HPO-9008 Wi-Fi Network Kit

Installation and Application Guide

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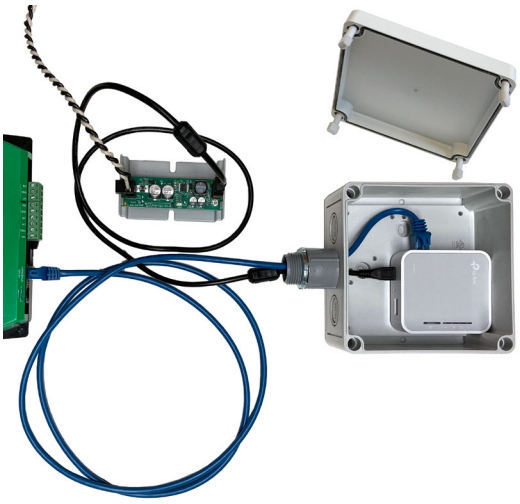


Contents

Introduction 1
Sample Installations 2
TP-Link Routers in Client Mode with an IP Router 2
TP-Link Routers in Client Mode with KMC Commander 3
TP-Link Router in Access Point Mode 4
Preparation 5
Mounting 6
Connecting 8
Mode Switch and Physical Connections 8
Configuration Pages 9
Controller and BACnet Router Configuration 15
Troubleshooting 15
Wi-Fi Signal Is Not Strong Enough 15
Communication Lost with TP-Link Router 15
Connected BACnet Devices Are Not Discoverable 16
Other Issues 16
HPO-9008 Kit Specifications 17
TP-Link Router 17
XEE-9008 Power Supply 17
Handling Precautions 18
We Value Your Feedback! 18
Important Notices 18
Support 18

Introduction

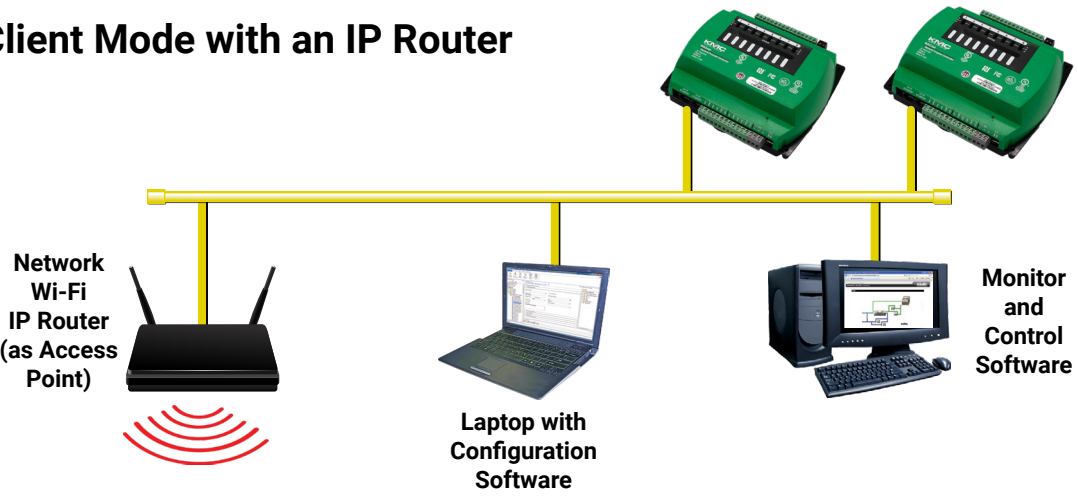
To create wireless network connections for KMC controllers, KMC supplies the **HPO-9008 Ethernet to Wi-Fi Network Adapter Kit**. The HPO-9008 kit includes:

- **TP-Link TL-WR902AC Wi-Fi router** (see its web page for firmware updates and complete information)
- **XEE-9008 power supply (24-VAC to 5-VDC)**
- Plastic enclosure (for mounting on a panel's conduit knockout hole)
- Cables (Ethernet and USB)

The TP-Link router connects to the controllers or BACnet router through an Ethernet cable. The controllers can be BACnet over IP controllers or other controllers connected through a BACnet router. See **Sample Installations on page 2** and **Preparation on page 5**.

Sample Installations

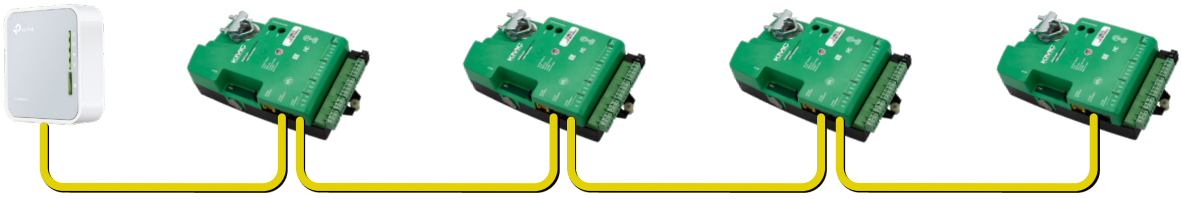
TP-Link Routers in Client Mode with an IP Router



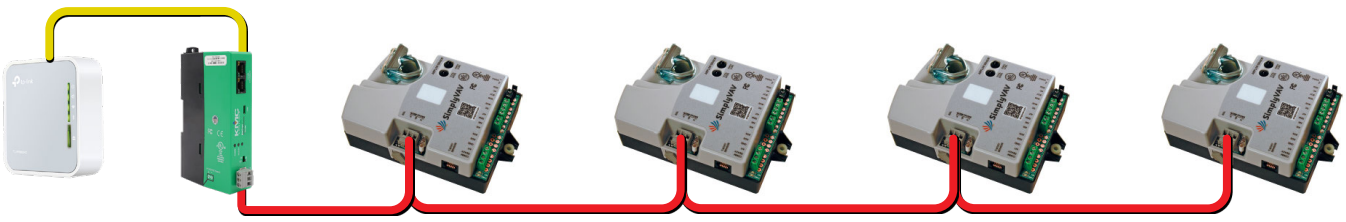
NOTE: In this example, all the “wireless” controllers will appear on the same network.

BACnet over IP Controllers (Wireless, One-to-One)

TP-Link Routers in Client Mode

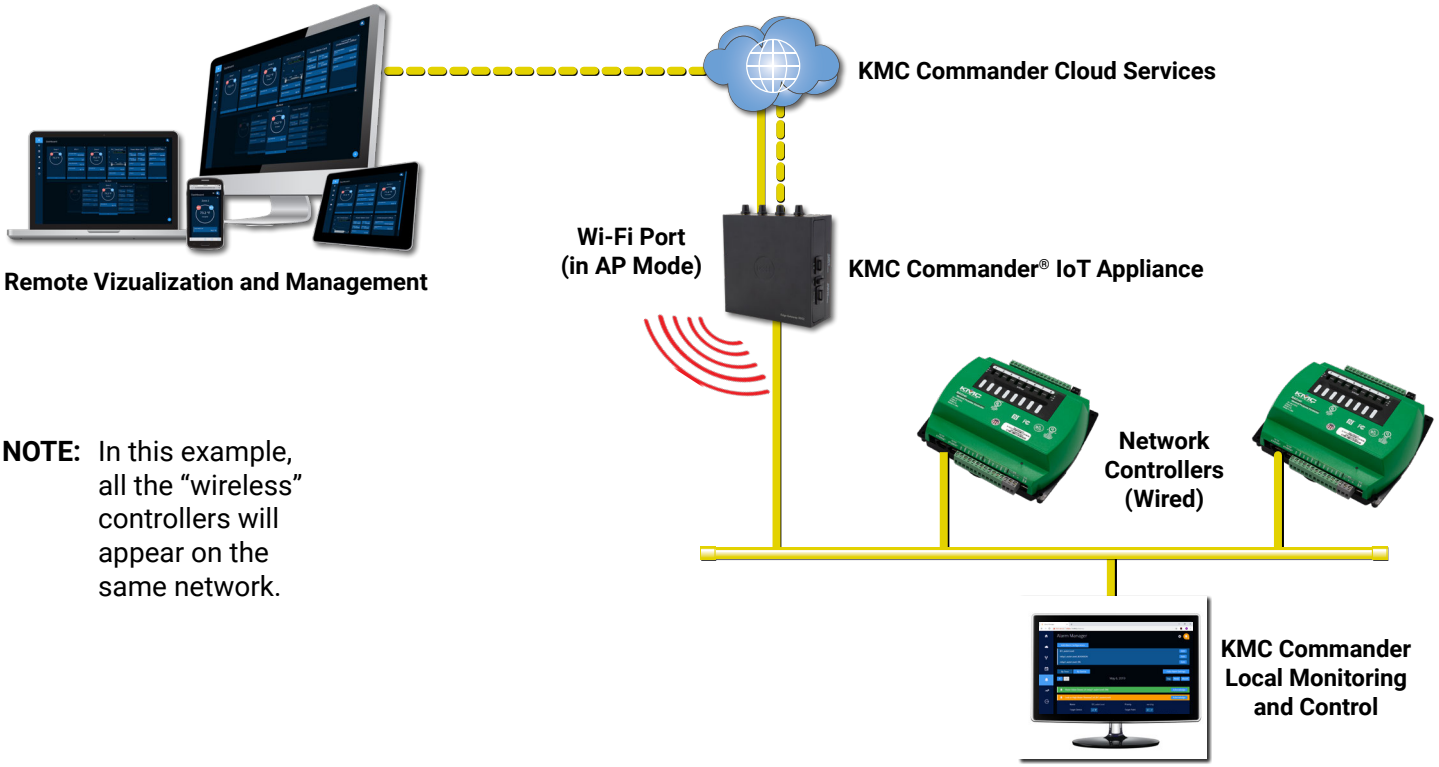


BACnet over IP Controllers (Wireless, One-to-Many)



BAC-5051AE BACnet Router and MS/TP Network Controllers (Wireless, One-to-Many)

TP-Link Routers in Client Mode with KMC Commander



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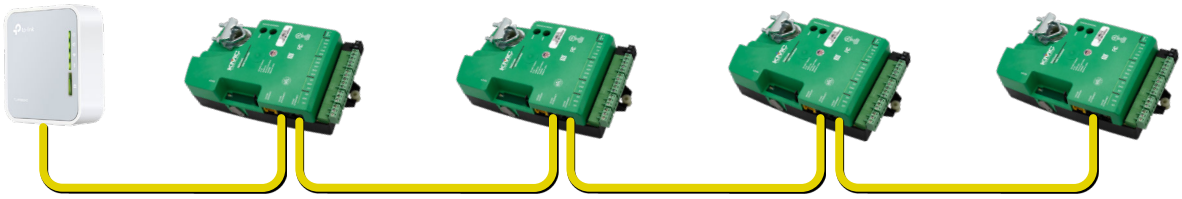
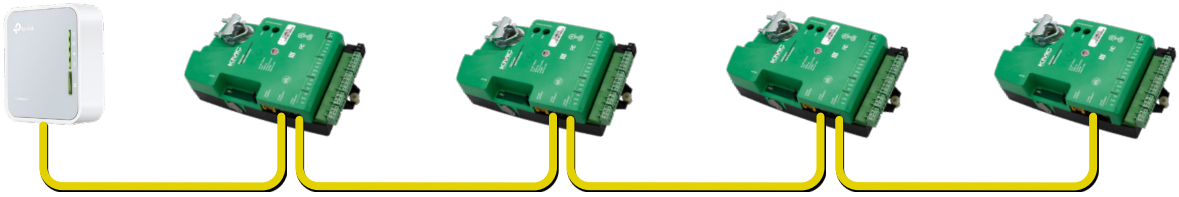
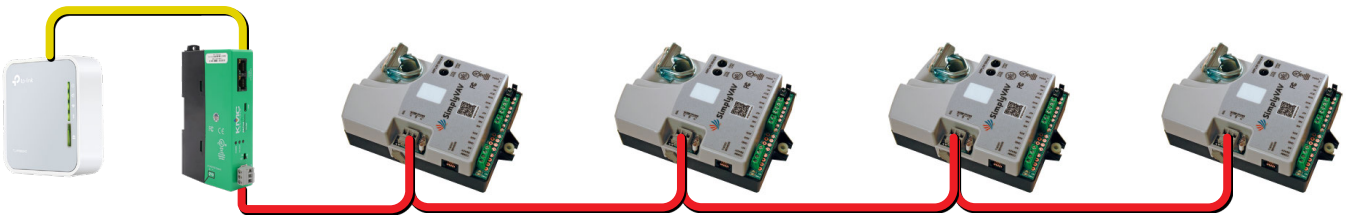


BACnet over IP Network Controllers (Wireless, One-to-Many)

TP-Link Routers in Client Mode

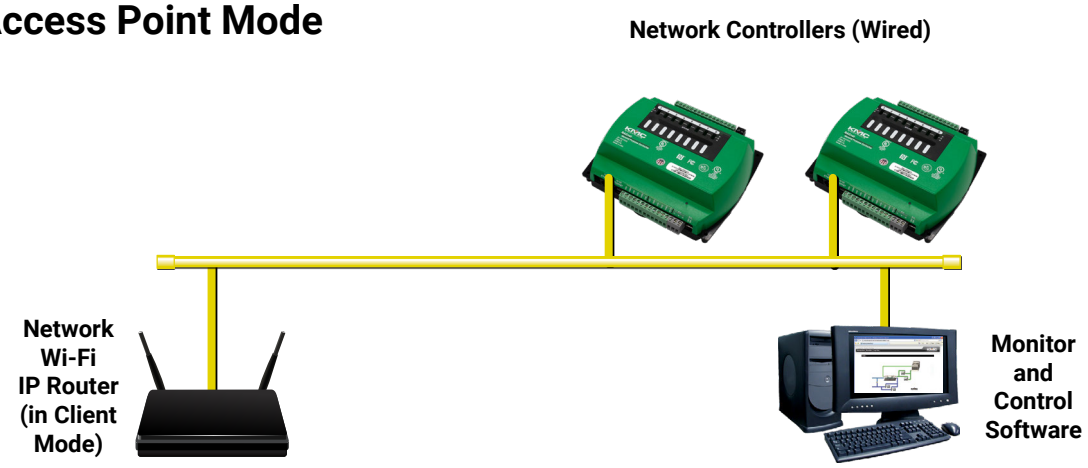


BACnet over IP Network Controllers (Wireless, One-to-Many)

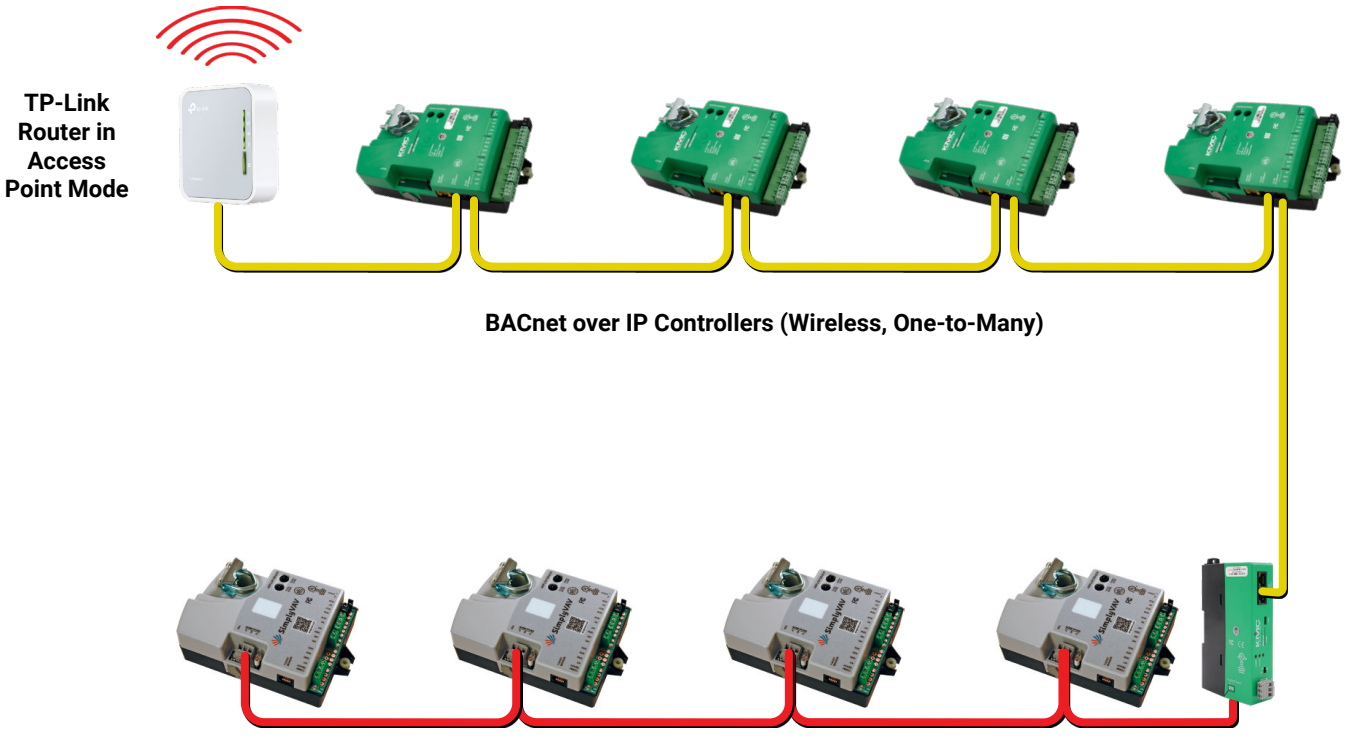


BAC-5051AE BACnet Router and MS/TP Network Controllers (Wireless, One-to-Many)

TP-Link Router in Access Point Mode



NOTE: In this example, all the “wireless” controllers will appear on the same network.



Preparation

From the building's IT department, get fixed IP addresses and subnet mask information for use in the installation of routers and controllers.

NOTE: A gateway address cannot be specified in the TP-Link router. When the router is used in AP mode, connected controllers may be able to use the router's IP address as their gateway.

The TP-Link wireless router does **not** have a BACnet MS/TP connection. Also, it and standard IP routers do **not** pass BACnet over Ethernet information. Use one or more of the following BACnet communication solutions:

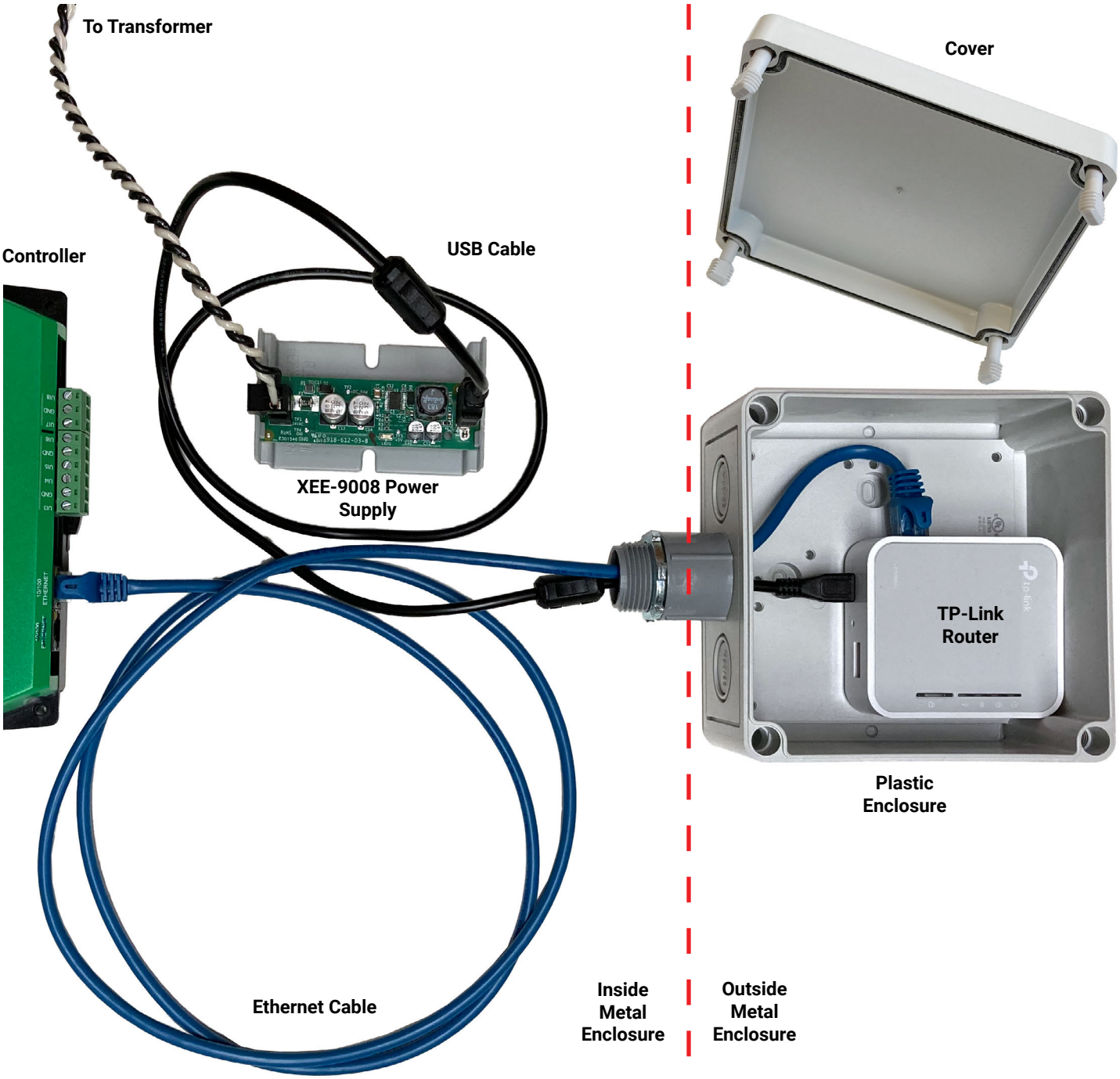
- Use devices configured for **BACnet over IP**.
- For **BACnet over Ethernet** devices, use a multiport BACnet router between the devices and the TP-Link wireless router.
- For BACnet **over MS/TP** devices, use a BAC-5051AE BACnet router between the MS/TP network and the TP-Link wireless router.

For controller and BACnet router configuration information, see **Controller and BACnet Router Configuration on page 15**.

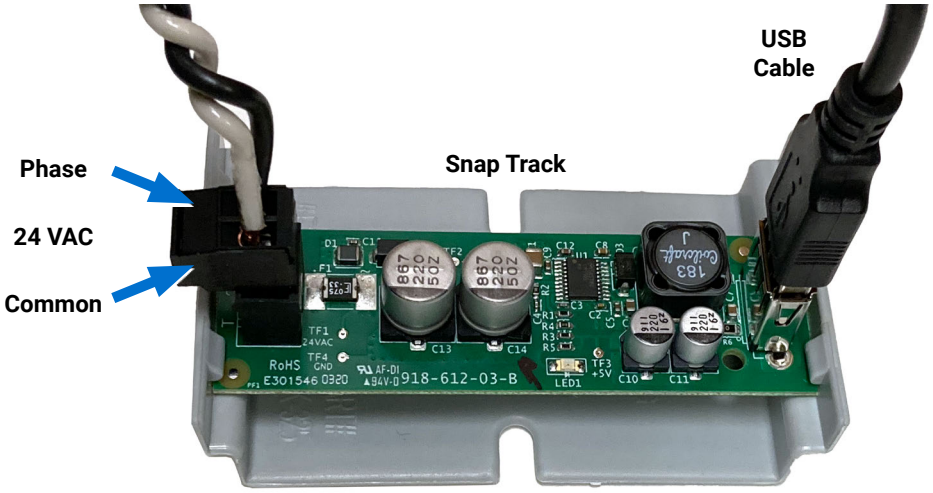
Mounting

NOTE: The TP-Link router must be mounted where adequate Wi-Fi signal strength will be available (e.g., do not mount it inside a metal enclosure). Use a Wi-Fi repeater/extender for areas with inadequate coverage. Another TP-Link TL-WR902AC can be used for this purpose in range extender mode. See the manufacturer's instructions for setting up range extender mode.

NOTE: These mounting instructions assume that relevant controllers are mounted inside a metal controller enclosure (such as the **HCO-1034**, **HCO-1035**, or **HCO-1036**). The XEE-9008 power supply is mounted **inside** that metal enclosure. The TP-Link router and its plastic enclosure are mounted on the **outside** of the metal enclosure using the attached conduit connector.



1. Loosen the four screws on the supplied plastic enclosure and remove the cover.
2. Mount the enclosure on a controller panel knockout near the KMC BACnet controller (or BAC-5051AE router).
3. Mount the Snap Track for the XEE-9008 power supply inside the metal controller panel using (not supplied) screws.

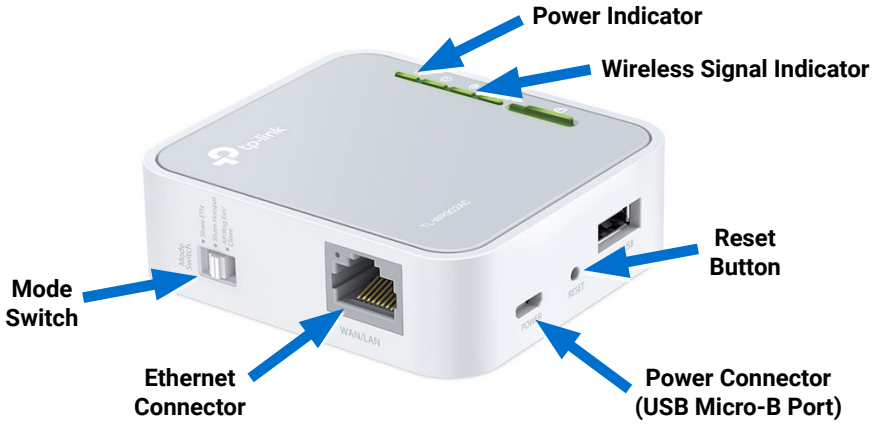


NOTE: If a separate enclosure (not included) is required for the XEE-9008 power supply inside the controller panel, mount it inside a suitable enclosure.

4. Thread the **supplied** Ethernet and USB cables through the knockout in the enclosure.

NOTE: The supplied USB cable (with molded ferrite beads to reduce EMI) **must** be used between the power supply and the router to meet FCC requirements.

5. Keep the TP-Link Wi-Fi Info Card containing the SSIDs and Wireless Password for use later in configuration. (See **Configuration Pages on page 9**.)
6. Place the TP-Link router in the enclosure.



NOTE: The router may rest on the bottom of its plastic enclosure, or it may be secured with the supplied hook-and-loop strips.

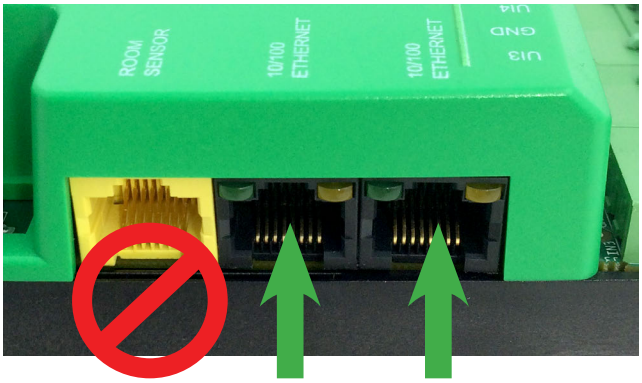
NOTE: Leave the router unsecured and the cover of the enclosure off until everything is configured and working properly. (After all other setup is completed, secure the router with the strips if desired, put the enclosure's cover in place, and tighten the screws.)

Connecting

Mode Switch and Physical Connections

NOTE: See the Hardware Information and Frequently Asked Questions sections of the included manufacturer's quick start guide for general information about the router.

1. Check that the **Mode Switch** is in the **AP/Rng Ext/Client** position.
2. Connect the Ethernet cable between the TP-Link router and the desired device (e.g., **Conquest "E" controller** or **BACnet router**). See **Sample Installations on page 2**.



(Room Sensor Connection) **Ethernet Connections** **(BAC-90xxE Shown)**

⚠ CAUTION

On a KMC Conquest Ethernet model controller, do NOT accidentally connect a cable to the Room Sensor port from an Ethernet port on a switch, router, or another daisy-chained Conquest controller! The **voltage from the Room Sensor port** (that powers STE-9xxx NetSensors) **WILL DAMAGE the connected Ethernet port!** If the Ethernet port is damaged, the wireless connection may still work, but communication with connected devices will be lost.

3. Connect the XEE-9008 power supply to the TP-Link router with the **included** USB cable.

NOTE: Be sure the USB plugs are pushed all the way into their connectors.

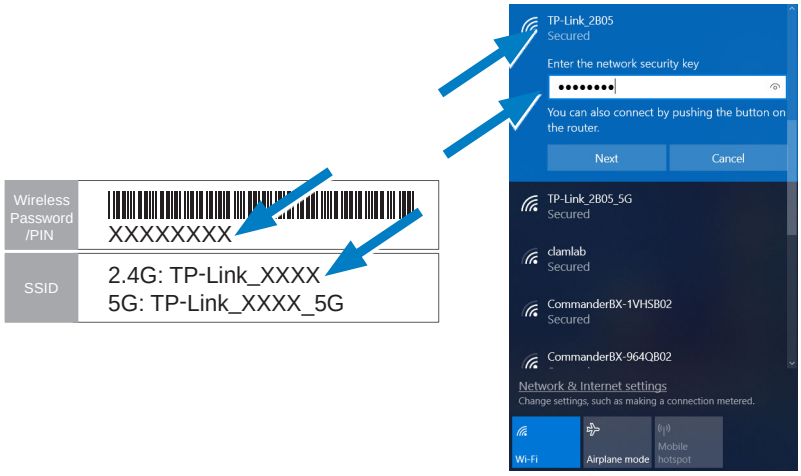
4. Connect 24 VAC to the black removable terminal block on the XEE-9008 power supply.

NOTE: A minute after the router has powered up, the green **Power** and **Wireless** LED should be (solid) ON. (See the manufacturer's instructions for more information and other LED indications.)

Configuration Pages

Connecting to the Router

1. View Wi-Fi connections on your phone or laptop and click on your router's network name.



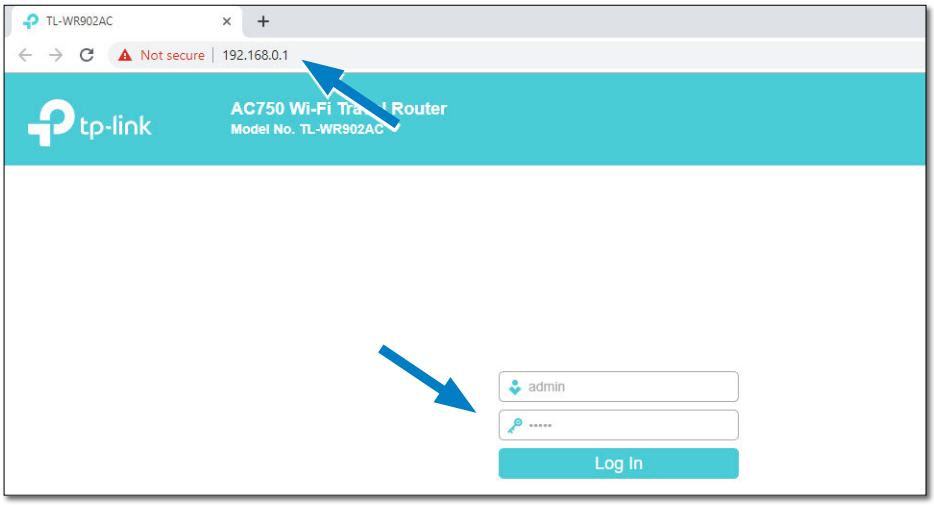
NOTE: Your router's default SSID (network name) and password are printed on a label on the back of the router.

2. Enter the network's eight-digit **password** (network security key) and click **OK** (or **Next** and **Join**).

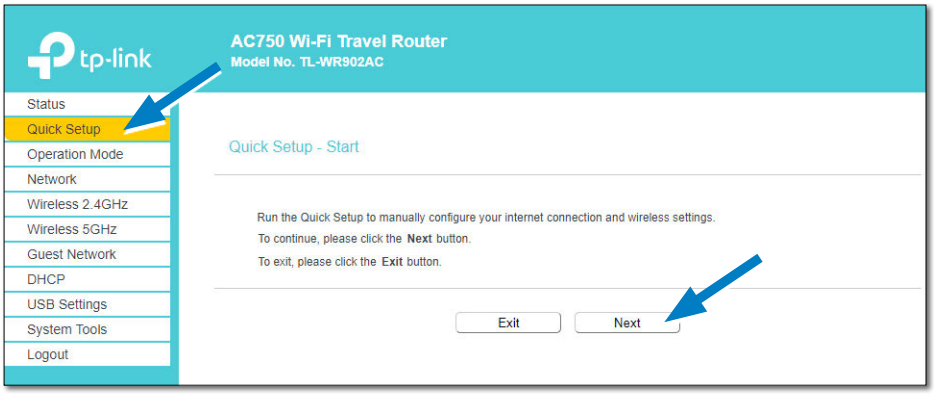
NOTE: This establishes a connection between the TP-Link router (as an access point) and the laptop or phone as a client.

NOTE: If you have trouble connecting the router, check that the phone or laptop IP settings are in DHCP mode. (See the Help for your operating system.)

3. Open a browser and log into **http://tplinkwifi.net/** or **http://192.168.0.1/**.



4. Enter **admin** as both the username and password.
5. Click the **Log In** button.
6. Click the **Quick Setup** link in the menu on the left.



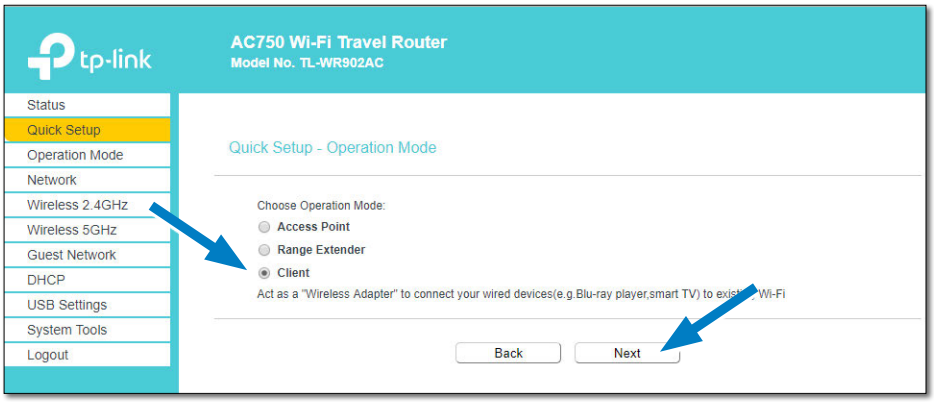
7. Click the **Next** button to start the Quick Setup.

NOTE: If problems occur during configuration (e.g., losing all communication with the router), the router can be reset to the **default configuration** using the Reset button. With the router powered on, use a pin to press and hold the **Reset** button (about 5 seconds) until all the LEDs turn off, and then release the button. After the router has fully rebooted (about 1 minute), connect to it starting at Step 1 of **Configuration Pages on page 9**.

8. Continue with one of the following two sections:
   - **Configuring the Router as a CLIENT on page 11**
   - **Configuring the Router as an ACCESS POINT on page 13**.

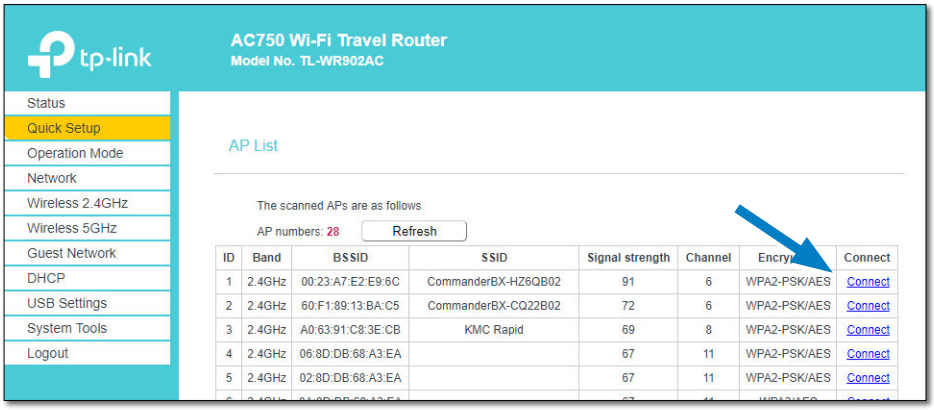
Configuring the Router as a CLIENT

1. Select **Client**.



2. Click the **Next** button.

3. Find the desired Access Point and click **Connect**.



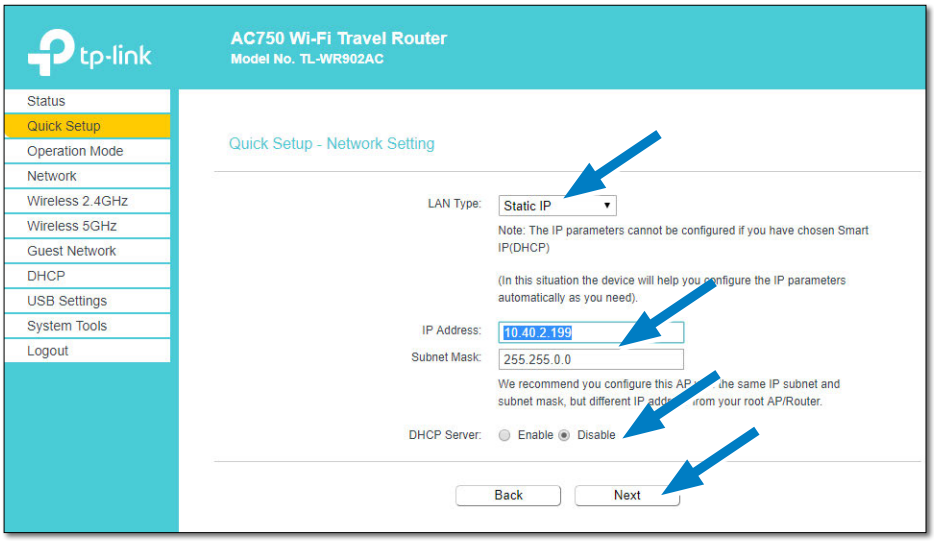
4. Enter the Access Point's Password.

NOTE: Be sure that password and encryption method match exactly.

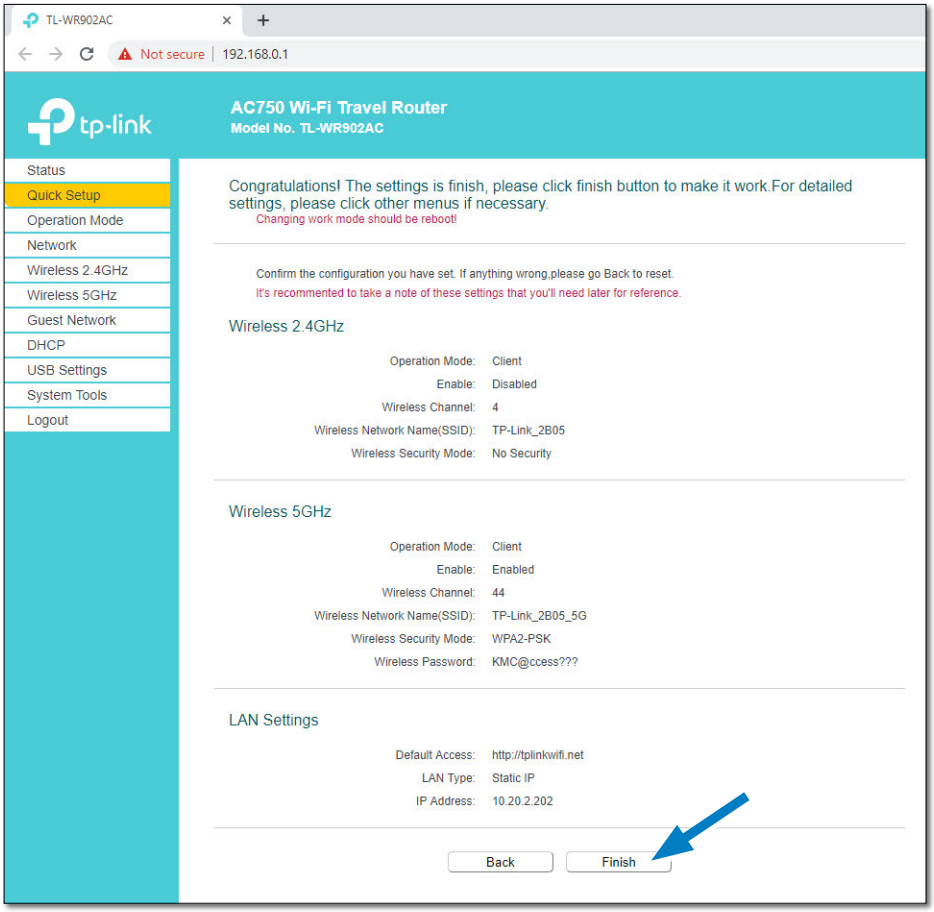
5. Click the **Next** button.

6. Change **LAN Type** drop-down box selection to **Static IP**.

7. Enter the new **IP address** and **Subnet Mask** (supplied by the IT department) of the TP-Link router.



8. Next to DHCP Server, click **Disable**.
9. Click the **Next** button.
10. Review the settings for accuracy.



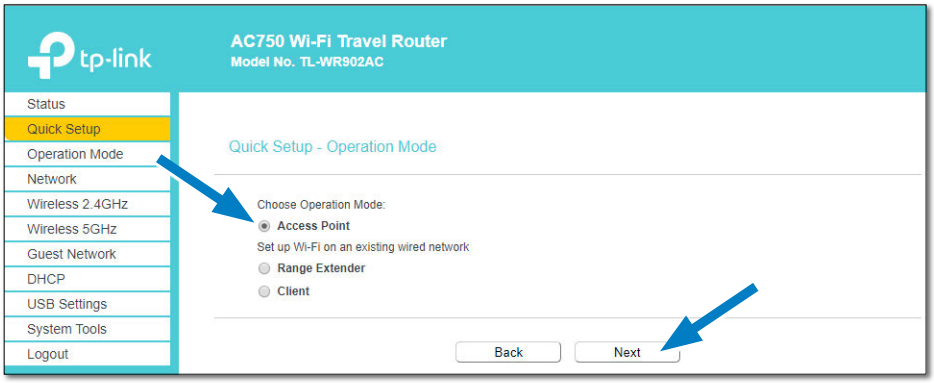
11. Scroll down and click the **Finish** button.

12. After rebooting, log in to the TP-Link router at its new address to verify correct operation.

13. Access the connected network devices.

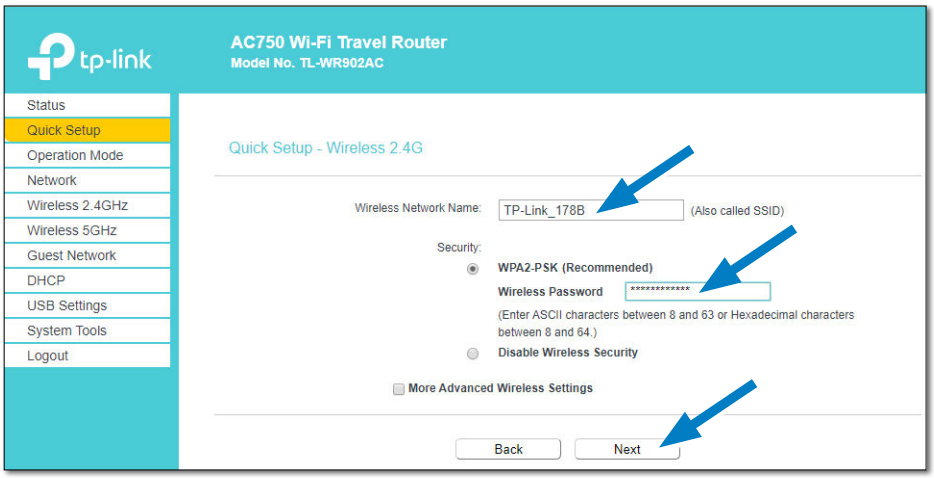
Configuring the Router as an ACCESS POINT

1. Leave **Access Point** selected.



2. Click the **Next** button.

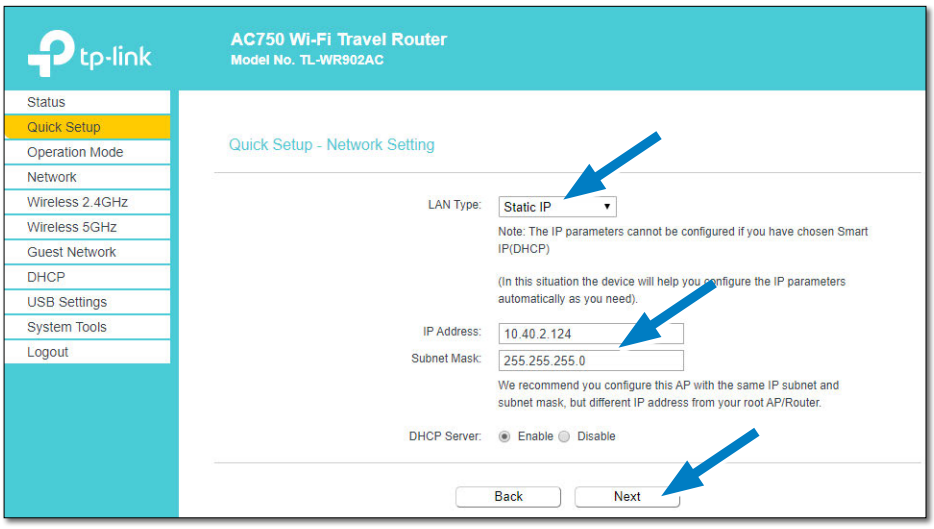
3. Change the SSID Wireless Network Name and Password (for 2.4G and/or 5G) as desired.



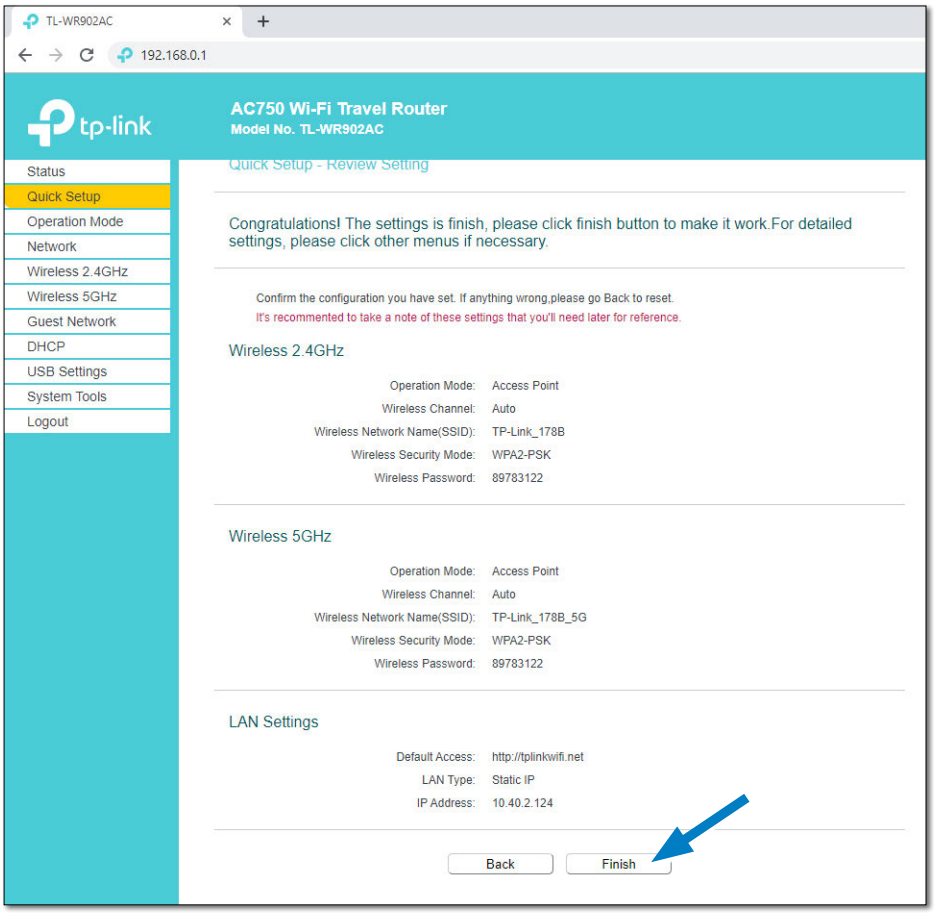
4. Click the **Next** button.

5. Change **LAN Type** drop-down box selection to **Static IP**.

6. Enter the new **IP address** and **Subnet Mask** (supplied by the IT department) of the TP-Link router.



7. Click the **Next** button.
8. Review the settings for accuracy.



9. Scroll down and click the **Finish** button.
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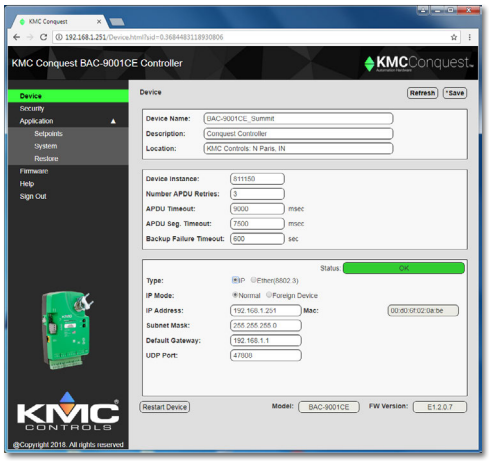
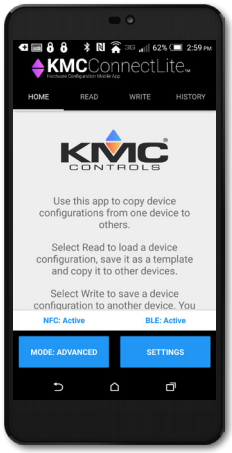
11. Access the connected network devices.

Controller and BACnet Router Configuration

To configure KMC Conquest Ethernet-enabled “E” model controllers for the correct **IP** addresses for the wireless network, use the **built-in web configuration pages** (see the **Conquest Ethernet Controller Configuration Web Pages Application Guide**) or the **KMC Connect Lite** app. See the relevant documents.





Troubleshooting

Wi-Fi Signal Is Not Strong Enough

Mount the HPO-9008 in a way that ensures adequate Wi-Fi signal strength (e.g., not inside a metal enclosure or behind large metal objects).

For areas with inadequate coverage, use a Wi-Fi repeater/extender. Another TP-Link TL-WR902AC router can be used for this purpose in range extender mode. See the manufacturer’s instructions for setting up range extender mode.

Communication Lost with TP-Link Router

Check that the TP-Link router is powered (indicator lights are on). If not, check the XEE-9008 power supply, transformer, and wiring.

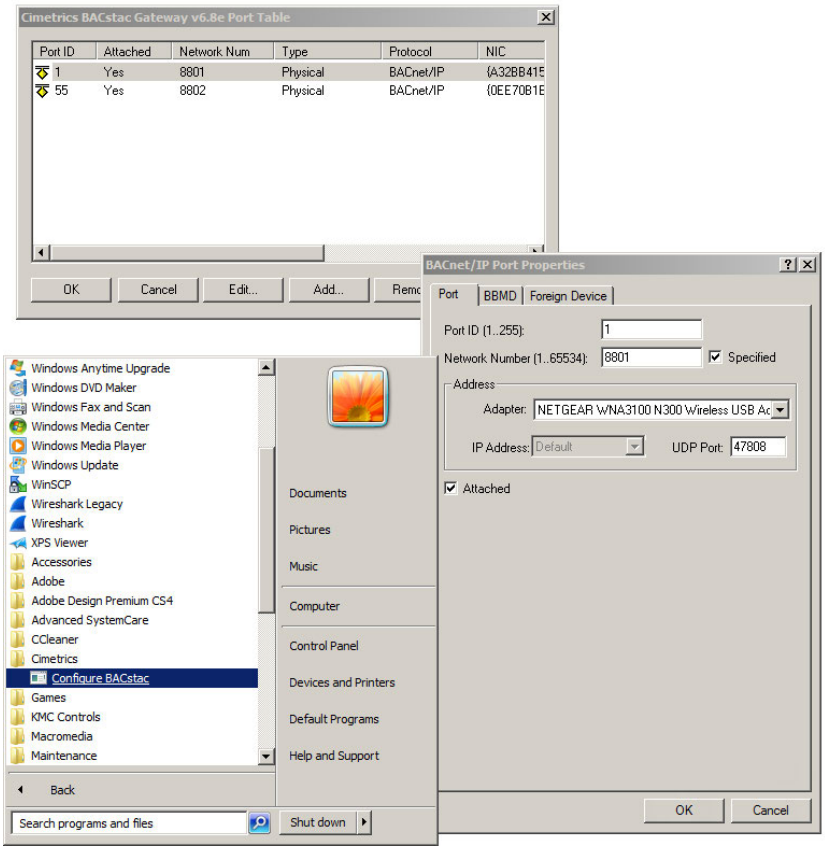
Cycle the power to the TP-Link router and wait at least a minute.

If all communication with the powered TP-Link router is still lost, reset the router to the **default configuration**. With the router powered on, use a pin to press and hold the **Reset** button (about 5 seconds) until all the LEDs turn off, and then release the button. After the router has fully rebooted (about 1 minute), connect to it again starting at Step 1 of **Configuration Pages on page 9**.

Connected BACnet Devices Are Not Discoverable

If web configuration pages for the controllers (or BAC-5051AE) and the TP-Link router can be viewed on the network, but the controllers cannot be found in a BACnet discovery (e.g., in KMC Connect or TotalControl):

- Check that the IP addresses, subnet mask, and gateway in all the devices are compatible with the desired network and each other.
- Check that the TP-Link router and the computer are both connected properly to the same network.
- Check the configuration and connections.
- Check that any firewall has the necessary open ports.
- If the router's Ethernet port is accidentally connected to a Conquest controller's Room Sensor port (that powers STE-9xxx NetSensors), the Ethernet port will be damaged. The wireless connection may still work, but communication with connected devices will be lost. See **Mode Switch and Physical Connections on page 8**.
- Check that the Cimetrics BACstac driver is properly set for wireless operation as needed. See the Configuring the Cimetrics BACstac Driver appendix in the **KMC Connect** or **TotalControl** software manuals.



Other Issues

For router firmware updates and complete information about the TP-Link TL-WR902AC Wi-Fi Travel Router, see **TP-Link's web site**.

HPO-9008 Kit Specifications

TP-Link Router

See manufacturer's information from TP-Link.

XEE-9008 Power Supply

Power, Input from Transformer (Terminal Block)

Supply voltage	24 VAC (50/60 Hz); –15%, +20%; Class 2 only
Required power	40 VA
Wire size	12–24 AWG, copper, in a removable screw terminal block

Power, Output to Router (USB Type-A 2.0 Port/Receptacle)

Output voltage	5 VDC
Output current	1.5 A, max.
Wiring	USB cable (supplied USB cable in kit, with molded-in ferrite beads, must be used to meet FCC regulations)

Mounting

Mounting	Snap Track

Environmental Limits

Operating	32 to 120° F (0 to 49° C)
Shipping	–40 to 160° F (–40 to 71° C)
Humidity	0 to 95% relative humidity (non-condensing)

Regulatory Approvals

FCC	FCC Class A, Part 15, Subpart B and complies with Canadian ICES-003 Class A*

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Handling Precautions

For digital devices, take reasonable precautions to prevent electrostatic discharges to the devices when installing, servicing, or operating them. Discharge accumulated static electricity by touching one's hand to a securely grounded object before working with each device.

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