

When contacting "helpdesk" please give specific information on where in this guide the system failed.

we have written the:

basic systematic Troubleshooting procedure.

Boot problems

This Section only troubleshoots boot problems - it does not verify the correct function of the machine in the field.

In order to test the computers, it is *necessary* first to verify that the startswitch is working properly; therefore please follow this procedure:

1: How to test startswitch startup :

Turn on machine with a computer in slot 1.

The topmost diode on the startswitch should be blinking slowly (0.5Hz)

After 1-2 minutes it should start blinking faster (2Hz) indicating that computer 1 has established connection to the startswitch.

If OK then startswitch is OK and slot 1 can be used to verify other computers.

IF not, Make sure powered on computer 1 comes on! (if not - reinsert computer, check fuses, check voltage (12-14.8V), reinsert CFA card)

THEN IF that does not help - change the cable to startswitch.

THEN IF that does not help replace the computer number 1 with another one.

IF that helps, the original computer has a fault. If it fails try yet another one

Otherwise - startswitch has a problem. - verify that jumper JP2 is present.

2: How to test if a computer is booting:

IF you think that one or more specific computer(s) does not work/boot:

THEN please insert the computer into slot 1 (nearest startswitch circuit board on the rightmost wall looking into the cabinet) and start up the machine.

The topmost diode on the startswitch should be blinking slowly (0.5Hz)

After 1-2 minutes it should start blinking faster (2Hz)

If it does so, The computer in slot 1 is OK and can communicate on its serial bus (startswitch/display/servo).

(we assume that the connection to the start switch is ok and that startswitch is working - ie. fast blinking with another computer inserted in slot 1)

If the start switch does not start blinking at 2 HZ, pls proceed

IF the blinking does NOT go to the 2 Hz:

Verify that the diode labelled "POWER" on the computer (at the edge, topmost on circuit board with fan) is lit and stable (not blinking).

IF NOT - either voltage is not in range (11.7-14.8V) OR there is loose connection at either 12V or Ground at the backplane, preventing sufficient current for the startup of the computer.

IF diode is lit and you are unsure whether the startswitch is working - then please turn off and put the

computer at slot 3 and startup and verify that Display is staying at the "Robovator...please wait" message. This confirms a faulty computer.

If display however works - then there is a problem with the connection to the startswitch - hence this double check - proceed below "How to test the startswitch"

Note: this test can also be done at slot 3 - if display continues to the "Loading System...100% Done" message, then the computer as such IS working. However if it does not, there can be problems with display and/or Servo and the cables to these units. Therefore testing in slot 1 is somewhat more likely to be trusted. Testing in both slots is the safest!

Few things to do with faulty computer (one thing at a time !!)

0. Verify basic hardware boot by removing ALL computers from the cabinet except the one under test.

When powered up there should be a short beep from the computer board (not the display). If this beep does not come

goto step 5 or replace the computer.

1. take out CFA card and reinsert

2. Replace CFA card with one from another computer that works - if this helps, get a new one from the manufacturer.

3. take off and reinsert jumper JP3 on the middle circuit board (only applies to versions 8 to 11) iokort version 12 does not have this jumper.

3. verify the insertion and orientation (stripe furthest away from backplane) of the wide grey ribbon cable connecting the motherboard with the middle circuit board.

4. Replace the ribbon cable with one from another computer that does work

5. reset cmos by moving jumper JP4 on motherboard (it might need to boot once without USB key before working correctly)

3: Testing slot 3

First verify that you have a working computer by placing it in slot 1 (assuming that startswitch is working).

Now, put a working computer (one which have passed the test No 2) in slot 3 and start up.

Because you have tested it to work with the startswitch - it MUST also work with display and servo. Therefore after 1-2 minutes it will change from "Robovator...Please wait" message, to "Loading System...100% Done" message.

(NOTE: In this situation - the blinking diode on the startswitch should go into its fastest blinking mode (10Hz) if everything else is working)

IF it does NOT do so - then there is a problem with either the display, the cable on the display, the plug on the cabinet, the internal cable from backplane to the cabinet plug OR a short circuit in the cable to the servo.

IF display is stuck at the "Loading System...100% Done" - then there is problems with the USB key or the files therein. Check that the USB cable is connected to the computer number 3 and that the USB stick is seated. If this does not help - then USB key or usb cable is faulty.

The startswitch diode will NOT start blinking at 10Hz.

IF display continues but stops at the "syncing power controller", then go to "Testing if communication from slot 3 to 1 is working"

4: Testing communication from slot 3 to slot 1

1. Verify that you have a working computer in slot 1 (How to test if a computer is booting)
2. Verify that startswitch is working (how to test startswitch)

THEN IF display continues to stop at the "syncing power controller" then there must be problems with the LAN connection and/or the synchronization of the software:

1. Verify/check/replace the LAN cables to/from computer 1+3 and the power to the LAN switch. Try using another socket in the LAN switch. Please note any change in the number of lights on the LAN switch. There should be as many lights as there are computers connected + 1 for power.
2. Check/replace the narrow ribbon cable on first computer 3 - then on computer 1. Orientation is stripe furthest away from backplane on both connectors.
3. use a correctly configured computer with the SW_interface program running before startup to see numbers changing during boot in the "ROBOVATOR Segment STAUS" window. (1) means loading files. (2) means main program loading and running. a Filled/black/green dot means that user has pressed ESC and ENT and computer is at the main menu. a (3) means that main program has failed and ended.

(Note: IF you recently have made changes to the USB key OR updated software and problems arose at first boot after change - then there is problems with missing or faulty files on the usb key. Recreate from backup. Always make backup before manual changes.)

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After succes with these steps - system should boot fully and ask to start PTO. - Please do NOT be Too fast on the buttons at this stage. When asked to press ENT to continue, it is adviseable to wait at least one second before pressing ENT to get to the main menu.

Go into "Other"->Cams online to verify that all 1-8 cams show an "A". (this only applies to machines with up to 8 rows). Those with 0 has either not booted or cannot communicate via LAN. Please put them one after another in slot 1 to verify them. computer 1 is the rightmost "A".

If this is ok - do tests in the field. If one computer fails - move it to another position and test again to verify if problem is related to computer or backplane.

Tools not moving can be either electric failure on computer, backplane, hydraulic, cables or camera. Using sw_inspector software will help eliminating the camera.

Moving computer with error following, identifies computer as problem.

(Remember to start at the top of this manual at each boot)

Servocontroller troubleshooting

UNPRECISE STEERING IS DUE TO CAMERA PROBLEMS

1. does the display give a message like "no servo connect) at startup? If yes, check all cables to servocontroller. If this does not solve the problem, replace servocontroller
2. Does display give a message like "pls lift machine" if yes, check that the sensor sensing the that the machine is lifted functions properly, check that the signal is present at the startswitch. (see that the diode comes on and off when the machine is lifted and lowered)
3. Does the display give a message like "error at initialisation? When the machine is initialised? If yes, check the the ball bearings allows free movement of the frame.
4. Read the system pressure on the display, is it between 60 and 100 bar? If not, check the cables to the hydraulic valve controlling the pressure. (bottom of machine close to electric battery) If no pressure, hydraulic valve maybe defect)
5. If still problem with servocontroller, remove the connectors (mark the positions) and connect a wire from battery to the valves (right valve at bottom of tank looking into the machine). If you connect the outer spool to the battery, the frame should move in the one direction , when you connect the other spool to the battery, the frame should move in the other direction. If the frame does not move, and the pressure is ok, the frame is stuck or the valve is clogged.

One or more rows do not work:

If **one** row starts to make mistakes, the reason can be that the data from the camera is missing.

First check that the computer is “online” and that there is no lamp error.

Check that the tools can operate: In the menu “toolmode” choose “calibrate”

Go to the main menu and activate the machine: The tools should close. Deactivate the machine: The tools should open. If the tools fails to operate, check the glass uses on the startswitch.

Check the cables to the valve, check the valve.

If valves are ok, check the image of the camera. Use a smartphone or a tablet to access the machine via WI-FI or via cable if the machine has no WI-FI.

If the image is OK look for the blue tool marks in the image. If the blue marks are missing, change the settings to smaller plant size.

If the image is not ok, look for loose connections of the 3 cables between the camera and the backplane of the computer. Take out the cables and inspect the connectors for dirt and insert the connectors again. Do this also on the camera end of the cables. Be careful not to put the cables in the wrong sockets. If problem persists switch the computers to see if problem stays on this row.

If **more than one row** does not work properly the reason can be that the speed signal is missing.

Check that the wheel is allowed to run on the ground at all times and not lifted into the air.

Check the cables from the wheel to the machine.

Remove the speed connectors from the backplane one at a time and put them back into their sockets.

Remove and replace the 2 black jumpers on the backplane with the jumpers installed.

To check if there is a problem with the speed signal do this:

In the display go to "trip menu" read the display. Mark the position of the wheel. Turn the wheel 10 revolutions forward. Turn the wheel 10 turns backward to the same position. Read the display. The reading should be very close to the first reading.

If the error is more than 3% there is a problem with the wheel, cables or other hardware.

Note: The speed signal was reversed from PWR version 003C to 003D.

Cams lost but the machine is still working:

The LAN switch is defect or the LAN cables/connectors have problems. Check/replace the narrow grey cable from mainboard to IO-board

Display says “wait” and nothing happens:

There is no communication between computer 3 and display or computer 3 is defect. Check the display cable. Switch the computer 3 with another computer. (beware of the USB cable) If this

results in communication with the display check or replace the wide grey cable from mainboard to IO-board. If problem persists try another display.

Display says “internal communication...” and nothing happens:

Work through section 1 to 4.

Display says “oil leak” but there is no visible oil leak

This error is generated when the oil pressure does not rise as it should when the pressure valve closes. There could be an oil leak in the system and for safety reasons the software disables the pressure.

The reason could also be an internal oil leak or a defective accumulator.

To find out:

Start the machine and start the PTO.

Go to “oil pressure” in the menu of the grey display box.

Stop the PTO.

Watch how the pressure is dropping. It should drop slowly, max 10 bar pr minute.

If it drops faster, there is an internal oil leak, check the valves at the actuators for defective O-rings.

Watch the pressure dropping and note the pressure at which it suddenly starts to drop fast.

This pressure is the pre-load pressure of the accumulator. It should be 50 bars. If it is lower, the accumulator must be topped up with nitrogen.

If the pressure does not drop the above described way with a clear point from which it drops fast, but drops fast all the way, the accumulator is defective and must be replaced.

If the accumulator is defective you can still use the machine if you override this error.

To do this:

Set `PRESSURESAFETY_OVERRIDE = 1` in the sw.ini file.

You can use the gray display box if you do it before starting the PTO

Or you can do it with the WI-FI

You can also rise the speed of the PTO a little to see if the error is related to too little oil flow from the pump.

If you use the machine with a defective accumulator for extended periods of time, (the pressure valve switches on and off very frequently) there will be extra wear on the pump.