

# CONTEMPORARY CONTROLS®

## BASrouter Series Version 3.0

### Enhanced Diagnostics

The compact and durable BASrouter series of BACnet multi-network routers provides stand-alone routing between BACnet networks such as BACnet/IP, BACnet Ethernet, and BACnet MS/TP- thereby allowing the system integrator to mix BACnet network technologies within a single BACnet internetwork. Field-proven circuit design and up-to-date ANSI/ASHRAE BACnet standard operation provide unbeatable reliability. Building on this proven reliability, we have enhanced the BASrouter features to provide built-in BACnet diagnostic capabilities with visual analytics MS/TP status table, routing status table, network errors count, and traffic statistics. This allows the integrator to easily install robust BACnet networks, or speed up troubleshooting drastically when necessary. Our compact BACnet routers come in two distinct models.

The BASrouter is housed in a rugged metal enclosure, it is DIN-rail mountable, and it is 24 VAC/VDC powered.

It's optically isolated MS/TP port provides the needed bias and termination to the serial bus right out of the box. The web page is used for router configuration and diagnostic analysis of BACnet/IP and BACnet MS/TP networks.

### Versatile Routing:

- BACnet/IP and BACnet MS/TP and BACnet Ethernet
- Two BACnet/IP Networks (between two UDP ports)

### Convenient Installation:

- Web Page for Commissioning and Troubleshooting
- 24 VAC/VDC (+/-10%), 47-63 Hz input voltage
- DIN-rail mounted



### Network Support:

- 10/100 Mbps Ethernet port
- Optically Isolated MS/TP port
- MS/TP Baud Rates range 9.6-76.8 kbps
- MS/TP Diagnostic Web Page
- DHCP client
- Routing Table Web Page
- BACnet/IP Broadcast Management Device (BBMD)
- Foreign Device Registration (FDR)

## Enhanced Diagnostics

The Status screen web page is always operational and displays BACnet network statistics in real time. In addition, a visual analytics device status table is updated every 5 seconds to display BACnet MS/TP bus status which allows the system integrator to analyze and ensure the stability of the MS/TP network segment as well as resolve existing network issues if necessary. MS/TP Device Status is a graphical table of the BACnet MS/TP device MAC addresses on the attached EIA-485 physical segment. Devices are identified by their MAC address and displayed as:

ONLINE – Green square

OFFLINE – Gray square

ROUTER – Blue square

The Network Errors count provides an accumulating count of BACnet MS/TP network errors such as: invalid frames, partial frames, bad CRC, wrong data length, or silence timer greater than 100ms. This count will keep incrementing if there are present MS/TP network issues until the error conditions on the MS/TP bus are resolved. This value can be cleared to check for proper network operation after fixing a problem.

Multiple networks, possibly employing different physical layer technologies, may be interconnected by BACnet routers to form a BACnet internetwork. The Routing table web page provides a routing table which contains information about the network topology of the surrounding BACnet internetwork such as Destination Network, Network Type, Connecting Network, and Network Status – making network troubleshooting faster and easier.

**BASRTP-B Status**

**MSTP Device Status**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127

Green=Online Blue=Router MAC Gray=Offline

**Network Errors: 4**

**Statistics**

B/IP 1 In Packets	B/IP 1 Out Packets	B/IP 2 In Packets	B/IP 2 Out Packets
156	87	0	0
B/Eth In Packets	B/Eth Out Packets	MSTP In Packets	MSTP Out Packets
0	0	71	64
TX PFM Count	RX PFM Count	TX Token Count	RX Token Count
319	3	3597	3595
Invalid long Frames	Next Station	SoleMaster	
0	2	No	

**BASRT-B Routing Status**

Discover Routing Table

**Routing Table**

Destination Network	Network Status	Connecting Network	Network Type	Next Router Address
1326	Operational	Direct	MS/TP	N/A
1	Operational	Direct	B/IP1	N/A
9292	Operational	1	B/IP1	10.0.13.33:47808
218	Operational	1	B/IP1	10.0.0.218:47808
221	Operational	1	B/IP1	10.0.3.206:47808
1100	Operational	1	B/IP1	10.0.11.68:47808

The Portable BASrouter provides the same stand-alone routing and network diagnostics as the standard BASrouter in an even more compact case. Powered by a USB port, it is easily connected to a laptop PC for fast and easy BACnet commissioning or quick network analysis.

### Additional Portability Features:

- USB port powered 5 VDC
- Compact plastic case can be easily carried

# BASrouterLX — High-Performance BACnet® Router with Diagnostic Capabilities

In addition to the standard BASrouter, the BASrouterLX accommodates more features and provides higher network performance.

- MS/TP baud rates range from 9.6– 115.2 kbps
- Auto-discovery of MS/TP slaves
- BACnet MS/TP capture using Wireshark®
- 50 BBMD entries, 147 FDR entries
- MS/TP Backbone
- Whitelist
- Backward Routing
- DIN-rail mount or panel mount options

The BASrouterLX is a high-performance BACnet router with diagnostic capabilities, providing stand-alone

routing between BACnet networks such as BACnet/IP, BACnet Ethernet, and BACnet MS/TP. Besides its high-speed processor, it has advanced features such as MS/TP slave proxy support (allowing auto-discovery of MS/TP slaves) and MS/TP frame capture. As a BBMD, up to 50 BDT and 147 FDR entries are supported. The BASrouterLX has two physical communication ports — a 10/100 Mbps BACnet/IP Ethernet port and an optically-isolated EIA-485 port for MS/TP. Router configuration is accomplished via web pages.



## BACnet /IP Network Security

Although your BACnet MS/TP network is secure by nature, your BACnet/IP network could contain security weaknesses. The BASrouter LX can optimize BACnet/IP network security by utilizing a Whitelist. By configuring the Whitelist, only specific BACnet/IP devices can communicate to the BACnet internetwork.



## MS/TP Backbone

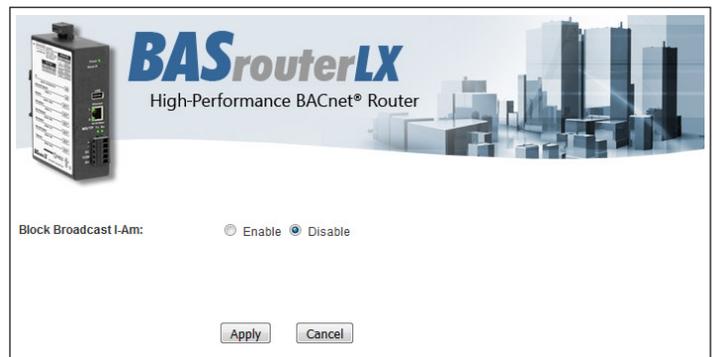
MS/TP backbone allows BACnet communication to occur in some special cases, for example when two routers are connected via MS/TP. The BACnet/IP devices on either side of the routers in this case have no idea of the MS/TP link in between and this results in the messages being dropped because of smaller size of the Max APDU on the MS/TP side. Enabling this feature allows the BACnet/IP devices to work properly.

## BACnet MS/TP capture using Wireshark

MS/TP Traffic capture is continuously stored to a buffer in the BASrouterLX. When you press the Generate button the buffer is written into a Wireshark compatible file. You can then view this file on your PC with the free Wireshark tool.

## Broadcast I-Am

In normal operation, the router forwards broadcast I-Am messages received from the BACnet/IP side to the BACnet/MSTP side. For MS/TP devices with small memory, this may cause an issue if they receive a flood of I-Am messages. When this feature is enabled, the router does not forward the broadcast I-Am messages to the MS/TP side.



## Ordering Information

Model	RoHS	Description
BASRT-B	✓	BASrouter BACnet/IP to MS/TP to Ethernet DIN-Rail Mount
BAS RTP-B	✓	BASrouter Portable BACnet/IP to MS/TP to Ethernet
BASRTLX-B	✓	BASrouterLX High Performance BACnet Router DIN-Rail Mount
BASRTLX-B/P	✓	BASrouterLX High Performance BACnet Router Panel Mount



<https://www.ccontrols.com/basautomation/basrouters.htm>

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