Equipment Touch Installation and Setup Guide

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

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

Contents

What is the Equipment Touch?

The Equipment Touch is a touchscreen device with a 4.3 in. color LCD display that you connect to the Rnet port of one of the following controllers to view or change its property values, schedule equipment, view trends and alarms, and more, without having to access the system's server.

- i-Vu® Open Router
- i-Vu® Open Link
- AppController
- Fan Coil Open
- MPC Open XP
- RTU Open
- UC Open
- UC Open XP
- UPC Open *
- Unit Vent Open
- VAV Zone Single Duct
- VAV Zone Fan Terminal
- VVT Bypass
- VVT Zone
- WSHP Open
- W2W Open

NOTE Requires controller driver v6-00-082 or later.

* The Equipment Touch does not support the following microblocks in a UPC Open controller:
  Carrier Schedule
  Carrier Binary Point
  Carrier Binary Value
  Carrier Zone Setpoint for Integration

You wire the Equipment Touch to the controller's Rnet port. The Equipment Touch must be powered by an external power source. The Rnet can have one Equipment Touch, plus ZS sensors and/or a Wireless Adapter that communicates with wireless sensors.

NOTE The Equipment Touch cannot share the Rnet with SPT Sensors or a TruVu™ ET Display.

You can install and run the Equipment Touch with only its built-in system screens, or you can create a customized touchscreen file in ViewBuilder. This requires that you:

1. Create customs screens in ViewBuilder, and then save the touchscreen (.touch) file. See "Working with touchscreens" in ViewBuilder Help.
2. In the i-Vu® interface, right-click the controller and select **Driver Properties** to attach the touchscreen file.
3. Download **All Content** to the controller. See "Downloading to controllers" in i-Vu® Help.

Specifications

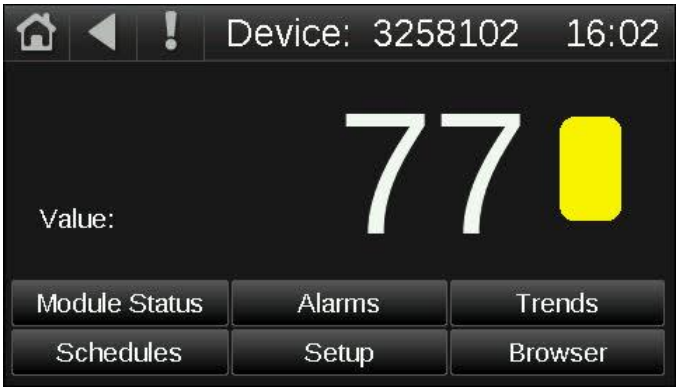
Power	Requires a 24 Vac (±15%), 5 VA, 50–60 Hz, Class 2 external power supply	
Display	4.3 in. resistive touchscreen color LCD display with backlighting (Wide Quarter VGA, 480x272 pixels)	
Enclosure	ABS plastic with polycarbonate bezel	
Ports	• EIA-485 based serial port for Rnet communication • USB host port	
Microcontroller	32-bit	
Memory	• 16 MB Flash memory to store program code and screen file. • 1.5 MB RAM to store variable data and LCD data. • 4 KB Serial EEPROM to store non-volatile configuration data.	
Real-time clock	A 365-day real time clock/calendar chip. The time and date will be maintained for a minimum of 72 hours after loss of power (at room temperature).	
Audible alarm notification	A piezoelectric sounder	
Temperature sensor	Range: Accuracy over 30.0°F to 100°F: Accuracy over full range: Resolution:	-4.0°F to 140°F (-20°C to 60°C) ±1.0°F (±0.55°C) ±2.0°F (±1.1°C) 0.2°F (0.1°C)
Humidity sensor	Range: Accuracy over 20 to 80% RH: Accuracy over full range: Resolution:	0 to 100% RH ±3.0% RH ±5.0% RH 0.05% RH
Environmental operating range	-4°F to 140°F (-20°C to 60°C), 10–90% RH, non-condensing	

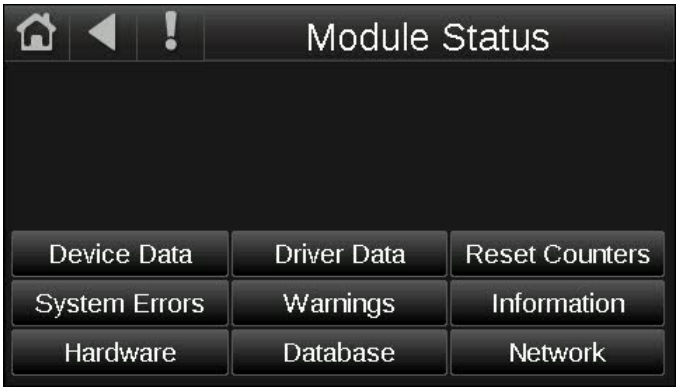
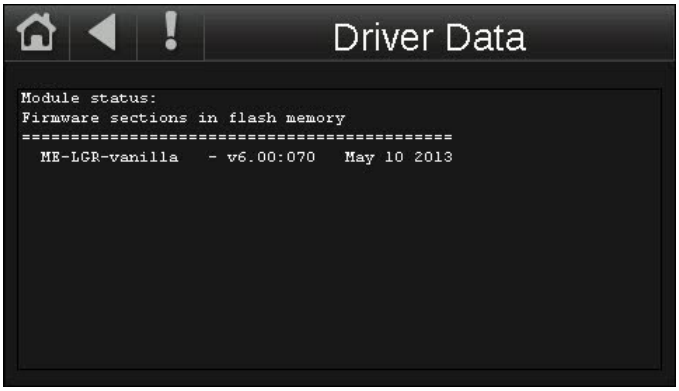
Mounting	Wall or panel mounting within the building interior.
Overall dimensions	Width: 5.44 in. (13.82 cm) Height: 4.55 in. (11.56 cm) Depth: 1.24 in. (3.15 cm)
Backplate dimensions	Width: 4.79 in. (12.2 cm) Height: 3.94 in. (10 cm)
Weight	8 oz. (0.23 kg)
Listed by	UL-916 (PAZX), CE, FCC Part 15-Subpart B-Class A
Device identification	The Equipment Touch's box contains a label with the product name and the serial number that begins with **EQC**. Remove the front of the Equipment Touch and turn it over to see the serial number on a label attached to the control board.

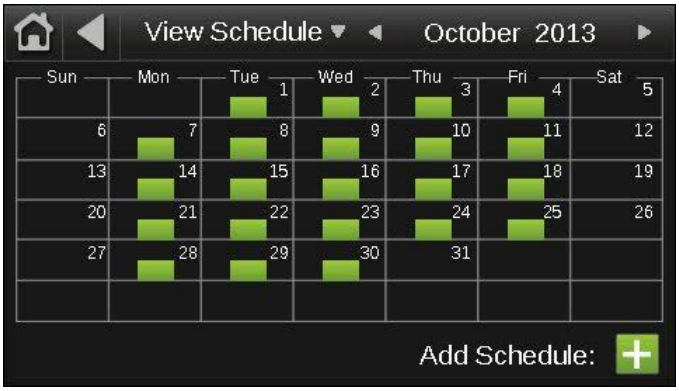
Equipment Touch screens

The Equipment Touch will display the system screens below as well as custom-designed screens.

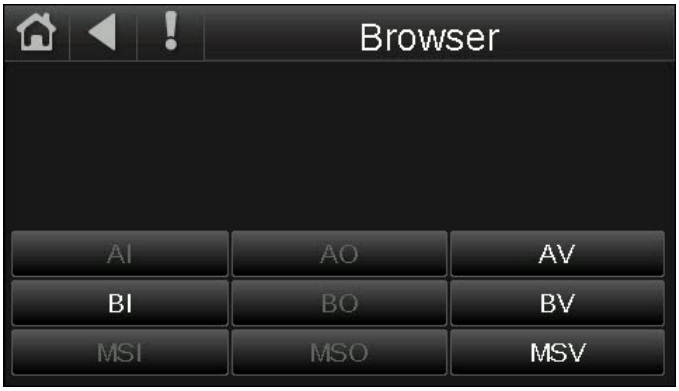
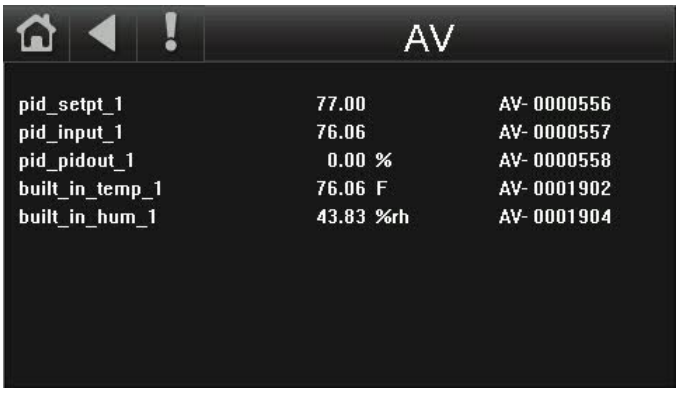
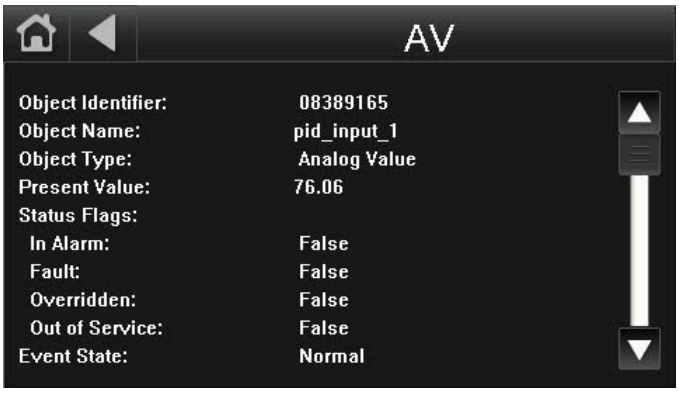
Screen name	Description
Standby	If included in the touchscreen file, a custom screen that displays when the Equipment Touch has had no user activity for the time specified on the **Inactivity Timeout** screen. The **Standby** screen is not interactive, and as soon as you touch the screen, the **Home** screen displays. If the touchscreen file does not include a Standby screen, the Home screen displays after a period of inactivity.
Home	A custom screen for the Equipment Touch.

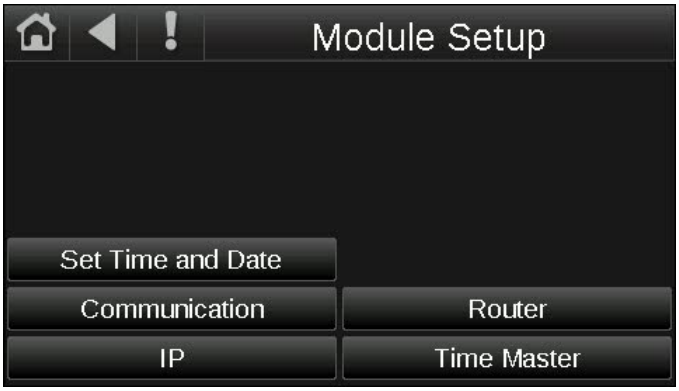
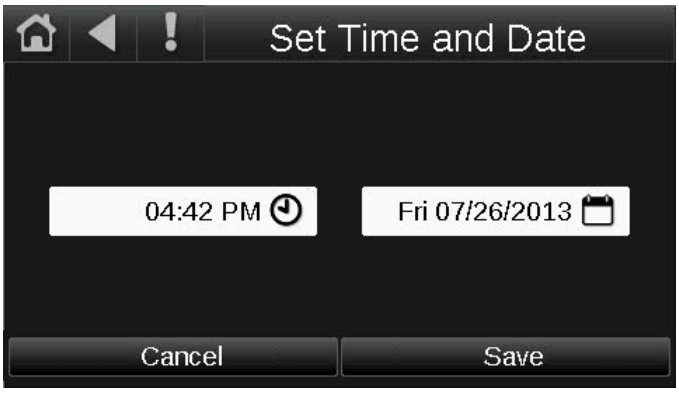
Screen name	Description
Login	 Displays if the screen you selected requires a password. Enter your password, then touch **Done**. Each screen is programmed with one of the following password levels: **A screen requiring this password level...** / **Can be accessed by...** User / A user logged in with the User, Admin, or Factory password Admin / A user logged in with the Admin or Factory password Factory / A user logged in with the Factory password No password / Anyone NOTES • The default password for a new Equipment Touch is **admin**. • You can change passwords on the *Touchscreen Setup* (page 22) > **Passwords** screen. • You log out on the **Setup** screen.
System	 Displays the BACnet device instance number, the controller's time, temperature read from the controller's prime variable, and zone color. Touch a button to jump to the **Module Status**, **Alarms**, **Trends**, **Schedules**, **Setup**, or **Browser** screen.

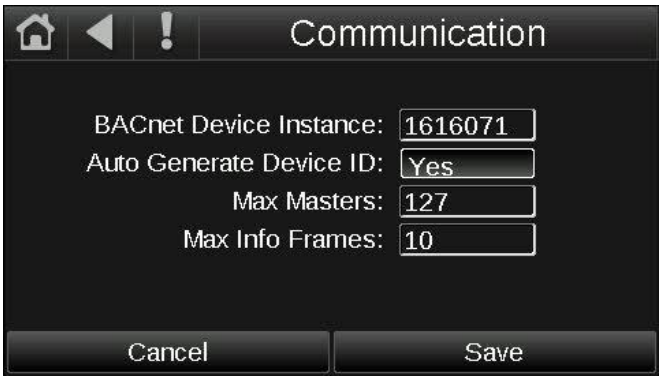
Screen name	Description
Module Status	 Touch a button to see one of the following sections of a Module Status report: **Device Data**, **Driver Data**, **Reset Counters**, **System Errors**, **Warnings**, **Information**, **Hardware, Database**, **Network**. For example, the screens below show examples of the Driver Data and Reset Counters information.  

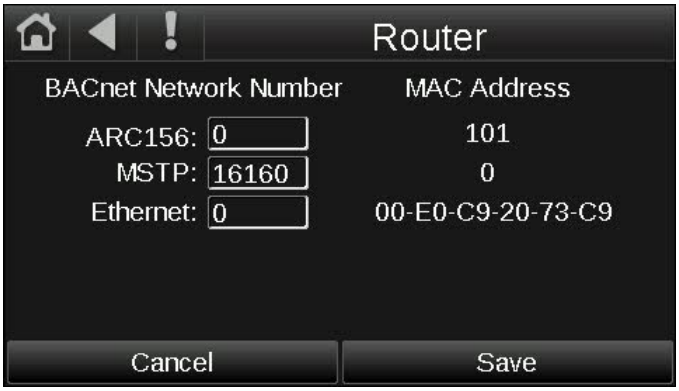
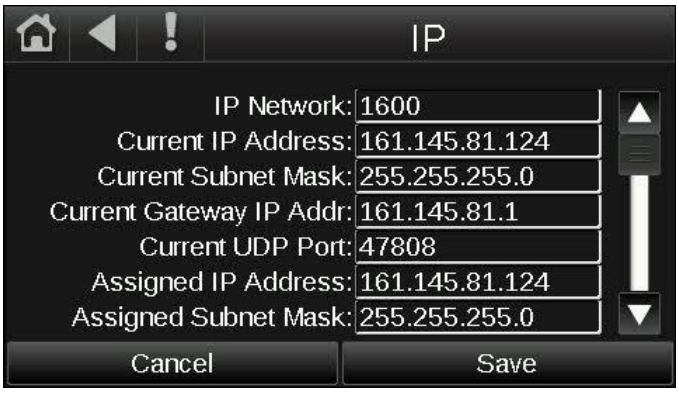
Screen name	Description
Alarms	 Lets you view alarms from the controller. See "Viewing alarms" in the *Equipment Touch User Guide*.
Trends	 Lets you view trends for points that have trending enabled. See "Viewing trends" in the *Equipment Touch User Guide*.
Schedules	 Lets you view, add, edit, or delete BACnet schedules in the controller. See "Setting up schedules" in the *Equipment Touch User Guide*.

Screen name	Description
Setup	 Touch a button to jump to the **Module Setup**, **Touchscreen Setup**, or **Login** screen.

Screen name	Description
Browser	 Touch a button to see that type of BACnet objects found in the controller. Each screen shows a list of network-visible BACnet objects with BACnet Object Name, Current Value, and BACnet Object Instance number. Below is an example of AV BACnet objects in a controller.  Touch an object in the above screen to see the details shown below. 

Screen name	Description
Module Setup	 Touch a button to jump to the **Set Time and Date**, **Communication**, **Router**, **IP**, or **Time Master** screen. **NOTE** A yellow value on a Module Setup screen indicates the value has been changed.
Set Time and Date	 Touch the time or date field to edit it.

Screen name	Description
Communication	 Lets you edit the information below for the controller. Touch a field to tap in new information. **BACnet Device Instance** number **Auto Generate Device ID**–Enter No or Yes You can edit the following fields that pertain to the controller's MS/TP network: **Max Masters** - Set this to the highest MAC address (up to 127) on the MS/TP network. If you later add a device with a higher address, you must change this field to that new address. **Max Info Frames** - Specifies the maximum number of information messages a controller may transmit before it must pass the token to the next controller. **CAUTION** Increasing this number allows the controller to transmit more messages while it has the token, but it also increases the overall time it takes for the token to pass through the network. • For a router, set this value to a high number such as 200. • In non-router controllers, use the following formula to calculate this value: [2 - (devices * (.002 + (80/baud))] / [(600/baud) * devices] = Max Info Frames For example, if the network has 15 devices at 19200 baud, Max Info Frames would be 4. **NOTE** You may need to increase the result of the formula for controllers that need to communicate many values to other devices.

Screen name	Description
Router	 Lets you view or edit the router's ARC156 or MS/TP network number. Touch a field to tap in the new number on the keypad. **NOTE** BACnet Ethernet network support will be added in a future release.
IP	 Lets you view or edit network addresses and the UDP Port. Touch a field to tap in the new number on the keypad.

Screen name	Description
Time Master	 If the Equipment Touch is serving as the front-end for your system, you should designate a controller to be the BACnet Time Master. If a controller will be the BACnet Time Master, this screen lets you configure how it sends time synchronization broadcasts. **Time Sync Mode** - Tap in the number below that represents your selection: • **0 = No Broadcast** - The controller will not act as Time Master. • **1 = Local Broadcast** - If it doesn't already exist, a BACnet address with network number and MAC address length both set to zero is added to the controller's **Time Synchronization Recipients** list found on the driver's **Device** page in the i-Vu® interface. The controller will then send time broadcasts only to controllers on its ARCnet or MS/TP network. • **2 = Global Broadcast** - If it doesn't already exist, a global address with network number set to 65535 and MAC address length set to zero is added to the controller's **Time Synchronization Recipients** list found on the driver's **Device** page in the i-Vu® interface. The controller will then send time broadcasts to all its connected networks. **Time Sync Interval** - Enter how often local or global time broadcast should be sent (1-9999 minutes). If **Time Sync Interval** is set to zero, no time sync messages are sent. **NOTE** If the controller looks through its Time Synchronization Recipient List and finds an entry with MAC address length set to zero and network number set to 65535, the controller's BACnet Time Master mode is set for Global Broadcast. If there is no global broadcast entry in the recipient list, the controller then looks for a local broadcast address (MAC address length set to zero and network number set to zero or to the same network number as the module's). If such an entry is found, the BACnet Time Master mode is set for Local Broadcast. Otherwise, the mode defaults to Disabled/None.

Screen name	Description
Touchscreen Setup	 Lets you *edit the touchscreen settings* (page 22).

Wiring and mounting the Equipment Touch

CAUTION If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Mounting

The Equipment Touch must be mounted within the building interior. You can mount the Equipment Touch:

- In a panel with the controller or on the panel door
- On a wall up to 500 feet from the controller

Wiring

- The Equipment Touch requires a 24 Vac power supply. It is not powered by the Rnet.

  CAUTION The Equipment Touch can share a power supply with the Carrier controller as long as you:

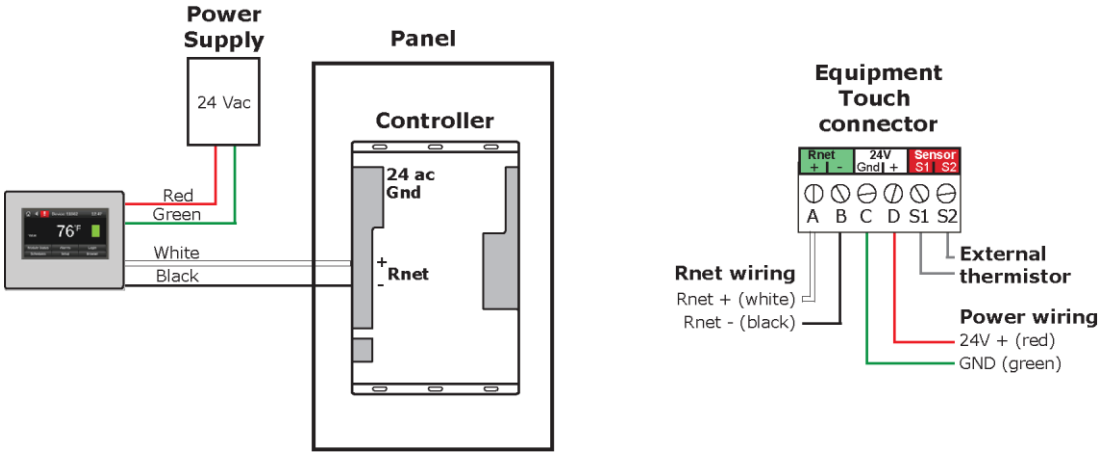
  - Maintain the same polarity.
  - User the power supply only for Carrier controllers.

- You can also wire an external 10 kOhm, Type II thermistor (Carrier part number 33ZCT55SPT) to the Equipment Touch. See *Appendix: External sensor resistance requirements* (page 27).

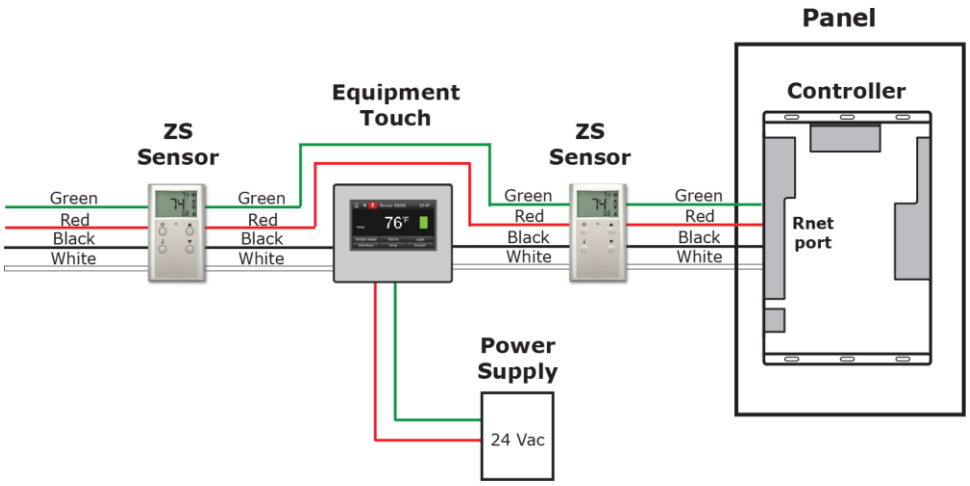
See:
Wiring specifications (page 15)
To wire and mount the Equipment Touch (page 16)

Wire the Equipment Touch in one of the following ways:

- Wire the Equipment Touch directly to the controller's Rnet port as shown below.



- Wire the Equipment Touch in a daisy-chain configuration with up to 5 ZS zone sensors as shown below.



NOTE You do not need to set an address for the Equipment Touch.

Wiring specifications

Power wiring

2-conductor wire 18 AWG for distances up to 100 feet. All transformer secondaries must be grounded. Wiring connections must be in accordance with NEC and local codes.

Rnet wiring

NOTE If you wire the Equipment Touch directly to the controller's Rnet port, you can use a 2-conductor cable instead of the standard 4-conductor Rnet cable.

Description	4-conductor, shielded or unshielded, CMP, plenum rated cable
Conductor	22 AWG (7x0096) bare copper
Maximum length	500 feet (152 meters)
Insulation	Low-smoke PVC (or equivalent)
Color Code	Black, white, green, red
Shielding	If shielded, Aluminum/Mylar shield (100% coverage) with TC drain wire
UL temperature rating	32–167°F (0–75°C)
Voltage	300 Vac, power limited
Listing	UL: NEC CL2P, or better

To wire and mount the Equipment Touch

1 Remove the backplate from the Equipment Touch:

a) Hold the Equipment Touch as shown in the picture below.

b) While firmly pressing the 2 tabs on top of the Equipment Touch, pull on the backplate with your index finger until the backplate releases from the Equipment Touch.

2 Pull the communication cable, power cable, and external thermistor wiring (if applicable) through the large hole in the center of the backplate. See figure in step 5.

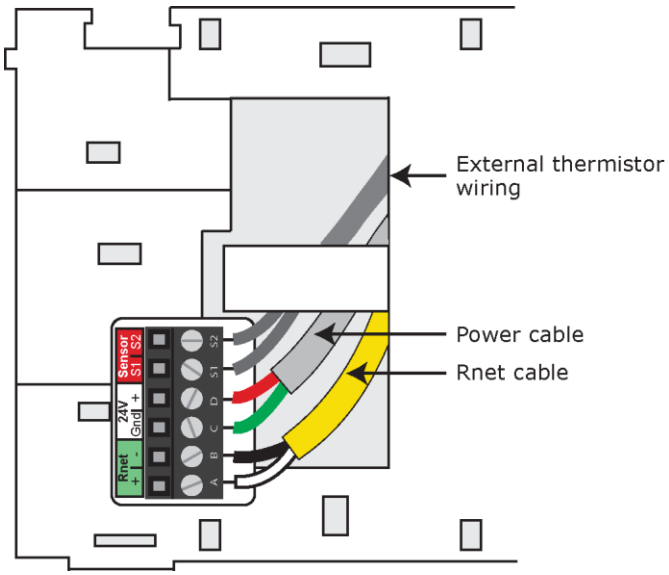
3 Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the individual wire insulation.

4 If wiring 1 cable to the Equipment Touch, cut the shield wire off at the outer jacket, then wrap the cable with tape at the outer jacket to cover the end of the shield wire.

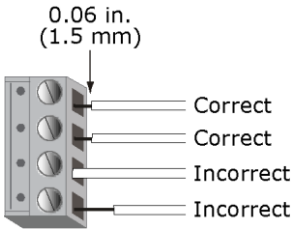
If wiring 2 cables in a daisy-chain configuration, twist together the shield wires, then wrap the shield wires with tape.

5 Strip about 0.25 inch (0.6 cm) insulation from the end of each wire.

6 Connect wiring to the Equipment Touch as shown below:



CAUTION Allow no more than 0.06 inch (1.5 mm) bare communication wire to protrude. If bare communication wire contacts the cable's foil shield, shield wire, or a metal surface other than the terminal block, the device may not communicate correctly.



7 Attach the backplate to the wall or panel. If mounting in or on a panel:

a) Drill two 3/16 inch (4.8 mm) pilot holes in the panel.

b) Attach backplate using pan head 6-32 x 3/8" to l/2" long machine screws. Do not overtighten screws to prevent damage to plastic housing.
RECOMMENDATION Use Loctite 220 on screw threads if the Equipment Touch will be subject to vibration.

8 Attach the Equipment Touch to the backplate:

a) Place the bottom of the Equipment Touch onto the backplate by aligning the 2 slots on the Equipment Touch with the tabs on the backplate.

b) Push the Equipment Touch onto the backplate until the tabs at the top of the Equipment Touch snap onto the backplate.

9 Turn off the controller's power.

10 Connect the other end of the Rnet wiring to the controller's **Rnet** port or to a zone sensor.

NOTES

- Insert the shield wire with the ground wire into the controller's **GND** terminal.
- Use the same polarity throughout the Rnet.

11 Connect power wiring to a 24 Vac power supply.

12 Turn on the controller's power.

To set up scheduling functionality

You can define BACnet schedules for each time clock microblock in the controller's control program(s).

To allow a user to create schedules on the Equipment Touch:

1 In the i-Vu® or Field Assistant tree, right-click the controller, and then select **Driver Properties**.

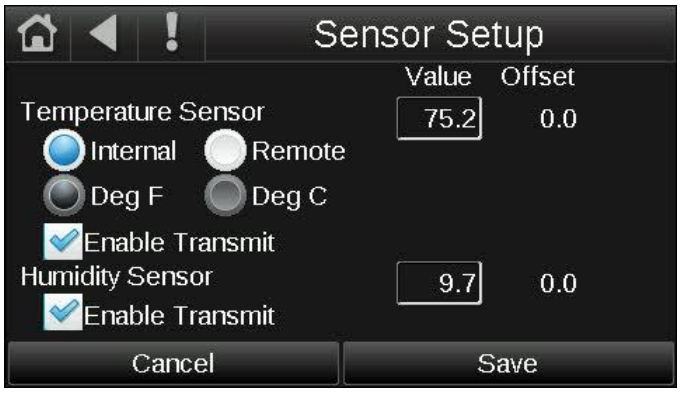
2 On the **Settings** tab, scroll down to **TouchScreen Control** and verify that **TouchScreen Schedule Edit Enable** is checked.

CAUTION If scheduling will be done in the i-Vu® interface, you should disable scheduling in the Equipment Touch so that they do not overwrite each other's schedules. To disable scheduling, uncheck **TouchScreen Schedule Edit Enable**.

Using the Equipment Touch's temperature and humidity sensors to control equipment

To set up the sensors on the Equipment Touch

Go to **Setup** > **Touchscreen Setup** > **Sensor Setup**.



On this screen, you can:

- **Select the temperature sensor**—You can use values from the Equipment Touch's internal temperature sensor. Or, you can wire an external (remote) thermistor to the Equipment Touch and use its temperature value instead of the internal temperature sensor's value.
  NOTE The **Deg F** and **Deg C** setting is determined by the controller's control program.
- **Disable transmission of the temperature and humidity**—See NOTE below.
- **Set an offset**—Enter a correct temperature/humidity value to create an offset for all future values.

To use the temperature or humidity value in a control program

1 In Snap, place a BACnet Analog Value Parameter microblock 

in your control program.

2 Enable the **Network Visible** field.

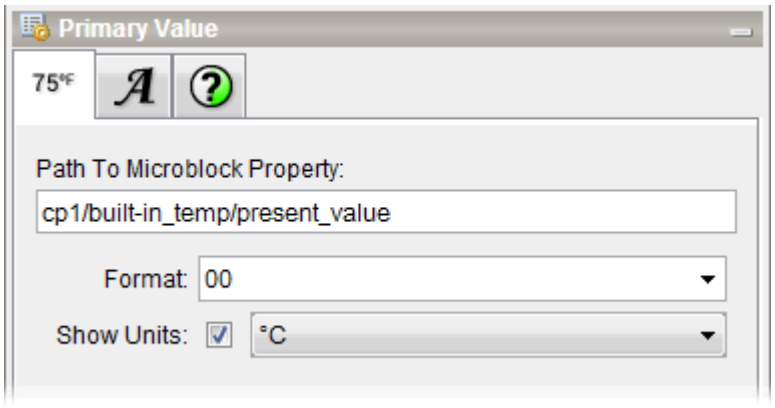
3 In the **Object Instance** field, select **Use specific value**, then enter one of the following:

1902 for Temperature
1904 for Humidity

NOTE By default, the Equipment Touch transmits its temperature value (av: 1902, writes every 1 minute) and relative humidity value (av: 1904, writes every 5 minutes). If the 1902 or 1904 object instance numbers are to be used in a different manner, you can turn off the transmission of the temperature and humidity values. See *To edit touchscreen settings* (page 22).

To display the temperature or humidity value on a custom screen

In ViewBuilder, add a Primary Value or Number control to the screen, and then set the **Path To Microblock Property** to <control program instance>/<AV mb reference name>/present_value.



NOTE The Units setting (°F or °C) affects only what you see in ViewBuilder, not the primary value shown on the Equipment Touch.

To edit touchscreen settings

1 On the **System View** screen, touch **Setup** > **Touchscreen Setup**.

2 Touch a button to jump to one of the following screens:

Screen	Description
About	Displays information about the touchscreen firmware.
Inactivity Timeout	Lets you define how long the Equipment Touch can have no activity before returning to the Standby screen and logging out the user. Set to 0 to deactivate this feature.
Sensor Setup	Lets you set up the Equipment Touch's temperature and humidity sensors. See *Using Equipment Touch's temperature and humidity sensors to control equipment* (page 20).
Clean Screen	Displays a one-minute countdown timer so that you can clean fingerprints from the display window without touching something that would affect equipment operation.
Key Click Off/On	Touch **Key Click Off** to turn off the sound when you touch a field or button. Touch **Key Click On** to turn on the sound.
Alarm Sound Off/On	Touch **Alarm Sound Off** to turn off the alarm notification sound or touch **Alarm Sound On** to turn on the sound. An alarm will generate a sound only if it is set up in ViewBuilder to do so.
Reload Firmware	Erases the current firmware so that you can load new firmware through the USB port. See *To update the Equipment Touch's firmware* (page 24).

Screen	Description
Language	 English, German, Portuguese, Simplified Chinese, French, Italian, Korean, Spanish, Japanese, Traditional Chinese, Swedish, Thai, Russian If optional languages were defined when the touchscreen file was created, this screen lets you select which language to use for Equipment Touch system screens. If custom screens were included in the touchscreen file, they will display in the language that they were created in.
Passwords	Lets you change the User or Admin password, if allowed.
Calibrate Touch Panel	Lets you recalibrate the Equipment Touch by touching targets. The device is calibrated in the factory, but time, temperature, or handling could affect the calibration. Recalibrate the screen if you touch it in one location and it responds as if you touched it in another.

To update the Equipment Touch's firmware

The Equipment Touch has a USB port at the bottom that allows you to update the device's firmware from a USB flash drive.

PREREQUISITE The USB flash drive must be formatted as FAT, FAT16, or FAT32. To verify, right-click the flash drive in Windows Explorer, then select **Properties**. **File system** should show **FAT**xx. If **File system** shows NTFS or anything else, you must reformat the drive. Right-click the flash drive, then select **Format**. In the **File system** field, select **FAT (Default)**, then click **Start**.

CAUTION Follow the steps below in order. If you select **Reload Firmware** (step 3) on the display before you insert the USB drive (step 2), the touchscreen will become inoperable.

To update the firmware:

1. Create a folder on the flash drive called **Touch**, then put the ETxxxxxx.hex file in the folder.
2. Plug the flash drive into the Equipment Touch's USB port.
3. From the System screen, touch **Setup** > **Touchscreen Setup** > **Reload Firmware**.
4. A warning message appears. Touch **Yes** to continue.
5. The following series of messages appear:
   Verifying Firmware Image.
   Reading Firmware Image from USB.
   Installing Application.
   Verifying Firmware Image.

   When the Home screen displays, remove the flash drive.

Resetting the Equipment Touch

You can create a reset.dat file and put it on a USB flash drive to reset some of the Equipment Touch's functionality.

PREREQUISITE The USB flash drive must be formatted as FAT, FAT16, or FAT32. To verify, right-click the flash drive in Windows Explorer, then select **Properties**. **File system** should show **FAT**xx. If **File system** shows NTFS or anything else, you must reformat the drive. Right-click the flash drive, then select **Format**. In the **File system** field, select **FAT (Default)**, then click **Start**.

1. Insert the USB flash drive into your computer.
2. Create a folder on the flash drive named **Touch**.
3. In a text editor such as Notepad, start a new file.
4. In the file, type a function number from the table below.
5. Save the file to the flash drive's **Touch** folder with the name **reset.dat**.
6. For the second function 01 in the table below, copy any updated firmware .hex file into the **Touch** folder.
7. Insert the flash drive into the USB port at the bottom of the Equipment Touch.
8. Cycle power to the Equipment Touch.

If...	Then you should...	Function number
You cannot get to the **Touchscreen Setup** screen	Restart the firmware	01
You need to quickly update the firmware on several Equipment Touch devices	Reload the firmware - Put the new firmware in the **Touch** folder with the reset.dat file.	01
• You want to carry your Equipment Touch from site to site • Your Equipment Touch has a unrecoverable error	Reset factory defaults	04
The Equipment Touch does not respond correctly to the location where you touched the screen	Calibrate the touchscreen	08

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

Industry Canada Compliance

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

Appendix: External sensor resistance requirements

Temp (°C)	Temp (°F)	Resistance (Ohms)
-40	-40	335,651
-35	-31	242,195
-30	-22	176,683
-25	-13	130,243
-20	-4	96,974
-15	5	72,895
-10	14	55,298
-5	23	42,315
0	32	32,651
5	41	25,395
10	50	19,903
15	59	15,714
20	68	12,494
25	77	10,000
30	86	8,056
35	95	6,530
40	104	5,325
45	113	4,367
50	122	3,601
55	131	2,985
60	140	2,487
65	149	2,082
70	158	1,752

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*
3/2/20	Cover	Updated logo	X-D
4/24/19	Using Equipment Touch's temperature and...	Added default values of temperature an relative humidity	X-TS-JN-F-RD
8/27/18	What is the Equipment Touch?	Added TruVu™ ET Display to the NOTE following the picture.	X-D
4/16/18	Resetting the Equipment Touch	Reworded step 6 and removed function number 02 from it.	X-O-JM-F
	Industry Canada Compliance	New topic	X-H-JH-E
7/8/16	What is the Equipment Touch?	Removed i-Vu® Open Router from list of controllers	C-TS-RD-E
5/7/15	What is the Equipment Touch Equipment Touch screens	Replaced System screen image with one that does not show units	X-O-GA-BR
	To edit touchscreen settings	Replaced language screen image and listed languages	X-D-CP
	Resetting the Equipment Touch	New topic	X-O-TC-O
	To update the Equipment Touch's firmware	Changed list of messages in step 5.	X-D-CP
9/10/14	Wiring and mounting the Equipment Touch	Changed Carrier part number 33ZCT57SPT to 33ZCT55SPT.	C-TS-PH-E
7/29/14	Equipment Touch screens	Added note under Login screen that the default password for a new Equipment Touch is admin.	X-TS-RB-E-RB

* For internal use only