CopperCube

Setup Guide

CopperTree Analytics

Delta Controls

A Delta Group Company

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Set up your CopperCube

Congratulations on purchasing a CopperCube. This document explains how to install and configure your CopperCube to collect and archive trend logs.

Before You Start

There are several tasks you should do before you begin to install and set up your CopperCube.

Onboarding Forms

Before you visit the site to deploy the CopperCube, use these two onboarding forms to collect IT and building information from the client. Carry these with you to the site so that you have all the information required to set up the CopperCube. We advise you to keep these documents for future reference.

- CopperCube Setup Checklist for IT
- CopperCube and Kaizen Setup form (if you are using CopperTree Kaizen with CopperCube)

Equipment

You need a laptop to complete this setup.

If your laptop is DHCP-enabled, this will make this setup process easier. If your laptop has a static IP address and is not set up to obtain an IP address automatically, see the Troubleshooting section to enable DHCP on your laptop Ethernet adaptor.

You also need an Ethernet network cable to connect your laptop to CopperCube's ETH 2 port (Verge model) or LAN 2 port (eCORE model).

Site Names and Device Ranges

Consider the following information before you start:

- The **site name** is a unique name on your BACnet network with a unique range of devices. The name should be kept as short as possible as this data is stored repeatedly in the database. All site names must start with one of the following characters: a character between "A" and "Z", "_", or a character between "a" and "z". You should also avoid space characters and extra capital letters in the site name.
- When setting up a building in CopperTree Kaizen to receive the data from the CopperCube, the site name and the device range numbers set up in this CopperCube must match the names and ranges used in Kaizen. To minimize mistakes during the installation, prepare a list of all the site names and device ranges used on your Kaizen site before you start the CopperCube install.
- Even though enteliWEB does not have the same site name matching requirement as Kaizen, using identical names in both CopperCube and enteliWEB will save you a lot of time when you configure the CopperCube in enteliWEB.
- You can only set up 1 site per BACnet network. Setting up multiple sites in a single BACnet network produces communication problems in the CopperCube.

CopperCube Redundancy

Each site should employ one or more of the following data redundancy strategies to protect any critical data collected by the CopperCube.

- Install more than 1 CopperCube to monitor the same trend logs.
- Set up a scheduled backup of your CopperCube data to a network storage location. See the CopperCube Application Guide for more details.
- Set up a scheduled backup of your CopperCube data to a USB storage device. For example, back up to a local USB hard drive or USB flash drive. See the CopperCube Application Guide for more details.
- Send data to an external SQL database using SQL Connector. See the CopperCube Application Guide for more details.
- Use the CopperTree Analytics Kaizen service to back up data. For more information, contact CopperTree Analytics at customersolutions@coppertreeanalytics.com.

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1. Physical Setup

(Verge model)

1. Connect the power supply to the CopperCube.
2. Plug a network cable between your laptop's Ethernet port and the CopperCube's fixed-IP port/diagnostic port (ETH 2). Do not use a switch or hub that is connected to other devices or networks.
3. Open a web browser, type "169.254.8.29" into the address bar and press Enter. The status page of the CopperCube graphical user interface (GUI) opens in the browser.
   If the browser is unable to find this address, go to the Troubleshooting section on this setup manual.

(eCORE model)

1. Connect the power supply to the CopperCube. Press the power button until the green power light turns on.
2. Plug a network cable between your laptop's Ethernet port and the CopperCube's fixed-IP port/diagnostic port (LAN 2). Do not use a switch or hub that is connected to other devices or networks.
3. Open a web browser, type "169.254.8.29" into the address bar and press Enter. The status page of the CopperCube graphical user interface (GUI) opens in the browser.
   If the browser is unable to find this address, go to the Troubleshooting section on this setup manual.

2. Logon to CopperCube GUI

To display the login screen, click ***Login***.

If this is your first time logging into the CopperCube GUI, in the Username field, type "partner", and in the Password field, enter the serial number of the CopperCube (**do not include the "/" on the serial number**.) Click Login.

In the Select Time Zone field, select your time zone. You can also select your preferred Network Time Protocol (NTP) server by entering the server's site address.

3. Set the IP Address of the CopperCube

Every CopperCube comes pre-configured with two active Ethernet ports. This allows you to easily set up the IP address of the CopperCube device.

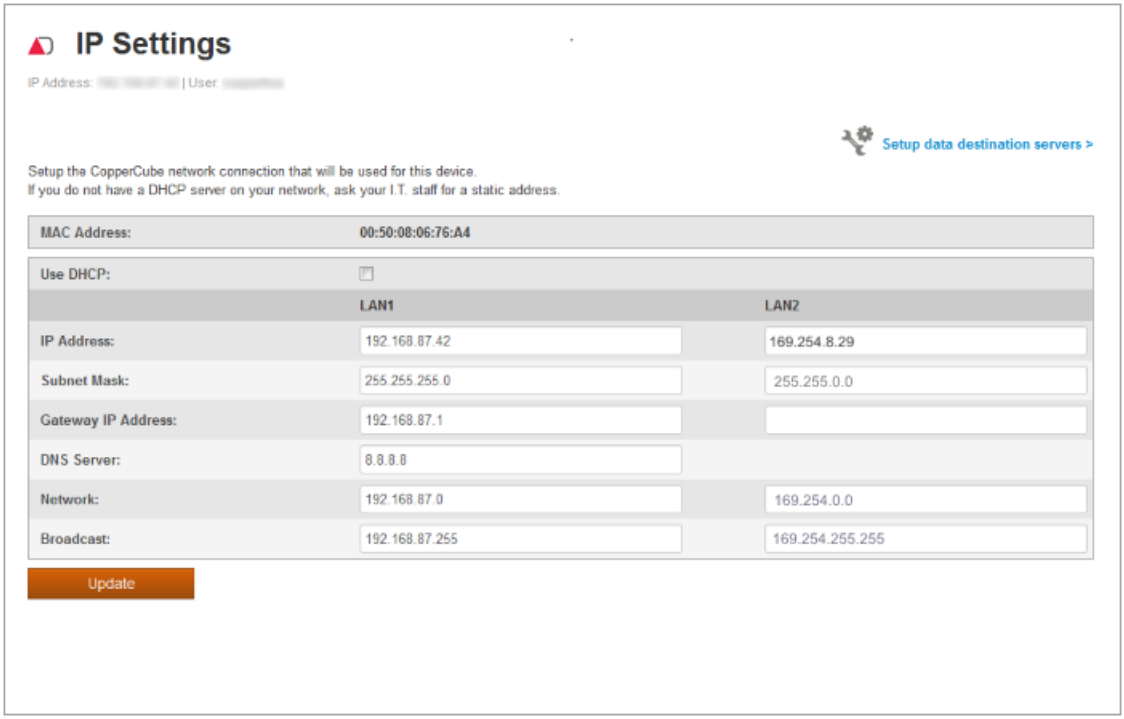
We have preconfigured port ETH 2 (or LAN 2) so that you can configure port ETH 1 (or LAN 1) to be compatible with your network. Port ETH 2 (or LAN 2) is set with a static IP address of 169.254.8.29. With this known address, you can connect to and access the CopperCube using a Internet browser on your laptop or computer.

Note: ETH 1 and ETH 2 are ports on the Verge model. LAN 1 and LAN 2 are ports on the eCORE model.

To configure IP settings for the CopperCube:

1. Click ***Settings > IP Settings***.

2. Enter the network information provided by IT for the CopperCube in the IP Settings fields in the LAN1 column:



- **Use DHCP**. If your site uses Dynamic Host Configuration Protocol (DHCP), check this box and record the IP address that appears in the IP Address field below. Once this box is selected, all other IP setting fields are grayed out and you do not need to complete them.
- **IP Address**: Enter the CopperCube's static IP address.
- **Subnet Mask**: Enter your network's subnet mask.
- **Gateway IP Address**: Enter the default gateway IP address.
- **DNS Server**: Enter the DNS Server address.

The CopperCube GUI completes the **Network** and **Broadcast** fields automatically based on the network information you've provided.

3. Click Update and wait for the CopperCube to apply the new settings.

4. Set Data Destinations

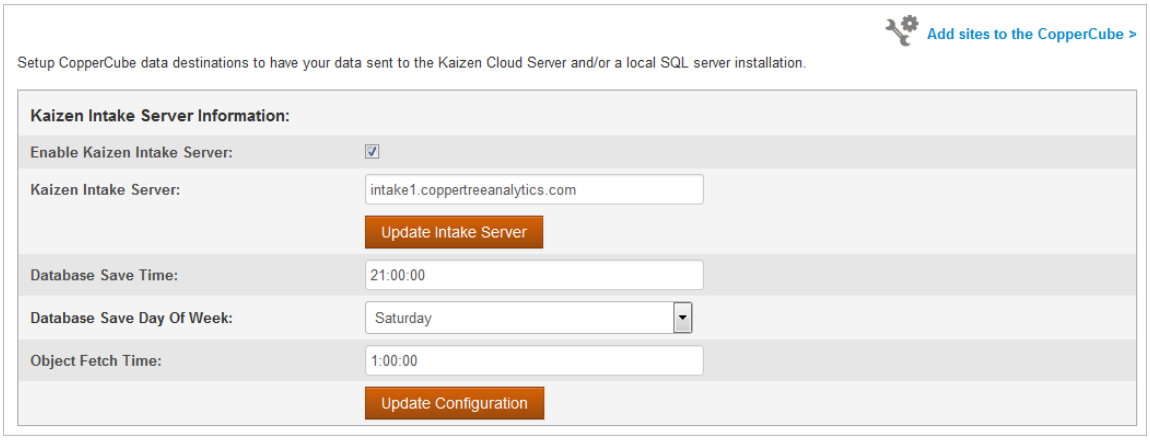
The CopperCube is able to archive data internally within the device. Alternatively, the CopperCube can also send data to Kaizen Cloud Server and/or to a SQL database.

This section describes how to set up the CopperCube to send data to Kaizen Cloud Server or to a SQL server.

Skip this step and go ahead to Step 5 (connecting the CopperCube to the site/building network) if one of the following is true:

- You are not sending your data to Kaizen or an external SQL database.
- You have a CopperCube KDP (Kaizen Data Pump) model. Kaizen Cloud Server is automatically enabled as a data destination. You may still want to change the default time and date in the Kaizen Intake Server Information that is used to send data to Kaizen.

Set Up CopperCube to Send Data to Kaizen Cloud Server



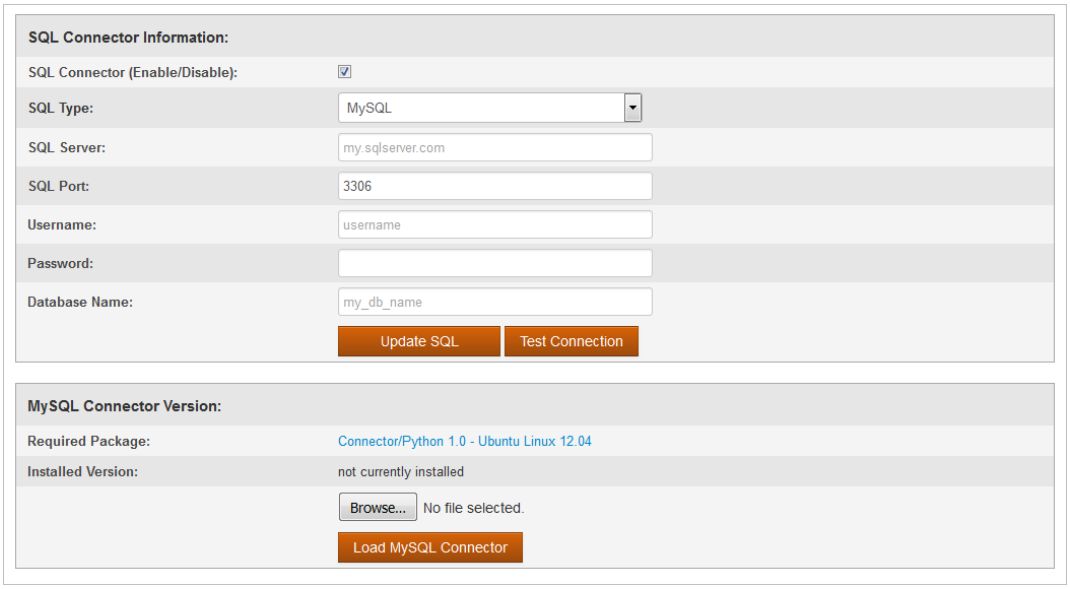
1. Ensure Kaizen is set up before you start this procedure.
2. Click ***Settings > Data Destinations***.
3. Select the Enable Kaizen Intake Server box.
4. In the Kaizen Intake Server field, enter this server address: intake1.coppertreeanalytics.com. Click Update Intake Server to save changes.
5. Set up a schedule to automatically complete the following tasks during times when network traffic is not as busy (based on 24-hour clock):
    - **Database Save Time** and **Database Save Day of Week**. The time and day when CopperCube saves the device databases set up to be sent to Kaizen.
    - **Object Fetch Time**. The time when CopperCube retrieves and saves objects, properties and values.
6. Log into Kaizen, create the building and map the CopperCube to it using the site names and device ranges that you will set up later in this set up procedure.

Set Up CopperCube to Send Data to a SQL Server

The CopperCube is able to send data to a SQL server. The CopperCube supports Microsoft MS SQL, MySQL and PostgreSQL.

The SQL Connector is a separate purchased option, and is available as an upgrade if needed. The SQL Connector is not offered with the CopperCube KDP model.

To start a 30-day trial of SQL Connector, see the section about setting up CopperCube to send data to a SQL Server.



1. Ensure the SQL server and database is set up before you start this procedure.
2. On the CopperCube GUI, click ***Settings > Data Destinations***.
3. If you are using a MySQL server, download the MySQL Connector/ Python driver version 1.0.x for Ubuntu Linux (where x is 11 or higher).
    1. In the MySQL Connector Version section, click the link in the Required Package field.
    2. On the web page, in the Select Platform field, select Ubuntu Linux.
    3. Click Download to start downloading the .deb package.
4. Select the SQL Connector box to establish a connection with the SQL Connector. Clearing the box will disable this connection and hide all the SQL Connector fields.
5. If you are using a MySQL server, install the MySQL Connector driver:
    1. In the MySQL Connector Version section, click Browse and navigate to the location of the .deb package that you've downloaded. Select the file and click Open.
    2. Click the Load MySQL Connector button. After the driver is installed, the page automatically refreshes and the Installed Version field displays the version number of the connector that you've just installed.
6. Complete all the required database connection options:
    - **SQL Type**. From the drop-down list, select the type of SQL database server used.
    - **SQL Server**. Enter the name of the SQL host server or its IP address.
    - **SQL Port**. Enter the SQL Server port number used to establish this connection.
    - **Username** and **Password**. Enter the user name used to logon to the SQL server.
    - **Database Name**. Enter the name of the database
7. Click Update SQL to save your inputs.
   If a SQL Connector trial license is available, setting up the SQL Connector will start the trial. The SQL Connector option will be disabled at the end of the 30-day trial period if you choose not to purchase an additional SQL Connector license, and the SQL Connector data transmission will cease.

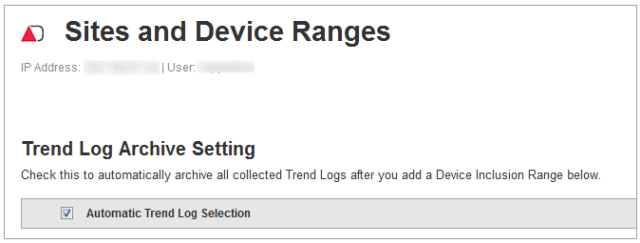
5. Connect the CopperCube to the Site/Building Network

1. Connect the CopperCube to the site/building's network using the CopperCube's ETH 1 port (or LAN 1 port if you are using the eCORE model).
2. To verify that the CopperCube IP address has been set up correctly, on a workstation **on** the site/building network, enter the new IP address in the browser's address bar and press Enter. You should see the device status page if your connection settings are correct.
3. If you have set up the CoppeCube to send data to a SQL server, on the Data Destinations page, verify the connection to the SQL server by clicking Test Connection.

   Complete the rest of the set up procedure by accessing the CopperCube device status page in 1 of the following ways:

   - On a site/building network workstation
   - On your laptop that is connected to the site/building network
   - On your laptop that is connected directly to the CopperCube ETH 2 port (or LAN 2 port if you are using the eCORE model).

6. Turn Off Automatic Selection of All Trend Logs



When the Automatic Trend Log Selection box is selected, CopperCube will automatically discover and archive all trend logs it finds on the site. However, in most cases, instead of allowing the system to choose all trend logs, you want to select specific trend logs to archive.

To turn off the setting that automatically selects all trend logs:

1. Click ***Settings > Sites and Device Ranges*** .
2. Clear the Automatic Trend Log Selection box. The process of archiving selected trend logs is explained later in this setup manual.

Even though automatic selection is turned off, the CopperCube will still continue to discover new trend logs on the site. These trend logs will be set to **Not Archived** by default.

7. Define a BACnet Site and Device Ranges

This section describes how to set up a BACnet site in CopperCube. The CopperCube connects to the site and collects the trend logs. The trend log data is saved internally on the CopperCube. The data can also be moved to a Kaizen or SQL server. You can add multiple BACnet sites on the same CopperCube but each site has to have a unique connection to a BACnet network.

You need to consider the following information before you add a site:

- The **site name** is a unique name on your CopperCube with a unique range of devices. The name should be kept as short as possible as this data is stored repeatedly in the database.
  When setting up a building in CopperTree Kaizen to receive the data from the CopperCube, this site name needs to be entered as an exact match. It is recommended to minimize spaces and extra capitals.
- You need to enter the **connection type** and **device number** for the CopperCube on the BACnet network. This device number must not conflict with any other device numbers in this BACnet network.
  If connecting to multiple sites, the device number does not need to be the same for every site but should be what works best for that particular site.
- You can only set up 1 site per BACnet network. Setting up multiple sites in a single BACnet network produces communication problems in the CopperCube.

Adding a New Site

1. Click ***Settings > Sites and Device Ranges*** .
2. Click Add.
3. Enter a site name.
4. Enter a Device Number that identifies the CopperCube in the site's BACnet network.
5. In the Connection Type field, select the type of network connection for the CopperCube at the site:

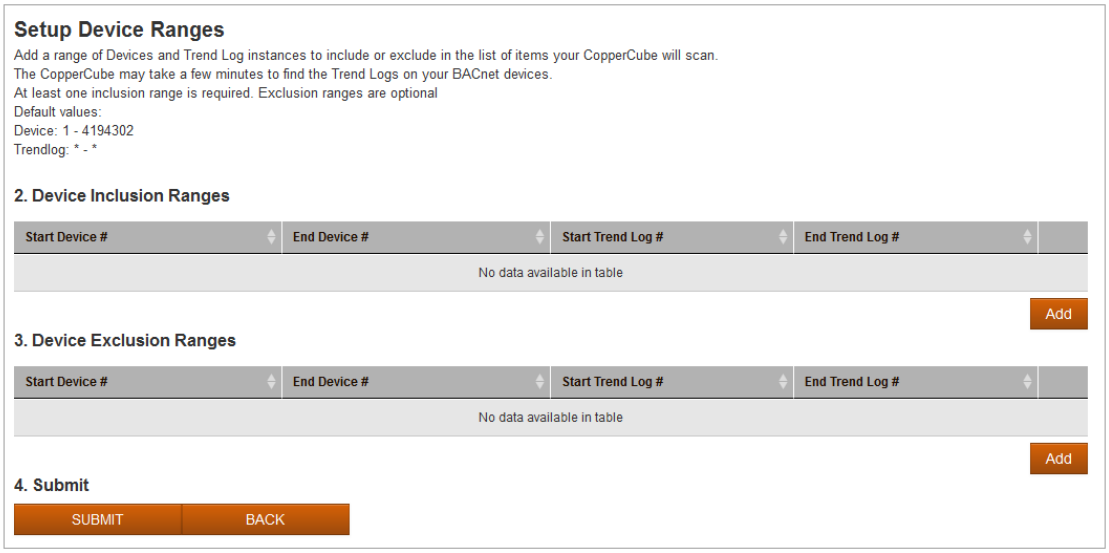
Connection Type		Procedure
Ethernet		Select **Ethernet** from the Connection Type drop down list. Click Submit to save your changes.
Regular IP Connection		1. To connect to a site via non-Ethernet local network connection, select **IP Regular** from the Connection Type drop down list. 2. Enter the UDP Port Number of the CopperCube used to connect to the network (in most cases this should be 47808). 3. Enter the IP Address that was assigned to the CopperCube. By default, the IP address from IP settings appears in this field. 4. Click Submit to save your changes.
Foreign IP Connection		1. To connect to a site via through a BACnet Broadcast Management Device (BBMD), select **IP Foreign** from the Connection Type drop down list. 2. Enter the IP Address that was assigned to the CopperCube. By default, the IP address from IP settings appears in this field. 3. Enter the BBMD Address of the BBMD device of the BACnet network. 4. Enter the BBMD Port of the BBMD device. 5. Enter the BBMD Username to access the BBMD device. 6. Enter the BBMD Password to access the BBMD device. 7. Click Submit to save your changes.

Define a Device Inclusion Range

The CopperCube only monitors trend logs defined by the device inclusion ranges. Trend logs outside of these inclusion ranges, and trend logs that are part of device exclusion ranges do not appear on the Trend Log Management page.

For the purpose of setting up your CopperCube, one inclusion range should be created to allow the CopperCube to discover all the trend logs on the site. If you have a large site with many network segments and third-party devices, consider setting up several device inclusion ranges. The CopperCube does not discover devices omitted from the inclusion ranges, and allows the CopperCube to perform better in a busy network.

CopperCube automatically excludes Historian, Operator Workstations (OWS), and enteliWEB.



Creating a New Device Inclusion Range

These steps describe how you can add a new Device Inclusion range. The inclusion range also restricts BACnet automatic device discovery to device numbers found in this range. If the site has devices you do not want the CopperCube to discover, omit them from the inclusion range.

1. Click ***Settings > Sites and Device Ranges*** .
2. In the sites table, in your site's row, click Edit.
3. In the Device Inclusion Ranges section, click Add. The Add Site Range window opens.
4. Accept all default values in all fields.
   If you want to create more specific device ranges, in the Start and End Device # fields, enter the device numbers that form the lowest and highest limits in the device range. This range is inclusive.
5. In the Start and End Trend Log # fields, accept the default asterisk wildcard value.
6. Click Submit to save your changes.
7. Click Submit again.

It will take some time for all your trend logs to appear in the CopperCube GUI, depending on the size and speed of your site network.
You can view the progress of the CopperCube on the Status and Usage Summary on the Trend Log Management page (Data > Trend Log Management) .

8. Select Specific Trend Logs to Archive

This section describes how to select individual or multiple trend logs to archive.

Note: It will take some time for all your trend logs to appear in the CopperCube GUI, depending on the size and speed of your site network.

1. Click ***Data > Trend Log Management*** .

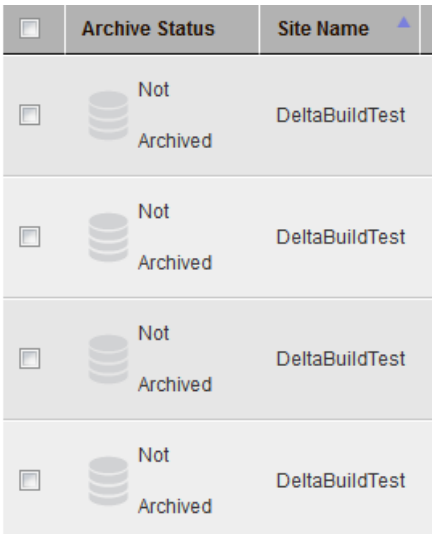
2. Click the refresh symbol below the search filter section to refresh the trend log list. This ensures the latest trend log information is displayed.

3. At the top of the screen, use the filters to display only the trend logs you're interested in. The filters are applied automatically after a filter option is selected.
You can filter using the following options:

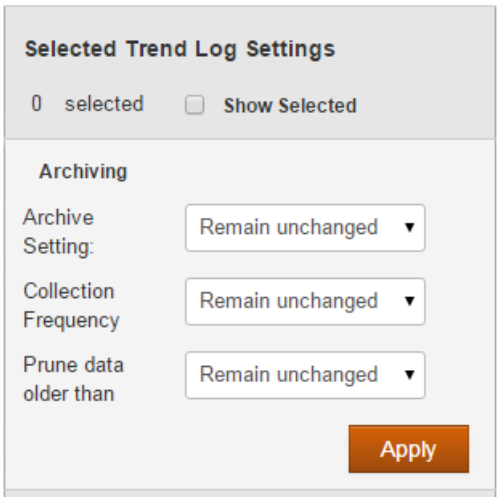
Filter Option		Description
Select a Site		Displays a list of all the sites monitored by this CopperCube. Select All to display trend logs from all sites, or a single site to display the site's trend logs.
Device Range		Create a device number filter range so that only trend logs that fall within this range (inclusive) are displayed in the filter results.
Filter by archiving setting		Select Not Archived to display all the trend logs that have not been set up to be archived.
Search		Search for any string or portion of string, if applicable. Only items that contain this string in any field appears in your search results. This search is case-sensitive.
Trend Log Range		Create a trend log number filter range so that only trend logs that fall within this range (inclusive) are displayed in the filter results.
Filter by trend status		This status reflects the trend log's active status on the CopperCube: archived, non-archived, pending, detached, offline, historical, error or all trend logs. Detached trend logs are trend logs that are no longer valid because they have been removed from an inclusion range or deleted from a site. These detached trend logs are rarely found on a fresh set up. When the Historian Data Import setting is enabled, the CopperCube detects Historian trend logs that are within the site and device range monitored by the CopperCube. Use the Historical filter to only display monitored trend logs from Historian devices in the network. See the CopperCube Application Guide for more information. **Note:** The Historian Data Import setting and the Historian filter are not available with the CopperCube KDP model.

4. From the results list, select the trend logs you want to archive.

To select a single trend log, check the selection check-box in the same row as the trend log. To select all the trend logs on the results list, check the selection check-box next to the Archive Status column in the table. The CopperCube remembers which trend logs you've selected for future sessions.



5. To determine how these selected trend logs are archived, in the Selected Trend Log Settings section, make the following changes:



- In the **Archiver Setting** field, select Archive.
- The default **Collection Frequency** of the trend logs is 4 hours. The CopperCube may naturally visit a trend log more often to avoid losing samples, so reducing the collection frequency should only be done when prompted by CopperCube Technical Support.
- In the **Prune data older than** field, you can change the settings for the auto-pruning function by selecting an option from the drop down list. By default, CopperCube models (except the KDP model) prune any data older than 5 years. The KDP model prunes data older than 2 months.

Note: If you check the **Show Selected** box, the filter criteria is ignored (and grayed out) and only the trend log items that you've selected in this current session and in previous sessions appear on the trend log list. Viewing selected trend logs is useful for those users who need to view the same trend logs regularly.

6. Click Apply. The page will be updated, and the CopperCube will start archiving.

Stop Archiving Specific Trend Logs

This action is similar to the previous procedure in that you select the trend logs the same way as above but you need to set them to Do Not Archive under Archive Setting.

9. Confirm Data Destinations

(Only if your CopperCube is set up to send data to Kaizen or SQL Connector)

Check the Connector Statistics section on the Status page of the CopperCube GUI to verify that data is sent to external server destinations. You should also logon to Kaizen or the SQL database to verify that these databases are receiving the archived data.

10. Turn On Automatic Selection of All Trend Logs

When you are satisfied with the archiving performance of the initial set up, go back to the CopperCube GUI and turn on the Automatic Selection of All Trend Logs box.

This ensures future new trend logs that are defined by the device inclusion ranges are archived automatically.

Troubleshooting

Use the procedures in this section to troubleshoot the connection between the CopperCube and your laptop.

Verify the physical connections are functioning properly

The LED lights at the CopperCube's ETH 2 port (or LAN 2 for the eCORE model) and at your laptop's Ethernet port should be lit up. If you do not see any lights, you may have a faulty network cable or port.

Enable DHCP on the laptop's Ethernet Adaptor

This ensures your laptop has the correct IP address to communicate with the CopperCube.

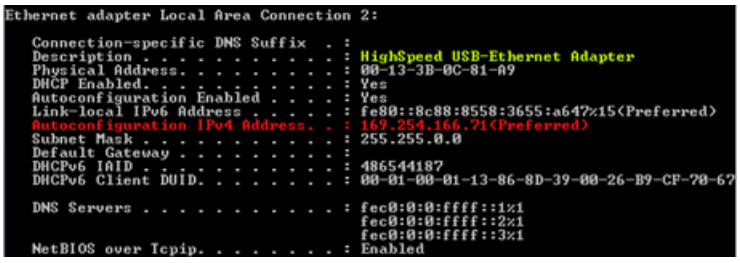
(In Windows 10)

1. Press the Windows logo key and type `Network Status`. Press Enter.
2. Select Change Adapter Options.
3. Right-click on the laptop's Ethernet Adaptor used to connect to the CopperCube and select Properties.
4. In the item list, scroll down to the item called Internet Protocol Version 4, check the box and click on the Properties button.
5. In the properties window, take a screenshot of the settings in case you need to re-enter the settings later.
6. Select the option Obtain an IP Address Automatically and click OK. Click OK to close all windows.
7. Restart the laptop.
8. Log on to the CopperCube GUI.

Verify that your laptop IP address is in the correct range

(In Windows 10)

1. Make sure the CopperCube is connected to the laptop's Ethernet port.
2. On the laptop, press the Windows logo key and the "R" key to bring up the Run dialog.
3. In the Run dialog, type `cmd` and press Enter.
4. In the Command dialog, type `ipconfig` and press Enter.
5. Scroll down the screen to find the Ethernet adaptor which the CopperCube is connected to. Its IPv4 Address should read: 169.254.*.* (where * are randomly determined by your laptop).



6. If the IPv4 address reads something else, your laptop Ethernet adaptor is not configured for DHCP. Go to the above procedure to enable DHCP.
   The IPv4 address should also not be identical to the CopperCube's address (169.254.8.29). If the address is identical, change the last numbers indicated by the asterisks: 169.254.*.* and try to access the CopperCube status page again.

Where to Find More Information

If you need further assistance in setting up your CopperCube, please contact Delta Controls Technical Support team at technicalsupport@deltacontrols.com. or +1-877-575-5914.

To purchase a SQL Connector license option, go to the Delta Controls License Management portal licensing.deltacontrols.com.

If you have purchased your CopperCube from CopperTree, contact CopperTree Analytics Customer Solutions at +1-778-726-0524 or customersolutions@coppertreeanalytics.com.

If you have purchased your CopperCube from a vendor other than Delta Controls or CopperTree Analytics, contact your vendor for assistance.