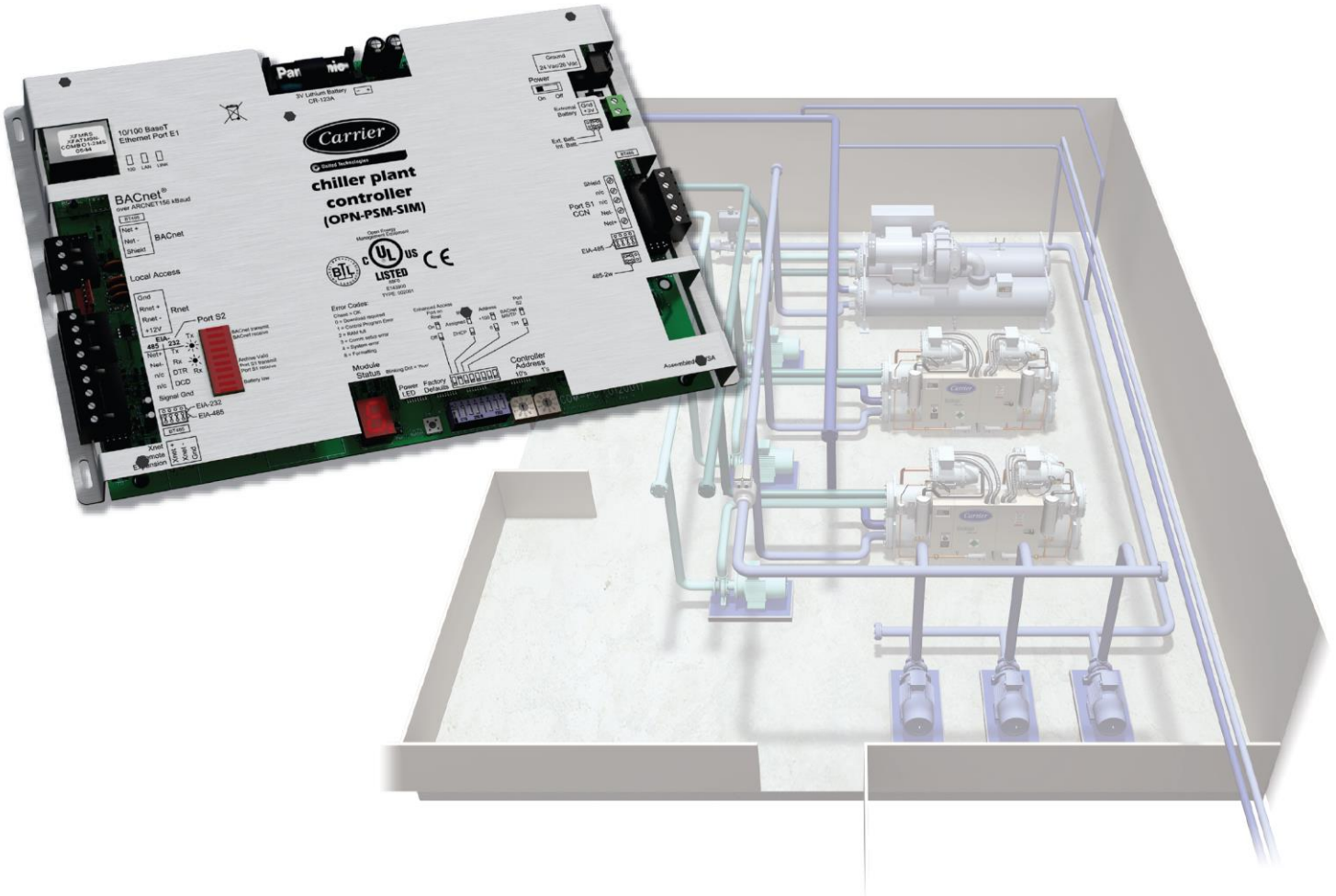
Carrier® ChillerVu™ (OPN-PSM-SIM) Installation and Start-up Guide



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

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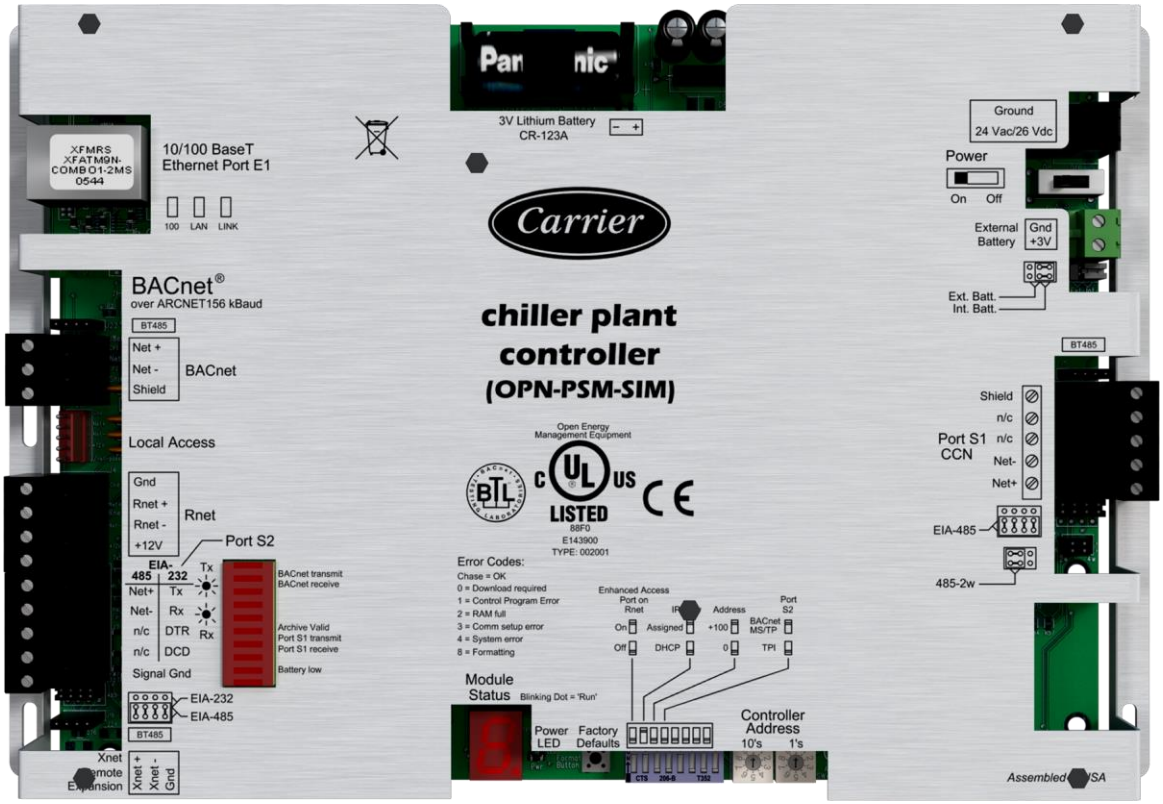
What is the Carrier® ChillerVu™?

Part #OPN-PSM-SIM

The Carrier® ChillerVu™ provides full and advanced chiller plant management using an EquipmentBuilder library of validated algorithms and strategies that enhance operation. You can apply the algorithms as designed or customize them in the EIKON® application. You can also integrate the Carrier® ChillerVu™ with third party equipment using open protocols.

You can select from the following protocols:

- BACnet MS/TP
- BACnet ARC156
- Modbus
- LonWorks Explicit
- CCN



Carrier® ChillerVu™ specifications

Driver	drv_psm_x-xxx-xxx
Maximum number of control programs*	999
Maximum number of BACnet objects*	12000
Maximum number of third-party integration points using the EIKON® application*†	1000
* Depends on available memory † BACnet third-party integration points are not counted.	
Power	24 Vac ±10%, 50–60 Hz, 24 VA 26 Vdc ±10%, 10 W
10/100 BaseT Ethernet Port	For communication on the Ethernet at 10 or 100 Mbps, half duplex For LAN, BACnet/Ethernet, BACnet/IP, and/or Modbus TCP/IP communications
BACnet port	For BACnet ARC156 communication
Port S1	5-pin EIA-485 for CCN Network and/or CCN Service Tool connection (9600 and 38400 baud)
Port S2	Configurable EIA-485/EIA-232 for third party network connections, including: • BACnet MS/TP @ 9600, 19200, 38400, and 76800 baud • Modbus (RTU and ASCII modes) @ 9600, 19200, 38400, and 76800 baud • LonWorks (requires SLTA-10 adapter) @ 38400 and 76800 baud
Rnet port	The standard control programs that are included with the Carrier® ChillerVu™ library do not use communicating sensors or touchscreen devices. A custom control program can allow you to connect to the Rnet port. • Supports up to 15 wireless and/or ZS sensors, and one Equipment Touch or TruVu™ ET Display or OptiPoint™ interface • Supplies 12 Vdc/210 mA power to the Rnet at an ambient temperature of 77°F (25°C) with a 24 Vac nominal power source. NOTE Ambient temperature and power source fluctuations may reduce the power supplied by the Rnet port. **NOTE** If the total power required by the sensors on the Rnet exceeds the power supplied by the Rnet port, use an external power source. The Wireless Adapter, Equipment Touch, or TruVu™ ET Display or OptiPoint™ interface must be powered by an external power source. See the specifications in each device's Installation and Start-up Guide to determine the power required.
Rnet Local Access port	For system start-up and troubleshooting
Xnet Remote Expansion	For communication with Automated Logic® MEx or Carrier MPC Open XPIO expanders Up to 6 expanders with a maximum of 144 points between the Carrier® ChillerVu™ and the expanders

Microprocessor	32-bit Motorola Power PC microprocessor with cache memory, Fast Ethernet controller, high performance 32-bit communication co-processor, ARCNET communication co-processor, and I/O expansion CAN co-processor
Memory	16 MB non-volatile battery-backed RAM (with 12 MB available for use), 8 MB Flash memory, 32-bit memory bus
Real-time clock	Battery-backed real-time clock keeps track of time in event of power failure
Battery	10-year Lithium CR123A battery retains the following data for a maximum of 720 hours during power outages: time, control programs, editable properties, schedules, and trends. To conserve battery life, you can set the driver to turn off battery backup after a specified number of days and depend on the archive function to restore data when the power returns. A low battery is indicated by the **Battery low** LED or a low battery alarm in the WebCTRL® application.
Protection	Built-in surge and transient protection for power and communications in compliance with EN61000-6-1. Incoming power and network connections are protected by non-replaceable internal solid-state polyswitches that reset themselves when the condition that causes a fault returns to normal. The power and network connections are also protected against transient excess voltage/surge events lasting no more than 10 msec. **CAUTION** To protect against large electrical surges on serial EIA-485 networks, place a PROT485 at each place wire enters or exits the building.
BT485 connector	You attach a BT485 (not included) to a controller at the beginning and end of a network segment to add bias and to terminate a network segment.
Status indicators	LEDs indicate status of communications and low battery status. Seven segment display indicates running, error, and power status.
Environmental operating range	-20 to 140°F (-29 to 60°C), 10–90% relative humidity, non-condensing
Physical	Rugged aluminum cover, removable screw-type terminal blocks
Overall dimensions	Width: 11 5/16 in. (28.7 cm) Height: 7 1/2 in. (19 cm)
Mounting dimensions	Width: 10 13/16 in. (27.5 cm) Height: 5 in. (12.7 cm)
Recommended panel depth	2 3/4 in. (7cm)
Weight	1.4 lbs (0.64 kg)
Listed by	UL-916 (PAZX), cUL-916 (PAZX7), FCC Part 15-Subpart B-Class A, CE

Using expanders

You can connect expanders to the Carrier® ChillerVu™ to increase the number of inputs and outputs, up to a total of 6 expanders connected to the Xnet.

The Carrier® ChillerVu™ is compatible with the following expanders:

Automated Logic®

- MEx016u
- MEx48u
- MEx816u
- MEx88u

Carrier®

- MPC Open XPIO48
- MPC Open XPIO816

For details on individual expanders, see the Automated Logic® expander's *Technical Instructions* or the Carrier *MPC Open XP and MPC Open XPIO48/816 Installation and Start-up Guide*.

Safety considerations

WARNING Disconnect electrical power to the Carrier® ChillerVu™ before wiring it. Failure to follow this warning could cause electrical shock, personal injury, or damage to the controller.

Mounting the Carrier® ChillerVu™

WARNING

When you handle the Carrier® ChillerVu™:

- Do not contaminate the printed circuit board with fingerprints, moisture, or any foreign material.
- Do not touch components or leads.
- Handle the board by its edges.
- Isolate from high voltage or electrostatic discharge.
- Ensure that you are properly grounded.

Screw the Carrier® ChillerVu™ into an enclosed panel using the mounting slots on the cover plate. Leave about 2 in. (5 cm) on each side of the controller for wiring. See mounting dimensions in *Specifications* (page 2).

If using expanders, see *Installing an expander* (page 7) before mounting the controller.

Wiring the Carrier® ChillerVu™ for power

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

CAUTIONS

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

To wire for power

1. Turn off the Carrier® ChillerVu™'s power switch to prevent it from powering up before you can verify the correct voltage.
2. Remove primary power from the 24 Vac transformer.
3. Pull the screw terminal connector from the controller's power terminals labeled **Ground** and **24 Vac/26 Vdc**.
4. Connect the transformer wires to the screw terminal connector.
5. Apply primary power to the transformer.
6. Measure the voltage at the Carrier® ChillerVu™'s power screw terminal connector to verify that the voltage is within the operating range of 21.6 - 26.4 Vac.
7. Insert the screw terminal connector into the Carrier® ChillerVu™'s power terminals.
8. Turn on the Carrier® ChillerVu™'s power switch.
9. Verify that the Power LED is on and the Run LED is blinking.

Installing an expander to the Carrier® ChillerVu™

The Carrier® ChillerVu™ is compatible with the following expanders:

Automated Logic®

- MEx016u
- MEx48u
- MEx816u
- MEx88u

Carrier

- MPC Open XPIO48
- MPC Open XPIO816

To install an expander, see the following:

1 *Mount the expander.* (page 7)

2 *Wire the expander for power.* (page 8)

3 *Address the expander.* (page 9)

4 *Wire inputs and outputs.* (page 9)

For details on individual expanders, see the Automated Logic® expander's *Technical Instructions* or the Carrier *MPC Open XP Installation and Start-up Guide*.

To mount an expander

WARNING

When you handle the expander:
- Do not contaminate the printed circuit board with fingerprints, moisture, or any foreign material.
- Do not touch components or leads.
- Handle the board by its edges.
- Isolate from high voltage or electrostatic discharge.
- Ensure that you are properly grounded.

Wiring restrictions for connecting the expanders to the Carrier® ChillerVu™

- Maximum length: 100 feet (30 meters)
- 22 or 24 AWG, low-capacitance, twisted, stranded, shielded copper wire

Mount the expanders by the Carrier® ChillerVu™, by screwing the expander into an enclosed panel, using the mounting slots on the coverplate. Leave about 2 in. (5 cm) on each side of the controller for wiring.

To attach expanders

Do not exceed 100 feet total wire length.

1 Wire the controller's **Xnet Remote Expansion** port to the same port on the expander.

Connect:

- Gnd to Gnd
- Xnet- to Xnet-
- Xnet+ to Xnet+

NOTE To use more than one expander, wire their **Xnet Remote Expansion** ports together in a daisy-chain configuration. The Carrier® ChillerVu™ must be the first device on the expander network.

2 You must set the Xnet baud rate to 500 kbps in the WebCTRL® interface on the driver's **Xnet** page. See *To set up the driver* (page 36).

3 If the expander network has more than one expander, place the **Term** jumper in the down position or remove it from all expanders except the one at the end of the expander network. The **Term** jumper must be in the up position on the expander at the end of the network.

To wire the expander for power

CAUTIONS

- The expanders are powered by a Class 2 power source. Take appropriate isolation measures when mounting it in a control panel where non-Class 2 circuits are present.
- For the Carrier® ChillerVu™ to recognize an attached expander, you must turn on the expander before you turn on the Carrier® ChillerVu™.

1 Verify that the expander's power switch is in the **Off** position.

2 Connect the 24 Vac power source to the **24 Vac/26 Vdc** and **Ground** terminals, being sure to maintain proper polarity if power is being shared.

3 Turn on the expander's power switch.

4 Verify that the expander's **Power** LED is on and the **Run** LED is blinking.

To set the expander's address

You must give the expanders an address that is unique on the expander network.

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

2 Set the expander's address on the rotary switch.

EXAMPLE If the controller's address is 2, point the arrow on the switch to 2.

NOTE The Carrier® ChillerVu™ can have a maximum of 6 expanders. You MUST address the expanders as 1 through 6. Higher addresses will not work.

3 Turn on the expander's power and then turn on the attached controller's power. The controller reads the powered expander's address each time you turn on the controller.

⚠ **CAUTION** The first time the controller communicates with an expander, it triggers a software download. This may occur if the expander(s) are blank (not a normal condition) and in cases where the controller's driver has been updated. During that time, the red **Error** LED and the green **Run** LED on the expander(s) flash in sequence. This process may take several minutes to complete. Do not disconnect power or communications wiring during this download.

To wire inputs and outputs

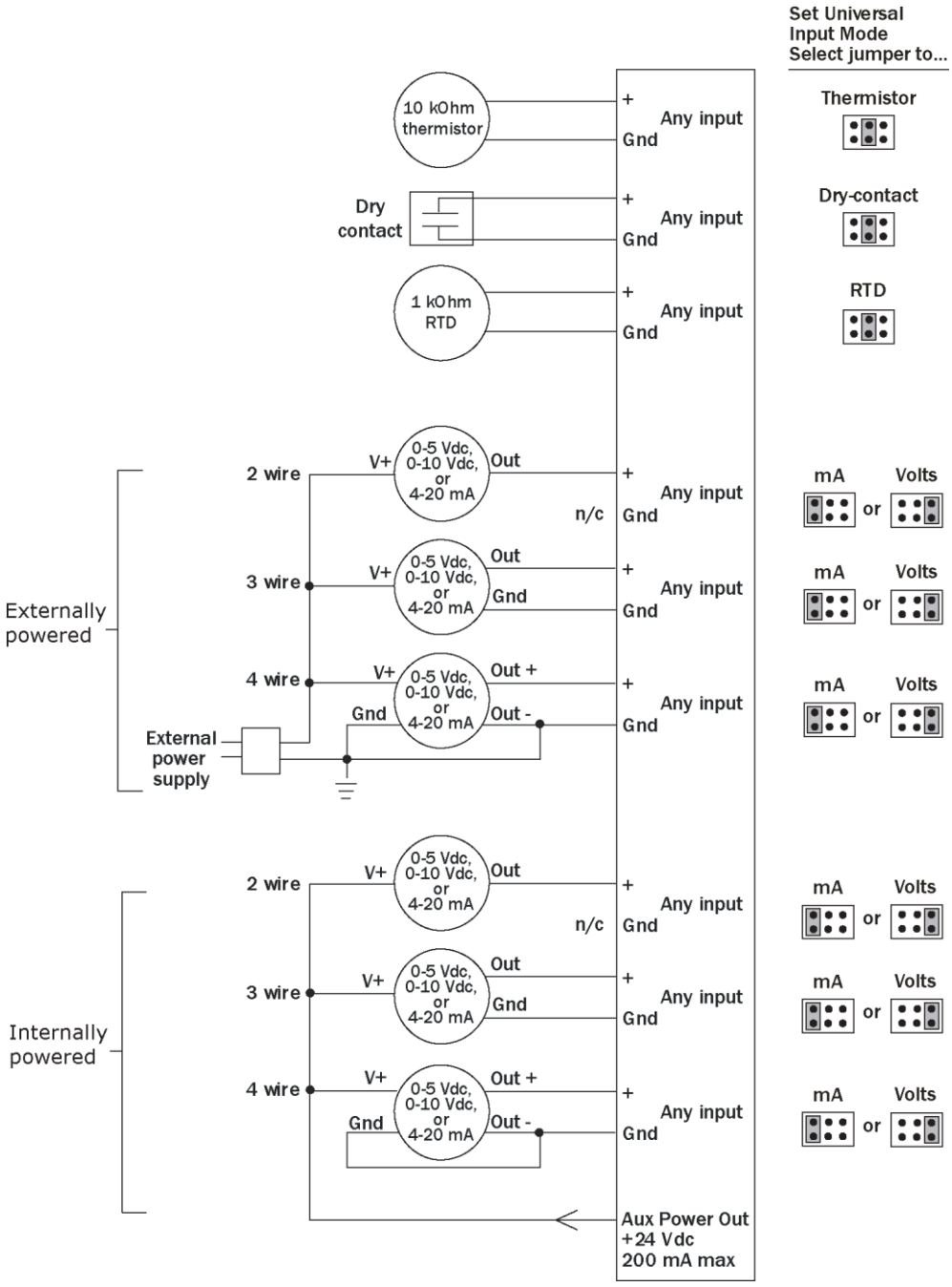
The following applies to the inputs and outputs on the Automated Logic® and Carrier expanders.

1 Turn **off** the expander's power.

2 Connect the input wiring to the screw terminals on the expander. See figure below.

NOTES

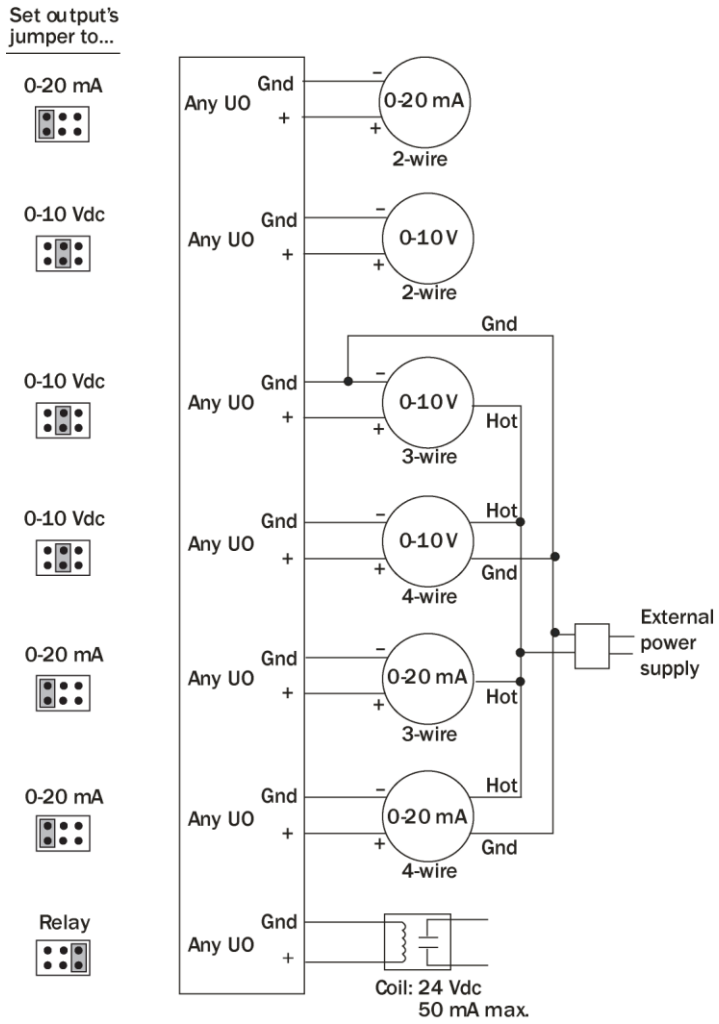
- Connect the shield wire to the **GND** terminal with the ground wire.
- For a loop-powered 4-20 mA sensor, wire the sensor's positive terminal to the **+** terminal on the expander's **Aux Power Out** connector. Wire the sensor's negative terminal to an input's **+** terminal.



3 Set each input's **Universal Input Mode Select** jumper to indicate the type of input.

4 Connect digital and analog output wiring to the **UO** screw terminals on the expander and to the controlled device. Connect the ground wire to the UO's **Gnd** terminal.

WARNING! Binary outputs are powered, 24 Vdc channels. Dry contact binary outputs are not supported. Do NOT apply 24 Vac to these universal outputs.



5 Set each output's jumper to the type of device wired to the output.

6 For each digital output, turn the output's potentiometer clockwise until it stops (maximum output).

7 Turn on the expander's power.

Addressing the Carrier® ChillerVu™

The Carrier® ChillerVu™ needs two addresses, one for the controller network and one for the Ethernet.

The Carrier® ChillerVu™ needs...	That is unique on the...	Notes	See...
A MAC address	controller network	You set the MAC address on the controller's rotary switches.	*To set the controller network MAC address* (page 13)
An IP address	Ethernet	You can use one of the following:	
		• The **default** IP address that your system creates: ○ IP address = 192.168.168.**x** where **x** is the controller network MAC address. ○ Subnet mask = 255.255.255.0	*To use a default IP address* (page 13)
		• A DHCP IP address	*To use a DHCP IP address* (page 14)
		• Assign a **custom** IP address	*To use a custom IP address* (page 14)

NOTES

- 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.
- The controller network MAC address and IP address are defined in SiteBuilder in the controller's properties dialog box.
- You can address the Carrier® ChillerVu™ before or after you wire it for power.

To set the controller network MAC address

CAUTIONS

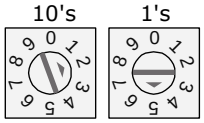
- The MAC address must be unique on the controller network.
- If you are using default IP addressing, the MAC address must match the last octet of the **Address** field in the controller's properties dialog box in SiteBuilder.

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

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

2 Use the rotary switches to set the address. 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 If the controller's address is 25, point the arrow on the **Tens** (**10's**) switch to 2 and the arrow on the **Ones** (**1's**) switch to 5.



To use a default IP address

CAUTION The IP address must be unique on the Ethernet.

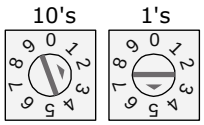
1 If wired for power, turn off the controller's power.

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

3 Set the **IP Addr** DIP switch to **Assigned** (**On**).

4 Use the rotary switches to set the Carrier® ChillerVu™'s address. 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 If the controller's address is 25, point the arrow on the **Tens** (**10's**) switch to 2 and the arrow on the **Ones** (**1's**) switch to 5.



5 Set the **+100/0** DIP switch to **On** to add 100 to **x** in the IP address.

EXAMPLE If you turn on this DIP switch and the controller network MAC address is 25, the IP address is 192.168.168.125.

6 Connect Port E1, which is the only port that speaks BACnet over IP.

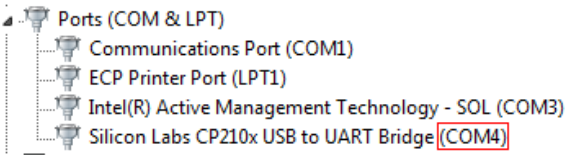
The default address is an intranet address. Data packets from this address are not routable to the Internet.

To obtain an IP address using DHCP

1. Turn the Carrier® ChillerVu™'s power off.
2. Check the communications wiring for shorts and grounds.
3. Set the **IP Addr** DIP switch to **DHCP** (**Off**).
4. Set **Enhanced Access Port** DIP switch to **Off**.
5. Connect Port E1, which is the only port that speaks BACnet over IP.
6. Turn the Carrier® ChillerVu™'s power on. The DHCP server assigns an IP address to the Carrier® ChillerVu™.
7. Set a unique Device Instance number using a touchscreen device, Hyperterminal, or *PuTTY* (page 26).
8. Turn the controller's power off, then on again.

To assign a custom IP address

1. Obtain the IP address, subnet mask, and default gateway address for the controller from the facility network administrator.
2. Set the Carrier® ChillerVu™'s **Enhanced Access** DIP switch to **ON**.
3. Set the **Assigned/DHCP** DIP switch to **Assigned**.
4. Turn off the controller's power.
5. Connect a laptop with the WebCTRL® Server to the Carrier® ChillerVu™'s **Local Access** port. See *To communicate through the local access port* (page 42).
6. In SiteBuilder, set your **Configure** > **Preferences** > **Connections** tab settings.

Field	Value
Port	The computer's port number that the USB cable is connected to. **NOTE** To find the port number, plug the USB cable into the computer's USB port, then select **Start** > **Control Panel** > **System** > **Device Manager** > **Ports (Com & LPT)**. The COM port number is beside **Silicon Labs CP210x USB to UART Bridge**. 
Baud Rate	115200
Data Bits	8
Parity	None
Stop Bits	1

7 On the **Network** tree, double-click the controller.

8 On the **Address** tab, select **Specify a custom or DHCP IP Address**.

9 Type the **IP Address**, **Subnet Mask**, and **Default Gateway Address**.

10 Click **Download Address**.

11 When the download is complete, click **Module Status** in the same dialog box to verify the controller's address.

12 When finished, set the Carrier® ChillerVu™'s **Enhanced Access** DIP switch to **OFF** to restore normal functionality to the **Local Access** port.

13 Turn on the controller's power.

Wiring for communications

The Carrier® ChillerVu™ communicates using BACnet and/or third-party protocols, and can connect to a variety of port types at multiple baud rates. See table below.

Port	Protocol	Port type(s)	Baud rate(s)
Ethernet Port E1	BACnet/IP BACnet/Ethernet Modbus/IP Telnet Diagnostics **NOTE** All protocols can run simultaneously.	Ethernet	10 Mbps 100 Mbps
BACnet	BACnet ARC156	EIA-485 (2-wire)	156 kbps
S1	CCN	EIA-485 (2-wire)	9600 bps 19.2 kbps 38.4 kbps
S2 [1]	BACnet MS/TP	EIA-485 (2-wire)	9600 bps 19.2 kbps 38.4 kbps 76.8 kbps (default)
	Modbus	EIA-232 EIA-485 (2-wire) EIA-485 (4-wire)	Various
LonWorks	Lonworks Explicit	5-pin Port S2 to connect LonWorks SLTA-10	57.6 kbps
Local Access	Enhanced Access	Rnet [2]	115.2 kbps

[1] **Port S2** supports only one protocol and one wire type at a time.

[2] See *Wiring devices to the Carrier® ChillerVu™'s Rnet port* (page 28).

Ethernet, BACnet MS/TP, ARC156, and CCN wiring specifications

For...	Use...	Maximum Length
Ethernet	CAT5e or higher Ethernet cable	328 feet (100 meters)
BACnet MS/TP* BACnet ARC156*	22 or 24 AWG, low-capacitance, twisted, stranded, shielded copper wire	2000 feet (610 meters)
CCN	• 3-conductor • 18 or 20 AWG stranded tinned copper wire • Polyethylene insulation, PVC jacket • Shielded with a drain wire • Belden wire P#8772 or similar **NOTE** Must meet the above requirements	1000 feet (305 meters)

*For details see the *Open Controller Network Wiring Guide*.

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

To wire to a BACnet/ARC156 network

1. Turn **off** the Carrier® ChillerVu™'s power.
2. Check the communications wiring for shorts and grounds.
3. Connect the communications wiring to the controller's screw terminals labeled **Net +**, **Net -**, and **Shield**.

   NOTE Use the same polarity throughout the network segment.
4. If the Carrier® ChillerVu™ is at either end of a network segment, connect a BT485 to the Carrier® ChillerVu™.
5. Turn **on** the Carrier® ChillerVu™'s power.
6. Verify communication with the network by viewing a Module Status report in the WebCTRL® interface.

Ethernet and BACnet MS/TP wiring specifications

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

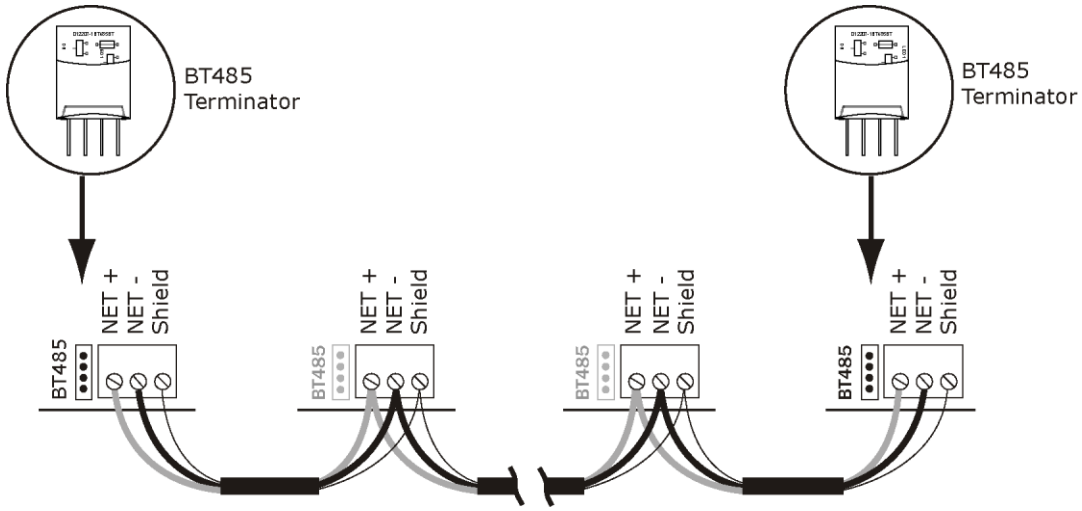
WARNING Do not apply line voltage (mains voltage) to the controller's ports and terminals.

To wire to a BACnet MS/TP network

The Carrier® ChillerVu™ communicates using BACnet on an MS/TP network segment communications at 9600 bps, 19.2 kbps, 38.4 kbps, or 76.8 kbps.

Wire the controllers on an MS/TP network segment in a daisy-chain configuration.

Install a BT485 on the first and last controller on a network segment to add bias and prevent signal distortions due to echoing.



See the *MS/TP Networking and Wiring Installation Guide* for more details.

1. Turn **off** the Carrier® ChillerVu™'s power.
2. Check the communications wiring for shorts and grounds.
3. Connect the communications wiring to the controller's screw terminals labeled **Net+** and **Net-** on **Port S2**.

   NOTE Use the same polarity throughout the network segment.
4. Set the **Port S2 MS/TP** DIP switch to **Enable** (**ON**).
5. If the Carrier® ChillerVu™ is at either end of a network segment, connect a BT485 to the Carrier® ChillerVu™.
6. Turn **on** the Carrier® ChillerVu™'s power.
7. To change the port's baud rate, see *To set a port's baud rate using PuTTY* (page 26).

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

To connect the Carrier® ChillerVu™ to the Ethernet

Connect an Ethernet cable to the Ethernet port.

NOTE If your system has controllers on different IP subnets separated by an IP router, you must configure one controller on each subnet as a BACnet Broadcast Management Device (BBMD). Do not configure more than one BBMD per subnet as this would cause circular routes. To avoid this problem:

- Let SiteBuilder automatically configure your BBMD tables. (SiteBuilder defines only one controller per IP subnet as a BBMD.)
- Use the BBMD Configuration Tool to make sure that a controller's BBMD table does not contain the IP addresses of other controllers on the same IP subnet.

To wire to a BACnet over Ethernet network

1. Turn off the power for the Carrier® ChillerVu™ by disconnecting power terminals.

   NOTE The controller reads the address each time you turn it on.
2. Connect Port E1, which is the only port that speaks BACnet over Ethernet.
3. Turn on the power for the Carrier® ChillerVu™ by connecting power terminals.
4. See *Addressing the Carrier® ChillerVu™* (page 12) for details on setting the IP address. You can use *PuTTY* (page 26) or a touchscreen device.
5. Use a Modstat to find your Ethernet hexadecimal address and enter that in SiteBuilder.

To wire to the BACnet over IP network (DHCP)

1. Turn **off** the Carrier® ChillerVu™'s power.
2. Check the communications wiring for shorts and grounds.
3. Set the **Assigned/DHCP** DIP switch to the **DHCP** position.
4. Set the **+100/0** DIP switch to **On** to add 100 to **x** in the IP address.

   EXAMPLE If you turn on this DIP switch and the MAC address is 25, the IP address is 192.168.168.125.

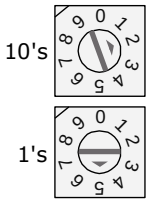
   NOTE The DHCP address is an intranet address. Data packets from this address are not routable to the Internet.
5. Verify DIP switch **1** is set to **Off**.
6. Connect Port E1, which is the only port that speaks BACnet over IP.
7. Turn **on** the Carrier® ChillerVu™'s power.
8. Set a unique Device Instance number using a touchscreen device or *PuTTY* (page 26).

To wire to a BACnet over IP network (assign a custom IP)

1 Turn **off** the Carrier® ChillerVu™'s power.

2 Using the rotary switches, set the Carrier® ChillerVu™'s address. 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 If the controller's address is 25, point the arrow on the **Tens** (**10**'s) switch to 2 and the arrow on the **Ones** (**1**'s) switch to 5.



3 Obtain the IP address, subnet mask, and default gateway address for the controller from the facility network administrator.

4 Set the **Assigned/DHCP** DIP switch to the **Assigned** position.

5 Set the **+100/0** DIP switch to **On** to add 100 to **x** in the IP address.

EXAMPLE If you turn on this DIP switch and the MAC address is 25, the IP address is 192.168.168.125.

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

6 Set the following using a touchscreen device or *PuTTY* (page 26).

- IP address
- A unique Device Instance number

7 Connect Port E1, which is the only port that speaks BACnet over IP.

Wiring Specifications

- 328 feet (100 meters)
- Use one of the following CAT5 or higher Ethernet cables:
  - A cross-over cable to connect the Carrier® ChillerVu™ directly to the third-party device
  - A straight-through cable to connect the Carrier® ChillerVu™ to a hub or switch, and a second straight-through cable to connect the hub or switch to the third-party device

NOTE Use the same polarity throughout the network segment.

8 Turn **on** the Carrier® ChillerVu™'s power.

To wire to a CCN network

1 Turn off the Carrier® ChillerVu™'s power.

2 Check the communications wiring for shorts and grounds.

3 Verify that the Port S1 485/232 jumper is set to EIA-485 (left side) and the 2/4 jumper to 485-2w (right side).

4 Connect the Carrier® ChillerVu™'s Port S1 to the CCN bus. Use the same polarity throughout the network segment.

Wire this Port S1 terminal	To this CCN device terminal
Signal Ground (Pin 5)	**G**
Net- (Pin 2)	**-**
Net+ (Pin 1)	**+**

NOTE The CCN Shield should be tied/taped back or daisy chained if the Carrier® ChillerVu™ is not at one end of the bus.

5 Turn **on** the Carrier® ChillerVu™'s power.

Commission the Carrier® ChillerVu™ using Network Service Tool

1 Use **Network Service Tool V** (NST V) to connect the Carrier® ChillerVu™ directly into Port S1, which is designated for CCN communications.

2 Upload the Carrier® ChillerVu™ (Default CCN Address 0, 1).

NOTE After uploading the controller the CCN address should be changed to something other than 0,1. This avoids addressing conflicts when uploading Carrier equipment into the i-Vu application. When using NSTV the CCN address can be changed by highlighting the Carrier® ChillerVu™ and then clicking on the Display/set properties icon.

3 Access the **Service Configuration Table** IP_CONF to enter the following configuration options:

NOTE A static IP address is required, as DHCP is not supported.

- **Host IP Address** - enter the device manager's IP address, provided by the LAN administrator (allowable entries for xxx.xxx.xxx.xxx: xxx is a decimal number between 0 - 255)
- **Subnet Mask** - enter the device manager's IP address, provided by the LAN administrator (allowable entries for xxx.xxx.xxx.xxx: xxx is a decimal number between 0 - 255)
- **Default Gateway** - enter the IP Gateway's IP address, provided by the LAN administrator (typically a router on the Ethernet LAN).

CCN ENET Configuration

Device Type -

- Select **0** for **Gateway** if the converter connects the primary CCN Bus (Bus 0) to the Ethernet. Toggle the spacebar to select **0**.
- Select **1** for **Bridge** if the converter connects a secondary CCN Bus to the Ethernet. Toggle the spacebar to select **1**. The CCN Element number of the CCN Bridge becomes the CCN secondary bus number assigned to controllers residing on the network.

  NOTE You can only have one Gateway per system.

  If configured as a Bridge:

- **CCN/Ethernet Gateway Address** - enter the IP address of the i-Vu® device manager that is configured as the CCN Ethernet Gateway. This is the same address that was entered in the Host IP address for the CCN Gateway. (Entries are allowed for xxx.xxx.xxx.xxx:xxx are decimal numbers between 0 - 255.)

  NOTE When the device manager is configured as the Gateway, it ignores the CCN/Ethernet Gateway IP address. In this case, leave the CCN/Ethernet gateway address at its default setting (0.0.0.0.).

Wiring for third party protocols

You can connect third party protocols after you set up BACnet. The drv_psm for the Carrier® ChillerVu™ allows access to the following third party protocols. Additional drivers are not required.

You can use this combination of protocols or a subset of them:

BACnet port (ARC156 only) AND Port S1 (CCN only) AND Port S2 (1 of 3 protocols) AND Port E1 (all 4 protocols or any combination of them)

Port	Protocol(s)
BACnet	BACnet ARC156
Port S1	CCN
Port S2	1 of the following 3 protocols - DIP switch selectable (TPI or MS/TP) • BACnet MS/TP • Modbus RTU • LonWorks via SLTA
Port E1	All or any combination of the following: • BACnet/IP • BACnet/Ethernet • Modbus/IP • CCN/IP

To wire to Modbus RTU on Port S2

NOTE You can use Port S2 for Modbus RTU or Lon SLTA-10, but not at the same time.

1. Turn **off** the Carrier® ChillerVu™'s power.
2. Set DIP switch 5 to **TPI**.
3. Set jumpers to **EIA-485** and **Half Duplex**.
4. Connect the communications wiring to Port S2. Connect to **Net+**, **Net-**, and **Gnd**.

   Wiring specifications

   - A dedicated 24 AWG to 18 AWG twisted pair wire (EIA-485)
   - 2000 feet (610 meters) for 76.8 kbps
   - 3000 feet (914.4 meters) for 9600 bps, 19.2 or 38.4 kbps, before needing a Repeater
   - Devices should be daisy chained and not star wired
   - If the Carrier® ChillerVu™ is at either end of a network segment, connect a BT485 to the Carrier® ChillerVu™

   NOTE Use the same polarity throughout the network segment.

5. In the WebCTRL® interface, go to **Driver Properties** > **Protocols** > **Modbus** and enter the baud rate.
6. Turn **on** the Carrier® ChillerVu™'s power.

To wire to a Modbus over IP network

1. Turn **off** the Carrier® ChillerVu™'s power.
2. Check the communications wiring for shorts and grounds.
3. Connect Port E1 to the third-party device.

   NOTE Port E1 will still be capable of BACnet communication.

   Wiring Specifications

   - 328 feet (100 meters)
   - Use one of the following CAT5 or higher Ethernet cables:
     - A cross-over cable to connect the Carrier® ChillerVu™ directly to the third-party device
     - A straight-through cable to connect the Carrier® ChillerVu™ to a hub or switch, and a second straight-through cable to connect the hub or switch to the third-party device

   NOTE Use the same polarity throughout the network segment.

4. Turn **on** the Carrier® ChillerVu™'s power.

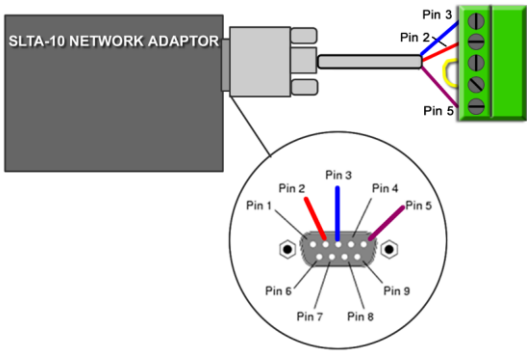
To connect to the LonWorks network using the SLTA-10

1 Turn **off** the Carrier® ChillerVu™'s power.

2 Set DIP switch 4 to **TPI**.

3 Set the Port S2 jumper to EIA-232.

4 Connect the communications wiring to Port S2.



Wire Specifications

- 18–28 AWG; twisted pair preferable
- 50 feet (15.24 meters) maximum length

NOTE Do not power the device from the same transformer that powers the Carrier® ChillerVu™.

5 Set the SLTA-10 DIP switches as shown below.

NOTE Switches 6 - 8 set the baud rate to 57600 for communication between the controller and the SLTA-10.

6 In the WebCTRL® interface, right-click the Carrier® ChillerVu™ in the navigation tree, select **Driver Properties**.> **Protocols** > **LonWorks**, and set the baud rate to 57600.

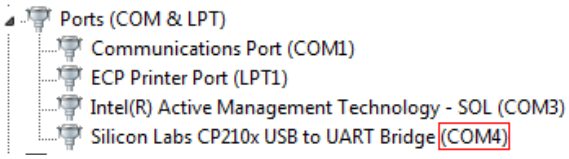
7 Turn **on** the Carrier® ChillerVu™'s power.

To wire a third-party device

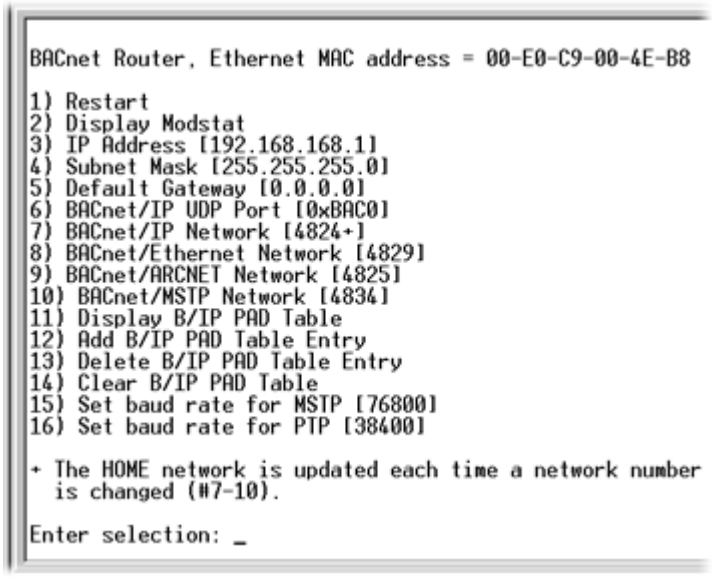
See the *Integration Guide* for the third-party device or protocol.

To set a port's baud rate using PuTTY

1. Download and install PuTTY from the *PuTTY website* (*http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html*).
2. Connect a computer to the Carrier® ChillerVu™'s **Local Access** port. See *To communicate through the local access port* (page 42).
3. Set the Carrier® ChillerVu™'s **Enhanced Access** DIP switch to **ON**.
4. Turn the Carrier® ChillerVu™'s power **Off**, then **On**.
5. Start PuTTY.
6. Under **Category** > **Connection**, select **Serial**.
7. Under **Options controlling local serial lines**, enter the following settings:

Field	Value
Serial line to connect to	Replace X with the computer's port number that the USB Link Kit cable is connected to. **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**. 
Speed (baud)	115200
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None

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



9 Type the number of the baud rate field, then press **Enter**.

10 Type the new baud rate, then press **Enter**.

11 Type `1`, then press **Enter** to restart the controller.

12 When finished, set the Carrier® ChillerVu™'s **Enhanced Access** DIP switch to **OFF** to restore normal functionality to the **Local Access** port.

13 Turn the Carrier® ChillerVu™'s power **Off**, then **On**.

Wiring devices to the Carrier® ChillerVu™'s Rnet port

The standard control programs that are included with the Carrier® ChillerVu™ library do not use communicating sensors or the Equipment Touch.

A custom control program could allow you to connect the following to the Rnet port.

- Up to 15 ZS sensors
- One Wireless Adapter that communicates with up to 15 wireless sensors
- One Equipment Touch
- One TruVu™ ET Display or OptiPoint™ interface

NOTES

- ZS sensors, a Wireless Adapter, and an Equipment Touch can share the Rnet, but not SPT sensors.
- The Wireless Adapter, Equipment Touch, or TruVu™ ET Display or OptiPoint™ interface must be powered by an external power source.

See the device's Installation and Start-up Guide for complete wiring instructions.

Adding the Carrier® ChillerVu™ into the WebCTRL® system

To prepare to create your system

You must create the control program before building your Carrier® ChillerVu™ system.

The Carrier® ChillerVu™ accepts any of the following:

- Applications from the psm (plant system manager) equipment SAL library

  NOTE These applications will not load into any controller except the Carrier® ChillerVu™ controller.
- UC applications from the Universal Controller equipment sal library
- Air Handler applications from the AHU Builder library
- CCN applications from the ivu-6.0 or 6.5-discovery library
- User-created EIKON® programs

  NOTE When creating your program in the EIKON® interface, you must select **Control Program** > **PSM**, **Open (non PIC)**, or **CCN** to be able to download the program into the controller.

The EquipmentBuilder or EIKON® application

1 Use the EquipmentBuilder or EIKON® application to create control program(s) for your Carrier® ChillerVu™.

2 If applicable, print the Sequence of Operation, which includes the points list.

NOTE You can create a points list under **Reports** in the WebCTRL® application.

To create your system in SiteBuilder v6.5

You must complete the following procedures to successfully install your Carrier® ChillerVu™ into the WebCTRL® system. Use the Help in the referenced software for detailed descriptions of these procedures.

1 If you have not created your system yet, open SiteBuilder and select **File** > **New**. Enter the **System Name**, click **Next**, and click **Next** again.

2 In SiteBuilder, on the **Network** tree, verify that the BACnet/IP network is correct for your system.

3 To the BACnet/IP network, right-click and select **BACnet Device Router**.

   a) Enter the controller's **Name**.

   b) Change the **Device Definition** to **PSM** to add the driver.

   c) If necessary, on the **General** tab, click **Browse**, and then select drv_psm_<latest version>.driver.

   d) On the **Address** tab, check **Specify a custom or DHCP IP Address**.

   e) Enter the controller's **IP address**, **Subnet Mask**, and **Default Gateway Address**.

4 If you have a CCN system:

   On the **CCN tab**:

   1. If the controller will serve as the CCN Gateway, check **This device is the CCN Gateway**. If this controller will be a CCN Ethernet Bridge, fill in the **CCN Gateway IP Address** of the CCN Gateway.
   2. In the **Element Number** field, fill in a unique **Element Number**.
   3. Click **OK**.

5 If the Carrier® ChillerVu™ will have an MS/TP network attached, right-click on the PSM icon in the network tree and choose **Add BACnet Network**. In the general tab give the network a name and set the Network Number.

6 Close SiteBuilder.

7 Open the WebCTRL Server and then the WebCTRL® application.

8 To set up the CCN network, follow the steps in *To scan in and download CCN device*s (page 30).

9 To set up the MS/TP network, follow the steps in *To add the control program and graphic in the WebCTRL® interface* (page 32).

To scan in and download CCN devices

Set up CCN information

1 Follow these steps to set the Carrier® ChillerVu™ as the Gateway or Bridge (default).

   NOTE

   a) Set the Carrier® ChillerVu™'s **Port S2** DIP switch **TPI** to **CCN** (Off) and cycle the controller's power.

   b) Right-click the Carrier® ChillerVu™ and select **Driver Properties**.

   c) Expand **Protocols** and select **CCN**.

d) Select the correct baud rate (default is 9600 bps) from drop-down list.

e) If it is the Gateway, select **CCN Gateway** for **Device Type**. If it is a Bridge, select **CCN Bridge**.

f) Change the **Element** number from the default (1).

g) Continue with the steps below.

Connect to a CCN system

1 In the WebCTRL® interface, select the system in the navigation tree.

2 On the **Devices** page > **CCN Setup** tab, enter your CCN Gateway IP address and click **Connect to Gateway**.

NOTE If the server has more than 1 NIC, type the IP address the server will use to connect to controllers.

3 After connecting to the Gateway, select it in the navigation tree.

4 On the **Devices** page > **CCN Discovery** tab, verify that **Discover Tables** is checked.

NOTE The scanning time for discovering tables increases based on the number of devices. You may choose to discover tables at a later time for a faster scan.

5 Enter the **Bus** and **Element** ranges that encompass all your devices.

NOTE Depending on your number of devices, it could be faster to scan several small ranges.

6 Click **Start Scan**. When the process is complete, a message appears showing the number of control programs found.

NOTES

- If the scan does not begin, wait a minute and try again. There may be a delay when first starting the system.
- If an error message appears, click on the message to view an explanation.

7 Click **Download CCN** to download the control programs, drivers, and parameters.

8 In the WebCTRL® navigation tree, right-click the Carrier® ChillerVu™ and select **Driver Properties** from the drop-down list.

9 Under **Driver**, expand **Protocols**.

10 On the **CCN** tab, under **Broadcast Configuration**:

- If the Carrier® ChillerVu™ will be the time broadcaster on the CCN network, check **Time Broadcast Enable**.
- If there is another CCN device already set as the time broadcaster, check **Use CCN Time Sync** so the Carrier® ChillerVu™ synchronizes its clock with the CCN network.

11 Click **Accept**.

TIPS

- indicates you need to download the device by clicking **Download CCN**.
- Click to view a log of activity on the **Devices** page in the current session. **Copy to Clipboard** lets you copy the text to paste it into another application.
- Status messages are color coded as follows:
  - Red - reports an error
  - Blue - requires action
  - Green - indicates an upload or download is in process

To add control programs and graphics in the WebCTRL® interface

Use the following procedure to add all of the control programs (.equipment files) that you need to run your system.

1. Select the Carrier® ChillerVu™ in the navigation tree.
2. On the **Devices** > **Manage** tab, select the Carrier® ChillerVu™ in the list on the page.
3. Click the **Add Control Program** button 

. A dialog window appears.
4. Type a **Display Name** for the control program.
5. Select the **Controller** that you are adding the program to.

   NOTE If you already have the maximum number of control programs for a controller, it will not appear in the list.
6. To add the control program, do the following:

If the control program is...	
In the **Control Program** drop-down list	1. Select the control program that you generated in EquipmentBuilder or Snap. 2. Click **Accept**.
Not in the **Control Program** drop-down list	1. Click **Add New**. 2. Browse to select the control program. 3. Click **Open**. 4. Click **Continue**. 5. Click **Close**. 6. Click **Accept**.

1. To add a graphic, click **Add New** under **Views** and browse to your .view file.
2. Click **Continue**. When message appears **File added successfully**, click **Close**.
3. Click **Close** again.
4. Right-click on the controller in the controller list and select **Check Status** from the list. The status of the controller should say **File Mismatch**.
5. Click the **Download All Content** button.
6. Configure the controller on the **Properties** page > **Control Program** tab.
7. Check out and commission the equipment.

To configure third party protocols in the WebCTRL® interface

After you download the driver and control program(s) to the Carrier® ChillerVu™, you must configure the protocol properties in the WebCTRL® interface.

Modbus RTU on Port S2

1 Verify the **Port S2** DIP switch (5) **TPI** is **On** and the controller's power has been cycled.

2 On the WebCTRL® **Network** tree, click ▷ to the left of your Carrier® ChillerVu™.

3 Under **Driver**, expand **Protocols** > **Modbus**.

4 Under **Port Configuration**, check **Enable** under **Port S2**.

5 Select **EIA-485** for **Communication Type**,

6 Enter your **Baud** rate.

7 Under **Protocol Configuration**, select the correct option for **Is this device a Master?**.

8 Accept all other default settings.

9 Click **Accept**.

Modbus over IP network

1 Verify the **Port S2** DIP switch (5) **TPI** is **On** and the controller's power has been cycled.

2 On the WebCTRL® **Network** tree, click ▷ to the left of your Carrier® ChillerVu™.

3 Under **Driver**, expand **Protocols** > **Modbus TCP/IP**.

4 Select **TCP/IP** for **Communication Type**.

5 Under **Modbus Protocol Configuration**:

- If your Carrier® ChillerVu™ is a client:
  1. Select **Yes** for **This device is a Client**.
  2. Click **Accept**.
  3. In the navigation tree, under **Protocols** > **Modbus TCP/IP**, go to **IP Index Table** and follow the directions at the bottom of the page to fill in the **Server IP Addresses**.
- If your Carrier® ChillerVu™ is a server, select **No** for **This device is a Client**.

6 Click **Accept**.

The LonWorks network using the SLTA-10

1 Verify the **Port S2** DIP switch (5) **TPI** is **On** and the controller's power has been cycled.

2 On the WebCTRL® **Network** tree, click ▷ to the left of your Carrier® ChillerVu™.

3 Under **Driver**, expand **Protocols** > **LonWorks**.

4 Under **Port Configuration**, select **Port S2** for **is connected to the LonWorks network**, then select **SLTA**.

5 Set **Baud** to 57600.

NOTE This is the the baud rate between the LonWorks SLTA-10 and the Carrier® ChillerVu™, not the LonWorks network.

6 Accept all other default settings.

7 Click **Accept**.

Configuring CCN PIC files to communicate with Chiller Manager

To enable the CCN PIC equipment files to communicate with the Chiller Manager program, you must edit the Reference Names in SiteBuilder for the chillers. You must have already completed *To scan in and download CCN devices to your WebCTRL® system* (page 30).

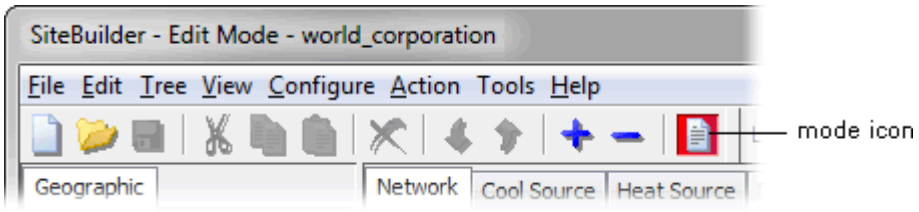
Before proceeding, you must have already:

- Created your WebCTRL® database
- Discovered and downloaded the CCN PICs to the Carrier® ChillerVu™ controller
- Created and added the Chiller Manager control programs to the WebCTRL® database
- Have WebCTRL Server running

1 From the WebCTRL Server interface, click **Launch Concurrent SiteBuilder**.

2 Type your **Name** and **Password**.

3 Click the mode icon to change from View Mode (red) to concurrent Edit Mode (green) and then click **Continue**.



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, WebCTRL Server and field communications run normally. In edit mode, the WebCTRL Server is not affected, but field communications are disabled and operators will see question marks on WebCTRL® pages instead of live data. After you switch to view mode or close SiteBuilder, field communications resume automatically.

4 In the **Geographic** tree, right-click on a chiller and select **Properties** from the drop-down menu.

5 In the **Properties** dialog > **General** tab, you must change the **Reference Name** to `#chiller_x`, where `x` is the chiller number.

EXAMPLE For a 3-chiller system, the chiller reference names are:

- #chiller_1
- #chiller_2
- #chiller_3

6 Click **OK**.

7 Repeat steps 4 - 6 for every chiller.

8 When all chillers are renamed, click the mode icon to change to **View Mode**.

9 Close SiteBuilder.

10 To verify your chiller connections in the WebCTRL® interface, select the Chiller Manager program in the navigation tree and go to the **Properties** > **Network Points** tab. If you see any errors on the pre-configured network points, review your **Reference Name** edits.

To set up the driver

After you download the driver and control program(s) to the Carrier® ChillerVu™, you may want to change the driver's properties in the WebCTRL® interface to suit your application.

1 On the WebCTRL® **Network** tree, click ▷ to the left of your Carrier® ChillerVu™.

2 Click ▷ to the left of **Driver** to see its children.

3 Make changes as needed on the **Properties** page for **Driver** and any of its children.

Driver

On the **Driver** page, you can change the following properties:

- Backup battery conservation settings. See table below.
- Module clock synchronization and failure. See table below.
- Network Input microblock communication properties.

Backup Battery	
Turn off internal backup battery after ___ days to conserve battery life (shutoff date/time)	How long backup battery should run after power loss. **TIP** Downloading activates the battery backup. To conserve battery life when you know the Carrier® ChillerVu™ will be without power for an extended period after downloading (for example, during shipment): 1 Verify the **Archive Valid** LED is lit, then set this field to 0. 2 After you install the Carrier® ChillerVu™ and apply power, enter a number greater than 0.
TouchScreen Control	
TouchScreen Schedule Edit Enable	Check this field to allow a user to edit this controller's schedules from an Equipment Touch or System Touch Schedules screen. **NOTE** Schedules edited on an Equipment Touch or System Touch are not uploaded to the WebCTRL® application. This could result in the controller operating on a schedule that differs from the one you see in the WebCTRL® interface.
Module Clock	
Clock Fail Date and Time	Date and time the control program uses when controller's real-time clock is invalid. **TIP** Use an occupied date and time (such as a Tuesday at 10 a.m.) so the equipment does not operate in unoccupied mode if the controller loses power during occupancy.
Time Synch Sensitivity (seconds)	When the controller receives a time sync request, if the difference between the controller's time and the time sync's time is greater than this field's value, the controller's time is immediately changed. If the difference is less than this field's value, the controller's time is slowly adjusted until the time is correct.

Network Microblocks	
Number of poll retries before Network Input Microblocks indicate failure	The maximum number of retries after the initial attempt that a Network microblock will attempt to communicate with its target device. If unsuccessful, the point will transition to an idle state for 30 seconds before attempting to communicate again. Change this field only if directed by Technical Support.
Periodic rebinding interval	If a microblock uses a wildcard in its address, this timer determines how often the microblock will attempt to find the nearest instance of its target. For example, if an outside air temperature address uses a wildcard, a VAV application will look for the outside air temperature on the same network segment or on the nearest device containing that object.
BACnet COV Throttling	
Enable COV Throttling	Under normal circumstances, COV Throttling should be enabled to prevent excessive network traffic if an object's COV Increment is set too low. See EXCEPTION below. When enabled, if an object generates excessive COV broadcasts (5 updates in 3 seconds), the driver automatically throttles the broadcasts to 1 per second. Also, if the object's value updates excessively for 30 seconds, an alarm is sent to the WebCTRL® application listing all objects that are updating excessively. A Return-to-normal alarm is sent only after all objects have stopped updating excessively. EXCEPTION: In rare circumstances, such as process control, a subscribing object may require COV updates more frequently than once per second. For these situations, clear this checkbox, but make sure that your network can support the increased traffic. You will also need to disable the **Excessive COV** alarms under the driver's **Common Alarms**.
Trend Sampling	
Collect a daily midnight sample for all points in this controller that are sampling on COV	For values that change infrequently, select to verify at midnight daily that the point is still able to communicate trend values.

Device

On the **Device** page, you can change the following properties:

- BACnet device object properties for the Carrier® ChillerVu™
- Carrier® ChillerVu™ communication

Configuration	**NOTE** The three APDU fields refer to all networks over which the Carrier® ChillerVu™ communicates.
Max Masters and Max Info Frames	Apply only if the Carrier® ChillerVu™'s MS/TP network is enabled.

Notification Classes

A BACnet alarm's Notification Class defines:

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

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

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

Calendars

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

Common and Specific Alarms

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

Common alarms:

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

Specific alarm:

- Dead Module Timeout
- Low Battery Alarm

NOTE To set up alarm actions for controller generated alarms, see "Setting up alarm actions" in WebCTRL® Help.

Module Generated Alarm	
Description	Short message shown on the **Alarms** page or in an alarm action when this type of alarm is generated.
Events	
Alarm Category and Alarm Template	See "Alarms" in WebCTRL® Help.
Enable	Clear these checkboxes to disable Alarm or Return to normal messages of this type from this controller.
Notification Class	Do not change this field.

Custom Translation Tables

You can set up a translation table that an analog input will use to translate the raw data from a non-linear sensor to the engineering units you want it to output on the wire. In the **Network** tree, select **Custom Translation Table #1**, **#2**, or **#3**. The **Properties** page has instructions. For the input to use the translation table, navigate to the input in the **Geographic** tree, select the **Details** tab, then set **Sensor Type (Scaling Method)** to **Non-Linear, Custom Table #__**.

BACnet router properties

On the **BACnet router properties** page, you can change the following properties:

- IP address of the router in the controller and the system database
- BACnet routing settings
- Color and prime variable caching settings

IP Configuration	
Allow remote management of IP configuration	For future use.
Enable IP configuration changeover	Select to remotely change the router's **IP Address**, **Subnet Mask**, and **Default Gateway Address**. Type the new addresses and the **UDP Port** that your server is using to communicate to all controllers. In the **Changeover timeout** field, enter: • 0:00 to have the controller use the **Next** settings as soon as the controller can communicate with the **Next Default Gateway Address**. • A specific length of time to have the controller use the **Next** settings as soon as the controller can communicate with the **Next Default Gateway Address**, or when the timeout expires, whichever occurs first. See "To remotely change a controller's IP address" in WebCTRL® Help for more information on using this feature.
BACnet Router Options	
Ignore all Reject-Message-to-Network, Reason=1 messages	Clear to delete and rediscover a router if a network's router indicates that the network is no longer present (reason=1). Select to continue routing messages to a network even if its router indicates that the network is no longer present.
Color/Prime Variable Caching	
Disable Color Cache	Clear (enable) to improve responsiveness in retrieving colors. Select (disable): • To reduce network traffic to third-party (non-color-supporting) devices • If using the Carrier® ChillerVu™ on the controller network, not as a router **NOTE** Selecting this checkbox also disables dead module alarms.
Dead Module Timeout	After this period (minutes:seconds) of non-response from a controller, the router sends an alarm to the server.

BACnet firewall

Requires v6-02 or later driver

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

Protocols

On the **Protocols** page, you can enable or disable Telnet diagnostics. This allows you to write to a text file the communication between the controller and a third party device. This file is used for troubleshooting.

Xnet

If the Carrier® ChillerVu™ has MPC Open XPIO or MEx expanders attached, you can change the baud rate and communications timeout on the **Xnet** page.

Xnet Configuration	
Data Rate	Set at 500 kbps.
Comm. Timeout (seconds)	If the expander does not receive communication from the controller for this amount of time, the expander will reset itself. The range is 15–300 seconds.

Communicating through the Local Access port with a USB Link

Using a computer and a USB Link, you can communicate locally with the Carrier® ChillerVu™ to download or to troubleshoot.

CAUTIONS

- Maintain polarity when controllers share power.
- Failure to maintain polarity while using the USB Link on a computer that is grounded via its AC adapter may damage the USB Link and the controller.
- 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. Plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

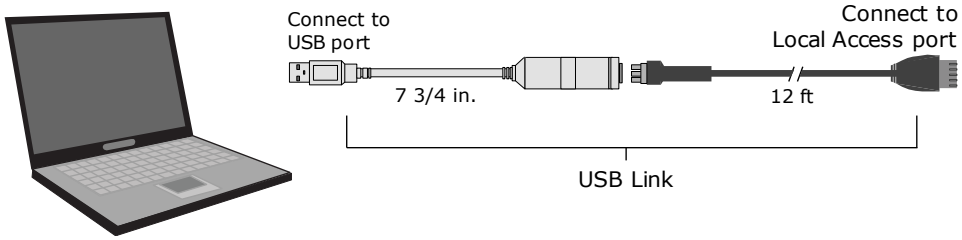
PREREQUISITES

- For the WebCTRL® application to communicate with the controller, the controller must have been downloaded with at least its driver.
- Laptop with USB port
- USB Link (Part #USB-L)

Using a USB Link

1 The USB Link driver is installed with an WebCTRL® v5 or later system. 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.

2 Connect the laptop to the Local Access port of 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.

3 Set the controller's **Enhanced Access** DIP switch.

To communicate in...	Set switch to...
The WebCTRL® application	Off
PuTTY or HyperTerminal	On
SiteBuilder to set a custom IP address	On

4 Turn the controller's power off, then on again.

To communicate using PuTTY

You can connect a computer to a controller's Local Access port and use PuTTY, a free open source terminal emulation program, to:

- Set controller properties, such as IP address and network information
- Retrieve a Modstat

PREREQUISITES

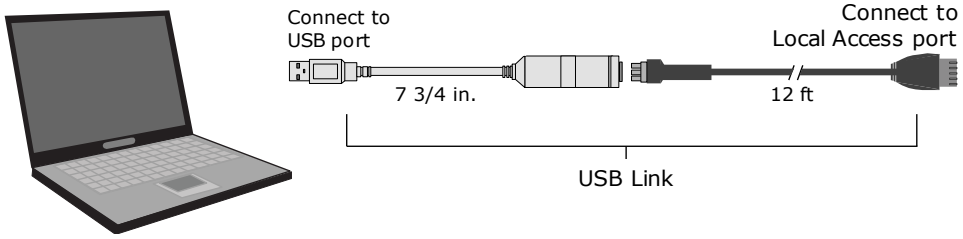
- A computer with a USB port
- A USB Link cable
  NOTE The USB Link driver is installed with an WebCTRL® v5 or later system. But if needed, you can get the latest driver from *http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx*. Install the driver before you connect the USB Link 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.

Using PuTTY

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 or ZS sensor using the USB Link cable(s).



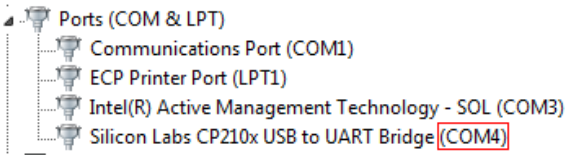
NOTE If using a USB isolator, plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

3 To change a router's IP address, subnet mask, or default gateway, set its **IP Address** DIP switch to **Assigned**.

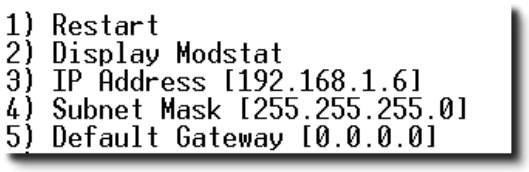
4 Start PuTTY.

5 Under **Category** > **Connection**, select **Serial**.

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

Field	Value
Serial line to connect to	Replace X with the computer's port number that the USB Link cable is connected to. **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**. 
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.



8 Do one of the following:

- To change a property value:
  a. Type the number of the property, then press **Enter**.
  b. Type the new value, then press **Enter**.
- To take an action, type number of the action, then press **Enter**.

9 If you changed a value, type `1`, then press **Enter** to restart the controller.

10 Close PuTTY.

To set up a local access connection in the WebCTRL® interface

For the WebCTRL® application to communicate with the Local Access port, you must do the following:

1 On the **System Configuration** tree, select **Connections**.

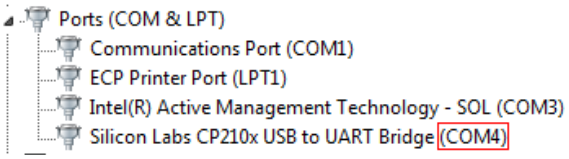
2 On the **Configure** tab, click **Add**.

3 From the **Type** drop-down list, select **BACnet/Rnet Local Access Connection**.

4 Optional: Edit the **Description**.

5 Type the computer's **Port** number that the USB cable is connected to.

NOTE To find the port number, plug the USB cable into the computer's USB port, then select **Start** > **Control Panel** > **System** > **Device Manager** > **Ports (Com & LPT)**. The COM port number is beside **Silicon Labs CP210x USB to UART Bridge**.



6 Set the **Baud** rate to 115200.

7 Click **Accept**.

8 On the **View** tab, select **BACnet/Rnet Connection** from the drop-down list.

9 Click **Accept**.

10 On the **Configure** tab, select **BACnet/Rnet Connection**, then click **Start**.

NOTE If an error message appears, make sure the COM port you selected is not in use. For example, PuTTY may be open and is holding the port open.

11 On the **Network** tree, select the controller that you are connected to.

12 Click , then select **Manual Command**.

13 Type `rnet here` in the dialog box, then click **OK**.

14 On the **Properties** page, click **Module Status**. If a Modstat report appears, the WebCTRL® application is communicating with the controller.

Troubleshooting

If you have problems mounting, wiring, or addressing the Carrier® ChillerVu™ or the expander, contact Carrier Control Systems Support.

NOTE To help you troubleshoot, obtain a Module Status (Modstat) from the controller and review the System Error and Warning details.

Controller LED's

The **Module Status** LED can display the following error codes. Verify the LED patterns by cycling power to the controller and noting the lights and flashes.

Error Code...	Indicates...	Possible solutions
0	The control program or driver has not been downloaded.	Download All Content to the Carrier® ChillerVu™.
1	A control program error	Obtain a Module Status Report (Modstat) and look for error conditions. See *To get the controller's serial number* (page 48) below for instructions on obtaining a Modstat. If you cannot determine the error from the Modstat, contact Automated Logic® Technical Support.
2	The controller's memory is full	In the WebCTRL® interface, reduce the amount of trend data being stored in the controller. In SiteBuilder, reduce the amount of control programs.
3	A setup error	Verify: • The address has been set on the rotary switches. See *Addressing the Carrier® ChillerVu™* (page 12). • The address is unique on the network • DIP switches are set correctly
4	A system error	Obtain a Module Status Report (Modstat) and look for error messages. See *To get the controller's serial number* (page 48) below for instructions on obtaining a Modstat. If you cannot determine the error from the Modstat, contact Automated Logic® Technical Support.
8	Factory defaults are being restored	The number 8 should display only during the short restoring period. If this number displays continuously or flashes intermittently with another number, try each of the following: • Turn the Carrier® ChillerVu™'s power off, then on. • Format the Carrier® ChillerVu™. See Restore factory defaults below. • Download the controller. • Replace the Carrier® ChillerVu™.

Other LED's show the status of certain functions.

If this LED is on...	Status is...
Power	The Carrier® ChillerVu™ has power..
Link	The controller is connected to the Ethernet.
LAN	The Ethernet port is transmitting or receiving data.
100	The connection speed is 100 Mbps. If LED is not lit, the connection speed is 10 Mbps.
BACnet transmit	The Carrier® ChillerVu™ is transmitting data over the BACnet/ARC156 network.
BACnet receive	The Carrier® ChillerVu™ is receiving data over the BACnet/ARC156 network.
Archive Valid	The controller's memory backup is valid.
Port S1 transmit	The Carrier® ChillerVu™ is transmitting data from **Port S1**.
Port S1 receive	The Carrier® ChillerVu™ is receiving data on **Port S1**.
Battery low	The battery is low.

Expander LED's

The LED's show the status of certain functions.

If this LED is on...	Status is...
Power	The Carrier® ChillerVu™ has power.
Rx	The Carrier® ChillerVu™ is receiving data from the network segment
Tx	The Carrier® ChillerVu™ is transmitting data over the network segment
UO#	The binary output is active
Run	Lights based on expander health. See table below
Error	Lights based on expander health. See table below

The **Run** and **Error** LED's indicate expander and network status.

If Run LED shows...	And Error LED shows...	Status is..
2 flashes per second	Off	Normal
5 flashes per second	2 flashes per second	Boot is running or driver is updating
5 flashes per second	On	Fatal error. Replace expander or return for repair.

To restore factory defaults

CAUTION This erases all archived information and user-configuration settings. You will have to reconfigure all custom settings. It is recommended to restore the factory defaults only under the guidance of Carrier Control Systems Support.

To erase volatile memory data and restore factory default configuration settings:

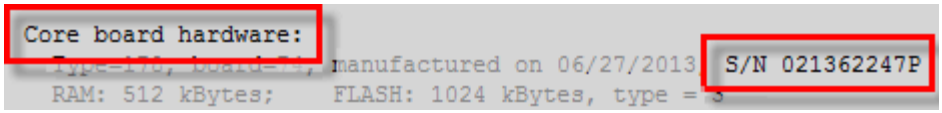
1. Turn off the Carrier® ChillerVu™'s power switch.
2. Make sure the address switches are not set to 0, 0.
3. Hold down the controller's **Factory Defaults** button while you turn its power on.
4. Continue to hold down the **Factory Defaults** button until the controller displays **8** and then the chase pattern, then release the button.
5. Turn on the Carrier® ChillerVu™'s power switch.

CAUTION If you have a CCN network and you restore factory defaults, you must download to the Carrier® ChillerVu™ from the WebCTRL® application and NOT upload it. Uploading results in losing your CCN communication.

To get the Carrier® ChillerVu™'s serial number

If you need the Carrier® ChillerVu™'s serial number when troubleshooting, the number is on:

- a sticker on the back of the main controller board
- a Module Status report (Modstat) under **Core** (or **Main**) **board hardware**



To obtain a modstat in the WebCTRL® interface:

1. Select the Carrier® ChillerVu™ in the **Network** tree.
2. On the **Properties** page, click **Module Status**.

To replace the Carrier® ChillerVu™'s battery

The Carrier® ChillerVu™'s 10-year Lithium CR123A battery retains the following data for a maximum of 720 hours during power outages: time, control programs, editable properties, schedules, and trends.
To conserve battery life, you can set the driver to turn off battery backup after a specified number of days and depend on the archive function to restore data when the power returns.
A low battery is indicated by the **Battery low** LED or a low battery alarm in the WebCTRL® application. You can purchase replacement batteries from any retailer that sells a CR-123A battery.

1. Verify that the Carrier® ChillerVu™'s power is on.
2. Using a small flathead screwdriver, pry up each side of the black battery clip until it is free and you can remove it.
3. Remove the battery from the controller, making note of the battery's polarity.
4. Insert the new battery into the controller, matching the polarity of the battery you removed.
5. Push the black clip back onto the battery until you hear both sides click in place.
6. Download the Carrier® ChillerVu™.

To take the Carrier® ChillerVu™ out of service

If needed for troubleshooting or start-up, you can stop communication between the WebCTRL® application and the Carrier® ChillerVu™.

1. On the WebCTRL® **Network**  tree, select the Carrier® ChillerVu™.
2. On the **Properties** page, check **Out of Service**.
3. Click **Accept**.

Compliance

FCC Compliance

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

CAUTION Changes or modifications not expressly approved by the responsible party for compliance could void the user's authority to operate the equipment.

CE Compliance

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

Document revision history

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

Date	Topic	Change description	Code*
1/20/21	To wire a CCN network	Added note to step 2 of NSTV about changing the CCN address to avoid conflicts Specified CCN ENET Configuration Device Type numbers to use.	C-TS-JN-E
1/28/19	BACnet firewall	Changed "prevents the controller from receiving BACnet messages" to "prevents the controller from responding to BACnet messages".	X-PM-KC-O
	Specifications	Added surge CAUTION to Protection specification.	X-TS-AK-E-CC
10/26/18	Wiring devices to the Carrier® ChillerVu™'s Rnet port	Reworded, removed SPT/RS sensors, added TruVu™ ET Display or OptiPoint™ interface.	X-D
	Specifications	Reworded Rnet port specification and added power supplied by Rnet port. Reworded Protection specification and added first paragraph.	X-H-JS-O
4/27/17	Ethernet, BACnet MS/TP, ARC156, and CCN wiring specifications	Added CCN specs	C-TS-JN-E-RD
2/23/17	Specifications Wiring devices to the Carrier® ChillerVu™'s Rnet port	Changed WS sensors to wireless sensors	C-D
2/6/17	BACnet Firewall	New topic.	C-OC-RD-O
	Wiring devices to the Carrier® ChillerVu™'s Rnet port	Removed device details and clarified lack of support except in a custom control program.	C-AE-BL-O-WB
	Specifications	changed details for Rnet port	C-D
	Cover What is the Carrier® ChillerVu™?	Changed Carrier® ChillerVu™ to new silkscreen	C-D
7/11/16	To communicate using PuTTY	New topic.	C-D
	To restore factory defaults	Added caution about uploading CCN.	C-D
	To create your system in SiteBuilder	SiteBuilder v6.5 no longer requires you to enter CCN information when it is not a CCN controller.	C-D
	To use a default IP address To use a DHCP IP address To wire to the BACnet over IP network (DHCP) To wire to the BACnet over IP network (assign a custom IP)	Corrected **IP Addr** DIP switch name from Default to DHCP.	C-D
2/9/16	To attach expanders	Added step explaining jumper settings for connecting more than one expander.	X-TS-RD-E-BR
12/3/15	To connect to LonWorks network using the SLTA-10	Added step to enter the baud rate in Driver Properties	C-TR-GG-E-JN
	To wire to Modbus RTU on Port S2	Added step to enter the baud rate in Driver Properties	C-TR-GG-E-JN
	Wiring for communications	Correction - BACnet/ARC156 added to table.	C-D

* For internal use only

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