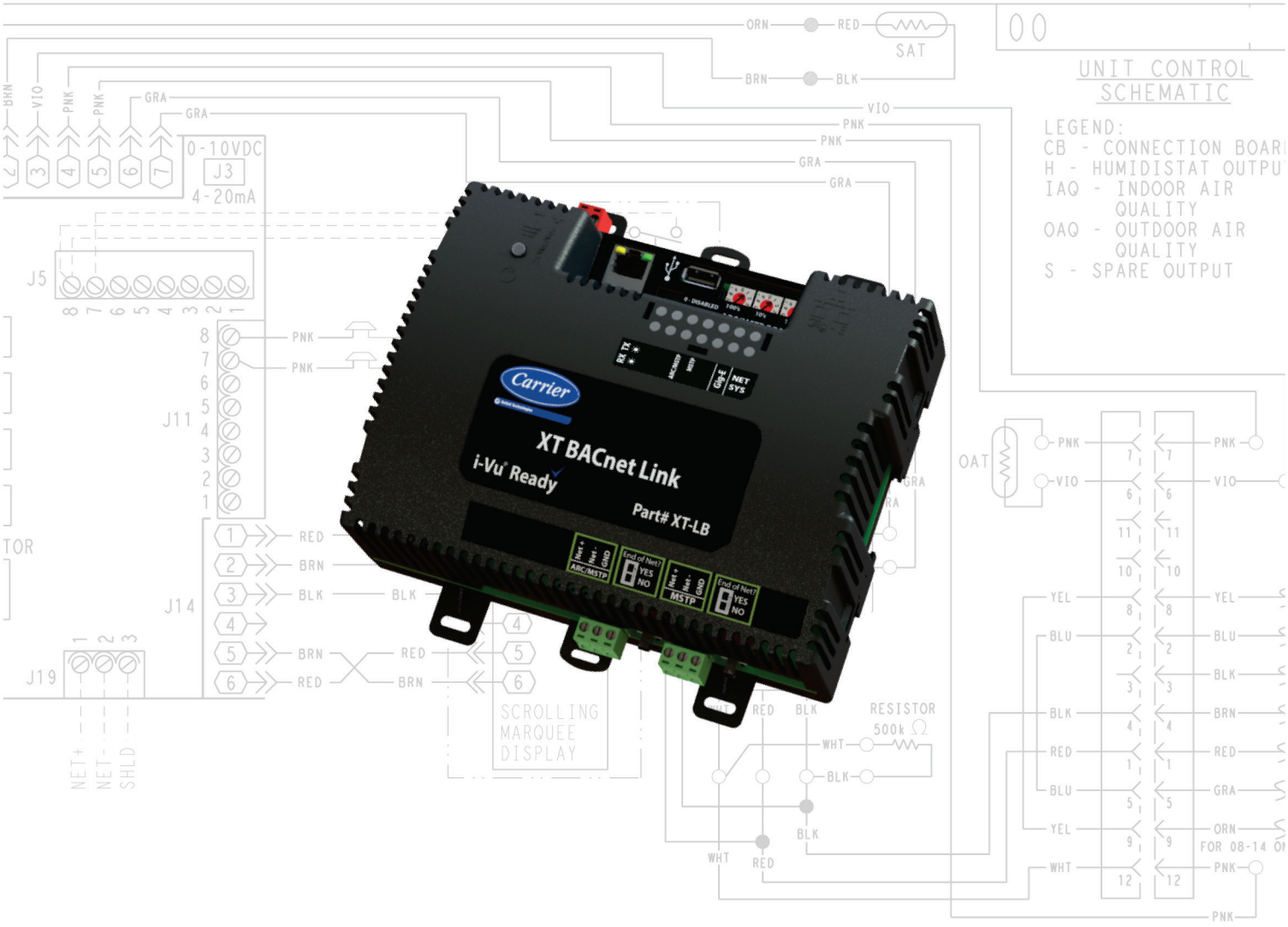
i-Vu® XT BACnet link
Installation and Start-up Guide



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Important changes are listed in **Document revision history** at the end of this document.

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What is the i-Vu® XT BACnet link?

The XT BACnet Link (part# XT-LB):

- Provides BACnet routing between any supported BACnet communication types
- Runs control programs
- Can have two BACnet/IP networks communicating on the Gig-E port
- Can serve as a BACnet Broadcast Management Device (BBMD) on each of the BACnet/IP networks
- Supports Foreign Device Registration (FDR)
- Supports DHCP IP addressing
- Has built-in network diagnostic capture functionality for troubleshooting
- Has network statistics that can be viewed numerically or as trend graphs
- Works with the i-Vu® v6.5 or later system

The i-Vu® XT BACnet link has 3 physical BACnet communication ports:

Port type	**For routing this type of communication...**	**At...**
10/100/1000 Mbps Ethernet	BACnet/IP and/or BACnet/Ethernet	10, 100, or 1000 Mbps (1 Gbps)
High-speed EIA485 port	BACnet/ARCNET or BACnet/MSTP	156 Kbps 9.6 to 115.2 Kbps
Electrically isolated EIA485 port	BACnet/MSTP	9.6 to 115.2 Kbps

The i-Vu® XT BACnet link also has a:

- 10/100 Mbps Ethernet Local Access port for configuring, commissioning, and troubleshooting
- USB port for recovery

Specifications

Driver	drv_fwex_< version >.driverx
Maximum number of control programs*	999
Maximum number of BACnet objects*	
Third-party integration points	1500

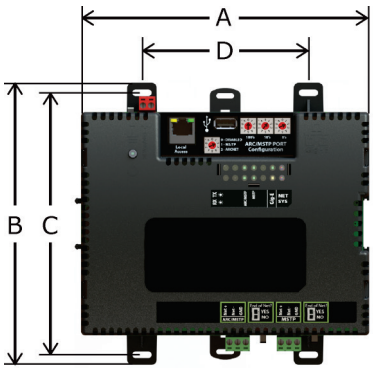
* Depends on available memory.

Power	24 Vac ±10%, 50–60 Hz, 50 VA 26 Vdc ±10%, 15 W

Gig-E port	10/100/1000 BaseT Ethernet port for BACnet/IP and/or BACnet/Ethernet communication on the Ethernet at 10, 100, or 1000 Mbps, full duplex
ARC/MSTP port	For communication with either of the following: • A BACnet ARCNET network at 156 kbps • A BACnet MS/TP network at 9600 to 115200 bps This port's **End of Net?** switch can be set to **Yes** to terminate the network segment.
MSTP port	For communication with a BACnet MS/TP network at 9600 to 115200 bps. This port's **End of Net?** switch can be set to **Yes** to terminate the network segment.
Local Access port	Ethernet port at 10 or 100 Mbps for system start-up and troubleshooting
USB port	USB 2.0 host port for device recovery
Microprocessor	32-bit ARM Cortex-A8, 600MHz, processor with multi-level cache memory
Memory	16 GBs eMMC Flash memory and 256 MB DDR3 DRAM (22 MB available to use). User data is archived to non-volatile Flash memory when parameters are changed, every 90 seconds, and when the firmware is deliberately shutdown or restarted. **NOTE** When you change a parameter, you must wait 30 seconds before turning the power off, in order for the change to be saved.
Real-time clock	Real-time clock keeps track of time in the event of a power failure for up to 3 days
Protection	Device is protected by a replaceable, fast acting, 250 Vac, 2A, 5mm x 20mm glass fuse. The power and network ports comply with the EMC requirements EN50491-5-2.

LED status indicators	• Tricolor **NET** LED to show network status
	• Tricolor **SYS** LED to show system status
	• A **TX** (Transmit) and **RX** (Receive) LED for:
	  • Gig-E port
	  • ARC/MSTP port
	  • MSTP port
	See *LED*s (page 30).

Environmental operating range	32 to 140°F (0 to 60°C), 10–90% relative humidity, non-condensing
Physical	Fire-retardant plastic ABS, UL94-5VA
Terminal blocks and connectors	Screw-type terminal blocks. 0.2 in (5.08 mm) pitch connectors

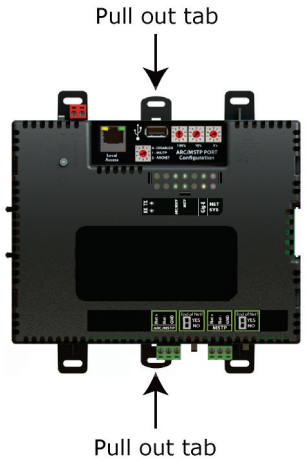
Mounting	35mm DIN rail mounting or screw mounting 
Overall dimensions	A: 7.1 in. (18.03 cm) B: 6.95 in. (17.65 cm) Depth: 2.79 in. (7.09 cm)
Screw mounting dimensions	C: 6.45 in (16.38 cm) D: 4.1 in. (10.4 cm)
Recommended panel depth	6 in. (15.24 cm) minimum
Weight	1 lb. 1 oz. (0.482 kg)
Compliance	United States of America: FCC compliant to Title CFR47, Chapter 1, Subchapter A, Part 15, Subpart B, Class A; UL Listed to UL 916, PAZX, Energy Management Equipment
	Canada: Industry Canada Compliant, ICES-003, Class A cUL Listed UL 916, PAZX7, Energy Management Equipment
	Europe: CE Mark EN50491-5-2:2009; Part 5-2: EMC requirements for HBES/BACS used in residential, commercial and light industry environment EN50491-3:2009, Part 3: Electrical safety requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) Low Voltage Directive: 2014/35/EU RoHS Compliant: 2011/65/EU
	Australia and New Zealand: C-Tick Mark, AS/NZS 61000-6-3

To mount the i-Vu® XT BACnet link

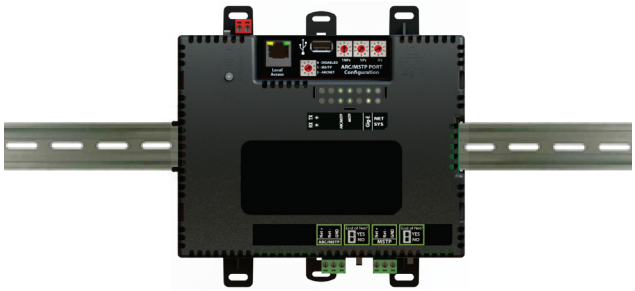
The i-Vu® XT BACnet link must be mounted in a metal enclosure or cabinet which is properly rated for the location where it is being installed.

DIN rail mount

1 Push down and pull out the center tabs shown below to clear the din rail trough on the back of the controller.



2 Place the controller on the DIN rail so that the rail is in the trough on the back of the controller.



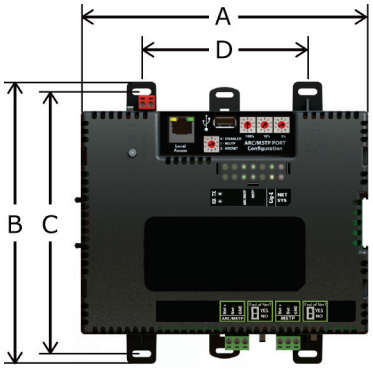
3 Push the center tabs towards the controller until you hear them click.

4 Pull gently on the controller to verify that it is locked in place.

Screw Mount

Leave about 2 in. (5 cm) on each side of the controller for wiring.

Insert #6 screws through the mounting holes. Use no more than 8 in.lbs. torque to secure plastic tab to mounting surface.



A:	7.1 in. (18.03 cm)
B:	6.95 in. (17.65 cm)
C:	6.45 in. (16.38 cm)
D:	4.1 in. (10.4 cm)
Depth:	2.79 in (7.09 cm)

Wiring for power

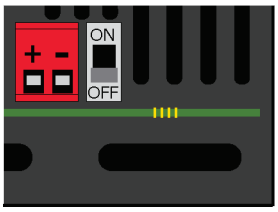
WARNING Do not apply line voltage (mains voltage) to the controller's ports and terminals.

CAUTIONS

- The i-Vu® XT BACnet link is powered by a Class 2 power source. Take appropriate isolation measures when mounting it in a control panel where non-Class 2 circuits are present.
- Carrier controllers can share a power supply as long as you:
  - Maintain the same polarity.
  - Use the power supply only for Carrier controllers.

To wire for power

1 Make sure the i-Vu® XT BACnet link's power switch is in the **OFF** position to prevent it from powering up before you can verify the correct voltage.



2 Remove power from the power supply.

3 Pull the red screw terminal connector from the controller's power terminals labeled **24 Vac/Vdc** (**+/-**).

4 Connect the power supply's wires to the red screw terminal connector.

5 Connect an 18 AWG or larger wire from the power supply's negative (-) terminal to earth ground. This wire must not exceed 12 in. (30.5 cm).

6 Apply power to the power supply.

7 Measure the voltage at the red screw terminal connector to verify that the voltage is within the operating range of 20 to 30 Vac or 23.4 to 30 Vdc.

8 Insert the red screw terminal connector into the controller's power terminals.

9 To verify the polarity of the wiring, measure the voltage from the negative terminal of the red screw terminal connector to a nearby ground. The reading should be 0V.

10 Turn on the controller's power switch.

11 Verify that the ⏻ LED on top of the controller is on.

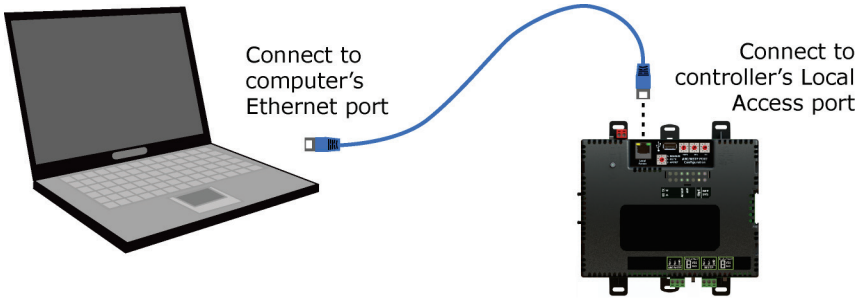
12 Measure the voltage at the red screw terminal connector to verify that the voltage is within the operating range of 20 to 30 Vac or 23.4 to 30 Vdc.

Addressing the i-Vu® XT BACnet link

Set this port's address or MSTP baud rate...	In this location...	See...
IP	Local Access	To set the IP address
MSTP	Local Access	*To set the MSTP port address and baud rate* (page 10)
ARC/MSTP	Local Access	*The ARC/MSTP port address and baud rate* (page 11)

To open Local Access:

1 Connect an Ethernet cable from a computer to the controller as shown below.



2 Turn off the computer's Wi-Fi if it is on.

3 Set the computer's Ethernet port to use DHCP or to the static IP address 169.254.1.2.

4 Open a web browser on the computer. The Local Access web pages should automatically display.

NOTES

- Your default web browser cannot be Google™ Chrome™ with its Home page set to www.google.com.
- If the Local Access page does not open automatically, type the following url in your web browser's address field:
  http://169.254.1.1

See *To communicate through the Local Access port* (page 26) for general information on using Local Access.

Rotary switch settings

Rotary switch settings (see example below) are used to determine the following items in your system, so you should plan carefully before setting the switches.

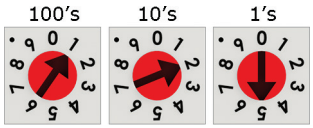
- If you use a **Default IP address**, the final octet is the number created by the three rotary switch settings (must be a unique number from 1 to 253). See *To set the IP address* (page 9).
- If you autogenerate the following:

  Device Instance, the number is automatically set to a number equal to the ((IP network number x 100) + rotary switch settings).

  BACnet Network Number for the ARC/MSTP port, the number is automatically set to a number equal to the ((IP network number + rotary switch settings) x 10).

  Autogenerating is set up through *Local Access* (page 26).
- The rotary switch settings determine the router number in the i-Vu interface.

EXAMPLE The switches below are set to 125.



CAUTION Do not leave the rotary switches set at 0 (the factory default). The i-Vu® XT BACnet link cannot be discovered if the rotary switches are left at 0.

To set the IP address

You must define the i-Vu® XT BACnet link's IP addressing (IP address, subnet mask, and default gateway) in Local Access so that the controller can communicate with the i-Vu® on the IP network.

Use one of the IP addressing schemes described below with the associated instructions that follow.

Use a...	If...
DHCP IP Address generated by a DHCP server	The IP network uses a DHCP server for IP addressing
Custom Static IP Address from your network administrator	You do not use a DHCP server and the answer to any of the following questions is yes. Will the i-Vu® system: • Share a facility's existing IP data network? • Have 199 or more Carrier IP devices, or 254 or more devices with static IP addresses? • Be connected to the Internet? • Have at least one device located on the other side of an IP router? • Have any third-party IP devices?
Default IP Address that your system creates	The answer to all of the above questions is no.

NOTE Carefully plan your addressing scheme to avoid duplicating addresses. If third-party devices are integrated into the system, make sure your addresses do not conflict with their addresses.

To set a DHCP IP address

1. On the Local Access **Modstat** tab, find the controller's **Ethernet MAC address** and write it down.
2. On the **Ports** tab under **IP Port**, select **DHCP**.
3. Click **Save**.
4. Write down the **IP Address**.
5. Give the DHCP network administrator the IP address and Ethernet MAC address and ask him to reserve that IP address for the controller so that it always receives the same IP address from the DHCP server.

To set a custom IP address

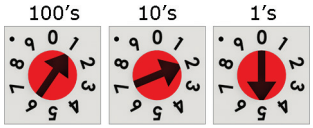
1. Obtain the IP address, subnet mask, and default gateway address for the controller from the facility network administrator.
2. On the Local Access **Ports** tab under **IP Port**, select **Custom Static**.
3. Enter the **IP Address**, **Subnet Mask**, and **Default Gateway** addresses that the network administrator gave you.
4. Click **Save**.

To set a default IP address

Default IP addressing assigns the following to the controller:

- IP address = 192.168.168.**x**
  where **x** is the setting on the rotary switches in the range from 1 to 253
- Subnet mask = 255.255.255.0
- Default Gateway = 192.168.168.254

1 Set the controller's three rotary switches to a unique address on the network. Set the left rotary switch to the hundreds digit, the middle switch to the tens digit, and the right switch to the ones digit.
EXAMPLE The switches below are set to 125.



2 On the Local Access **Ports** tab under **IP Port**, select **Default IP Address**.

3 Click **Save**.

CAUTIONS

- The Default IP address range is 1 to 253. Setting the rotary switches to 0 will set the Default IP address to 1. Setting the switches to 255 will set the Default IP to 253. Do not set the switches to 254.
- If you set the Default IP address in Local Access and then change the rotary switches, you must do one of the following to correct the IP address in the controller:
  - Go to the Local Access **Ports** tab and click the **Update IP Address**.
  - Cycle the controller's power.

  You will then need to correct the IP address in the i-Vu® application using **Find Devices** and **Upload All Content**. See the i-Vu® Help for more information.

NOTE The default address is an intranet address. Data packets from this address are not routable to the Internet.

To set the MSTP port address and baud rate

1 On the Local Access **Ports** tab under **MSTP Port**, type the address in the **MSTP Address** field. The address must be in the range 0 to 127.

2 Select the MS/TP network's **Baud Rate**. Use the same baud rate for all devices on the MS/TP network.

NOTE Use the same baud rate for all controllers on the network segment.

3 Click **Save**.

To set the ARC/MSTP port address and baud rate

Port address

- For ARCNET, you cannot change the default address of 254.
- For MS/TP, you cannot change the default address of 0.

For MS/TP, set the port's baud rate

1 On the Local Access **Ports** tab under **ARC/MSTP Port**, select the **MSTP Baud Rate**.

NOTE Use the same baud rate for all controllers on the network segment.

2 Click **Save**.

Wiring for communications

The i-Vu® XT BACnet link communicates on the following ports.

Port	Protocol	Port type(s)	Speed(s)
Gig-E	BACnet/IP	Ethernet	10 Mbps 100 Mbps 1000 Mbps
ARC/MSTP [1]	BACnet/ARCNET	RS485	156 kbps
ARC/MSTP [1]	BACnet/MSTP	RS485	9600 bps 19.2 kbps 38.4 kbps 57.6 kbps 76.8 kbps (default) 115.2 kbps
MSTP	BACnet/MSTP	RS485	9600 bps 19.2 kbps 38.4 kbps 57.6 kbps 76.8 kbps (default) 115.2 kbps
Local Access	HTTP/IP	Ethernet [2]	10 Mbps 100 Mbps
USB Port	USB2.0	USB	

[1] Set the **MSTP/ARCNET** rotary switch to:
0 if the port is not used
1 for MS/TP
2 for ARCNET

[2] See *To communicate through the Local Access port* (page 26).

Wiring specifications

For...	Use...	Maximum Length
Ethernet	CAT5e or higher Ethernet cable	328 feet (100 meters)
ARCNET	22 AWG, low-capacitance, twisted, stranded, shielded copper wire *	2000 feet (610 meters)
MS/TP	22 AWG, low-capacitance, twisted, stranded, shielded copper wire *	2000 feet (610 meters)

* See the *Open Controller Network Wiring Guide*.

WARNING Do not apply line voltage (mains voltage) to the controller's ports and terminals.

To connect the i-Vu® XT BACnet link to the Ethernet

Connect an Ethernet cable to the Gig-E Ethernet port.

If your system has multiple routers that reside on different IP subnets, you must set up one router on each IP subnet as a BACnet/IP Broadcast Management Device (BBMD).

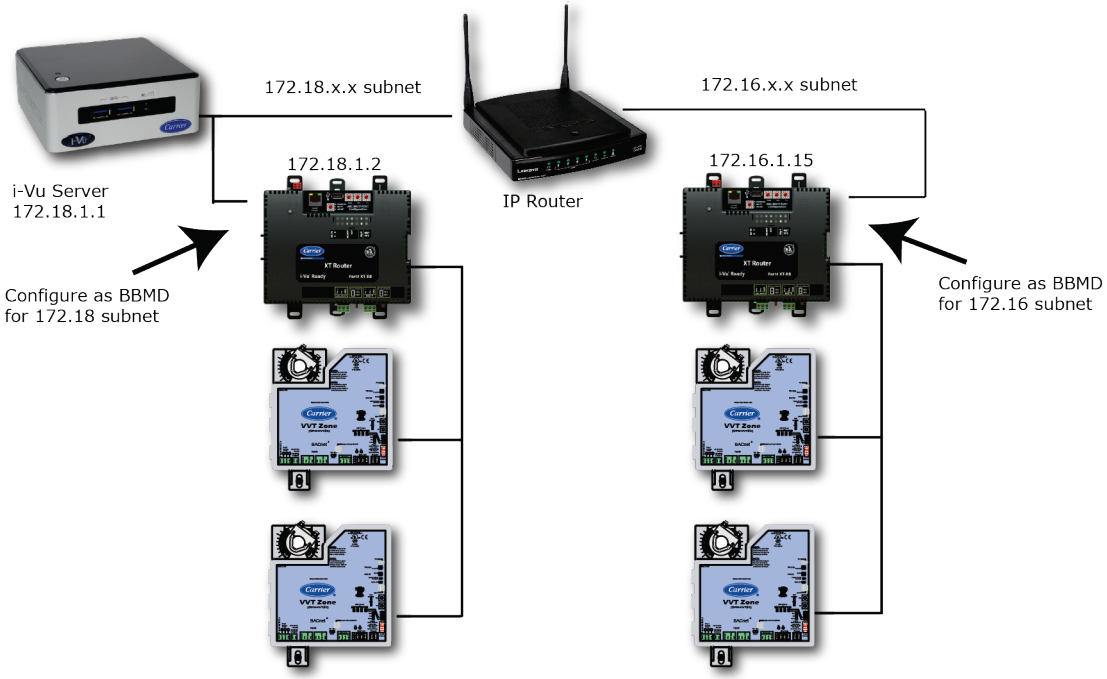
Every subnet with a router must have a BBMD configured in order for broadcasts from routers on that subnet to reach the rest of the routers on the network.

NOTES

- The i-Vu® Standard or Plus application - If the i-Vu® web server is on a separate subnet than the rest of the routers, the internal router must be assigned an IP address and configured as a BBMD.
- The i-Vu® Pro application - If the i-Vu® Pro server is on a separate subnet than the rest of the routers, you must register it as a foreign device.

Use the **BBMD Configuration Tool** to:

- Define the **Broadcast Distribution Table** (BDT) in each BBMD
- Enable an i-Vu® Control System to find routers that are on different subnets
- Allow controllers on one subnet to communicate with controllers on other subnets
- Enable the i-Vu® application to see, upload, or configure controllers on different subnets



To wire to a BACnet/ARCNET network

1. Turn **off** the i-Vu® XT BACnet link's power.
2. Check the communications wiring for shorts and grounds.
3. Connect the communications wiring to the **ARC/MSTP** port's screw terminals labeled **Net +**, **Net -**, and **GND**.

   NOTE Use the same polarity throughout the network segment.
4. Set the **MSTP** / **ARCNET** rotary switch to 2.
5. If the i-Vu® XT BACnet link is at either end of a network segment, set the port's **End of Net** switch to **Yes**.

   NOTE The controller's **End of Net** switch applies network termination and bias. See the *Open Controller Network Wiring Guide.*
6. Turn on the controller's power.
7. To verify communication with the network, get a Module Status report in the i-Vu® interface for a controller on the ARCNET network.

   NOTE This step requires that you have discovered and uploaded the router in the i-Vu® application.

To wire to a BACnet MS/TP network

An MS/TP network can be wired to either the **ARC/MSTP** port or the **MSTP** port.

1. Turn **off** the i-Vu® XT BACnet link's power.
2. Check the communications wiring for shorts and grounds.
3. Connect the communications wiring to the **ARC/MSTP** or **MSTP** port's screw terminals labeled **Net +**, **Net -**, and **GND**.

   NOTE Use the same polarity throughout the network segment.
4. If you are using the **ARC/MSTP** port, set the **MSTP** / **ARCNET** rotary switch to 1.

   NOTE If the **ARC/MSTP** port is not being used for any network, set this rotary switch to 0.
5. If the i-Vu® XT BACnet link is at either end of a network segment, set the port's **End of Net** switch to **Yes**.

   NOTE The controller's **End of Net** switch applies network termination and bias.
6. Turn on the controller's power.
7. To verify communication with the network, get a Module Status report in the i-Vu® interface for a controller on the MS/TP network.

   NOTE This step requires that you have discovered and uploaded the router in the i-Vu® application.

Find and upload in the i-Vu® interface

1. In the i-Vu® interface, select the system level in the navigation tree.
2. On the **Devices** page > **Manage** tab, click **Find Devices** to discover your routers.
3. Once routers are found, select one or more routers in the list on the **Manage** tab and click **Upload All Content** to upload to the i-Vu® application. Use **Ctrl+click**, **Shift+click**, or both to select multiple items.
4. Click **OK** when you see the message **This will upload all content for the controller. Are you sure you want to do this?**. When complete, a check mark under **Status** indicates a successful upload.

   NOTES

   - If an error message appears, click on the message to view an explanation.
   - For details, see the i-Vu® Help.

Adjusting the i-Vu® XT BACnet link driver properties

After you find and upload the i-Vu® XT BACnet link in the i-Vu® interface, you may want to customize the i-Vu® XT BACnet link's settings for your applications. You can change settings on the **Driver Properties** page.

1 In the i-Vu® interface, right-click the i-Vu® XT BACnet link in the navigation tree and select **Driver Properties**.

2 Adjust the driver as desired.

Driver

The **Driver** page provides the following information plus the items described in the table below:

- The date/time of last parameter change or the last time the database was archived
- If control programs, properties, and schedules were successfully stored in memory
- Undelivered Alarm Status

Controller Clock	
Clock Fail Date and Time	Date and time the controller uses when its real-time clock is invalid.
Time Synch Sensitivity (seconds)	When the controller receives a time sync request, if the difference between the controller's time and the time sync's time is greater than this field's value, the controller's time is immediately changed. If the difference is less than this field's value, the controller's time is slowly adjusted until the time is correct.
Network Microblocks	
Number of integration points requested and **Number of integration points active**	Shows how many non-BACnet third-party Network I/O microblocks the controller is using. These two counts will differ if you exceed the product's integration point limits. For example, if your controller provides 25 points and its control program includes 27 Modbus points, your **Integration points requested** will be 27 and your **Integration points active** will be 25.
Number of poll retries before Network Input Microblocks indicate failure	The maximum number of retries after the initial attempt that a Network microblock will attempt to communicate with its target device. If unsuccessful, the point will transition to an idle state for 30 seconds before attempting to communicate again. Change this field only if directed by Technical Support.
Periodic rebinding interval	If a microblock uses a wildcard in its address, this timer determines how often the microblock will attempt to find the nearest instance of its target. For example, if an outside air temperature address uses a wildcard, a VAV application will look for the outside air temperature on the same network segment or on the nearest device containing that object.
Debug	
Enable Debug Messages	Enable only if directed by Carrier Controls System Support.

Device

The **Device** page provides the following information plus the items described in the table below:

- BACnet device object properties for the i-Vu® XT BACnet link
- Status of the BACnet communication
- The character sets supported by this device for BACnet communication

Configuration	
BACnet System Status	The current state of the controller: Operational Download in Progress Download Required Backup in Progress Non-Operational
The following three fields refer to all networks over which the i-Vu® XT BACnet link communicates.	
APDU Timeout	How many milliseconds the device will wait before resending a message if no response is received.
APDU Segment Timeout	How many milliseconds the device will wait before resending a message segment if no response is received.
Number of APDU Retries	The number of times the device will resend a message.
Controller Clock	
Time Broadcaster will synchronize time every ____	If you have third-party BACnet devices on one of the router's networks, you can have the router send a BACnet time sync to those devices at the interval you define in this field.
Time Synchronization Recipients	To define third-party BACnet devices as Time Synchronization Recipients: **1** Click **Add**. **2** Select **Device ID** or **Address** in the **Recipient Type** field. **3** Enter the Device ID or Address information. **4** Click **Accept**.

Notification Classes

A BACnet alarm's Notification Class defines:

- Alarm priority for Alarm, Fault, and Return to Normal states
- Options for BACnet alarm acknowledgment
- Where alarms should be sent (recipients)

Alarms in the i-Vu® application use Notification Class #1. The i-Vu® application is automatically a recipient of these alarms.

Priorities	**NOTE** BACnet defines the following Network message priorities for Alarms and Events.	
	Priority range	**Network message priority**
	00–63	Life Safety
	64–127	Critical Equipment
	128–191	Urgent
	192–255	Normal
Priority of Off-Normal	BACnet priority for Alarms.	
Priority of Fault	BACnet priority for Fault messages.	
Priority of Normal	BACnet priority for Return-to-normal messages.	
Ack Required for Off-Normal, Fault, and Normal	Specifies whether alarms associated with this Notification Class require a BACnet Acknowledgment for Off-Normal, Fault, or Normal alarms.  **TIP** You can require operator acknowledgment for an Alarm or Return-to-normal message (stored in the i-Vu® database). In the i-Vu® interface on the **Alarm** > **Enable/Disable** tab, change the acknowledgment settings for an alarm source or an alarm category.	
Recipient List		
Recipients	The first row in this list is the i-Vu® application. Do not delete this row. Click **Add** if you want other BACnet devices to receive alarms associated with this Notification Class.	
Recipient Description	Name that appears in the **Recipients** table.	
Recipient Type	Use **Address** (static binding) for either of the following: • Third-party BACnet device recipients that do not support dynamic binding • When you want alarms to be broadcast (you must uncheck **Issue Confirmed Notifications**). This use is rare.	
Days and times	The days and times during which the recipient will receive alarms.	
Recipient Device Object Identifier	Type the **Device Instance** in the **#** field.	
Process Identifier	Change for third-party devices that use a BACnet Process Identifier other than 1. The i-Vu® application processes alarms for any 32-bit Process Identifier.	
Issue Confirmed Notifications	Select to have a device continue sending an alarm message until it receives delivery confirmation from the recipient.	
Transitions to Send	Uncheck the types of alarms you do not want the recipient to get.	

Calendars

Calendars are provided in the driver for BACnet compatibility only. Instead, use the **Schedules** feature in the i-Vu® interface.

Common and Specific Alarms

On these pages, you can enable/disable, change BACnet alarm properties, or set delays for the following BACnet alarms:

Common alarms:

- Duplicate Address
- Control Program
- Controller Halted
- Locked I/O
- Program Stopped
- Excessive COV
- All Programs Stopped

Specific alarm:

- Dead Controller Timeout

NOTE To set up alarm actions for controller generated alarms, see *Setting up alarm actions* in the i-Vu® Help.

Controller Generated Alarm	
Description	Short message shown on the **Alarms** page or in an alarm action when this type of alarm is generated.
Events	
Alarm Category and Alarm Template	See *Setting up an alarm source in the i-Vu® interface* in i-Vu® Help.
Enable	Clear these checkboxes to disable Alarm or Return to normal messages of this type from the i-Vu® XT BACnet link.
Notification Class	In a typical i-Vu® system, the Notification Class is 1; however, if needed, you can associate a different notification class with the alarm. See Notification Classes to set up alarm delivery options for a specific Notification Class.

BACnet router properties

CAUTION Do not change the settings on this page as it will result in communication failure. Use the Local Access pages to change settings and then resolve mismatches in the i-Vu® application.

BACnet firewall

If this IP controller is accessible from the Internet, you can increase security by enabling its BACnet firewall. When enabled, this feature prevents the controller from receiving BACnet messages from unidentified sources and allows communication only with IP addresses that you define. These can be all private IP addresses and/or a list of IP addresses. Follow the instructions in the i-Vu® interface to set up the BACnet firewall.

Network Diagnostics - Statistics

This page shows the network statistics for each of the i-Vu® XT BACnet link's ports that are in use. This same information is provided in a *Module Status report* (page 32).

Click a link at the bottom of each section to see the statistics displayed as trend graphs. You can also access these trends by clicking the controller in the navigation tree, and then selecting **Trends** > **Enabled Points** > and the desired trend graph.

Click a port's **Reset** button to set all of the numbers to zero so the counting can start over.

Router Statistics	
Error Counters	**Dropped Packets**—Data packets that could not be delivered. **Route Not Found**—Packets that could not be delivered because the requested network does not exist. **Route Unreachable**—These are routed packets whose destination network is either busy of offline
Network Activity	Shows the number of incoming and outgoing unicast and broadcast packets for each of the i-Vu® XT BACnet link's networks.
Routed Sourced Packets	Shows the number of packets initiated by the i-Vu® XT BACnet link that are not in response to a request from another device. The numbers in this table will also appear in the appropriate columns in the **Network Activity** tab.
Trends	**Router Error Rate**—Shows the total number of errors within the trend sampling interval. **Router Packet Rate**—Shows the total number of packets transmitted and received within the trend sampling interval.
Gig-E Port Statistics	
BACnet/IP Statistics	**BACnet/IP Rx Unicast Packets**—BACnet/IP packets received from a single BACnet device. **BACnet/IP Tx Unicast Packets**—BACnet/IP packets transmitted to a single BACnet device. **BACnet/IP Rx Broadcast Packets**—BACnet/IP broadcast packets received by the i-Vu® XT BACnet link. **BACnet/IP Tx Broadcast Packets**—BACnet/IP broadcast packets transmitted by the i-Vu® XT BACnet link. **Whitelist Rejections** (if *BACnet Firewall* (page 19) is enabled)—Messages blocked by the BACnet Firewall because the IP address that sent the message was not in the whitelist.

Ethernet Statistics	**Ethernet Rx packets**—All packets (including non-BACnet packets such as a ping) received by the i-Vu® XT BACnet link. **Ethernet Tx packets**—All packets (including non-BACnet packets such as a ping) transmitted by the i-Vu® XT BACnet link. **Receive Errors (total)**—All errors related to received packets such as CRC errors, FIFO errors, frame errors, length errors, missed errors, and overrun errors. **Transmit Errors (total)**—All errors related to transmitted packets such as aborted errors, carrier errors, dropped errors, FIFO errors, heartbeat errors, and window errors. **Dropped Packets**—Packets dropped by the i-Vu® XT BACnet link's Ethernet interface.
Trends	**Gig-E Error Rate**—Shows the total number of errors within the interval time. **Gig-E Packet Rate**—Shows the total number of packets transmitted and received within the trend sampling interval
ARC/MSTP Port Statistics when used for ARCNET	
Error Counters	**Node Reconfiguration**—The ARCNET reconfigurations initiated by the i-Vu® XT BACnet link. **Bus Reconfiguration**—An ARCNET reconfiguration not generated by the i-Vu® XT BACnet link (such as when a controller connects to the network). **Excessive NACK**—Excessive NACKs received by the i-Vu® XT BACnet link's ARCNET chip. Excessive NACKs are usually the result of a station which is unable to process a steady stream of packets due to buffer overflows or slow responses. **Dropped Packets**—Dropped receive and transmit framess. These may be dropped due to buffer allocation failures, length errors, or NACKed transmit packets.
Activity Counters	**BACnet/ARCNET Rx Packets**—BACnet/ARCNET data packets received by the i-Vu® XT BACnet link. **BACnet/ARCNET Tx Packets**—BACnet/ARCNET data packets transmitted by the i-Vu® XT BACnet link.
Trends	**ARC Error Rate**—Total number of errors within the interval time on this network, including break errors, framing errors, etc.. **ARC Packet Rate**—BACnet/ARCNET data packets transmitted through router, not the total utilization.

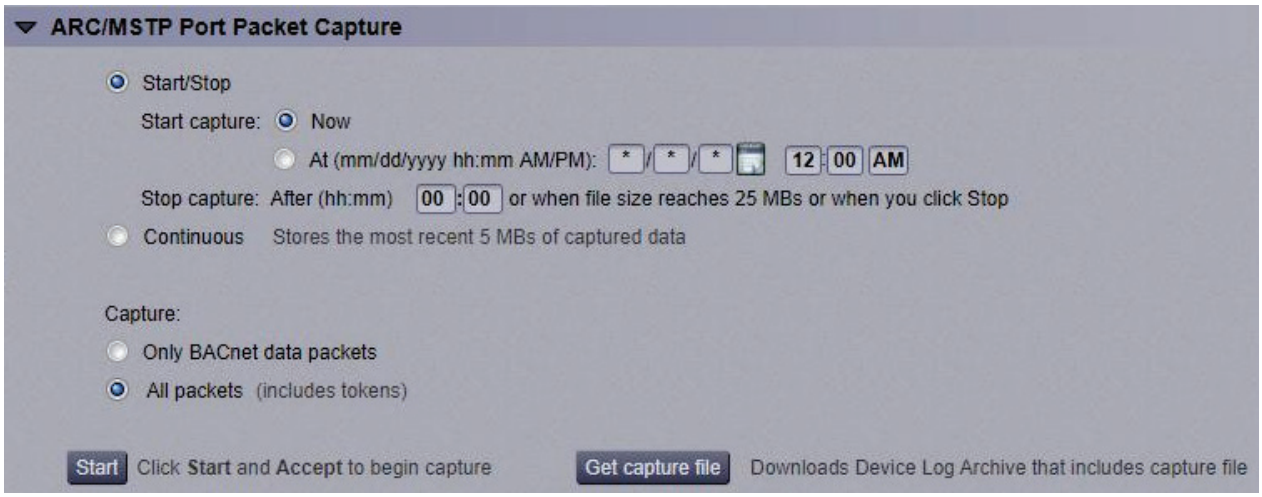
ARC/MSTP Port Statistics when used for MSTP or **MSTP Port Statistics**	
Error Counters	**UART Errors**—UART receive and transmit errors such as break errors, framing errors, parity errors, and overrun errors. **Invalid Frames**—Received MS/TP frames that contain an error such as CRC. **Dropped Packets**—Dropped receive and transmit frames. These may be dropped due to buffer allocation failures, length errors, or APDU timeouts (in the case of transmit frames) **Dropped Tokens**—Dropped tokens that have been retransmitted. **No responses—**Messages that did not receive a response from the destination device.
Activity Counters	**BACnet/MSTP Rx Packets**—BACnet/MSTP data packets received by the i-Vu® XT BACnet link. **BACnet/MSTP Tx Packets**—BACnet/MSTP data packets transmitted by the i-Vu® XT BACnet link.
Latency	**Average Value (milliseconds)**—The average time from when a packet is queued to be transmitted until it is actually transmitted on the bus. **Maximum Value (milliseconds)**—The maximum time from when a packet is queued to be transmitted until it is actually transmitted on the bus
Trends	**MSTP Error Rate**—Total number of errors within the interval time on this network, including break errors, framing errors, etc. **MSTP Network Utilization**—Percentage of total bus bandwidth used to transmit data packets. **NOTE** This is for all bus traffic, not just traffic generated by the i-Vu® XT BACnet link.

Network Diagnostics - Packet Capture

This page allows you to capture network communication on a port and then download the capture file for troubleshooting. Choose one of the following capture options:

- **Start/Stop** - Define the start and stop criteria, and then click **Start** and **Accept** to begin the capture. When the capture stops, the capture file is generated.
  NOTE If a Start/Stop capture is running on any other port, the **Get capture file** button will be disabled until all Start/Stop captures have completed.
  - **Start capture:** - When you check **At (mm/dd/yyyy hh:mm AM/PM)**, enter the time and date, and click **Start**, the packet capture begins at the date and time you specified.

    NOTE The hours field is validated from 0 to 12, and minute field is validated from 0 to 59.
  - **Continuous** - Click **Start** and **Accept** to begin the capture. Click **Save** to momentarily stop the capture and create the capture file. The capture will automatically resume. Click on the **Start/Stop** option to end the **Continuous** capture.



To download the capture file

Capture files are Wireshark files that are added to the Device Log Archive .tgz file. Do the following to view the files.

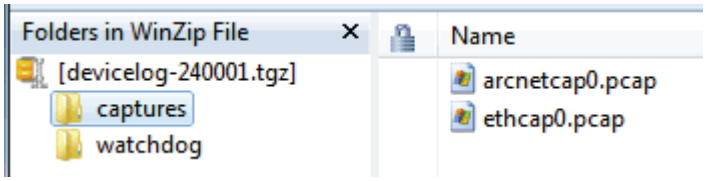
1 If you do not have Wireshark installed on your computer, download the latest version from the *Wireshark website* (*http://www.wireshark.org*).

2 Run the install program, accepting all defaults. Include WinPcap in the installation.

3 On i-Vu®'s **Packet Capture** page, click **Get capture file** to download the .tgz file. Click **get file** and the message appears "Retrieving the file, this may take a little while".

NOTE If the size of the .tgz is large, there could be a considerable delay (for example, over 2 minutes) after you click **Get capture file** until your browser begins the download.

4 Open the .tgz file. The files are in the **captures** folder.



Capture file names are based on the ports.

NOTES

- If you have an MSTP capture file for both the MSTP port and the ARC/MSTP port, the file names will be:
  mstpcap0 for the ARC/MSTP port
  mstpcap1 for the MSTP port
- Clicking **Get capture file** generates the port's .pcap file. If the port has a .pcap file from a previous capture, that file will be overwritten.

5 Extract the .pcap file from the .tgz file.

6 Open the .pcap file in Wireshark.

Protocols

The **Protocols** page shows the status of the protocols currently running on the i-Vu® XT BACnet link.

To set up Network Statistic trends

PREREQUISITE To view Network Statistic trends, you must have a i-Vu® v6.5 system with the latest cumulative patch.

To view the *Network Statistics* (page 20) as trend graphs, select the controller in i-Vu®'s navigation tree and go to one of the following:

- On the **Driver Properties** > **Network Diagnostics** > **Statistics** page, click a Trend link at the bottom of each section.
- Click the **Trends** drop-down button, select **Enabled Points** and then the graph you want.

You can define:

- How the graph looks on the trend's **Configure** tab.
- How you want trend samples to be collected on the **Enable/Disable** tab. See table below.

Field	Notes
Sample every _:_:_ (hh:mm:ss)	(Recommended method) To record the value at a regular time interval, enter hh:mm:ss in this field.
Sample on COV (change of value)	To record the value only when the value changes by at least the amount of the **COV Increment**, set the **Sample every** field to 0:00:00 and enter a value in the **COV Increment** field.
Max samples	Network Statistic trends have a non-configurable maximum trend log buffer size of 1440. **NOTE** Trending consumes memory in the controller. Click **Reset** to delete all samples currently stored in the controller.
Stop When Full	Check this field to stop trend sampling when the maximum number of samples is reached.
Enable trend log at specific times only	Collects trend data for the specific period of time you define in the time and date fields.
Enable Trend Historian	Archives trend data to the system database.
Store Trends Now	Writes all trend data in the controller to the system database without having to enable trend historian.

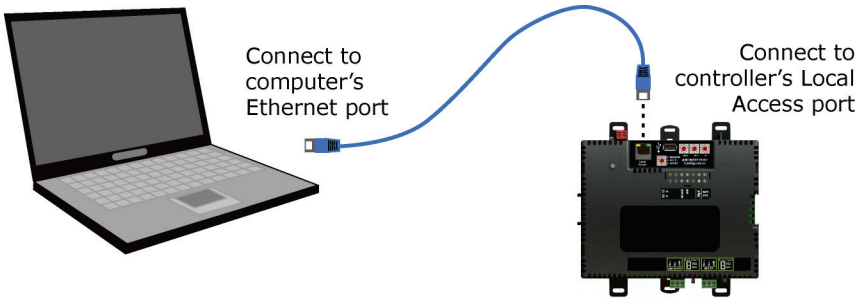
Field	Notes
Write to historian every __ trend samples	Writes all trend data in the controller to the system database each time the controller collects the number of samples that you enter in this field. This number must be greater than zero and less than the number entered in the Max samples field. The number of trends specified must be accumulated at least once before the historical trends can be viewed. **NOTE** Any trends not stored in the historian will be lost if the controller loses power.
Trend samples accumulated since last notification	Shows the number of samples stored in the controller since data was last written to the database.
Last Record Written to Historian	Shows the number of trend samples that were last written to the database.
Keep historical trends for __ days	This is based on the date that the sample was read. Select the first option to use the system default that is defined on the **System Settings** > **General** tab. Select the second option to set a value for this trend only.

To communicate through the Local Access port

Using a computer and an Ethernet cable, you can communicate with the i-Vu® XT BACnet link through a web browser to:

- View the controller's Module Status report
- View/change controller and network settings
- Troubleshoot

1 Connect an Ethernet cable from a computer to the controller as shown below.



2 Turn off the computer's Wi-Fi if it is on.

3 Set the computer's Ethernet port to use DHCP or to the static IP address 169.254.1.2.

4 Open a web browser on the computer. The Local Access web pages should automatically display.

NOTES

- Your default web browser cannot be Google™ Chrome™ with its Home page set to www.google.com.
- If the Local Access page does not open automatically, type the following url in your web browser's address field:
  http://169.254.1.1

ModStat tab

This tab provides the controller's Module Status report that gives information about the controller and network communication status. See *Appendix - Module Status field descriptions* (page 37).

Device tab

BACnet Object	
Device Instance	**Autogenerated**—(Default) The Device ID is automatically set to a number equal to the (IP network number) x 100 + rotary switch address. **Assigned**—Lets you enter a specific number that is unique on the BACnet network.
Device Name	**Autogenerated**—(Default) The Device Name is automatically set as the word device + the Device Instance. For example, device2423911. **Assigned**—Lets you enter a specific name that is unique on the BACnet network.
Device Location	You can enter an intuitive location for the device in the i-Vu® interface.
Device Description	You can enter an intuitive description for the device in the i-Vu® interface.
Configuration	
APDU Timeout	How many milliseconds the device will wait before resending a message if no response is received.
APDU Segment Timeout	How many milliseconds the device will wait before resending a message segment if no response is received.
APDU Retries	The number of times the device will resend a message.
Controller Information	
Clear Counts/Logs	Clears Reset counters and the three message history fields from the Module Status.

Ports tab

IP Port	
IP Addressing	Select the type of addressing the controller is to use. See Addressing the i-Vu® XT BACnet link.
BACnet Network Number	**Disable Routing**—If the IP port is not used. **Autogenerated**—(Default) The BACnet/IP network number is automatically set to 1600. **Assigned**— Lets you enter a specific number.
BACnet UDP Port	The port that the i-Vu® application uses for BACnet communication.
BACnet NAT Routing Configuration	
Enable NAT Routing	Reserved for future use.
Secondary IP Network	

BACnet Secondary IP Net Number	Reserved for future use.
BACnet Secondary UDP Port	Reserved for future use.
Ethernet Port	
MAC Address	A factory assigned Ethernet MAC Address for the **Gig-E** port.
BACnet Network Number	Specify a number for the BACnet/Ethernet network or set to 0 if the port is not used.
ARC/MSTP Port	
End of Network	Indicates status of the controller's **End of Net?** switch.
Active Protocol	Indicates status of the controller's ARCNET/MSTP rotary switch. 0=Disabled 1=ARCNET 2=MS/TP
MAC Address	You cannot change the default address.
ARCNET Baud Rate	The baud rate for ARCNET.
MSTP Baud Rate	Set this to a baud rate that all other devices on the MS/TP network are set to.
MSTP Max Master	To increase MS/TP performance, enter the highest address used on the MS/TP network for a master controller. This number must be less than or equal to 127.
MSTP Max Info Frames	This is the maximum number of information messages a controller may transmit before it must pass the token to the next controller. Valid values are 1 to 255. **TIP** Set **Max Info Frames** to a number in the range 20 to 100 so that the router does not become a bottleneck for traffic being routed from a high speed network to the slower MS/TP network.
BACnet Network Number	**Disable Routing**— If ARCNET/MSTP port is not used. **Autogenerated**—(Default) The network number for the ARCNET/MSTP port is automatically set to a number equal to ((IP network number + rotary switch settings) x 10). **Assigned**— To enter a specific number.
MSTP Port	
End of Network	Indicates status of the controller's **End of Net?** switch.
MSTP Address	The controller's unique address on the MS/TP network.
Baud Rate	Set this to a baud rate that all other devices on the MS/TP network are set to.
MSTP Max Master	To increase MS/TP performance, enter the highest address used on the MS/TP network for a master controller. This number must be less than or equal to 127.
MSTP Max Info Frames	This is the maximum number of information messages a controller may transmit before it must pass the token to the next controller. Valid values are 1 to 255. **TIP** Set **Max Info Frames** to a number in the range 20 to 100 so that the router does not become a bottleneck for traffic being routed from a high speed network to the slower MS/TP network.

BACnet Network Number	**Disable Routing**— If the MSTP port is not used. **Autogenerated**—(Default) The network number for the MSTP port is automatically set to a number equal to ((IP network number + rotary switch address) x 10) + 3. **Assigned**— To enter a specific number.
Home Network	Typically, this is the main BAS network where alarms and trends are delivered to. This sets the BACnet Address of the Device object.

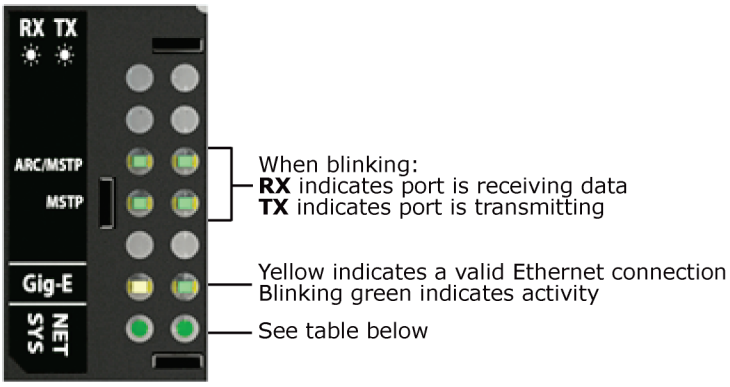
Security tab

BACnet Firewall	If your BACnet Firewall configuration in the i-Vu® interface did not include the i-Vu® server IP address, thus blocking communication with the i-Vu® server, you can disable the controller's BACnet Firewall through Local Access. **NOTE** You can enable the BACnet Firewall only in the i-Vu® interface.

Troubleshooting

If you have problems mounting, wiring, or addressing the i-Vu® XT BACnet link, contact Carrier Controls System Support.

LEDs



NET (Network Status) Tricolor LED

Color	Pattern	Condition	Message in Module Status	Possible Solutions
Red	On	Ethernet connection problem	No Ethernet Link	• Connect Ethernet Cable • Check other network components
Red	1 blink	One of the following BACnet/IP (Ethernet) DLL reporting issue: • Unable to create tasks • Unable to open socket for BACnet port	BACnet/IP error	Cycle power
Red	2 blink	Current default IP address does not match the current rotary switch setting	Default IP address mismatch	• Use Local access to set the IP address • Cycle power to accept new IP address • Change rotary switches to match current default IP address

NET (Network Status) Tricolor LED

Color	Pattern	Condition	Message in Module Status	Possible Solutions
Blue	On	One of the following issues: • Port communication firmware did not load properly • Port communication firmware is not running • Invalid protocol selected	ARCNET/MSTP firmware error	• Change rotary switch to select valid protocol • Cycle power
Blue	1 blink	Invalid address selected for protocol	Invalid address selection for ARCNET/MSTP	Change rotary switch to valid address
Blue	2 blink	Router has same MAC address as another connected device	Duplicate address on ARCNET/MSTP	Change rotary switch to unique address
Blue	3 blink	Router is the only device on the network	No other devices detected on ARCNET/MSTP	• Check that network cable is connected properly • Check that baud rate is correct
Blue	4 blink	Excessive errors detected over 3 second period	Excessive communication errors on ARCNET/MSTP	• Check that network cable is connected properly • Check that baud rate is correct
Blue	5 blink	ARCNET traffic overload possibly due to circular router or excessive COVs (change of values)	Event System Error - FPGA RX FIFO full	• Check the network configuration for a circular route • Increase the time between COVs to reduce excessive COV traffic
Green	On	All enabled networks are functioning properly	No errors	No action required

SYS (System Status) Tricolor LED

Color	Pattern	Condition	Message in Module Status	Possible Solution
Red	2 blink	Restarting after an abnormal exit	Auto restart delay due to system error on startup	After 5 minute delay has expired, if condition occurs again then cycle power
Red	4 blink	Firmware image is corrupt	Firmware error	Download driver again
Red	Fast blink	Firmware error has caused the firmware to exit and restart	Fatal error detected	No action required
Green	1 blink	No errors	Operational	No action required
Green	2 blink	Download of driver is in progress	Download in progress	No action required

SYS (System Status) Tricolor LED

Color	Pattern	Condition	Message in Module Status	Possible Solution
Green	3 blink	BACnet Device ID is not set	Download required	Download the controller
Green	Fast blink	Installation of recently downloaded driver is occurring	N/A	No action required
Blue	On	Router is starting up	N/A	No action required
Blue	Slow blink	Linux (operating system) is starting up	N/A	No action required
Blue	Fast blink	Linux is running but it could not start the firmware application	N/A	Download driver

To get a Module Status report

A Module Status report provides information about the controller and verifies proper network communication with the controller. You can get this report:

- In the i-Vu® application—Right-click the controller on the navigation tree, then select **Module Status**.
- In the i-Vu® application—Select the controller on the navigation tree. On the **Properties** page, click **Module Status**.
- On the controller's Local Access **ModStat** tab—See *To communicate through the Local Access port* (page 26).

See *Appendix - Module Status field descriptions* (page 37).

To get a Device Log

If Carrier Controls System Support instructs you to get the controller's Device Log containing diagnostic information for troubleshooting:

1 Select the i-Vu® XT BACnet link in the i-Vu® navigation tree.

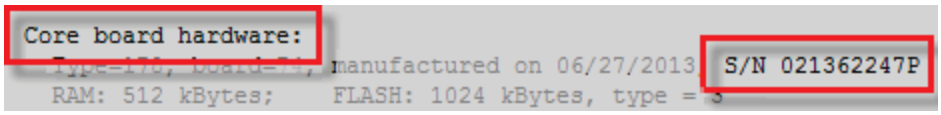
2 On the **Properties** page, click **Device Log**.

NOTE You can click **Device Log Archive** to download a file containing multiple Device Logs to your computer. This also contains any network packet captures that have been run from the Network Diagnostics - Packet Captures driver page.

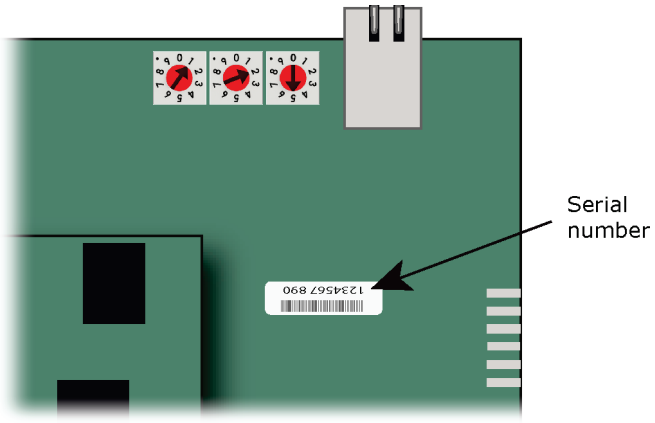
To get the i-Vu® XT BACnet link's serial number

If you need the controller's serial number when troubleshooting, the number is on:

- A Module Status report (Modstat) under **Core** (or **Main**) **board hardware**



- A sticker on the main board



See *To get a Module Status report* (page 32).

To replace the i-Vu® XT BACnet link's fuse

If you turn on the controller's power switch and the ⏻ LED is not lit, the fuse that protects the controller may be blown. Remove the fuse and use a multimeter to check it.

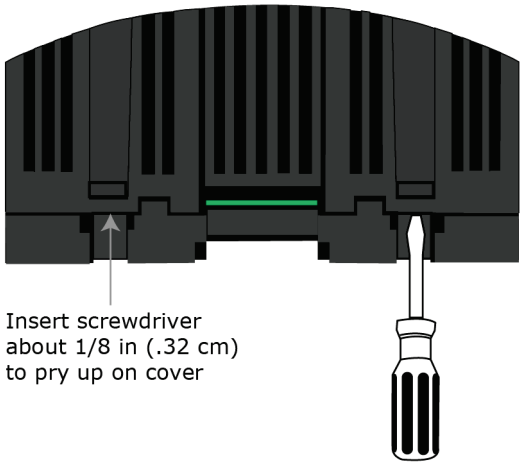
The fuse is a fast acting, 250Vac, 2A, 5mm x 20mm glass fuse that you can purchase from one of the following vendors:

Manufacturer	Mfr. Model #
Littelfuse	0217002.HXP
Bussmann	S500-2-R
Belfuse	5SF 2-R
Optifuse	FSD-2A

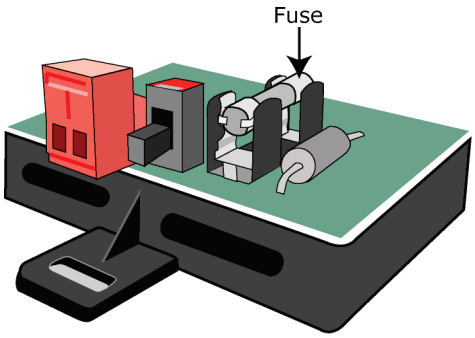
Before replacing the fuse, try to determine why the fuse blew. Check the power wiring polarity of the i-Vu® XT BACnet link and any other devices that share the power supply. Use the same polarity for all of them.

To replace the fuse:

1. Turn off the controller's power.
2. Remove the red power connector.
3. On one end of the controller, insert a small flathead screwdriver as shown below, and then gently pry up on the cover until it is released from the base.



4. Remove the cover from the base.
5. The fuse labeled **F1** is located near the power connector. Use a fuse puller to remove the fuse.



6. Use the fuse puller to snap the new fuse into the fuse holder.
7. Replace the controller's cover.
8. Replace the power connector.
9. Turn on the controller's power switch.
10. Verify that the ⏻ LED on top of the controller is on.

To take the i-Vu® XT BACnet link out of service

If needed for troubleshooting or start-up, you can prevent the i-Vu® application from communicating with the i-Vu® XT BACnet link by shutting down communication from the i-Vu® XT BACnet link to the i-Vu® application. When **Out of Service**, i-Vu® no longer communicates properties, colors, trends, etc.

1 On the i-Vu® navigation tree, select the i-Vu® XT BACnet link.

2 On the **Properties** page, check **Out of Service**.

3 Click **Accept**.

Compliance

FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1 This device may not cause harmful interference.

2 This device must accept any interference received, including interference that may cause undesired operation.

NOTE This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with this document, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

CAUTION Any modifications made to this device that are not approved by Carrier will void the authority granted to the user by the FCC to operate this equipment.

CE Compliance

WARNING This is a light industrial product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Industry Canada Compliance

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Appendix - Module Status field descriptions

Field	Description
Date/Time	Date and time the Modstat was run
CM	The controller's rotary switch address (MAC address)
Model Name	Model Name identifies the Product Type
Device Instance	A unique ID assigned to the controller
Driver built	When the driver was built
Downloaded by	When and where the last download was performed
Data Partition Version	Data Partition identifies the clipping used when the product was manufactured. **NOTE** This field will say **None** except for a Carrier product from the factory. If a Carrier product is subsequently downloaded in the field, then this field will say **None**.
# PRGs initialized # PRGs running	If applicable, the number of control programs that were downloaded vs. the number that are running. If these numbers are not the same, the controller has a problem such as lack of memory.
Driver version	The name, version, and date of the driver, as well as all the bundles and versions.
Reset Counters:	The number of times each of the following events have occurred since the last time the controller was commanded to clear the reset counters. See **NOTE** below this table.
Power failures	Interruption of incoming power
Commanded boots	Includes commands issued from the i-Vu® interface such as the zap manual command, plus commands issued during a memory download.
System errors	Error in the controller's firmware or hardware
S/W Watchdog timeouts	Watchdog is firmware that monitors the application firmware for normal operation. If the watchdog firmware detects a problem, it restarts the application firmware.
H/W Watchdog timeouts	H/W Watchdog will restart the controller if it detects a severe problem with the controller's operating system
System status	Gives the current status of the controller's operation. See *LEDs* (page 30) for all possible conditions.
Network status	Gives the current status of the controller's networks. See *LEDs* (page 30) for all possible conditions.
System error message history	High-severity errors since the last memory download. Shows the most recent 10 messages. See **NOTE** below this table.
Warning message history	Low-severity errors and warning messages since the last memory download. Shows the most recent 10 messages. See **NOTE** below this table.

Field	Description
Information message history	Information-only messages since the last memory download. Shows the most recent 10 messages. See **NOTE** below this table.
ARC156 reconfigurations during the last hour	An ARCNET network normally reconfigures itself when a controller is added to or taken off the network. The **Total** field indicates the number of reconfigurations in the last hour. **Initiated by this node** indicates the number of reconfigurations initiated by this controller. Typical sources of the problem could be this controller, the controller with the next lower rotary switch address, any controller located on the network between these two controllers, or the wiring between these controllers. An excessive number in these fields indicates a problem with the network.
Core and Base board hardware	Gives the following information about the controller's boards: • Type and board numbers that are used internally by Carrier. • The manufacture date and serial number.
Number of BACnet Objects	Indicates the number of BACnet objects that were created in the device and the number of those objects that are network visible
Database Partition	**Non-Volatile** partition (16 MB maximum) contains data that needs to be preserved through a power cycle and archived to flash such as parameters and trend data. **Volatile** partition (6 MB maximum) contains data that does not need to be preserved through a power cycle such as status values that are calculated during runtime.
IP Networks - BBMDs	Shows the following information for each active IP network: **BBMD Active** shows whether the BACnet Broadcast Management Device is currently active (1) or inactive (0). **BBMD Entries**—the number of entries in the BBMD table (500 maximum). **FDT Entries**—the number of entries in the Foreign Device Table (500 maximum).
Third party integration points	Shows number of points used.
Network Information	The various network addresses for the controller. The **Current** and **Assigned** addresses will be the same unless the **Enable IP configuration changeover** on the **BACnet Router Properties** page is being implemented.
Statistics and Network Activity	Shows network communication statistics to assist with troubleshooting. See *Network Diagnostics - Statistics* (page 20) for more information.
Route Information Port Number	BACnet networks that a router is currently routing traffic to. The list changes as BACnet routers are added or removed from the system.

NOTE If you want to clear the Reset counters and the three message history fields, click the **Clear Counts/Logs** button on the controller's **Properties** page in the i-Vu® application or in the controller's Local Access pages.

Document revision history

Important changes to this document are listed below. Minor changes such as typographical or formatting errors are not listed.

Date	Topic	Change description	Code*
1/11/18	To set the ARC/MSTP port address and baud rate	Correction - default address for ARCNET is 254.	C-TS-CI-E

* For internal use only

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