upper portion of the router connects the wide-area-network or the WAN side. A firewall - which can be disabled by the user - separates the two portions. A stateful firewall makes decisions based upon the structure of the message and who is initiating and who is responding.

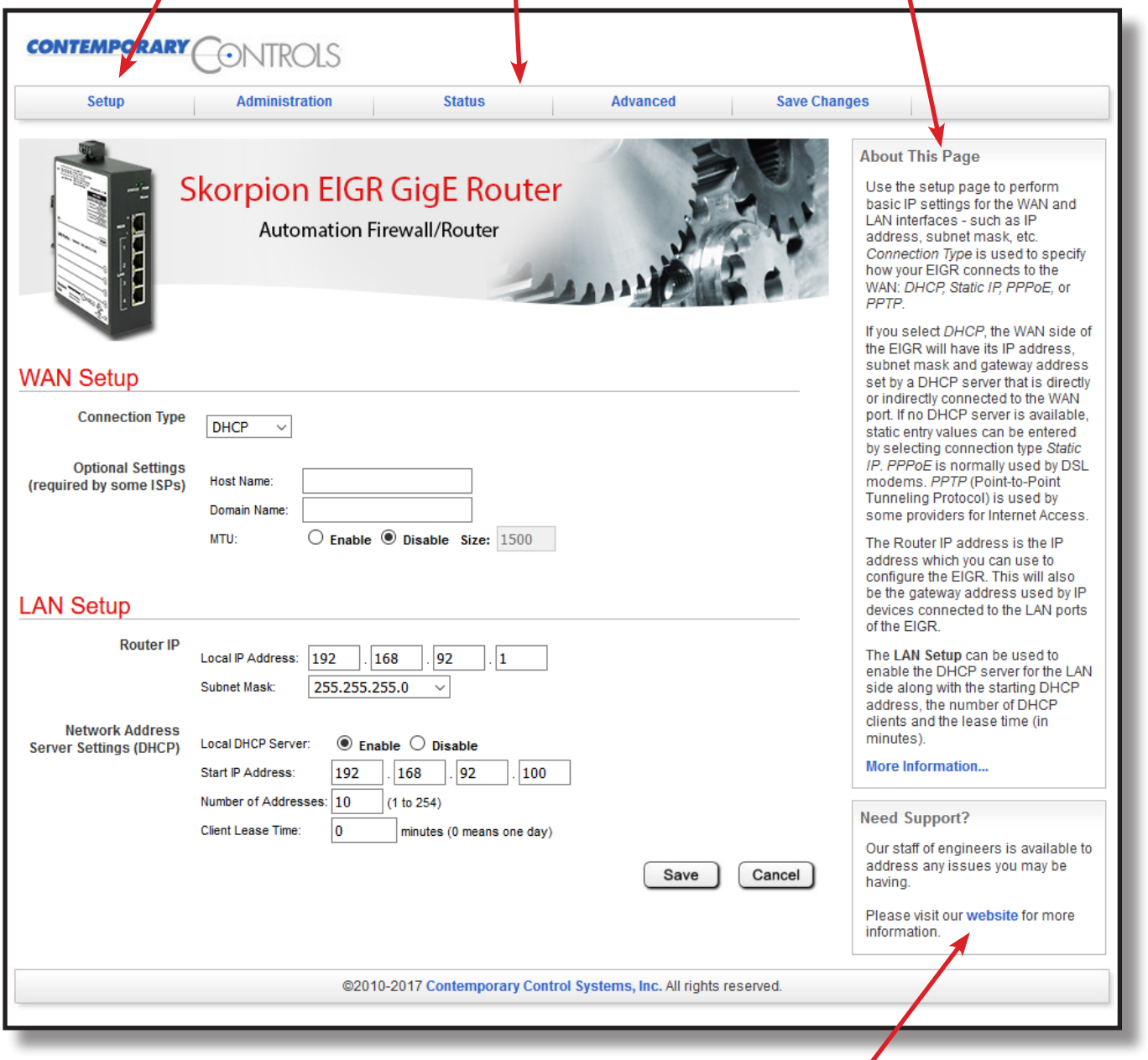


Web Page Configuration

Setup Menu
displays the screen shown on this page

Menu Bar
provides quick access to all main screens

Resident Help Screens
provide immediate assistance on any feature on any screen



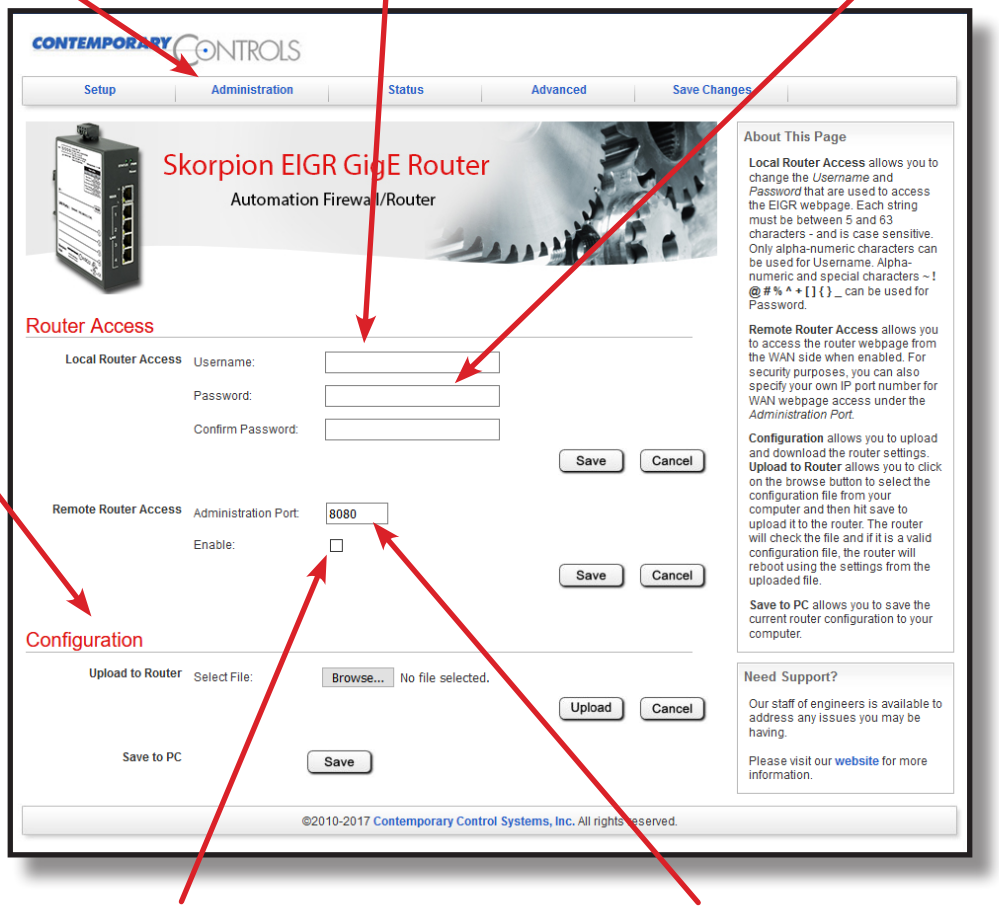
For More Information
each screen has a convenient link to our website

Secure Login – From Any IP-connected Computer

Administration Menu
displays this screen

Default Username is "admin"
Entering a new value is recommended.
Default restored if reset switch is used.

Default Password is "admin"
Entering a new value is recommended.
Default restored if reset switch is used.



Save or Retrieve Configuration

Remote Router Access
Disabled by default. Enable if configuration is desired from a web browser on either LAN side or WAN side.

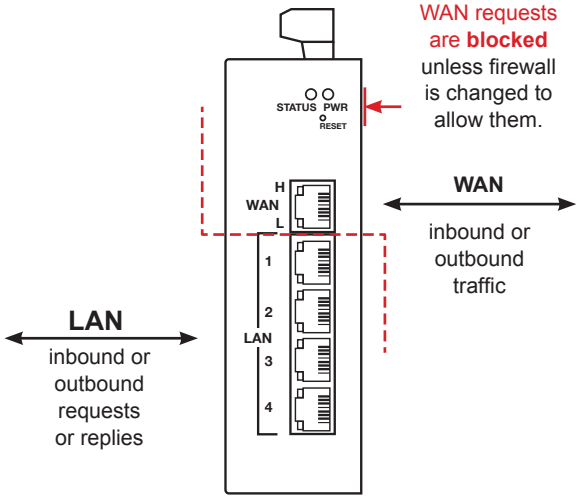
Administration Port
Default setting of 8080 can be changed after Remote Router Access is enabled, but well-known ports are not recommended.

Stateful Firewall – Promotes Secure Communication

The lower part of the router connects the LAN side (the local-area-network). The upper part connects the WAN side(wide-area-network). A firewall (which can be disabled by the user) separates the two parts.

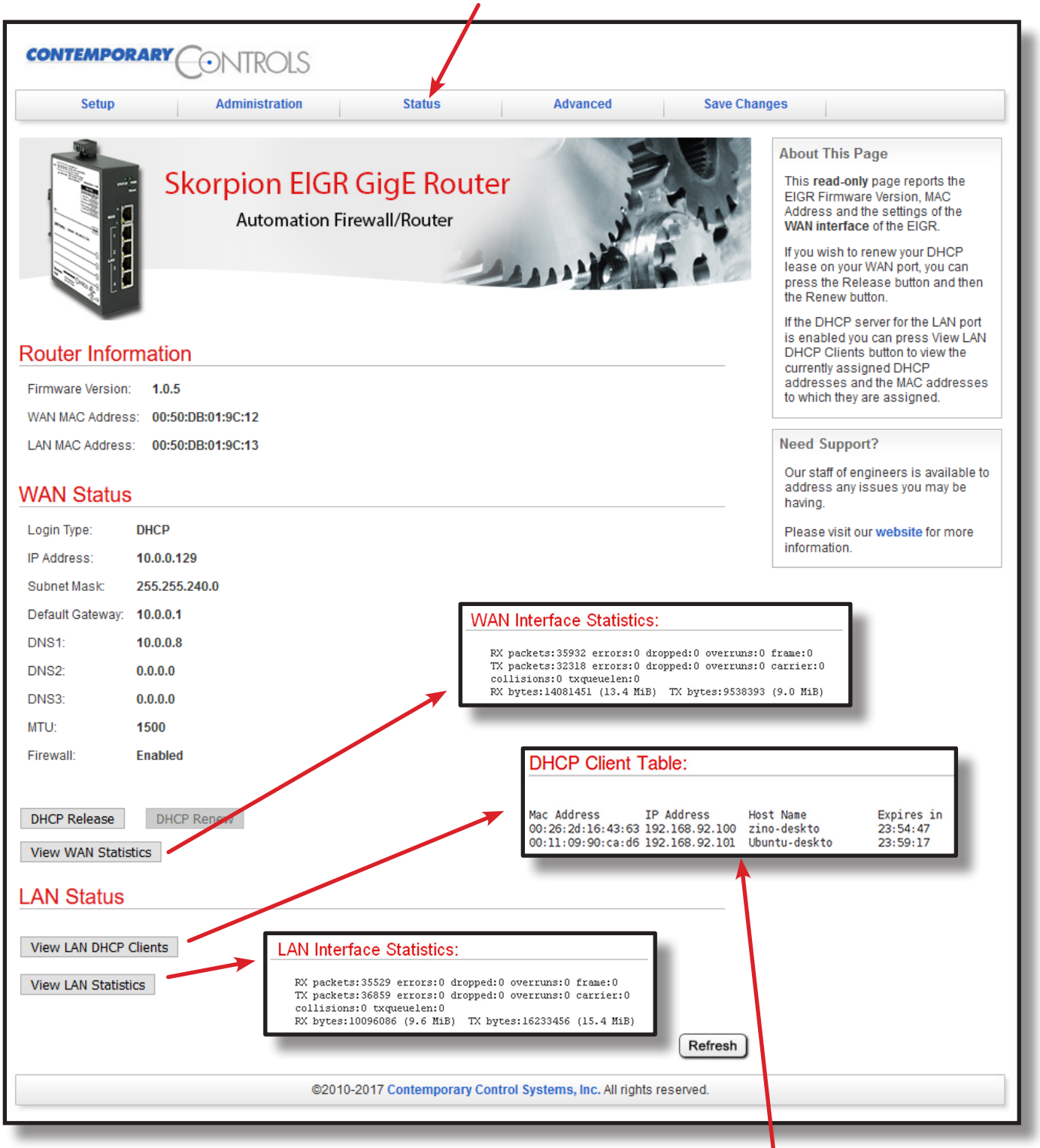
A firewall controls the passing of messages from one side of a router to the other. A *stateful firewall* acts on the structure of the message and who is initiating and who is responding.

Originating requests from the LAN side and corresponding responses from the WAN side ***pass through*** the firewall. But traffic originating from the WAN side is ***blocked*** from the LAN side ***unless*** the firewall is adjusted to allow it. This protects the LAN side from unauthorized WAN access.



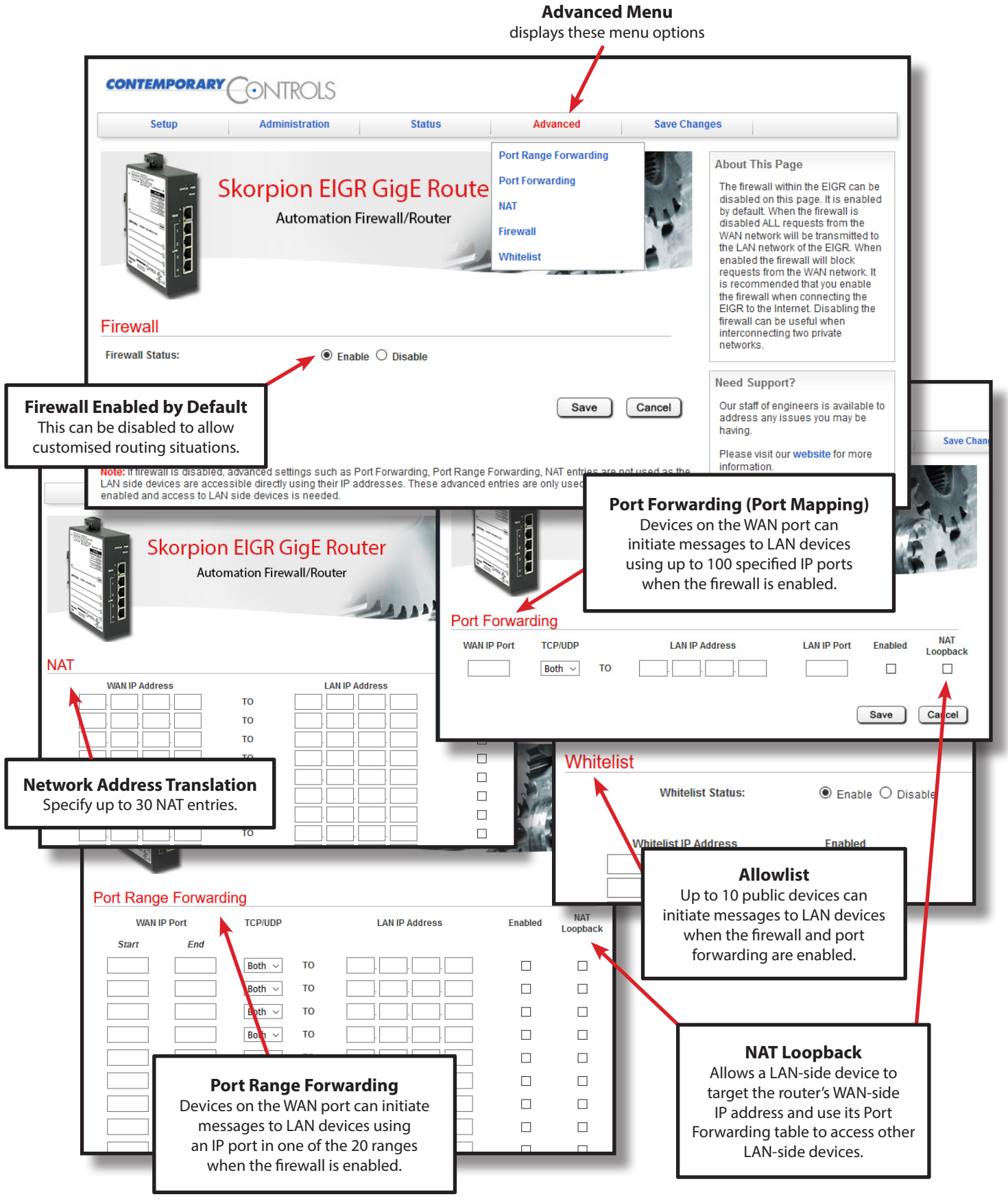
Status and Configuration Report – Just a Click Away

Status Menu
displays the screen shown on this page



If the EIGR is enabled as a DHCP Server,
clicking the View LAN DHCP Clients button brings up another window to view the status of the LAN devices being served.

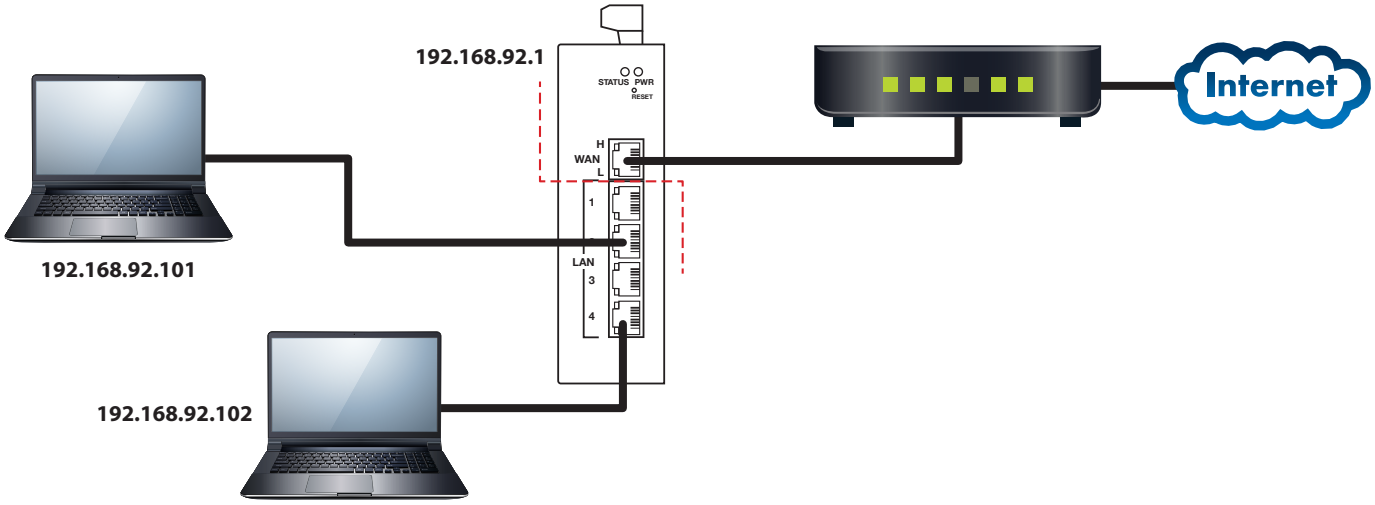
Advanced Features – for Demanding Situations



Application #1 – A Cable Modem Connection to the Internet

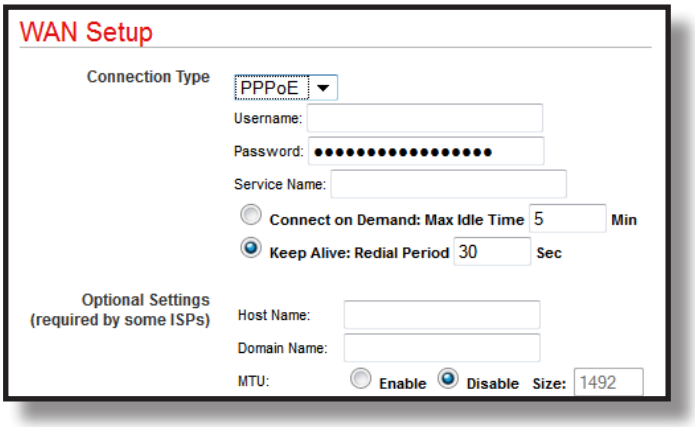
In the WAN Setup, the default Connection Type is *DHCP* – where a DHCP server on the WAN side will automatically assign an IP address, subnet mask, default gateway address and one or more DNS addresses to the WAN side of the IP router. Some cable modems have DHCP server functionality.

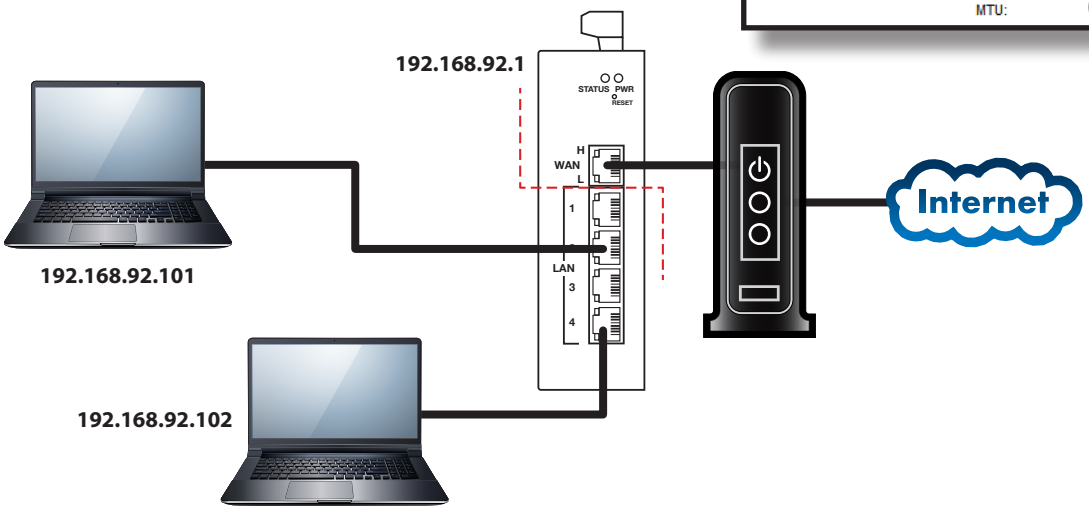
If a DHCP server is unavailable on the WAN network, you must make static IP entries for the WAN side of the router. Enter the IP address, subnet mask, default gateway address and one or more DNS addresses when using the Static IP option.



Application #2 – A DSL Modem Connection to the Internet

With DSL modems, the PPPoE protocol must be selected — and a username and password provided. Once a connection is established, the ISP furnishes all the needed WAN IP address assignments.

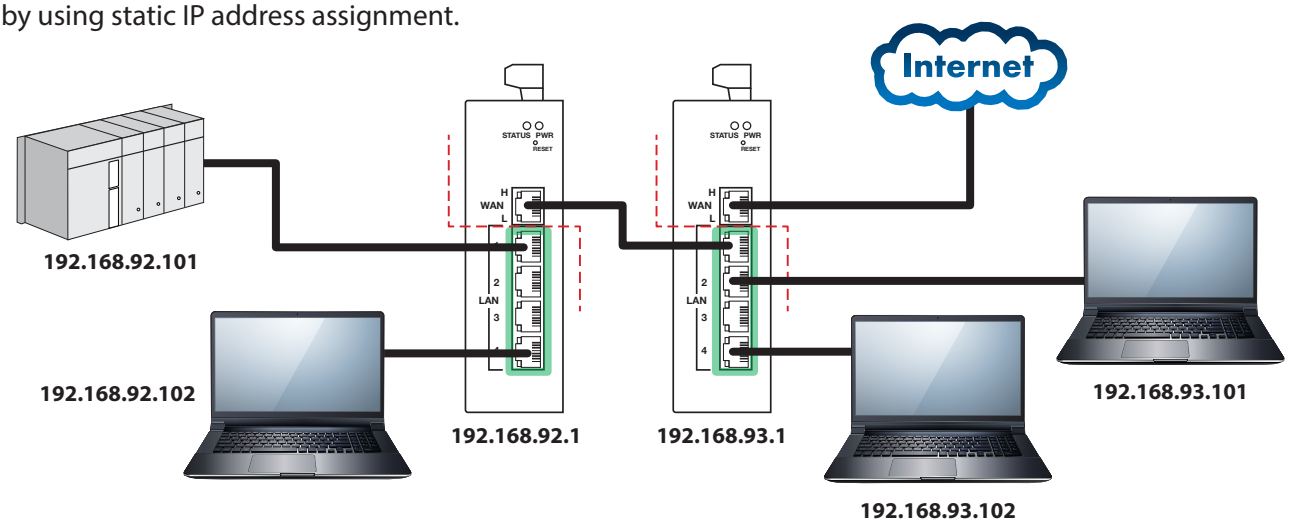




Application #3 – Cascaded Routers for Additional Isolation

For increased security and isolation, IP routers can be cascaded. Make sure that each LAN-side subnet address is unique when cascading IP routers. The left-most IP router can have its WAN-side IP address assigned using DHCP client or by using static IP address assignment.

The illustration shows a pair of EIGR routers, but the right-most router could also be some other type of router — perhaps one already existing in the business system — because the EIGR supports standard Internet protocols.



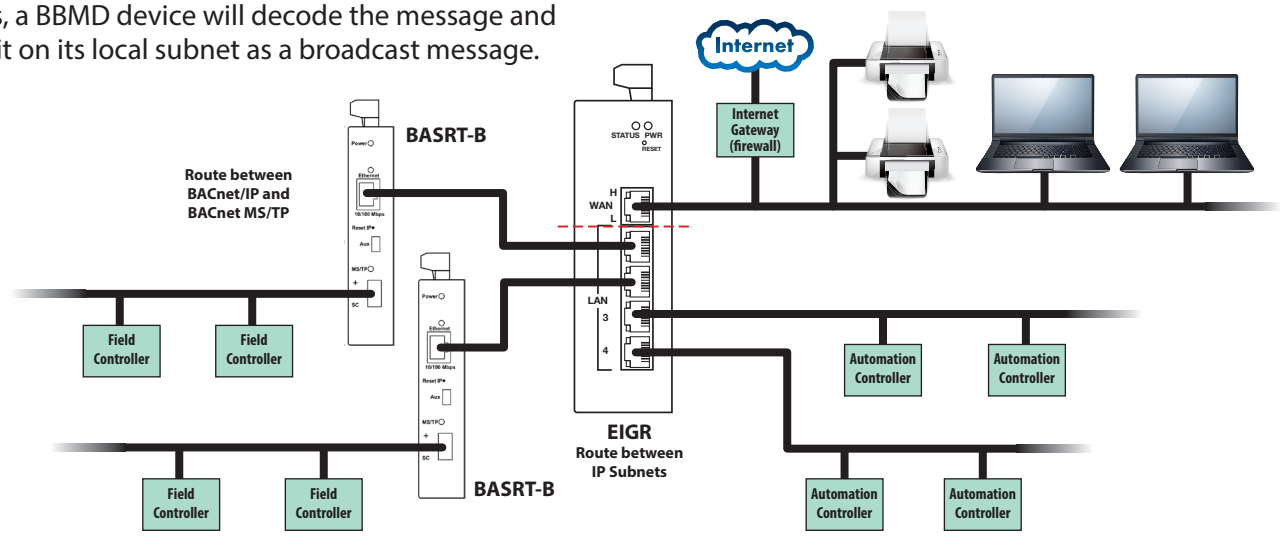
Application #4 – Limiting BACnet Traffic

When attaching BACnet devices to IP networks it is possible that the IP network has been sub-netted through the use of IP routers. Most IP routers will not pass broadcast messages which are crucial to BACnet's operation. The solution is to incorporate BACnet/IP Broadcast Management Device (BBMD) functionality within the BACnet internetwork.

The BBMD concept requires that a broadcast message originating on one subnet be encapsulated into a directed message and sent to all remote subnets since these directed messages will pass through IP routers. Once the encapsulated messages are received on the remote subnets, a BBMD device will decode the message and resend it on its local subnet as a broadcast message.

Therefore, it would appear that a BBMD device must be present on each subnet in order to provide this encoding and decoding function.

However, this is not the case if all the BACnet/IP devices support Foreign Device Registration (FDR). At a minimum, one BBMD device is required to be located on one of the subnets with FDR devices registering to this one BBMD. This is what is shown in the example with a BAS Router providing BBMD functionality while allowing for foreign devices registration. Notice that connecting to a BACnet MS/TP network is an option.

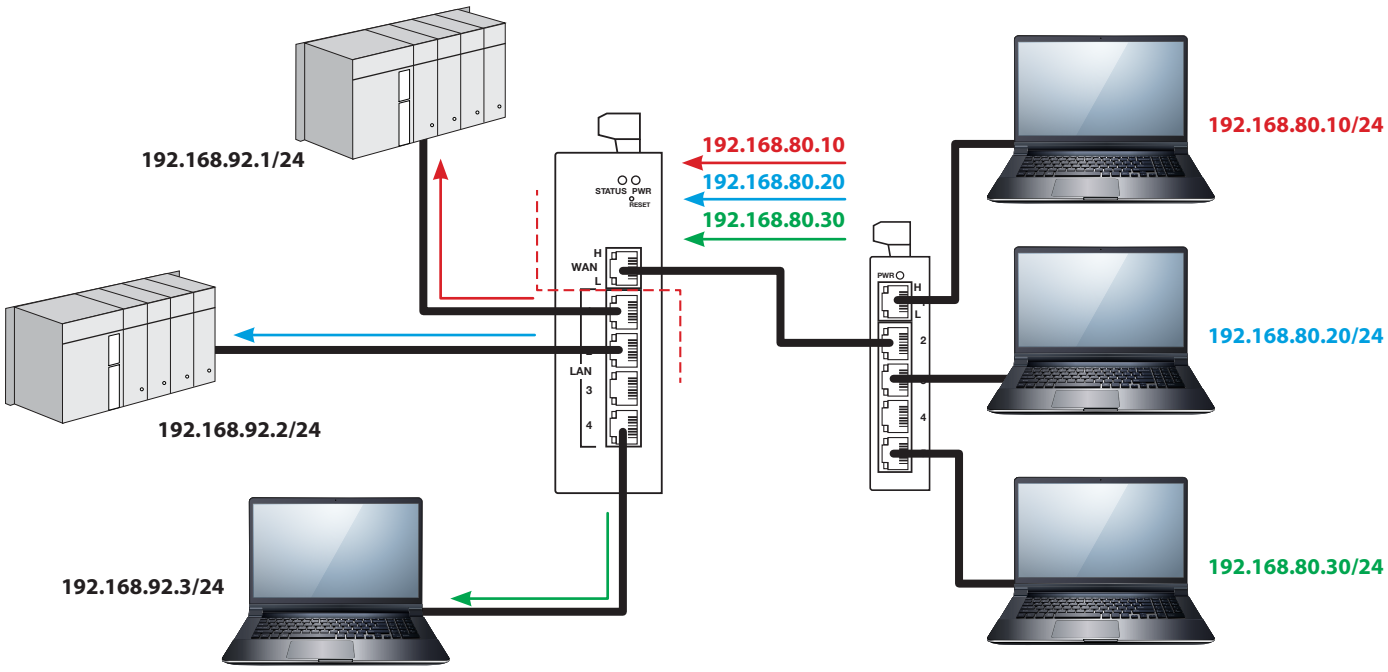


Application #5 – Disable the Firewall for Unrestricted Routing

There are times when you may want to disable the firewall. The firewall controls the passing of messages from the public (WAN) side of the router to the private (LAN) side — and normally this protects the private side from unauthorized public access.

Under the Advanced Tab, you may choose to disable the firewall. Typically, the firewall is disabled when the LANs on both sides of the router are within one organization. That is, ***there is no public side*** — both sides are essentially private, so no firewall is needed.

LAN IP Address	WAN IP Address
192.168.92.1/24	192.168.80.10/24
192.168.92.2/24	192.168.80.20/24
192.168.92.3/24	192.168.80.30/24



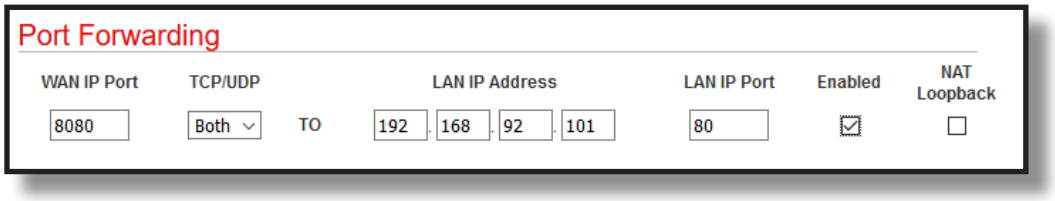
Application #6 – Port Forwarding to Access a Private Web Server

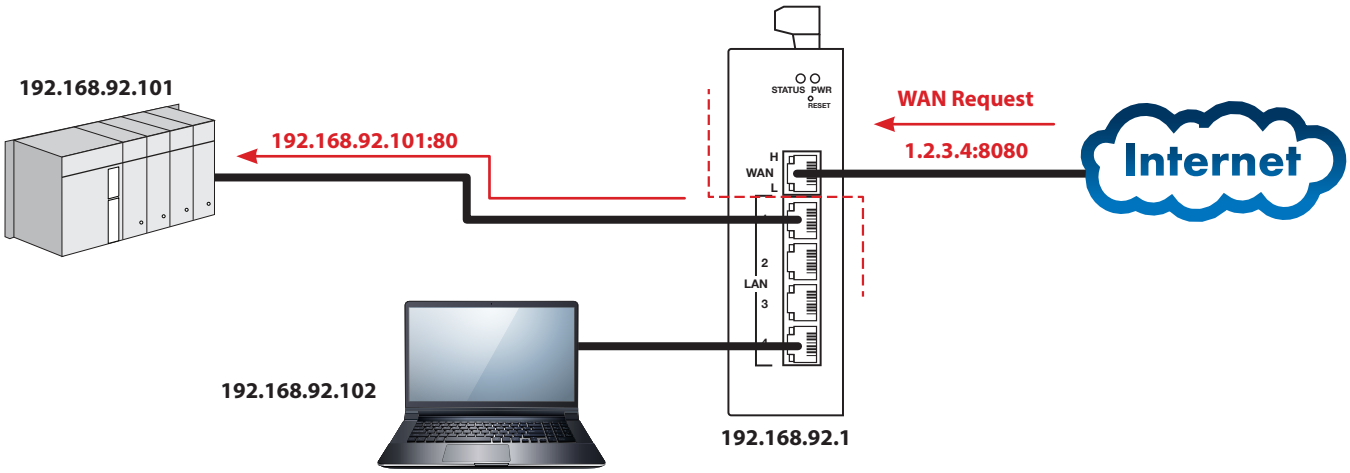
The firewall will normally block all WAN-side requests. Port forwarding allows computers on the WAN side to access devices on the LAN side by opening up ***selected*** WAN IP ports. The only WAN-side requests that will be forwarded through the IP router are those that specify both the router's WAN address and a destination IP port number that exists in the router's IP port forwarding table. When this match is made, the message is forwarded to the indicated IP address on the LAN side.

This is very useful when only one public IP address is available, but there is a need to access multiple LAN-side devices. In this example, we want to access a private web server at 192.168.92.101 which is normally invisible from the Internet. Using port forwarding, we allow a WAN-side request made to the router's public (WAN) address. For additional security, the port numbers have been translated.

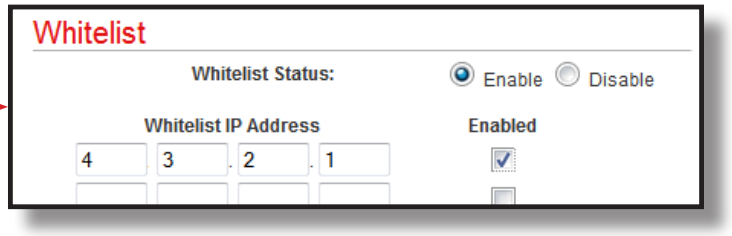
You can also select Port Range Forwarding to allow an ***entire range*** of addresses through the firewall. Note that ***any WAN-side device*** can use port forwarding — but you can greatly enhance security by creating a ***allowlist*** of allowed WAN-side devices. This is illustrated at the bottom of the page.

Internal IP Address	LAN IP Port	WAN IP Port	External IP Address
192.168.92.101/24	80	8080	1.2.3.4



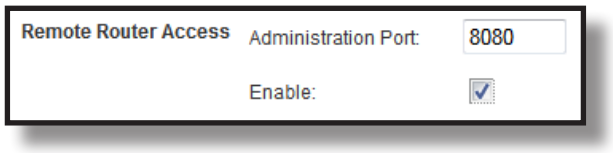


Enhance Security with a Allowlist
Specify which WAN-side devices can use port forwarding.



Application #7 – Router Access from a WAN-side Device

In some situations, you may want a WAN-side device to access and possibly configure the router. This is enabled via the Remote Router Access control (shown below) found under the Administration tab.



Caution: Enabling this control grants access to any device on the public or WAN-side. To restrict access to just certain WAN devices, you must construct a allowlist such as the example below which specifies an outside (public or WAN-side) device that has the IP address of 4.3.2.1.

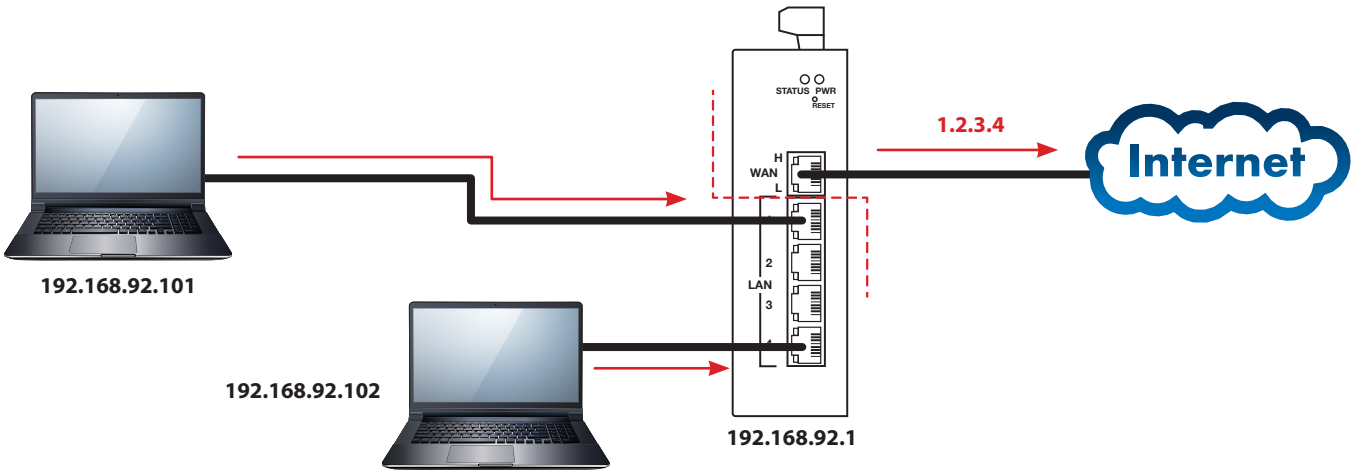
Enhance Security with a Allowlist
Specify which WAN-side devices can configure the router.

Application #8 – Port Address Translation (PAT)

PAT (also known as a firewall) allows a many-to-one mapping of private IP addresses to one public address. Not only does this provide enhanced security for the devices on the LAN side, it also allows multiple LAN-side devices to communicate to devices on the WAN side using only one WAN IP address. When the WAN network is connected to the Internet, this allows the LAN devices to communicate on the Internet via one public IP address.

Most ISPs will limit the number of public IP addresses provided to their customers. PAT is done by the use of port assignments — thus, granting private IP addresses access to the Internet. In this example, the ISP provided the router the public address of 1.2.3.4. Both LAN-side PCs have automatically been assigned local IP ports and granted access to the Internet — and no configuration was needed.

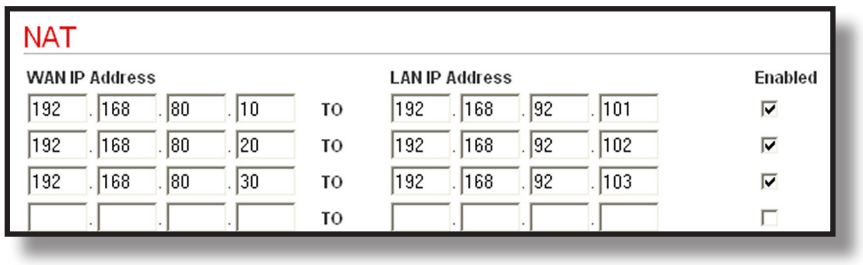
Internal IP Address	LAN IP Port	External IP Address
192.168.92.101/24	5001	1.2.3.4
192.168.92.102/24	5002	1.2.3.4

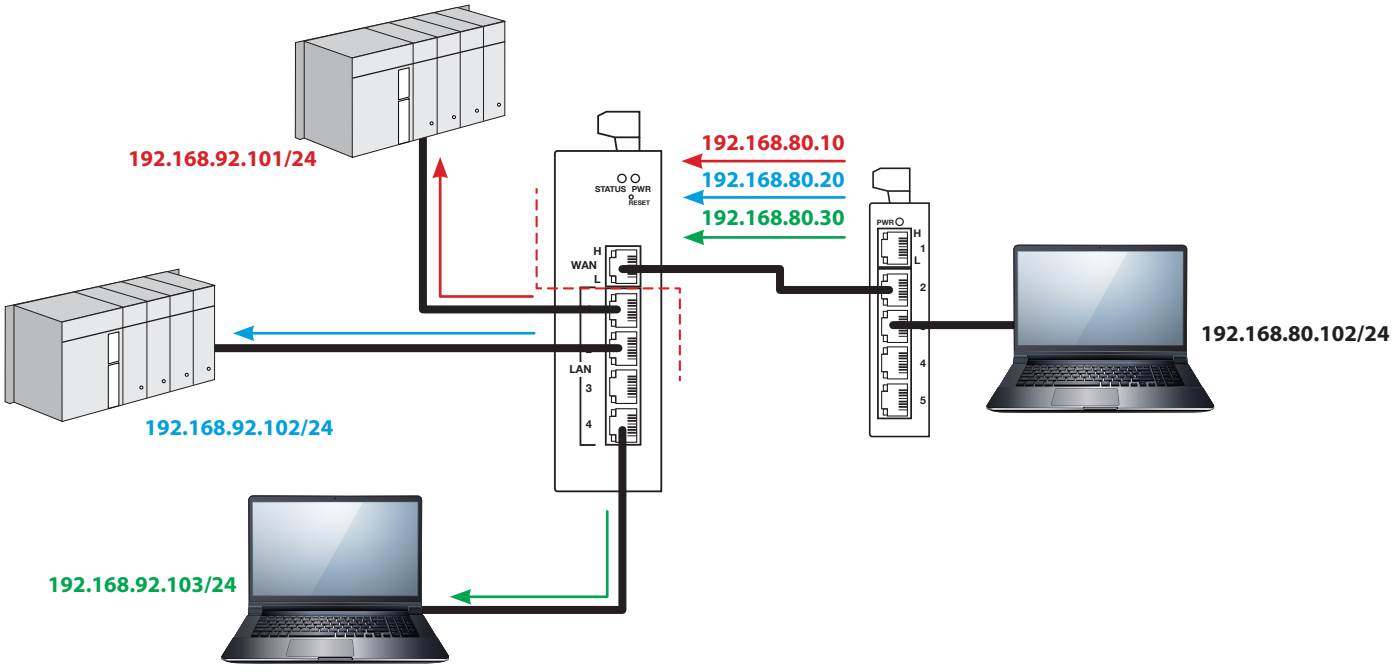


Application #9 – Network Address Translation (NAT)

NAT allows for a one-to-one mapping of internal IP addresses to external IP addresses. This could be helpful when accessing duplicate systems that are configured the same. The actual LAN-side addresses are hidden. Notice that the LAN and WAN subnets are different.

Internal IP Address	External IP Address
192.168.92.101/24	192.168.80.10/24
192.168.92.102/24	192.168.80.20/24
192.168.92.103/24	192.168.80.30/24





Application #10 – EIGR-V VPN

VPNs provide a secure way to encrypt and transmit data between two or more devices. This makes the VPN technology suitable for remote access to devices at remote location. Although it is possible to open ports in firewalls using port forwarding or NAT, IT professionals are often reluctant to compromise the security of their network and usually decline this type of request. The VPN model of the EIGR router, EIGR-V, has built-in OpenVPN software that can be configured to setup VPN. In the client mode, an OpenVPN config file can be loaded to the router via the VPN Client webpage and the router can form a secure tunnel between itself and the RemoteVPN server hosted by Contemporary Controls. Since OpenVPN is an open technology, it is possible to connect to other OpenVPN servers. By installing the EIGR-V at a remote location, a secure way to connect to the LAN side IP devices from the comfort of your home or office is possible.

Specifications

Power Requirements	10–36 VDC ±10% 7 W or 24 VAC ±10% 11 VA 47–63 Hz
Operating Temperature	0°C to 60°C (Standard) -40 to + 75°C (Extended Versions)
Storage Temperature	–40°C to 85°C
Relative Humidity	10–95%, non-condensing
Protection	IP30
Mounting	TS-35 DIN-rail
Ethernet Communications	IEEE 802.3 10/100/1000 Mbps data rate 10BASE-T, 100BASE-TX and 1000BASE-T 100 m (max) CAT5 cable length

LEDs

Power	Green = Power OK
Status	Green = Boot-up complete
H	Green = 1000 Mbps communication established Yellow = 100 Mbps communication established Flash = Activity
L	Yellow = 10 Mbps communication stablished Flash = Activity

Regulatory Compliance

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

Ordering Information

Model	*RoHS*	*Description*
EIGR-E	✔	Skorpion GigE IP Router 0 to 60°C
EIGR-EX	✔	Skorpion GigE IP Router -40 to +75°C
EIGR-V	✔	Skorpion GigE IP Router with VPN 0 to 60°C
EIGR-VX	✔	Skorpion GigE IP Router with VPN -40 to 45°C

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