

# 11. TROUBLESHOOTING

## 11.1 Processor and Fault Resets

- Toggle the Run/Reset pin on the P1 controller.
- Disable, then Enable the Digital System command.
- Press the Clear Fault State button on the Control Panel software located in the Diagnostics category.

Note: To use the Clear Fault state buttons the Controller must be in the Fault Reset state.

### Processor Resets\*

- Using the Control Panel software, navigate to the Actions drop down menu and select the Reset feature.
- Cycle the controller power.

#### Processor Reset Key Sequence:

- Press and hold the Up and Down arrow keys for three seconds.
- Press enter when the “\*\*SYSTEM RESET\*\*” message displays.
- If the Arrow keys are released, the controller returns to normal operation.
- When the Enter key is pressed, Line 2 changes to “Release Key.”
- When all keys are released, the Processor resets.

(\*Processor resets also clear faults)

The following table indicates which inhibit alarms require fault resets. Warning alarms never require resets.

| Alarm            | Requires Fault Reset |
|------------------|----------------------|
| AC Line Sync PLL | No                   |
| Current Trip     | Yes                  |
| Line Loss        | No                   |
| Heatsink Temp    | Yes                  |

## 11.2 Warning Alarms

During a warning alarm the STATUS LED will be flashing orange. For all controllers with the remote display, when a warning alarm is present it will be displayed on the LCD.

### 11.2.1 Voltage Limit

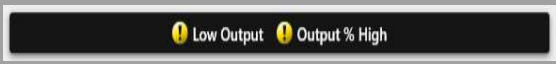
The controller will not be allowed to exceed the voltage limit setting. The voltage limit setting is recommended to be 105% of the Full Scale Voltage setting.



### FIND IN CONTROL PANEL

#### WARNING ALARMS

Active Warning alarms are displayed with a yellow icon in the “Status” section of the device dashboard



## 11.2.2 Current Limit

The controller will not be allowed to exceed the current limit setting. The current limit setting is recommended to be 105% of the Full Scale Current setting.

## 11.2.3 Power Limit

The controller will not be allowed to exceed the power limit setting. The power limit setting is recommended to be 105% of the Full Scale Power setting.

## 11.2.4 Heat Sink Temp

Indicates that the heat sink is within 5°C of the maximum temperature rating for the SCR. Check the fans for proper operation or for any possible obstructions in the air flow.

## 11.2.5 Shorted SCR

The controller is detecting a shorted SCR.

All controllers have shorted SCR detection. This will detect any shorted SCR in any phase, with any load type, and any phase rotation with the following exception.

Only certain SCRs can be detected in a three phase Zero Cross controller with a delta or 3-wire wye load. The phase rotation also affects which phase can be detected.

This feature is user-selectable. A user may disable the Shorted SCR alarm in the case of nuisance warnings.

|            | Phase Rotation 123 |    |     | Phase Rotation 321 |     |     |
|------------|--------------------|----|-----|--------------------|-----|-----|
|            | Zone               |    |     | Zone               |     |     |
| Phase      | A                  | B  | C   | A                  | B   | C   |
| Zero Cross | Yes                | No | Yes | No                 | Yes | Yes |

## 11.2.6 Low Output

The controller is at 100% output and the Set Point Reference (or command signal) is higher than the Feedback. In other words the controller is being asked to provide a higher output than it can provide to the load from the power source.

## 11.2.7 Network Timeout

The controller did not receive any communications via CCI Link™ or the Field bus module, in a timeout period. For a device with a Fieldbus module, the timeout period is configurable using Communications Heartbeat Time [SP 125]. CCI Link™ uses its own timeout mechanism ([SP 125] is not considered).

## 11.2.8 Output% Low / High

The Output % Low alarm occurs when the controller output % is at a value lower than the threshold set using the “Output% Low Alarm Threshold” parameter [SP 3402]. The Output % High alarm occurs when the controller output % is at a value higher than the threshold set using the “Output% High Alarm Threshold” parameter [SP 3403].

When using the “Tap Change” functionality, these alarms change to “Tap Change Up” and “Tap Change Down.”

#### Output% High Alarm Threshold [SP 3402]

Default value: 100%

Sets a threshold in % so that when the controller’s output % is above this value it will indicate a HIGH OUTPUT % Alarm or TAP CHANGE UP Alarm.

#### Output% Low Alarm Threshold [SP 3403]

Default value: 0%

Sets a threshold in % so that when the controller output % is below this value it will indicate a LOW OUTPUT % Alarm or TAP CHANGE DOWN Alarm.



### FIND IN CONTROL PANEL

#### OUTPUT% ALARM THRESHOLDS [SP 3402, 3404]

Category: Alarms > Thresholds

|                             |                                  |   |
|-----------------------------|----------------------------------|---|
| Output High Alarm Threshold | <input type="text" value="100"/> | % |
| Output Low Alarm Threshold  | <input type="text" value="0"/>   | % |

## 11.3 Inhibit Alarms

During an Inhibit Alarm the STATUS LED will be RED. The display will indicate the alarm that is present.

The Inhibit Alarms can be mapped to Relay 1 using the Control Panel software.



### FIND IN CONTROL PANEL

#### INHIBIT ALARMS

Active Inhibit Alarms are displayed with a red icon in the “Status” section of the device dashboard

 Line Phase Loss  PLL Lock Loss

### 11.3.1 AC Line Sync PLL

The controller is not registering any line voltage. The line voltage is not present or too low for the controller to operate.

### 11.3.2 Current Trip

The controller has exceeded the Current Trip setting. This feature will shut the controller down and display an alarm. To get the controller operating once again, a few different methods will remove the current trip alarm. Only one of the following must be done:

1. With hardware: Open, then Close the  $\overline{\text{Run/Reset}}$  jumper on P1 (pins 8 & 9).
2. With software: Uncheck and check the zone digital “Enable” button.

### 11.3.3 Line Loss

An AC line connection has been lost.

### 11.3.4 Heatsink Temp

A heatsink has exceeded the temperature rating for the SCR. Check the display to find which zone has triggered the alarm. Check for obstructions preventing the fans from operating correctly.

### 11.3.5 Network Timeout

The controller did not receive any communications via CCI Link™ or the Fieldbus module, depending on controller hardware, in a timeout period. The Network Timeout inhibit alarm will only be active if the Network Timeout Action [SP

128] is set to “STOP, fault shutdown.” For a device with a Fieldbus module, the timeout period is configurable using Communications Heartbeat Time [SP 125]. CCI Link™ uses its own timeout mechanism ([SP 125] is not considered).

### 11.3.6 Other Non-Typical Alarms

“SRAM ERROR, ROM ERROR, WATCHDOG TIMEOUT, MODULE EEPROM”

These types of errors are uncommon but may occur under specific conditions. Turn off the control power and reapply it. If any of these warnings continue to appear, contact Control Concepts, Inc.

## 11.4 Heatsink Warning/Inhibit Alarm Temperatures

| Controller Frame Amp Rating | Warning (°C) | Inhibit (°C) |
|-----------------------------|--------------|--------------|
| 8, 16, 32                   | 100          | 105          |
| 50                          | 94           | 99           |
| 80                          | 83.5         | 88.5         |
| 100, 130, 160               | 99           | 104          |
| 200, 240                    | 91           | 96           |
| 320, 400                    | 99           | 104          |

## 11.5 Additional Controller Statuses

### 11.5.1 AC Line Status [MP 342]

| AC Line LED Indications for Single Phase Controllers |                             |                                                                           |
|------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------|
| Color                                                | Possible Conditions         | Description                                                               |
| Red                                                  |                             |                                                                           |
|                                                      | ADC Timing / Control Timing | One or both is not true (Bit return: 0), but AC Line Voltage is detected. |
| Green                                                |                             |                                                                           |
|                                                      | ADC Timing / Control Timing | Both are true. (Bit return:1), and AC Line Voltage is detected.           |
| Off                                                  |                             |                                                                           |
|                                                      | No AC Line Voltage          | AC Line Voltage is off or to low to detect.                               |

**Note:** See Phase Rotation [MP 342 bit 5] for Three Phase controllers.

Phase A [MP 342 bit 0] Absent / Present

Indicates if the AC line is present for Phase A

Phase B [MP 342 bit 1] Absent / Present

Indicates if the AC line is present for Phase B

Phase C [MP 342 bit 2] Absent / Present

Indicates if the AC line is present for Phase C

#### Phase Rotation [MP 342 bit 4] TBD / OK

Indicates that the phase rotation has been determined.

#### Phase Rotation [MP 342 bit 5] 1-2-3 / 3-2-1

Indicates the phase rotation. Phase Rotation [MP 342 bit 5] is only applicable for Three Phase controllers. Connect controller to Control Panel to troubleshoot if any color other than Green is displayed for the AC Line Status LED.

#### Control Timing [MP 342 bit 6] Blank / OK

The timing for SCR firing. This must be OK in order for the SCR to turn ON.

#### ADC Timing [MP 342 bit 7] Blank / OK

The timing for feedback data collection synchronization.

## 11.5.2 Main EEPROM Status [MP 336]

|                 |     |    |   |                     | Status Color: (Red) | (Green)     |
|-----------------|-----|----|---|---------------------|---------------------|-------------|
| Bit Definition: | Bit | 15 | = | TBD                 |                     |             |
|                 |     | 14 | = | TBD                 |                     |             |
|                 |     | 13 | = | EE SP Def           | Update Required     | OK          |
|                 |     | 12 | = | EE Write Protected  | Fail                | OK          |
|                 |     | 11 | = | User SP Backup      | Fail                | OK          |
|                 |     | 10 | = | Not Used            |                     |             |
|                 |     | 9  | = | Not Used            |                     |             |
|                 |     | 8  | = | Repair Record Table | Fail                | OK          |
|                 |     | 7  | = | Error Record Table  | Fail                | OK          |
|                 |     | 6  | = | MFG Table           | Fail                | OK          |
|                 |     | 5  | = | Cal Table           | Fail                | OK          |
|                 |     | 4  | = | Cal V Table         | Fail                | OK          |
|                 |     | 3  | = | MFG SP V Table      | Fail                | OK          |
|                 |     | 2  | = | User SP V Table     | Fail                | OK          |
|                 |     | 1  | = | Blank               | Init Required       | Initialized |
|                 | Bit | 0  | = | Read/Write          | Fail                | OK          |

#### Read / Write [MP 336 bit 0] OK/Fail

During power up, checks to see if the EEPROM is functional.

#### Initialized [MP 336 bit 1] Init/Init Required

The EEPROM is blank and needs initialization.

#### User SP V Table [MP 336 bit 2] OK/Fail

Status of the user setup parameter table.

#### MFG SP V Table [MP 336 bit 3] OK/Fail

Status of the manufacturing setup parameter table.

#### Cal V Table [MP 336 bit 4] OK/Fail

Status of the calibration setup parameter table.

#### Cal Table [MP 336 bit 5] OK/Fail

Status of the calibration data table.

MFG Table [MP 336 bit 6] OK/Fail  
Status of manufacturing data table.

Error Record Table [MP 336 bit 7] OK/Fail  
Status of the error record table.

Repair Record Table [MP 336 bit 8] OK/Fail  
Status of the repair record table.

User SP Backup [MP 336 bit 11] OK/Fail  
Status of the backup user setup parameter table.

EE Write Protected [MP 336 bit 12] OK/Fail  
The status of the EEPROM write protection.

EE SP Def [MP 336 bit 13] OK/Update Required  
The status of the setup parameter definition table.

### 11.5.3 Misc Status [MP 335]

Waiting for Enter Key [MP 335 bit 3]  
The controller has halted during initialization. Press the “Enter” button on the Diagnostic 1 tab.

**Note: Only bit that has user significance is Bit 3. All other Bits are used for manufacturing use only.**

## 11.6 Data Trace

The data trace feature in the MicroFUSION power controller records the controller’s line voltages, load voltages, and load current waveforms for a period of 2 cycles. The scope feature in Control Panel allows the user to change data trace settings and view the data trace signals in a graph. Refer to the Control Panel User’s Manual for more information on the controller data trace and scope features.

## 11.7 Trap and Fault History

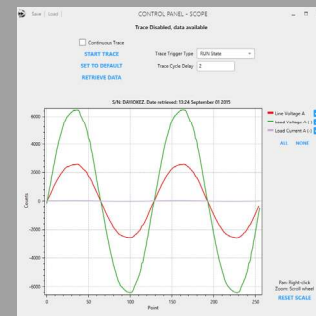
The controller saves event information for when an alarm, processor error, or other event occurs. Use Control Panel, in the “Diagnostics” category, to view and clear this information. Refer to the Control Panel User’s Manual for more information.



### FIND IN CONTROL PANEL

#### DATA TRACE

Category: Side Bar > Scope



### FIND IN CONTROL PANEL

#### TRAP & FAULT HISTORY

Category: Diagnostics > Trap & Fault History

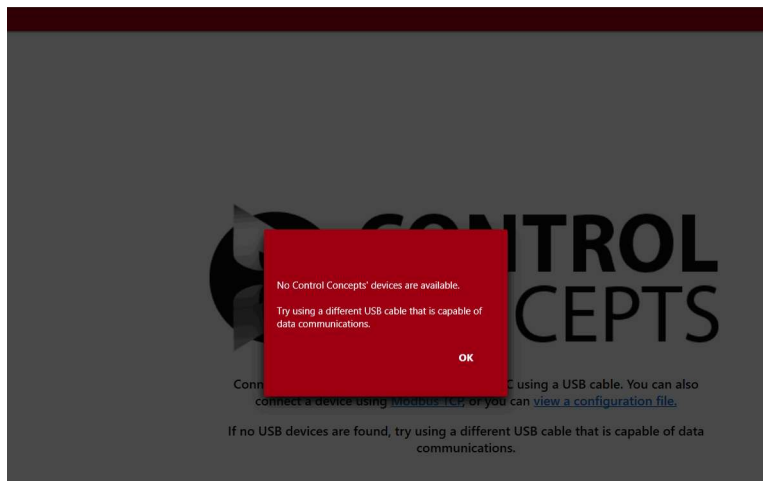
## 11.8 USB Communication Issues

A failure to connect to the MicroFUSION controller with the Control Panel software can occur when using microUSB cables of unknown manufacture.

A USB communication session could not be established.

Ensure the MicroFUSION controller has 24Vdc applied and is on with the indicator lights on the device showing normal operation.  
See Chapter 4, Indicator LED's.

A delay of 30 seconds or more can occur when first connecting a controller to a PC before it will respond to Control Panel connections.



Common issues of no communication with the Control Panel software, identified by the Control Panel reporting ‘No Control Concepts’ devices are available” have often been traced to the quality of the USB cable used.

Many micro USB cables that are being manufactured and sold through common vendors and retail outlets often do not meet minimum specifications for conductivity and data communications.\*

USB hubs, adapters, extension cables, isolators, or repeaters are not recommended and may cause communication issues when connected to a PC communicating with a MicroFUSION device.

While the MicroFUSION controller has been tested and validated to work with cable lengths of 15 feet (3 meters), cable routing and external electrical interference may also cause communication failures.

If a no communication error or no device available message occurs during connection or operation of a MicroFUSION device, it is recommended to try a different brand of USB cable. Recheck connections and ensure the USB port on the PC running the Control Panel software is functioning normally. Disconnect other USB devices connected to the PC and recheck device communication before contacting technical support.

Control Concepts, Inc sells USB cables validated to work with our digital controllers.  
Contact our sales and support line at 1-800-756-2799, or visit our website at [www.ccipower.com](http://www.ccipower.com) for ordering information.

\* USB cables sold for use with cellphones, tablets, and other devices may not support data transfer.