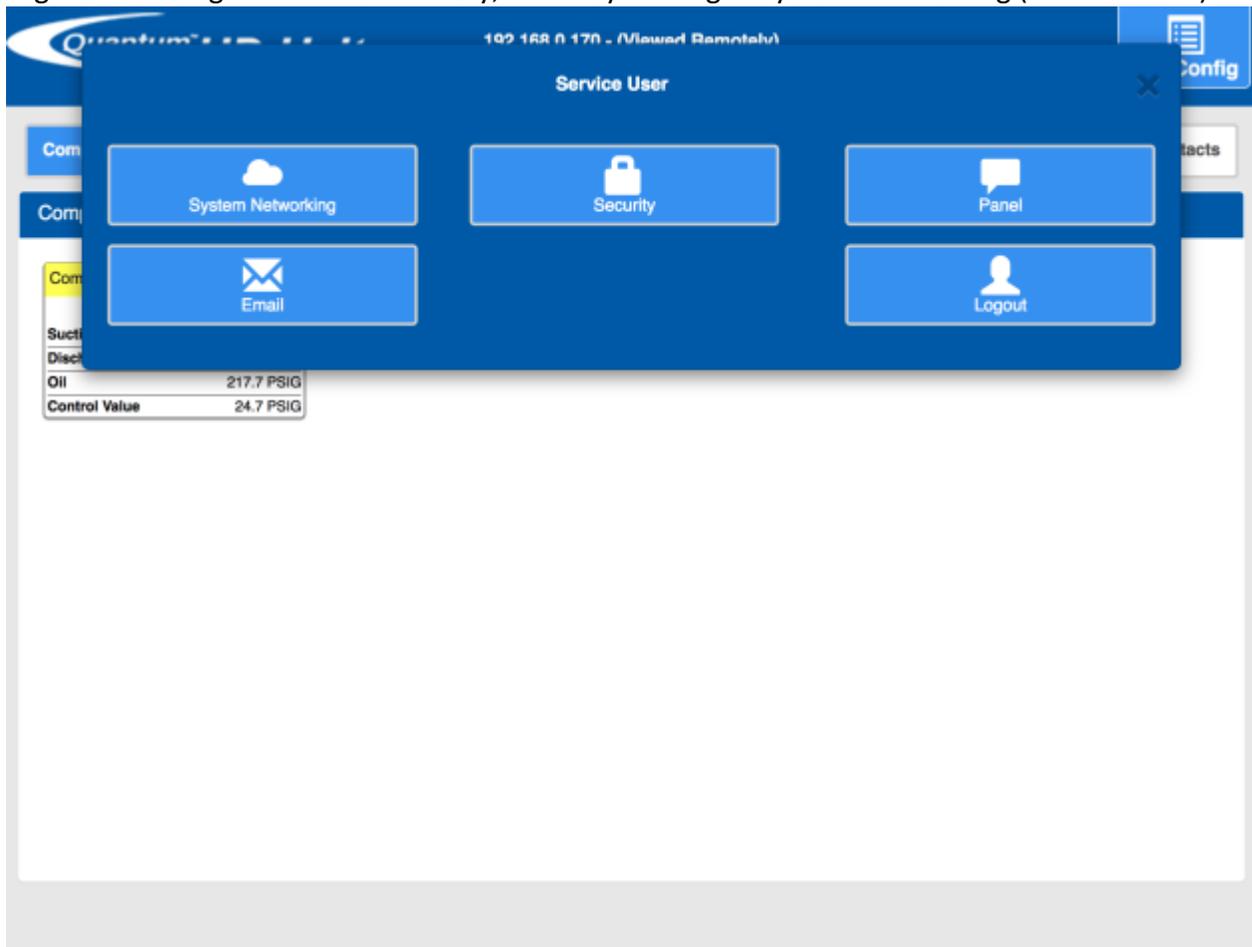


# Networking

If all segments of the control (dependent on which segments were ordered) are listed and shown on the System Overview page (shown above) no action needs taken on the System Networking page. If a segment of control does not appear on the System Overview page, or a segment is being added after delivery, select Sys Config. > System Networking (shown below).



There are two scenarios when setting up the system networking: initial setup and adding a new segment to an existing network of segments. See below for the steps to follow in each scenario.

## **Initial Setup**

Initial setup is when all of segments of control that are part Quantum HD Unity family are new.

1. Verify that the Ethernet cables for each of segments of control are plugged in.
2. Scan the network and add the appropriate segments of control. (Refer to Scanning the Network)
3. Change the network configuration. (Refer to Network Page)
4. Edit the IPs for each of the segments of control. (Refer to Editing a Segment of Control)

## **Adding a new segment to existing network**

1. Verify that Ethernet cable for the segment of control is plugged in.
2. From a previously installed segment of control add the new segment of control to the network. (Refer to Linking Segments of Control Together)

## **List Page**

The list page displays a list of the all the segments of control that are currently networked and communicating. Segments of control can be edited with regards to product category, IP address port, and URL or deleted from this page. A “Scan Network” button is available on this page as a quick means to adding control sections that may be added after initial startup (Refer to Scanning the Network). An “Add Panel” button is available on the lower right side of the page to add a segment of control manually (Refer to Linking Segment of Control Manually).

Quantum<sup>™</sup> HD Unity  
SYSTEM CONTROLLER

192.168.0.152 - (Viewed Remotely)  
10/31/2016 - 15:15:39

Sys Config

List Network Add Factory Card Back

Products

Product	Address	Status		
Condenser/Vessel	192.168.0.152:80	Connected	Edit	Delete

Scan Network Add Panel

All networked products must be 10.40 or greater.

## Network Page

The network page contains two fields: **Gateway Address** and **Subnet Mask**. The network administrator should provide both of these. The factory defaults, noted in their respective sections, are sufficient if the segment of control is not connected to the plant's network. The combination of both the gateway address and subnet mask create a subnet. Upon saving changes to these fields, the networking for all of the segments of control listed on the current panel's Sys Config. > System Networking > List page will be changed. The IP for each segment of control listed on the current panel's Sys Config. > System Networking > List page will be set to the lowest IPs for that specific network. It is the network administrator's responsibility to edit the IP for each of the segments of controls such that there are not any IP conflicts. Each of the

products need to have a matching gateway address and subnet mask so that they can communicate to each other.

The screenshot shows the Quantum HD Unity System Controller web interface. The top navigation bar includes the logo, the IP address 192.168.0.152 (Viewed Remotely), the date and time 10/31/2016 - 15:25:07, and a Sys Config button. Below the navigation bar, there are buttons for List, Network (selected), Add Factory Card, and Back. The main content area is titled "Global Network Configuration" and contains a form with two rows of input fields. The first row is labeled "Gateway Address" and contains four fields with values 192, 168, 0, and 1. The second row is labeled "Subnet Mask" and contains four fields with values 255, 255, 255, and 0. A Save button is located at the bottom right of the form.

Field	Value 1	Value 2	Value 3	Value 4
Gateway Address	192	168	0	1
Subnet Mask	255	255	255	0

## Gateway Address

The gateway address is the IP of the device that acts as a conversion from one network to another. A router/modem is often a gateway to the Internet, the gateway address will most likely be the IP of the local router. This can be found in the manual for your router. If the segment of control is not on the plant network the factory default, noted below, is sufficient.

**Default:** 192.168.0.1

## Subnet Mask

The subnet mask and gateway determine what IPs can be reached from the panel. The larger the subnet the more IPs the panel will be able to communicate with. The maximum for each

number in the subnet mask is 255. If the segment of control is not on the plant network the factory default, noted below, is sufficient.

**Default:** 255.255.255.0

### **Example**

If a panel has a gateway address of 192.168.0.1 and subnet mask of 255.255.255.0 then the panel can only communicate with other computers that have an IP with the prefix 192.168.0... In other words, the panel can only communicate with panels that have an IP of 192.168.0.X where X is a number in the range of 0-255. See the table below for more examples.

<b>Subnet mask</b>	<b>Other Computers' Prefix</b>
255.255.0.0	192.168.X.X
255.0.0.0	192.X.X.X

### **Linking Segments of Control Together**

Once the network has been set up, the next step is to link a segment of control. There are three ways to link segments of control together: linking the segment of control manually, scanning the network, or adding a factory card.

#### **Linking Segment of Control Manually**

The steps to Link a segment of Control Manually are as follows:

1. Navigate to Sys Config. > System Networking

2. Press the “Add Panel” Button on the lower right hand side of the screen.

The screenshot displays the Quantum HD Unity System Controller web interface. At the top, the header includes the logo, the IP address 192.168.0.152 (Viewed Remotely), and the date/time 10/31/2016 - 15:15:39. A 'Sys Config' button is in the top right. Below the header is a navigation bar with buttons for 'List', 'Network', 'Add Factory Card', and 'Back'. The main content area is titled 'Products' and contains a table with one entry: 'Condenser/Vessel' at address '192.168.0.152:80' with status 'Connected'. To the right of the table are 'Edit' and 'Delete' buttons. Below the table are 'Scan Network' and 'Add Panel' buttons. A note at the bottom states: 'All networked products must be 10.40 or greater.'

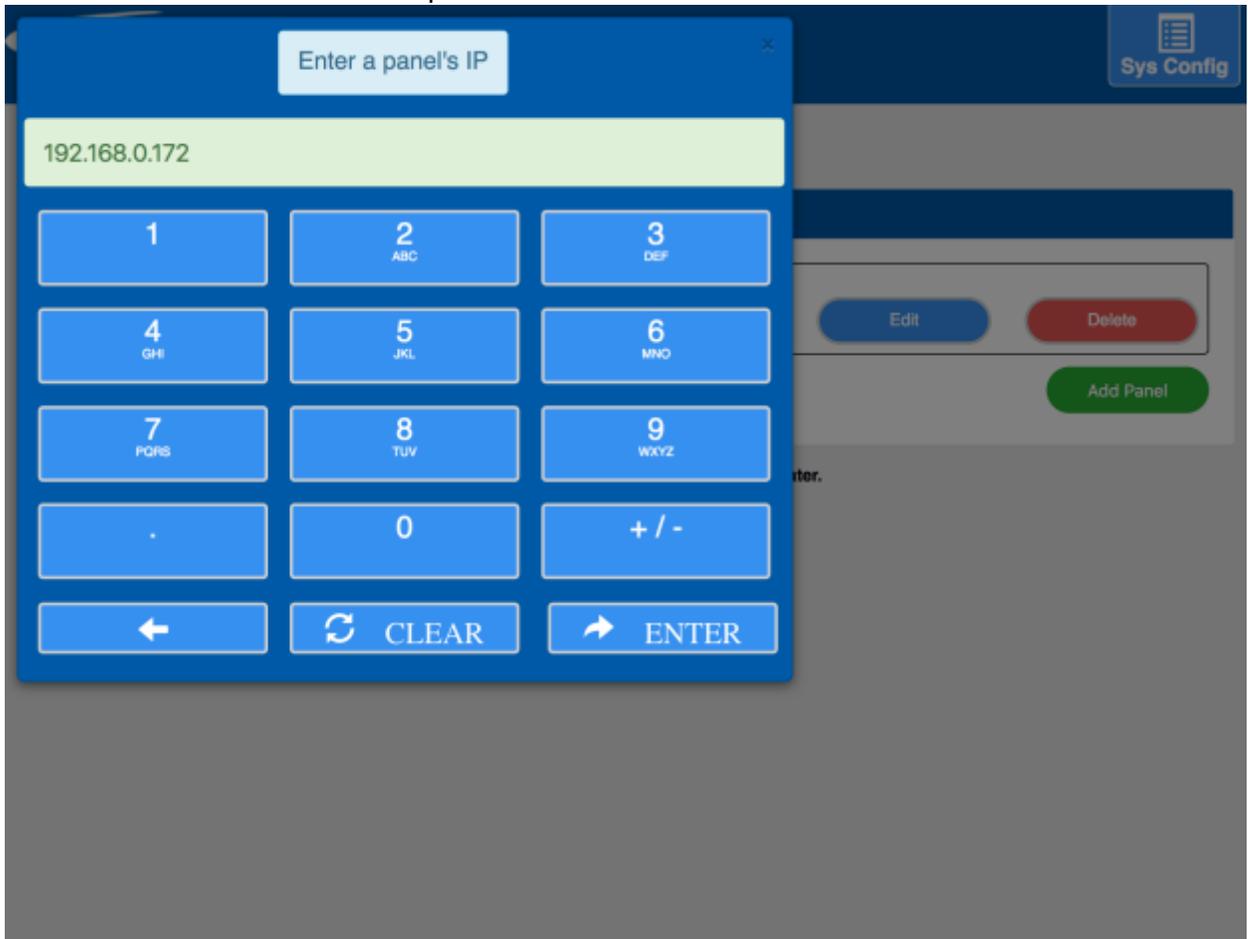
Product	Address	Status		
Condenser/Vessel	192.168.0.152:80	Connected	Edit	Delete

Scan Network

Add Panel

All networked products must be 10.40 or greater.

3. Type in the IP address of the segment of control to be added and press the “Enter” button on the onscreen number pad.



If the segment of control’s IP address is outside the network the user will be prompted to enter an IP address inside the network with which they want the segment of control to added to be

associated.

Quantum HD Unity  
SYSTEM CONTROLLER

192.168.0.152 - (Viewed Remotely)  
10/31/2016 - 15:31:35

Sys Config

List Network Add Factory Card Back

External IP

10.16.0.15 is outside the 192.168.0.x  
Enter the IP you want the product to have after it has been added.

New IP

192 168 0

Save

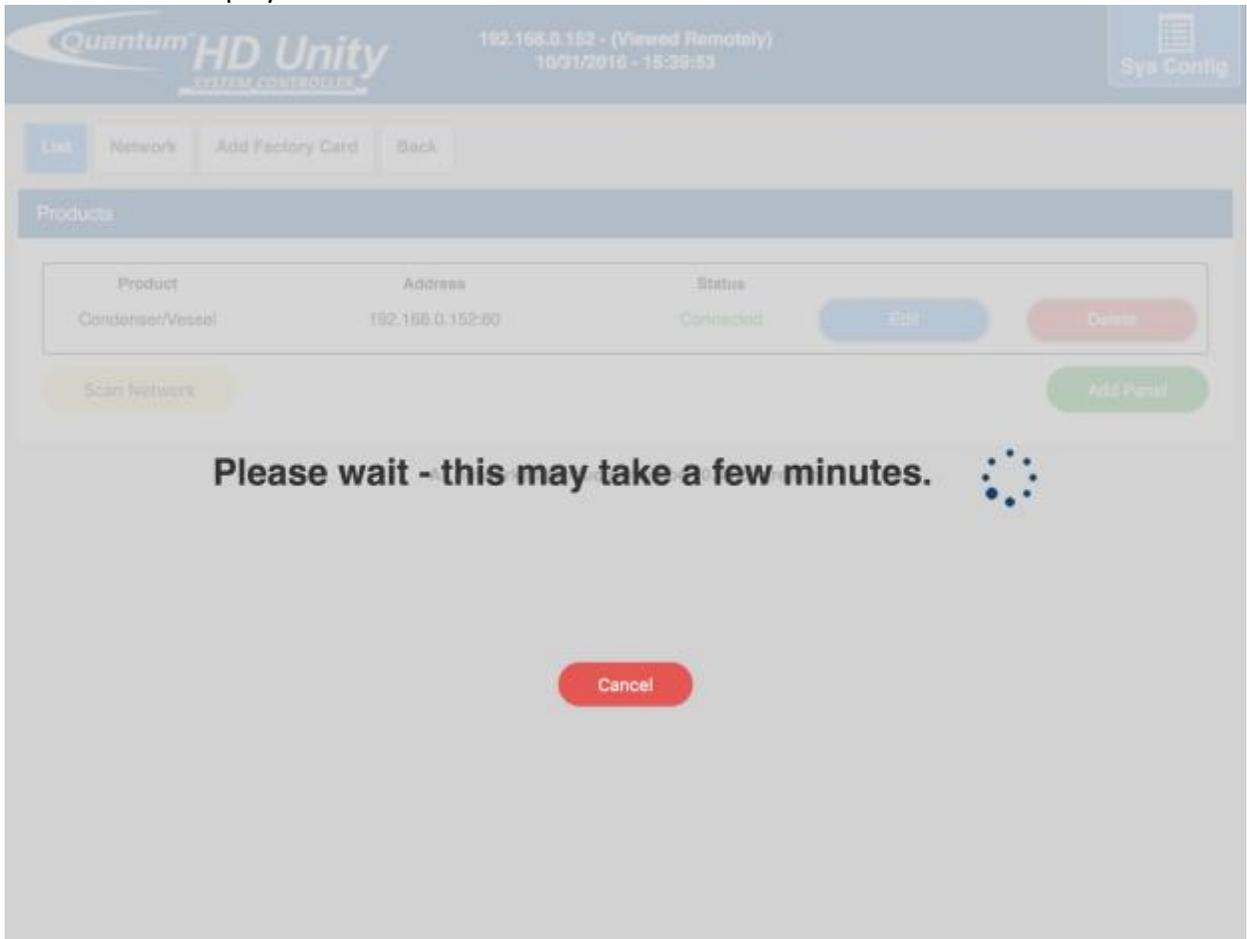
## Scanning the network

Scanning the network allows the user to press a button and find the segments of control within the network. The time that it takes to scan the network is dependent on the speed of the network and the size of the network. If scanning takes too long, press “Cancel” button to stop the scan and link the segment of control manually.

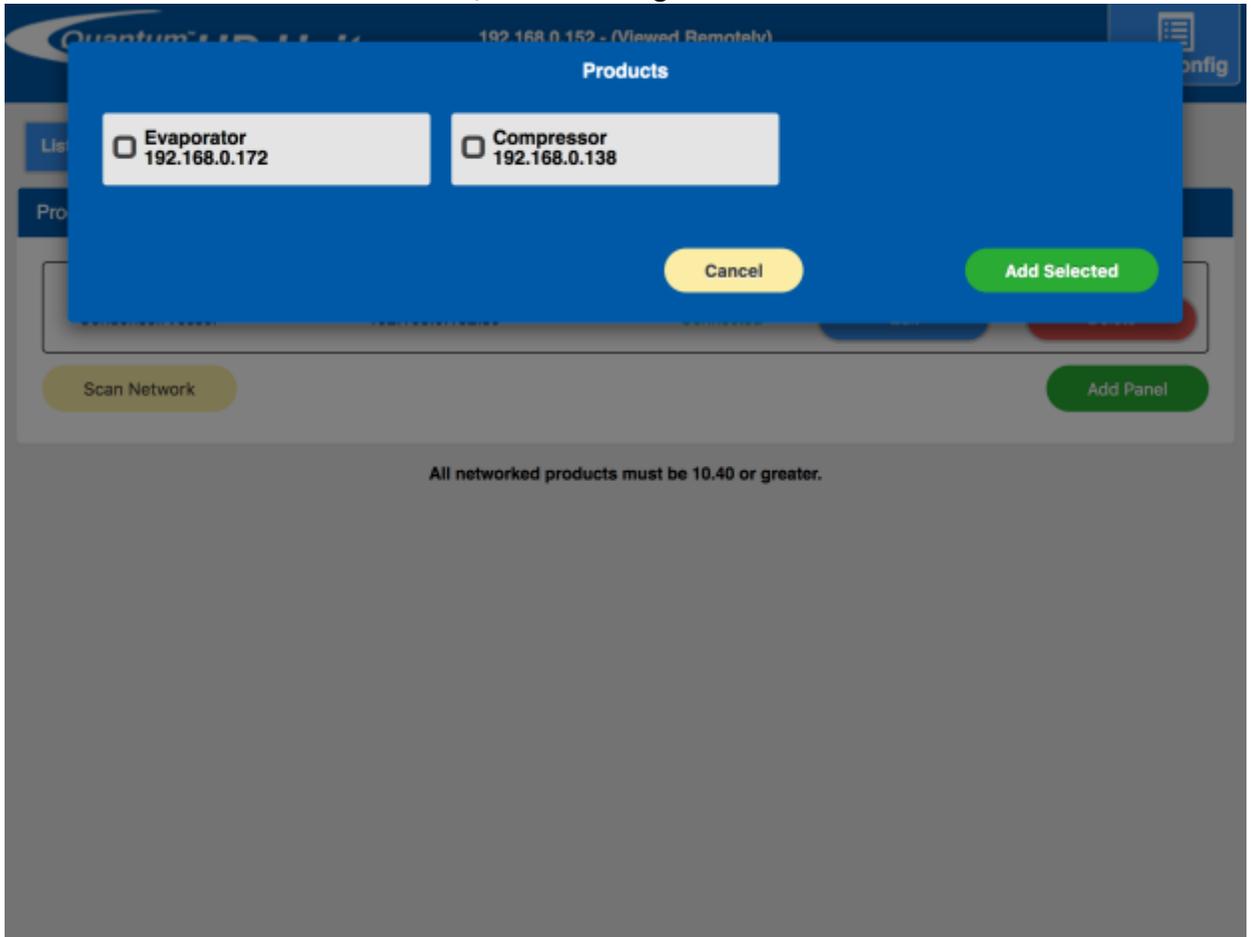
The steps to link segments of control by scanning the network are as follows:

1. Navigate to the Sys Config. > System Networking page.

2. Press the “Scan Network” button in the lower left hand corner of the page. A loading screen will be displayed.



3. Once the network has been scanned, select the segments of control to be linked.



4. Press "Add Selected".

### **Adding a Factory Card**

If and only if the user has a card with the Factory IP address they can link a segment of control through the following steps:

1. Navigate to Sys. Config > System Networking
2. Press the "Add Factory Card" link in the sub-navigation bar.

3. Select the which segment of control they have that has a factory IP Address.

The screenshot shows the Quantum HD Unity SYSTEM CONTROLLER interface. The top navigation bar is blue and contains the logo, the text '192.168.0.152 - (Viewed Remotely)' and '10/31/2016 - 15:55:06', and a 'Sys Config' button. Below the navigation bar are four buttons: 'List', 'Network', 'Add Factory Card' (highlighted in blue), and 'Back'. The main content area features a blue header for the 'Add factory card' form. Inside the form, there is a prompt: 'Select a product to add a card that has a factory IP address.' Below this is a table titled 'Factory IP Addressses' with the following data:

Factory IP Addressses	
Compressor	192.168.0.170
Condenser/Vessel	192.168.0.171
Engine Room	192.168.0.173
Evaporator	192.168.0.172

Below the table is a 'Product' label and a dropdown menu with 'Add factory card' selected. A blue 'Save' button is located at the bottom right of the form.

4. Upon selecting the product, the user will be redirected to a page where they will be prompted to enter an IP address. Enter an IP address inside the network with which the

segment of control to added should be associated.

Quantum HD Unity  
SYSTEM CONTROLLER

192.168.0.152 - (Viewed Remotely)  
10/31/2016 - 15:58:53

Sys Config

List Network Add Factory Card Back

Add factory card

**Add Condenser/Vessel Factory card**  
Enter the IP you want the product to have after it has been added.

New IP 192 168 0

Save

5. Press “Save”.

After entering the new IP address and pressing save the segment of control will be linked to the other linked segments of control.

**Factory IP Addresses:**

Segment of Control	Default IP
Compressor	192.168.0.170
Condenser/Vessel	192.168.0.171

Evaporator	192.168.0.172
Engine Room	192.168.0.173

## **Editing a Segment of Control**

The steps to edit a segment of control are as follows:

1. Navigate to Sys Config. > System Networking.
2. Press the edit button that is in the same row as the segment of control to be edit.
3. Make the changes. (Refer to Linking Segment of Control Manually for information on each field.)
4. Press the "Save" button.

5. Press "Yes" in the confirmation box. Once "Yes" is pressed all automated control will be suspended for 20-30 seconds.

Product	Evaporator
IP	192 168 0 172
Port	80
Uri	

## Fields

**Product** - The product category that the IP points to. If the product has multiple components the user will be able to select which components are enabled. The only product with this feature is Condenser/Vessel.

**IP Address** - The network administrator will provide the numerical IP address. If the segment of control is not on the plant network the factory default, noted below, is sufficient. Notice a certain number of octets are pre filled and disabled. This is based on the network page's gateway and subnet mask configuration (Refer Network Page).

**Port** - The network administrator will provide the port number for each segment of control. The default is 80.

**URL** - Enter a URL if the segment of control is to be accessed through an external website.

### **Extra Fields**

There are extra fields depending the on product type:

**Name** - This is displayed if the product type is Compressor. This is the name that will be displayed throughout the compressor program and in the top bar of the screen when accessing the compressor. The default name is Compressor.

## **Deleting a Segment of Control**

The steps to deleting a segment of control are as follows:

1. Navigate to Sys Config. > System Networking.
2. Press the delete button that is in the same row as the segment of control to be deleted.
3. Press "Yes" in the confirmation Box.

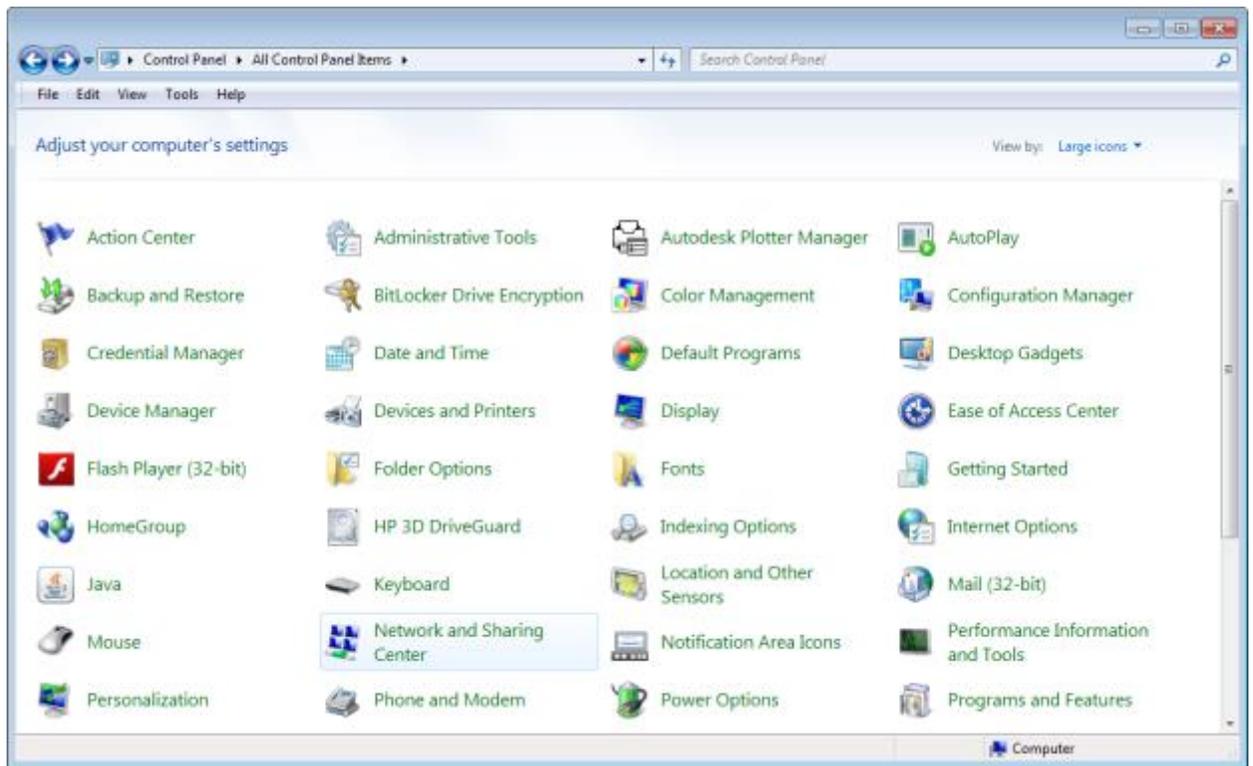
## **Common Problem and Troubleshooting**

Before following any of the steps below, verify that all of the Ethernet cables are connected to the switch in the Quantum HD Unity panel.

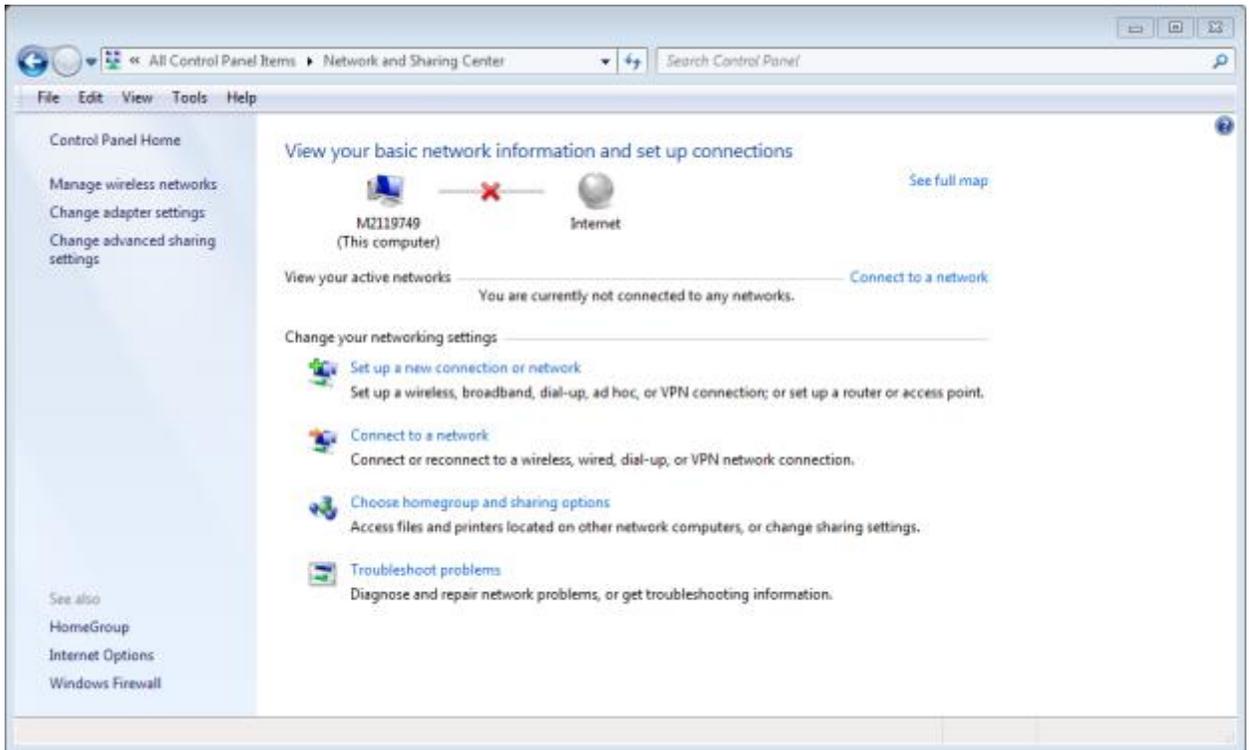
### **Setting up a laptop for troubleshooting**

A laptop must be preconfigured to communicate with segments of controls for troubleshooting purposes before following the any of the steps for scenarios below. The laptop must have the same networking settings as the segment of control. Below are the steps for setting the network on a Windows laptop.

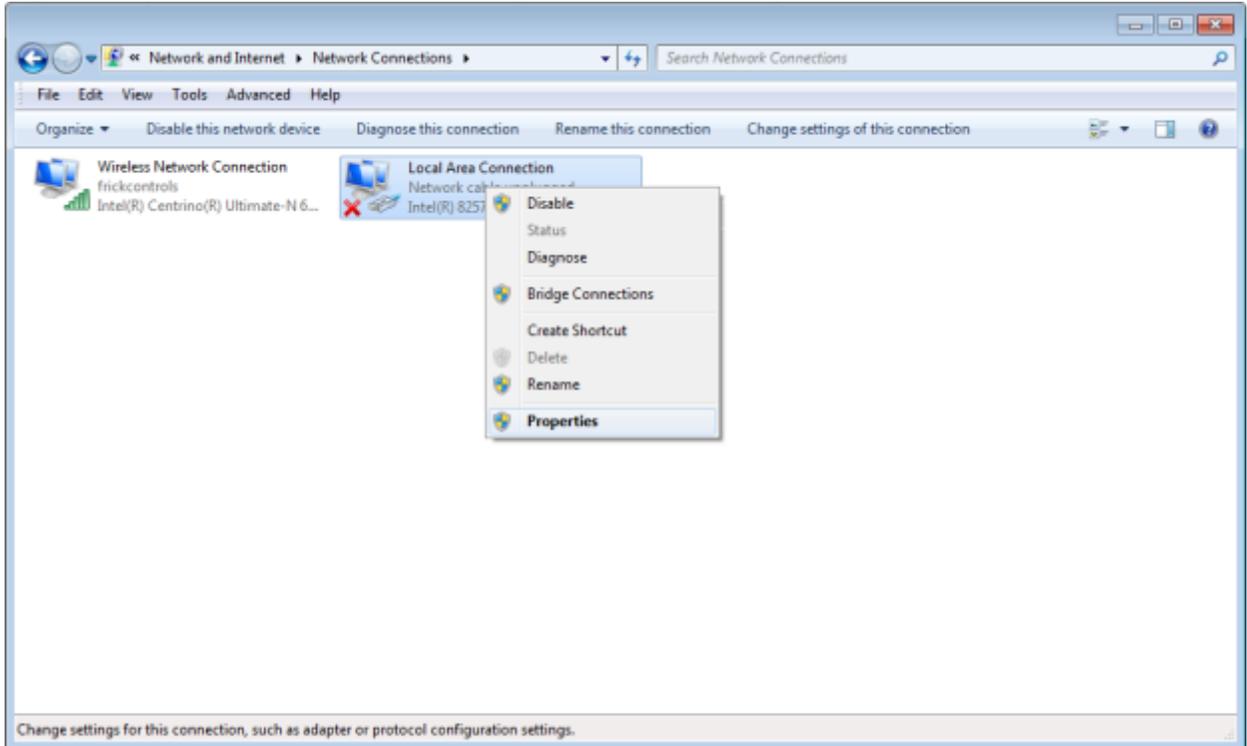
1. Navigate to Sys Config. > System Networking > Network on a segment control, and record the Gateway Address and Subnet Mask.
2. On the laptop navigate to the Control Panel
3. Click on Network and Sharing Center



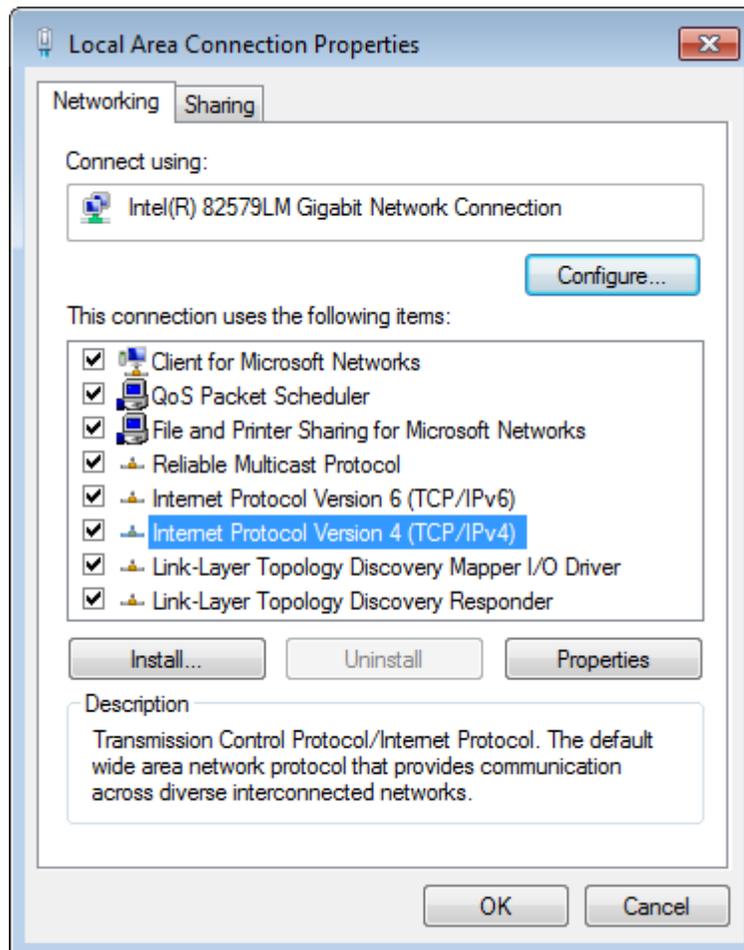
4. On the left of the Network and Sharing Center click "Change adapter settings"



5. Right click your Local Area Network adapter and select "Properties" from the menu.

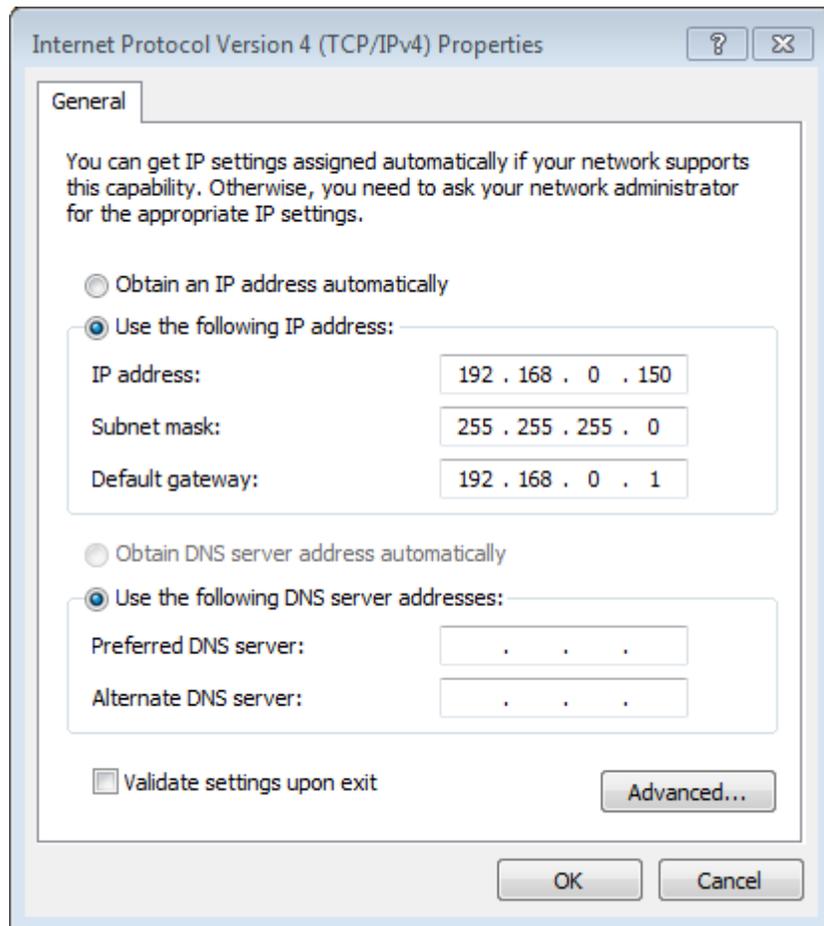


6. Select "Internet Protocol Version 4 (TCP/IPv4)" and click the properties button



7. Set the Subnet mask and Default gateway to match the subnet mask and gateway address that was recorded in step 1. The IP address can be set to an IP where the first three octets match the first three octets of the gateway address and the last octet is a number from 2-254 that no other computer is using.

**Note:** The numbers in the image below are an example configuration the actual numbers to be entered may be different.



## Unable to Connect to a Product

When a segment of control is unable to connect to another segment of control the major reason is that the IP of the disconnected segment of control is different than expected.

### Verify the IP

Plug a laptop into the switch and enter the IP of the segment of control that is unreachable into a browser's address bar. If a page is not displayed after 10 seconds, then the IP is not correct (Refer to Fix an Incorrect IP).

### Fix an Incorrect IP

To fix an incorrect IP for a product that cannot be found do the following:

1. Delete the segment of control that displays "Cannot Connect" on the Sys Config. > System Networking page. (Refer to Deleting a Segment of Control)

2. Reset the IP to factory defaults on the segment of control that was displaying "Cannot Connect". (Refer to Resetting the IP to Factory Defaults)
3. If there are not any other segments of control associated with the default IP (see table in step 5) for that specific segment of control, then skip to step 13.
4. Plug a laptop into the Ethernet switch and set the laptop's subnet mask to 255.255.255.0 and the default gateway to 192.168.0.1 (refer to Setting up a laptop for troubleshooting steps 2-7). The IP address for the laptop can be set to anything with the prefix 192.168.0.X where X is a number from 2-254 that no other computer is using.
5. With a laptop plugged into the Ethernet switch, enter the segment of control's default IP into a browser's URL bar. The defaults are as follows.

<b>Segment of Control</b>	<b>Default IP</b>
Compressor	192.168.0.170
Condenser/Vessel	192.168.0.171
Evaporator	192.168.0.172
Engine Room	192.168.0.173

6. Navigate to Sys Config. > System Networking
7. If there is not a segment of control in the list on the System Networking page whose IP address matches the IP address in the header bar, then add the segment of control. (Refer to Linking Segment of Control Manually)
8. If all of the segments of control in the list are displaying connected, then skip to step 12.
9. Delete all the segments of control except for the segment of control whose IP matches the IP in the header at Sys Config. > System Networking.
10. Navigate to Sys Config. > System Networking > Network.
11. Change the Gateway Address and Subnet Mask fields to match the fields of the other segments of control and press "Save".
12. Once the network has been set and the page reloaded. Navigate to Sys Config. > System Networking and edit the segment of control that matches the IP address in the header bar of the screen with the desired settings. (Refer to Editing a Segment of Control)
13. From the segment of control on which step 1 was performed, add the segment of control that was just edited. (Refer to Linking Segment of Control Manually)

14. Disconnect the laptop from the switch and return the laptops network settings to its original settings.

### **Unable to Edit Segment of Control**

The primary cause of a user being unable to edit a segment of control is that the segment of control is unable to communicate with all of the other segments of control. Verify that each of the segments of control are connected by navigating to Sys Config. > System Networking and fix any of the disconnected segments of control. (Refer to Unable to Connect to a Product)

### **Unable to Change the Network**

The cause of a user's inability to change the network is that all of the segments of control are not communicating with each other. Verify that each of the segments of control are connected by navigating to Sys Config. > System Networking and fix any of the disconnected segments of control. (Refer to Unable to Connect to a Product)