BAS Portable Router — Designed for Buildings

Communications Built for Buildings

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

Simple Installation

- 10/100 Mbps Ethernet Auto-MDIX port
- Powered through the USB port
- Diagnostic LEDs include MS/TP traffic monitor
- Optically-isolated MS/TP communication port
- Removable connector for the MS/TP port
- Lightweight portable plastic case

Effortless Configuration

- Web server for commissioning, re-configuring and troubleshooting
- Reset switch to return to factory default IP address
- MS/TP baud rates: 9600 to 76800 bps
- Jumper selectable MS/TP bias and termination

Standards Compliant

- CE Mark
- RoHS compliant

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Product Overview

The Portable BAS Router is a convenient device used to connect a laptop computer to an MS/TP network. All the electronics are provided in a lightweight, small plastic case. The unit is powered from a USB port. This small device can easily be carried from jobsite to jobsite in a laptop computer bag—utilizing a CAT5 cable for communication and a USB cable for power. No batteries or wall wart power supplies are required. Because the BAS Portable Router operates on USB power from the computer, no source of power (like a 120 VAC receptacle) is required other than the laptop.

This product routes messages between BACnet/IP and BACnet MS/TP networks as per the ANSI/ASHRAE 135-2004 standard. It allows BACnet/IP devices connected over Ethernet to communicate with MS/TP devices. The router is configurable via its web page.

The BASRTP-B is housed in a lightweight, plastic case and is powered from a USB port. 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 removeable 3-pin terminal block for the EIA-485 connection as well as an RJ-11 jack. Through either one of these ports, up to 127 devices can be addressed—as many as 31 on the local bus. 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.

The Portable BAS Router is shipped with a 5-foot CAT5 Ethernet cable and a 6-foot USB cable.

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.

Each unit complies with Class A radiated and conducted emissions as defined by EN55022 and CFR 47, Part 15.

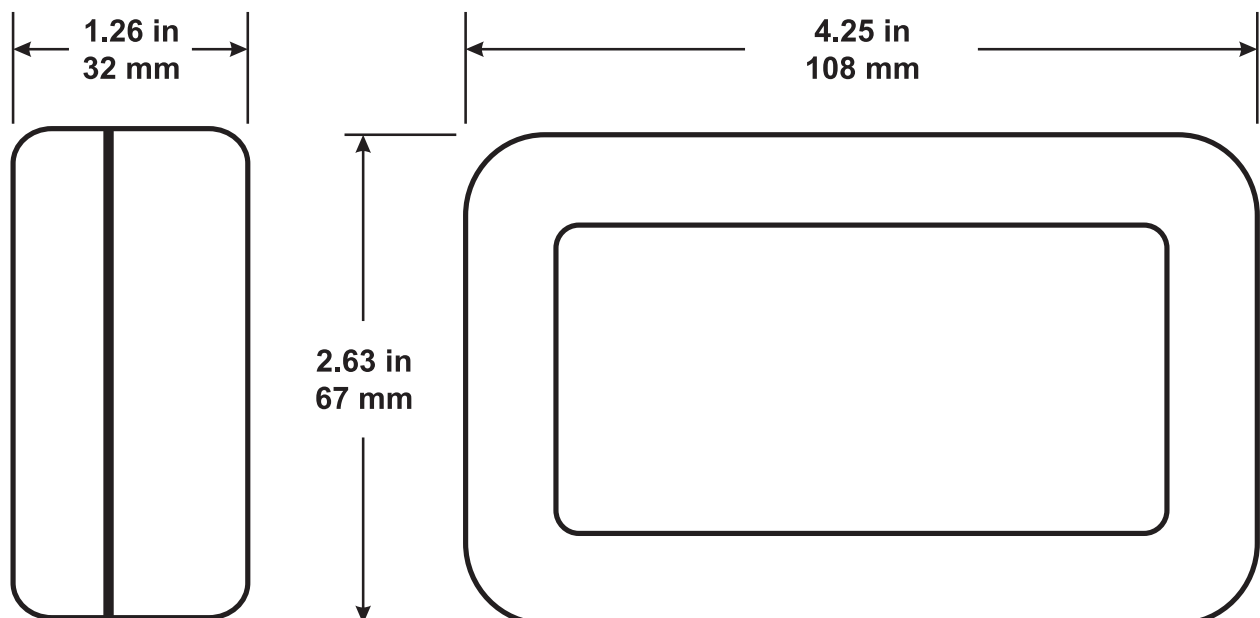# BAS Portable Router — Designed for Buildings

Typical Application

Portable Router Connecting Laptop to MS/TP Network
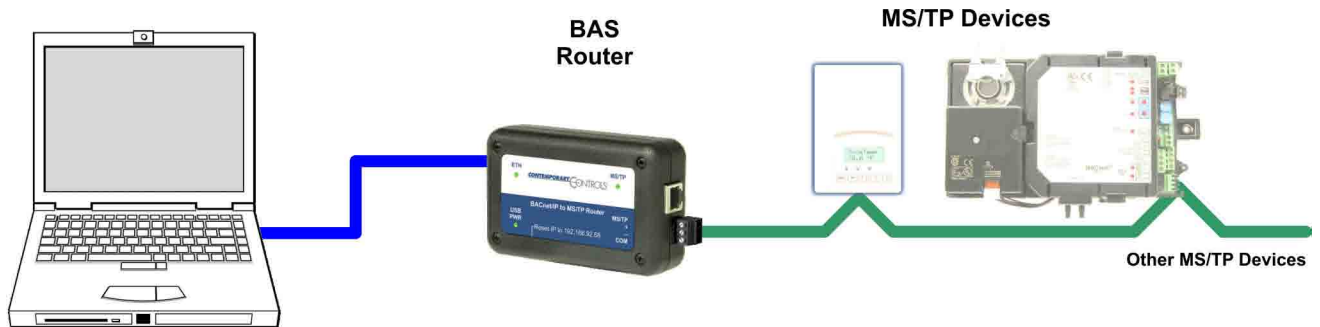
- **Lightweight**
- **USB powered (no batteries, no wall wart)**

Mechanical

The BASRTP-B features a USB 2.0 Full Speed Device Port that accepts a USB cable with a Type B jack. It takes a 5 VDC from a host computer, while drawing no more than 500 mA of current. It can operate from a USB hub, if desired.

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Specifications

Electrical

INPUT	USB (Type B Port)
Voltage (V, nominal)	5 VDC
Current (mA, typical)	300
Power	2.5 W
Frequency	N/A

Environmental

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

Functional

	Ethernet	MS/TP
Compliance	IEEE 802.3	ANSI/ASHRAE 135-2004
Data rate	10 Mbps, 100 Mbps	9600; 19,200; 38,400; 76,800 bps
Physical layer	10BASE-T, 100BASE-TX	EIA-485
Cable length	100 m (max)	1200 m (for AWG 18)
Port connector	Shielded RJ-45	3-pin terminal block
		RJ-11
LEDs	Green = 100 Mbps	Flashing green = receive valid activity
	Yellow = 10 Mbps	
	Flash = activity	
Flow control	Half-duplex (backpressure)	

Regulatory Compliance

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

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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

Modbus (MB) Pin Assignments

Terminal	Usage
D +	DATA +
D −	DATA −
SC	Signal Common

RJ-11 (MS/TP) Pin Assignments

Terminal	Usage
2	DATA −
4	Signal Common
5	DATA +

Note: All other pins are unused.

Electromagnetic Compatibility

Standard	Test Method	Description	Test Levels
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

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Router Configuration

Router Configuration Page with Default Values

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Device Parameter	Default Value	Description
Device Instance	0	The router device instance is a 22-bit value (4, 194,303). Each network device must have a unique device instance.

BACnet/IP Parameters	Default Value	Description
BACnet/IP UDP Port	0xBAC0	16-bit hex value (0–FFFF) is set to 0xBAC0. Value should not change, but if you must hange 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 Address	192.168.92.68	IP address of the router can be 0.0.0.1 through 255.255.255.254.
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.

MS/TP Parameters	Default Value	Description
MS/TP MAC Address	00	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 addresses.
Max Info Frames	40	The maximum number of messages that can be routed onto the MS/TP network by the router per token pass. Its range is 1–40, 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.

Ordering Information

Model	Description
BASRTP-B	Portable USB BACnet/IP to MS/TP Router with cables

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