

General Troubleshooting



The PL-1746 controller, PS-4108 rack, and PS-6400 keypads cannot be repaired in the field. If a unit fails, do not disassemble it. Contact Customer Service

| Problem | Possible Solution |
|--|---|
| Controller & keypad dead | <ol style="list-style-type: none">1. Check main fuse.2. Check power supply to controller. |
| Keypad dead, but controller LED's are ON | <ol style="list-style-type: none">1. Check wiring between keypad and controller. |
| Keypad Fault LED ON | <ol style="list-style-type: none">1. Keypad microprocessor has malfunctioned. Turn the controller off and back on. If the keypad Fault LED does not go off, contact Customer Service. |
| Menu operation slow on keypad display | <ol style="list-style-type: none">1. Check KEYBOARD QTY programming. If it is set for two keypads, but only one is connected, menu operation will be very slow. |
| Power up is slow | <ol style="list-style-type: none">1. When more than one keypad/display is attached to one controller, some power supplies will take longer to come up (i.e., Condor HB24-1.2-A+). |
| COMM FAILURE—HOST TO KEYBOARD message | <ol style="list-style-type: none">1. This message may flash briefly on power-up under normal conditions.2. If the message persists, check keypad wiring connections at keypad and controller.3. Check DIP switch settings.4. While performing processor-intensive programming tasks such as recalculating many setpoints due to a change in SCALE FACTOR, or creating many setpoints through PULSE COPY, the controller may temporarily cease communication with the keypad. Once the calculations are complete, contact will be re-established. Press ESC to clear any remnants of the error message. |
| Programming functions not accessible | <ol style="list-style-type: none">1. Programming is not enabled. See ENABLE CODES for details. |
| ERROR: RESOLVER NOT CONNECTED message | <ol style="list-style-type: none">1. Resolver or resolver cable may have failed. See Resolver Troubleshooting. |
| ERROR: WD RESET message | <ol style="list-style-type: none">1. This indicates that the watchdog timer has timed out. To clear, turn power to keypad OFF and ON. If this doesn't help, keypad is probably defective. |
| POS (position) moves opposite to machine direction | <ol style="list-style-type: none">1. Check INCREASING DIR for the correct direction of rotation.2. Check resolver wiring. |
| POS (position) does not match machine position | <ol style="list-style-type: none">1. Verify that OFFSET is correct. Once set, the offset value should not change. If it does, check the resolver coupling to be sure it is not loose. Also see Resolver Troubleshooting. |
| Outputs cycling regularly at incorrect machine positions | <ol style="list-style-type: none">1. Check that the correct program number is active.2. Check the setpoints of the output(s) in question. Also check SPEED COMP settings.3. Verify that OFFSET is correct. |
| Erratic Operation | <ol style="list-style-type: none">1. Run the Watchdog Timer test described under MEMORY TESTS in the programming section of this manual.2. See Resolver Troubleshooting. |
| Analog output not working | <ol style="list-style-type: none">1. Check that ANALOG QTY and ANALOG OUTPUT are programmed correctly.2. Check that analog output module is located in the correct module position.3. Check correct wiring of analog output.4. Verify that the load is within specifications for the analog module.5. Try a different analog output module. |

General Troubleshooting (cont'd)

| Problem | Possible Solution |
|---|--|
| Backplane: Unable to write to the 1746 programming functions in the M:O files | The Programming Error Register (I:S.7) or the Hardware Status/Error Register (I:S.5) may have an error bit set. This will prevent writing any data to the M:O files until the error is cleared. Clear the error by toggling bit O:S.0/8 from a 0 to a 1. |

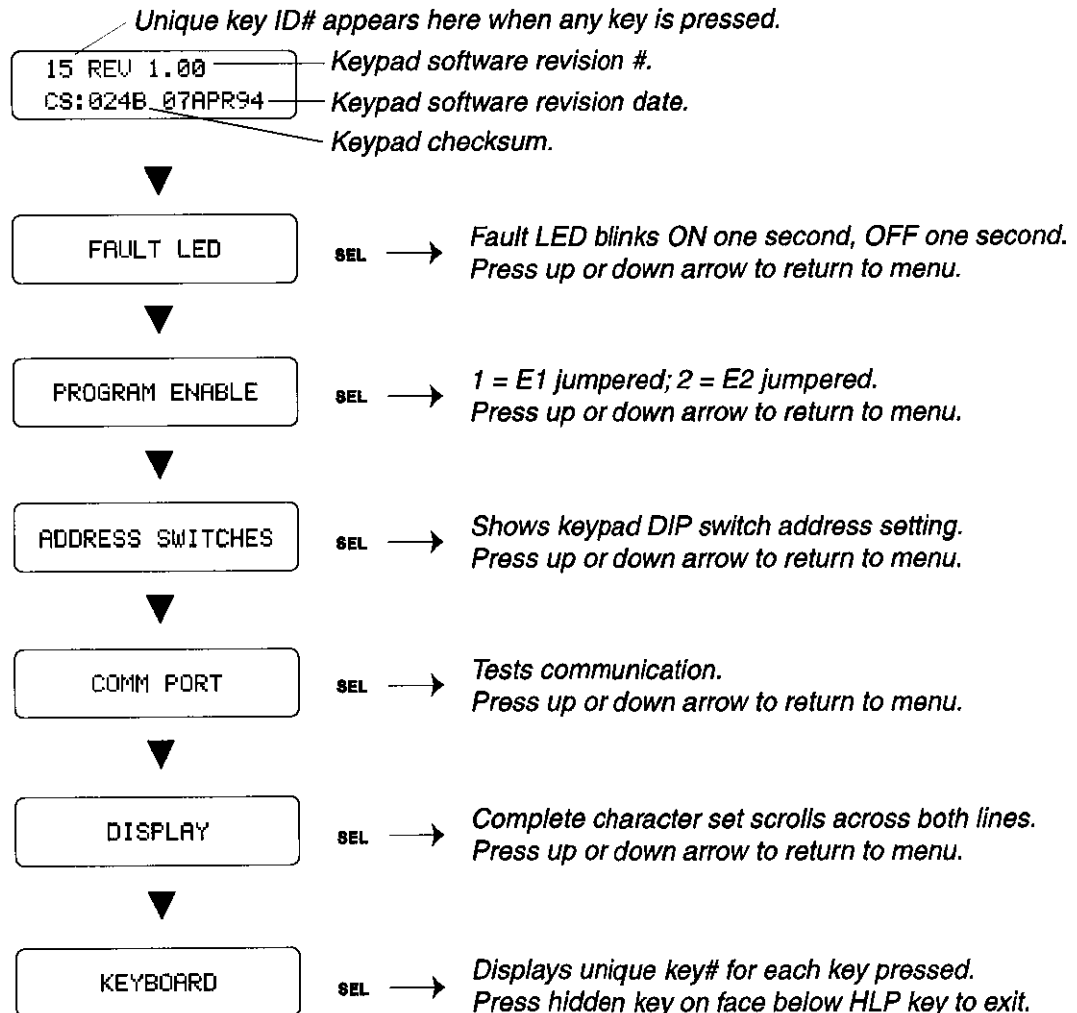
PS-6400 Keypad Troubleshooting



The keypad cannot be repaired in the field. If a unit fails, do not disassemble it. Return it to the factory for replacement.

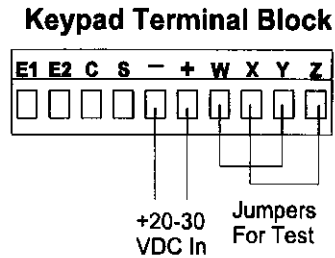
Keypad Fault LED If the Fault LED on the keypad lights, turn the controller off and back on. If the keypad Fault LED does not go off, the keypad microprocessor has malfunctioned. Return the keypad to the factory.

Keypad Diagnostics The keypad includes a series of diagnostics that show the status of various keypad functions. To start the diagnostics, turn the controller off, then restart the controller while pressing any key on the keypad.



PS-6400 Keypad Troubleshooting (cont'd)

Keypad Communications Port Test Setup



When the COMM PORT diagnostic is run with keypad terminals W, X, Y, and Z jumpered as shown, a string of "plus" signs will scroll across the display. When either jumper is removed, the scrolling will stop.

Resolver Troubleshooting

Mechanical Problems

If the resolver is generating erratic RPM or position readings, or the position appears to be shifting periodically with respect to the machine cycle, check the mechanical coupling between the resolver and the machine.

If the coupling is not slipping, loosen the coupling and rotate the resolver shaft in both directions with sudden, jerky motions. If the controller displays unusual position or RPM readings, the resolver may need to be replaced.



Resolvers cannot be repaired in the field. If a unit fails, do not disassemble it. Return it to the factory for replacement.

Electrical Problems

If any wire in one of the three individually shielded pairs becomes disconnected, the following error message will appear on the keypad/display:

ERROR: RESOLVER
NOT CONNECTED!

The output channels will immediately be disabled until the resolver is reconnected. Press ESC to clear the error message.

Note that ESC will clear the message and restore access to keypad programming even if the resolver has not been reconnected.

Follow this procedure to troubleshoot electrical problems:

1. Verify that the electrical connections at each end of the resolver cable are secure.
2. Disconnect the cable at the controller. Measure the resistances between all wires on the terminal block. The paired wires should have the resistances shown in the table below, while the resistance between every other combination of wires should be infinite. If the resistances are correct, the controller may need to be replaced.
3. If the resistances in Step 2 are incorrect, the problem may be in the cable or in the resolver. Disconnect the cable at the resolver and measure the resistances at the resolver pins. If the resistances are correct, the cable is bad. If the resistances are wrong, the resolver should be replaced.

| Wire Pair | Resistance | or | Resistance |
|-------------|---------------|----|-----------------|
| White/Black | 15 to 25 Ohms | | 60 to 85 Ohms |
| Red/Black | 20 to 40 Ohms | | 135 to 185 Ohms |
| Green/Black | 20 to 40 Ohms | | 135 to 185 Ohms |

Note: The resolver resistance will fall into one set of ranges or the other, depending on the date of manufacture.

PS-4108 Rack Troubleshooting

| Problem | Possible Solutions |
|-----------------------------------|--|
| A digital output does not operate | <ol style="list-style-type: none">1. Verify correct wiring from the output to the load.2. Verify that the LED on the solid state relay lights at the correct times.3. Verify that the channel's status, as viewed on the PS-6400 Keypad/Display's I/O status screen, operates correctly.4. Verify that the setpoint programming in the PL-1746 is correct.5. Check for other programming such as timed outputs, group and mode logic, and enable windows (9x channels) in the PL-1746 that can inhibit outputs.6. Verify that the relay's fuse is operational using the on-board fuse tester.7. Replace the solid state relay with a known good relay.8. Check the RUNNING (green) LED (D12). It should be continuously lit.9. Check the COMMUNICATIONS (yellow) LED (D11). It should be continuously lit.10. Verify that the PL-1746 module is operating correctly. If not, see the PL-1746 troubleshooting guide.11. Verify that the cable connections between PL-1746 module and the PS-4108 racks are correct.12. Verify that the rack's addressing switches are set correctly.13. Verify that the rack's termination switches are set correctly.14. Verify that the rack quantity is set correctly in the PL-1746. |
| An analog output does not operate | <ol style="list-style-type: none">1. Verify correct wiring from the output to the load.2. Verify that the analog programming in the PL-1746 is correct.3. Replace the analog module with a known good module.4. Check the RUNNING (green) LED (D12). If it is dark, go to step 6.5. Check the COMMUNICATIONS (yellow) LED (D11). It should be continuously lit.6. Verify that the PL-1746 module is operating correctly. It should be continuously lit.7. Verify that the cable connections between PL-1746 module and the PS-4108 racks are correct.8. Verify that the rack's addressing switches are set correctly.9. Verify that the rack's termination switches are set correctly.10. Verify that the rack quantity is set correctly in the PL-1746. |
| An input does not operate | <ol style="list-style-type: none">1. Verify correct wiring to the input.2. Verify that the input's LED is operating correctly.3. Verify that the input's status, as viewed on the PS-6400 keypad's I/O status screen, operates correctly.4. Verify the group and mode programming and the enable window programming (9x channels) in the PL-1746.5. Check the RUNNING (green) LED (D12). It should be continuously lit.6. Check the COMMUNICATIONS (yellow) LED (D11). It should be continuously lit.7. Verify that the PL-1746 module is operating correctly. If not, see the PL-1746 troubleshooting guide.8. Verify that the cable connections between PL-1746 module and the PS-4108 racks are correct.9. Verify that the rack's addressing switches are set correctly.10. Verify that the rack's termination switches are set correctly.11. Verify that the rack quantity is set correctly in the PL-1746. |

PS-4108 Rack Troubleshooting

| Problem | Possible Solutions |
|--|--|
| An input to an external device that is driven by a digital AC output stays on continuously | <ol style="list-style-type: none">1. Verify that the LED on the solid state relay lights at the correct times.2. Verify that the channel's status, as viewed on the PS-6400 Keypad/Display's I/O status screen, operates correctly.3. Verify that the setpoint programming in the PL-1746 is correct.4. Check for other programming such as timed outputs, group and mode logic, and enable windows (9x channels) in the PL-1746 that can inhibit outputs.5. See if installing a 10k, 5W resistor in parallel with the external device's input corrects the problem.6. Replace the solid state relay with a known good relay.7. Contact the factory. |
| A digital DC output stays on continuously | <ol style="list-style-type: none">1. Verify that the LED on the solid state relay lights at the correct times.2. Verify that the channel's status, as viewed on the PS-6400 keypad's I/O status screen, operates correctly.3. Verify that the setpoint programming in the PL-1746 is correct.4. Check for other programming such as timed outputs, group and mode logic, and enable windows (9x channels) in the PL-1746 that can inhibit outputs.5. Verify correct wiring from the output to the load. Polarity must be observed when wiring DC outputs.6. Replace the solid state relay with a known good relay.7. Contact the factory. |

Error Messages: PL-1746-C01 Module



The module cannot be repaired in the field. If a unit fails, do not disassemble it. Return it to the factory for replacement.

The PL-1746 major errors will fault the SLC 500 CPU. The following are the error codes displayed on the PL-1746 module and their meanings:

PLS Module Display Readout

EX 05 Interrupt from unused vector
EX 06 NMI without PWRFAIL_
EX 07 Resolver not OK
EX 08 Backplane overflow
EX 09 SLC interface pipe is full
EX 0A SLC fatal error
EX 0B SLC access timer time-out
EX 0C Rack interface time-out
EX 0D Power supply failed
EX 0E PS-4108 Rack interface data error
EX 0F PS-4108 Rack interface time-out
and data error

RS Logix 500 Major Errors - Troubleshooting

S75 Call factory.
S76 Call factory.
S77 Check resolver wiring.
S78 Check ladder for too many writes to the M0 or M1 file.
S79 Call factory.
S7A Call factory.
S7B Call factory.
S7C Check I/O rack configuration and DIP switches.
S7D Check to see if 24VDC is present on front of module.
S7E Check I/O rack configuration and DIP switches.
S7F Check I/O rack configuration and DIP switches.

Error Messages: PL-1746-C02/C03 Module



The module cannot be repaired in the field. If a unit fails, do not disassemble it. Return it to the factory for replacement.

The following are the error codes displayed on the PL-1746 module. These errors will appear in the Hardware Status Register I:S.5. To clear the error, toggle bit O:S.0/8 ON and OFF. See Input Status Register in Chapter 3, page 3-3.

PLS Module Display Readout

EX 05 Interrupt from unused vector
EX 06 NMI without PWRFAIL_
EX 07 Resolver not ok
EX 08 Backplane overflow
EX 09 SLC interface pipe is full
EX 0A SLC fatal error
EX 0B SLC access timer time-out
EX 0C SLC queue overflow
EX 0D Power supply failed
EX 0E System Busy
EX 0F Reserved

Troubleshooting

Call factory.
Call factory.
Check resolver wiring.
Check ladder for too many writes to the M0 or M1 file.
Call factory.
Call factory.
Call factory.
Call factory.
Check to see if 24VDC is present on front of module.
See Hardware Status/Error Register in Chapter 3, page 3-3.

Note: The PL-1746-C02/C03 has a green POWER LED, which lights to indicate that the CPU is out of reset, and a yellow FAULT LED which lights if there is a PL-1746-C02 system fault.

Error Messages: PS-6400 Keypad (cont'd)

| Error Message: | Description: |
|--|--|
| Too many speed compensated channels | The maximum number of speed compensated channels have already been programmed. Solution: <i>Press ESC key to clear the error.</i> |
| Too many timed outputs | The maximum number of timed outputs have been used. Solution: <i>Press ESC key to clear the error.</i> |
| A group is in Mode 1 or Mode 2: Can't go to ONE | There are groups that are in modes that affect the offset of the group. Cannot change Group Position Display to ONE offset for all groups. Solution: <i>Press ESC key to clear the error.</i> |
| Can't change # of channels in last group | There was an attempt to change the number of channels in the last group. The last group receives all remaining channels available in the controller. Solution: <i>Press ESC key to clear the error.</i> |
| Mode cannot be 1 or 2 if Group Position Display in ONE | There was an attempt to set a group to mode 1 or 2 when the Group Position Display is set to ONE. Solution: <i>Press ESC key to clear the error. Change the Group Position Display to "EACH".</i> |
| Keypad RS-485 link was broken | Check for Loose Wires. One of the wire connections from the controller to keypad has experienced an intermittent connection or maintained an open connection. Solution: <i>Press ESC key to clear the error. Check to make sure cable connections are securely plugged in. Check wires going into connectors for broken wires or loose connections. Check for continuity between connectors while flexing the cable to check for intermittent connections.</i> |
| Too many setpoints | There was an attempt to program in another setpoint after the maximum number of setpoints were already in the controller. Solution: <i>Press ESC key to clear the error.</i> |
| Value out of limit | A number was entered that exceeds allowable limits for the item being programmed. Some examples are: A setpoint value that exceeds the scale factor, a channel number that exceeds the number of channels available, a program number higher than is allowed by the controller, etc. Solution: <i>Press ESC key to clear the error and re-enter a value that is within the limits of the parameter.</i> |
| Pulse will overlap another pulse in the same channel | There was an attempt to program a pulse that has either an ON or OFF point overlapping an existing pulse in the channel. Solution: <i>Press ESC key to clear the error. Review the existing setpoints to determine the cause of the overlap condition and re-enter values.</i> |
| I/O power fail (PL-1746-C01 only) | This indicates that the power supply for the isolated circuitry and rack has failed. Solution: <i>Press ESC key to clear the error. Check power source and connections to I/O rack power input.</i> |
| EEPROM reset to factory defaults | The configuration data in the PLS has been reset to factory default values. This happens when the user executes a memory test function 7000 or 7001. |