

Reflow Blower Serial Troubleshooting Guide

- Machine Alarm : - Blower Serial Communication.
- Objective :- To verify the cause of either Cable harness, Blower Card or Blower the issue.
- Troubleshooting Tools : - Multimeter, Screw Driver (4 In 1), Precision Screwdriver and Allen Key.
- Estimated Time Require : - Depends on the troubleshooting. Estimated 8 hrs.
- Safety : - Follow the same safety rules as in the reflow oven manual.

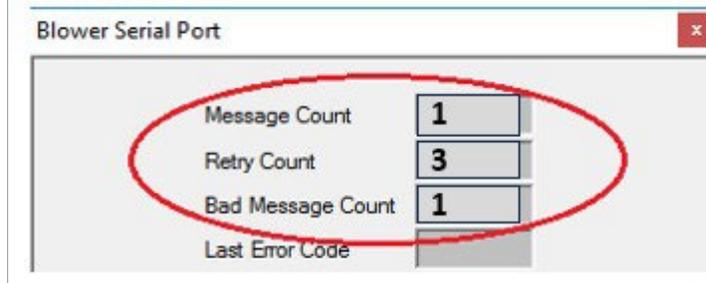
Here are the testing procedures we would like to have performed:

1. Power Down Machine
 - Exit the machine application software.
 - Exit Windows
 - Power down the machine at the machine's disconnect.
2. Test each blower for any binding or drag.
 - Spin each blower by hand, all , verify that each blower spins freely. Listen for any drag or rubbing noise.
 - If any seem harder to spin, have any drag or have any wires or other items rubbing against the blower, replace the blower!
 - Check all top and bottom blowers and each cooling blower.
3. Inspect each blower cable from the blower board to the blower. Make sure to inspect both the blower power and feedback cables for each blower. **This is a very important step!**
 - Inspect for nicks, frays, breaks or any place the insulation may have been cut/rubbing especially against the motor's rotor, metal shroud or protective cage. We have seen in the past where a wire from the hall effect sensor that provides feedback to the blower card was rubbing against the blower or the metal cage causing a short to ground. If one of these wires shorts to ground it can take out the 5 volts and 3.3 Volts on the board.
 - Unplug each blower plug (motor & feedback)
 - Inspect each connector (motor side & harness side) for any signs of heat or discoloration.
 - Make sure each pin in each connector is securely seated in the plug housing and is not being pushed back when the mating connector is connected.
 - Tug each wire slightly to check for loose crimp connections.
 - Replace any suspect plug/crimp
 - At the blower board, remove each wire from the blower board plug and re-seat, make sure the spring clamp in the plug is on the wire and not the insulation. There are five connectors (three for the feedback and two for the blower power).
 - Verify that all cables are neatly zip tied away from the blower and there is no chance of rubbing or interference with the blower.
 - Verify that all motor capacitors are properly mounted and the mounting nut is tight.

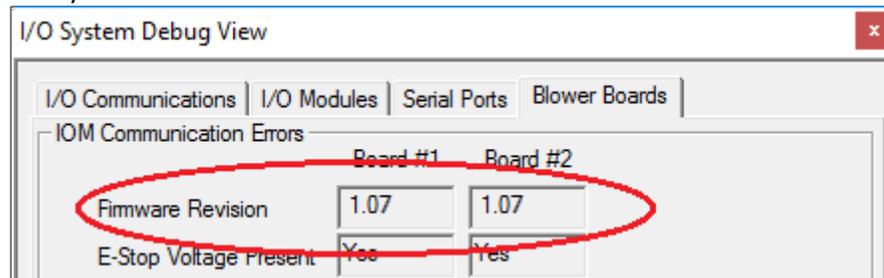
4. Test Blower Board #1 Blowers.

- Install the known good blower board in Blower Board #1 position (Top Blowers and Cooling Blower #1).
- **If there is a ground wire attached to the blower board, top right near the heat sink, cut this wire off as close to the circuit board as possible.**
- Set DIP Switches per the schematic
- Reconnect all connectors.
- Power on the machine.
- Verify the blower board's Signal Fault LED flashes on then off when the board is powered up.
 - If you missed the LED flash, you can turn off the 24 VDC power at CB-54, wait 30 seconds and turn CB-54 back on.
 - If the board's Signal Fault LED does not flash
 - ✓ Turn off CB-54.
 - ✓ Unplug the power connector (P1) from the blower board
 - ✓ Turn on CB-54.
 - ✓ Verify 24 VDC on wires 180 & 199 at the blower board plug. These are the outer two wires.
 - ✓ Turn off CB-54.
 - ✓ Plug the power connector (P1) into the blower board.
 - ✓ Turn on CB-54.
 - ✓ If the board's Signal Fault LED still does not flash, the board is probably defective, replace the board.

- Verify the 5 VDC on the blower board is steady. This can be verified by measuring between the Red and Black Feedback wires on the top left of the blower board. It should read around 5.0 VDC steady with power on the boards. Use a Min/Max meter if available to capture the minimum value.
 - Move each wire blower bundle one at a time while monitoring the 5 VDC on the board.
- Verify communications with the blower board.
 - If CB-54 was **not** on when the machine application software was started, shut down the application software and restart it!
 - In the machine application software, open the blower serial port window, **Modules->Blower Serial Port**.
 - The Blower Serial Port window should show:
 - ✓ Message Count: 1
 - ✓ Retry Count: 3
 - ✓ Bad Message Count: 1



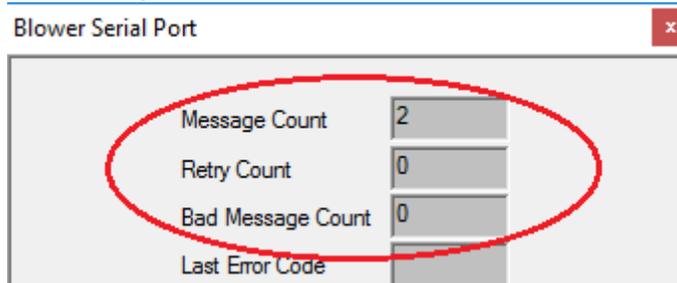
- Verify the blower board's firmware revision.
 - Open **View->I/O System View->Blower Boards** tab.
 - Verify the firmware revision is **1.07**.



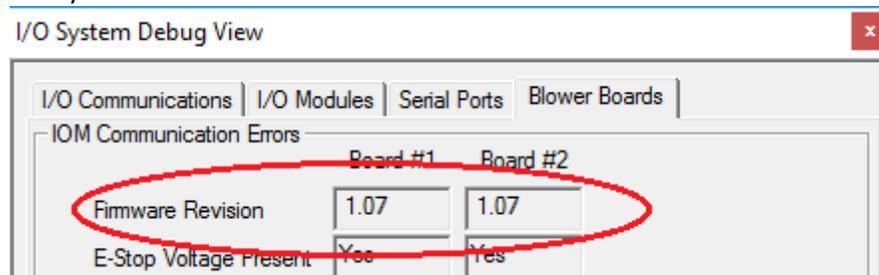
- If the firmware is not 1.07, use the Firmware Loading software to upload the correct firmware to the board.
- Run each blower one at a time and let run for several minutes while monitoring the 5 VDC on the board.

- Monitor the communications on the Blower Serial Port. The **Message Count** should be increasing, while the **Retry Count & Bad Message Count** should remain unchanged (3 & 1 respectively).
 - Measure 240 VAC on Bottom Right corner connector of board between the Black and White wires.
 - Power down the machine.
5. Test Blower Board #2 Blowers (Lower Blowers and Cooling Blower #2).
- Move the known good blower board to position two.
 - Repeat step 4 above.
6. If the known good board passes both tests above, continue testing with two boards.
- Power off the machine and add a new Board in Blower Board #1 position.
 - Set DIP Switches per the schematic
 - Reconnect all connectors.
 - Power on the machine and verify that both red Signal Fault LED's flash on then off during power up.
 - Verify the 5 VDC on both blower boards is steady. This can be verified by measuring between the Red and Black Feedback wires on the top left of the blower board.
 - Verify that both Blower Boards are detected properly in the OmniMax software.

- Open **Modules->Blower Serial Port**.
- The Blower Serial Port window should show:
 - ✓ Message Count: 2
 - ✓ Retry Count: 0
 - ✓ Bad Message Count: 0



- Verify the both blower board's firmware revision.
 - Open **View->I/O System View->Blower Boards** tab.
 - Verify the firmware revision is **1.07**.



- If the firmware is not 1.07, use the Firmware Loading software to upload the correct firmware to the board.

7. If **neither** blower board is detected:
- Exit the machine application software.
 - Exit Windows.
 - Power down the machine at the machine's disconnect.

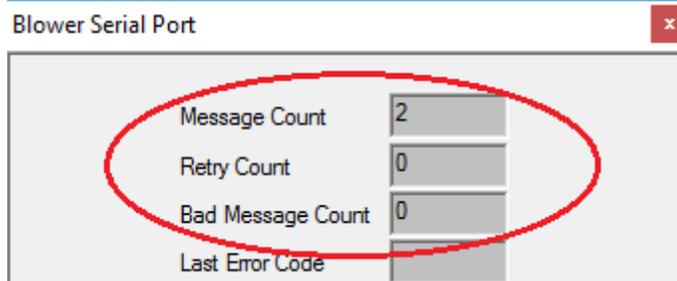
- Verify all connections on the blower boards, especially power and communications.
 - Power (Brown & Purple wires) are plugged into P1 (Top Right connector above heat sink).



- Communication (Black, Red & White wires) are plugged into P2 (To the left of the power plug and above the surface mount micro-controller).



- **Verify that the ground wire from both blower boards have been cut off.**
- Power on the machine and check communications, **Modules->Blower Serial Port.**

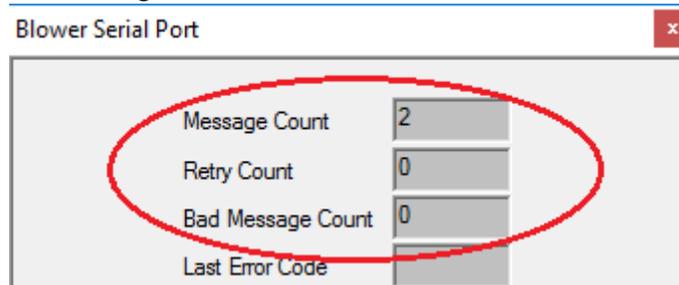


- If neither board is still detected:
 - Power down the machine at the machine's disconnect.
 - Replace the Serial Cable from Main Module to Serial Boards.
 - Power on the machine and check communications, **Modules->Blower Serial Port.**
 - If neither board is still detected:
 - Power down the machine at the machine's disconnect.
 - Replace the Main Module and the Crossover Cable to the computer.
- 8. If only one board is detected:
 - Exit the machine application software.
 - Exit Windows.
 - Power down the machine at the machine's disconnect.
 - Verify all connections on the blower board that was not detected.
 - Power on the machine and verify communications, **Modules->Blower Serial Port.**
 - If the same board is still not detected:

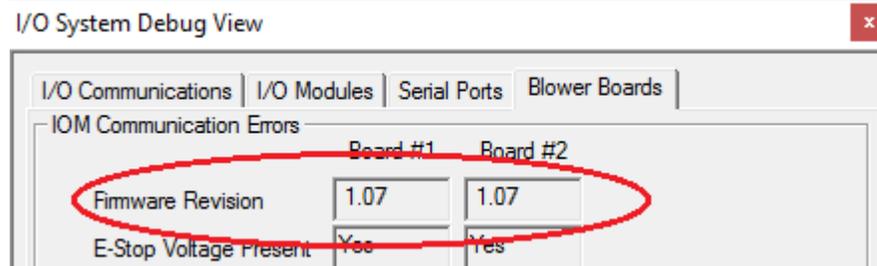
- Exit the machine application software.
- Turn off the CB-54, 24 VDC.
- Wait 30 seconds and turn on the CB-54.
- Verify both board's Signal Fault LED flashes on then off during power up.
- If the Signal Fault LED **does not** flash on the suspected board, it is probably bad, replace the board.

9. If the Signal Fault LED flashes on both blower boards:

- Verify the 5 VDC on each blower board is steady. This can be verified by measuring between the Red and Black Feedback wires on the top left of the blower board.
- Verify communications with the blower board.
 - In the machine application software, open the blower serial port window, **Modules->Blower Serial Port**.
 - The Blower Serial Port window should show:
 - ✓ Message Count: 2
 - ✓ Retry Count: 0
 - ✓ Bad Message Count: 0



- Verify each blower board's firmware revision.
 - Open **View->I/O System View->Blower Boards** tab.
 - Verify the firmware revision is **1.07**.



- If the firmware is not 1.07, use the Firmware Loading software to upload the correct firmware to the board.

- Run each blower one at a time and let run for several minutes while monitoring the 5 VDC on the board.
- Monitor the communications on the Blower Serial Port. The **Message Count** should be increasing, while the **Retry Count & Bad Message Count** should remain unchanged (3 & 1 respectively).
- Measure 240 VAC on Bottom Right corner connector of board between the Black and White wires.
- Power down the machine.

10. If one or both of the blower boards does not work and no other issues were found and corrected, it is most likely either a blower or blower harness.

- Replace the blower harness for the board(s) having the issue. This include the blower power cable and feedback cable for all 8 blowers on the board.
- If replacing the harnesses does not solve the problem, remove each blower and visually inspect for any signs of a defective blower.