CONTROL CONCEPTS

CONTROL PANEL SOFTWARE USERS MANUAL

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CONTROL CONCEPTS, INC
8077 CENTURY BLVD, CHANHASSEN, MN 55317
PHONE: (952) 474-6200
FAX: (952) 474-6070
www.ccipower.com

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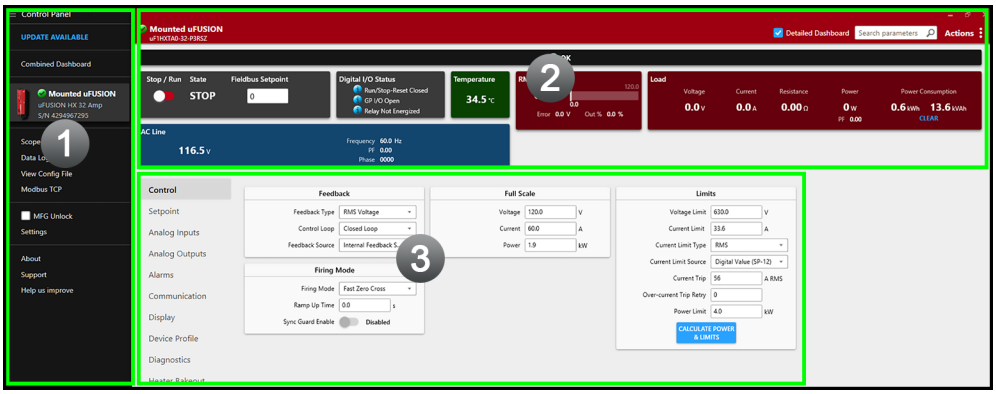
OVERVIEW

The Control Panel Software is designed for robust digital control of all Control Concepts, Inc. devices. Through a simple USB connection Control Panel enables full control of Feedback, Firing Modes, Limits, Setpoints, Parameters and many other useful features. In addition, if a Connect Gateway Module is connected, the software will allow full manipulation of up to 10 controllers simultaneously. The Control Panel Software is available for download at www.ccipower.com under the Products pull down menu. This manual is intended to inform and explain the features of Control Panel to a new user, so that the user has a working knowledge of the functions of the software. If additional information or help is needed, contact Control Concepts, Inc. and we would be happy to answer any and all questions.

The Control Panel default display is split up into three basic areas: Navigation Menu, Dashboard, and Categories of Control.



Overview Figure 1.00: Location of each of the three basic areas

1) Navigation Menu

The Navigation Menu shows all connected devices, Software Update Availability, Software Version, Scope and Data Logging feature, Settings for Auto-Connect and Data Usage, as well as basic information and contact links.

2) Dashboard

This area shows real time data information of a connected device. The Control Panel Software allows the user to customize the Dashboard by adding or hiding data screens.

In addition, any critical device statuses that are active will be displayed in this area. If there are no active statuses, a green check mark accompanied by “OK” text will be displayed. The status bar is always displayed regardless of device type or display settings.

Control Panel also allows a user to search for a specific parameter, simplify the Dashboard by hiding non-essential data screens, and command a selected controller to carry out an action via the Actions pull down menu.

3) Categories of Control

Control Panel enables robust control of a connected Control Concepts, Inc. device. Within each Category of Control, there are various Parameters that are available for user manipulation. Depending on the connected device, different Categories will be available for user manipulation.

SETUP

Installation

The installer for the Control Panel Software (CCIControlPanelSetup.exe) can be found at www.ccipower.com

Installation Procedure

1. Run CCIControlPanelSetup.exe, and follow the prompts
2. Connect a Control Concepts Inc. device via USB
3. Supply power to the Control Concepts Inc. device
    - For FUSION and MicroFUSION, apply control power to the controller
    - For a Connect Gateway Module, connect the provided Ethernet cable to the CCI Link™ connector on the Connect Gateway Module and the CCI Link™ connector on the controller with its control power applied
4. Run ControlPanel.exe from Program Files or the shortcut on the desktop and follow all command prompts

Minimum PC Requirements

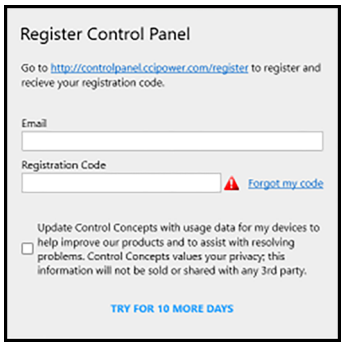
- 1 GHz Single-Core Processor
- 1GB RAM
- 100 MB of available hard disk space
- 1280 x 768 x 60 Hz Compatible Display Adapter
- Windows 7® (32/64 bit), Windows 8® (32/64 bit), or Windows 10® (32/64 bit) Operating Systems
- Microsoft®.NET Framework 4.0 – Client Profile

Control Panel Registration

When Control Panel is opened for the first time, the software will prompt the user to register. It is possible to continue to use Control Panel without registering up to 10 days after first running the application, after this grace period the software will lock the user out until registration is completed.

Setup Figure 1.00: Location of activation code

Fill out the form and click “Register”. Control Concepts, Inc. values costumer privacy and all information will not be sold or shared with any 3rd party. An email will be sent to the provided email address from controlpanel@ccipower.com containing a link to complete the registration process. The link will open a web page containing a registration code, as seen in Setup Figure 1.00. This code is unique to the email address provided, and will only work with that specific email. Make sure to save this code as multiple computers can be activated using the provided email and registration code.

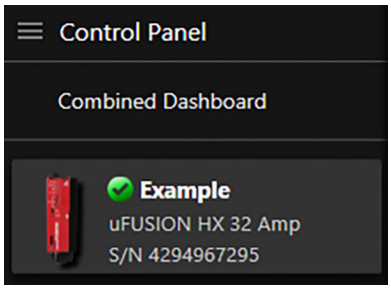


Setup Figure 1.01: Registration prompt

Enter the email address used to register and the registration code into the Control Panel dialog shown in Setup Figure 1.01. If you would like Control Panel to send usage information, make sure that the check box next to the data usage disclaimer is selected. This information helps us understand how our customers are using our products. Click “FINISH” to finish registering and close the window. The Control Panel Software is now setup and ready to be used.

MicroFUSION and FUSION Controller Setup

To setup a controller using the Control Panel software, first connect a USB from a Control Concepts, Inc. device to a computer. When a secure connection is made, the Control Panel software will show an image of the connected device in the Navigation Menu, as seen in Setup Figure 1.02. The software allows the user to set the unique MAC ID, assign a Tag name, and assign specific settings for the controller.



Setup Figure 1.02: Example of a successfully connected microFUSION controller

Device on a Network

To finish setup on a device that is connected to a network via a Connect Gateway Module, a unique MAC ID needs to be assigned. The MAC ID is factory set to 63, and can be set to a value between 1 and 10.

Assigning a MAC ID

There are two possible ways to assign a unique MAC ID to a controller on a network: (1) Using the selected device; (2) Using the Connect Gateway Module.

1) Using the Selected Device
- Select the appropriate device from the Navigation Menu and select the Communication category.
- Select “UPDATE MAC ID” and enter a value between 1 — 10. This value must be unique to the controller.
- Select “OK”, after a brief moment the controller will display the new MAC ID.

2) Using a Connect Gateway Module
- Select the Connect Gateway Module and navigate to the appropriate device. They will be listed as Device 1 — 10.
- Select “UPDATE MAC ID” and enter a value between 1 — 10. This value must be unique to the controller.
- Select “OK”, after a brief moment the controller will display the new MAC ID.

Assigning a Tag

Similar to the assignment of a unique MAC ID, there are two possible ways to assign a unique tag: (1) Using the selected device; (2) Using the Connect Gateway Module.

1) Using the Selected Device
- Select the appropriate device from the Navigation Menu and select the Communication category.
- In the Tag text box, enter a value that will help identify the controller.
- Click anywhere outside of the parameter field or hit “Enter” on the keyboard to populate the Tag.

2) Using a Connect Gateway Module
- Select the Connect Module and navigate to the appropriate device. They will be listed as Device 1 — 10.
- In the Tag text box, enter a value that will help identify the controller.
- Click anywhere outside of the parameter field or hit “Enter” on the keyboard to populate the Tag.

Connect Gateway Module Setup

First, ensure that all controllers are networked and connected to the Connect Gateway Module.

Set the IP Address

Select the Connect Gateway Module from the Navigation Menu and open the Communication category. Then, check if the IP Address needs to modified. If it does, highlight the default IP Address and enter in the new values. Click anywhere outside the text box, or hit “Enter” on the keyboard to finalize the new value.

Note: Only one section of the IP Address can be modified at time. Repeat the process until the IP Address reflects the correct values.

Set the Unique Tag

Remaining within the Communication category, view the current Tag name. If the tag name is unacceptable, assign a new one by highlighting the text and entering a new value. The Tag can by any 16-character alpha-numeric value. To finalize the new tag click anywhere outside the text box or hit “Enter” on the keyboard.

Check MAC IDs

Check that each connected controller has a unique MAC ID. Select the Connect Gateway Module from the Navigation Menu and select each Device (1 — 10) that is connected. If a MAC ID needs to be changed select the “UPDATE MAC ID” button from the Device display screen. Enter a new MAC ID into the available text box and select “OK”.

1. NAVIGATION MENU

The Navigation Menu displays the current software version, available updates, connected devices and their respective networks (if applicable), Scope, Data Logger, Config File, Modbus TCP options, Settings, About, Support, and Contact forms for Control Concepts, Inc.

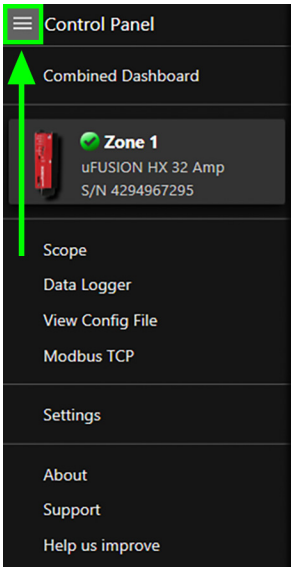


Figure 1.00: Location of Navigation Menu button

1.1 Navigation Button

Clicking will show/hide the Navigation Menu (Figure 1.00).

1.2 Combined Dashboard

This feature changes the Dashboard to simultaneously display the current status of the Connect Gateway Module and all networked devices. This helpful feature allows the user to control the Digital Stop/Run [SP 129] setpoint for any controller on the network. In addition, each networked controller will display its current status/alarm/fault state.

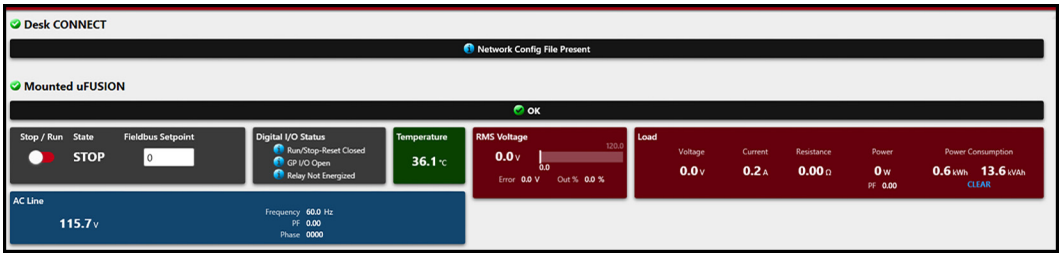


Figure 1.01: This example shows a Connect Module with one networked device. If more devices are in the network, their Tags and dashboards will appear in a cascade format

To exit the combined dashboard view, select any device from the Navigation Menu.

1.3 Devices and Networks

All connected devices and their networks will appear in the Navigation Menu. Any device can be selected by clicking on its respective image. If a device is selected, its unique display will appear. If a Connect Gateway Module is selected, the display allows control of any device on the network. If the user would like to manipulate setpoints or parameters for a particular device, navigate to the appropriate icon and select it. In addition, all connected devices will display their tag name, type of device, and unique serial number.

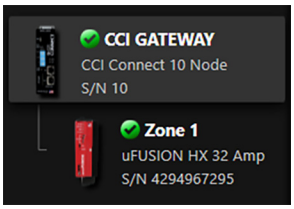


Figure 1.02: A Connect Gateway Module with a networked device

1.4 Scope and Data Trace

Scope records the line voltage, load voltage, and load current waveform for a period of 2 cycles. The Scope feature is only available if a controller is connected directly to Control Panel using a USB connection. If a controller is connected using a Connect Gateway Module, the Scope feature will not work.

A device needs to be selected in the Navigation Menu for the scope settings and graph to appear. If there are multiple devices connected to Control Panel, the information in the scope window will update as a new device is selected. After clicking the “Scope” option, the window as shown in Figure 1.03, will appear. When the screen first opens the user can choose from a list of options:

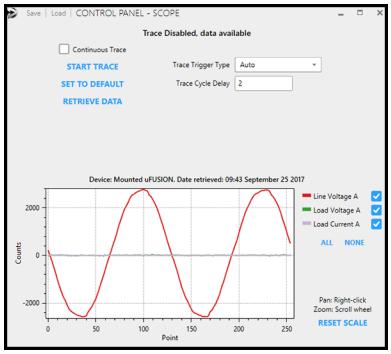


Figure 1.03: Appearance of the Scope display

Continuous Trace

The Trace feature will run in the background and record data until Continuous Trace is clicked a second time. The amount of time between data points is determined by the Trace Cycle Delay value [SP 1853].

Start Trace

By selecting Start Trace, without Continuous Trace selected, only a single data point will be taken. Depending on the Trace Trigger Type selected, the Scope feature will record the data point immediately, or wait until the next valid trigger condition is met.

Set to Default

This will reset the Trace Trigger Type to “Over-Current trip” and Trace Cycle Delay to a value of 2.

Retrieve Data

When Retrieve Data is selected, the controller will stop collecting data, retrieve the data, and then update the Scope graph display. If a data trace was Disabled when Retrieve Data was selected and a valid trigger condition was met, the controller will retrieve the data processed during the previous trigger event.

Trace Trigger Type [SP 1852]

There are 8 trigger types that are available to choose from:

Setting	Description
Auto	Starts on the next AC line, positive half cycle
Run	An active Run state will trigger the trace
Zero Cross	The next Zero Cross fire pulse will activate the trace
Zero Cross Positive	Trigger event equates to the next positive half cycle in a valid Zero Cross fire pulse
Zero Cross Negative	Trigger event equates to the next negative half cycle in a valid Zero Cross fire pulse
Limit	Trigger event is initiated by any limit reached (Voltage/Current/Power)
Shorted SCR	Trigger will trip if a Shorted SCR event occurs
Over-current trip	Trigger will trip if an Over-Current trip event occurs

Trace Cycle Delay [SP 1853]

After the trigger has been tripped, data is collected until the set number of cycles is reached. Then, the trace will cease data acquisition and hold the data for the last two cycles. For example, if Data Trace Cycles = 10, then 10 cycles of data will be collected and the last 2 cycles will be saved for viewing.

Range: 0 - 100 Cycles (0 = Continuous)

Scope Graph

Once a controller's trace data is available ("Trace Disabled, data available" status), Control Panel will automatically retrieve the data and display the Scope graph. Use the check-boxes in the graph legend to show or hide signals on the graph. Using the "ALL" and "NONE" buttons, will enable or disable the Line Voltage, Load Voltage, and Load Current To pan through data, Right-Click and hold on the graph display and scroll left or right to navigate around the data screen. Use the mouse scroll-wheel to zoom. Use the scroll-wheel directly above the X or Y axis to zoom the graph on that axis only. If your mouse supports a clickable scroll-wheel, click and drag with the scroll wheel to select a section of the graph to zoom to. Click the "RESET SCALE" button in the lower right corner of the graph to reset the scaling back to the original screen display.

Save and Load Data Trace

Click the "Save" button at the top left corner of the Control Panel scope window to save the current trace data to a (.csv) file. Input the desired location and file name in the dialog that appears. Import the data trace (.csv) file to a spreadsheet application for further analysis, or load the data back into the Control Panel Scope to view the data graphically. The "Save" button will be disabled if a data trace is not currently displayed in the Control Panel Scope graph. Click the "Load" button at the top left corner of the Control Panel Scope window to view the data in a trace data (.csv) file in the Control Panel Scope graph. Select the desired (.csv) file in the dialog that appears and the Scope graph will appear, displaying the data trace from the file. The S/N of the unit and the date/time of the original data trace are displayed above the Scope graph.

1.5 Data Logger

Use the Data Logger to record signals, statuses, and other device information for the devices connected to Control Panel. To access the Data Logger feature, click the "Data Logger" button in the Control Panel navigation menu. Additionally, both individual and multiple devices can be logged simultaneously.

After clicking the "Data Logger" option, the Control Panel data logger window will appear as shown in Figure 1.04.

- Select the devices you wish to log on the left side of the window under the "Select Devices:" label.

- Adjust the logging interval with the slider under the "Interval (seconds)" label, which has a range of 1 - 60 seconds.

- Click the "START" button to start logging. The software will then prompt the user to choose a file location for the data to be stored.

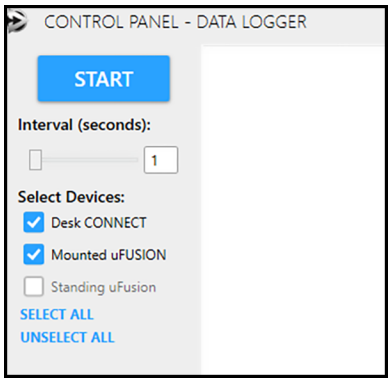


Figure 1.04: Appearance of Data Logger screen

Parameter values for the selected devices will appear in the grid on the right side of the window. To stop logging, click the "STOP" button. The Data Logging CSV file can be imported into a spreadsheet program for further analysis.

1.6 View Configuration File

Click "View Config File" to view a previously saved device configuration file. After clicking the button, select the desired configuration file in the dialog that appears and click "Open." Control Panel is capable of viewing the ".xml" configuration file saved by the legacy Control Panel applications. To load a legacy configuration file, change the file selection from "CCI Device Config" to "Legacy Config File" in the file selection dialog.

A device will appear in the Control Panel window once the file is loaded. A file icon signifies that the device has been created from a configuration file, and the file name appears below the serial number or device description. Click on the device to view its parameters. Multiple configuration files can be viewed in Control Panel by clicking "View Config File" from the Navigation Menu and selecting a file multiple times. When done viewing, click the "X" to the top right of the device icon to remove the device from the Navigation Menu.

1.7 Modbus TCP

Control Panel can connect to any device that has the optional Modbus TCP communications module installed. Before Modbus TCP can be utilized, a valid Modbus TCP controller will need to be connected and configured.

To connect:
- For FUSION and microFUSION apply power to the controller and connect to Control Panel.
- For a Connect Gateway Module, connect a CAT5e Ethernet cable from the CCI Link™ connection port on the Connect Gateway Module, to the CCI Link™ connection port on the controller while power is applied.

The devices are shipped with a default IP address of 255.255.255.255. Connect the device to Control Panel using a USB connection to update the IP address to the desired value.

For a Connect Gateway Module, it is possible to set the IP address by navigating to the Communication category. Enter the correct IP Address using the TCP / IP text box.

After setting the device's IP address, connect the device to the desired local area network using an Ethernet cable and the connector on the devices' Modbus TCP module. To connect the device in Control Panel, click the "Modbus TCP" button on the Navigation Menu.

Figure 1.05: Example view of the Modbus TCP dialog

The window in Figure 1.05 will appear showing the Modbus TCP devices found on the local area network. Select one or more devices from the list and click "Connect." A device will display "(unknown tag)" and "(unknown S/N)" if it has not yet been configured using Modbus TCP and Control Panel. After a device is connected for the first time, the device's tag name and serial number will be displayed alongside the IP address in the connection dialog. Once a device is connected to Control Panel using the Modbus TCP module, the device will appear in the Navigation Menu with an additional line of text which will display the devices IP address.

Note: If the Device is on a different subnet, click the "Add Device" button (shown in Figure 1.05) and manually enter the IP address.

1.8 Settings

There are two settings that can be enabled or disabled using the Settings feature found within the Navigation Menu. The user can either enable or disable the USB Auto-Connect for devices connected via USB, or enable and disable usage data. The Settings feature will also display the Registered Email and Registration Code associated with the Control Panel account. This is helpful, as multiple computers can be registered with the same Control Panel account, using the original Registration Code.

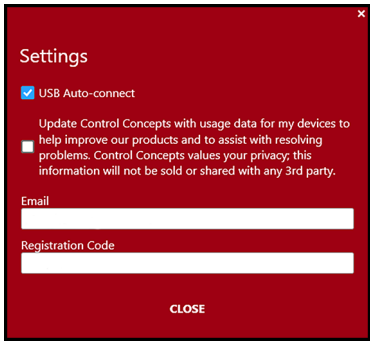


Figure 1.06: Appearance of Settings dialogue

USB Auto-Connect

If the USB Auto-Connect is enabled, Control Panel will attempt to verify and recognize any and all devices which are connected via USB. If this setting is disabled, a "Connect USB" button will appear on the Navigation Menu. Clicking this button will display a list of connected devices. Select an appropriate device to connect it to Control Panel.

Usage Data

While it is entirely up to the users discretion, Control Concepts, Inc. appreciates the release of any usage data associated with our software or devices. The information sent will not be distributed to any 3rd party, and will remain confidential. The usage data will allow Control Concepts, Inc. to improve the Control Panel Software and devices.

1.9 About

When About is selected, Control Panel will display the Application Version and Database Version that is currently being run. When contacting Control Concepts, Inc. with troubleshooting related questions, it is helpful to include the Version information. In addition, the displayed window will also contain a number with which to reach Control Concepts, Inc. and a link to the company website.

1.10 Support

When Support is selected it will display a form that will allow Control Concepts, Inc. support staff to assist in troubleshooting or answering any Control Panel question. Make sure to include the Software/Database Version, Firmware and specific devices connected. Control Panel will use the registered email as default, but should this be insufficient, enter a new email into the prompt.

1.11 Help Us Improve

This form is used as a means for users to suggest changes or new features for Control Panel. Control Concepts, Inc. reviews and weighs all suggestions and critiques.

1.12 Software and Updates

Software Version

The current Control Panel software version will be displayed in the upper left corner of the display area. It will read as, “v. x.x.x.x”, however, if the last digit is a zero, then the version will display as “v. x.x.x” as seen in Figure 1.07. Should any troubleshooting require the user to contact Control Concepts, Inc., the version number will assist the support staff in solving the issue at hand.

Update Available

This will appear only if there is an available update from Control Concepts, Inc. The computer that the Control Panel Software is installed on, needs to have access to the Internet in order to check if an update is available. If the “UPDATE AVAILABLE” text is visible, select the text and a pop-up window will appear that will tell the user the new version number, and display a link for the release notes. The “Release Notes” will contain information about the update.

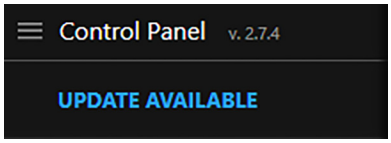


Figure 1.07: Appearance of the software version and the “UPDATE AVAILABLE” prompt

2. DASHBOARD

The Dashboard allows the user to view real time data from a connected controller, search for parameters, and select a process or action from the Actions drop down menu.

2.1 Detailed Dashboard

The Dashboard has two modes: Condensed and Detailed. To switch between these two views, select the box adjacent to the Detailed Dashboard text.

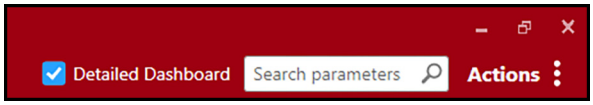


Figure 2.00: Detailed Dashboard feature is Enabled

Single Phase Single Zone Controller

If a singular controller is connected in Detailed Mode, Control Panel will display Run/Stop State, Setpoint information, Digital I/O Status, Temperature of Controller, Selected Feedback Type, Load information, and AC Line information.

The Condensed View will display Run/Stop State and Setpoint information, Temperature of Controller, AC Line information, and Selected Feedback Type.

Three Phase Controller

For a Three Phase device, the Single Zone dashboard displays the Load Voltage, Load Current, and Line Voltage for each phase A, B, and C in the “Load” Section. In a Condensed view, Control Panel displays the same data as a Single Phase Single Zone controller.

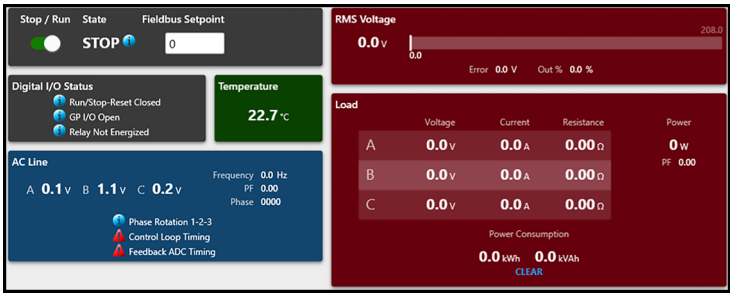


Figure 2.01: Detailed view of a Three Phase Single Zone Dashboard

Multizone Dashboard

The Multizone dashboard displays runtime parameters and statuses for each zone in a table. Any active warning alarms for a zone will appear below the zone row in the table. The temperature and AC line parameters for all of the zones are displayed in separate sections.

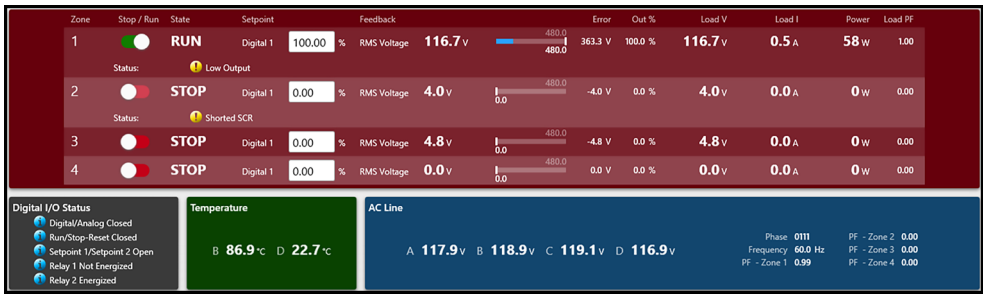


Figure 2.02: Detailed view of a Multizone Dashboard.

2.2 Search Parameters

Use the search box to quickly find a parameter name/number, action name, or group name. Categories with a parameter or action that match the search text will be shown in the category list on the left. If a category does not contain a matching element it will not be shown. If no matching parameters, actions, or groups are found, the display will be empty. Use the “X” button in the search box to clear your search terms and return to the standard view. The search terms also remain active when switching between connected devices, which provides a convenient way to view the values of a parameter across multiple devices.

2.3 Actions Menu

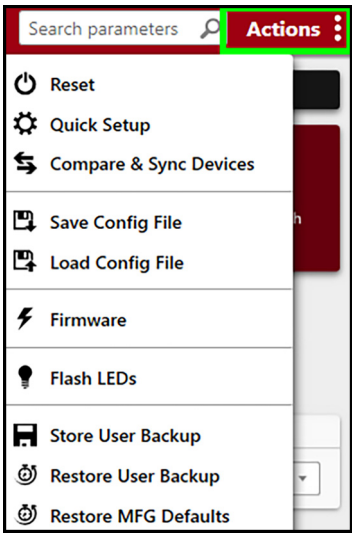


Figure 2.03: Actions drop down menu.

2.3.1 Reset

Single Zone

Reset will power cycle the controller. A prompt will pop-up which will remind the user that resetting the device will interrupt operation. Select “OK” if the correct controller is selected, and Control Panel will immediately close the prompt window and power cycle the controller.

Multizone using a Connect Gateway Module

When using a Connect Gateway Module, Control Panel will only reset the device that is selected from the Navigation Menu.

- Reset a Networked Controller -

To reset a particular controller, select the controller from the device tree on the Navigation Menu and Reset using the Actions menu.

- Reset the Connect Gateway Module -

Navigate to the Connect Gateway Module and select “Reset” from the Actions menu. A prompt will appear reminding that the reset will interrupt operation. Selecting “OK” will reset the Connect Gateway Module but will leave the connected controllers unchanged.

WARNING

Do not use the Reset feature while the controller is in RUN state.

2.3.2 Quick Setup

Open Quick Setup from the Actions menu.

Step 1 - Selecting the Control Feedback Type

There are 7 available types of feedback that can be assigned to a controller, select the appropriate type and click “NEXT”.

Step 2 - Assigning the Full Scale parameter

Assign a valid value type as directed by the prompt. This value should be specific to the intended load and use of the controller.

Step 3 - Set Limit Values

Set the Voltage and Current limits. After Quick Setup is complete, it is possible to adjust the Limit values in the Setpoints category (See Section 3.1.2: Setpoints, or the appropriate User’s Manual for additional information).

Step 4 - Choose a Firing Mode

The user will then be prompted to choose between Phase Angle Firing and Zero Cross Firing. If the user would like to assign Zero Cross Transformer, HiPER, or Fast Zero Cross this can be done from the Control Panel after setup is complete.

Step 5 - Setpoint Selection

Quick Setup will prompt the user to select a setpoint source used to control the output. Select the appropriate source and continue. If an Analog Setpoint is selected, an addition step will appear which will allow the user to select the range and type of input used.

Once the user has completed Steps 1 — 5, Quick Setup will display a summary of the selections made. If the summary is satisfactory, select “FINISH”. If a setting needs to be changed, click “PREVIOUS” until the appropriate window is displayed. Then, change the setting and continue through the Quick Setup.

2.3.3 Compare & Sync Devices

Use Control Panel to compare and synchronize settable parameters between multiple devices (a few parameters such as MAC ID, Tag, and Local Mode Enable are not included). First select the desired device in Control Panel, and then click the "Compare & Sync Devices" button in the device action menu. The selected device's parameters will be used as the source when copying parameters to other devices.

A check box will appear next to the device icon if the device is the same type as the source device. Use the check box to choose which of the devices will be compared. A message will appear if all comparable device parameters are equal. The parameters that differ between one or more devices will appear in the grid. Click on the headings to expand and collapse sections in order to navigate the differing parameters (the "EXPAND ALL" and "COLLAPSE ALL" buttons can also be used.) The values of the source parameter values have a blue background, and parameters that have values that differ from the source value have a red background.

Use the check boxes near the headings and/or parameter names to select the parameters that you wish to copy to the selected devices from the source device. At any time, click "CLOSE" to return to the selected device's dashboard and parameters. Click "SYNC DEVICES" to update the selected parameters in all of the selected devices.

After the updates are complete, the grid will reload to reflect the changes to the device parameters. Devices can also be compared or synchronized to a device configuration file, or multiple configuration files can be compared to each other. When using the device comparison and synchronization tool, the configuration files will become selectable just like a connected device. The "Compare & Sync" button is also available in the dashboard for a selected configuration file, and the configuration file can be used as the source device for copying parameter values to other connected devices.

2.3.4 Save/Load Config Files

Control Panel can save a configuration file for a MicroFUSION or FUSION power controller containing the values for the controller's setup parameters and calibration data. The configuration file is useful for device setup and troubleshooting:

- Save time by loading the configuration file into other devices that share the same configuration
- Send the configuration file to Control Concepts' support team to assist with troubleshooting
- Revert a device to a previous configuration saved in a configuration file
- Compare a device's previous configuration as saved in a configuration file to the current configuration of a connected device

Even with one master configuration file that is loaded to multiple units, it is recommended to save individual configuration files for each controller for future reference as the calibration information may be unique for each controller. The Connect Gateway Module also contains the "Save Config File" and "Load Config File" functions. However, these buttons save and load a Network Configuration File specific to the Connect Gateway Module.

Save Config File

Click the "Save Config File" item in the device action menu to save the configuration file to your PC. The configuration file should be saved after all parameters are set to desired values. After clicking the button, a save file dialog will appear. Select the desired location and click the "Save" button to finish saving the configuration file. The file is saved with the file extension ".ccidevice," and the default file name contains the device frame serial number. You can open the file into a text editor to view the contents and see the devices settings (JSON format).

Load Config File

Click the "Load Config File" in the device action menu to load a previously saved configuration file to a MicroFUSION or FUSION controller. The "Load Config File" menu item will be disabled if the controller is in the RUN state. After clicking the button, select the desired configuration file in the dialog that appears and click "Open." Control Panel is capable of loading the ".xml" configuration file saved by the legacy Control Panel applications. To load a legacy configuration file, change the file selection from "CCI Device Config" to "Legacy Config File" in the file selection dialog.

After selecting a configuration file to load, the dialog shown in Figure 2.03 appears summarizing the differences between the connected device (“Current Value”) and the configuration file (“File Value”). A message dialog will appear instead if the configuration file and the connected device are already in-sync. Navigate the parameter differences by expanding and collapsing the category headings. De-select any parameters that you do not wish to update by clicking the blue check-boxes. Click “Update Device” to proceed with changing parameter values for the connected device to the values displayed in the “File Value” column. Click “Cancel” to exit the screen without updating the device.

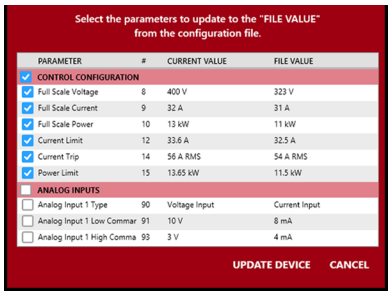


Figure 2.03: Appearance of a successfully loaded config file

Updating the device to the values in the Config File

After clicking “Update Device” in the review dialog, Control Panel will update the connected device. This process may take a few seconds. The dialog shown in Figure 2.04 will appear when the update finishes, if any parameters could not be updated successfully, the dialog shown in Figure 2.05 will appear indicating what parameters could not be updated.

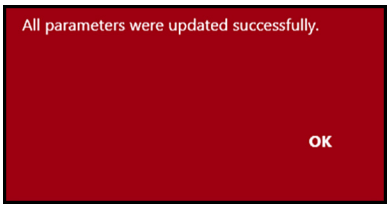


Figure 2.04: Dialog shown if the update was successful

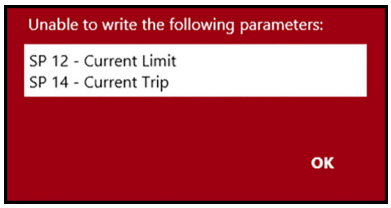


Figure 2.05: Dialog shown if the update was unsuccessful

2.3.5 Firmware

If a user would like to upgrade the controller Firmware, first contact Control Concepts, Inc. If a new Firmware is necessary, a Firmware file will be sent to the registered email address. Save this file in a convenient location. Then:

- Select the appropriate device from the Navigation Menu
- Click on Firmware from the Actions menu
- Navigate to the location of the new Firmware file, and select “Open”
- After a brief moment, Control Panel will begin the update

This may take a few minutes depending on the size of the new Firmware file. It is vital that no interruptions are made to Control Panel or the controller during the Firmware update. If an interruption occurs, there is a extremely high chance that the controller will essentially brick and will be rendered unusable. If this occurs, IMMEDIATELY contact Control Concepts, Inc. and our support staff will assist in finding a solution.

2.3.6 Flash LEDs

This feature is used to visually identify which controller is selected in a network of controllers. By flashing the LEDs, a user can quickly identify which controller is selected within Control Panel and verify that the correct controller is selected. To activate “Flash LEDs”:

- Navigate to the Actions drop down menu
- Select Flash LEDs
- Look to see what controller is flashing its forward facing LEDs

2.3.7 Backups and MFG Defaults

Store and Restore Backups

Select “Store User Backup” from the Actions drop down menu to store all of the user-settable [SP] parameters to a backup location in the device. If any of the [SP] values are incorrect or different in the future, the backup can be used to restore the [SP] parameters to the backup values. Click “Restore User Backup” to restore the [SP] parameters to the backup values, and click “OK” on the confirmation dialog.

Restore MFG Defaults

Click the “Restore MFG Defaults” from the Actions drop down menu to restore the device’s parameters and settings to the original factory settings. Click “OK” on the confirmation dialog to proceed.

3. CATEGORIES OF CONTROL

The Control Panel offers a myriad of control categories for a user to fully manipulate the settings of a controller.

The MicroFUSION and FUSION controllers have access to 10 categories: Control, Setpoint, Analog Inputs/Outputs, Alarms, Communication, Display, Device Profile, Diagnostics, and Heater Bakeout. A Connect Gateway Module has access to 5 categories: Network, Communication, Device Profile, Diagnostics, and Devices.

This manual will only give a brief description of the available categories and the options found within them. For a more robust description, find the appropriate section within the MicroFUSION User's Manual or the Connect Gateway Module User's Manual found on the Control Concepts, Inc. website.

3.1 MicroFUSION and FUSION Categories

3.1.1 Control

The Control Category allows a user to set the Feedback, Firing Mode, Full Scale settings, and Limits of a controller.

Settings	Description
Feedback	Allows a user to change the Feedback Type and Feedback Source.
Firing Mode	Allows a user to change the Firing Mode. The available Firing Mode settings change based on the selected Mode
Full Scale	Allows a user to set the Full Scale settings for a selected controller
Limits	Allows a user to set the Voltage Limit, Current Limit/Type/Source/Trip, Over-Current Trip Retry, OCT Retry Delay Time, and Power Limit

Resistance Sample & Hold Pulsing

This is a feature that is only available in a Phase Angle firing mode and is used to maintain a set resistance value. The user sets the value of the resistance level that will be maintained, and the software will pulse the resistance to this level at a frequency and duration that is also set by the user. The feature will only activate if the resistance exceeds the Setpoint Trigger Threshold [SP 27] value, which is a user set value that determines the amount of allowable drift before the controller will pulse back to the set resistance level.

3.1.2 Setpoint

The Setpoint Category lets a user designate the Run/Stop setting, Setpoint Select, Setpoint Values and General Purpose Input.

Settings	Description
Run/Stop	User will select how the Run/Stop Configuration will behave
Setpoint Select	Allows a user to set what type of Setpoint the controller will use to operate
Setpoint Values	Allows a user to set the values used by a Fieldbus or Keypad Setpoint
General Purpose Input	Allows a user to select the behavior of the General Purpose Input. After selecting a function, use pins 8 and 10 of the P1 Connector to enable or disable the selection

3.1.3 Analog Inputs

The controller's analog inputs can be used to control the setpoint and/or an adjustable current limit. The Analog Input category gives access to the Analog Input(s) and Pulse Width Modulation (PWM) Input.

Settings	Description
Analog Input 1	Allows a user to select the Input Signal Type, Full Scale setting, the Low/High Command value, and output percentage
Analog Input 2	Similar settings to Analog Input 1, but allows a user to determine if Analog Input 2 scales Analog Input 1
PWM Input	A PWM signal may be used as a setpoint. The signal must be connected to Analog Input 1 to function and setpoint source [SP 102] or [SP 103] must also be set to PWM Input

3.1.4 Analog Outputs

The Retransmits (Analog Outputs) are configured similarly to the Analog Inputs. The two Retransmits can be configured independently as either a current source (0 – 20 mA) or as a voltage source (0 – 10 Vdc). The Retransmits may be mapped to Load Voltage, Load Current or Power and can also be set to a direct out signal.

Settings	Description
Analog Output 1 / 2	Allows a user to select the Meter Output Type, Meter Signal Selection, Meter Out value and the Low/High Command value and output percentage
Load Resistance Maximum	Used to scale the Analog Output signal when using Load Resistance as a meter signal

3.1.5 Alarms

Control Panel enables robust control of warning and inhibit alarms. In the Alarms category, the user can control what alarms will be displayed if a fault event occurs, and set various alarm thresholds.

Settings	Description
Options	Enable/Disable Hero mode, I/O Power Inhibit, Shorted SCR Check, Out% Alarm Display Text, Missed SCR Firing Detection, Relay Normal State, and Low Output Alarm
Thresholds	Users can set the Deviation Band percentage, and the Output High/Low Alarm Threshold
Relay 1*	Allows a user to set the Alarm Mask behavior. Highlight a check-box to enable or disable an alarm
Partial Load Fault Detection	A feature that monitors the system for a change in resistance. The feature allows a user to set the Tolerance percentage, Mode, Target Resistance and Alarm Delay Time

*** = MicroFUSION Only; A FUSION controller has (2x) Relays to connect to.**

I/O Power Inhibit Enable*

When [SP 111] is set to Enable (1) and the I / O Power Supply fails, an inhibit alarm will be indicated and the controller will transition to FAULT state which will shut down the output. The FAULT state shut down can be disabled by setting this parameter to Disable (0). The inhibit alarm will still be present, however when set to Disable (0), the controller will not be put into FAULT state.

*** = MicroFUSION Only**

3.1.6 Communication

Communication is most often used to flash the LEDs on the front of the controller or to Change/Check the IP address, MAC ID, and controller Tag. This area also displays some information about the controllers connection status.

Settings	Description
Local Mode Enable	Control Panel will lock out the setpoint from being modified through a Connect Gateway Module or a Modbus TCP
Network Timeout	Designates how a controller will behave in the event of a Network Timeout
CCI Link	Lets a user change the controller Tag or MAC ID and flash the controllers LEDs

3.1.7 Display

Display is used to configure a Remote Display used with microFUSION and FUSION controllers. The Remote Display is optional for microFUSION units, and is standard for all FUSION controllers.

Figure 3.00: Appearance of the Custom Screen List

Screen List

- Default Screen List -

The Default Lists will show line/load voltages, load currents and heatsink temperatures. If a controller is equipped with a communications card, the default list will also show specific parameters pertaining to the communications settings.

- Custom Screen List -

The Screen List can be customized to display any combination of parameters (limit 50 screens). Customize the display by selecting one parameter from the left panel and dragging it over to the right panel.

-Parameter Lock and Program-

A Parameter Lock can be setup to prevent anyone from changing parameter values using the Remote Display keypad. The default Parameter Lock is set to 4000, however this value can be changed to any value from 1 - 9999. To change the Parameter Lock value, highlight the existing value and then enter in the desired value. Not all parameters can be locked. The parameters that can be locked have a small image of a lock next to the parameter name and clicking the small image will lock or unlock the parameter. A locked parameter will have a 'locked' lock next to its name and an unlocked parameter will display an 'unlocked' lock (Figure 3.01).

Once the Screen List and/or Parameter Lock has been configured to the desired settings, click "PROGRAM". Then, connect the Remote Display to the controller or update the Screen List using the Remote Display (refer to the CCI Link™ Remote Display User's Manual).

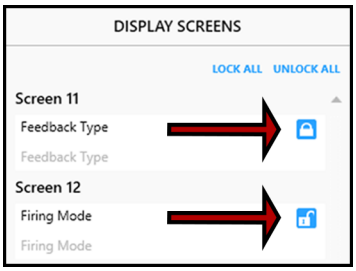


Figure 3.01: Appearance of a locked and unlocked parameter

Options

- Auto Scroll -

Enabled: Screens will be shown for a few seconds, and then cycle to another.
Disabled: Remains on the parameter last used by the user.

- Periodic re-initialization -

When Enabled, this setting will periodically refresh the display.

- Periodic re-initialization time -

This parameter allows the user to set the amount of time between re-initializations.

3.1.8 Device Profile

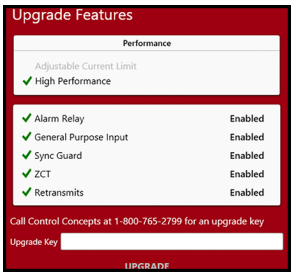


Figure 3.01: Enter the Upgrade Key

All data displayed in Device Profile is read-only. While no data can be manipulated, it is possible to upgrade the controller from this category.

- Model Upgradeable -
If the controller model is field upgradeable, the text next to Model will reflect it as such. To Upgrade, first contact Control Concepts, Inc. about upgrading your model. If the upgrade is possible, Control Concepts, Inc. will send the user an Upgrade Key, which can then be entered into the Upgrade Features Screen. After a brief moment, Control Panel will begin to Upgrade the connected Controller.

- Firmware -
If a user would like to upgrade the controller Firmware, first contact Control Concepts, Inc. If a new Firmware is necessary, a Firmware file will be sent to the registered email address. Save this file in a convenient location. Then:

- Select the appropriate device from the Navigation Menu
- Click on Firmware from the Actions menu
- Navigate to the location of the new Firmware file, and select “Open”
- After a brief moment, Control Panel will begin the update

This may take a few minutes depending on the size of the new Firmware file. It is vital that no interruptions are made to Control Panel or the controller during the Firmware update. If an interruption occurs, there is a extremely high chance that the controller will essentially brick and will be rendered unusable. If this occurs, IMMEDIATELY contact Control Concepts, Inc. and our support staff will assist in finding a solution.

3.1.9 Diagnostics

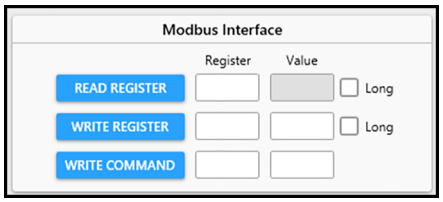


Figure 3.02: Appearance of the Modbus Interface

Modbus Interface

- Read Register -
Enter the number of the parameter you wish to read into the Register box next to the Read Register button. Selecting this button will read the parameter’s value and display it in the Value box.

‘Long’ Parameters

The ‘Long’ check box is for reading parameters that have MSW and LSW. It calculates the 32 bit value from the parameter entered and the following parameter. When entering the register value, use the parameter’s MSW. Do not use the single length parameters.

The following is an example of how the ‘Long’ check box calculates the value using the MSW and LSW.

Load Power HI (MSW [MP 245]) Load Power LO (MSW [MP 246])

Enter 245 in the register value, make sure the ‘Long’ check box is checked. Click the ‘Read Register’ button.

32-bit

HI	LO	=	[	HI 1	X	65536	]	+	LO 1
MP 245	MP 246			MP 245					MP 246

Figure 3.03: Equation for proper HI /LO 32-bit values

Note: The HI 1 variable is multiplied by 65536, because that number represents the number of numerical possibilities of a the 16-Bit HI / LO octet of the valid [MP XXXX (MSW / LSW)] parameters.

- Write Register -
Enter the number of the parameter into the Register box and the value that you wish to write into the Value box next to the Write Register button. Selecting this button will write the value to the parameter. This feature is not often used, as writing to the parameter from the “Control” section in Control Panel is the recommended procedure.

- Write Command -
Writes special commands to the controller. **Do not use unless under direct support from Control Concepts, Inc.**

Trap and Fault History
The controller will save event information for when an alarm, processor error, or other event occurs. By selecting “RETRIEVE”, the controller will pull up information pertaining to either Trap or Fault History, depending on which is selected. The user will then have the option to save the file for later viewing. The data pulled up will show the Time of the event, the event code, and a generic message for what the event pertained to. At the bottom of the pulled up window, “SAVE TO FILE” will appear. This button saves the retrieved data to a user specified location. To save, click the button, and select a location that is convenient and easy to find. If “CLEAR”, is selected, than all stored Trap and Fault History data will be purged from the Control Panel memory.

Diagnostic Test
Do not use unless under direct support from Control Concepts, Inc.

3.1.10 Heater Bakeout

When Heater Bakeout is enabled [SP 24] and the controller is switched into Run state, it will ramp up at a linear rate, phase angle firing, to full-on for the time set by the value entered to the parameter [SP 21]. During Heater Bakeout the control loop will run in open-loop. When the controller’s output reaches full-on, Heater Bakeout will terminate at the end of the set time. Then the controller will transition into normal run state with the selected firing mode and follow the selected setpoint command.

Settings	Description
Heater Bakeout Time	Sets the duration of Heater Bakeout
Voltage Limit	Designates the voltage limit used during Heater Bakeout
Current Trip	Designates the current trip used during Heater Bakeout
Enable with Power-Cycle	Sets the behavior of Heater Bakeout when the controller is power-cycled

3.2 Connect Gateway Module Categories

3.2.1 Network

The Connect Gateway Module can be enable to record device data using the Logging feature.

Settings	Description
Logging	Enable/Disable the logging function and view archived data

3.2.2 Communication

Communication lets a user assign unique identifiers for the Connect Gateway Module.

Settings	Description
TCP / IP	Allows a user to modify the IP Address of the Connect Gateway Module
CCI Link	Allows a user to assign a unique Tag name

3.2.3 Device Profile

This category shows general manufacturing information and enables a user to upgrade the Connect Gateway Module.

Settings	Description
Model	Shows the type of Connect Gateway Module that is connected
Model - Upgradeable	Gives access to upgrading the node count. Contact Control Concepts, Inc. if an upgrade is desired
Manufacturing Information	Gives spec info. When contacting Control Concepts, Inc. include the information from this section
Firmware	Gives access to upgrading the firmware. Contact Control Concepts, Inc. for a Firmware upgrade request

3.2.4 Diagnostics

The Diagnostics Category of a Connect Gateway Module behaves in the same manner as a microFUSION or FUSION controller. See Section 3.1.9 for more details.

3.2.5 Devices

The Device categories change depending on the number of devices that are networked to the Connect Gateway Module. Each Device category allows a user to change unique identifiers, flash LEDS of the controller and set parameters.

Settings	Description
Update MAC ID	Allows a user to assign a unique MAC ID to the selected controller
Flash LEDS	Sends a message to the controller to flash the LEDS on the front of the unit. Helps identify the selected unit
Set Parameters	The settable parameters change based on the Fieldbus Type of the Connect Gateway Module, see the appropriate section in the Connect Gateway Users Manual for more information
Tag	Assigns a unique Tag name to the selected controller

4. COMMON ERRORS

Common issues that can occur when connecting to a device are described in this section. If these tips do not help resolve your issue or your issue is not listed, please call technical support at 1 (800) 765-2799.

4.1 Device Appearance

It is possible that the device does not appear in Control Panel. This is often due to two issues: (1) There is a problem with the USB hardware; (2) Another program may have already established a connection with the device which wont allow Control Panel to find the device.

Troubleshooting suggestions:

- Make sure your USB cables and USB hubs have a secure connection between the device and the PC
- Try closing any programs running in the background that may have USB connectivity
- Make sure only one instance of the Control Panel application is running
- The first time a device is connected to the PC, the PC automatically installs the device driver. For new devices that have not been connected to the PC previously, it is sometimes necessary to disconnect and reconnect the controller after the driver is installed.

4.2 Check Power

“Check Power” appears when Control Panel finds a device using USB, but the device does not respond to any of Control Panel’s requests.

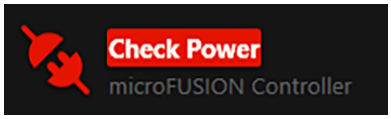


Figure 4.00: Check Power error icon

Troubleshooting suggestions:

- Apply power to the device using the USB port and connect to Control Panel
- Try resetting the device using the “Reset” button on the front of the device
- Try unplugging and re-plugging the USB connection to the device
- Check wiring to the device, verify proper orientation and voltage.

4.3 Connection Issues

Control Panel may encounter a problem during the connection process.

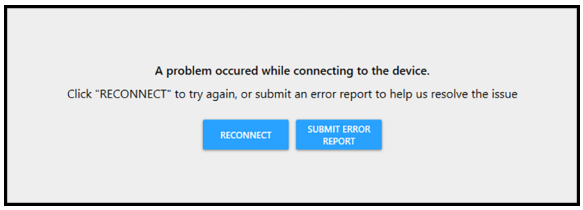


Figure 4.01: Appearance of the connection error dialog

Troubleshooting suggestions:

- Click the “RECONNECT” button to see if the issue disappears
- Update to the latest Control Panel software by downloading the latest version from www.ccipower.com
- Click “SUBMIT ERROR REPORT” to send an error report to Control Concepts

4.4 No Firmware

“No firmware” appears when the device has entered the boot loader and has no firmware to run.

Troubleshooting suggestions:

- Try resetting the device using the “Reset” button on the front of the device
- Update the device firmware by clicking on the “No firmware” message or icon and follow the instructions
- Cycle power to the device

4.5 Update Firmware

“Update Firmware” appears when a device connected to a Connect Gateway Module via the CCI Link™ bus is running an out-of-date firmware version which is not supported by the device.

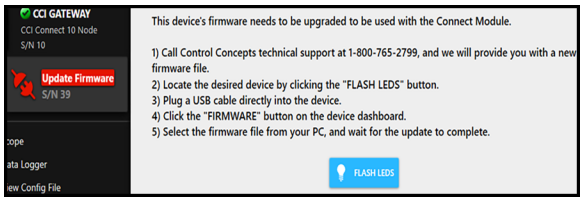


Figure 4.02: Update Firmware dialog

Troubleshooting suggestions:

- Follow the instructions on the screen to update the firmware of your device

4.6 MAC ID

The CCI Link™ bus requires devices have an address (MAC ID) for communication. When a new system is delivered from Control Concepts, Inc. all the power controllers in the system have a default MAC ID of 63. The MAC ID for these controllers all need to be set to a unique value between 1 and 10 to allow Control Panel to connect.

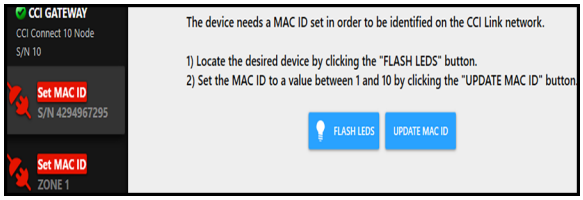


Figure 4.03: Update MAC ID dialog

Troubleshooting suggestions:

- Update the MAC ID by clicking on the “Update MAC ID” message or icon and follow the instructions.