

Troubleshooting and Diagnostics



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Basic Troubleshooting

The following list provides general troubleshooting tips:

- When changing inverter parameters or configuring the SC-OPE, verify the effect of each adjustment as it is made. If too many adjustments are made before checking for proper operation, it may be very difficult to determine the cause of a sudden problem.
- If and when a problem arises, try to determine the most recent change made to the system. It may have been a parameter value change, wiring change, etc. Examine the latest change(s) for errors, or restore the most recent known working system configuration.
- When it is difficult to narrow the problem down to a single component, try substituting a spare part (SC-OPE, cable, etc.) for the most likely problem component.
- Load a known working set of parameters from one inverter to the problem inverter (via the SC-OPE as a copy unit).
- Substitute a simpler method of operation. For example, if network control is not working, try keypad control. If the speed control potentiometer input does not work, verify that the speed control register (F001) method does work. If the simpler method of operation does not work, the more complex method has little chance of working.
- Troubleshooting a new application is different from troubleshooting a system that is already installed and was once working. For new applications, it is important to follow the installation instructions step by step (for the inverter and for the SC-OPE).
- For an existing application that has stopped working, check for simple things likely to interrupt proper operation—such as input power loss, a changed Hand/ Auto mode on the SC-OPE, a loose cable or wiring terminal, a missing input signal from another system, etc.

Basic Symptoms The following table lists basic symptoms and possible causes and solutions. More detailed troubleshooting tips are in the next section.

| Symptom | Possible Causes and Solutions |
|--|--|
| SC-OPE display is blank and its Power LED is OFF | Inverter power is OFF. Check input power, circuit breakers or fuses, or cutoff switches. |
| | Cable from SC-OPE to inverter is loose. Check the connections at each end of the cable. |
| | Inspect the RJ45 modular jacks for damage (one on the inverter, one on the SC-OPE), used by the communications cable. |
| | The cable from SC-OPE to inverter may be defective. Substitute a new cable. |
| | If you suspect the SC-OPE may be defective, replace it with the original inverter keypad or another known working SC-OPE. |
| SC-OPE display output has changed from its normal output for normal operation. | Perhaps another person or event changed the mode or state of the SC-OPE. As a starting point, you can reset the SC-OPE to its powerup state by pressing and holding the MODE key for 6 seconds. |
| SC-OPE was operating under network control (Net Ctrl), but somehow the SC-OPE has changed to keypad control (Key Ctrl) | If the SC-OPE is configured to change from network control to keypad control via the Stop key, a Stop key press event may have caused the exit from network control. Manual intervention will be necessary to return the SC-OPE to network control. See "Selecting Keypad or Network Control" on page 3-4. |
| Error code is displayed | The inverter has probably tripped due to over-current, over-voltage, etc. Refer to the inverter manual for interpreting error codes. Press the STOP key to clear the error from the display. |
| Motor does not move upon a Run command | Speed input may be zero. This may be confirmed by viewing the contents of parameter F001 (via Monitor Mode). If sourced externally, also check input terminals or network command operation, etc. |
| | The Run command may not be reaching the inverter. This may be confirmed by checking the Run LED on the SC-OPE keypad. |

Troubleshooting SC-OPE/Inverter Control Inputs

Keypad versus Network Control

The inverter is always either under SC-OPE keypad or network control. That is, the SC-OPE is configured either to send commands from its keypad, or to pass through control commands from an attached network. Press the Monitor Mode key to view the current setting. See “Selecting Keypad or Network Control” on page 3-4.

When using keypad control:

- The Run command and Frequency Setting sources *must* be set to come from the keypad... Run:OPE/Frq:OPE.

```

0.0V  0.0% 0.00kW
█ 0.0Hz
Run:OPE/Frq:OPE
Norm Stop / Key Ctrl
  
```

Control source = SC-OPE Keypad

When using network control:

- For network control to operate, either or both the Run Source and Frequency Source settings must be “OPE.” A configuration of Run:TRM/Frq:TRM *will not* follow the network commands.

```

0.0A  0.0% 0.00kW
█ 0.00  0.00Hz
Run:OPE/Frq:OPE
Norm Stop / Net Ctrl
  
```

Control source = Network

- You can choose the SC-OPE’s response to the Stop Key—whether there is no action, or whether it will change the SC-OPE control source setting from Network Control to Keypad Control. See “SC-OPE Network Configuration” on page 4-12.



Tip: *If you are having difficulty getting network control to work, try using keypad control to verify that you can get the motor turning. It is easier to troubleshoot more basic problems by using the SC-OPE keypad.*

Run Command and Speed Setting Sources

Getting the inverter and motor to respond depends on several factors, but primarily inverter input power, a working Run command source, and a non-zero speed (output frequency) reference. The inverter can be configured to accept a Run command from one of several sources; the same is true for the speed setting. This flexibility can make troubleshooting difficult, but the SC-OPE’s Monitor Mode can help you determine these respective settings. In Monitor Mode, use the Hand/Auto key to change these settings to match the actual sources your system provides for the inverter. See “Hand/Auto Key Operation” on page 3-31.

```

0.0A  0.0% 0.00kW
█ 0.0  0.00Hz
Run:OPE/Frq:OPE
Norm Stop / Key Ctrl
  
```

Hand/Auto setting

After verifying the Run command source and Speed Setting source are correct, use the following table if the inverter/motor still does not respond.

| Symptom | Related Configurations and Solutions |
|---|---|
| <p>No Run Command Run command does not cause motor to turn or engage (Run LED is OFF)</p> | <p>If the inverter is configured to expect the Run command from the input terminals (Run:TRM):</p> <ul style="list-style-type: none"> • Ensure one of the intelligent inputs is programmed for the appropriate FWD or REV function. Note: The SJ300/L300P inverters have a built-in [FWD] terminal. • Use a digital voltmeter (DVM) to measure the voltage at the [FWD] or [REV] terminal when the Run command is active and inactive. <p>If you are using the SC-OPE keypad as the Run command source (Run:OPE):</p> <ul style="list-style-type: none"> • You can test the keypad keys individually. See “Keypad and LED Diagnostics” on page 5-7. • The [REV] key may be independently disabled via the SC-OPE configuration. See “Limiting the Direction of Rotation” on page 3-6. |
| <p>No Frequency Setting Run command causes Run LED to turn ON, but motor does not turn</p> | <p>If you are using the SC-OPE keypad (Frq:OPE) to edit the output frequency (F001) directly:</p> <ul style="list-style-type: none"> • Use Monitor Mode to verify the value of F001 (on second line of display). If it is zero, use the Change Data key and Arrow keys to change the value. • Check the value of the maximum output frequency. <p>If the output frequency setting comes from the analog input terminals (Frq:TRM):</p> <ul style="list-style-type: none"> • Use a digital voltmeter (DVM) to verify the input voltage and polarity, or current and direction at the terminals. • Check the value of the maximum output frequency. <p>If the output frequency source is set to come from the keypad potentiometer (Frq:VM):</p> <ul style="list-style-type: none"> • Note that the Frq:VM setting requires the use of the original Hitachi keypad (with potentiometer) to set the output frequency for this configuration. For SC-OPE use, do not set the frequency source to FRQ:VM. |

Performing SC-OPE Diagnostics

The Configuration Menu in the SC-OPE features a Diagnostics Mode. You can perform diagnostics to verify proper keypad operation, LED indicator illumination, and network port operation. The network port check assumes a loopback connection exists. In order to pass the network port part of the diagnostics, you must install the loopback connection. However, you can perform diagnostics on the keypad keys without installing a loopback connector—but the network port test will fail.

Network Port Loopback Test



To prepare a loopback connector for the network port (RS422/485):

1 Find the connector plug in the Bezel Kit to install jumper wires for the loopback.

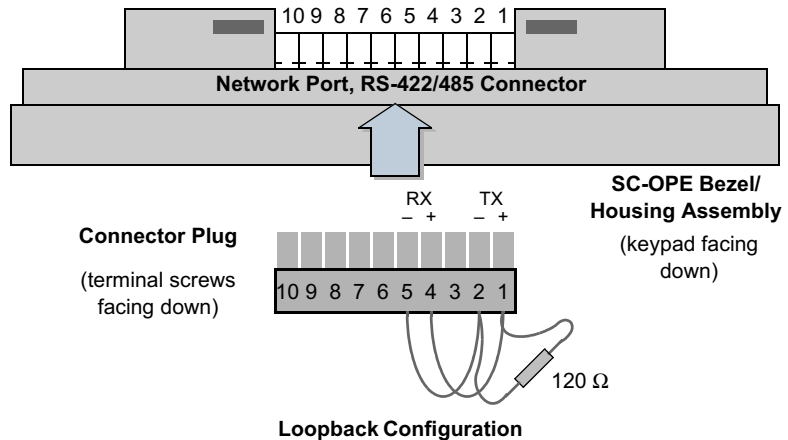
Caution: Use insulated wire (not bare wire) for the loopback jumpers. Otherwise, a short circuit may develop.

2 Connect TX+ (terminal 1) to RX+ (terminal 4)

3 Connect TX- (terminal 2) to RX- (terminal 5)

4 Connect a termination resistor (120 Ω) from TX+ (terminal 1) to TX- (terminal 2)

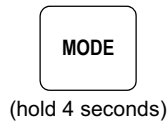
5 Insert the connector plug into the SC-OPE network port connector.



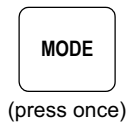
Keypad and LED Diagnostics

To perform SC-OPE keypad and LED diagnostics:

- 1 Access the Configuration Menu, using the Mode key as shown.

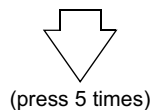


```
Config Transfer Mode
Waiting for PC...
Press MODE key for
Configuration menu.
```



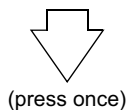
```
Configuration Menu
Inverter Port Cfg
>>
```

- 2 Scroll down the Configuration Menu list with the Down Arrow key as shown until you reach the Diagnostics Mode menu item.



```
Configuration Menu
Diagnostics Mode
[Enter]Req. Loopback
```

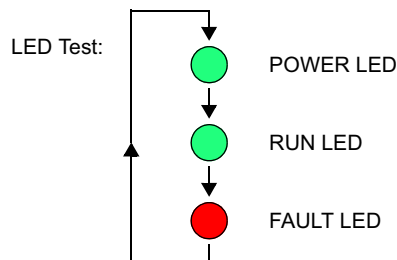
- 3 Press [Enter] to enter the Diagnostics Mode. The network serial port test occurs immediately and the result is given on the display's bottom line.



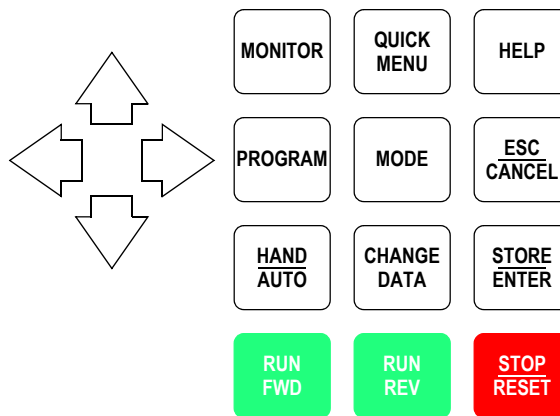
```
DIAGNOSTICS MODE
PRESS ANY KEY

Port Diag PASSED
```

- 4 Observe that the three LEDs are flashing ON repeatedly in the sequence:



5 The keypad test is operator-driven. When you press any key shown below, the display prints the name of that key for verification.



For example, press the Program key to display its name on the third display line.



6 Returning to normal SC-OPE operation requires you to reset the SC-OPE. Press and hold the Mode key for 6 seconds; release it when the Startup Screen displays.

