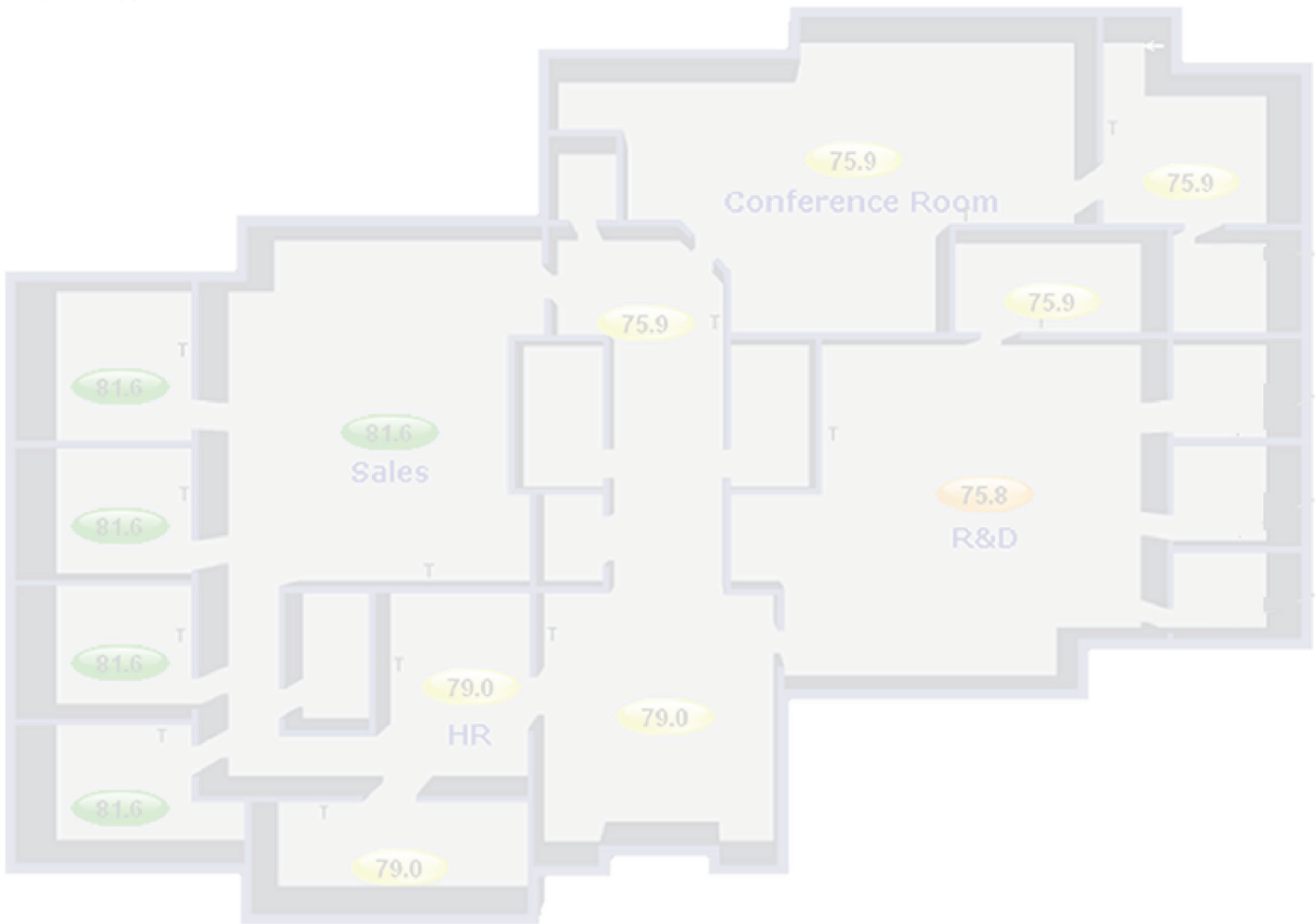




United Technologies
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SiteBuilder v7.0

Help





Verify that you have the most current version of this document from www.hvacpartners.com or your local Carrier office.

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

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What is SiteBuilder?

SiteBuilder creates the database that the i-Vu® Pro Server application uses to communicate with controllers in the field.

SiteBuilder uses a tree interface to display the system hierarchy. The **Geographic** tree represents the areas, controlled zones, and mechanical equipment in a system. The **Network** tree represents the communication network of routers and controllers with the i-Vu® Pro Server application.

After you create a database in SiteBuilder, you should use the i-Vu® Pro application to automatically discover Open controllers and/or a system with a single CCN Gateway. However, you must use SiteBuilder to build a system with multiple CCN Gateways.

Multiple CCN Gateways

- 1 *Create a database (page 3).*
- 2 *Build a Network tree for a CCN system. (page 13)*

Building a complete system in SiteBuilder includes the following detailed steps:

- 1 *Creating a database (page 3)*
- 2 *Building a Geographic tree (page 7)*
- 3 *Building a Network tree (page 12)*
- 4 *Assigning equipment to controllers (page 53)*
- 5 *Testing a system (page 54)*

What's new in SiteBuilder v7.0

Feature	Improvement
Improved security settings	<p>To increase security, the i-Vu® Pro application defaults to the following settings:</p> <ul style="list-style-type: none">• If your system is set to use TLS, the i-Vu® Pro application automatically uses TLS 1.2.• The i-Vu® Pro application requires SOAP applications to run over HTTPS.• The i-Vu® Pro application allows only add-ons that have been approved by Carrier. <p>NOTE If needed, you can <i>override these defaults</i> (page 64) in SiteBuilder; however, doing so will lessen the security of your system.</p>

Creating a system database

PREREQUISITE For any database type except Apache Derby, you must install and set up the database application before creating your system database. An Apache Derby database is installed with your i-Vu® Pro system.


Follow the procedures below to create your system database.

To create a new SiteBuilder database

After you create a database in SiteBuilder, you should use the i-Vu® Pro application to automatically discover Open controllers and/or a system with a single CCN Gateway. However, you must use SiteBuilder to build a system with multiple CCN Gateways.

- 1 Click **File > New**.
- 2 Enter appropriate values in each of the **New Database** fields. See table below.
- 3 Click **Next**.
- 4 Do one of the following:
 - If you selected a MySQL, PostgreSQL, or SQL Server® **Database Type**, enter the **Database Connect Strings, Login** and **Database User** info. See table below. Then click **Next**.
 - If you selected an Apache Derby, go to step 5.
- 5 Make language selections. See table below.
- 6 Click **Next**.
- 7 Click **File > Close**.
- 8 If you have multiple CCN Gateways, use SiteBuilder to build a Network tree for them. See *To build a Network tree for a CCN system* (page 13).
- 9 For BACnet, or single CCN Gateway systems, use the i-Vu® Pro interface to populate your database. You do not need to set up the information in SiteBuilder.
 - a) Launch the i-Vu Pro Server. Wait for it to finish opening the database.
 - b) Browse to **http://localhost** to open the i-Vu® Pro interface.
 - c) Use the login and password you set up in SiteBuilder.
 - d) Find your devices and networks and upload the files. See i-Vu® Pro Help for details.

Field	Notes
System Name	Enter the name for this system that will be displayed at the top of the i-Vu® Pro navigation tree.

Field	Notes
System Directory Name	<p>The name of the folder that contains all the system files: i-Vu_Pro_x.x\webroot\<system_directory_name></p> <p>This name is automatically generated from the System Name, but it can be edited. The System Directory Name must have:</p> <ul style="list-style-type: none"> • less than 80 characters • only alphanumeric characters, dashes, and underscores • no spaces
Administrator Login Name, Password, and Confirm Password	<p>Type a Login Name and Password (8-character minimum) for the Administrator operator.</p> <p> CAUTION To increase the security of your system, do not use "Administrator" as the Login Name.</p> <p>NOTE You can change the password requirements in the i-Vu® Pro interface. See "Advanced password policy" in i-Vu® Pro Help.</p>
Database Type	<p>Select the type of database your system will use.</p> <p>NOTE If you select Derby, SiteBuilder automatically creates the necessary files and folder structures under the i-Vu_Pro_x.x folder. Do not move or rename system files or folders.</p>
Make this the default system for iVu	Select this box to open this system when you start the i-Vu® Pro application.
Starting Base Network Number Starting Base Device Instance Number	SiteBuilder automatically assigns sequential numbers to BACnet networks and devices as you add them to the database. Choose starting numbers that will generate unique network and device instance numbers across all systems that this system will communicate with.
Server BACnet Device Instance	Must be unique to the BACnet network. Unique Server Device IDs are important if you are running multiple copies of the i-Vu® Pro application on the same network.
Languages	Select all languages that you want your system to support.
System	<p>Select the language that you want to use for:</p> <ul style="list-style-type: none"> • The default language for new operators • Alarms sent to the database • State text and object names downloaded to the field • The default language for the i-Vu® Pro login page. <p>NOTE You can select a different language on the login page.</p> <p>All other information is displayed in the operator's language.</p>


For MySQL, PostgreSQL, or SQL Server® Database Types

Database Connect Strings:	
Server	<p>Type one of the following:</p> <ul style="list-style-type: none"> • <code>localhost</code> if the i-Vu® Pro application and the database are on the same machine • The name or IP address of the machine that the database is on if different than the i-Vu® Pro application

Port	<p>Do one of the following:</p> <ul style="list-style-type: none"> Type the appropriate default port number from the list below. Type the port number that the database uses for communication if different than the database default. <p>Default ports are:</p> <table> <tr> <td>MySQL</td> <td>3306</td> </tr> <tr> <td>PostgreSQL</td> <td>5432</td> </tr> <tr> <td>SQL Server</td> <td>1433</td> </tr> </table>	MySQL	3306	PostgreSQL	5432	SQL Server	1433
MySQL	3306						
PostgreSQL	5432						
SQL Server	1433						
Instance	The name that you gave the i-Vu® Pro database in the database application.						
Database User:							
Login	The user login that you set up in the database application.						
Password	The password that you set up in the database application.						

NOTE To change **Database Connect Strings** for an existing system, select the **Modify database** connection parameters in the **File > Open** dialog box, then click **Next**.

To assign system properties

- 1 Double-click New System  on the **Geographic** tree.
- 2 Enter values in the **System** dialog box. See table below.
- 3 Optional: Click **Notes**, then type in the notes field.
- 4 Click **OK**.

General tab	
Name	The name displayed on the Geographic or Network tree.
Reference Name	A permanent name for a tree item that allows the item to be referenced from graphics, Properties pages, external spreadsheets, etc. A reference name consists of lowercase letters, numbers, hyphens, and underscores (no spaces), and it cannot begin with a number. In the system hierarchy, a reference name must be unique among its siblings, unless it is a global reference name that begins with a # sign.
Base Network Number Base BACnet Device Instance	SiteBuilder automatically assigns sequential numbers to BACnet networks and devices as you add them to the database. Choose starting numbers that will generate unique network and device instance numbers across all systems that this system will communicate with.
Server BACnet Device Instance	ID for the i-Vu® Pro server. Must be unique to the BACnet network.
BACnet Alarm Recipient Instance	ID for the server that receives alarms. Typically, the i-Vu® Pro server receives alarms, so enter the same ID as the Server BACnet Device Instance .
Views	You may <i>attach a graphic file</i> (page 9) now or later.

Advanced tab

Enable Network Address Translation (NAT)

Check this field if either of the following statements is true for your system:

- The server that receives alarms goes through a NAT router (firewall) to get to the Internet
- One or more devices in the database are behind a NAT router.

To enter the **Network Number** and **IP Address**, click the link that best describes your system in *To build a Network tree* (page 14).

Notes tab

These notes can also be seen on the i-Vu® Pro **Properties** page.




Building a Geographic tree

The **Geographic** tree represents the areas, controlled zones, and mechanical equipment in a system.

You can copy, replicate, and move areas and equipment. See *Productivity tools* (page 55).




To add an area


An area is a logical group of areas or mechanical equipment.

- 1 Right-click the system  or an area  on the **Geographic** tree that will be the parent of the new area.
- 2 Select **Add Area**.
- 3 Enter values in the **Area** dialog box.
- 4 Attach graphic (.view) files now or later.
- 5 Optional: Click **Notes**, then type in the notes field.
A notes icon () on the tree indicates where you added notes.
- 6 Click **OK**.

To add BACnet equipment


A piece of equipment represents a mechanical device that provides heating, ventilating, air conditioning, or other service to a building.

- 1 Right-click the area  where you want to add the equipment.
NOTE You may add BACnet equipment at the system level .
- 2 Select **Add BACnet Equipment**.
- 3 Enter values in the **BACnet Equipment** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field.
A notes icon () on the tree indicates where you added notes.
NOTE These notes can also be viewed and changed from the i-Vu® Pro Properties page and Equipment Checkout tool.
- 5 Click **OK**.


Field	Notes
Name	The name displayed on the Geographic or Network tree.
Reference Name	A permanent name for a tree item that allows the item to be referenced from graphics, Properties pages, external spreadsheets, etc. A reference name consists of lowercase letters, numbers, hyphens, and underscores (no spaces), and it cannot begin with a number. In the system hierarchy, a reference name must be unique among its siblings, unless it is a global reference name that begins with a # sign.
Object Instance	SiteBuilder automatically assigns this unique number when you assign a piece of equipment to a controller.
Control Program	<p>Select an existing control program from the list of control programs in the i-Vu_Pro_x.x\webroot\<<system_name>\programs folder.</p> <p>If the equipment's control program is not yet in the programs folder, type its name in this field. This equipment is called phantom equipment and has a grayed out icon . You can add points to this equipment. To convert phantom equipment to working equipment, put its control program in the programs folder, select the phantom equipment in SiteBuilder, then select Edit > Reload Control Program.</p>
Require operator to record any changes to equipment	To provides support for 21 CFR 11, you can check this field to require a i-Vu® Pro operator to record a reason for changing an equipment property. You can also set this option in the i-Vu® Pro interface. See "Recording reasons for edits" in i-Vu® Pro Help.
Views	You may attach graphic files now or later. See the topic below for details.

To add CCN equipment

NOTE You can use the i-Vu® Pro application to add a control program, in place of the following procedure.


- 1 Right-click the area  where you want to add the equipment.

NOTE You may add CCN equipment at the system level .

- 2 Select **Add CCN Equipment**.
- 3 Enter values in the **CCN Equipment** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field.
A notes icon () on the tree indicates where you added notes.

NOTE These notes can also be viewed and changed from the i-Vu® Pro Properties page and Equipment Checkout tool.

- 5 Click **OK**.
- 6 You must assign the equipment to the CCN Bridge that controls it. See *Assigning equipment to controllers* (page 53).



Field	Notes
Name	The name displayed on the Geographic or Network tree.
Reference Name	A permanent name for a tree item that allows the item to be referenced from graphics, Properties pages, external spreadsheets, etc. A reference name consists of lowercase letters, numbers, hyphens, and underscores (no spaces), and it cannot begin with a number. In the system hierarchy, a reference name must be unique among its siblings, unless it is a global reference name that begins with a # sign.
Associate with CCN Controller	Select the correct Bus and Element number from the drop-down list
Object Instance	SiteBuilder automatically assigns this unique number when you assign a piece of equipment to a controller.
Control Program	Select an existing control program from the list of control programs in the I-Vu_Pro_x.x\webroot\<system_name>\programs</system_name> folder. If the equipment's control program is not yet in the programs folder, type its name in this field. This equipment is called phantom equipment and has a grayed out icon  . You can add points to this equipment. To convert phantom equipment to working equipment, put its control program in the programs folder, select the phantom equipment in SiteBuilder, then select Edit > Reload Control Program . Reloading updates all instances of a control program throughout the system and marks the controller(s) for an All Content download.
Require operator to record any changes to equipment	To provides support for 21 CFR 11, you can check this field to require a i-Vu® Pro operator to record a reason for changing an equipment property. You can also set this option in the i-Vu® Pro interface. See "Recording reasons for edits" in i-Vu® Pro Help.
Views	You may attach graphic files now or later. See the topic below for details.

To attach graphic files to an area or a piece of equipment


You can attach one or more graphics to an area or piece of equipment in SiteBuilder. For example, you can assign a floorplan and a lighting plan to the same area. Or, you can attach an equipment graphic, an engineering shop drawing, and an as-built document to a single piece of equipment.

See ViewBuilder Help to learn how to create graphics (.view files). All .view files must be stored in the **I-Vu_Pro_x.x\webroot\\views\graphics** folder.

To attach a graphic:







- 1 Double-click an area or piece of equipment on the **Geographic** tree.
- 2 Select a file in the **Available Views** list.
NOTE A Graphics page is marked (lv15); a custom WAP Properties page is marked (wap).
- 3 Click the Attach button .
- 4 Optional: To edit the graphic's properties that were defined in ViewBuilder, double-click the file in the **Attached Views** list or click . For a description of each field, see *Managing attached views* (page 10).
- 5 Click **OK**.

NOTES

- To assign graphics that have not yet been created, click the New View button .
- You can also perform this task in the i-Vu® Pro interface. See "To attach a graphic in the i-Vu® Pro interface" in i-Vu® Pro Help.

Managing attached views

Double-click an area or a piece of equipment to open the properties dialog box.

Click this button...	To...
	Attach view Select a file in the Available list, then click the Attach button.
	Remove view Select a file in the Attached list, then click the Remove button. NOTE If you remove a file, then decide to reattach it, SiteBuilder will not remember any property changes.
	Type a new view name Type a name for a graphic that will be added to the system later.
	Edit the attached view's properties You can edit the view's navigation properties that were defined in ViewBuilder.
Display Name	If you attach more than one graphic to the tree item, change Default to the name you want to appear in the i-Vu® Pro Graphics button drop-down list.
Is the Default view	If you attach more than one graphic to the tree item, check this field to display this graphic the first time you go to that item's Graphics page. NOTES <ul style="list-style-type: none">• You can designate only one default graphic per tree item. If you check this field, SiteBuilder unchecks it for any other graphic assigned to that tree item.• The default graphic is bolded in the Attached Views list.
Action	Indicates which i-Vu® Pro button will display the file.
Category	Select None if you want to select the graphic from the Graphics button drop-down list. To add a new category to this list, see "Graphics pages" in i-Vu® Pro Help.
Instance	The name that you enter in ViewBuilder when creating a link to the graphic. See "Adding links" in ViewBuilder Help.
Included in download	Equipment graphics only. Select to have the .view file included in an All Content download so that it can be uploaded by Field Assistant. The graphic will have  beside it in the Attached Views list.
	Refresh view files Click the Refresh button to have SiteBuilder refresh a graphic that was edited after it was attached.

NOTE You can attach and remove views and edit many of the above properties in the i-Vu® Pro interface. See "To attach a graphic" in i-Vu® Pro Help.

Building a Network tree

The **Network** tree represents the communication network of routers and controllers with the i-Vu® Pro server. You can build a **Network** tree for a single building (one site) or for several facilities in different locations (multiple sites).

Contact the network administrator

Before you build a Network tree, obtain IP addresses for the following devices from the facility network administrator:

- The i-Vu® Pro server
- Each BACnet router/CCN device manager
- IP and NAT routers that affect your BACnet or CCN network

You must also ask the network administrator to open, or in the case of NAT routers port forward, the following ports:

- TCP 80 between the i-Vu® Pro server and its clients
- UDP 47808 between the i-Vu® Pro server and its BACnet routers
- UDP 50005 between the i-Vu® Pro server and its CCN device managers

NOTE If you have to build your Network tree before you have the actual IP addresses, enter temporary addresses, then change them to the actual addresses later.

Setting up geographically separate areas

Areas in different geographical locations, such as different campuses, can be part of the same site if they are on the same wide area network (WAN) and are set up for the same time zone in SiteBuilder.

If your system contains areas with different time zones, you must add at least one site on the **Network** tree for each time zone.

NOTE When using more than one site for a shared BACnet/IP network, the network numbers must be the same. SiteBuilder will automatically assign different network numbers, but you must manually change them to the same number. Each device's IP address must be unique.

Setting up multiple CCN Gateways

You must set up a separate site for each CCN Gateway that you have in your system. You can only have one Gateway per site.

NOTE When using more than one site for a shared BACnet/IP network, the network numbers must be the same. SiteBuilder will automatically assign different network numbers, but you must manually change them to the same number. Each device's IP address must be unique.

To build a Network tree for a CCN system with a single or multiple Gateways

If your CCN system has...	You must...
A single CCN Gateway	Use the i-Vu® Pro application to find and download the Gateway and system
An i-Vu® Integrator	Add it in SiteBuilder, even if it is the only CCN Gateway. See "To add an i-Vu® Integrator (page 20)" in SiteBuilder Help.
Multiple CCN Gateways without a NAT router	<ol style="list-style-type: none"> 1 In the SiteBuilder Network tree, add one site with one BACnet/IP network for each Gateway. 2 In the i-Vu® Pro interface, discover all the Gateways, Bridges, and controllers. <p>NOTES</p> <ul style="list-style-type: none"> • You must have the Multi-CCN license for this feature to work. • Supports up to 50 CCN Gateways in one system • Every Gateway must be Bus 0. • Every BACnet/IP Network Number must be the same.
Multiple CCN Gateways with a NAT router	<ol style="list-style-type: none"> 1 In SiteBuilder, configure the NAT information. 2 In the Network tree, add one site with one BACnet/IP network per Gateway. 3 Add one CCN Gateway and all its Bridges to each site you set up. 4 In the i-Vu® Pro application, discover the rest of your controllers under the Bridges. <p>NOTES</p> <ul style="list-style-type: none"> • You must have the Multi-CCN license for this feature to work. • Supports up to 50 CCN Gateways in one system • Every Gateway must be Bus 0. • Every BACnet/IP Network Number must be the same.

CCN Gateways and Bridges can be any of the following:

- i-Vu® Link
- i-Vu® CCN Router
- i-Vu® Integrator
- Carrier® ChillerVu™

NOTE For your i-Vu® Open system, use the i-Vu® Pro application to find your i-Vu® Open routers and controllers. You do not need to set up the information in SiteBuilder.

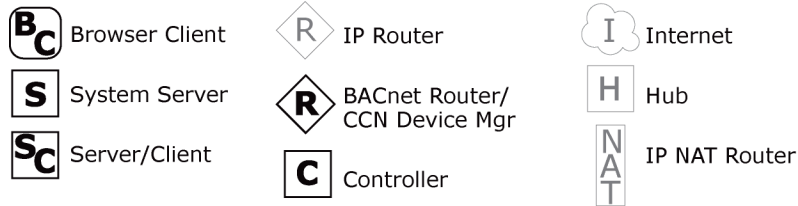
See *To Build a Network tree* (page 14) for selecting the specific instructions that apply to your network architecture.

To build a Network tree

Click the network below that resembles your system for instructions on how to build the SiteBuilder Network tree. If you are not sure which network to build, ask your network administrator.

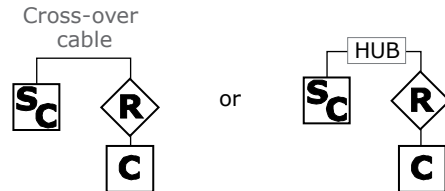
NOTE If communications between the i-Vu® Pro server and any BACnet router pass through a NAT router (firewall) anywhere in the system, you must enable Network Address Translation (NAT) in SiteBuilder. Click the appropriate link below for instructions.

Legend

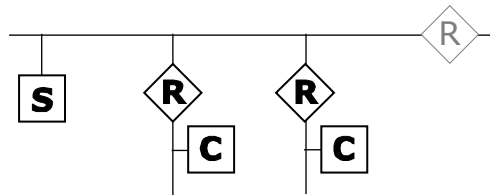


NOTE The term "BACnet routers" includes Carrier Open routers and CCN Device Managers.

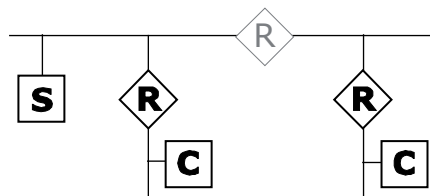
1 Simple network (page 16)



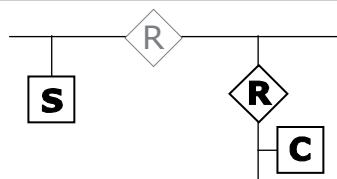
2 Server and BACnet routers on the same IP network (page 22)



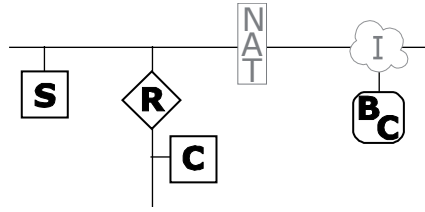
3 BACnet routers separated by an IP router (page 27)



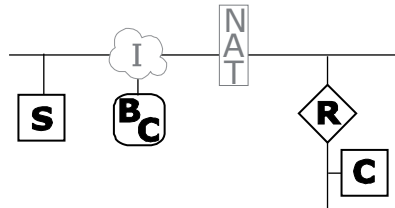
4 Server on an IP subnet without a BACnet router (no BBMD) (page 31)



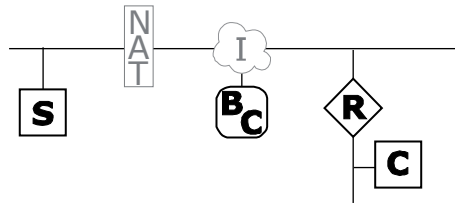
5 Entire BACnet network behind a NAT router (page 35)



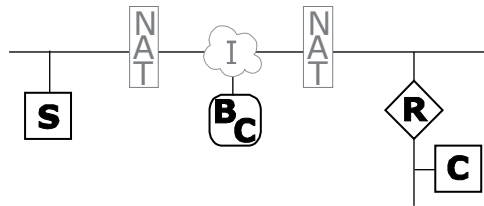
6 BACnet router behind a NAT router (page 39)



7 Server behind a NAT router (page 43)

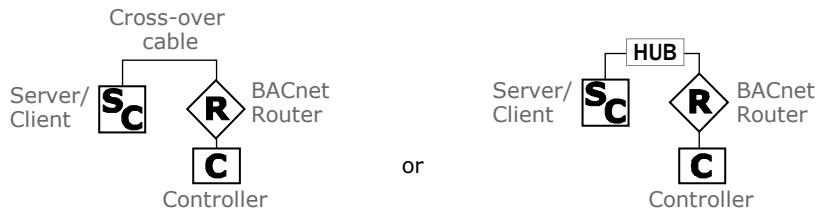


8 Server and BACnet router behind different NAT routers (page 48)




Simple network

In this simple network, the server/client computer is connected to a BACnet router with a cross-over cable or hub.




To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Site Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router closest to the i-Vu® Pro server to be the peer caching router. The peer caching router will poll other routers on the IP network for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p>
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.

Field	Notes
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.



Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.

- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.


Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.
Media Type	Select BACnet/IP .

To add a BACnet router

- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.
Device Instance	This number must be unique throughout an entire BACnet system. Do one of the following: <ul style="list-style-type: none"> • Use the default number based on SiteBuilder's next sequential Device Instance number • Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015. NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.</p>
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.
Address tab	
Select Use Default IP Address , then type the Address (Dial Setting On Device) .	
CCN tab	
This device is a CCN Gateway	Check if router is a CCN Gateway. Enter Element Number , and Baud Rate , if applicable. Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address , Element Number , and Baud Rate , if applicable.
Networks tab	
i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.	
Notes tab	
These notes can also be seen on i-Vu® Pro Properties page.	

To add a BACnet/ARCNET or MS/TP network



- 1 On the **Network** tree, right-click the device router .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.
- 6 If you are adding an MS/TP network to a i-Vu® XT router, double click the router. On the **Networks** tab, select the physical port that the MS/TP network will use.
- 7 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	<p>Do one of the following:</p> <ul style="list-style-type: none"> • Use the default number • Enter a specific number <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate this network number. The number you enter in SiteBuilder must match the autogenerated number in controller setup pages. The number is: 1600 (the default IP network number) + the router's rotary switch address, and ending with the port identifier number (0 for Port S1 or 3 for the Port S2). EXAMPLE If the IP network number is 1600 and the rotary switch address is 15 and this is an MS/TP network, the Network Number is 16153.</p>
Media Type	Select Arcnet or MS/TP .

NOTE When wiring an MS/TP network to a router port, you must set the port's baud rate using one of the following methods:

- Open router—Using the router's Local Access port and PuTTY. See "To set a port's baud rate using PuTTY" in the router's *Installation and Start-up Guide*.
- i-Vu® XT router—In the i-Vu® Pro interface on the driver's **BACnet Router Properties** page or in Local Access on the **Ports** tab.

To add a controller

- 1 Right-click the network  that the controller is attached to.
- 2 Select **Add BACnet Device**.
- 3 Enter values in the **BACnet Device** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field.
A notes icon () on the tree indicates where you added notes.
- 5 Click **OK**.

Field or Tab	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Address	Type the rotary dial address of the controller.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.
Device Instance	Use the default number unless you use a naming convention for your devices. A device instance number must be unique throughout an entire BACnet system.
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.

To add an i-Vu® Integrator

The i-Vu® Pro application cannot discover an i-Vu® Integrator, even if it is your only Gateway. You must manually add it using the following procedure.

- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Enter a **Name**, which is displayed on the **Network** tree.
- 5 Optional: Edit the **Reference Name**.

NOTE Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.

- 6 Do one of the following in the **Controller** field. If you have:
 - o A controller that is not listed in the droplist, browse to the controller's driver.
 - o An i-Vu® Integrator using a Modbus driver (drv_ivu_ccn2_x-xx-xxx), select **i-Vu Integrator** and then proceed to step 8.
 - o An i-Vu® Integrator using a LonWorks (drv_ivu_ccn2lon_x-xx-xxx) or GE Lighting driver (drv_ivu_ccn2gel_x-xx-xxx), you must:
 - a. Browse to and select your driver.
 - b. In the **Custom Driver** dialog box, select **i-Vu Integrator - Custom**.
 - c. Click **OK**.
- 7 Fill in the **Device Instance**, if you are not using the default.

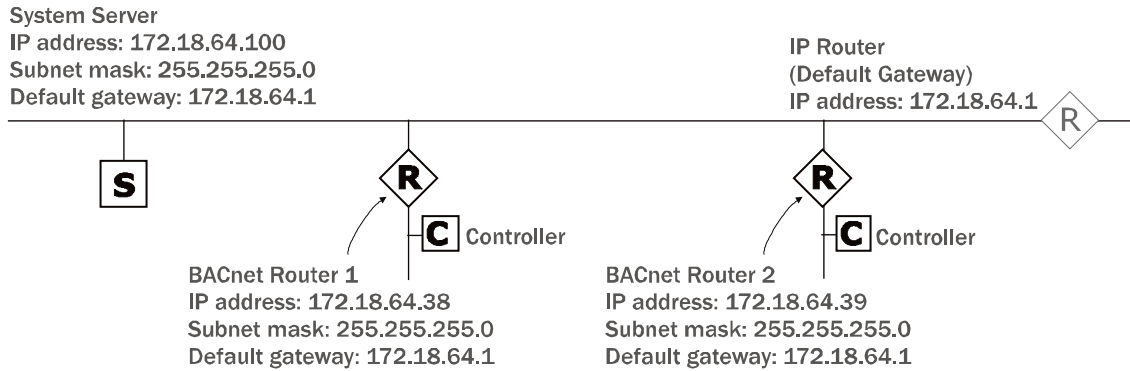
NOTE Use the default number unless you use a naming convention for your devices. A Device Instance number must be unique throughout an entire BACnet system.
- 8 If you have a file for a BACview® or touchscreen device, do one of the following:
 - o Select a **.bacview** or **.touch** file from the drop-down list.
 - o Type the complete file name for a **.KPD** or **.S37** file. Include the extension. This field is case sensitive.
- 9 On the **Address** tab, select **Use Default IP Address**, then type the **Address (Dial Setting On Device)**.
- 10 On the **CCN** tab, check **This device is a CCN Gateway**, if applicable, and then enter **Gateway IP Address**, **Element Number**, and **Baud Rate**.
- 11 Click **OK**.
- 12 Entries on the **Notes** tab appear on the i-Vu® Pro **Properties** page.

Troubleshooting a simple network


- On the i-Vu® Pro **Connections** page, do not type the IP address unless the i-Vu® Pro server has dual NICs (Network Interface Cards).
- Use this calculator to verify that the devices are on the same subnet.

Server and BACnet routers on the same IP network

In this example, the server and BACnet routers are on the same IP network.




To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Site Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router closest to the i-Vu® Pro server to be the peer caching router. The peer caching router will poll other routers on the IP network for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p>

Field	Notes
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.




Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.

- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.
Media Type	Select BACnet/IP .


To add a BACnet router

- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.
- 5 Repeat steps 1 through 4 for the second router. See tables below.
- 6 Add networks and controllers as needed under each BACnet router.

General tab		
Name	The name displayed on the Network tree.	
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.	
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.	
Device Instance	<p>This number must be unique throughout an entire BACnet system. Do one of the following:</p> <ul style="list-style-type: none"> Use the default number based on SiteBuilder's next sequential Device Instance number Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015. NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.</p>	
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.	
Address tab	See: <i>Setting Open device IP addresses (page 67)</i> or <i>Setting i-Vu® XT device IP addresses (page 75)</i>	Example Router
Use Default IP Address	<p>Select if the i-Vu® Pro system is on a dedicated IP network, then type the Address (Dial Setting On Device).</p> <p>NOTE The router's IP Address DIP switch must be set to Assigned.</p>	
Specify a custom or DHCP IP Address	<p>Select if the i-Vu® Pro system is on a non-dedicated IP network, then enter values in the following fields.</p> <p>NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address</p>	
IP Address	Type the BACnet router's IP address that you got from the network administrator.	172.18.64.38
	<p>NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type <code>:<port number></code> after the address. For example, 172.18.64.38:47901.</p>	
Subnet Mask	Type the BACnet router's subnet mask that you got from the network administrator.	255.255.255.0

Default Gateway Address	Type the BACnet router's default gateway address that you got from the network administrator.	172.18.1.1
Automatically Configure My BBMDs	Check this field for all BACnet routers in your system even though this kind of network cannot use BBMDs.	
Local Access Connection	Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder</i> (page 67). After the download is complete, click Module Status to verify the router's address. i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses</i> (page 75).	
CCN tab		
This device is a CCN Gateway	Check if router is a CCN Gateway. Enter Element Number , and Baud Rate , if applicable. Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address , Element Number , and Baud Rate , if applicable.	
Networks tab		
Networks tab	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.	
Notes tab		
Notes tab	These notes can also be seen on i-Vu® Pro Properties page.	

To add a BACnet/ARCNET or MS/TP network



- 1 On the **Network** tree, right-click the device router .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.
- 6 If you are adding an MS/TP network to a i-Vu® XT router, double click the router. On the **Networks** tab, select the physical port that the MS/TP network will use.
- 7 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	<p>Do one of the following:</p> <ul style="list-style-type: none"> • Use the default number • Enter a specific number <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate this network number. The number you enter in SiteBuilder must match the autogenerated number in controller setup pages. The number is: 1600 (the default IP network number) + the router's rotary switch address, and ending with the port identifier number (0 for Port S1 or 3 for the Port S2). EXAMPLE If the IP network number is 1600 and the rotary switch address is 15 and this is an MS/TP network, the Network Number is 16153.</p>
Media Type	Select Arcnet or MS/TP .

NOTE When wiring an MS/TP network to a router port, you must set the port's baud rate using one of the following methods:

- Open router—Using the router's Local Access port and PuTTY. See "To set a port's baud rate using PuTTY" in the router's *Installation and Start-up Guide*.
- i-Vu® XT router—In the i-Vu® Pro interface on the driver's **BACnet Router Properties** page or in Local Access on the **Ports** tab.

To add a controller

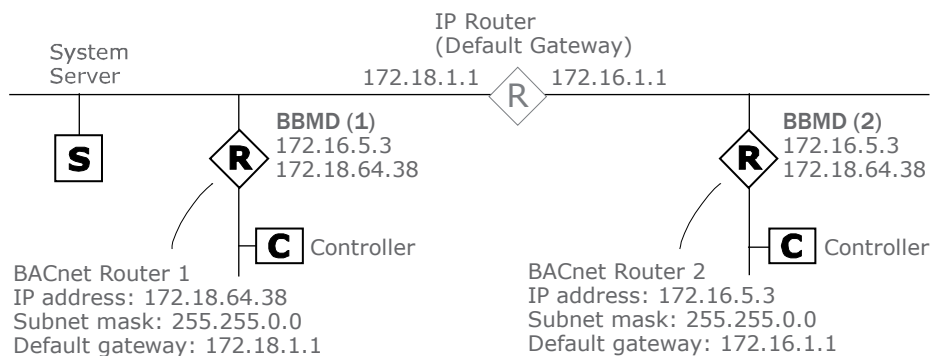
- 1 Right-click the network  that the controller is attached to.
- 2 Select **Add BACnet Device**.
- 3 Enter values in the **BACnet Device** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field.
A notes icon () on the tree indicates where you added notes.
- 5 Click **OK**.

Field or Tab	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Address	Type the rotary dial address of the controller.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.


Field or Tab	Notes
Device Instance	Use the default number unless you use a naming convention for your devices. A device instance number must be unique throughout an entire BACnet system.
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.

BACnet routers separated by an IP router

To minimize network communications, IP routers do not pass on broadcasts that they receive. You can set up your BACnet network so that BACnet Broadcast Management Devices (BBMDs) can pass BACnet broadcasts across IP routers to other BBMDs.




To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.

Field	Notes
Site Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router closest to the i-Vu® Pro server to be the peer caching router. The peer caching router will poll other routers on the IP network for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p>
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.




Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.

- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	<p> Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number?</p> <p>i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.</p>

Field	Notes
Media Type	Select BACnet/IP .

To add BACnet routers

- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **Device Properties** dialog box. See table below.
- 4 Click **OK**.
- 5 Repeat steps 1 through 4 for the second router. See tables below.
- 6 Add networks and controllers as needed under each BACnet router.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.
Device Instance	This number must be unique throughout an entire BACnet system. Do one of the following: <ul style="list-style-type: none"> • Use the default number based on SiteBuilder's next sequential Device Instance number • Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015. NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.</p>
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.

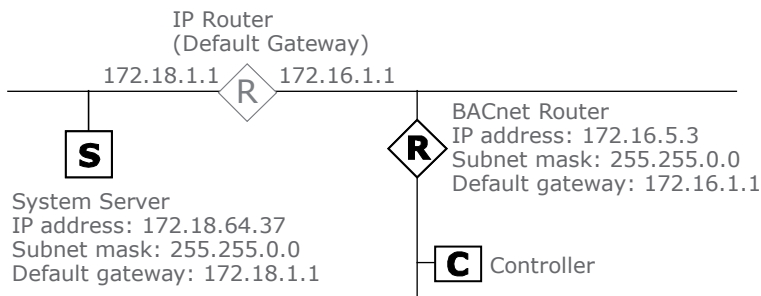
Address tab	See: <i>Setting Open device IP addresses (page 67)</i> or <i>Setting i-Vu® XT device IP addresses (page 75)</i>	Example Router 1	Example Router 2
Specify a custom or DHCP IP Address	Select this option, then enter values in the following fields. NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address		
IP Address	Type the BACnet router's IP address that you got from the network administrator. NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type :<port number> after the address. For example, 172.18.64.38:47901.	172.18.64.38	172.16.5.3
Subnet Mask	Type the BACnet router's subnet mask that you got from the network administrator.	255.255.0.0	255.255.0.0
Default Gateway Address	Type the BACnet router's default gateway address that you got from the network administrator.	172.18.1.1	172.16.1.1
Automatically Configure My BBMDs	Check this field for all BACnet routers in your system. EXCEPTION If your system has more than 50 IP subnets, see <i>Setting up BBMDs (page 78)</i> .		
Local Access Connection	Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder (page 67)</i> . After the download is complete, click Module Status to verify the router's address. i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses (page 75)</i> .		
CCN tab			
This device is a CCN Gateway	Check if router is a CCN Gateway. Enter Element Number , and Baud Rate , if applicable. Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address , Element Number , and Baud Rate , if applicable.		
Networks tab	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.		
Notes tab	These notes can also be seen on i-Vu® Pro Properties page.		

Server on an IP subnet without a BACnet router (no BBMD)


To minimize network communications, IP routers do not pass on broadcasts that they receive. But, you can set up Carrier controllers as BACnet Broadcast Management Devices (BBMDs) to pass BACnet broadcasts across IP routers to other BBMDs.

The i-Vu® Pro server is not a BBMD. If the server is on an IP subnet without a BBMD, you must *register the server as a foreign device* (page 81) to a BBMD in the system. That BBMD will then forward BACnet broadcasts to the server. Register the server with the BBMD that will have the fastest response time. Response time is affected by distance and network complexity.

NOTE The BACnet device must be set up as a BBMD before you register the server as a foreign device.




To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Site Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.

Field	Notes
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router closest to the i-Vu® Pro server to be the peer caching router. The peer caching router will poll other routers on the IP network for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p>
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.




Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.

- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? <p>i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.</p>
Media Type	Select BACnet/IP .

To add a BACnet router

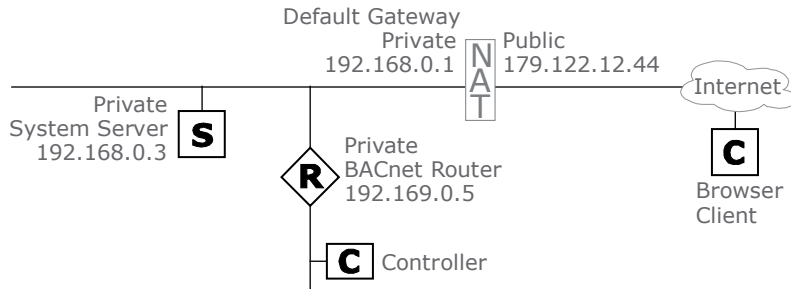
- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.
- 5 Add a network and controllers as needed under the BACnet router.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.
Device Instance	This number must be unique throughout an entire BACnet system. Do one of the following: <ul style="list-style-type: none"> • Use the default number based on SiteBuilder's next sequential Device Instance number • Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015. NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.</p>
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.
Address tab	See: Example router <i>Setting Open device IP addresses (page 67) or</i> <i>Setting i-Vu® XT device IP addresses (page 75)</i>
Specify a custom or DHCP IP Address	Select this option, then enter values in the following fields. NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address

IP Address	Type the BACnet router's IP address that you got from the network administrator. NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type :<port number> after the address. For example, 172.18.64.38:47901.	172.16.5.3
Subnet Mask	Type the BACnet router's subnet mask that you got from the network administrator.	255.255.0.0
Default Gateway Address	Type the BACnet router's default gateway address that you got from the network administrator.	172.16.1.1
Automatically Configure My BBMDs	Check this field for all BACnet routers in your system. EXCEPTION If your system has more than 50 IP subnets, see <i>Setting up BBMDs</i> (page 78).	
Local Access Connection	Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder</i> (page 67). After the download is complete, click Module Status to verify the router's address. i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses</i> (page 75).	
CCN tab		
This device is a CCN Gateway	Check if router is a CCN Gateway. Enter Element Number , and Baud Rate , if applicable. Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address , Element Number , and Baud Rate , if applicable.	
Networks tab	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.	
Notes tab	These notes can also be seen on i-Vu® Pro Properties page.	

Entire BACnet network behind a NAT router


In this example, the entire BACnet system is behind a NAT router (firewall), but clients can access the network from the Internet. Small companies use this kind of network with a cable modem or DSL such as a Linksys® router.



NOTES

- The client will use the server NAT router's public IP address to access the i-Vu® Pro server.
- The NAT router must be set up to port forward HTTP traffic to the i-Vu® Pro server. See *Building a Network tree* (page 12).


To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Site Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.

Field	Notes
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router closest to the i-Vu® Pro server to be the peer caching router. The peer caching router will poll other routers on the IP network for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p>
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.




Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.


- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? <p>i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.</p>
Media Type	Select BACnet/IP .

To add a BACnet router

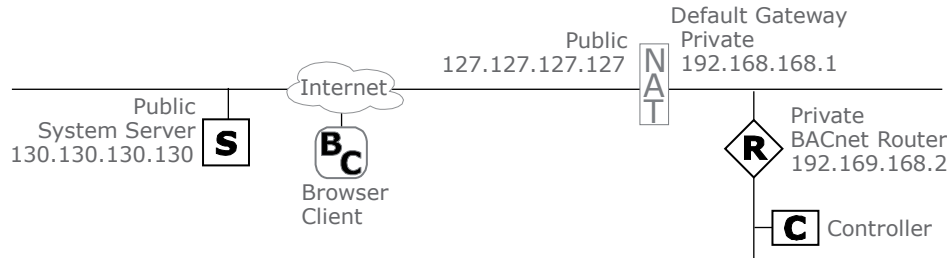
- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.
- 5 Add a network and controllers as needed under the BACnet router.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.
Device Instance	This number must be unique throughout an entire BACnet system. Do one of the following: <ul style="list-style-type: none"> • Use the default number based on SiteBuilder's next sequential Device Instance number • Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015.</p> NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.
Address tab	See: Example router <i>Setting Open device IP addresses</i> (page 67) or <i>Setting i-Vu® XT device IP addresses</i> (page 75)
Specify a custom or DHCP IP Address	Select this option, then enter values in the following fields. NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address

IP Address	Type the BACnet router's private IP address that you got from the network administrator.	192.168.0.5
	 CAUTION SiteBuilder allows duplicate private IP addresses in the system, even on the same private network. So you must verify with your network administrator that the private network has no duplicate addresses. NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type :<port number> after the address. For example, 172.18.64.38:47901.	
Subnet Mask	Type the BACnet router's subnet mask that you got from the network administrator.	255.255.255.0
Default Gateway Address	Type the BACnet router's default gateway address that you got from the network administrator.	192.168.0.1
Automatically Configure My BBMDs	Check this field for all BACnet routers in your system even though this kind of network cannot use BBMDs.	
Local Access Connection	<p>Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder</i> (page 67).</p> <p>After the download is complete, click Module Status to verify the router's address.</p> <p>i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses</i> (page 75).</p>	
CCN tab		
This device is a CCN Gateway	<p>Check if router is a CCN Gateway. Enter Element Number, and Baud Rate, if applicable.</p> <p>Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address, Element Number, and Baud Rate, if applicable.</p>	
Networks tab		
	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.	
Notes tab		
	These notes can also be seen on i-Vu® Pro Properties page.	

BACnet router behind a NAT router


This type of network layout is not recommended because the server is not protected by a NAT router (firewall), but it is commonly used with DSL or a cable modem.




NOTES

- When using NAT routers, the controllers on different sites cannot communicate with each other.
- The BACnet router's NAT router must be set up to port forward BACnet traffic (typically UDP 47808) to the BACnet router. See *Building a Network tree* (page 12).

To edit System Properties


- 1 In SiteBuilder, on the **Network** tree, double-click the system .
- 2 In the **System Properties** dialog box, click the **Advanced** tab.
- 3 Check **Enable Network Address Translation (NAT)**.
- 4 Type the **NAT Alarm Recipient Address** information. In most systems, the i-Vu® Pro server is the alarm recipient.
 - Type the **Network Number** of the BACnet/IP network where the i-Vu® Pro server is located. You will add this network later. See "To add a BACnet/IP network".
 - Type the i-Vu® Pro server's public IP address in the **IP Address** field. (130.130.130.130, in the example above.)
- 5 Click **OK**.

To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Devices under this site are behind a NAT	Check this field.
Deliver alarms from this site to the server through a NAT	This field is automatically checked when you check Devices under this site are behind a NAT . This setting is required even though it may not make sense in this network layout.
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router behind the NAT to be the peer caching router. The peer caching router will poll other routers behind the same NAT for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>NOTE If a system has multiple BACnet routers behind different NAT routers, put each router in a different site in SiteBuilder, then set the BACnet router in each site as the peer caching device.</p>
	<p>The diagram illustrates a network topology where three sites are connected to a central cloud labeled 'I'. Site 1 is on the left, containing a server 'S' and a router 'R'. Site 2 is in the center, containing a router 'R'. Site 3 is on the right, containing a router 'R'. Two NAT routers are positioned between Site 1 and Site 2, and between Site 2 and Site 3, indicating that Site 2 is behind NAT for both Site 1 and Site 3.</p>
	<p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p>
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.



Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.

- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.
Media Type	Select BACnet/IP .


To add a BACnet router

- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.
- 5 Add a network and controllers as needed under the BACnet router.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.

General tab

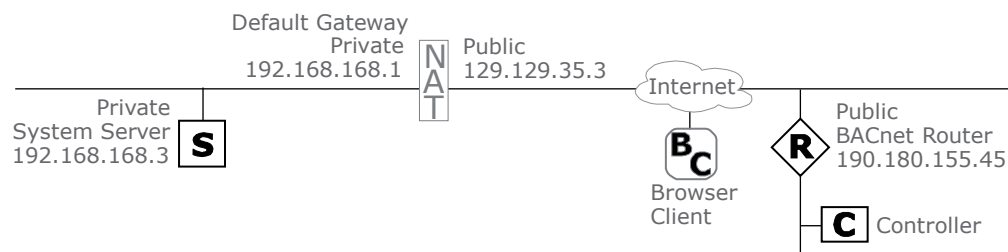
Device Instance	<p>This number must be unique throughout an entire BACnet system. Do one of the following:</p> <ul style="list-style-type: none">• Use the default number based on SiteBuilder's next sequential Device Instance number• Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015.</p> <p>NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.</p>
Screen File	<p>If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.</p>

Address tab	See:	Example values
Specify a custom or DHCP IP Address	<p>Select this option, then enter values in the following fields.</p> <p>NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address</p>	
IP Address	<p>Type the BACnet router's private IP address that you got from the network administrator.</p> <p> CAUTION SiteBuilder allows duplicate private IP addresses in the system, even on the same private network. So you must verify with your network administrator that the private network has no duplicate addresses.</p> <p>NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type <code>:<port number></code> after the address. For example, 172.18.64.38:47901.</p>	192.168.168.2
Subnet Mask	<p>Type the BACnet router's subnet mask that you got from the network administrator.</p>	255.255.255.0
Default Gateway Address	<p>Type the NAT router's private address that you got from the network administrator.</p>	192.168.168.1
NAT Address	<p>Type the NAT's public IP address that you got from the network administrator.</p>	127.127.127.127
NAT CCN Port	<p>Type the NAT's public port for the NAT address that translates to the private CCN/IP port.</p>	

Automatically Configure My BBMDs	Check this field for all BACnet routers in your system even though this kind of network cannot use BBMDs.
Local access Connection	<p>Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder</i> (page 67).</p> <p>After the download is complete, click Module Status to verify the router's address.</p> <p>i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses</i> (page 75).</p>
CCN tab	
This device is a CCN Gateway	<p>Check if router is a CCN Gateway. Enter Element Number, and Baud Rate, if applicable.</p> <p>Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address, Element Number, and Baud Rate, if applicable.</p>
Networks tab	
Networks tab	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.
Notes tab	
Notes tab	These notes can also be seen on i-Vu® Pro Properties page.

Server behind a NAT router


This network layout is usually used to add a new segment to an existing BACnet network.




NOTES

- The client will use the server NAT router's public IP address to access the i-Vu® Pro server.
- The NAT router must be set up to port forward HTTP traffic to the i-Vu® Pro server. This router also must be set up to port forward BACnet traffic (typically UDP 47808) to the server. See *Building a Network tree* (page 12).

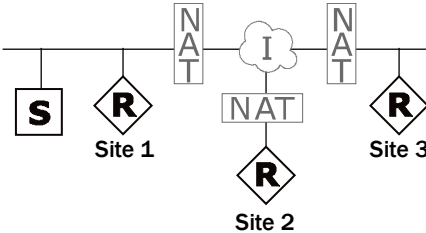
To edit System Properties

- 1 In SiteBuilder, on the **Network** tree, double-click the system .
- 2 In the **System Properties** dialog box, click the **Advanced** tab.
- 3 Check **Enable Network Address Translation (NAT)**.
- 4 Type the **NAT Alarm Recipient Address** information. In most systems, the i-Vu® Pro server is the alarm recipient.
 - Type the **Network Number** of the BACnet/IP network where the i-Vu® Pro server is located. You will add this network later. See "To add a BACnet/IP network".
 - Type the NAT's public IP address in the **IP Address** field. (129.129.35.3, in the example above.)
- 5 Click **OK**.


To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Devices under this site are behind a NAT	Uncheck this field.
Deliver alarms from this site to the server through a NAT	Check this field.
Time Zones	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.

Field	Notes
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router behind the NAT to be the peer caching router. The peer caching router will poll other routers behind the same NAT for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>NOTE If a system has multiple BACnet routers behind different NAT routers, put each router in a different site in SiteBuilder, then set the BACnet router in each site as the peer caching device.</p> 
Optimize download for Open PIC controllers	<p>You can select Do Not Use Peer Caching to slightly reduce network bandwidth, but you will not receive Dead Module Timeout alarms for the BACnet routers.</p> <p>Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.</p>
Include graphics in Open programmable controller download	<p>Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.</p>

To add a BACnet/IP network


- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.




Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.

- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.

Field	Notes
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.
Media Type	Select BACnet/IP .

To add a BACnet router

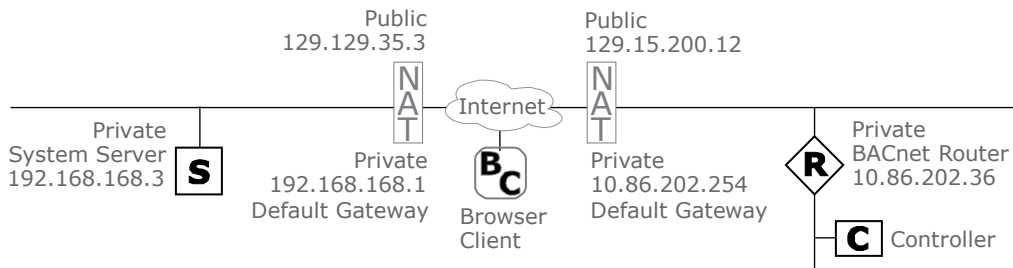
- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.
- 5 Add a network and controllers as needed under the BACnet router.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.
Device Instance	This number must be unique throughout an entire BACnet system. Do one of the following: <ul style="list-style-type: none"> • Use the default number based on SiteBuilder's next sequential Device Instance number • Enter a specific number. i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015. NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.

Address tab	See: <i>Setting Open device IP addresses</i> (page 67) or <i>Setting i-Vu® XT device IP addresses</i> (page 75)	Example router
Specify a custom or DHCP IP Address	Select this option, then enter values in the following fields. NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address	
IP Address	Type the BACnet router's IP address that you got from the network administrator. NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type :<port number> after the address. For example, 172.18.64.38:47901.	190.180.155.45
Subnet Mask	Type the BACnet router's subnet mask that you got from the network administrator.	255.255.255.0
Default Gateway Address	Type the BACnet router's default gateway address that you got from the network administrator.	129.129.35.3
Automatically Configure My BBMDs	Check this field for all BACnet routers in your system even though this kind of network cannot use BBMDs.	
Local Access Connection	Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder</i> (page 67). After the download is complete, click Module Status to verify the router's address. i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses</i> (page 75).	
CCN tab		
This device is a CCN Gateway	Check if router is a CCN Gateway. Enter Element Number , and Baud Rate , if applicable. Leave unchecked if router is not a a CCN Gateway, enter Gateway IP Address , Element Number , and Baud Rate , if applicable.	
Networks tab	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.	
Notes tab	These notes can also be seen on i-Vu® Pro Properties page.	
NOTE The client will use the public IP address to access the i-Vu® Pro server.		

Server and BACnet router behind different NAT routers


This type of network layout using NAT routers (firewalls) is the most common.




NOTES

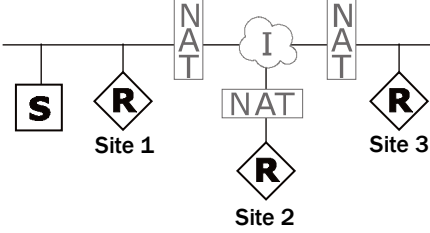
- When using NAT routers, the controllers on different sites cannot communicate with each other.
- The client will use the server NAT router's public IP address to access the i-Vu® Pro server.
- The server NAT router must be set up to port forward HTTP traffic to the i-Vu® Pro server. This router also must be set up to port forward BACnet traffic (typically UDP 47808) to the server. See *Building a Network tree* (page 12).
- The BACnet router's NAT router must be set up to port forward BACnet traffic (typically UDP 47808) to the BACnet router. See *Building a Network tree* (page 12).

To edit System Properties


- 1 In SiteBuilder, on the **Network** tree, double-click the system .
- 2 In the **System Properties** dialog box, click the **Advanced** tab.
- 3 Check **Enable Network Address Translation (NAT)**.
- 4 Type the **NAT Alarm Recipient Address** information. In most systems, the i-Vu® Pro server is the alarm recipient.
 - Type the **Network Number** of the BACnet/IP network where the i-Vu® Pro server is located. You will add this network later. See "To add a BACnet/IP network".
 - Type the NAT's public IP address in the **IP Address** field. (129.129.35.3, in the example above.)
- 5 Click **OK**.

To add a site

- 1 On the **Network** tree, right-click the system .
- 2 Select **Add Site**.
- 3 Enter values in the **Site** dialog box. See table below.
- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Number	SiteBuilder automatically assigns a unique site number, but if needed, you can change it to some other unique number.
Devices under this site are behind a NAT	Select this checkbox.
Deliver alarms from this site to the server through a NAT	This field is automatically checked when you check Devices under this site are behind a NAT .
Time Zone	By default, the site is set to the same time zone as the i-Vu® Pro server. If the site is in a different time zone, select Specify Time Zone , and then select the zone from the drop-down list.
Peer Caching	<p>Select Use Peer Caching, click the drop-down arrow, then choose the BACnet router behind the NAT to be the peer caching router. The peer caching router will poll other routers behind the same NAT for colors and prime variables.</p> <p>Peer caching also checks the communication status of the peer caching router and any routers for which it is caching. If any of the routers cannot communicate, a Dead Module Timeout alarm is issued.</p> <p>NOTE If a system has multiple BACnet routers behind different NAT routers, put each router in a different site in SiteBuilder, then set the BACnet router in each site as the peer caching device.</p>  <p>The diagram illustrates a network topology for peer caching. A central cloud labeled 'I' represents the i-Vu Pro server. It is connected to two NAT routers. The left NAT router connects to Site 1, which contains a server 'S' and a BACnet router 'R'. The right NAT router connects to Site 3, which contains a BACnet router 'R'. Site 2, located below the cloud, contains a BACnet router 'R' and is connected to the cloud 'I' via its own NAT router.</p>
Optimize download for Open PIC controllers	Check to increase download speed. The full source files are not downloaded into the PIC controllers when this is checked.
Include graphics in Open programmable controller download	Uncheck to increase download speed. If you are not changing the graphics, you may not want to include them in every download.


To add a BACnet/IP network

- 1 On the **Network** tree, right-click the site .
- 2 Select **Add BACnet Network**.
- 3 Enter values in the **Network** dialog box. See table below.




Every site with a CCN Gateway must have the same Network Number if they are on the same IP network.


- 4 Optional: Click **Notes**, then type in the notes field. These notes can also be seen on the i-Vu® Pro **Properties** page.
- 5 Click **OK**.

Field	Notes
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Network Number	 Every site with a CCN Gateway must have the same Network Number. Click Yes in the dialog box stating This network number is already in use. Only in rare cases do you want to duplicate this. Are you sure you want a duplicate network number? i-Vu® Open systems: Use the default number unless your BACnet administrator gives you a different number.
Media Type	Select BACnet/IP .

To add a BACnet router

- 1 Right-click the BACnet/IP network .
- 2 Select **Add BACnet Device Router**.
- 3 Enter values in the **BACnet Device Router** dialog box. See table below.
- 4 Click **OK**.
- 5 Add a network and controllers as needed under the BACnet router.

General tab	
Name	The name displayed on the Network tree.
Reference Name	Global reference names begin with # and must be unique within the entire system. Non-global reference names (no #) must be unique among siblings.
Controller	Select the controller in the drop-down list. NOTE If the controller you are adding is not listed, browse to the controller's driver.


General tab		
Device Instance	<p>This number must be unique throughout an entire BACnet system. Do one of the following:</p> <ul style="list-style-type: none"> • Use the default number based on SiteBuilder's next sequential Device Instance number • Enter a specific number. <p>i-Vu® XT router only—Check Autogenerated only if you plan to let the controller autogenerate its Device instance. The number you enter in SiteBuilder must match the autogenerated number in the controller setup pages that you access through the Service Port. This number is equal to: (IP network number x 100) + the router's rotary switch address EXAMPLE If the IP network number is 1600 and the rotary switch address is 15, the Device Instance is 160015.</p> <p>NOTE To see the Autogenerated checkbox, you must click OK in the properties dialog box, then double-click the router to reopen the properties.</p>	
Screen File	If you have a file for a BACview® or touchscreen device, select a .bacview or .touch file from the drop-down list.	
Address tab	See: <i>Setting Open device IP addresses (page 67)</i> or <i>Setting i-Vu® XT device IP addresses (page 75)</i>	Example router
Specify a custom or DHCP IP Address	<p>Select this option, then enter values in the following fields.</p> <p>NOTE Open router only—The router's IP Address DIP switch must be set to: Assigned if using a custom IP address DHCP if using a DHCP IP address</p>	
IP Address	Type the BACnet router's private IP address that you got from the network administrator.	10.86.202.36
	<p> CAUTION SiteBuilder allows duplicate private IP addresses in the system, even on the same private network. So you must verify with your network administrator that the private network has no duplicate addresses.</p> <p>NOTE If the i-Vu® Pro server will use a port other than 47808 for BACnet communication, type :<port number> after the address. For example, 172.18.64.38:47901.</p>	
Subnet Mask	Type the BACnet router's subnet mask that you got from the network administrator.	255.255.255.0
Default Gateway Address	Type the private IP address of the router's NAT that you got from the network administrator.	10.86.202.254
NAT Address	Type the public IP address of the router's NAT that you got from the network administrator.	129.15.200.12
NAT CCN Port	Type the NAT's public port for the NAT address that translates to the private CCN/IP port.	

Address tab	See: <i>Setting Open device IP addresses (page 67)</i> or <i>Setting i-Vu® XT device IP addresses (page 75)</i>	Example router
Automatically Configure My BBMDs	Check this field for all BACnet routers in your system even though this kind of network cannot use BBMDs.	
Local Access Connection	<p>Open router only—If your network administrator gave you a custom IP address (not DHCP), you must connect to the router locally and then Download Address before the i-Vu® Pro server can communicate with the router. See <i>To set a controller's custom IP address in SiteBuilder (page 67)</i>.</p> <p>After the download is complete, click Module Status to verify the router's address.</p> <p>i-Vu® XT router only—You cannot download the router's IP address from SiteBuilder. See <i>Setting i-Vu® XT device IP addresses (page 75)</i>.</p>	
CCN tab		
This device is a CCN Gateway	<p>Check if router is a CCN Gateway. Enter Element Number, and Baud Rate, if applicable.</p> <p>Leave unchecked if router is not a CCN Gateway, enter Gateway IP Address, Element Number, and Baud Rate, if applicable.</p>	
Networks tab	i-Vu® XT router only—Shows the network number, media type, and if applicable, lets you select the router port that each network will use.	
Notes tab	These notes can also be seen on i-Vu® Pro Properties page.	

Assigning equipment to controllers

Each controller on the **Network** tree may operate one or more pieces of equipment on the **Geographic** tree. Assign the equipment to the controller where you will wire its physical inputs and outputs.

To assign equipment to controllers

- 1 On the **Geographic** tree, select or multiple-select equipment .
- 2 Right-click a controller on the **Network** tree.
- 3 Select **Assign Equipment**.

Or, you can drag the selected equipment, then drop it onto a controller.



TIP Click **View > Highlight > Not Assigned** to show unassigned equipment and phantom equipment as red text.

To unassign equipment

You cannot delete a piece of equipment from the **Network** tree; you must unassign it.

- 1 On the **Network** tree, right-click a piece of equipment.
- 2 Select **Unassign Equipment**.

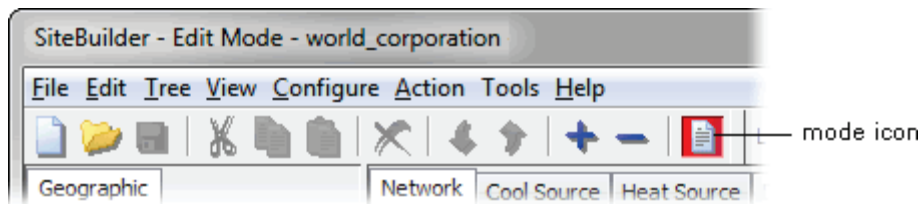
Testing a system

After creating a database, you can check your work by running the system without connecting to the controllers. See "Running i-Vu_Pro_Server" in i-Vu® Pro Help.

To run SiteBuilder concurrently with the i-Vu® Pro Server application

You can start SiteBuilder from the i-Vu® Pro Server application if they are both running on the same computer.

- 1 In the i-Vu_Pro_Server application, click **Launch Concurrent SiteBuilder**.
- 2 Type your **Name** and **Password**.
- 3 Click the mode icon to change from view only mode (red) to edit mode (green).



- 4 Close SiteBuilder after you make your changes.

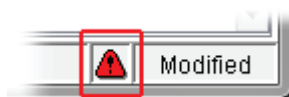
NOTES

- Any changes you make while SiteBuilder is in edit mode are saved immediately. You cannot "close" SiteBuilder without saving changes.
- In view only mode, i-Vu_Pro_Server and field communications run normally. In edit mode, the i-Vu_Pro_Server is not affected, but field communications are disabled and operators will see question marks on i-Vu® Pro pages instead of live data. After you switch to view mode or close SiteBuilder, field communications resume automatically.

Using the Error Log

When an error occurs in the SiteBuilder database, a red triangle appears in the lower right corner of the screen indicating that a message has been written to the Error Log. The Error Log displays database errors for the current SiteBuilder session and erases the messages when you close SiteBuilder.

Click **File > Error Log** to view the errors or click the red triangle in the lower right corner.



SiteBuilder productivity tools

Use the following features to work efficiently in SiteBuilder.

To copy tree items

- 1 Right-click the item you want to copy.
NOTE Its children will be copied as well.
- 2 Select **Copy**.
- 3 Right-click the item that will be the new parent of the copied item.
- 4 Select **Paste**.
- 5 Double-click each pasted item to change its properties if necessary.

NOTE Use the *Library or Export/Import Clipping* (page 60) feature to copy and paste between two databases.

To replicate a tree item

The Replicate command makes copies of a tree item and all of its children. For example, if you have a building with 6 identical floors, you can build one floor, then replicate it 5 times. The Replicate command can generate the following for the item that you replicate:

- A unique name for each area or device
- A unique name and object instance number for each piece of equipment
- A unique IP address for each BACnet device router
- A unique address for each BACnet device




TIP Define all the properties of an item before you replicate it.

NOTES

- Plan carefully when replicating an item with children. When you replicate an item with children, `copy_of_` is added at the beginning of the children's reference names. The cleanup required may outweigh the benefits of the replication.
- The Replicate command does not copy phantom equipment.

To replicate an item:

- 1 Right-click an area, a piece of equipment, or a device that you want to replicate.
- 2 Select **Replicate**.
- 3 Enter values in the **Replicate** dialog box. See table below.
- 4 Click **OK**.



Field	Notes									
Number of Times To Replicate	The number of copies you want									
Name Template, Reference Name Template, and Starting Character to replace * in names	<p>SiteBuilder gives the first copy a unique name and reference name by replacing the * in the Templates with the Starting Character. For each additional copy, SiteBuilder increases or decreases the character.</p> <p>NOTES</p> <ul style="list-style-type: none"> The asterisk appears at the end of the name in the Template fields, but you may move it if needed. Use additional asterisks to insert zeros in the numbers. For example, to replicate 15 times with a Starting Number of 1: <table border="1"> <thead> <tr> <th>If Name Template Is...</th> <th>First copy's name Is...</th> <th>Last copy's name Is...</th> </tr> </thead> <tbody> <tr> <td>Building 1*</td> <td>Building 11</td> <td>Building 115</td> </tr> <tr> <td>Building **</td> <td>Building 101</td> <td>Building 115</td> </tr> </tbody> </table> <p> TIP See the results of your settings in the Preview box.</p>	If Name Template Is...	First copy's name Is...	Last copy's name Is...	Building 1*	Building 11	Building 115	Building **	Building 101	Building 115
If Name Template Is...	First copy's name Is...	Last copy's name Is...								
Building 1*	Building 11	Building 115								
Building **	Building 101	Building 115								
Increase characters or Decrease characters	<p>Increase: 1, 2, 3 or a, b, c</p> <p>Decrease: 9, 8, 7 or i, h, g</p>									
Specify Object Instance and Starting Object Instance Number	<p>Equipment only.</p> <p>Check Specify Object Instance and enter a starting number to set sequential numbers for each copy.</p> <p>Uncheck Specify Object Instance to have SiteBuilder assign the numbers.</p>									
IP Address Template and Starting Number	<p>BACnet device routers only.</p> <p>Enter an IP address and starting number to set a sequential IP address for each copy.</p>									
Starting Address Number	<p>BACnet devices only.</p> <p>Enter a starting address number to set a sequential address for each copy.</p>									

To rearrange sibling items

- 1 Select the item that you want to move.

NOTE Its children will move as well.

- 2 Move the item using one of the following methods:

- Click  or  on the toolbar.
- Hold down the **Alt** key, then press the up or down arrow key.

NOTE To move an item to different parent, use the **Cut** and **Paste** commands.

To delete tree items



CAUTION You cannot undo the **Delete** command. Save the database before you delete items.

- 1 Right-click the item you want to delete.
- 2 Select **Delete**.

NOTE When you delete a control device from the **Network** tree, its corresponding equipment on the **Geographic** tree becomes unassigned.

To find items in SiteBuilder

- 1 Click **Edit > Find**.
- 2 Type the text you are looking for in the **Find What** field.
- 3 To narrow the search, check:
 - **Case Sensitive** to find exact case. For example, Heat finds only Heat and Heating, but not heat or heating.
 - **Match Full Text** to find exact words. For example, Heat finds Heat, but not Heating.
- 4 Tell SiteBuilder where to search:
 - **Active Tree Only**—Check to search only the tree that is currently active. Uncheck to search all trees.
 - **From Current Location**—Check to search the selected item and its children. Uncheck to search from the top of the tree.
- 5 Check the types of information that you want SiteBuilder to search for in the properties dialog boxes.

NOTE Check **Type** to search Control Program, Controller, or Driver names. Check **Other** to search any other properties not specifically listed.
- 6 Click **Find**. The **Found Items** are listed.
- 7 Double-click a **Found Item** to highlight the item on the tree and to open its properties dialog box.

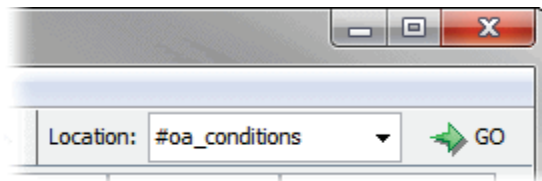
To find assigned tree items

Use the **Find In Tree** command to show an item's assigned counterpart on the opposite tree.

- 1 Right-click a tree item.
- 2 Select **Find In Network (or Geographic) Tree**.

To locate a tree item

- 1 Type or paste the item's path in the **Location** field.



NOTE Type the global reference name (for example, #oa_conditions) or the relative path (for example, geographic/world_corporation/first_floor/vav_101).

- 2 Press **Enter** or click **Go**.

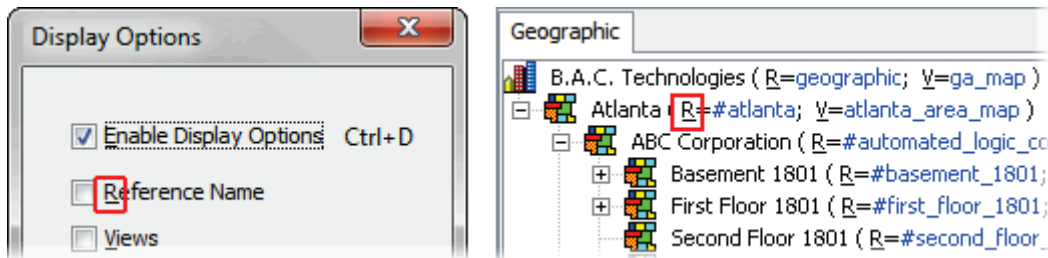
NOTE If the path does not match any item in the database, the text in the **Location** field turns red.

To show tree item details

To show details for the items on the **Geographic** and **Network** trees:

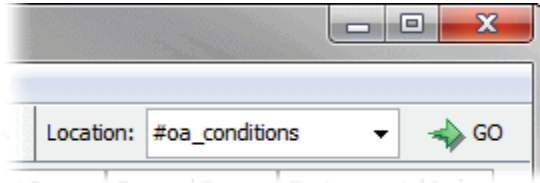
- 1 Select **View > Display**.
- 2 Check the options that you want to see.

NOTE Hold down the Alt key to see an underlined letter for each option in the **Display Options** dialog box. That letter identifies each option in the tree.



To copy a tree item's path

- 1 Select a tree item to view its path in the **Location** field.
- 2 Highlight the text in the field or triple-click it.



- 3 Press **Ctrl+C** to copy the path to the clipboard.
- 4 Paste this information into another application if desired.

Mouse and keyboard shortcuts

You can use typical mouse and keyboard shortcuts in SiteBuilder such as double-click, right-click, multiple-select, and the arrow keys.

Ctrl+drag Hold down the **Ctrl** key to drag and drop a copy of a selected item.

F6 Activates the opposite tree.

Using library items and clippings

SiteBuilder exports and imports items from one system to another, even if the database types are different. For example, you can export a library item or clipping from a Derby database and import it into a MySQL database.

Export/Import...	To...	Exported Items
<i>Library item</i> (see "To export and import library items" page 60)	Create generic Geographic tree items that can be reused as building blocks for new or existing systems.	<ul style="list-style-type: none">• A selected Geographic tree item• Reports• Alarm categories
<i>Clipping</i> (see "To export and import a clipping" page 61)	Move part or all of a system into another system for one-time integration of additions into a master system.	<ul style="list-style-type: none">• One or more selected Geographic and Network tree items including attached control programs, graphics, and drivers• Trend data (optional)• Reports• Alarm categories• Location-dependent security information• Schedules and schedule group membership (including the entire schedule group and schedules, if it does not exist in the target system)• Alarm actions

To export and import library items

You can export and import items from one database type to another. For example, you can export a library item from a Derby database and import it into a MySQL database.

To export library items

- 1 Right-click a **Geographic** tree item that you want to export to the library.
NOTE All children of the item will be exported as well.
- 2 Click **Export To Library**.
- 3 Click **Browse**.
- 4 Browse to an existing folder or create a new folder for the library you want to export.
- 5 Name the .library file.
- 6 Click **Select**.
- 7 Type the **Entry Name**.
- 8 Click **Next**.
- 9 Click **Finish**.

To import library items



- Do not save a database if you cancel an import command before the process is complete because items will be partially imported.
- Do not cancel an import command while running SiteBuilder concurrently with i-Vu_Pro_Server because items will be partially imported.

1 Right-click the **Geographic** tree item that will be the parent of the imported library item.

2 Select **Import From Library**.

3 Do one of the following:

- Select a library item from the list.
- Browse to the desired .library file, then click **Select**, then **Next**.

NOTE SiteBuilder generates a list of naming and numbering conflicts that were found during the import process. The **Original Value** and the **New Value** that SiteBuilder created to fix the conflict are listed beside the affected tree location name.

4 Select a **Severity Level** to filter the list of issues.

5 Select an issue from the list.

6 Click **Edit** to change the properties of that item.

7 Repeat steps 4 through 6 for each error.

NOTE Click **Save Messages** if you want to save the issues to a text file.

8 Click **Next**.

9 Click **Finish**.

To export and import a clipping

Clippings must be exported and imported into the same version of SiteBuilder, but they can be exported from one database type and imported into another database type. For example, you can export a clipping from a Derby database and import it into a MySQL database.

NOTE A site can have only one BACnet/IP network. The import process will automatically merge a clipping of a BACnet/IP network into the target system's BACnet/IP network if the networks have identical reference names. If the names are different, the import will create a second BACnet/IP network under the site, and you will have to manually correct this. See step 13 of *To import a clipping* (page 62).

To export a clipping

- 1 Select **File > Clipping > Export**.
- 2 On the **Geographic** or **Network** tree, select the tree items you want to include in the clipping. Use **Ctrl+click**, **Shift+click**, or both to select multiple items.
- 3 Click **Add** in the **Export Clipping** dialog box. Repeat steps 2 and 3 if necessary.
NOTE Red text in this list indicates that a corresponding device or assigned equipment is missing. Hover over the text for details.
- 4 Optional: Check **Include trend data** if you want historical trend data in the clipping.
NOTE The import and export can take a long time if trend data is included.
- 5 Click **Export**.
- 6 Name and save the exported file.
- 7 Click **Export**.
- 8 Close the **Export Clipping Progress** dialog box.

To import a clipping

NOTE You can also perform this task in the i-Vu® Pro interface if the clipping does not include trend data. A clipping with trend data can be imported only in SiteBuilder running in non-concurrent mode.

- 1 Save your SiteBuilder database.
- 2 Select **File > Clipping > Import**.
- 3 **Browse** to and select the clipping you want to import, then click **Next**.
- 4 Optional: If necessary, change the location path where the clipping will be imported, then click **Next**.
- 5 If asked if you want to replace event templates, follow the on-screen instructions.
- 6 If asked if you want to overwrite components, follow the on-screen instructions.

NOTES

- SiteBuilder lists any conflicts and problems that were found during the import. The **Original Value** and the **New Value**, if any, that SiteBuilder created to fix the conflict are listed beside the affected tree location name.
 - You cannot cancel the import process. If the import produces unwanted results, close SiteBuilder without saving your database. Any program or graphics files that were included in the clipping will still be imported.
- 7 Select a **Severity Level** to filter the list of issues.
 - 8 Select an issue from the list.
 - 9 Click **Edit** to change the properties of that item.
 - 10 Repeat steps 7 through 9 for each error.
NOTE Click **Save Messages** if you want to save the issues to a text file.
 - 11 Click **Next**.

12 Click **Finish**.

13 Do any of the following that apply.

If you imported...	Do the following in the SiteBuilder application...	Do the following in the i-Vu® Pro application...
Another site into the system	Change the new site's BACnet/IP network number to be the same as the other BACnet/IP network(s).	Download All Content to all Carrier IP routers in the system.
A second BACnet/IP network into a site	Move the items under the new network to the original BACnet/IP network, then delete the new network.	Download Parameters to any controllers that you moved.
Any controllers that use the SiteBuilder option Automatically Configure My BBMDs	N/A	Download BBMDs to the routers.
Any controllers that use manually configured BBMD tables	N/A	Update the routers' BBMD tables. See "To set up BBMDs through the i-Vu® Pro interface (page 78)" or "To set up BBMDs using the BBMD Configuration Tool (page 80)" in i-Vu® Pro Help.

Advanced topics

To set up i-Vu® Pro server communication

By default, the i-Vu® Pro server uses the following TCP and UDP ports.

Port	Traffic
TCP/IP 80	HTTP server
TCP/IP 443	Secure HTTP server (HTTPS)
TCP/IP 47806	Alarm Popup alarm action
UDP/IP 47808	BACnet (used by all BACnet vendors)

Under some circumstances, a facility may require the i-Vu_Pro_ server to use a different port for HTTP traffic. Or, you may need to set up secure i-Vu_Pro_ communication using TLS.

To change server communication settings:

- 1 In SiteBuilder, select **Configure > Preferences > Web Server**.
- 2 Enter appropriate values. See table below.

Field	Notes
Restrict to IP Address	If your i-Vu_Pro_ server has multiple IP addresses and you don't want i-Vu_Pro_ pages served to all the IP addresses, type the IP address that you want to serve pages on. Use this field only under the direction of Carrier Technical Support.
Enabled Web Server Ports	For systems with clients both on an internal network and that connect through the Internet, select Both HTTP and HTTPS . This allows you to configure your firewall so internal clients can use HTTP and external clients are required to use TLS.
HTTP Port	To use an HTTP port other than 80, the URL used on a client to access the i-Vu_Pro_ system must include the port. For example, for an HTTP port of 90, each client must use the URL <code>http://<servername>:90</code>
HTTPS Port	To use a secure port other than 443, the URL used on a client to access the i-Vu_Pro_ system must include the port. For example, to sue port 444, each client must use the URL <code>https://<servername>:444</code> To use https, you must set up TLS in your browser. See "What is TLS?" in i-Vu_Pro_ Help.
Keystore Password	See "What is TLS?" in i-Vu_Pro_ Help.
Allow TLS 1.1	If your system is set up to use TLS, i-Vu® Pro automatically uses TLS 1.2. If a i-Vu_Pro_ client computer cannot use TLS 1.2, you can check this box to allow the less secure TLS 1.1.

Field	Notes
Allow SOAP applications over HTTP	By default, i-Vu® Pro requires that SOAP applications run over HTTPS. If you have an external SOAP application that must run over HTTP, you can either change the application or check this box. NOTE User names and passwords are vulnerable over HTTP connections.
Allow unsigned add-ons	By default, i-Vu® Pro allows only add-ons that have been approved by Carrier. Check this box if you want to allow other unapproved add-ons in your system.
Authentication Provider	If your system has one or more i-Vu_Pro_ add-ons that provide a different user authentication mechanism such as LDAP or Active Directory, the add-on name(s) will appear in this list. Select the one you want to use from the list or leave it set on Default to use i-Vu_Pro_'s built-in mechanism. Depending on the add-on's capability, selecting a provider other than Default may affect any of the following: <ul style="list-style-type: none"> • Change the User Name and Password requirements in i-Vu_Pro_ • Remove operators or operator groups from the i-Vu_Pro_ interface • Display a different login page than i-Vu_Pro_'s standard login page

To disable default global reference names

SiteBuilder can create global and non-global reference names. SiteBuilder creates global reference names by default because they are easier to work with than non-global reference names. However, using non-global reference names can be more efficient for jobs with many identical areas. You can use both kinds of reference names in the same database.

Both types of reference names consist of lowercase letters, numbers, hyphens, and underscores (no spaces).

A global reference name begins with the pound sign (#) and must be unique within the entire system. A global reference name is a complete i-Vu® Pro path.

A non-global reference name must be unique only among its sibling tree items. You must specify absolute or relative paths when using non-global reference names. See “Defining i-Vu® Pro paths” in ViewBuilder Help for more information.

Follow the steps below to disable the global reference name default.

- 1 Select **Configure > Preferences**.
- 2 Uncheck **Make default reference names global (#refname)** on the **General** tab.

NOTE Changing this default will not affect existing reference names.

Changing a control program

If you change...	Then...	Notes
A control program's logic in the Snap application	Do one of the following in SiteBuilder to have the changes take effect: <ul style="list-style-type: none"> Right-click the equipment on the Geographic tree, then select Reload Control Program. Select Action > Reload Selected, select the control program(s) you want to reload, then click OK. 	Reloading updates all instances of a control program throughout the system and marks the controller(s) for an All Content download in the i-Vu® Pro interface.
Only a control program's parameters in the Snap application	Same as above.	Reloading marks the controller(s) for an Only Parameters download in the i-Vu® Pro interface.
Something in the control program that does not affect logic, such as Properties page text	Right-click the equipment on SiteBuilder's Geographic tree, then select Rebuild Equipment Pages .	No download required.
A control program in the i-Vu® Pro interface but then need to restore the original values set in the Snap application	Right-click the equipment on SiteBuilder's Geographic tree, then select Reset to Control Program Defaults .	This marks the controller(s) for an Only Parameters download in the i-Vu® Pro interface.

NOTES

- You can reload a control program or select a different control program in the i-Vu® Pro interface.
- If you change a control program in the Snap application and it does not display correctly in the i-Vu® Pro interface, **Ctrl+right-click** the i-Vu® Pro action pane, and then select **Refresh**.

To change or upgrade a driver



CAUTIONS

- Upgrading drivers requires an All Content download to all affected controllers. Downloading to all controllers at the same time can take several hours for a large system. Communication with the controllers is suspended during an All Content download.
- An All Content download clears trend, history, and alarm data from the affected controllers. At the beginning of the download process, trends that have the Trend Historian enabled are saved to the system database.

To change or upgrade a driver:

- 1 Copy the new driver to **webroot\<system_name>\drivers** folder.
- 2 In SiteBuilder, do one of the following:
 - o Upgrade multiple drivers. Select **Action > Scan For New Device Drivers**, then follow the on-screen instructions.

-or-

 - o Upgrade a single driver:
 - a. Double-click the driver on the **Network** tree.
 - b. Select the new driver from the **Driver Definition** drop-down list.
 - c. Click **OK**.
 - d. Select the device(s) to change in the **Change Which Devices** dialog box.
 - e. Click **OK**.

NOTES

- If a driver becomes corrupt (for example, a driver page is missing in the i-Vu® Pro interface), right-click the driver on the **Network** tree, then select **Reload Driver**. Reloading updates all instances of the driver throughout the system and marks the controller(s) for an All Content download. Changes you made on the i-Vu® Pro driver pages remain in effect.
- You can also change, upgrade, or reload a driver in the i-Vu® Pro interface.

Setting Open device IP addresses

For the i-Vu® Pro server to communicate with Carrier controllers on the IP network, the i-Vu® Pro server and each controller must have the following:

- IP address (unique and static)
- Subnet mask
- Default gateway address, if your system has a default gateway (IP router)

You can use one of the following IP addressing methods for the i-Vu® Pro system.

Use...	If...
<i>DHCP addressing</i> (page 68) (requires v6.0 or later controller drivers)	The IP network uses a DHCP server for IP addressing

Use...	If...
Custom addressing (page 69)	The answer to any of the following questions is yes and you do not have a DHCP server. <ul style="list-style-type: none"> • Will the system share a facility's existing IP data network? • Will it have 199 or more Carrier IP devices, or 254 or more devices with static IP addresses? • Will it be connected to the Internet? • Will it have at least one device located on the other side of an IP router? • Will it have any third-party controllers?
Default addressing (page 74)	The answer to all of the above questions is no.

To set an Open device's DHCP IP address

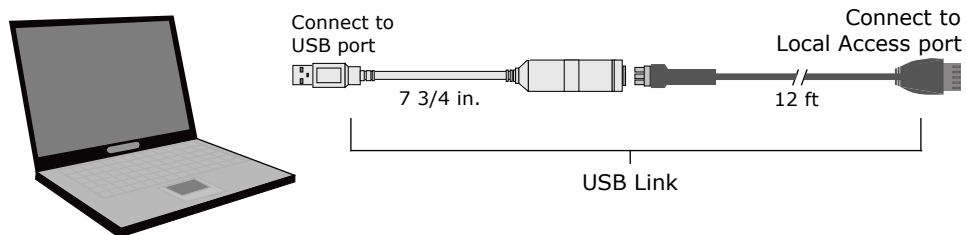
PREREQUISITES

- A computer with a USB port
- A USB Link cable

NOTE The USB Link driver is installed with i-Vu® Pro v5.1 or later systems. But if needed, you can get the latest driver from <http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>. Install the driver before you connect the USB Link to your computer

CAUTION If multiple controllers share power but polarity was not maintained when they were wired, the difference between the controller's ground and the computer's AC power ground could damage the USB Link and the controller. If you are not sure of the wiring polarity, use a USB isolator between the computer and the USB Link. Purchase a USB isolator online from a third-party manufacturer.

- 1 Connect the laptop to the controller or sensor using the appropriate USB Link cable(s).



NOTE If using a USB isolator, plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

- 2 i-Vu® Open Router or i-Vu® Open Link only: Turn off the router's power, set its **Router Config Mode** DIP switch to ON, then turn its power on again.
- 3 In SiteBuilder, set your **Configure > Preferences > Connections** tab settings.

Field	Value
Port	The laptop's Com port number that the USB Link is connected to.
Baud Rate	115200
Data Bits	8
Parity	None
Stop Bits	1

- 4 On the **Network** tree, double-click the controller.
- 5 On the **Address** tab, click **Module Status**.
- 6 Note the controller's **Ethernet MAC address**.
- 7 i-Vu® Open Router or i-Vu® Open Link only: When finished, turn off the controller's power, set its **Router Config Mode** DIP switch to **OFF** to restore normal functionality to the **Local Access** port, then turn the power on again.
- 8 Give the Ethernet MAC address to your DHCP network administrator and request that he reserve a static IP address for that MAC address.
- 9 Get from him the reserved IP address, subnet mask, and default gateway address for your router.
- 10 Repeat steps 1 and 2.
- 11 i-Vu® Open Router or i-Vu® Open Link only: Set the **DHCP/Assigned** DIP switch to **DHCP**.
- 12 Repeat steps 3 and 4.
- 13 On the **Address** tab, select **Specify a custom or DHCP IP Address**.
- 14 Type the **IP Address**, **Subnet Mask**, and **Default Gateway Address** that the DHCP network administrator gave you.
- 15 Click **Download Address**.
- 16 i-Vu® Open Router or i-Vu® Open Link only: Turn off the router's power, set its **Router Config Mode** DIP switch to ON, then turn its power on again.

To set the Open device's custom IP address

If your system's IP addresses are assigned by the network administrator, you can connect a laptop to a controller's Local Access Port and then use either of the following methods to set the controller's custom IP address so that the i-Vu® Pro server can communicate with it.

- *Set the custom IP address in SiteBuilder* (page 70)
- *Set the custom IP address using PuTTY* (page 71)

To set a controller's custom IP address in SiteBuilder

PREREQUISITES

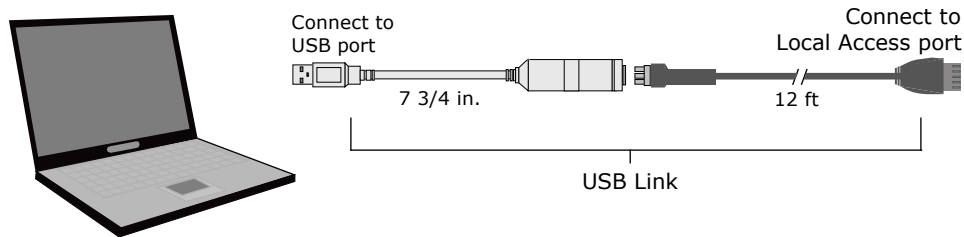
- A computer with a USB port
- A USB Link cable

NOTE The USB Link driver is installed with i-Vu® Pro v5 or later systems. But if needed, you can get the latest driver from <http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>. Install the driver before you connect the USB Link to your computer.



CAUTION If multiple controllers share power but polarity was not maintained when they were wired, the difference between the controller's ground and the computer's AC power ground could damage the USB Link and the controller. If you are not sure of the wiring polarity, use a USB isolator between the computer and the USB Link. Purchase a USB isolator online from a third-party manufacturer.

- 1 Connect the computer to the controller using the USB Link cable(s).



NOTE If using a USB isolator, plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

- 2 i-Vu® Open Router or i-Vu® Open Link only: Turn off the router's power, set its **Router Config Mode** DIP switch to ON, then turn its power on again. Set the router's **IP Address** DIP switch to **Assigned**.
- 3 In SiteBuilder, set your **Configure > Preferences, Connections** tab settings.

Field	Value
Port	The laptop's Com port number that the USB Link is connected to.
Baud Rate	115200
Data Bits	8
Parity	None
Stop Bits	1

- 1 Click **OK**.
- 2 In the Network tree, double-click the controller.
- 3 On the **Address** tab, select **Specify a custom or DHCP IP Address**.
- 4 Type the **IP Address**, **Subnet Mask**, and **Default Gateway Address**.

- 5 Click **Download Address**.
- 6 When the download is complete, click **Module Status** in the same dialog box to verify the controller's address.
- 7 i-Vu® Open Router or i-Vu® Open Link only: Turn off the router's power, set its **Router Config Mode** DIP switch to ON, then turn its power on again.

To set a controller's custom IP address using PuTTY

PREREQUISITES

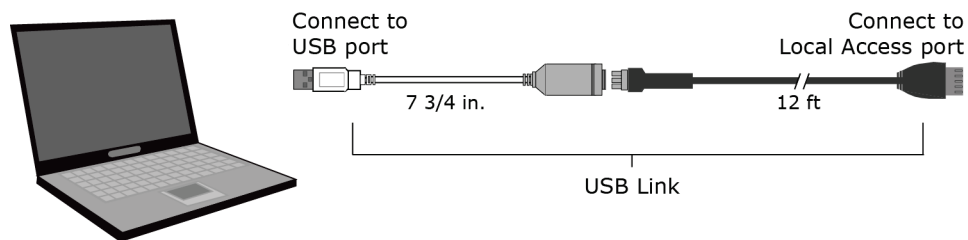
- A computer with a USB port
- A USB Link cable

NOTE The USB Link driver is installed with i-Vu® Pro v5 or later systems. But if needed, you can get the latest driver from <http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>. Install the driver before you connect the USB Link to your computer.



CAUTION If multiple controllers share power but polarity was not maintained when they were wired, the difference between the controller's ground and the computer's AC power ground could damage the USB Link and the controller. If you are not sure of the wiring polarity, use a USB isolator between the computer and the USB Link. Purchase a USB isolator online from a third-party manufacturer.

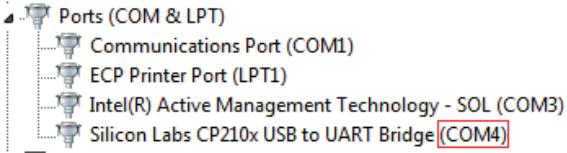
- 1 Download and install PuTTY from the *PuTTY website* (<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>).
- 2 Connect the laptop to the local access port of the controller, ZS sensor, or an SPT sensor using the USB Link cable(s).



NOTE If using a USB isolator, plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

- 3 i-Vu® Open Router or i-Vu® Open Link only: Turn off the router's power, set its **Router Config Mode** DIP switch to ON, then turn its power on again. Set the router's **IP Address** DIP switch to **Assigned**.
- 4 Start PuTTY.
- 5 Under **Category > Connection**, select **Serial**.

- 6 Under **Options controlling local serial lines**, enter the following settings:

Field	Value
Serial line to connect to	<p>Replace X with the computer's port number that the USB Link cable is connected to.</p> <p>NOTE To find the port number, select Start > Control Panel > System > Device Manager > Ports (Com & LPT). The COM port number is beside Silicon Labs CP210x USB to UART Bridge.</p> 
Speed (baud)	115200
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None

- 7 Click **Open**. A window similar to the one below appears.

```

1) Restart
2) Display Modstat
3) IP Address [192.168.1.6]
4) Subnet Mask [255.255.255.0]
5) Default Gateway [0.0.0.0]

```

- 8 If you changed a value, type 1, then press **Enter** to restart the controller.
- 9 Type the number of the address field, then press **Enter**.
- 10 Type the new address, then press **Enter**.
- 11 Type 1, then press **Enter** to restart the controller.
- 12 Close PuTTY.
- 13 i-Vu® Open Router or i-Vu® Open Link only: Turn off the router's power, set its **Router Config Mode** DIP switch to ON, then turn its power on again.

To remotely change a controller's custom IP address

Steps 1 through 5 below change the IP address in the controller. Steps 6 through 10 change it in the system database. Communication with the controller will be disrupted until all steps are performed.

- 1 On the i-Vu® Pro Installer navigation tree, right-click a router and select **Driver Properties > BACnet Router Properties** page.
- 2 Under **IP Configuration**, check **Enable IP configuration changeover**.
NOTE The field **Allow remote management of IP configuration** is for future use.
- 3 In the **Next** column, type the new **IP Address**, **Subnet Mask**, and **Default Gateway Address**. Type the **UDP Port** that your server is using to communicate to all controllers.
NOTE You must enter values in all 4 fields, even if the values will not change.
- 4 Do one of the following.

Set the Changeover timeout field to...	The router will use the Next settings...
0:00	As soon as the router can communicate with the Next Default Gateway Address .
A specific length of time	As soon as the router can communicate with the Next Default Gateway Address , or when the timeout expires, whichever occurs first.


- 5 Click **Accept**.
- 6 On the **System Options** tree, select **Connections**.
- 7 On the **Configure** tab, select the **BACnet/IP Connection**, then click **Disconnect**.
- 8 On the navigation tree, go to the controller's **Properties** page.
- 9 Make the necessary changes in the **Address** and **Subnet mask** fields.
- 10 Click **Accept**.
- 11 On the **System Options** tree, select **Connections**.
- 12 On the **Configure** tab, select the **BACnet/IP Connection**, then click **Start**.
- 13 On the navigation tree, go to the router's **Properties** page, then click **Module Status** to verify communication.

To set the Open device's default IP address

NOTES

- If you want to use the default IP addressing but a DHCP server exists, follow the instructions in *To set a controller's custom IP address* (page 69), and enter the default addresses listed in step 2 below.
- A network using default addressing does not have a default gateway (IP router).

1 If wired for power, turn off the controller's power.

2  The controller only reads the rotary switch positions during power up or upon reset.

3 i-Vu® Open Router or i-Vu® Open Link only: Set the **DHCP/Assigned** DIP switch to the **Assigned** position to use the following IP networking parameters.

IP address = 192.168.168.**x**

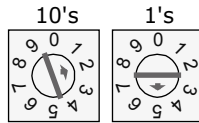
where **x** is the controller address you will set in steps 3 and 4.

Subnet mask = 255.255.255.0

Default gateway address = 192.168.168.254

4 Using the rotary switches, set the controller's address to match the **Address** in the controller's properties dialog box in SiteBuilder. Set the **Tens (10's)** switch to the tens digit of the address, and set the **Ones (1's)** switch to the ones digit.

EXAMPLE Setting the switches as shown in the figures below produces an IP address of 192.168.168.25.



5 On SiteBuilder's **Network** tree, double-click the controller.

6 On the **Address** tab, select **Use Default IP Address**.

7 In the **Address (Dial Setting on Device)** field, type the value of **x**.

8 Click **OK**.

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

Setting i-Vu® XT device IP addresses

For the i-Vu® Pro server to communicate with Carrier controllers on the IP network, the i-Vu® Pro server and each controller must have the following:

- IP address (unique on the IP network)
- Subnet mask
- Default gateway address, if your system has a default gateway (IP router)

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

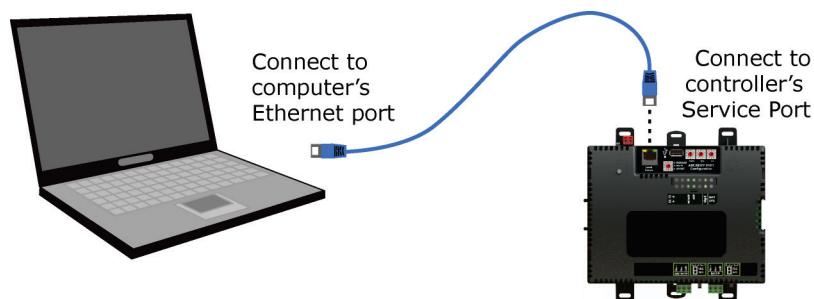
Use a...	If...
DHCP IP Address generated by a DHCP server	The IP network uses a DHCP server for IP addressing
Custom Static IP Address from your network administrator	You do not use a DHCP server and the answer to any of the following questions is yes. Will the i-Vu® Pro system: <ul style="list-style-type: none"> • 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 the IP address in the controller setup pages

You must define the i-Vu® XT device's IP address in 2 places, in SiteBuilder and in the controller setup pages. Defining it in the controller setup pages sets the IP address in the controller. To open the controller setup pages:

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



- 2 If your computer uses a static IP address, set the address to 169.254.1.x, where x is 2 or greater. If it uses a DHCP address, leave the address as it is.

- 3 Turn off the computer's Wi-Fi if it is on.
- 4 Open a web browser on the computer.
- 5 Navigate to <http://local.access> or <http://169.254.1.1> to see the controller setup pages.

To set a DHCP IP address

- 1 On the controller setup pages **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 controller setup pages **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**.

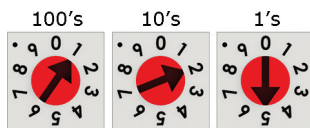
To set a default IP address

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 controller setup pages **Ports** tab under **IP Port**, select **Default IP Address**.
- 3 Click **Save**.

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

To remotely change an i-Vu® XT device's custom IP address

Steps 1 through 5 below change the IP address in the controller. Steps 6 through 10 change it in the system database. Communication with the controller will be disrupted until all steps are performed.

- 1 On the i-Vu® Pro navigation tree, right-click a router and select **Driver Properties > BACnet Router Properties** page.
- 2 Under **IP Configuration**, select **Enable IP configuration changeover**.
- 3 In the **Next** column, type the new **IP Address**, **Subnet Mask**, and **Default Gateway Address**. Type the **UDP Port** that your server is using to communicate to all controllers.

NOTE You must enter values in all 4 fields, even if the values will not change.

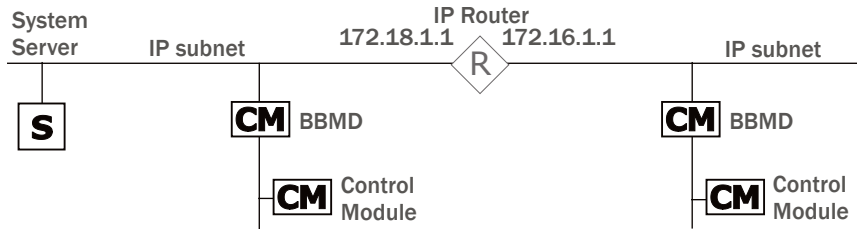
- 4 Do one of the following.

Set the Changeover timeout field to...	To have the controller use the Next settings...
0:00	As soon as the controller can communicate with the Next Default Gateway Address .
A specific length of time	As soon as the controller can communicate with the Next Default Gateway Address , or when the timeout expires, whichever occurs first.

- 5 Click **Accept**.
- 6 On the **System Options** tree, select **Connections**.
- 7 On the **Configure** tab, select the **BACnet/IP Connection**, then click **Stop**.
- 8 On the navigation tree, go to the controller's **Properties** page.
- 9 Make the necessary changes in the **Address**, **Subnet mask**, and **Default Gateway** fields.
- 10 Click **Accept**.
- 11 On the **System Options** tree, select **Connections**.
- 12 On the **Configure** tab, select the **BACnet/IP Connection**, then click **Start**.
- 13 On the navigation tree, go to the controller's **Properties** page, then click **Module Status** to verify communication with the controller.

Setting up BACnet Broadcast Management Devices (BBMDs)

To minimize network communications, IP routers do not pass on broadcasts that they receive. If your system has <control-module>s on different IP subnets separated by an IP router, you must set up a BACnet router on each IP subnet as a BACnet Broadcast Management Device (BBMD). A BBMD passes BACnet/IP broadcasts across the IP router to other BBMDs.



The following Carrier BACnet routers can function as a BBMD on an IP subnet:

Open routers:	i-Vu® XT routers:
i-Vu® Open Link	i-Vu® XT Router
i-Vu® Open Router	i-Vu® XT BACnet Link

To set up BBMDs, use the appropriate method in the table below.

If your i-Vu® Pro system has...	Use this method
Fewer than 50 IP subnets with no third-party BACnet routers	Let SiteBuilder automatically configure your BBMDs.
Any of the following: <ul style="list-style-type: none"> • More than 50 IP subnets • Carrier controllers on an IP subnet that has a third-party BBMD • Carrier controllers that need to communicate with third-party devices on a different IP subnet 	Set up custom BBMDs in the i-Vu® Pro interface or in the BBMD Configuration Tool.

NOTE If the i-Vu® Pro server is on an IP subnet without the Carrier BACnet router, register the server as a foreign device. See *To set up the i-Vu® Pro server as a foreign device* (page 81).

To set up BBMDs in SiteBuilder

As you add each Carrier BACnet router to an IP network on the **Network** tree, check **Automatically Configure My BBMDs** on the **Address** tab. SiteBuilder automatically selects a controller in each IP subnet as the BBMD and sets up BBMD tables appropriately.

To see which BACnet routers SiteBuilder assigned as BBMDs, select **View > Display > BBMD**. BBMDs show **B=assigned** on the **Network** tree.

To override SiteBuilder's BBMD selection, right-click a different BACnet router on the same IP subnet, then select **Force to BBMD**.

NOTE If you are managing 3rd party BBMDs, you must add every 3rd party device that could be a BBMD as a 3rd party device router in SiteBuilder.

To set up BBMDs through the i-Vu® Pro interface

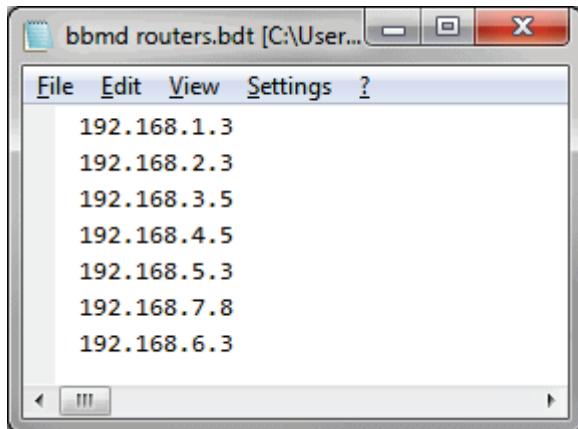
- 1 Make a list of the IP addresses for every controller that will function as a BBMD in your system.





CAUTION Multiple BBMDs on an IP subnet disrupt BACnet communications. Define only one BBMD on either side of each IP router in your system.

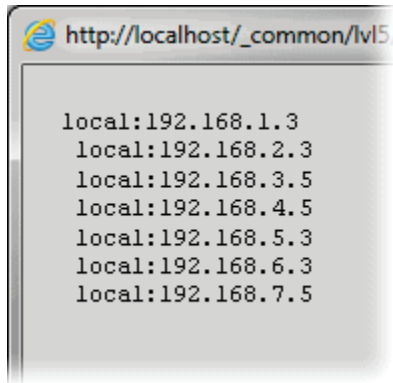
- 2 In Notepad, type the list putting each IP address on a separate line. (Open routers support up to 50 IP addresses per .bdt file; i-Vu® XT routers support up to 500.)

NOTE If you must communicate with a third-party router that does not use the BACnet/IP port 47808 (Oxbac0), you must include the hexadecimal port number in the IP address. For example, 172.168.23.67:0xe78a



- 3 Save the file in the **webroot**\<system_name> folder with a .bdt extension instead of .txt.
- 4 On the i-Vu® Pro navigation tree, select one of the Carrier controllers that will function as a BBMD.
- 5 To check if the controller has an existing BBMD table, click  and select **Manual Command**.
- 6 In the manual command field, type: `bbmd read x.x.x.x`
where x.x.x.x is the IP address of the controller you are on.
- 7 Click **OK**.
- 8 If the Broadcast Distribution Table contains IP addresses that are not in your .bdt file, add them to your .bdt file.
- 9 Click  and select **Manual Command**.
- 10 In the manual command field, type: `bbmd write filename.bdt x.x.x.x`
where `filename.bdt` is the .bdt file in the **webroot**\<system_name> folder and `x.x.x.x` is the IP address of the controller you are on.
- 11 Click **OK**.

- 12 Issue another bbmd read command to verify that the .bdt file was written correctly.



To set up BBMDs using the BBMD Configuration Tool

Before you begin, do the following:

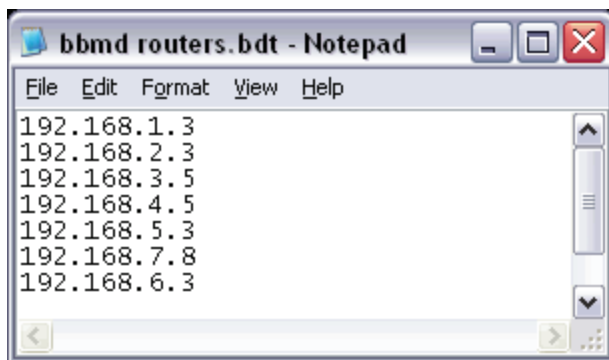
- o Set up the IP address, subnet mask, default gateway, and network numbers for the i-Vu® Pro server and each Carrier controller on the IP network. See *Setting custom TCP/IP addresses* (page 67).
- o The **BBMD Configuration Tool** is available on the i-Vu® Tech Tools DVD or go to <http://www.hvacpartners.com> (<http://www.hvacpartners.com>).

- 1 Make a list of the IP addresses for every controller that will function as a BBMD in your system.

 **CAUTION** Multiple BBMDs on an IP subnet disrupt BACnet communications. Define only one BBMD on either side of each IP router in your system.

- 2 In Notepad, type the list putting each IP address on a separate line. (Maximum of 50 IP addresses per .bdt file)

NOTE If you must communicate with a third-party router that does not use the BACnet/IP port 47808 (0xbac0), you must include the hexadecimal port number in the IP address. For example, 192.168.23.67:0xe78a



- 3 Save the file in the **webroot**\<system_name> folder with a .bdt extension instead of .txt.
- 4 Open the BBMD Configuration Tool.

- 5 In the i-Vu® CCN Router/i-Vu® Link or i-Vu® Open Router/i-Vu® Open Link **Address**, or **Host Name** field, type the IP address of the Carrier controller that functions as the BBMD (BACnet Broadcast Management Device) for its subnet.
- 6 To check if the controller has an existing BBMD table, click the Broadcast Distribution Table **Read** button.
- 7 If the **Broadcast Distribution Table** contains IP addresses that are not in your .bdt file, add them to your .bdt file.
- 8 Verify that the same controller IP address is still in the i-Vu® CCN Router/i-Vu® Link or i-Vu® Open Router/i-Vu® Open Link **Address** or **Host Name** field.
- 9 Click the Broadcast Distribution Table **Browse** button, then select the .bdt file that you made in step 2.
- 10 Click the Broadcast Distribution Table **Write** button.
- 11 Click **Read** again to verify that the new .bdt file was written to the Carrier controller.
- 12 Repeat steps 5 through 11 for each Carrier controller that will function as a BBMD in your system.

```

Read Broadcast Distribution Table
81 02 00 04
-----
192.168.1.3:
Read Broadcast Distribution Table Ack
192.168.1.3:47808 255.255.255.255
192.168.2.3:47808 255.255.255.255
192.168.3.5:47808 255.255.255.255
192.168.4.5:47808 255.255.255.255
192.168.5.3:47808 255.255.255.255
192.168.7.8:47808 255.255.255.255
192.168.6.3:47808 255.255.255.255
81 03 00 4A C0 A8 01 03 BA C0 FF FF FF FF C0 A8
02 03 BA C0 FF FF FF FF C0 A8 03 05 BA C0 FF FF
FF FF C0 A8 04 05 BA C0 FF FF FF FF C0 A8 05 03
BA C0 FF FF FF FF C0 A8 07 08 BA C0 FF FF FF FF
C0 A8 06 03 BA C0 FF FF FF FF
-----


```

To set up the i-Vu® Pro server as a foreign device

If the i-Vu® Pro server is on an IP subnet without an Carrier BACnet router, register the server as a foreign device to a BBMD in the system. That BBMD will then forward BACnet broadcasts to the server. Register the server with the BBMD that will have the fastest response time. Response time is affected by distance and network complexity.

- 1 Click  > **System Options** > **Connections**.
- 2 On the **Configure** tab, select **BACnet/IP Connection**.
- 3 If the **Status** column shows:
 - o **Connected**, click **Disconnect**.
 - o **Stopped** or **Design Mode**, go to step 4.
- 4 Type the i-Vu® Pro server's IP address in the **IP Address** field. (172.18.64.37, in the example above.)

NOTE If you have more than one network interface card, type the address that connects to the controller network.
- 5 Type the i-Vu® Pro server's subnet mask in the **IP Subnet Mask** field. (255.255.0.0, in the example above.)
- 6 Select **Force Registration** from the **Foreign Device** drop-down list.

- 7 Select the BBMD in the **Primary BBMD** field.
- 8 To have a backup in case the first BBMD fails, select another BBMD in the **Backup BBMD if primary fails** field.
- 9 Click  next to **Tuning Parameters**.
- 10 Keep the 600-second default value in the **Register FD Interval** field.
NOTE If the re-registration does not occur within this time, the BBMD will delete the i-Vu® Pro server from its list.
- 11 Click **OK**.
- 12 If running i-Vu® Pro Server (not i-Vu® Pro Design Server), select the **BACnet/IP Connection**, then click **Start**.

If your system does not have any BBMDs

Follow the steps below to create pseudo BBMDs so that you can register the server.

- 1 In the SiteBuilder application, double-click each BACnet router and check **Automatically Configure My BBMDs** on the **Address** tab.
- 2 In the i-Vu® Pro application, select any location on the navigation tree.
- 3 Run the manual command `bbmd update` to create a blank .bdt table in every router and mark them for download.
- 4 Download parameters to the routers.
- 5 Follow the steps above to register the i-Vu® Pro server as a foreign device to one of the routers.

Upgrading the i-Vu® Pro system

To upgrade to the i-Vu® Pro v6.5 system, see the *i-Vu® Application Upgrade Guide to v6.5*.

Working with databases

A i-Vu® Pro system has 4 databases: Main, Alarms, Trends, Audit Log.

An Apache Derby database is in the `\webroot\<system>\databases` folder.

An SQL Server® Express database is in the `\webroot\<system>` folder. You can get a copy of your system by copying the system folder.

A MySQL, Oracle, PostGreSQL, or SQL Server® database is in the database management system's file structure, not in your i-Vu® Pro system folder.

Use the following SiteBuilder features to work with your databases.

Relocate	Lets you define the new location of one or more system databases. EXAMPLES <ul style="list-style-type: none"> • If you move the trends database to a new server, use Relocate to tell the i-Vu® Pro application the database's new location. • Use Relocate to move data from My SQL databases on an old database server to MySQL databases on a new server. NOTE Does not apply to Apache Derby or SQL Serve®r Express databases.
Migrate	Moves the 4 i-Vu® Pro databases to a new database type. EXAMPLE Create an Apache Derby system, move the system to the customer's server, then migrate the databases to the final database type such as MySQL.
Replicate	Makes a copy of selected databases and/or system files in a new folder under \webroot . EXAMPLE Use Replicate to create a backup of your PostgreSQL system. See <i>System maintenance</i> (page 86) for another way to back up your system.
Clippings	Lets you export navigation tree portions of a system, then import them into a different system. See <i>Using library items and clippings</i> (page 60).

To relocate a database

- 1 Open your system in SiteBuilder.
- 2 Click **File > Manage Database > Migrate/Replicate**.
- 3 Select **Relocate**, then click **Next**.
- 4 Choose the database you want to relocate.
- 5 Type the connect string(s). See *Database Connect Strings* (page 84).
- 6 Change the **Login** and **Password** if you are using a different user name and password, then click **Next**.
- 7 Verify your selection(s). If correct, click **Next**. If you want to change your selection, click **Previous**.
- 8 Click **Finish**.

To migrate the databases

- 1 Open your system in SiteBuilder.
- 2 Click **File > Manage Database > Migrate/Replicate**.
- 3 Select **Migrate**, then click **Next**.
- 4 Select the **Database Type** from the drop-down list, then click **Next**. If migrating to Apache Derby or SQLServer Express, go to step 8.
- 5 Type the connect string(s). See *Database Connect Strings* (page 84).
- 6 Type in the **Login** and **Password**, then click **Next**.
- 7 Verify your selection. If correct, click **Next**. If you want to change your selection, click **Previous**.
- 8 Click **Finish**.

To replicate a database

- 1 Open your system in SiteBuilder.
- 2 Click **File > Manage Database > Migrate/Replicate**.
- 3 Select **Replicate database**, then click **Next**.
- 4 In the **New System Name** field, type the name of the copy.
- 5 Select the **Database Type** from the drop-down list, then click **Next**.
- 6 Choose the databases or files that you want to replicate.
- 7 Click **Next**. If replicating an Apache Derby or SQLServer Express database, go to step 10.
- 8 Type the connect string(s). See *Database Connect Strings* (page 84).



WARNING The **Main Database Connect String** must be different than the original system's. Using the same string will destroy the original database.

- 9 Type the **Login** and **Password**, then click **Next**.
- 10 Verify your selection(s). If correct, click **Next**. If you want to change your selection, click **Previous**.
- 11 Click **Finish**.

Database Connect Strings

For MySQL, Oracle, PostgreSQL, or SQL Server databases, you must enter the **Database Connect Strings**.

Database Connect Strings:

Server

Type one of the following:

- `localhost` if the i-Vu® Pro application and the database are on the same machine
- The name or IP address of the machine that the database is on if different than the i-Vu® Pro application

Port

Do one of the following:

- Type the appropriate default port number from the list below.
- Type the port number that the database uses for communication if different than the database default.

Default ports are:

MySQL	3306
Oracle	1521
PostgreSQL	5432
SQLServer	1433

Instance

The name that you gave the i-Vu® Pro database in the database application.

NOTE If the 4 i-Vu® databases do not reside under the default instance of SQL, then the instance name must be specified under the **Instance** column. The syntax for specifying the instance name of the SQL server is

`<Database>;instance=<instance name>`. For example, if the SQL instance name is `hvac`, the syntax for the Instance field for the main database called `iVu_Main` would be `iVu_Main;instance=hvac`.

Database User:

Login	The user login that you set up in the database application.
Password	The password that you set up in the database application.

NOTE To change **Database Connect Strings** for an existing system, select the **Modify database connection parameters** in the **File > Open** dialog box, then click **Next**.

Database Connect Strings:

Server	Type one of the following: <ul style="list-style-type: none">• <code>localhost</code> if the i-Vu® Pro application and the database are on the same machine• The name or IP address of the machine that the database is on if different than the i-Vu® Pro application								
Port	Do one of the following: <ul style="list-style-type: none">• Type the appropriate default port number from the list below.• Type the port number that the database uses for communication if different than the database default. Default ports are: <table><tr><td>MySQL</td><td>3306</td></tr><tr><td>Oracle</td><td>1521</td></tr><tr><td>PostgreSQL</td><td>5432</td></tr><tr><td>SQL Server</td><td>1433</td></tr></table>	MySQL	3306	Oracle	1521	PostgreSQL	5432	SQL Server	1433
MySQL	3306								
Oracle	1521								
PostgreSQL	5432								
SQL Server	1433								
Instance	The name that you gave the i-Vu® Pro database in the database application.								

Database User:

Login	The user login that you set up in the database application.
Password	The password that you set up in the database application.

NOTE To change **Database Connect Strings** for an existing system, select the **Modify database connection parameters** in the **File > Open** dialog box, then click **Next**.

System database maintenance

You should perform the following system maintenance on a regular basis. See *To safely shut down the i-Vu® Pro application for database server maintenance* (page 87) before doing any maintenance on your database server.

To back up a system

The type of database your system uses determines the method you use to back up the system.



CAUTION Do Not use SiteBuilder's Replicate feature to back up your database.

For Apache Derby or SQL Server Express

- 1 Shut down the SiteBuilder and i-Vu_Pro_Server applications.
- 2 In the **i-Vu_Pro_x.x\webroot** folder, copy your system folder.
- 3 Paste the copy to a new location.



TIP Zip the copy before transporting it over a network or to a USB drive.

For MySQL, MS SQL Server, or PostgreSQL

- 1 Follow the instructions above to copy your system folder in **i-Vu_Pro_x.x\webroot**.
- 2 Use the database management system's backup method. See *To safely shut down the i-Vu® Pro application for database server* (page 87) maintenance before doing any maintenance on your database server.

To compact and defragment

In a new i-Vu® Pro system, the records in a database are contiguous. As records are added, deleted, and modified, the records become scattered in the database. This condition, called fragmentation, can slow down system performance and increase the database size. Compact the database to correct this situation.

The files on the server's hard drive can also become fragmented. Defragment the hard drive to correct this situation.

You should compact and defragment on a regular schedule such as once a month. But, you may need to do these more often, depending on how often the data or files change.

NOTE Compacting a database may take several minutes to several hours, depending on its size.



TIP To minimize the effects of fragmentation, you should maintain at least 20% free disk space on the server.

Compacting the database

The following databases are compacted dynamically—compacting occurs in the background when a database is open.

- MySQL
- MS SQL Server
- MS SQL Server Express
- PostgreSQL

To compact a Derby database:

- 1 Shut down the SiteBuilder and i-Vu® Pro Server applications.
- 2 Open a Windows command prompt application and type `cd c:\i-Vu_Pro_x.x`, replacing x.x with your system version number.
- 3 Click **Enter**.
- 4 Type `"Derby Compression Tool.exe" <system name>`.
- 5 Click **Enter**.
- 6 When compacting finishes, close the command window.

Defragmenting the server's hard drive

For all database types, use a defragmentation utility such as Windows Disk Defragmenter or Norton SystemWorks.

NOTE If you are using a single computer as both the i-Vu® Pro server and the client, you must defragment the disk more often than the disk of a dedicated server—especially if people access the Internet from this computer.

To minimize the database size

The larger a database is, the less responsive it may become. Deleting closed alarm incident groups, expired schedules, and expired historical trends on a regular basis will reduce the database size. You can set up your i-Vu® Pro application to automatically delete these. See "System Settings > Scheduled Tasks tab" in i-Vu® Pro Help.

To safely shut down the i-Vu® Pro application for database server maintenance

Occasionally, the database server is shut down for maintenance or backups. If this is done without shutting down the i-Vu® Pro Server first, the database may get locked and the i-Vu® Pro application may not be able to reconnect.

- 1 Shut down the i-Vu® Pro application.
- 2 Shut down the database server.
- 3 Perform the maintenance or repair needed on the server.
- 4 Restart the database server.
- 5 Restart the i-Vu® Pro application.

Miscellaneous SiteBuilder menu commands

Menu command	Notes				
File > Open System Folder	When you have a database open in SiteBuilder, this command opens the system folder in Windows® Explorer.				
File > All Source Files > Import/Export	Use to export source files to a .zip file that can be imported into another i-Vu® Pro or Field Assistant system. Source files include: <ul style="list-style-type: none"> • Control programs (.equipment files only) • Drivers • Graphics (.view files only) • Touchscreen files • BACview® files • Report design files for Equipment Values or Trend Sample reports <p>NOTE If import detects a difference between a database file and an import file with the same name, import does not overwrite the database file. A message lists any file differences so that you can resolve them.</p>				
Edit > Run Global Point Count	Select the system level on the Geographic tree, then select this menu command to display the number of: <table border="1" data-bbox="673 846 1427 1234"> <tr> <td>Allowed points</td> <td>Points allowed by your system</td> </tr> <tr> <td>System points</td> <td>These include: <ul style="list-style-type: none"> • Network inputs/outputs with an address whose device does not exist in the database • All microblocks that have an input/output number assigned • The following display microblocks: AI, AO, AV, BI, BO, BV, MSI, MSO, MSV <p>NOTES</p> <ul style="list-style-type: none"> • RS or Airflow microblocks count as 1 point. • Does not count expander numbers greater than 89. </td> </tr> </table>	Allowed points	Points allowed by your system	System points	These include: <ul style="list-style-type: none"> • Network inputs/outputs with an address whose device does not exist in the database • All microblocks that have an input/output number assigned • The following display microblocks: AI, AO, AV, BI, BO, BV, MSI, MSO, MSV <p>NOTES</p> <ul style="list-style-type: none"> • RS or Airflow microblocks count as 1 point. • Does not count expander numbers greater than 89.
Allowed points	Points allowed by your system				
System points	These include: <ul style="list-style-type: none"> • Network inputs/outputs with an address whose device does not exist in the database • All microblocks that have an input/output number assigned • The following display microblocks: AI, AO, AV, BI, BO, BV, MSI, MSO, MSV <p>NOTES</p> <ul style="list-style-type: none"> • RS or Airflow microblocks count as 1 point. • Does not count expander numbers greater than 89. 				
Edit > Run Local Point Count	This command is like Run Global Point Count except that it counts points at and below the selected item.				
Edit > Run Point Count	Select an item on the Network tree, then select this menu command to display the number of non-BACnet third-party points allowed by a controller and an estimate of the number of third-party points used.				
Edit > Rebuild Graphic Resources	See “Setting up your system for non-English languages” in i-Vu® Pro Help.				
Edit > Export (or Import) Checkout Information	See "Commissioning Equipment" in i-Vu® Pro Help.				
Configure > Preferences > Language	See “Setting up your system for non-English languages” in i-Vu® Pro Help. <p>Current Session affects only what you see in SiteBuilder, and is not part of the system you create.</p>				
Configure > Preferences > Font	Click the name in the Font column to see a different font in SiteBuilder.				

Menu command	Notes
Action > Reload Selected	Use this command to select which control programs and drivers you want to reload. All occurrences of the selected items are reloaded.
Action > Compile JSP Cache	If the i-Vu® Pro server has a Pentium III ® processor, you may want to compile jsp cache as part of commissioning a system. Compile JSP Cache prepares and stores every i-Vu® Pro page on the server so that it can quickly serve pages to client browsers.
Action > Check Database Integrity	Use as Technical Support directs.
Tools > Configure Tools	Use this command if directed by Technical Support to install an added SiteBuilder feature.
Help > Apply Update	Use this command as directed by installation instructions for i-Vu® Pro service packs or patches.
Help > About > Java VM tab	<p>If the system runs slowly when performing memory-intensive tasks or produces "Out of memory" errors in the i-Vu® Pro Server application or in log files, you can increase the amount of memory that the i-Vu® Pro application is permitted to use. On the Java VM tab, click Memory Settings. If your i-Vu® Pro server is a 64-bit machine with at least 6 GB RAM, change Maximum memory to 3000 MB.</p> <p>NOTES</p> <ul style="list-style-type: none"> • The memory setting for the 64-bit machine depends on the size of the i-Vu® Pro system and what other services are running on the machine. For example, you could change the memory to 4000 MB if the database server is on a different machine. • You can also change this setting from i-Vu® Pro Server's Help > About menu command.

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*
		No changes yet	

* For internal use only



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