Successful BASrouter Installation and Operation

General Considerations:

BACnet Traffic: You ***must provide a BACnet client*** (AKA a ***tool*** or ***front-end***) to discover and manage BACnet devices. Our routers ***only pass messages*** — with no knowledge of what they contain.

BACnet Ethernet: Always leave this at its default of 0 — ***unless you are using BACnet Ethernet*** in which only Ethernet MAC addressing is used (no IP addressing)! If using more than one BACnet router, enable BACnet Ethernet ***on only one BACnet router*** — to avoid message loops.

Discovery: We suggest you download our **FREE** BACnet Discovery Tool (BDT) and run it from the BACnet/IP side of your network. BDT supports up to 1000 devices and up to 2000 objects per device, but ***it only works with UDP port BAC0***. (The BASRTLX-B supports slave discovery, but the BASRT-B and BASRTP-B support only slave communication — ***not slave discovery***). If BDT discovers MS/TP devices, our router is working and you may have configuration issues with your BACnet/IP tool. You can download BDT from:

www.ccontrols.com/sd/bdt.htm

IP access:

1. **IP Link LED**: This should flash with IP traffic. If it does not (or is off), check the IP path.
2. **IP Access**: If the BASrouter web page is inaccessible — but the unit responds to pings, try clearing your browser cache. If that does not help, try another browser.

Power: (The **BASRTP-B** is powered via its **USB port** — so items 1 and 2 below do not apply.)

1. **Be careful sharing power with other equipment!** Read the power section of the installation guide carefully! The BASrouter must get 24 VAC or 24 VDC.
2. **Power Conductors**: They should be 16–18 AWG.
3. **Recycle Power**: When troubleshooting (in case a transient condition caused an issue) always try recycling power — and also after making adjustments to the BASrouter.
4. ***COM* pin**: This is internally connected to zero volts.
5. **Chassis**: This is internally DC-isolated from zero volts.

Firmware: The firmware version is displayed in the lower-right portion of our router's main configuration screen. Check the following URL and upgrade your firmware if needed:

www.ccontrols.com/basautomation/basrouter_firmware_upgrade.htm

If you upgrade firmware, your may need a new Installation Guide. PDF copies of our latest Installation Guides can be downloaded from:

www.ccontrols.com/pdf/TD1201000I.pdf (for the larger BASRTLX-B)
www.ccontrols.com/pdf/TD0712000I2.pdf (for the smaller BASRT-B)
www.ccontrols.com/pdf/TD0702100I2.pdf (for the portable BASRTP-B)

Wireshark: Occasionally, operational issues may cause problems we cannot determine without detailed knowledge of your system and its traffic. In such cases, please send us a Wireshark capture. You can download Wireshark for **FREE** from:

www.wireshark.org/download.html

MS/TP Considerations:

IMPORTANT: If BDT (described above) does ***not*** discover MS/TP devices, carefully read and confirm the proper settings of all device and network parameters — and review the following:

SC Pin: This ***must be attached*** to the signal common used by all MS/TP devices (usually earth). If this connection is not made, MS/TP communication ***will never be reliable***.

MS/TP LED:

1. This flashes regardless of cable polarity, ***so double-check the MS/TP wiring polarity***. (Input connections are reverse-polarity protected.)
2. The BASrouter and all attached MS/TP devices ***must*** have the *same* ***baudrate***. If the baud rates differ, the BASrouter MS/TP LED ***may still flash***.
3. If the MS/TP LED ***never glows*** — but the baud rate is proper — check your MS/TP wiring and device settings.

Termination:

1. **BASRT-B or BASRTLX-B:** If the BASrouter is ***NOT*** at the end of the MS/TP bus, open its case and adjust the bias/termination jumpers as explained in the product installation guide.
2. **BASRTP-B:** If it ***IS*** at the bus end, attach a 120-Ω resistor across the **+** and **–** terminals.

MaxMasters Value: Each device in the MS/TP network should have this set to the same value. If this value is unknown, ***leave it at 127*** in the BASrouter.

MS/TP Bus: Use 3-wire cabling if our router and other MS/TP devices share isolated transceivers.

MS/TP Devices: How many are attached? The more devices used, the more issues can arise. EIA-485 technology supports 32 *full-load* devices. The BASrouter is a full-load device, so it can share an MS/TP bus with up to 31 devices. More devices can be attached if they are ***half-* or *quarter-load devices***. The theoretical limit is 64 half-load devices or 128 quarter-load devices (or a mix that yields the same load equivalence), but in reality MS/TP communication becomes problematic when high device counts are attempted. We advise limiting the device count to 31 — even if they are less than full-load devices.

Address Duplication: If your bus communication is unstable or unreliable, check for this problem (where same-addressed devices get the token and try to communicate simultaneously).

Status Screen: This is accessed via a button on the right side of the unit's ***main configuration screen***. This screen lists many parameters that are updated when you manually refresh the page. Some parameters are displayed only so you can take a screen capture to send to our engineers for study. Other parameters can help you — even if you have no knowledge of the BACnet standard. Read more at:

www.ccontrols.com/enews/0512story5.htm

BBMD Considerations:

Broadcast Distribution Table (BBMD) and Foreign Device Registration (FDR) Table:

1. **BASRT-B or BASRTP-B:** Each table (BBMD or FDR) has a limit of **FIVE** addresses.
2. **BASRTLX-B:** Each table (BBMD or FDR) has a limit of **FIFTY** addresses.
3. The BASrouter's ***own IP Address*** should ***NOT*** be in the table.
4. **BBMD table does not save:** Clear your browser cache or try another browser. (The entry ***seems*** accepted, but the table does not update.)

The BASrouter can only be a partner BBMD: It can have foreign devices register with it — but ***it cannot register as a foreign device*** to another BBMD.

Multiple BBMD-enabled devices: In any given subnet, only 1 device can do BBMD (otherwise, messaging gets confused). It is OK to have multiple BBMD-enabled devices — if only 1 such unit has entries in BBMD table. Often our router must communicate to a central BBMD for the whole internetwork. This requires the central BBMD be entered in our BBMD table and our router must be entered in the BBMD table of the central BBMD.

BBMD table Subnet Mask: A subnet mask of 255.255.255.255 is used when messages must traverse an IP router that blocks all broadcasts — by far the most common type of IP router. If the IP router can forward BACnet broadcasts (a rarity), then it is OK to another mask value. In this case (rare, but may save you a BBMD), use the ***subnet mask of the network***.

The BASRTP-B portable router has no BBMD functionality: This is because the BASrouter makes a ***temporary*** connection to commission or troubleshoot a system. If the BASRTP-B had BBMD and got the system working, once the BASRTP-B was removed the system would fail — since BBMD functionality would be gone.