Application Guide
KMD-5551E translator
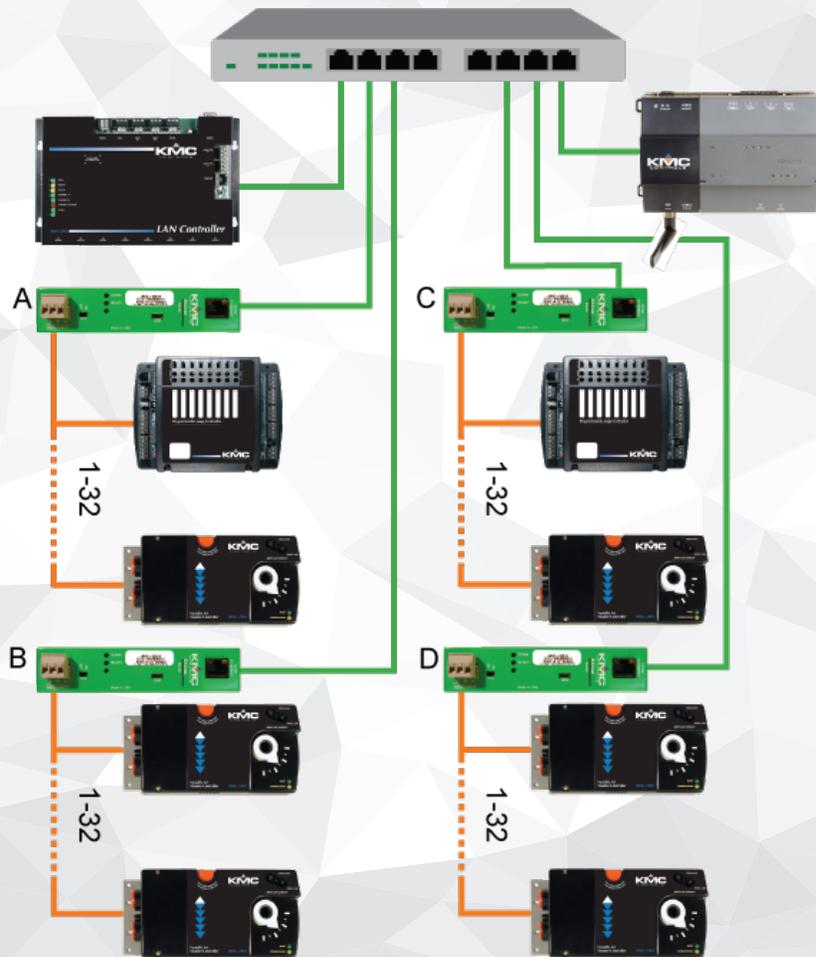
Includes installation, operation and maintenance instructions

Copyrights and trademarks

Handling precautions

To prevent damage from electrostatic discharges, take reasonable precautions when handling, servicing, or installing the router. Discharge accumulated static electricity by touching your hand to a securely grounded object before working with the router.

KMC Controls, Inc.
19476 Industrial Drive
New Paris, IN 46553
U.S.A.
TEL: 1.574.831.5250
FAX: 1.574.831.5252
info@kmccontrols.com

Contents 3

Section 1:   Introduction

This section provides a description of the KMC Controls KMD-5551E translator. It also introduces safety information. Review this material before installing or operating the translator.

The KMC Controls KMD-5551E translator is a KMDigital-to-BACnet translator. The Translator's features include:

- Translation between one KMD Tier 1 controller and up to 32 KMD controllers on the same Tier 2 network to a BACnet virtual network.
- Compatibility with Niagara^{AX} and Niagara 4 Frameworks.
- Easy installation and simple configuration from internally served web pages.
- Internal network diagnostics and route status reports.

Topics in this section

Specifications

Specifications are subject to change without notice.

Communication ports

BACnet Ethernet, BACnet IP, KMD Tier 1
10BaseT/100BaseT, RJ−45 connector

KMD Tier 2
One optically isolated Tier 2 port, 9.6−38.4 kilobaud
Removable three-screw terminal block, 12−22 AWG wire
Switched end-of-line termination

USB
USB micro B connection for power and communications

Configuration and software

All configuration is through internal browser-based configuration pages. This requires an HTML5 browser.

BACnet routing

One BACnet IP port that can be set up for any of the following protocols:

- Normal BACnet IP network routing
- BACnet broadcast management device (BBMD) with network and port address translation
- Foreign device registration with BACnet broadcast management devices (BBMDs)
- PAD (packet assembler/disassembler) routing

One BACnet Ethernet port

Installation

Supply voltage	24 VAC (50/60 Hz) or 24 VDC; −15%, +20%; Class 2 only; non-supervised (all circuits, including supply voltage, are power limited circuits) 5 volts DC from powered USB connection Supply source automatically switches to highest available voltage 8 VA required power
Weight	Approximately 5.3 ounces (149 grams)
Case material	Green and black flame retardant plastic

Processor and memory

Processor	Processor 32-bit ARM® Cortex-M4
Memory	Configuration parameters and diagnostics are stored in nonvolatile memory; auto restart on power failure

Regulatory and agency listings

UL	UL 916 Energy Management Equipment
	UL 864 Smoke Control Equipment listed (UUKL), 10th edition. For smoke control applications, see [Smoke Control Manual for KMC Conquest Systems](#), P/N 000-035-18.
RoHS	RoHS compliant (pending)
CE	CE compliant
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.

Environmental limits

Operating Temperature 32 to 120° F (0 to 49° C)

Shipping Temperature -40 to 140° F (−40 to 60° C)

Humidity 0–95% RH, non-condensing

Timekeeping

The KMD-5551E translator is a BACnet time master device.

Update interval	Daily, weekly, or monthly
Time message type	UTC, local, or both
Setting time	Synchronized to SNTP server, set from computer time, or manually entered

Niagara compatibility

Compatible with Niagara 3.8 and later. Requires a license and module added to a Niagara station, typically in a JACE controller, on the same BACnet internetwork.

Translation

Translates between one KMD Tier 1 controller, the controllers connected to one KMD Tier 2 network, or both to a BACnet virtual network. Values for KMD input, output, and variable points are translated between BACnet input, output, and value objects. Translation is limited to the following properties:

- Point values and Present values
- Manual and Out-of-service status
- Device, controller, and panel names
- Object and point names, descriptions, and labels
- Units of measure

Dimensions and mounting

Surface mount or 35 x 7.5 mm DIN rail mounting
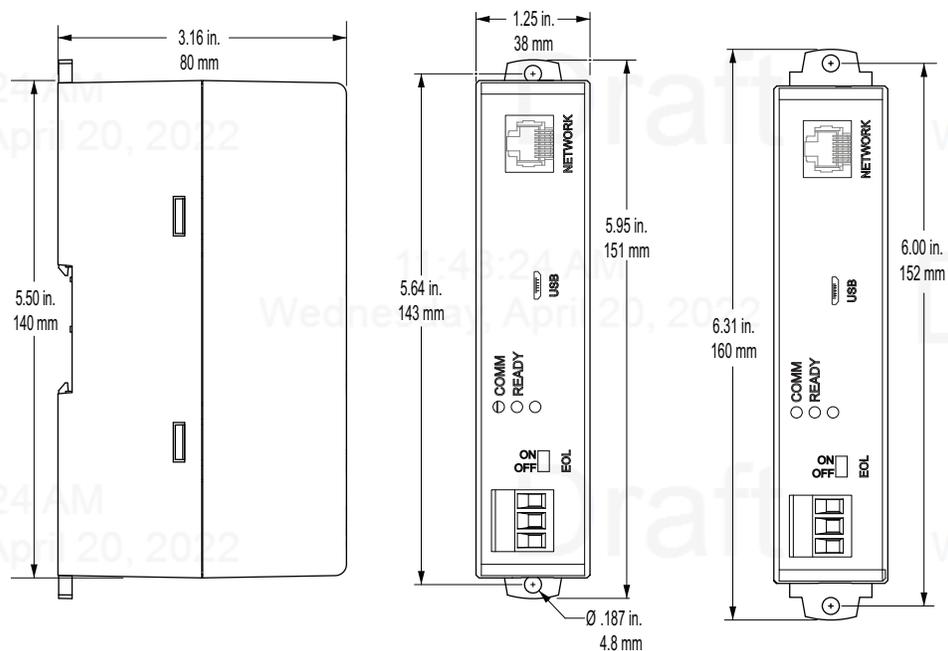
Accessories and replacement parts

The following accessories and replacement parts are available from KMC Controls, Inc.

Power transformer

XEE-6111-50	Transformer, 120-to-24 VAC, 50 VA, single-hub
XEE-6112-50	Transformer, 120-to-24 VAC, 50 VA, dual-hub
XEE-6112-100	Transformer, 120-to-24 VAC, 96 VA, dual hub (approved for smoke control applications)

Surge suppressors

KMD-5567	EIA-485 surge suppressor for MS/TP or Tier 2 networks

Cables

HSO-9001	Ethernet cable, 50 feet
HSO-9011	Ethernet cable, 50 feet, plenum rated

Replacement parts

HPO-9901	Controller replacement parts kit with terminal blocks and DIN clip

License

DR-KMD-TRANS	Niagara license for any KMD-5551E translator discovered by a station

Mounting the translator

For permanent installations, the translator can be flush mounted or snapped to a 35 x 75 mm DIN rail. For translator dimensions, see the topic *Specifications* on page 5.

Surface mounting Extend the mounting tabs away from the translator body and fasten with screws.

Illustration 1–1 Surface mounting the translator
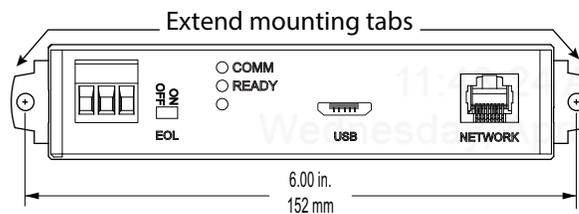
DIN rail mounting Mount the DIN rail and then do the following:

1 Extend the mounting tabs.

2 Place the bottom of the router over the DIN rail.

3 Push the mounting tabs back toward the router body to lock it to the rail.

Connecting for network routing

Connect the KMD-5551E translator to a network router or network switch and, as needed, to a KMD Tier 2 network. For permanent installations, the router is typically connected to a 24 volt transformer for power.

For installations that include Internet access, install the translator behind a firewall.

Illustration 1–2 Permanent installation
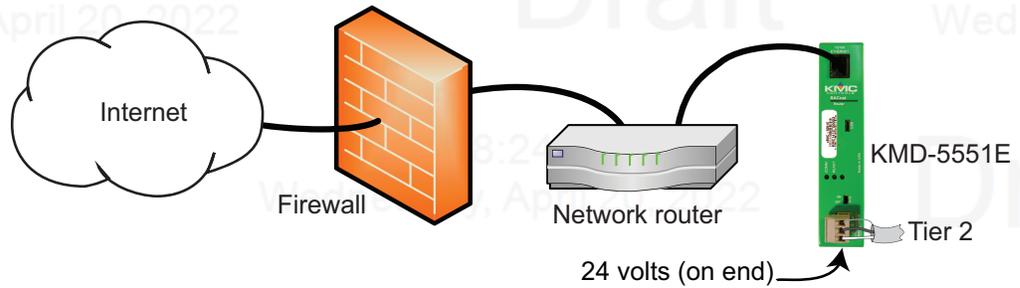
See also the following topics:

Tier 2 wiring

Use shielded cable and the following principles when connecting the KMD-5551E translator to a Tier 2 network:

- Use twisted pair, shielded cable with capacitance of no more than 51 picofarads per foot for all network wiring. See the bulletin *TB190529A, EIA-485 Network Wire Recommendations* available at kmccontrols.com.

- Connect the -A terminal in parallel with all other A or -A terminals.

- Connect the -B terminal in parallel with all other B or +B terminals.

- Connect the shields of the cables together at each controller.

- Connect the shield to an earth ground at one end only.

- Use a KMD-5575 repeater if the cable length will exceed 4,000 feet (1,220 meters). Use no more than seven repeaters per Tier 2 network.

- Place a KMD-5567 surge suppressor in the cable where it exits a building.

Illustration 1−3 Tier 2 wiring and end-of-line switches
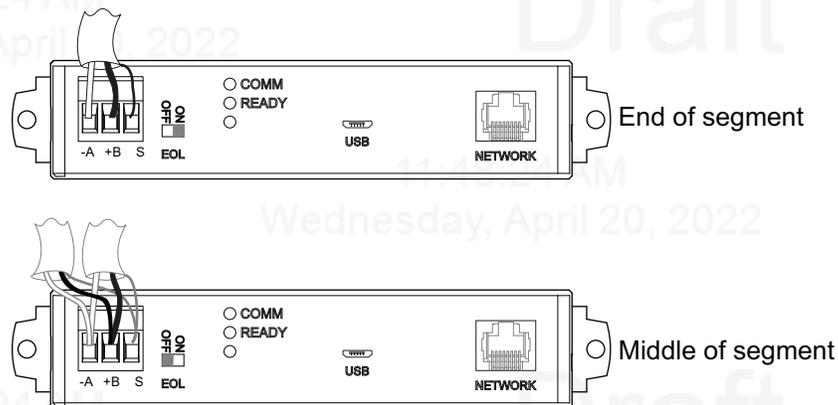
EOL (End-Of-Line) termination switches

The devices on the physical ends of the Tier 2 wiring segment must have end-of-line termination added for proper network operation.

- If the translator is at the end of the network segment, set the EOL switch to *ON*.

- If the translator is in the middle of the network segment, set the EOL switch to *OFF*.

Connecting power

Power the KMD-5551E translator from a 24 volt power source, either AC or DC, or from a USB connection. The translator begins to operate when a power source is applied. Use the following guidelines when choosing and wiring sources to the translator.

For USB power Connect the translator to a powered USB port with a USB A to USB micro B cable. Typically the USB ports on laptop computers can supply power to the router. When connecting to a USB hub, verify the power specifications of the hub. See the topic *Specifications* on page 5.

Illustration 1–4 USB connection

USB power
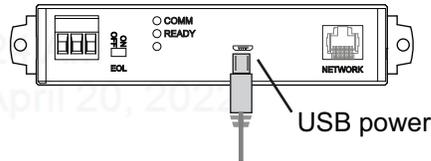
> **Note:** When using USB connection for power and communications, use the USB cable from the HPO-5551 Technician's Router Cable Kit. The cable from the kit is specified to supply enough power for both the USB and the network connection.

To use the USB for power and network communications, see the topic *Single-cable connection* on page 13.

For permanent installations, the translator is usually powered from a 24 volt transformer or DC power supply.

Illustration 1–5 24 volt power connections

24 volts AC   24 volts DC
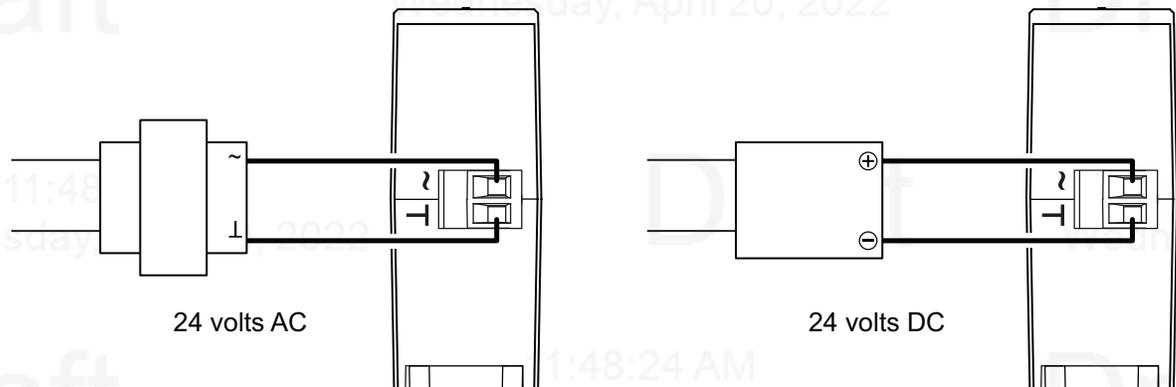
For 24 volt AC power Connect a 24 volt transformer to the black power terminal block on the end of the translator.

- Connect the AC phase to the phase terminal ($\sim$).

- Connect the ground side of the transformer to the ground terminal ($\perp$).

- Use a Class 2 transformer of the appropriate size to supply power to the translator.

- KMC Controls recommends powering the translator from a dedicated transformer.

- Do not run 24 volt power from within an enclosure to external devices.

For 24 volt DC power Connect a 24 volt power supply to the black power terminal block on the end of the router.

- Connect the positive terminal (**+**) to the phase terminal (∿).

- Connect the negative terminal (**-**) of the power supply to the ground terminal (⊥).

- Use a Class 2 power supply of the appropriate capacity to supply power to the translator.

- KMC Controls recommends powering the translator from a dedicated power supply.

- Do not run 24 volt power from within an enclosure to external devices.

Single-cable connection

The single-cable connection method connects the KMD-5551E translator to a computer with a USB cable that supplies both power and communications. The USB port becomes a virtual network interface card (NIC) and establishes a network between the computer and the translator.

> **Note:** Use the USB cable from the HPO-5551 Router Technician's Cable kit for a single-cable connection. This cable meets the specification to supply the power and communications required by the translator. Other cables may prevent routing on one or more ports.

Illustration 1−6 Single-cable connection
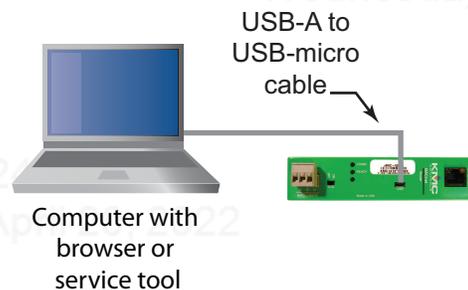
To set up a single-cable connection, do the following:

1 Plug the USB cable from the HPO-5551 cable kit into the translator.

2 Plug the other end of the USB cable into the computer.

Depending on the version of Windows, the first time the translator is plugged into a computer, Windows will display a message that it is installing a new driver. Click the message to see more details. Note the name of the device in the message because you will need this information in later steps. Allow the installation to finish and then close the dialog.

3 From the Windows Control Panel, click **Network and Internet**.

4 Click **Networking Sharing Center**.

5 Once the center is open, click **Change Adapter Settings**.

6 Identify the Local Area Connection that is associated with the translator and click it to open the connection.

7 In the Local Area Connection status, click **Properties**.

8 When the next dialog opens, choose **Internet Protocol Version 4**.

9 Click **Properties**.

10 In the Properties dialog, select **Use the following IP address** and then enter a unique IP address and subnet mask.

- The IP address must be unique and be part of the same subnet as the translator's address.

- If the translator is still configured with the default address, use 192.168.1.10.

- Set the subnet mask to 255.255.0.0.

11 When finished, click **OK** to save the work and then close all dialog boxes.

To test the connection, do the following:

1 Open a browser window.

2 Enter the address of the translator.

3 When the log in page opens, set up the translator as described in the topic

4 When the log in page opens, set up the translator as described in the topic *Setting up translation* on page 35.

Maintenance

The KMD-5551E translator requires no routine maintenance. If necessary, clean with a damp cloth and mild soap.

If you encounter difficulty

If you experience difficulty with the KMD-5551E translator, KMC Controls provides the following assistance.

The KMC Controls web site Navigate to the support section on the KMC Controls website for the latest information for KMD-5551E translator and other KMC Controls products.

<p align="center">www.kmccontrols.com</p>

KMC technical support Our distribution partners have unlimited and free access to our team of Technical Support representatives. We provide coast-to-coast and toll-free support from 8:00 AM Eastern Time to 5:00 PM Pacific Time.

<p align="center">Toll-Free Technical Support: (866) 303-4562</p>

Section 2: Translation concepts

This section explains the basics of translation, shows example networks, and explains the rules for translation.

The KMD-5551E translator connects between one or more KMDigital controllers and a BACnet internetwork. The translator polls designated KMDigital controllers and adds them as BACnet devices to a virtual BACnet network. The BACnet routing within the translator makes the virtual network and devices available to any other device or operator workstation on the internetwork. The devices on the virtual network can then be discovered and manipulated within the Niagara framework as standard BACnet devices and objects.

Illustration 2−1 KMD-5551E translator block diagram
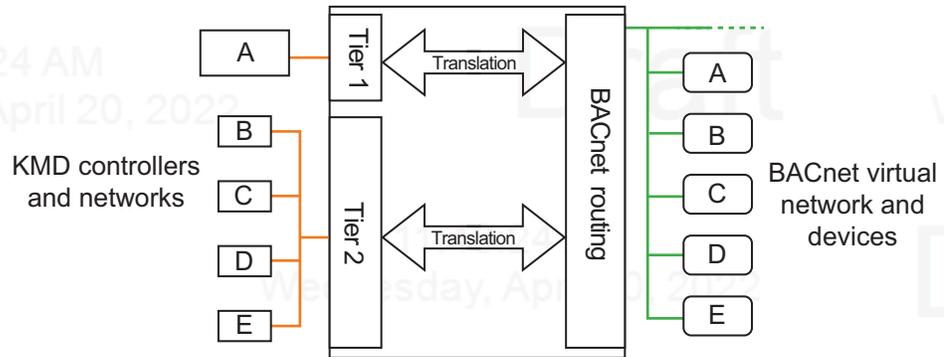
Topics in this section

Translation rules

The KMD-5551E translator supports one Tier 1 controller and up to 32 controllers on one Tier 2 network. The Tier 2 network does not have to be connected to the Tier 1 controller.

- KMDigital input, output, and variable points are translated as BACnet input, output, and value objects.
- Digital KMD points are translated to binary objects.
- Analog KMD points are translated to analog objects.
- KMD analog input points with Counts selected as units are translated as BACnet accumulator objects.
- Labels and descriptions in KMD points are translated as BACnet name and description properties.

At power-up or reset, the translator scans for devices on the designated KMD networks. For large networks the translator may take up to an hour to discover all devices and objects.

After the initial discovery, the translator automatically scans once an hour for new devices or changes. To start an immediate rediscovery, see the topic *KMD Subnet Device Configuration page* on page 44.

KMD to BACnet translation

The translator uses the following rules when transferring values from KMDigital points to BACnet objects.

- For KMD output and variable points *not set* to Manual, the value of the point is transferred to the Relinquish Default property of a BACnet output or value object.
- For KMD output and variable points *set* to Manual, the value of the point is transferred to Priority 8 in the Priority Array of a BACnet output or value object.
- Values for KMD input points are transferred to the Present Value of a BACnet input object.
- KMD input points set to Manual status are transferred to a BACnet input object as Out Of Service.
- When reading a property, values may be cached for up to 30 seconds.

BACnet to KMD translation

The translator uses the following rules when transferring values from BACnet objects to KMDigital points.

- Changing the BACnet Present Value property at any priority level transfers the value directly to the value of the KMD point and that point is then set to Manual.
- Changing an Input Object to Out of Service changes the KMD point to Manual.
- Values may be cached for up to 30 seconds.

Applicable controllers

The following controllers are compatible with the KMD-5551E translator.

Tier 1 controllers
- KMD-5210
- KMD-5205
- KMD-5270

Tier 2 controllers
- KMD-5800 series
- KMD-7000 series
- KMD-7100 series
- KMD-7300 series
- KMD-7400 series

Tier 2 controllers (obsolete)
- KMD-5500 series
- KMD-6000 series
- KMD-6100 series
- KMD-6300 series
- KMD-6400 series
- KMD-6900 series

Example networks

The following network diagrams are examples for connecting KMD-5551E translators to KMDigital networks. These are conceptual diagrams only. For detailed installation instructions, see the following topics.

- *Connecting for network routing* on page 10
- *Setting up translation* on page 35
- *Preparing a KMDigital site for a KMD-5551E and Niagara* on page 63

KMD Tier 2 only

For networks without a KMD Tier 1 controller, connect translators directly to the Tier 2 network and to the same local area network to which the station is connected. All Tier 2 devices will appear on the same virtual BACnet network.

- Split the Tier 2 network into segments of 32 controllers and add a translator to each segment.
- Connect one of the Tier 2 segment to Translator A.
- Connect the remaining segments to additional translators. In this example, Translator B.
- With Hardware Configuration Manager, renumber the Tier 2 controller controllers to prevent gaps in the KMD addresses.

Illustration 2−2 KMD-5551E translator connected to a Tier 2 network
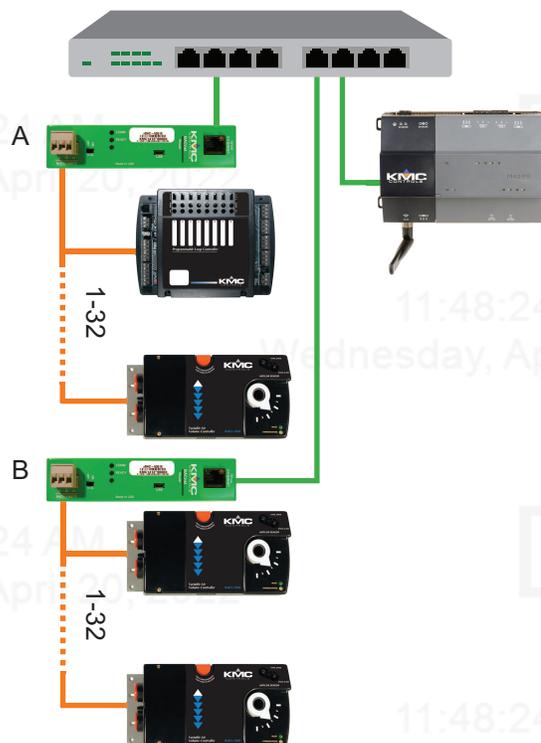
KMD Tier 1 and a single KMD Tier 2

Connect the KMD-5551E translator to the Tier 2 network and to the same local area network that the Tier 1 and JACE controllers are connected to. The Tier 1 and all Tier 2 controllers will appear on the same virtual BACnet network.

- Disconnect the Tier 2 network from the Tier 1 controller.
- Split the Tier 2 network into segments of 32 controllers and add a translator to each segment.
- Configure Translator A for the Tier 1 controller.
- Connect one of the Tier 2 segment to Translator A.
- Connect the remaining segments to additional translators. In this example, Translator B.
- With Hardware Configuration Manager, renumber the Tier 2 controller controllers to prevent gaps in the KMD addresses.

Illustration 2–3 KMD-5551E translator connected to a Tier 1 controller and a Tier 2 network
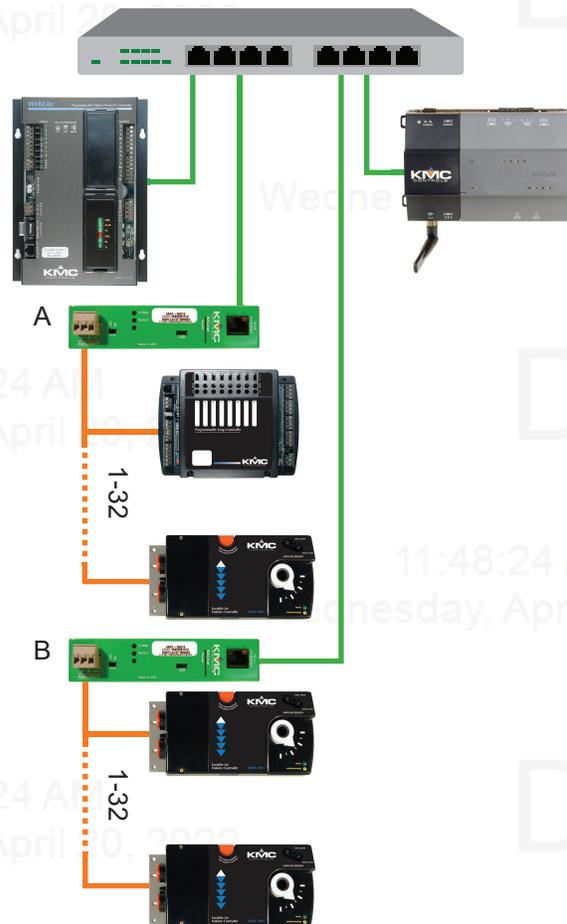
KMD Tier 1 and two KMD Tier 2 networks

A KMD-5210 LAN Controller requires several KMD-5551E translators to translate the points in a LAN Controller and the controllers on both Tier 2 networks to BACnet devices and objects.

- Disconnect the Tier 2 networks from the KMD-5210 LAN Controller.
- Split the Tier 2 networks into segments of 32 controllers and add a translator to each segment.
- Configure Translator A for the Tier 1 controller.
- Connect one of the Tier 2 segment to Translator A.
- Connect the remaining segments to additional translators. In this example, Translators B-D.
- With Hardware Configuration Manager, renumber the Tier 2 controller controllers to prevent gaps in the KMD addresses.

Illustration 2−4 Multiple KMD-5551E translators connected to a Tier 1 controller and two Tier 2 networks
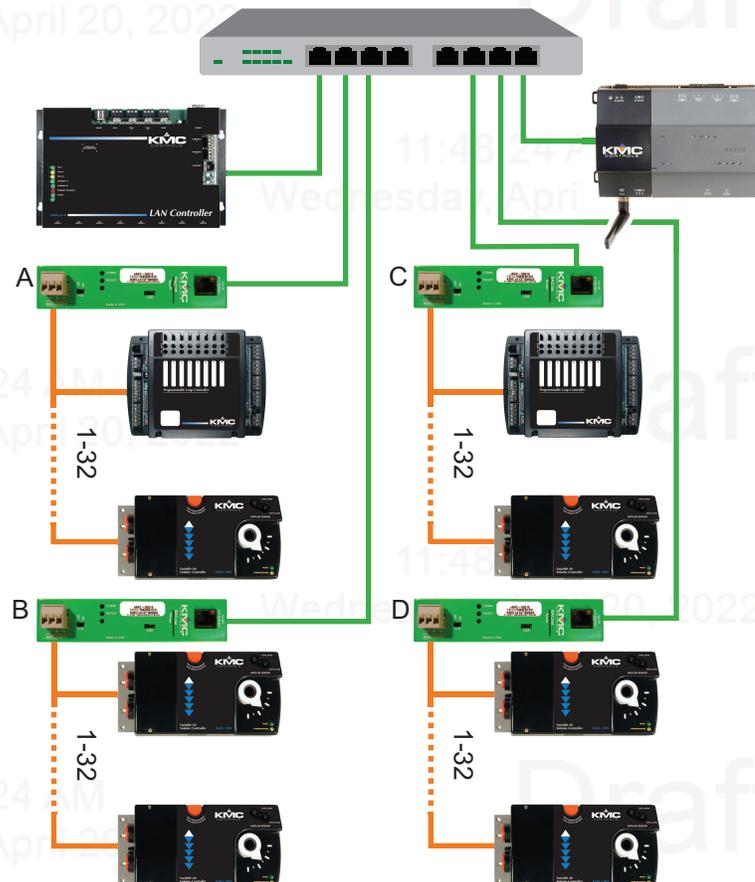
Section 3: Configuring the KMD-5551E translator

This section provides important guidelines for configuring a translator before it is placed on a network. Review this information carefully for proper installation.

The translator must be configured as a network device. To prevent disrupting an existing network, configure the network address before connecting the translator to the network. The BACnet device instance and other properties can be configured at the same time or after the IP address is assigned and the translator is installed in its permanent location on a network.

Topics in this section

Initial setup

Configure the KMD-5551E translator with an HTML5 compatible web browser using the web pages served from within the translator. The translator has the following default network address values.

- IP address—192.168.1.252

- Subnet mask—255.255.255.0

- Gateway—192.168.1.1

You will need the following information before you can configure a translator.

From the BACnet system engineer:

- BACnet device instance for the translator.

- Network numbers for each of the enabled networks.

- If applicable, the address and port for a PAD router or BBMD to which the translator will connect.

From the IT system administrator:

- The IP address for the translator.
- The IP subnetwork mask for the Ethernet LAN to which the translator will connect.
- The IP address of the network gateway.
- If the translator is part of a system that uses the Internet, you will also need the public IP address and port.

You will also need an HTML5-compliant browser, Ethernet cable, and a USB Type A-to-USB Type B micro cable or a 24 volt AC power source.

Setting up for configuration

To configure the translator, plug it into an Ethernet port. Typically, this is a direct connection to a computer Ethernet connection that requires changing the computer IP address. See the procedure *Changing your computer's address* on page 24.

In addition to the Ethernet connection, supply temporary power to the translator with a USB cable. An alternative to the USB power connection is a 24 volt AC source. See *Connecting power* on page 11.

Illustration 3−1 Connecting for configuration

USB for power
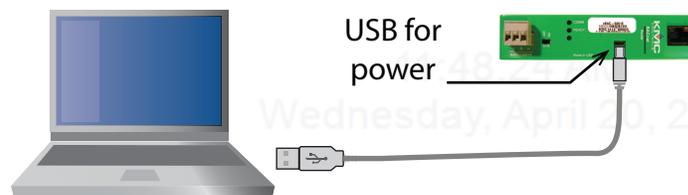
Logging in

Use an HTML5 browser to log in and configure the translator.

To log in, do the following.

1   Connect the translator to an Ethernet port by doing one of the following.

- Connect directly to the computer.
- Connect to a subnet that recognizes address 192.168.1.252.

2   Connect the translator to either USB or 24 volt AC power.

3   Open a new browser window.

4   Enter the address **192.168.1.252**.
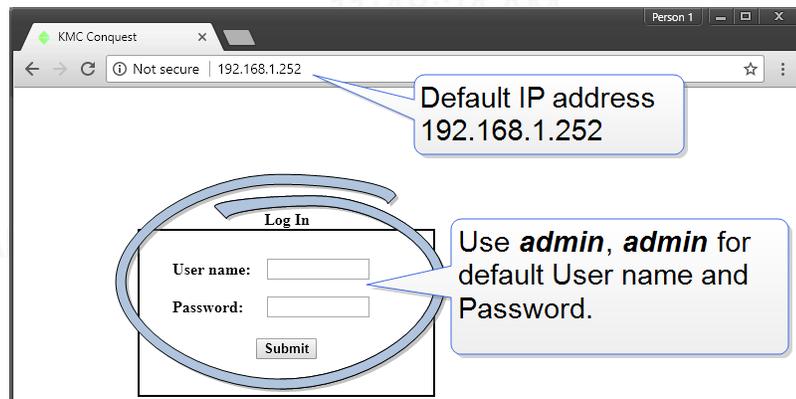
5   At the log in window enter the following user name and password.

- User name: **admin**
- Password: **admin**

6 Once you have logged in, other parameters of the translator can be changed from the Home page.

- To change the IP address, see the topic *Device properties page* on page 27.

- To set up BACnet routing and translation, see the topic *Setting up translation* on page 35

- To change passwords and add users, see the topic *Security page* on page 30.

> **Note:** Once you change the IP address, place the translator on the new subnet and log in using the new address. After the address is changed and saved, the translator will not respond to the old address.

Changing your computer's address

To directly connect a computer to a translator, you must set the IP address of the computer to be compatible with the IP address of the translator.

1 From the Windows Control Panel, click **Network and Internet** and then **Networking Sharing Center**.

2 Choose the local connection for the LAN. Depending on the computer and version of Windows, the exact name for the connection may be *Ethernet*, *Local Area Connection*, or something similar.
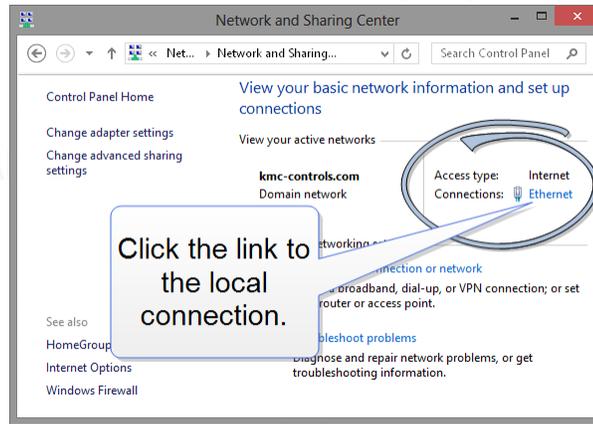
3 In the Ethernet Status dialog, click **Properties**.

4 In the Ethernet Properties dialog, scroll and select **Internet Protocol Version 4 (TCP/IP)** and then click **Properties**.
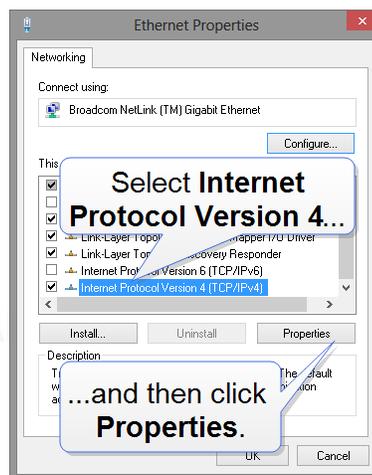
5   In the Properties dialog, select **Use the following IP address** and then enter the
       following for the IP address, subnet mask, and Gateway.

   - IP address—192.168.1.10

   - Subnet mask—255.255.255.0

   - Gateway—Leave empty or unchanged
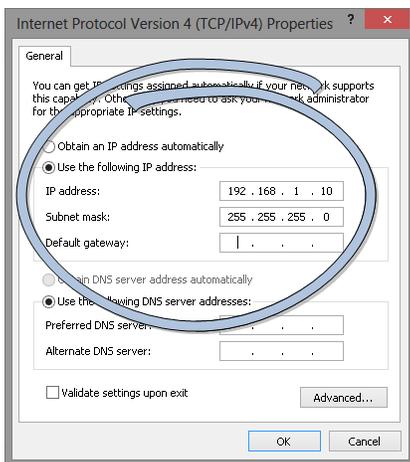
6   When all information is correct, click **OK**.

Device properties page

The Device page identifies the KMD-5551E translator for the Local Area Network (LAN). The IP Address, Subnet Mask, and Default Gateway values are supplied by the IT department system administrator.

The Device page also identifies the translator as a BACnet device and sets BACnet communication properties. The default device instance for the translator is 5551.

> **Note:** Once the window is saved, the translator will use the new settings and will require you to log in at the new address. If the translator is not on the same subnetwork as the network gateway router, it will not function correctly.

> **Note:** The Device Instance on this page identifies the KMD-5551E translator as a BACnet device, but not KMD controllers as BACnet devices. See the topics *Configuring the KMD Virtual Port* on page 43 and *KMD Subnet Device Configuration page* on page 44.

Device Name The name must be unique among all devices on the BACnet internetwork.

Description Optional information not included in the device name.

Location An optional value that describes the translator's physical location.

Device Instance A number that identifies the translator on the internetwork. The device instance must be unique on the internetwork and within the range of 0 to 4,194,302. The device instance is assigned by the BACnet system designer. The default device instance is

5051. This device instance is different than any device instance assigned to a KMD device by the translator.

Number APDU Retries Indicates the maximum number of retries that an Application Layer Protocol Data Unit (APDU) packet is retransmitted.

APDU Timeout Indicates the time—in milliseconds—between retransmissions of an APDU packet requiring an acknowledgment for which no acknowledgment has been received.

APDU Seg. Timeout The Segment Timeout property indicates the time—in milliseconds—between the retransmission of an APDU segment.

Backup Failure Timeout The time—in seconds—that the translator must wait before ending a BACnet backup or restore procedure. Use a BACnet Operator Workstation such as KMC Connect or TotalControl to back up the router.

IP Address The internal or private network address of the translator.

Subnet Mask Mask determines which part of the IP address is used for a network identifier and which part is used for a device identifier. The mask must match the mask for the network gateway router and other devices on the subnet.

Default Gateway The address of the network gateway router. The KMD-5551E translator and gateway router must be part of the same LAN subnet.

Restart Device Restarts the translator. Similar to restarting the translator with a BACnet cold start from KMC Connect or TotalControl. A restart does not change properties or save changes not yet saved.

MAC The MAC (Media Access Control) address uniquely identifies the translator on the local area network. This number is assigned by the manufacturer and cannot be changed.

Time page

Set the properties of the Time page to set up the translator as a BACnet time master device.

Time The local time and date as maintained by the translator is displayed at the top of the web page. Time and date can be entered directly or synchronized to the time in the computer running the browser.

Sync to PC Click to immediately transfer to the translator the time and date maintained by the computer running the browser.

Refresh Clicking **Refresh** discards any changes and reloads translator properties on the web page.

Save When finished making changes, click **Save** to make the changes permanent.

BACnet Time Sync Networks

Selects the interval and type of BACnet time message for each network.

Time Sync Period Sets the interval to send time synchronization to the selected BACnet networks. The choices are None, Daily, Weekly, Monthly, or Custom. The Custom interval is entered in minutes.

Interval Offset If Align Intervals is selected, the time synchronization messages are offset, in minutes, from the beginning of the hour or day.

Align Intervals If selected and a Time Sync Period is specified, time synchronization messages are sent at the start of the hour or day.

UTC Offset The UTC Offset property indicates the time offset—in minutes—between local standard time and Universal Time Coordinated. The value of the property ranges from -780 to +780 minutes. The time zones to the west of the zero degree meridian are positive values; those to the east are negative values. The value of the UTC Offset property is derived from the UTC received in a UTC Time Synchronization service request to calculate the correct local standard time.

Sync Network Enabled networks are indicated with a green background. To enable a network, see the topic *Setting up translation* on page 35.

Time Choice Sets the type of time synchronization to NONE, UTC, LOCAL, or UTC & LOCAL. The translator supports both UTC and local time synchronization.

- **UTC** The translator sends time sync messages in Universal Time Coordinated (UTC). The devices on the network then apply an offset to calculate local time and date. UTC is the preferred method when the building automation system crosses time zones.

- **Local time** The translator sends time sync messages in local time from which devices update their internal clock.

SNTP Time Server

A Simple Network Time Protocol (SNTP) server is a network device that synchronizes the time for devices connected to a local area network. The translator receives these time messages and rebroadcasts them as BACnet time service messages.

IP Address Enter the address of the SNTP server. The address is supplied by the IT department.

Sync Period Select an hourly, daily, weekly, monthly, or a custom interval to send the time synchronization message. The custom period is set in minutes.

Test Server Click to test the connection to the network SNTP server.

Daylight Saving Time

DST Status This property indicates *ACTIVE* when Daylight Saving Time is in effect and *INACTIVE* when it is not in effect.

DST Enable Enables the translator to change its time to Daylight Saving Time. The period of Daylight Saving Time is defined by DST Start Time and DST End.

DST Auto Calculation Selecting this check box sets the type of Daylight Saving Time calculation. When selected, the translator uses a rules-based calculation for DST figured from the day of the month selected in the DST Start Time and in the DST End Time. When this check box is clear, DST is set to specific calender dates.

DST Start Time Select the ordinal number, day, month and hour that starts Daylight Saving Time.

DST End Time Select the ordinal number, day, month and hour that ends Daylight Saving Time.

Security page

The Security page sets user access to the translator. Assign users to one of the four access levels.

- The user name list must include at least one name with Administrator privileges.
- User names and passwords are case sensitive.
- Only the Custom access level can be changed. To do so, select the check box next to each feature to which that role will be granted access. When finished, click **Save***.

The translator is configured with the following default user name and password.

- User name: **admin**
- Password: **admin**
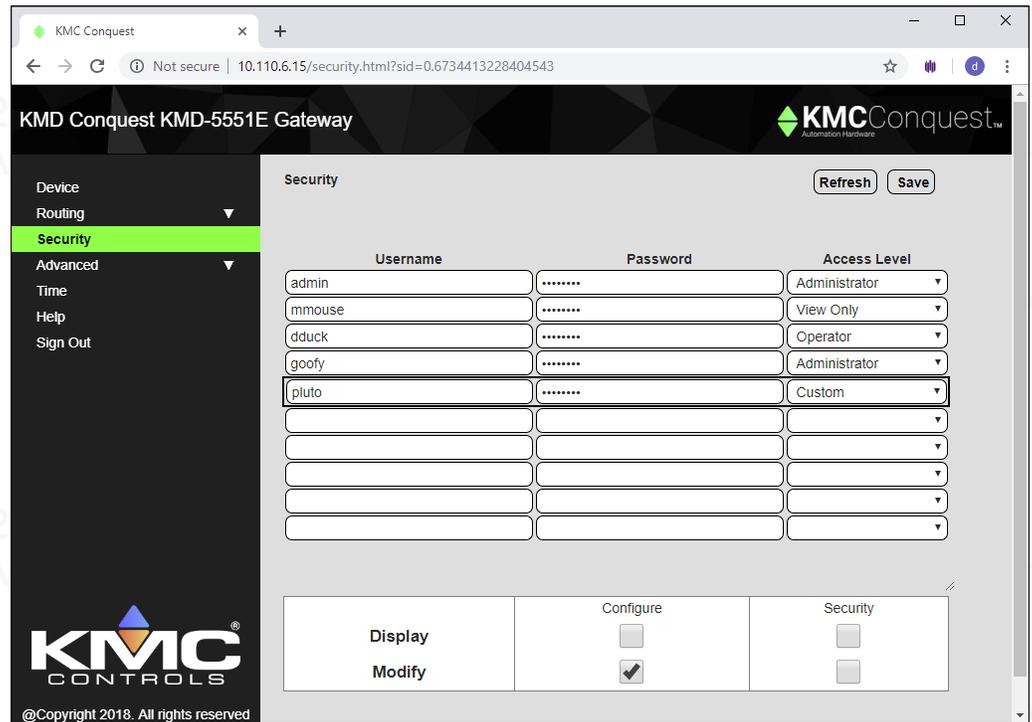
> **Note:** Granting access to the Balancing function also includes access to the Zoning function.

Table 3–1 Security access levels

	Configure	Security
Administrator	Display Modify	Display Modify
View Only	Display	
Operator	Display Modify	
Custom	Display* Modify*	Display* Modify*

*Assigned as required.

KMD HPO Override Report page

This KMD HPO Override Report page lists the override status of the optional HPO-6700 series output cards installed in KMD controllers.

- Only output points with the HPO card switches set to the H (Hand controlled On) or O (Off) position are listed in the report.

- The report does not show which of the H or O positions the switch is in.

- Controllers with switches set to the A (Auto) position are not listed in the report.

KMD controllers must be configured to recognize HPO cards. To configure the controllers use either *WinControl Plus* or *Hardware Configuration Manager*. See Technical Bulletin TB0305A, *WinControl Compatible Check Box* for details.

Illustration 3–2 HPO Override Report page

Name The name of the KMD controller is listed in the Index column.

Point Mnemonic The Point Mnemonic column identifies each output point that is in a manual mode (H or O). The mnemonic consists of three parts:

- The panel number of the controller on the Tier 2 network.
- The word "OUTPUT".
- The number of the output point within the controller.

Description The Description column lists the Description property assigned to the output point within the KMD controller.

Session timeout

The browser session will automatically close after 60 minutes of inactivity. After 58 minutes, the Reset Session Timer button appears on any open page. Click this button to reset the session timer.
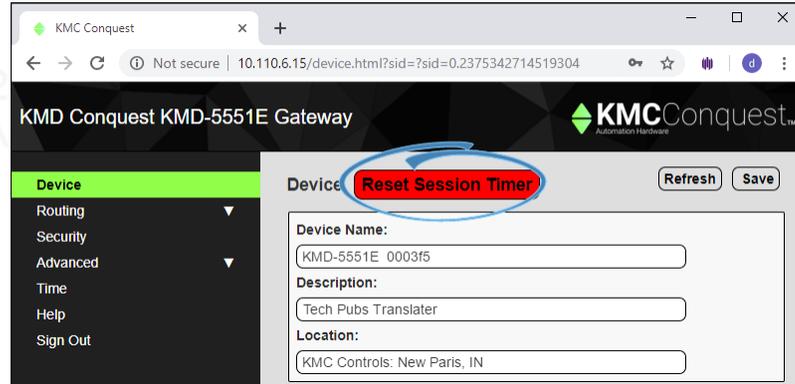
Section 4: Setting up translation

Use the Configuration window to set up the BACnet and KMD networks that will connect to the KMD-5551E translator. Review this information carefully for proper installation.

The KMD-5551E translator supports the following routing protocols.

- One KMD Tier 1 controller
- One KMD Tier 2 network
- One BACnet Ethernet network
- One BACnet IP network that can be set up for any of the following protocols.
    - Normal BACnet IP network routing
    - BACnet Broadcast Management Device (BBMD) with network and port address translation
    - Foreign device registration with a BBMD
    - Packet Assembling/Disassembling (PAD) routing

Set up translation either during initial configuration or after the translator has an IP address assigned and it is installed in its permanent location. See *Configuring the KMD-5551E translator* on page 21 for initial configuration and log in procedures.

Topics in this section

BACnet IP routing

The IP port can be configured for normal IP routing. The values to be used on this page are assigned by the BACnet system engineer.

For the log in procedure, see the topic *Initial setup* on page 21.

1 Use an Internet browser to log in.

2 Click **Routing**

3 Click **Configuration**.

4 Select **Enable** for the IP Port.

5 From the list box, choose **IP (Normal)**.

6 Click ***Save**.

7 Set the Network and Port properties as needed, clicking ***Save** after making each change.

> **Note:** Changes may not implement correctly if more than one at a time is made.

> **Note:** The translator will restart when a change is made and saved. To make additional changes, log in again.
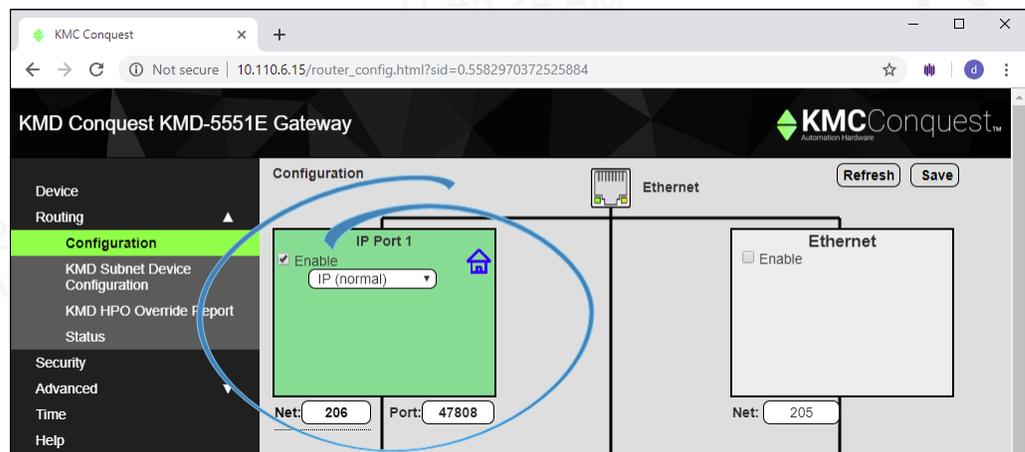
Enable Select to enable the network. The port block turns green when enabled.

Port Assign a unique UDP port number to each of the enabled IP networks. The default port number is 47808.

Net Designates the BACnet network number for the port. Assign network numbers in the range from 1 to 65534.

Other IP routing protocols

BACnet foreign device routing

A BACnet Foreign Device configuration can be useful for temporary network connections such as when using the router as a technician's diagnostic tool. For long-term network connections, KMC Controls recommends setting up a BACnet Broadcast Management Device (BBMD) configuration. Refer to *BACnet Broadcast Management Device routing*.

The IP Port can be configured as a BACnet Foreign device. The values on this page are assigned by the BACnet system engineer.

For the log in procedure, see the topic *Initial setup* on page 21.

1   Use an Internet browser to log in.

2   Click **Routing**.

3   Click **Configuration**.

4   Select **Enable** for the port.

5   From the drop-down list, choose **Foreign Device**.

6   Click ***Save**.

7   Set the Network and Port properties as needed, making sure to click ***Save** after each change.

   Note: Changes may not work correctly if more than one change is made at a time.

   Note: After clicking ***Save**, the translator will restart. For additional changes, log in again.
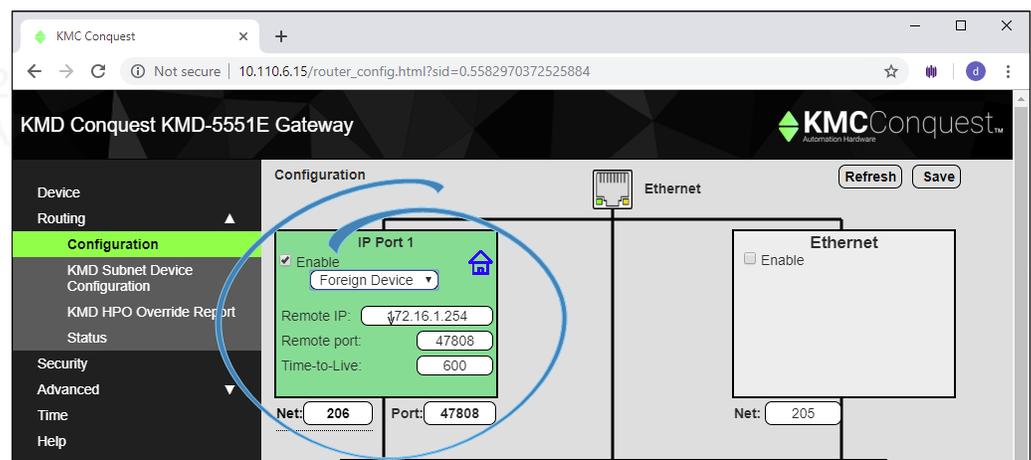
Enable Select to enable the network. The port block turns green when enabled.

Net Designates the BACnet network number for the port. Assign network numbers in the range from 1 to 65534.

Port Assign a unique UDP port number to each of the enabled IP networks. The default port number is 47808.

Remote IP Enter the address of the remote BBMD. If network address translation (NAT) is used between the KMD-5551E translator and the BBMD, contact the network system administrator for the correct public IP address.

Remote Port Enter the port number of the remote BBMD. If port address translation (PAT) is used between the KMD-5551E translator and the BBMD, contact the network system administrator for the correct public UDP port.

Time To Live Sets the interval at which the translator sends a registration message to the BBMD with which it is registered. The valid range is 1 to 65535 seconds.

If the BBMD does not receive a registration message within the value of the period set by Time To Live plus 30 seconds, the BBMD will remove the translator from its foreign device table and will not send broadcast messages to the translator.

Other IP routing protocols

- *BACnet IP routing* on page 35
- *BACnet Broadcast Management Device routing* on page 38
- *BACnet PAD routing* on page 40
- *Core properties* on page 57

BACnet Broadcast Management Device routing

For long-term network connections, KMC Controls recommends setting up a BACnet Broadcast Management Device (BBMD) configuration.

The IP port can be configured as a BBMD. When configuring the IP port as a BBMD, keep in mind the following rules.

- Configure only one BBMD for a single IP subnetwork.
- Assign the same BACnet network number to all BBMDs on the internetwork.
- The BBMD can accept registration from BACnet foreign devices or perform BBMD-to-BBMD routing.

For more information about BBMDs, refer to the application guide All About BACnet Broadcast Management Devices (BBMD).

For the log-in procedure, see the topic *Initial setup* on page 21.

To set up the translator as a BBMD, do the following:

1   Use an Internet browser to log in.

2   Click **Routing**.

3   Click **Configuration**.

4   For the port, select **Enable** .

5   From the IP Port list box, choose **BBMD**.

6   Click **Table**.

7   Type entries in the Broadcast Distribution Table (BDT).

Max. FD Table Entries:	128		Close
☐ Enable FD Service			
☐ Accept Remote Configuration			Add	Remove

sel	IP Address	Subnet Mask	Port
☐	192.168.1.252	255.255.255.255	47809

8 Set other properties as needed and then click ***Save**.

Note: The translator will restart. To make additional changes, log in again.
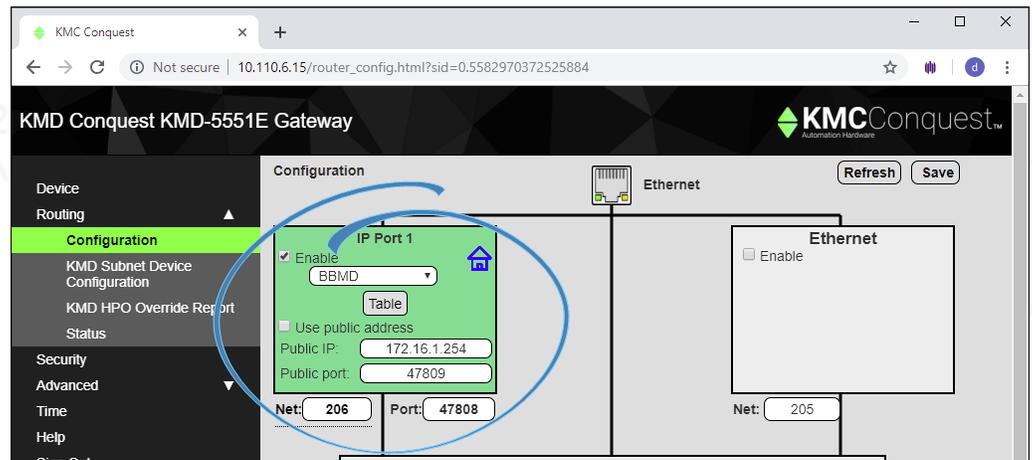
Enable Select to enable the network. The port block turns green when enabled.

Net Designates the BACnet network number for the port. Assign network numbers in the range from 1 to 65534.

Port Assign a unique UDP port number to each of the enabled IP networks. The default port number is 47808.

Network address translation

When using Network address translation, coordinate with the IT department to obtain a public IP address and a port exception in the firewall.

Use public address Select to enable network address translation and port forwarding.

Public address The static public IP address supplied by the IT department.

Public port The public UDP port supplied by the IT department. For security, use a port that is not in the typical range of BACnet ports.

Table

The items in Table define the Broadcast Distribution Table (BDT) for the BBMD. Enter the IP address, UDP port number and IP subnet mask of each BBMD that is part of the internetwork.

- If no BBMD uses a public IP address, then the BDT entries in every BBMD are the same.
- If the BBMD uses a public IP address, then the BDTs are different in every translator. Each BDT will use its own private IP address, port number and subnetwork mask and the public IP address, port number and subnetwork mask for all of the other BBMDs on the internetwork.

To add or delete entries, do the following:

- Adding entries—Click **Add** and type entries as needed. When finished, click ***Save**.
- Deleting entries—Select **sel** and then click **Remove**.

Max FDT Table Entries Sets the maximum number of foreign devices that can register at one time. The range of values for MAX FDT Entries is 1 to 128.

Enable FD Service When selected, the BBMD permits foreign devices to register with the BBMD. The maximum number of devices is limited by the value in Max FDT Table Entries.

Accept Remote Configuration When selected, the BBMD will update the BDT with a table it receives from another BBMD.

Other IP routing protocols

- *BACnet IP routing* on page 35
- *BACnet PAD routing* on page 40
- *BACnet foreign device routing* on page 37
- *Core properties* on page 57

BACnet PAD routing

The IP port can be configured for PAD (Packet Assembling and Dissassembling) routing to a companion PAD router located on a different subnet. The values on this page are assigned by the BACnet system engineer.

For the log in procedure, see the topic *Initial setup* on page 21.

1. Use an Internet browser to log in.
2. Click **Routing** and then **Configuration**.
3. Select **Enable** for the port.
4. From the list box, choose **PAD**.

5   Set other properties as needed and then click ***Save**.

Note: The translator will restart. To make additional changes, log in again.
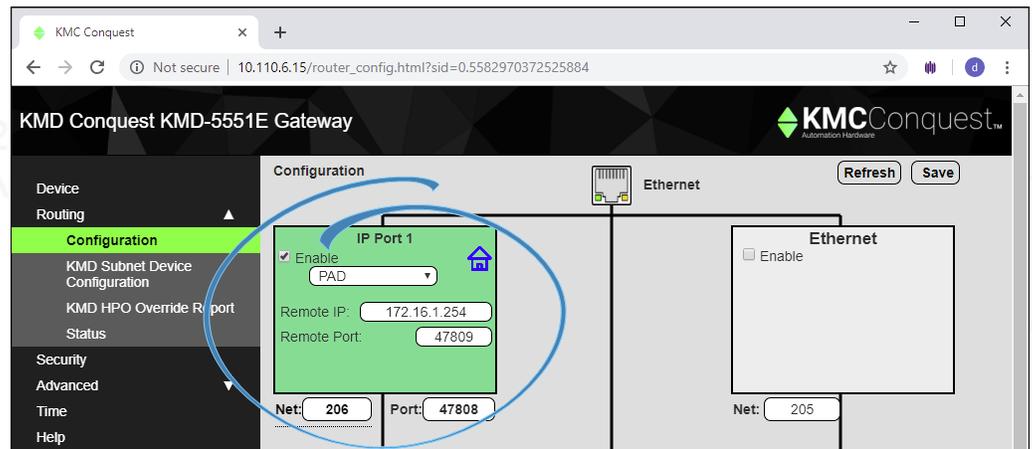
The KMD-5551E translator supports BACnet IP PAD routing. A BACnet IP PAD router is a special type of router that connects two or more BACnet network segments that are separated by at least one IP-only router. The PAD router monitors network traffic for BACnet messages addressed to other subnetworks and then repackages the message so that it can pass through IP routers, in effect forming a "tunnel" between the two network segments. A companion PAD router unpacks and retransmits the message on the remote BACnet network.

Enable Select to enable the network. The port block turns green when enabled.

Net Designates the BACnet network number for the port. Assign network numbers in the range from 1 to 65534.

Port Assign a unique UDP port number to each of the enabled IP networks. The default port number is 47808.

Remote IP Enter the address of the remote PAD router. If network address translation (NAT) is used between the local router and the PAD router, contact the network system administrator for the correct public IP address.

Remote Port Enter the port number of the remote PAD router. If port address translation (PAT) is used between the KMD-5551E translator and the PAD or BBMD, contact the network system administrator for the correct public IP address.

Other IP routing protocols

- *BACnet Broadcast Management Device routing* on page 38
- *BACnet IP routing* on page 35
- *BACnet foreign device routing* on page 37
- *Core properties* on page 57

BACnet Ethernet routing

Configure the Ethernet port in this page. The values on this page are assigned by the BACnet system engineer.

For the log in procedure, see the topic *Initial setup* on page 21.

1   Use an Internet browser to log in.

2   Click **Routing**.

3   Click **Configuration**.

4   For the Ethernet port, select **Enable**.

5   Enter the Network number.

6   Click ***Save**.

> **Note:** The router will restart. To make additional changes, log in again.
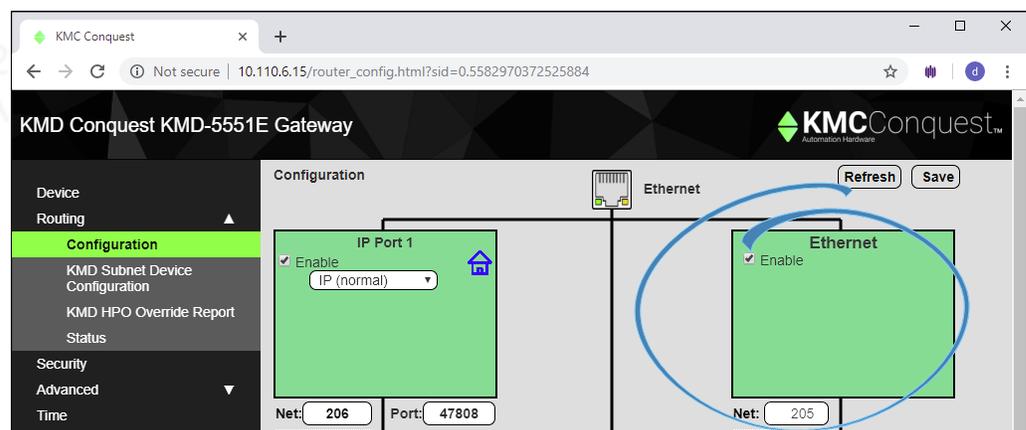
Enable Select to enable the network. The port block turns green when enabled.

Net Designates the BACnet network number for the port. Assign network numbers in the range from 1 to 65534.

Configuring the KMD Virtual Port

Configuring the KMD Virtual Port sets up KMDigital controllers as virtual BACnet devices on a BACnet virtual network.

NET Sets up the BACnet virtual network for the KMD controllers. The Tier 1 and all Tier 2 controllers connect to the same translator are added to this network as BACnet devices. Network numbers must be unique on the BACnet internetwork and in the range from 1 to 65534.

Main Net (Tier 1)

Settings in the Main Net area point the translator to a KMD Tier 1 controller. The KMD Tier 1 controller is added as a BACnet device to the BACnet virtual network designated in NET.

Enable Select to enable the connection to a Tier 1 KMDigital controller.

Main Panel IP Enter the IP address of the Tier 1 KMDigital controller.

Main Panel Port Use this only to set the UDP port for Network and Port Address Translation (NAT and PAT). Default is 21068.

Panel Number The number assigned to the Tier 1 controller in the KMDigital system.

Device Instance Assign a number that identifies the Tier 1 Controller on the BACnet internetwork as a BACnet device. The device instance must be unique on the internetwork and in the range from 0 to 4,194,302.

> **Note:** This device instance is different than the device instance assigned to the translator in the topic *Device properties page* on page 27. The device instance for the translator identifies the translator as a device on the BACnet internetwork. This device instance identifies the Tier 1 controller on the virtual BACnet network.

BACnet Device MAC The MAC (Media Access Control) address assigned to the Tier 1 controller for the virtual network. This must be unique on the virtual network and in the range from 0 to 127.

Subnet (Tier 2)

Settings in the Subnet area configure communications between the KMD-5551E translator and the KMDigital controllers connected to the translator's Tier 2 connector.

> **Note:** The KMD Tier 2 network must be wired to the Tier 2 connector on the translator. See the topic *Tier 2 wiring* on page 11.

Enable Select to enable the connection to a Tier 2 network.

Baud Rate Set this to match the Baud Rate of the controllers on the Tier 2 network.

Panel number Assign the translator a panel number address to use on the Tier 2 network. Typically this is zero (0).

KMD Subnet Device Configuration page

Use the KMD Subnet Device Configuration page for any of the following items.

- Enable a Tier 1 controller as a device on the BACnet virtual network.
- Add Tier 2 controllers as BACnet devices to the virtual network.
- View the status of the KMDigital devices on the virtual network.
- Rediscover the network for new or changed devices.

See the topic *Configuring the KMD Virtual Port* on page 43 to configure the Tier 1 controller and the Tier 2 network.

Rediscover Selected When clicked, the translator reloads the selected KMDigital controllers and updates the virtual BACnet devices. Depending on the size of the Tier 2 network, this may take several minutes.

Starting Device Instance Sets the first Device Instance the translator will assign when using Auto Assign Device Instance.

Auto Assign Device Instance When clicked, the translator automatically assigns BACnet Device Instance numbers to the KMD Tier 2 devices. The beginning instance number is set by the value in Starting Device Instance. All other Tier 2 controllers are assigned an instance number in sequence.

Save Click to save all changes on the page. This will force the translator to restart.

Visible to BACnet Select to make the KMD controller visible on the BACnet virtual network as a BACnet device.

> **Note:** Tier 1 controllers are enable on, but not set up on, this page. See the topic *Configuring the KMD Virtual Port* on page 43 to configure a Tier 1 controller.

Refresh Click to reload the current settings from the translator.

Status The Status column is a list of the online status and MAC address of each Tier 2 controller. Use the status column for troubleshooting translation issues.

> **Green** A green background will also include the base model number of the controller. This indicates the translator is working correctly and values are transferring as needed.

> **Red** A red background indicates that no controller is online for the MAC. This status could indicate that a previously discovered controller is now offline or no controller has been assigned to this MAC address.

> **Yellow** A yellow background indicates that the port for that MAC is locked. This may indicate that discovery is still in progress or that the translator has not been discovered by a Niagara station with the KMD translation service.

> **Gray** No device has been discovered at this MAC.

Illustration 4–1 Subnet Device Configuration page

KMD columns

Panel Number For informational purposes. This is the Panel Number assigned to the KMDigital controller on the KMD network.

Last Panel Designates the highest numbered KMDigital controller that the translator will add to the BACnet virtual network. Setting this lower than the highest numbered panel will result in missing BACnet devices. Setting this higher than the last available KMDigital controller may result in increased polling time.

Panel Name The name assigned to the controller on the KMDigital network.

BACnet columns

Lock Instance When selected, the assigned Device Instance will not be changed when automatically assigning device instance numbers to KMDigital controllers.

Device Instance For Tier 2 controllers, this assigns a number that identifies the controller on the BACnet internetwork as a BACnet device. The device instance must be unique on the internetwork and in the range from 0 to 4,194,302. For Tier 1 controllers, the device instance is shown only for information. See the topic *Configuring the KMD Virtual Port* on page 43 to change the device instance for a Tier 1 controller.

MAC address For Tier 2 controllers, this field assigns a MAC (Media Access Control) address to the Tier 2 controllers for the virtual network. This must be unique on the virtual network and in the range from 0 to 255. For Tier 1 controllers the MAC is shown only for information. See the topic *Configuring the KMD Virtual Port* on page 43 to change the MAC in a Tier 1 controllers.

Routing Status page

The KMD-5551E translator includes BACnet routing functions. References to the router and routing in this topic refer to the BACnet routing functions and networks, including the BACnet virtual network, within the translator. The status of the KMDigital networks, controllers, or points are not included on this page.

The Routing Status page contains a network status list and command buttons to update the display and networks. The page consists of three major parts.

- Send commands to the router with the *Routing Status buttons* on page 47.
- View the status of networks in the *Route Status list* on page 48.
- Clear selected networks by *Purging the Route Status list* on page 50.

Refresh Click to refresh the Route Status list. To automatically refresh the list every 10 seconds, select the **Auto Refresh** check box.

Illustration 4–2 Routing Status page

Routing Status buttons

The Route Status buttons are useful for diagnosing routing and network problems.

Send I-Am-Router-To-Network Broadcasts to all networks that the router is connected to the network. This can trigger updates throughout the network.

Clear Direct Network Status Forces the status of all direct networks to Active. If a network problem continues after clearing the direct networks, the networks with problems will return to a status other than Active.

Purge Remote Networks Removes all remote routes from the network table.

Send Who-Is-Router-to-Network Initiates a query to other routers that results in the discovery of other networks. Other routers respond with a BACnet I-Am-Router-To-Network message.

Clear Remote Networks Forces the status of all remote networks to Active. If a problem continues with a remote network, it will return to a status other than Active.

Send Sequence Sequentially broadcasts the three commands Purge, Clear and Send I-Am-Router-To-Network.

Route Status list

The Routing Status list is a diagnostic display of all networks known to the router. Both direct and remote networks are listed.

- Direct (or local) networks are connected directly to the router.
- Remote networks are on the other side of one or more remote routers. The path to a remote network always includes at least one directly connected network.

Each of the columns lists information about local or remote networks.

> ✓ **Tip:** If a directly connected network is shown to have a problem, the remote networks that connect to it will also show problems. Correct directly connected network problems before troubleshooting remote network problems.

Status The status of each network known to the router. See the table *Route status conditions* for a description of each condition.

Net The columns under Net will change modes depending on the setting of Use Learned Networks on the *Routing Status page* on page 46.

Destination The Destination is always the network number the router is using.

- If Use Learned Networks is enabled, this is the learned network number.
- If Use Learned Networks is not enabled, this is the network number entered for the port on the Configuration page.

Configured (Use Learned Networks enabled) The network number that is configured for the port on the Configuration page. If this number is different than the Destination network, the network number displays in red.

Discovered (Use Learned Networks not enabled) The learned network number at a port. If this network number is different than the network number on the Configuration page the number is in red and the status will be other than Active. Other networks are listed as N/A.

Next Router A list of each network connected to the router's ports that will be used to route a message to the next router.

- **Network** The BACet network number to the next router.
- **Address** The MAC address of the next router.

Time The time elapsed since the status update.

Idle Time The time elapsed since the router last passed traffic to the network.

Table 4–1 Route status conditions

Status	Icon	Description	Action
Active	🟢	The network is functioning correctly and is capable of passing traffic.	None required.
Busy	🟡	The amount of network traffic is high enough that no new traffic can be accepted.	A temporary condition that does not require intervention.
Down Gone	🔴 🚫	The network is not functional and is rejecting traffic.	Most likely will require manual intervention. Conditions that cause a network to be down may include either LAN or BACnet router problems.
No Status	(!)	The router is searching for the network.	Usually a temporary condition. Does not require intervention.
Duplicated Network	(D)	Two networks are using the same network number. A router cannot pass traffic on a duplicated network.	Usually requires intervention to locate and change the duplicated network number. Multiple duplicated networks are usually an indication of a network loop.
Duplicate MAC	(M)	The router has detected two MS/TP device using the same MAC address. Traffic is not routed.	Change the MST/TP MAC address in either the router or the device that contains the duplicated number.
Sole Master	(S)	The router is not detecting any master MS/TP devices on the local network. Slave devices may be present, however.	Requires corrective action if master devices are known to be connected to the local MS/TP network.

Table 4−1 Route status conditions (continued)

Status	Icon	Description	Action
BBMD: Unknown	(B)	Indicates the router is receiving BBMD traffic from an unknown BBMD. This does not stop traffic from routing.	If appropriate, add the unknown BBMD to the local BDT. A possible cause of unknown traffic is an address issue because of network address translation.
BBMD: Multiple	(B)	Indicates the router has detected another BBMD in the same subnet as itself. Traffic is not routed.	Remove a BBMD from the network.
Foreign Device NAK	(F)	A foreign device is preventing the router's request to distribute messages. Initially, this will not block traffic. However, as additional registration requests are received, attempts speed up until traffic is stopped.	The remote device server cannot register additional devices. Increase the value of Max FDT Entries in the remote server or register with a different server.
Mismatched Network Number	●	The learned network does not match the configured network.	Select **Use Learned Networks** on the Configuration page or change the router's network number.

Purging the Route Status list

To clear old data from the Route list, select a network and then click **Purge**.

- Choose **Select** to remove a specific remote network from the table.
- Choose **Select Routes** to remove all of the remote routes related to a directly connected network.

The selected network or networks are then cleared from the list. As the router detects the actual networks in use, they are added back to the list.

Licensing the translator

To provide a license to the KMD-5551E translator, the translator requires a KMC translator service to be running on a Tridium station.

The following are additional requirements.

- The KMD translator module is usually added to a station running on a JACE, but it may be added to a KMC Converge or Workbench station as long as the station is in operation continuously.
- Only one station needs to operate the translator service.
- The station must also have the BACnet driver added to the station's drivers.

Before starting, verify the BACnet network is running on the station. If the network is not running on the station, see the Tridium document *Niagara^{AX} BACnet Guide* to add the network to the station.

The following procedures will guide you through enabling the translation service.

1 *Purchase a license* on page 51.

2 *Download the required module files* on page 52.

3 *Discover and add translators to the BACnet network* on page 52.

4 *Add the module files to the station* on page 53.

5 *Add the translator license to the station* on page 53.

6 *Add the translation service palette* on page 54.

7 *Discover the KMD devices* on page 55.

Purchase a license

Purchase a license for a DR-KMD-TRANS driver from KMC Controls, Inc. When purchasing the license, you will need the Host ID of the Niagara station on which the translator service will run. One station running the translator service will enable all of the KMD-5551E translators on the internetwork.

To purchase a license, do the following:

1 Open the **Platform** of the computer or JACE that includes the station that will be licensed.

2 Open **Platform Administration**.

3 Click **View Details**.

4 Highlight the Host ID. The Host ID consists of several groups of characters separated with hyphens(-).

5 Press `CTRL+C` to copy the Host ID.

6   Paste the Host ID into an email or purchase order document to send to Customer Service at KMC Controls, Inc.

When the order is processed, Customer Service will add the Host ID to the online license server database and send a license and certificate file as attachments to an email. The files will be needed if an Internet connection is not available when you license the translator service.

Download the required module files

You will need translator module `.jar` files that are available from the software download section of partners.kmccontrols.com. Files for both Niagara^{AX} and Niagara N4 are included in a single `.zip` distribution file.

Niagara^{AX} Only a single file, `kmcKmdTranslator.jar`, is distributed.

Niagara N4 The folder in the distribution `.zip` file contains two required files:

    kmcKmdTranslator-rt.jar

    kmcKmdTranslator-wb.jar

To download the files, do the following:

1   Download the file from partners.kmccontrols.com and store it in a convenient location.

2   Open the downloaded `.zip` file.

3   Do one of the following:

- For Niagara^{AX} move the `.jar` file to the following location:
    `C:\KMC\Niagara-3.8.x\modules`

- For Niagara N4, move both `.jar` files to the following location:
    `C:\KMC\Niagara-4.x.x.x\modules`.

  For brands other than KMC, the "KMC" name in the file path will be different.

Discover and add translators to the BACnet network

All KMD-5551E translators must be connected to the same BACnet internetwork as the station and the station must have a BACnet driver installed. Installing and configuring the BACnet driver is covered in the Tridium document *Niagara^{AX} BACnet Guide*.

> **Note:** The translator device is different than a Tier 1 device. The translator will have the device instance number assigned in the *Device properties page* on page 27.

To discover the translator, do the following:

1   Open the station.

2   Expand **Config** and then **Drivers**.

3   Double click **BacnetNetwork**.

4   Click **Discover**.

5   In the **Configure Device Discovery** dialog, select the network that includes the translator.

6   When discovery is complete, select the translator from the **Discovered** list.

7   Click **Add** at the bottom of the page.

8   In the **Add** dialog, verify that type is set to **Bacnet Device**.

9   Click **OK**. The translator will be added to the Bacnet Network under the station drivers.

10   Repeat this procedure for all KMD-5551E translators on the internetwork.

If the translator cannot be discovered, verify that the station has a BACnet driver installed and that the driver is configured to be part of the same BACnet internetwork that includes the KMD-5551E translator.

Add the module files to the station

The KMD-5551E translator license service requires `.jar` module files to be added to the station.

To add files to a Niagara^{AX} station, do the following:

1   Open the platform.

2   Start the **File Transfer Client**.

3   In the **Files on this computer** list, locate the file, `kmcKmdTranslator.jar`.

4   Select the file.

5   On the right side of the page, locate the folder `opt/niagara/modules`.

6   Click ▶ to start the transfer.

To add files to a Niagara N4 station, do the following:

1   Open the platform.

2   Start the **File Transfer Client**.

3   In the **Files on this computer** list, locate the following files:

  ● `kmcKmdTranslator-rt.jar`

  ● `kmcKmdTranslator-wb.jar`

4   Select files.

5   On the right side of the page, locate the folder `opt/niagara/modules`.

6   Click ▶ to start the transfer.

Add the translator license to the station

The KMD-5551E translators are not enabled with a translation service until they are licensed. The service can be licensed with either an Internet connection or with local files. A license and certificate files are supplied in an email message from KMC Controls, Inc. when the translation driver is purchased.

Internet connection

If an Internet connection is available, the license and certificate can be obtained from the online license server.

1   Open the platform.

2   Start the License Manager.

3   Under **Licenses**, click **Import**.

4   Select **Import licenses from the licensing server**.

5   Click **OK**.

The License Manager will automatically locate the license server on the Internet and add a license and a certificate.

6   Click **OK** to restart the station.

Adding a license without an Internet connection

If an Internet connection is not available, you will need the KMC license and certificate files supplied by KMC Controls, Inc. when the driver was purchased. The procedure requires adding both a license and a certificate file to the platform.

1   Open the platform.

2   Start the License Manager.

3   Under **License**, click **Import**.

4   Select **Import one or more licenses from files**.

5   Browse to the location of the license file and select it.

6   Click **OK**.

Note: Do not restart the station at this time. It will be restarted when this procedure is finished.

7   Under **Certificates**, click **Import**.

8   Browse to the location of the certificate file and select it.

9   Click **OK**.

10   With the Application Director, restart the station.

Add the translation service palette

The KMC KMD Translator Service enables all KMD-5551E translators on the same BACnet internetwork.

1   Open the station.

2   Expand **Config** to reveal **Services**.

3   Open the palette side bar.

4   Select the **kmcKMDtranslator** palette.

5   Drag the **KMC KMD Translator Service** to **Services**.

Within a few minutes the translation service will enable translation for the KMD-5551E translators.

Discover the KMD devices

Once a translator is enabled from a licensed station, the KMD devices will be available for discovery in Workbench.

1   Open the station.

2   Expand **Config** and then **Drivers**.

3   Double-click **BacnetNetwork**.

4   Click **Discover**.

5   In the **Configure Device Discovery** dialog, select one or more virtual networks configured in KMD-5551E translators.

6   When discovery is complete, select the KMD devices in the **Discovered** list.

7   Click **Add** at the bottom of the page.

8   In the **Add** dialog, verify that **Type** is set to **Bacnet Device**.

9   Click **OK**. The KMD devices will be added to the BACnet Network under the station drivers.

Adjust the tuning policy

Using a KMD-5551E translator requires adjusting the tuning policy of the BACnet network.

To set the tuning policy, do the following:

1   Open the station.

2   Expand **Config**, **Drivers**, **BacnetNetwork**, and then **Tuning Policies**.

3   Double-click **Default Policy**.

4   In the Property Sheet, verify or make the following changes:

- Set **Write On Start** to **false**.
- Set **Write On Up** to **false**.
- Set **Write On Enabled** to **false**.
- Set **Poll Frequency** to **Slow**.

5   Click **Save**.

Illustration 4–3 BACnet tuning policy for KMD-5551E translator
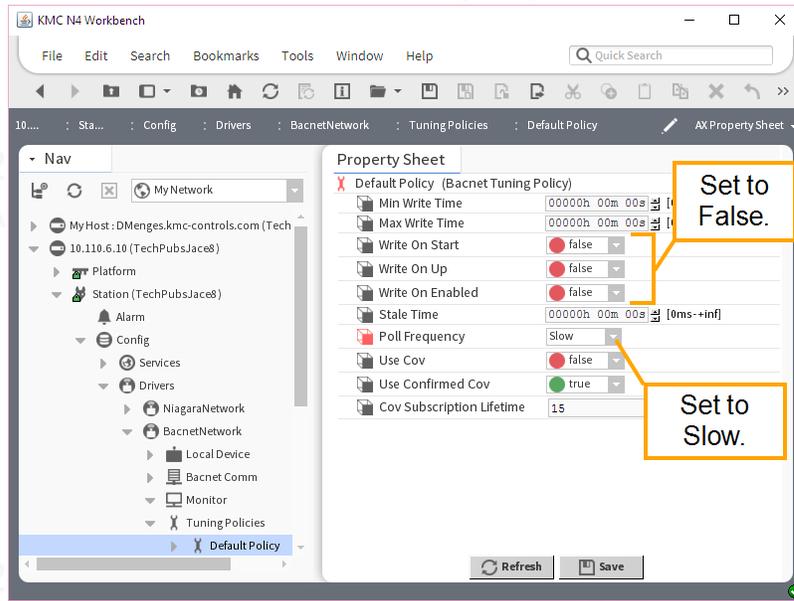
Core properties

The Core properties are general properties that apply to all BACnet routing protocols. The properties consist of the Home Port selection and the Niagara Compatibility option.

Home Port

Because the translator is a BACnet device, one of the BACnet networks in the translator must be designated as a home port. Make the designation with the Home Port property in the Router Core area.

- The home port is designated by the Home Port icon 🏠.
- The home port sets the network on which the translator is connected. In operator workstations, the translator appears on the network designated as the home port network.
- The home port can be assigned only to an enabled network.

Illustration 4–4 Home Port
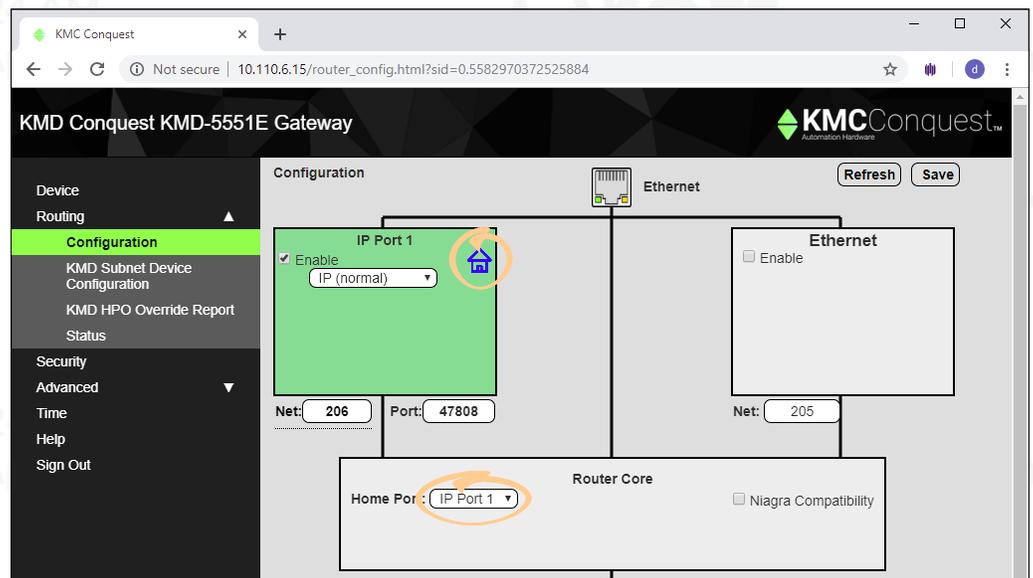
Niagara Compatibility

When selected, the translator is set to respond to the Niagara Set command. In this mode, when the translator receives a BACnet write with a non-NULL value and no priority level is designated, it will write the value only to the relinquish default property. It will not write to priority level 16 as would take place for a normal BACnet write.

Also in this mode, a write with a value of NULL and no priority will be acknowledged with a Simple ACK and the controller will drop the write, relinquish default will remain unchanged, and nothing will happen with priority 16.

To write a value at priority level 16 in compatibility mode, priority level 16 must be specified for the write.

Section 5: Advanced features

The topics in this section covers maintaining the translator.

Features in the Advanced group are for updating firmware in the translator and backing up the translator configuration.

Recovering the IP address—Discover an unknown network IP address.

Firmware updates—From time to time, KMC Controls issues updates to the firmware for the translator. The updates can be added directly to the translator from the browser pages.

Configure from file—Configuration properties for the translator can be saved in a JSON (JavaScript Object Notation) file. The file can then be used as a backup file or to configure other translators with similar properties.

Topics in this section

Recovering the network address

If the network address of the translator is lost or unknown, the translator will respond to the default IP address for the first 20 seconds after power is applied.

1   Disconnect the translator from the LAN and connect the translator as described in the topic *Initial setup* on page 21.

2   Unplug the translator from the power source.

3   On the computer, open a browser window and enter the default address of 192.168.1.252.

4   Reconnect the translator from the power source and immediately attempt to connect with the browser. The browser will respond with the translator's IP address and subnet mask.

5   Once the address is known, connect the translator to the correct IP subnet for normal operation or translator configuration.
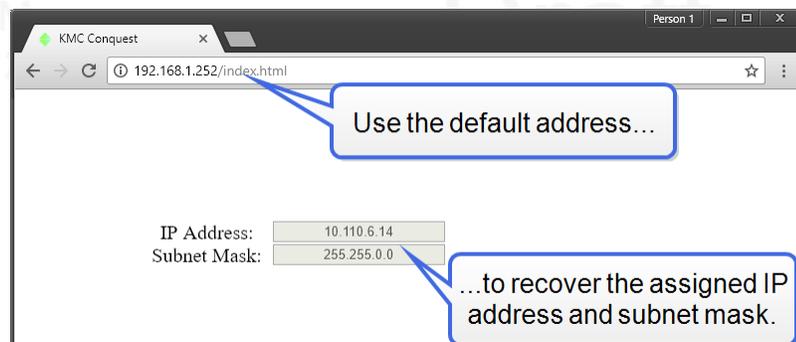
Updating the firmware

The translator firmware can be updated from the Firmware page in the Advanced group.

> **Note:** The translator firmware can also be updated with KMC Connect, TotalControl, or the Firmware Upgrade Tool. For instructions, see the help and other documentation for those programs.

Illustration 5–1 Firmware update page
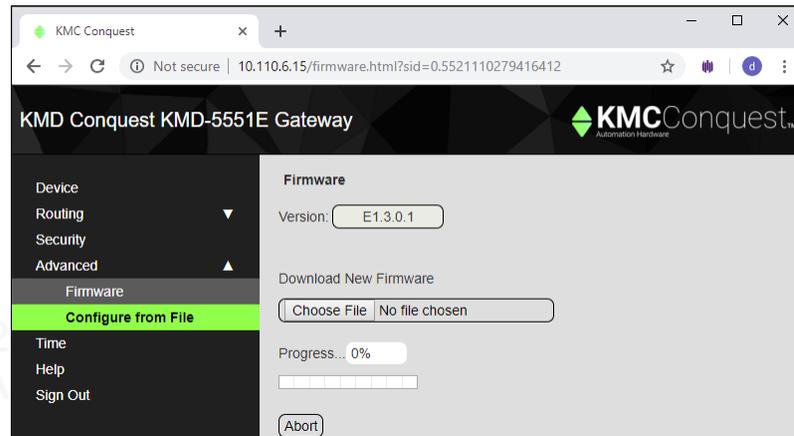
To update the firmware, do the following:

1   Download the new firmware from the KMC Partner Portal. A self-extracting executable file will install the firmware in the correct location.

2   Run the downloaded file. This will place a `.zip` file in the folder at `C:\ProgramData\KMC Controls\Firmware Upgrade Manager\BACnet Family\BAC-5051E.`
Do not unzip this file.

3   Use an Internet browser to log in to the router.

4   From the **Advanced** group, choose **Firmware**.

5   Click **Choose File** and browse to the following location: `C:\ProgramData\KMC Controls\Firmware Upgrade Manager\BACnet Family\BAC-5051E.`

6   Locate and open the folder with the correct version of firmware.

7   Select the `.zip` file.

8   When the Proceed with download? dialog box opens, click **OK**.

9   When the download is finished, click **Commit**.

10   In the Restart Device? dialog box, click **OK**. The translator will restart.

Configure from a file

Configuration properties for the KMD-5551E translator can be saved in a configuration file. The configuration file can then be used as a backup file or to configure other translators with similar properties.

1 Use an Internet browser to log in.

2 From the **Advanced** group, click **Choose File**.

3 Browse to the file location.

4 Choose the file.

5 Click **Open**.

6 When the Overwrite Router Configuration dialog opens, click **OK** to proceed.

Choose File Browse to the location and choose the configuration file.

Save Configuration Saves the router configuration in the file `config_5051E.json`. The file type is JSON (Java Script Object Notation) and it is saved in the current Windows user's Downloads folder.

Illustration 5–2 Configure from File page
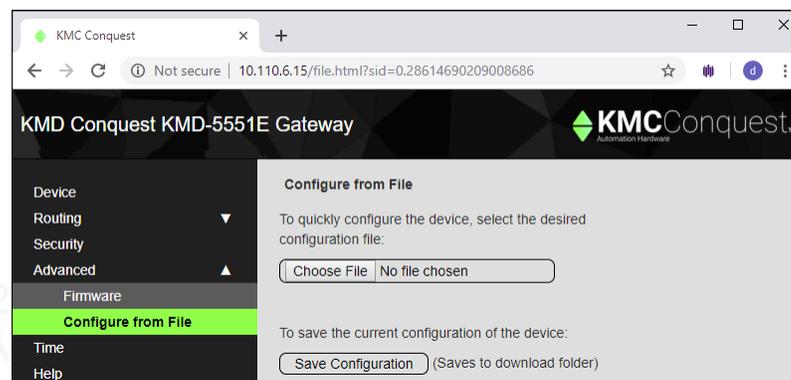
Appendix A: **Preparing a KMDigital site for a KMD-5551E and Niagara**

This topic is the recommend process for integrating KMDigital controllers into a Niagara site. The integrated site will use KMD-5551E translators as KMDigtal-to-BACnet gateways and replace WinControl with Niagara for alarms, trends, schedules, and graphics. Because this topic is only an outline to the process, control technicians and engineers should be familiar with the detailed procedures in the following list of documents. Download or locate these documents and review them before beginning this process.

- KMD-5551E Application Guide
- KMC Workbench Software Manual
- "Getting Started With Niagara" (Located in the Niagara Docs folder as `docUser.pdf` and DocUser in the Workbench Help system.)
- "Niagara BACnet Guide" (Located in the Niagara Docs folder as `docBACnet.pdf` and DocBACnet in the Workbench Help system.)

You will need the following programs that are available to our partner organizations at `kmccontrols.com`. Downloading software or software tools requires a user name and password.

- KMC Workbench or third-party workbench
- The KMD-5551E KMD translator module file or files for the correct version of Niagara.
  - Niagara^{AX} uses a single module file, `kmcKmdTranslator.jar`.
  - Niagara N4 uses two module files, `kmcKmdTranslator-rt.jar` and `kmcKmdTranslator-wb.jar`.
- KMC Connect or, if available, WinControlXL Plus.
- Hardware Configuration Manager (HCM) located the web site with KMC Connect.
- KMC LAN Monitor located with WinControl XL Plus.

Site evaluation and preparation

Careful site evaluation and preparation reduces the disruption to normal system operation. It will also reduce the time to install the translators, reconfigure the network, and commission a site.

1   Obtain or develop a system diagram with the location of all controllers and networks.

- Tier 1 controllers, their IP addresses, and KMD T1 addresses
- Tier 2 networks and KMD Tier 2 controller address
- IT subnetworks

2   Calculate the number of new translators based on splitting the Tier 2 networks into small segments. See *Before and after network example* on page 68.

- Add 1 translator for every Tier 1 controller and the first 32 Tier 2 controllers connected to the Tier 1 controller.

- Add 1 translator for every additional 32 Tier 2 controllers.

- Replace repeaters installed to break the network into 32 controller segments. Repeaters installed for long cable runs–runs that exceed 4000 feet (1220 meters)–can remain in place.

3   Correct any existing problems with the KMDigital network. For example, nuisance alarms, data dropped from graphics, gaps in controller (panel) numbers on Tier 2 networks, etc. Use LAN Monitor to diagnose system problems.

4   Verify that a network connection is available for every new translator and station. If necessary, add new switches.

5   From the IT department, request fixed IP address for the new translators and, if needed, for new station hardware devices.

Prepare the stations

One station on the Niagara site will need a translator license and a BACnet driver. All other stations that will integrate the KMD points will need only a BACnet driver added to the station.

1   Connect the station to the network.

2   Add the BACnet driver and configure it for the BACnet networks that are involved.

3   To one station only, add the KMD license, translator module files, and KMC KMD Translator service to the station. See the topic *Licensing the translator* on page 51.

- For Niagara^{AX}, add the single module file `kmcKmdTranslator.jar`.
- For Niagara N4, add both the `kmcKmdTransltor-rt.jar` and `kmcKmdTranslator-wb.jar` files.

Install and temporarily split the network.

The procedure in this part temporarily reconfigures the KMDigital system and adds the translators. See the example diagrams in the KMD-5551E Application Guide and *Before and after network example* on page 68.

1   Disconnect the Tier 2 networks from the Tier 1 controllers.

2   Split the Tier 2 networks into segments of no more than 32 controllers. Keep in mind that this wiring will need to be temporarily reconnected.

3   Use a browser to configure the translators. See the KMD-5551E Application Guide.

- Assign BACnet device instances, IP addresses, gateways, and default subnet masks.

- Configure the BACnet networks.

- Configure the KMDigital Virtual Port and KMD Subnet Devices.

4   Use WinControl or KMC Connect to remove Control Basic point sharing (want-points) that originates in Tier 1 controllers by moving it to other KMD devices on the network.

5   Use WinControl or KMC Connect to locate all KMD alarms in Control Basic programs and make notes so that you can reproduce them in Niagara. For alarm examples, see the keywords ALARM and DALARM in the Help system supplied with WinControl or KMC Connect.

Discovering controllers and points

This procedure outlines discovering and adding the KMDigital controllers and points to the station as BACnet devices and objects. Once discovered, network connections are restored, and operation is returned to WinControl. The station database can then be programmed offline.

1   Turn off WinControl.

2   In the translator web pages, enable the IP and Tier 2 networks ports.

3   Start the station or stations

4   In the station with the license, discover and add the KMD-5551 Translators to the BACnet network.

5   With KMC Workbench, verify on the property sheet of the KMC KMD Translator service that the translators are licensed. If they are licensed, start discovering and adding the KMD devices to the station's BACnet network.

6   In the translator web pages, discover and assign device instance numbers to the KMDigital controllers. This can take several minutes.

7   Once the translators are done discovering controllers, use KMC Workbench to add them to the BACnet network in the station.

8   Once the controllers have been added to the station, start discovering and adding points to the devices.

9   After all the points have been added, save and back up the station. The station backup file will be used for programming.

Temporarily restore the KMD network

To maintain normal system operation during the transition, restore the system to its original network configuration.

1   Remove the translators from the IP network by turning them off or unplugging the IP cable.

2   Restore the KMD Tier 2 networks or unplug them from the translators.

3   Start WinControl and connect it to the KMDigital network.

Configure the station

Work offline with the Niagara station backup file to integrate the KMDigital devices and points.

1   Use Link To and Link Mark to replace KMDigital want-points.

2   Add alarms, histories, schedules and graphics to the station. The recommended point limits are

- 20 points per graphic page
- 20 points per Tier 2 controller
- 40 points per Tier 1 controller.

3   In the station, change the following in the Bacnet Local Device Property Sheet:

Apdu Segment Timeout	2000	ms [0 - max]
Apdu Timeout	3000	ms [0 - max]
Number Of Apdu Retries	3	

4   In the station, change the following in the BACnet Driver IP Port Property Sheet:

Poll Service (Bacnet Multi Poll)

Poll Enabled	● true	
Fast Rate	00000h 00m 01s	[1ms - +inf]
Normal Rate	00000h 00m 05s	[1ms - +inf]
Slow Rate	00000h 00m 30s	[1ms - +inf]

5   In the station, change the following in the BACnet Network Property Sheet:

Default Policy (Bacnet Tuning Policy)

Min Write Time	00000h 00m 00s	[0ms - +inf]
Max Write Time	00000h 00m 00s	[0ms - +inf]
Write On Start	● false	
Write On Up	● false	
Write On Enabled	● false	
Stale Time	00000h 00m 00s	[0ms - +inf]
Poll Frequency	Slow	
Use Cov	● false	
Use Confirmed Cov	● true	
Cov Subscription Lifetime	15	min

Final changeover and commissioning

Once station programming is complete, permanently change the system to run as a Niagara site. If additional changes are required for the KMDigital controllers, connect WinControl or KMC Connect only as a temporary configuration tool. This will require connecting directly to a Tier 2 network with a KMD-5576 Communicator.

1   Split and reconnect the Tier 2 networks to the translators.

2   With Hardware Configuration Manager, change the KMD addresses to remove gaps in the addresses caused by splitting the networks.

3 In the translator subnetwork configuration page, match the new KMD controller addresses to their original BACnet device instance number.

4 Save backup files for commissioning.

- Use WinControl or KMC Connect to save KMD panel files.

- Backup all stations with KMC Workbench.

- In the Advanced web page of each translator, save the translator configuration file.

5 Shut off WinControl or KMC Connect.

6 Reconnect and start the translators.

Before and after network example

For best performance, split and reconfigure the KMDigital network as shown.

- Disconnect the Tier 2 controllers from the Tier 1 controllers.

- Split the Tier 2 networks into 32 controller segments.

- Replace repeaters installed to break the network into 32 controller segments. Repeaters installed for long cable runs should remain in place.

- To prevent excess token cycle time, renumber the controller addresses on the new Tier 2 segments.

Illustration A–1 Translator network example

Original   Split