

BAS Router — BACnet/IP to BACnet MS/TP Router



Standalone Routing

- Routes between BACnet®/IP and BACnet® MS/TP networks

Simple Installation

- 10/100 Mbps Ethernet Auto-MDIX port
- Input voltage range is 24 VAC/VDC ($\pm 10\%$), 47–63 Hz
- Diagnostic LEDs include MS/TP traffic monitor
- Optically isolated MS/TP communication port
- Removable connector for the MS/TP port
- DIN-rail mounted

Effortless Configuration

- Web server for commissioning, re-configuring and troubleshooting
- Reset switch to restore factory default IP address
- MS/TP baud rates: 9,600–76,800 bps
- Jumper-selectable MS/TP bias and termination

Standards Compliant

- CE Mark
- RoHS compliant

BAS Router — BACnet/IP to BACnet MS/TP Router

Product Overview

Ethernet connectivity is everywhere in a typical structure. Why not use the existing Ethernet infrastructure? It's there, it's free. If you have BACnet MS/TP devices to install, but no MS/TP home run is available, use a BAS Router to make the BACnet/IP to BACnet MS/TP connection. With the BAS Router you can use the Ethernet infrastructure and locate the MS/TP devices where you need them. You can take advantage of the many MS/TP devices in the marketplace and connect them to any BACnet/IP enabled controller. And of course, if you're trying to maintain a standard selection of spare MS/TP parts, you can employ the same MS/TP devices connected to MS/TP controllers as those connected to the BACnet/IP controller.

The BAS Router routes messages between BACnet/IP and BACnet MS/TP networks as per the ANSI/ASHRAE 135 (ISO 16484-5) standard. It allows BACnet/IP devices connected over Ethernet to communicate with MS/TP devices. The router is configurable via its web page.

The BASRT-B is housed in a metal case that mounts on 35-mm DIN-rail and is powered from a 24 VAC/VDC ($\pm 10\%$) source. The unit contains one MS/TP port and one 10/100 Mbps Ethernet port.

The MS/TP port offers an optically-isolated transceiver. It has a removable 3-pin terminal block for the EIA-485 connection. Logically, 255 devices can be addressed. Physically, the number of devices depends upon device loading.

For full-load devices, up to 31 devices can share the same bus segment as the BAS Router. For half-load devices, there can be 62. All MS/TP baud rates are supported from 9.6 to 76.8 kbps.

The Ethernet port offers a shielded RJ-45 connector. Through auto-negotiation and Auto-MDIX, it automatically matches its duplex setting, data rate and signal polarity to whatever is needed by the attached equipment. Therefore, any CAT5 cable can be used for hookup.

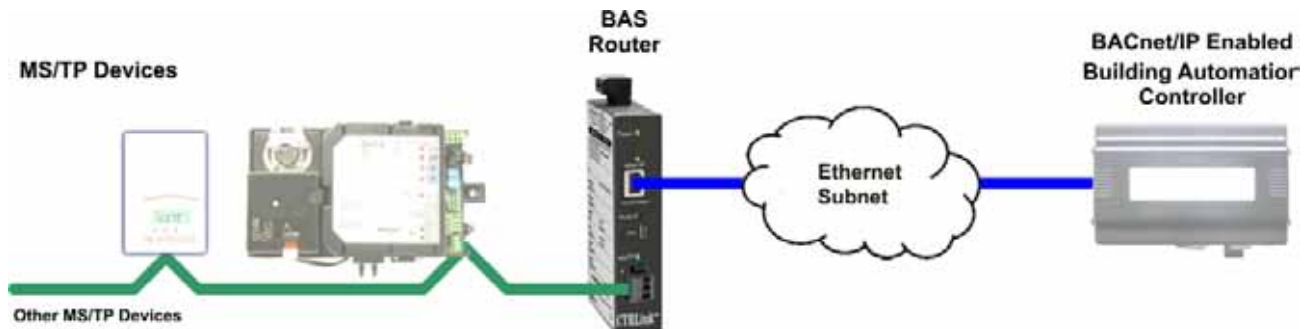
A resident web server allows commissioning, re-configuration and troubleshooting with a standard web browser. A reset switch is provided on the router to set the unit to the factory default IP address. Three LEDs are provided: The power LED glows green when proper power is provided. A bi-colour Ethernet LED glows green for 100 Mbps operation and yellow for 10 Mbps and indicates activity by flashing. A green LED flashes when valid MS/TP traffic is received.

Internal MS/TP bias and termination jumpers are provided to allow flexible bias and termination options. They can be removed for mid-span installations. Each unit complies with Class A radiated and conducted emissions as defined by EN55022 and CFR 47, Part 15.

BAS Router — BACnet/IP to BACnet MS/TP Router

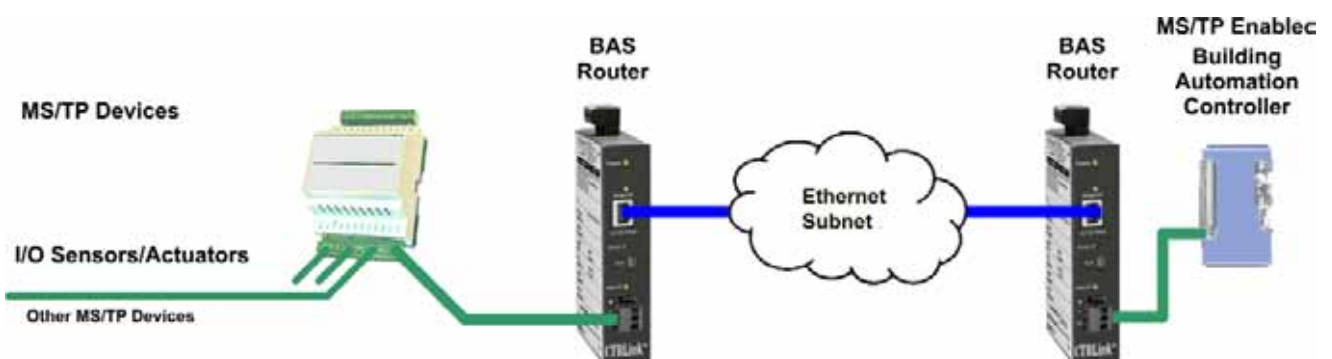
Typical Applications

Connect MS/TP Devices to BACnet/IP Enabled BAS Controllers



- Use existing Ethernet infrastructure
- Locate MS/TP devices where no MS/TP cable exists
- Add IP address to MS/TP devices
- Provide access to MS/TP devices from multiple BACnet/IP enabled controllers
- End-of-line MS/TP bias and termination provided by the BAS Router

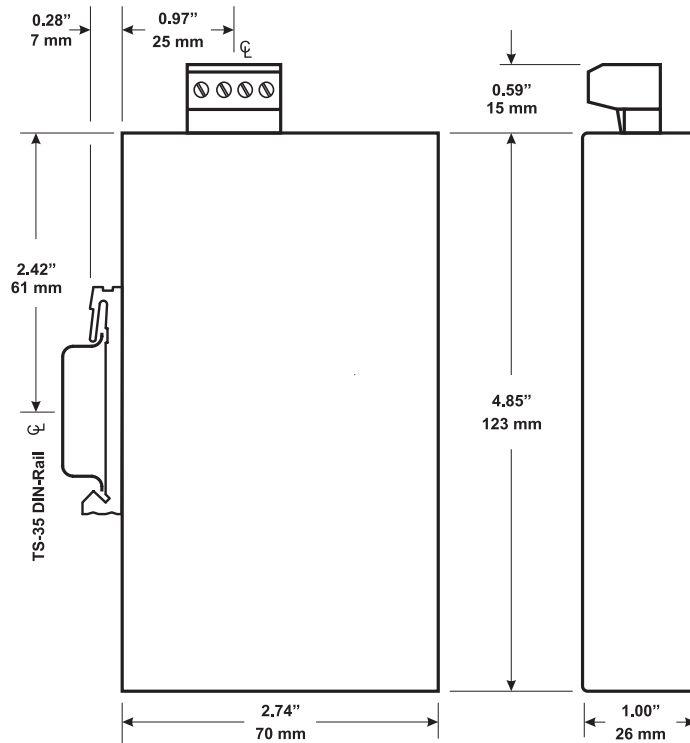
Tunnelling MS/TP Communications Through the Existing Ethernet Infrastructure



- Use existing Ethernet infrastructure
- Connect MS/TP devices to MS/TP BAS controllers where no MS/TP cabling exists
- Extend existing MS/TP cabling using the Ethernet infrastructure
- End-of-line MS/TP bias and termination provided by the BAS Routers

BAS Router — BACnet/IP to BACnet MS/TP Router

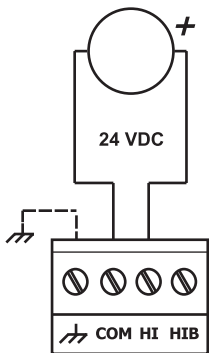
Mechanical



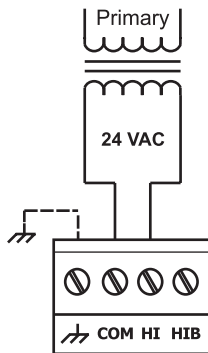
Power Diagrams

Internally, the BAS Router incorporates a half-wave rectifier and therefore can share the same power supply with other half-wave rectified devices. The BAS Router can also be powered from a DC source.

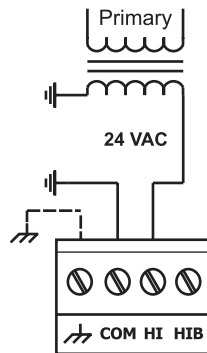
Connecting chassis to earth or using a backup source is always optional.



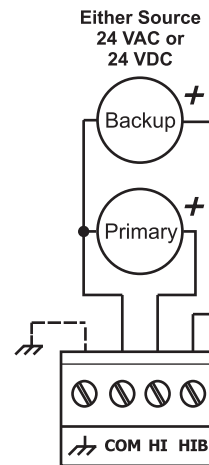
DC Powered



AC Powered



AC Powered with Grounded Secondary



Redundant Power

BAS Router — BACnet/IP to BACnet MS/TP Router

Specifications

Electrical

INPUT (class 2 circuits only)	DC	AC
Voltage (V, ±10%)	24	24
Current (mA, Max)	125	125
Power	3 W	3 VA
Frequency	N/A	47–63 Hz

Environmental

Operating temperature	0°C to 60°C
Storage temperature	–40°C to +85°C
Relative humidity	10–95%, noncondensing
Protection	IP30

Functional

	<i>Ethernet</i>	<i>MS/TP</i>
Compliance	IEEE 802.3	ANSI/ASHRAE 135 (ISO 16484-5)
Data rate	10 Mbps, 100 Mbps	9,600; 19,200; 38,400; 76,800 bps
Physical layer	10BASE-T, 100BASE-TX	EIA-485
Cable length	100 m (max)	1200 m
Port connector	Shielded RJ-45	3-pin terminal block
		Jumper-selectable bias and termination
LEDs	Green = 100 Mbps Yellow = 10 Mbps Flash = activity	Flashing green = receive activity
Flow control	Half-duplex (backpressure)	

Regulatory Compliance

CE Mark; CFR 47, Part 15 Class A ; RoHS

RJ-45 Pin Assignments

MDI RJ-45	10BASE-T/100BASE-TX Usage
1	TD+
2	TD–
3	RD+
4	Not Used
5	Not Used
6	RD–
7	Not Used
8	Not Used

MS/TP Pin Assignments

Terminal	Usage
+	DATA +
–	DATA –
SC	Signal Common

BAS Router — BACnet/IP to BACnet MS/TP Router

Router Configuration

The screenshot displays the 'Router Configuration' page for a Contemporary Controls BACnet Router. The browser window title is 'Contemporary Controls BACnet Router - Windows Internet Explorer' and the address bar shows 'http://192.168.92.68/'. The page features the Contemporary Controls logo and the title 'Router Configuration' in a large, bold, red font. On the left, there is an image of the physical router device, a black rectangular unit with various ports and a 'CTRLink' logo. The right side of the page contains a list of configuration fields with their default values:

- Device Instance: 0
- BACnet/IP UDP Port: BAC0
- BACnet/IP Network: 1
- IP Address: 192.168.92.68
- IP Subnet: 24
- IP Gateway: 192.168.92.1
- MS/TP MAC: 0
- MS/TP Network: 2001
- Max Masters: 127
- Max Info Frames: 100
- MS/TP Baudrate: 38400
- MS/TP Tolerance: Strict Lenient
- Save Changes (button)
- MAC Address: 00-50-DB-XX-XX-XX

Router Configuration Page with Default Values

BAS Router — BACnet/IP to BACnet MS/TP Router

<i>Device Parameter</i>	<i>Default Value</i>	<i>Description</i>
Device Instance	0	The router device instance is a 22-bit value (1–4,194,303). Each network device has a unique device instance.

<i>BACnet/IP Parameters</i>	<i>Default Value</i>	<i>Description</i>
BACnet/IP UDP Port	BAC0	16-bit hex value (0–FFFF) is set to 0xBAC0. Value should not change, but if you must change it, avoid well-known ports having hex addresses such as 15, 17, 50, etc.
BACnet/IP Network	1	BACnet/IP network number is a 16-bit value (1–65535). Each network must have a unique number.

IP Subnet	24	Value (0–30) in the “slash” notation is the number of bits with a “1” in the mask. The default value of 24 corresponds to 255.255.255.0 in the dotted decimal format. All devices on the same subnet which communicate via BACnet/IP should use the same subnet mask.
IP Gateway	192.168.92.1	Default gateway for the IP stack is a dotted decimal number in the range of 0.0.0.1 through 255.255.255.254.

<i>MS/TP Parameters</i>	<i>Default Value</i>	<i>Description</i>
MS/TP MAC Address	0	The 8-bit (0–127) MAC address of the router’s MS/TP port, in decimal. Lower MAC address numbers are preferred.
MS/TP Network	2001	This 16-bit decimal network number (1–65535) must be unique. No other MS/TP network can have the same network number.
Max Masters	127	The highest master MAC address (in decimal) in the MS/TP network. This can be as large as 127 and you should use 127 if you’re unsure of other MS/TP device.
Max Info Frames	100	The maximum number of messages that can be routed onto the MS/TP network by the router per token pass. Its range is 1–100, and typical values are 20–40.
MS/TP Baud Rate	38,400	The baud rate of the MS/TP network can be 9600; 19,200; 38,400 or 76,800 bps. All MS/TP devices on the same MS/TP network must use the same baud rate.
MS/TP Tolerance	Lenient	Setting determines the degree to which interoperability with devices is successful. Lenient option is less efficient for traffic flow but optimises interoperability.

BAS Router — BACnet/IP to BACnet MS/TP Router

Electromagnetic Compatibility

<i>Standard</i>	<i>Test Method</i>	<i>Description</i>	<i>Test Levels</i>
EN 55024	EN 61000-4-2	Electrostatic Discharge	6 kV contact & 8 kV air
EN 55024	EN 61000-4-3	Radiated Immunity	10 V/m, 80 MHz to 1 GHz
EN 55024	EN 61000-4-4	Fast Transient Burst	1 kV clamp & 2 kV direct
EN 55024	EN 61000-4-5	Voltage Surge	2 kV L-L & 2 kV L-Earth
EN 55024	EN 61000-4-6	Conducted Immunity	10 Volts (rms)
EN 55024	EN 61000-4-11	Voltage Dips & Interruptions	1 Line Cycle, 1 to 5 s @ 100% dip
EN 55022	CISPR 22	Radiated Emissions	Class A
EN 55022	CISPR 22	Conducted Emissions	Class B
CFR 47, Part 15	ANSI C63-4	Radiated Emissions	Class A

Ordering Information

<i>Model</i>	<i>Description</i>
BASRT-B	DIN-rail mount BACnet/IP to MS/TP Router

United States

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

Phone: +1 (630) 963-7070
Fax: +1 (630) 963-0109

info@ccontrols.com
www.ccontrols.com

China

Contemporary Controls
(Suzhou) Co. Ltd
11 Huoju Road
Science & Technology Park
New District, Suzhou
PR China 215009

Phone: +86-512-68095866
Fax: +86-512-68093760

info@ccontrols.com.cn
www.ccontrols.asia

United Kingdom

Contemporary Controls Ltd
Sovereign Court Two
University of Warwick
Science Park
Sir William Lyons Road
Coventry, CV4 7EZ
United Kingdom

Phone: +44-24 7641 3786
Fax: +44-24 7641 3923

info@ccontrols.co.uk
www.ccontrols.eu

Germany

Contemporary Controls GmbH
Fuggerstraße 1 B
04158 Leipzig
Germany

Phone: +49-341-520359-0
Fax: +49-341-520359-16

info@ccontrols.de
www.ccontrols.eu