Wattstopper®

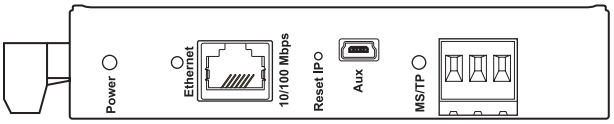
DLM Segment Network to IP Router

No: 29658– 12/19 rev. 1

Installation Instructions • Instructions d'Installation • Instrucciones de Instalación

Catalog Numbers • Les Nombre de Catalogue • Números de Catálogo: NB-ROUTER

Country of Origin: Made in USA • Pays d'origine: Fabriqué en USA • País de origen: Hecho en Estados Unidos de América



OVERVIEW

The NB-ROUTER (BASRT-B-WS) provides a connection point between a single Digital Lighting Management (DLM) segment network and an Ethernet LAN. The router has a rugged metal enclosure with an integral DIN rail mounting clip. The NB-ROUTER provides a browser-based interface for set up and configuration. Using an assigned IP address and additional Ethernet and BACnet MS/TP settings, the device automatically routes network communication between the segment network and an IP network.

The NB-ROUTER is perfect for applications with DLM segment networks originating from multiple locations, or for routing a segment network to a BAS via BACnet IP or BACnet Ethernet.

SPECIFICATION

Input Voltage (±10%).....24VAC/VDC

NOTE: NB-ROUTER ordered within the network enclosure comes pre-powered, otherwise order NB-PS power supply separately

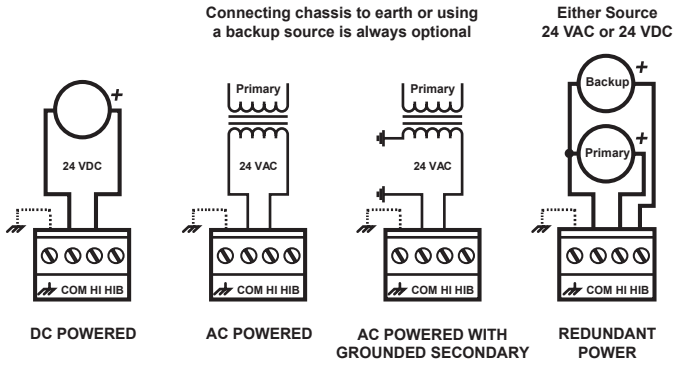
Power.....2 W DC, 4VAC
Frequency.....47-63Hz AC
Operating Temperature.....32° to 140°F (0° to 60°C)
Storage Temperature.....23° to 176°F (-40° to 80°C)
Relative Humidity.....10-95% (non-condensing)
Physical Layer
Ethernet.....10BASE-T, 100BASE-TX
MS/TP.....EIA-485
Cable Length Limit
Ethernet.....100 m
MS/TP.....1200 m
MS/TP Data Rate (bps).....9600, 19200, 38400, 76800
MS/TP Node Limit.....254 Devices total,
31 Full-load devices per segment

POWER CONNECTION

The NB-ROUTER requires 24 VAC or 24 VDC while drawing no more than 4 VA of power. The recommended conductor size is 16–18 AWG. COM is directly connected to zero volts and the chassis is DC isolated from zero volts. Input connections are reverse-polarity protected. See figure to the right for power options.

⚠ CAUTION ⚠

Internally, this device utilizes a half-wave rectifier and therefore can only share the same AC power source with other half-wave rectified devices. Sharing a common DC power source is also possible. Sharing AC power with full-wave rectified devices is NOT recommended. Devices powered from a common AC source could be damaged if a mix of half-wave and full-wave rectified devices exists.



MS/TP PHYSICAL LAYER BIAS AND TERMINATION

End-of-Line termination (120Ω) is normally applied at both ends of the MS/TP bus, especially when using long cable segments and faster data rates. Fail-safe voltage bias (200mV) ensures stable MS/TP operation. The BASrouter is shipped with fail-safe voltage bias and EOL termination applied. Depending on the application, these can be changed by removing jumpers inside of the case.

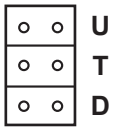
End Device – In a router application where the location of the router is at the end of the MS/TP bus segment – both bias and EOL termination must be applied.

Middle Device – In a router application where the location of the router is anywhere between the end MS/TP devices (in the middle of the bus), termination jumper should be removed. Fail-safe voltage bias jumpers could be left in place depending on whether other devices on the MS/TP bus are providing additional bias or not.

MS/TP PHYSICAL LAYER BIAS AND TERMINATION *(continued)*

Three configuration jumpers are located inside the NBRouter's case near the MS/TP connector. Removing the cover provides access to the 6-pin jumper block.

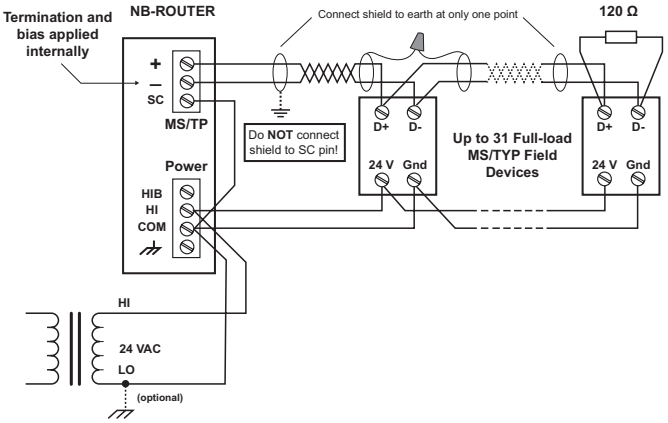
U Install jumper to apply pull-up bias
T Install jumper to terminate bus
D Install jumper to apply pull-down bias (all jumpers are installed by default)



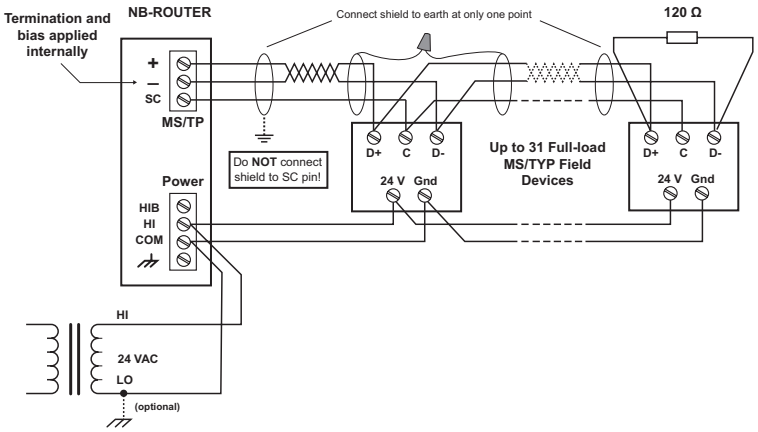
MS/TP PHYSICAL LAYER CONNECTION OPTIONS

For MS/TP devices that share a power source with the NB-Router

2-wire MS/TP Bus with Shared Power Source

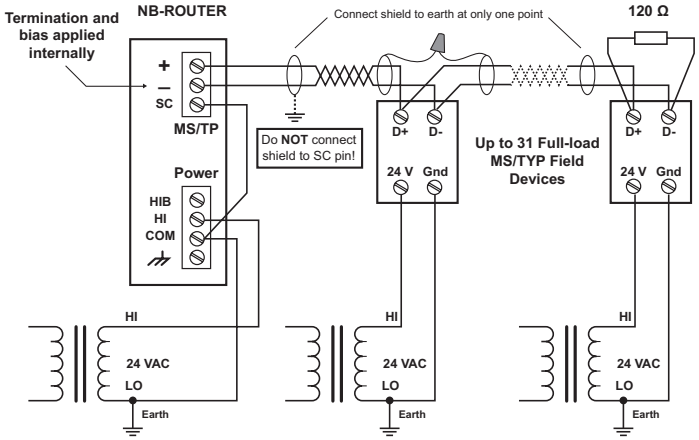


3-wire MS/TP Bus with Shared Power Source

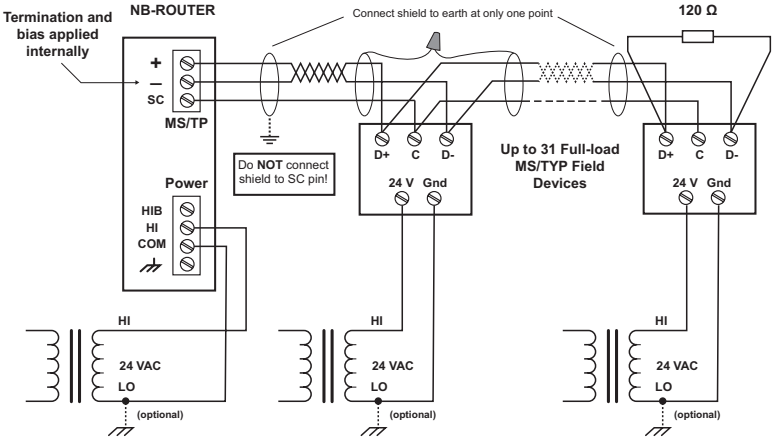


For MS/TP devices that use a power source separate from the NB-Router

2-wire MS/TP Bus with Separate Power Sources



3-wire MS/TP Bus with Separate Power Sources



WEBPAGE CONFIGURATION

The NB-Router ***BACnet routing function will be disabled by default*** until the unique factory-programmed password is changed. On login, click the ***Security*** tab and change the password to an 8-10 character alphanumeric value which must be different than the factory-programmed default password printed on the side label.

To configure the router initially, connect it to your Windows PC using an Ethernet cable and set the PC's IP and subnet mask in Local Area Connection –> Properties. In the Internet Protocol Version 4 (TCP/IPv4) settings of your Windows PC, specify an IP address and a Subnet mask in the same subnet as the BASrouter (e.g. 192.168.92.5 /24).

NB-Router's factory-programmed: **Default IP address** is ***192.168.92.68*** and a Class C subnet mask of ***255.255.255.0 (/24)***

User Name is: ***admin*** and the Password is printed on the Serial Label i.e. "***1W535317***"

Reset IP switch is located on the front, underneath RJ-45 connector. Press and hold the Reset IP button using a paper clip for at least 3 seconds while the router is powered. Remove power and restore power again to complete the reset IP, User ID, and Password procedure to factory-programmed defaults.

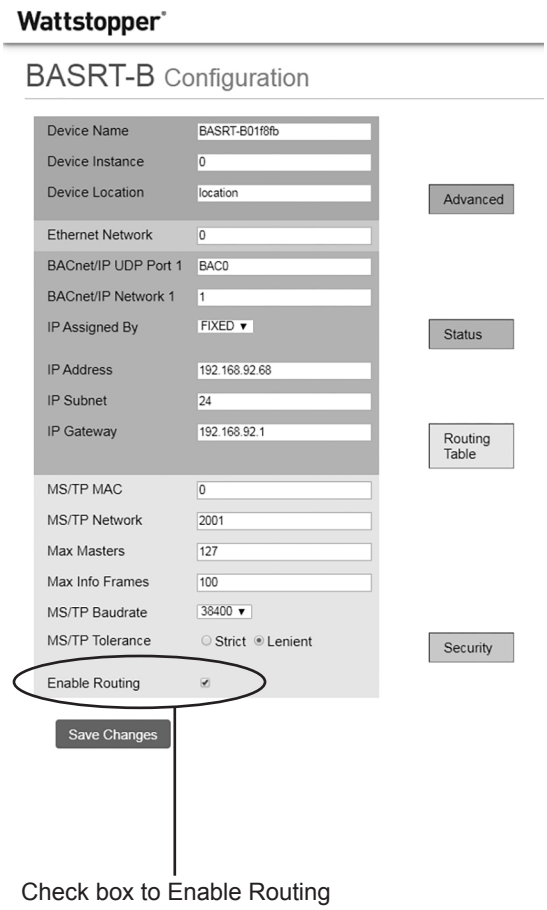
START UP CHECKLIST: CONFIGURE BACNET NETWORKS

DEFAULT DEVICE IDs and NETWORK NUMBERS

- Device ID are in the range 0-4194302
- Network Numbers are in the range of 1-65534
- The Segment Manager has a default Local Device ID of 861234
- The local MS/TP networks have default numbers: 8611, 8612, 8613
- The IP Network 1 has default number 1 (normal for networks)
- The IP Network 2 has a default number 1 [invalid] (should be set to match network chosen for BACnet routers)
- UDP Port for IP Network 1 and IP Network 2 can't be the same
- UDP Port for IP Network 1 is NOT the BACnet default. It has purposely been set to 0xBAC1 (47809) rather than 0xBAC0 (47808) to prevent other vendors from discovering it by accident
- UDP Port for IP Network 2 is set to default 0xBAC0 (47808)
- If only using MSTP ports, then BACnet setup is easy. Make sure the MSTP ports you are using are enabled. Then go to discover.
- If using BACnet routers connected to the same network as the second network port on the Segment Manager, then do the following: (See NB-Router Configuration)

NB-ROUTER CONFIGURATION

To enable routing of the MS/TP you must check Routing box in the web browse of the NB-ROUTER as well as accepting the EULA (see next page).



Check box to Enable Routing

- Device Name - MUST BE UNIQUE on the site
- Device Instance - MUST BE UNIQUE on the site. If routing is ever allowed through Segment Manager to this network, there will be problems if instance numbers collide
- BACnet/IP UDP Port - Default is hex BAC0 (47808) for BACnet
- BACnet/IP Network 1 - Must match all devices on this same Ethernet switch subnet
- IP Address - MUST BE UNIQUE on the local Ethernet switch
- IP Subnet - usually 24 (same as 255.255.255.0)
- IP Gateway - Correct Gateway for this network (If no route to other networks, make same as IP Address)
- MS/TP Mac - Usually 0 for router
- MS/TP Network - MUST BE UNIQUE for the site, that includes corporate network on other side of Segment Manager
- Max Master - Default is 127-best to leave it
- Max Info Frames - Default is 32
- MS/TP Baudrate - Default is 38400 (our devices do support 76800)
- MS/TP Tolerance - Strict is faster. It is possible that setting of lenient "might" help if there are many devices on the MS/TP wire

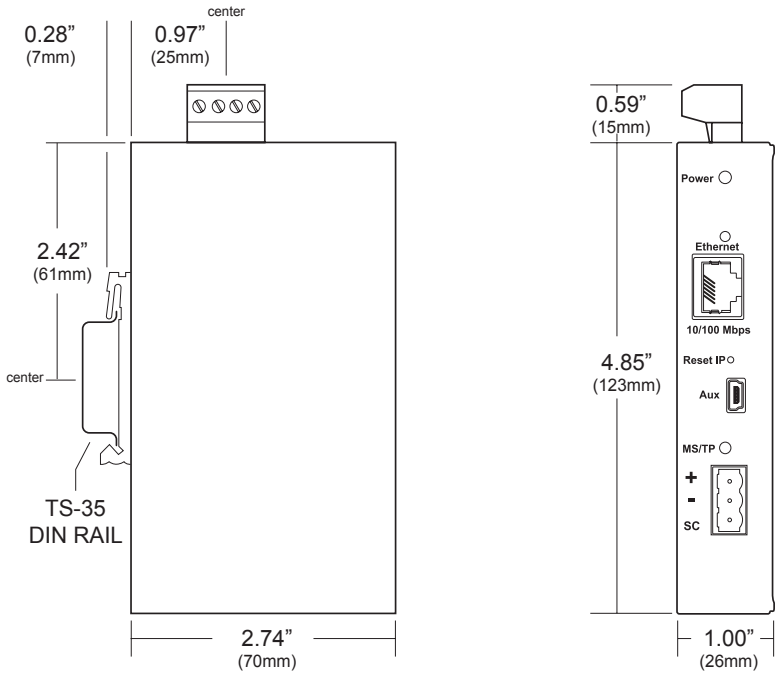
SEGMENT MANAGER CONFIGURATION FOR BACNET ROUTERS

1. Set IP Network 2 to the same Network Number as the BACnet Router's BACnet/IP Network 1
2. Set UDP Port to same as BACnet Router's BACnet/IP UDP Port 1 (should be 0xBAC0 on JACE, CC Router does not need 0x in front of BAC0)
3. **NOTE:** Each vendor of BACnet devices has a vendor ID. The Wattstopper vendor ID is 86. The use of the number 86 prefixing the network numbers and device IDs helps ensure they are unique on the site. If this network is ever connected to the site network with HVAC and other devices, the 86 prefix will help identify our devices.

EULA

"In order to enhance the security of our products, Legrand ships its products with all insecure ports closed and insecure protocols disabled. You are free to configure your device as needed, but in doing so note that you may be decreasing the security of your device and any information contained in the device. As you modify the device's default settings, keep in mind how this may impact the security of the device and your network. In addition, you should use caution in connecting your device to the Internet, especially if you have altered the default security settings. If you have any questions or concerns about how your modifications of the device may affect its security, please contact the Legrand customer service team at 1-800-879-8585 / https://www.legrand.us/support/wattstopper.aspx"

MULTI-LINE DRAWINGS AND DIMENSIONS



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