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SCAN▸X®

Diagnostic Troubleshooting Software

Part Number: B7812

User Guide

Introduction

This document provides user instructions for the Diagnostic Troubleshooting Software entitled **ScanX Diagnostics** supplied on the utility disk with all ScanX units. This application is used to troubleshoot the ScanX and enables the manipulation of individual system elements, as well as the monitoring of system settings. These capabilities, provided via the program user interface, allow the isolation of various system faults to identify a defective component. This document also includes several tests to help diagnose any problems and/or to ensure proper scanner functionality.

Connect the ScanX Device and Open the ScanX Diagnostics Program

Connect the ScanX device to the computer and turn it on prior to starting the software program. Open the **ScanX Diagnostics** using the **Start** button as follows.

1. Go to the **Start** button and select ***Programs***.
2. Select the ***Air Techniques*** folder then ***ScanX*** folder and click on the ***ScanX Diagnostics*** item.

Verify the USB Connection in the ScanX Diagnostics – Status Window

The ScanX Diagnostics program initially displays the status window, **ScanX Diagnostics – Status** (See Figure 1), which verifies the attached ScanX device connection and provides pertinent information relevant to the connected device. If the program does not successfully locate the connected scanner (See Figure 2), follow the **USB Interface Verification** procedure to troubleshoot any USB connection issues.

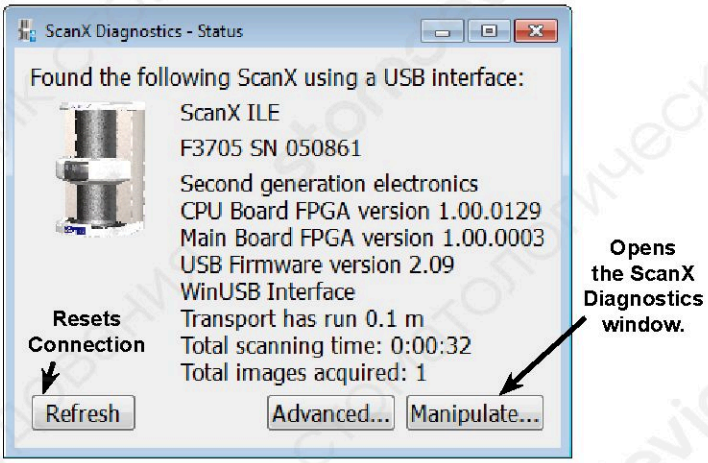


Figure 1. ScanX Status Window with USB Connection

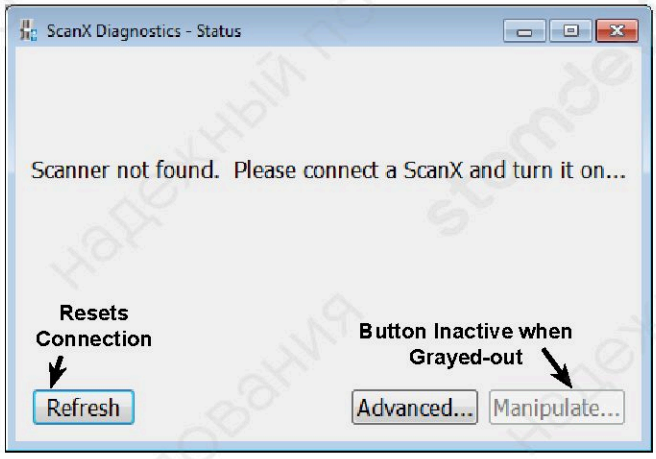


Figure 2. ScanX Status Window with no USB Connection

USB Interface Verification - When there are USB communication problems with the ScanX, solve them as follows.

1. Check Electrical Connections from wall outlet to power supply to ScanX.
2. Check that the ScanX power is turned ON.
3. Unplug the USB cable and plug it back in before proceeding.
4. Check that the device drivers were loaded. Some operating systems, such as Vista, require that the computer reboots in order to recognize the new software/drivers.
5. Make sure that the ScanX is **not** connected to a network server. The ScanX should be installed **only** on a dedicated acquisition computer using one of the approved operating systems. Air Techniques does not support the connection of ScanX to network servers.
6. If the ScanX and computer communication still fails after completing this procedure, call Air Techniques Technical Support for assistance. Please have the Serial Number of the ScanX and doctor name, address and telephone available to give to Technical Support personnel.

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Transition to the ScanX Diagnostics – Manipulate Window

Proceed to the main **ScanX Diagnostics** window (Figure 3) by clicking the ***Manipulate*** button in the **ScanX Diagnostics – Status** window **(**Figure 1). The **ScanX Diagnostics – Manipulate** window provides the user interface to set up the parameters for the tests presented in this document and displays the outputs from the various hardware components under test.

Diagnostic and Troubleshooting Tests

The tests included in this document refer to various hardware components and are used to ensure proper functionality and help diagnose potential problems with the ScanX. The user input and output data areas referred to in the tests are identified by Figure 3, the ScanX Diagnostics – Manipulate window.

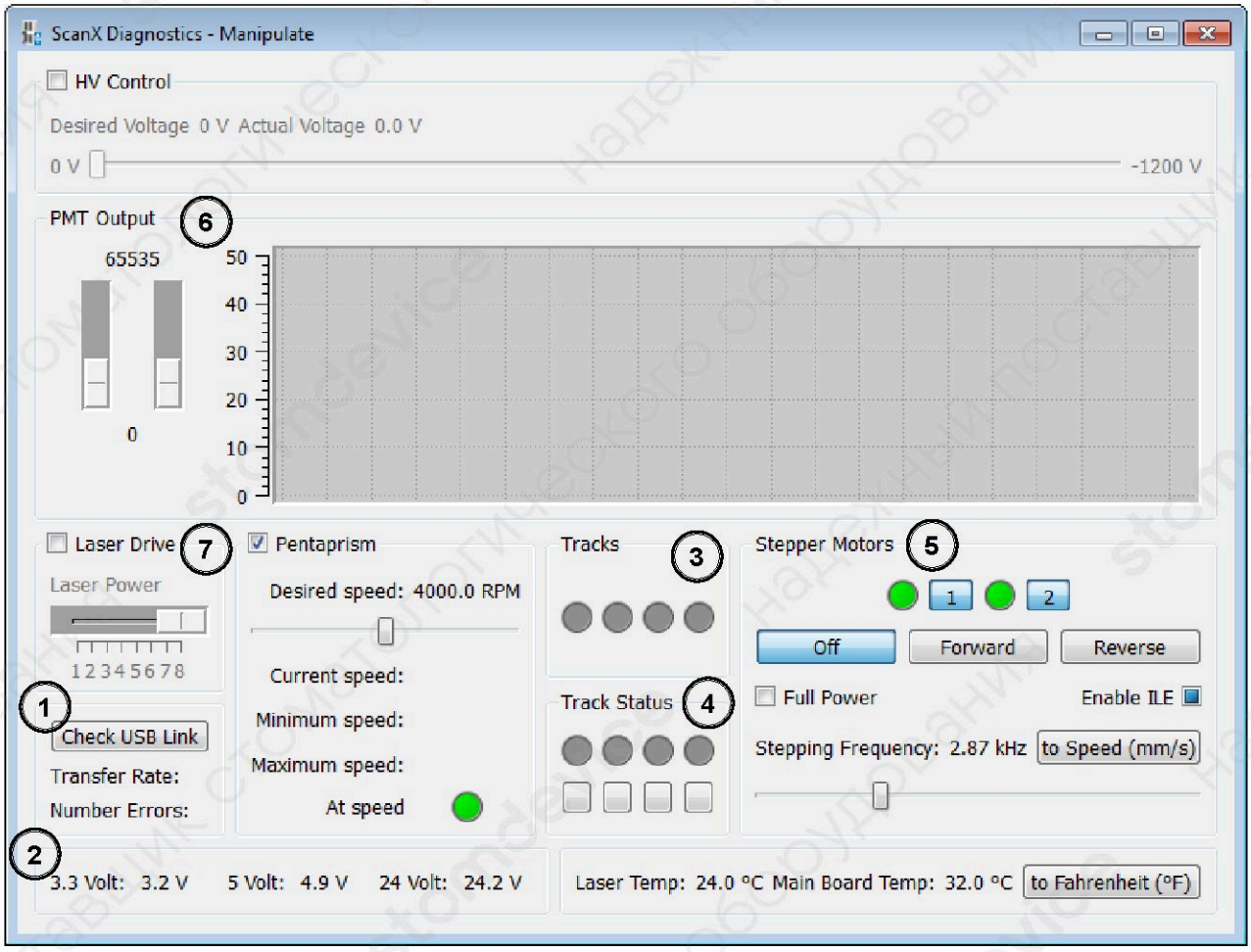


Figure 3. ScanX Diagnostics – Manipulate Window

Test	Description	Page	Test	Description	Page
1	**USB Data Transfer Rate Check**	3	5	**Stepper Motors Check**	4
2	**Internal Voltage Check (Power Supplies)**	3	6	**Light Tightness Checks**	5
3	**Inlet Plate Sensor Check**	3	7	**Laser Drive, Pentaprism Motor and SOL Board Checks**	6
4	**Track Status LED Check**	4			

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Test 1 - USB Data Transfer Rate Check

This test checks the transfer rate between the ScanX and the computer. Although the previous **ScanX Status** window shows a USB interface exists, this test verifies the reliability of the interface. ScanX models using first generation electronics should have a USB transfer rate of 4.5 MB/s or higher. Models using second generation electronics have a transfer rate of 30 MB/s or higher. Low rates can be unreliable and usually caused by the following.

a. Malfunctioning USB port or USB port below the 2.0 standard. Try a different USB 2.0 or higher port made 2.0 compatible.
b. Long or damaged USB cables. Change the USB cable.
c. Malfunctioning interface circuitry of the main board assembly. See the dealer.

Refer to the lower left section shown by Figure 3 and check the interface data transfer rate by clicking the ***Check USB Link*** button as shown by Figure 4. This further verifies the connection and shows the Transfer Rate. Remember, the Transfer Rate should always be 4.5 MB/s or higher for first generation electronics and 30 MB/s or higher for models using second generation electronics. The Number of Errors should always be 0.

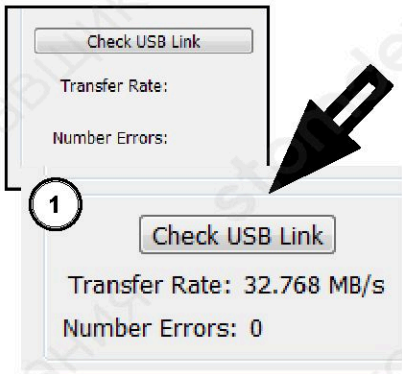


Figure 4. ScanX USB Transfer Rate

Test 2 - Internal Voltage Check

This test checks the input power of the ScanX power supply and the internally generated voltages. Refer to the lower left section shown by Figure 3 and verify the voltage values shown by Figure 5 are within acceptable ranges.

a. 3.3 V = between 2.97 and 3.63 V
b. 5 V = between 4.5 and 5.5 V
c. 24 V = between 21.6 and 26.4 V

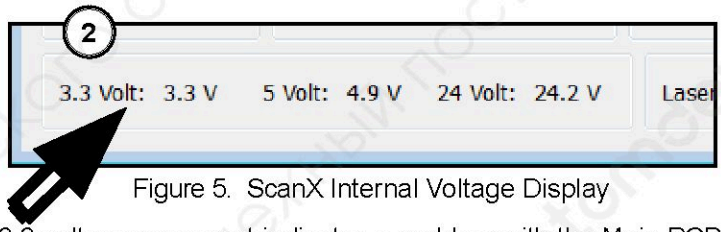


Figure 5. ScanX Internal Voltage Display

- ❑ A missing or out of specification value for the 5 or 3.3 volt measurement indicates a problem with the Main PCB assembly, while an out of specification value for the 24 volt measurement indicates a faulty power supply.
- ❑ If any of the supply voltages shown are not within the specifications, contact Air Techniques Technical Support. Always have the Serial Number of the ScanX and doctor's name, address and telephone number available when calling.

Note: All ScanX models, except the ScanX Duo, have four tracks, guide slots and indicator lights. The ScanX Duo has two tracks with associated guide slots and track indicator lights.

Test 3 - Inlet Plate Sensor Check

Check the function of the Inlet Plate Sensor by performing the following steps.

1. Refer to the ***Tracks*** section shown by Figure 3.

   Important: If all track indicator lights do not illuminate green, contact Technical Support.
2. Place and hold an unexposed plate in the rightmost slot.
3. With the PSP held in the slot, the Inlet Plate Sensor indicator should change from grey to green on the monitor as shown by Figure 6. If the indicator did not change color, remove and reinsert the PSP.

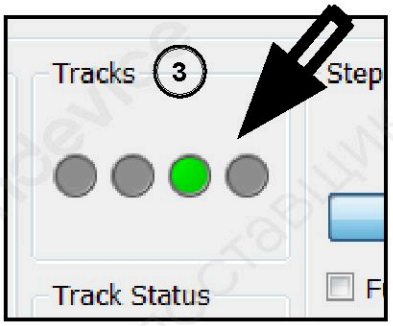


Figure 6. ScanX PSP Track Indicators

4. If the indicator still does not change, contact Air Techniques Technical Support. Always have the Serial Number of the ScanX and doctor's name, address, and telephone number available when calling.
5. Otherwise, remove the PSP and repeat the procedure for the remaining tracks verifying the corresponding color change for each track indicator.

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Note: All ScanX models, except the ScanX Duo, have four tracks, guide slots and indicator lights. The ScanX Duo has two tracks with associated guide slots and track indicator lights.

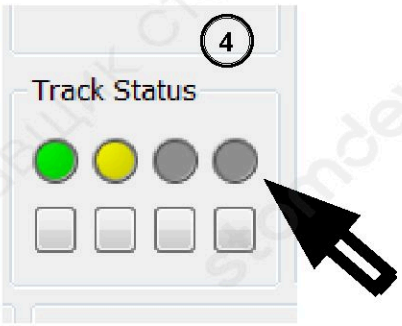


Figure 7.
ScanX Track State LED Indicator

Test 4 -Track Status LED Check

Check the function of the Track Status LEDs by performing the following steps.

1. Refer to the ***Track Status*** section shown by Figure 3.
2. Click the rightmost LED button and verify that the LED button shown by Figure 7 and the corresponding track LED on the front arch of the ScanX both illuminate green.
3. Click the same LED button again. Verify that the LED button shown by Figure 7 and the corresponding track LED on the front arch of the ScanX both illuminate amber. If the LED button's display color is amber and the arch track LED does not turn to amber, there is a problem with the Status board located in the top arch cover. Contact Technical Support. Always have the Serial Number of the ScanX and doctor's name, address, and telephone number available when calling.
4. Click the same LED button again to turn it off. If the LED turns off, repeat the test for the remaining LEDs.
5. The test is complete when all the LEDs have passed the procedure.

Test 5 -Stepper Motors Check

Check the function of the stepper motors by performing the following steps.

1. Refer to the ***Stepper Motors*** section shown by Figure 3.

   Note: Only stepper motor 2 is used by the ScanX Duo models.
2. Click one of the ***Stepper Motor*** buttons to enable motor operation and observe that the appropriate motor status indicator illuminates.
3. Click the ***Forward*** button to set the transport direction to ***Forward*** and verify that noise from the motor turning is heard.
4. Change the direction of the motor by clicking the ***Reverse*** button.
5. Click on the ***Forward*** button to set the transport direction back to ***Forward***. Feed an unexposed PSP into track on the left (test stepper motor 1) or track on the right (test stepper motor 2).
   Verify that plates drop out of both left and right tracks in about 45 seconds after being fed in.
6. Click the ***Off*** button.
7. If the motor turns off and the test ran successfully, repeat the test for the other motor.
8. If the motor fails to run, runs too slow, or is making a loud noise, please contact Technical Support.

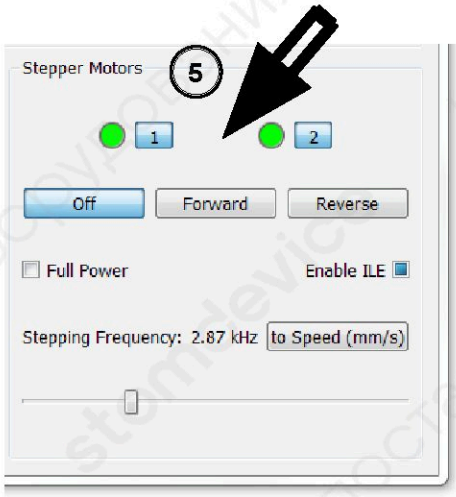


Figure 8.
ScanX Stepper Motor Test Section

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Test 6 - Light Tightness Check

This test checks for light leaks in the system first with the laser and eraser off, then with the laser and the eraser on, and finally with the introduction of a bright external environment. Refer to Figures 3 and 9 and check the ScanX for light leaks by performing the following steps.

CAUTION: Never Start the test with any of the covers removed from the ScanX. Ambient light at or near the inlet slot (arch) of the ScanX must be between 400-600 lux.

1. Refer to the ***PMT Output*** section shown by Figure 3.
2. Check the ***HV Control*** check box to start the cycle test with the laser and the eraser off.
3. Observe that the HV horizontal slider, the ***Desired Voltage***, and the ***Actual Voltage*** values are active and display current values. Verify that the peak and average values display in the ***PMT Output*** area.
4. Drag the vertical sliders up to adjust the scaling for the PMT output graph until the upper number increases from 50 to about 2000.
5. Drag the horizontal slider to the right to increase the desired voltage.

   CAUTION: To prevent damage to the PMT, uncheck the ***HV Control*** check box to stop the cycle whenever the average peaks above 400 before reaching -1000 volts on the bar.
6. Continue dragging the horizontal slider until the HV value reaches -1000 volts.
   a. A high value flat line effect suggests a bad PMT.
   b. No spikes suggest a disconnected or bad PMT.
   c. A high average value (significantly above 200) suggest a light leak in the system.
7. Observe blue lines moving along the graph on the lower portion of the screen, a red line showing peak and a green line showing average.
8. Observe the ***Peak*** value of the PMT Output. If this value rises above 2000, uncheck the ***HV Control*** check box to avoid damage to the PMT.
9. If the Average is higher than 250, make sure that the ScanX is not in direct daylight or directly under bright lights.

   Notes: Ambient light at or near the inlet slot (arch) of the ScanX must be between 400-600 lux.
10. If there is no bright light problem and the Average is still above 250, please contact Air Techniques Technical Support. Always have the Serial Number of the ScanX and doctor's name, address, and telephone number available when calling.
11. Uncheck the ***HV Control*** check box to stop the test with the laser and the eraser off.

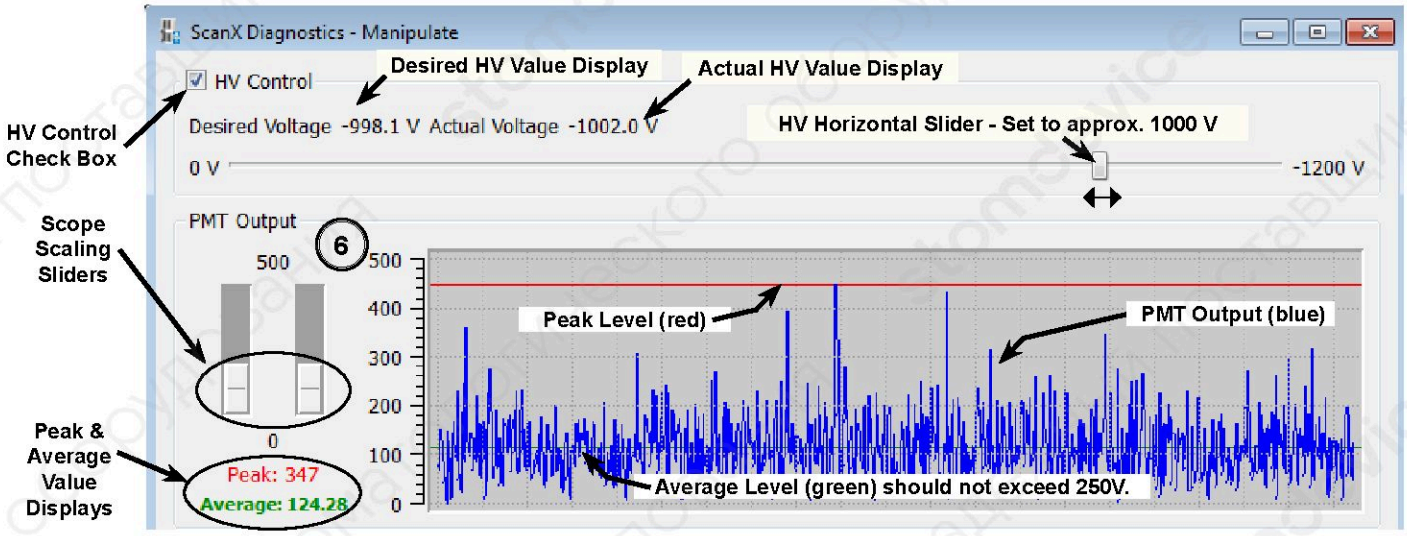


Figure 9. ScanX Light Tightness Test Section

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12. Refer to Figure 9 and make sure that the vertical scope scaling sliders are set to about 450 and the ***HV Control*** horizontal slider is set to approximately 1000 volts as described previously.
13. Check the ***HV Control*** check box to start the cycle test with the laser on and the eraser off.
14. Observe blue ***PMT Output*** lines moving along the graph. Note that the Average does not exceed 250. Any extremely high PMT values denote that the light leak is most likely outside the scanner section.
15. Refer to the ***Laser Drive*** section shown by Figure 3.
16. Check the ***Laser Drive*** check box shown by Figure 10.
17. Set the Laser Power bar to a value of 8.
18. Observe the blue ***PMT Output*** lines. Any high average PMT values denote that the light leak is most likely inside the scanner section caused by the laser.

    Notes: The next 2 steps apply only to ILE ScanX units to check if a light leak is caused by the in-line eraser. Refer to the ***Stepper Motors*** section (See Figure 8)
19. Click one of the ***Stepper Motor*** buttons to enable motor operation and observe that the appropriate motor status indicator illuminates.
20. Click the ***Forward*** button to set the transport direction to ***Forward*** and verify that noise from the motor turning is heard.
21. Activate the eraser by pressing ***Enable ILE*** located in the ***Stepper Motors*** section.
22. Observe the blue ***PMT Output*** lines. Any high average ***PMT Output*** values denote that the light leak is most likely inside the scanner section caused by the in-line eraser.
23. Uncheck the ***HV Control*** check box to stop cycle test with the eraser on.
24. Uncheck the ***Laser Drive*** check box to turn off the laser.
25. Uncheck the ***Enable ILE*** check box to turn off the eraser.
26. Click the ***Off*** button to stop the stepper motor.

Test 7- Laser Drive, Pentaprism Motor and SOL Board Checks

These tests check the components necessary for scanning and capturing images by ScanX. A malfunctioning laser, pentaprism or Start of Line (SOL) board is a possible cause for failure to produce an image. Check these three parameters for each component.

- ❑ **Laser -** When the laser is turned on, the surrounding area may experience a slight increase in temperature. Monitoring the laser temperature is a simple way to check that the laser is operating within a safe temperature range.
- ❑ **Pentaprism -** The pentaprism spins at approximately 4000 or 5000 rpm at start up depending on the model. Monitoring the programed, actual, minimum, and maximum speeds provides a reliable test of the pentaprism operation and performance.
- ❑ **Start of Line (SOL) Board -** The SOL board triggers the start of the scanning line when it detects the laser. Monitoring the actual, minimum and maximum speeds of pentaprism when the laser is on indicates that the SOL board is operating properly.

1. **Laser Drive Checks -** Check the laser by performing the following steps.
   a. Refer to the ***Laser Drive*** section shown by Figure 10.
   b. Check the ***Laser Drive*** check box.

      Note: Use patience when observing temperature values. Increases are slight and take time.
   c. Observe the ***Laser Temp*** reading located under the ***Stepper Motor*** section and record the value. Recorded temperatures indicate laser functionality as follows.
      1. A slight temperature increase indicates the laser is working properly.
      2. No temperature increase suggests that the laser is not operating.
      3. An large temperature increase suggests that the laser board is not functioning properly.
   d. Check the ***Laser Drive*** check box (uncheck) to stop the laser and continue to the pentaprism checks.

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2. **Pentaprism Motor Checks -** Check the pentaprism by performing the following steps.
   a. Refer to the ***Pentaprism*** section shown by Figure 10.
   b. Check the ***Pentaprism*** check box. Observe that the panel becomes active displaying the speed information.
      1. ***Desired speed*** adjustment slide bar appears with a default setting of 4000 RPM or 5000 RPM.
      2. ***At speed*** indicator illuminates green.
   c. Drag the ***Desired speed*** slide bar to select a new speed. Moving the slide bar to the left decreases the speed and conversely sliding to the right increases it.
   d. The ***At speed*** indicator changes to red until the desired value has been attained. Also listen for the sound level and for the sound of the pentaprism speed change during slide bar manipulation. Make sure that the indicator changes to green when the desired speed is reached.
   e. After the speed change, if the indicator never returns to green, the pentaprism is not operating properly at the correct speed. The problem may be due to a faulty pentaprism motor assembly, please contact Technical Support.

3. **SOL Board Checks -** Check the SOL board by performing the following steps.
   a. Refer to the ***Laser Drive*** and **Pentaprism** test sections as shown by Figure 10.
   b. Check the ***Pentaprism*** and the ***Laser Drive*** check boxes to turn the pentaprism and laser on.
   c. Observe that the controls are activated.
      1. ***Laser Temp*** displays the temperature.
      2. **Desired speed** displays the default setting.
      3. ***Current, Minimum*** and ***Maximum speeds*** display.
      4. ***At speed*** indicator illuminates green.
   d. Adjust speed value and check that current minimum and maximum values track to the new speed.
   e. If the new speed value change is not shown in the Pentaprism drive section, then the SOL board is most likely malfunctioning. Please contact Technical Support.

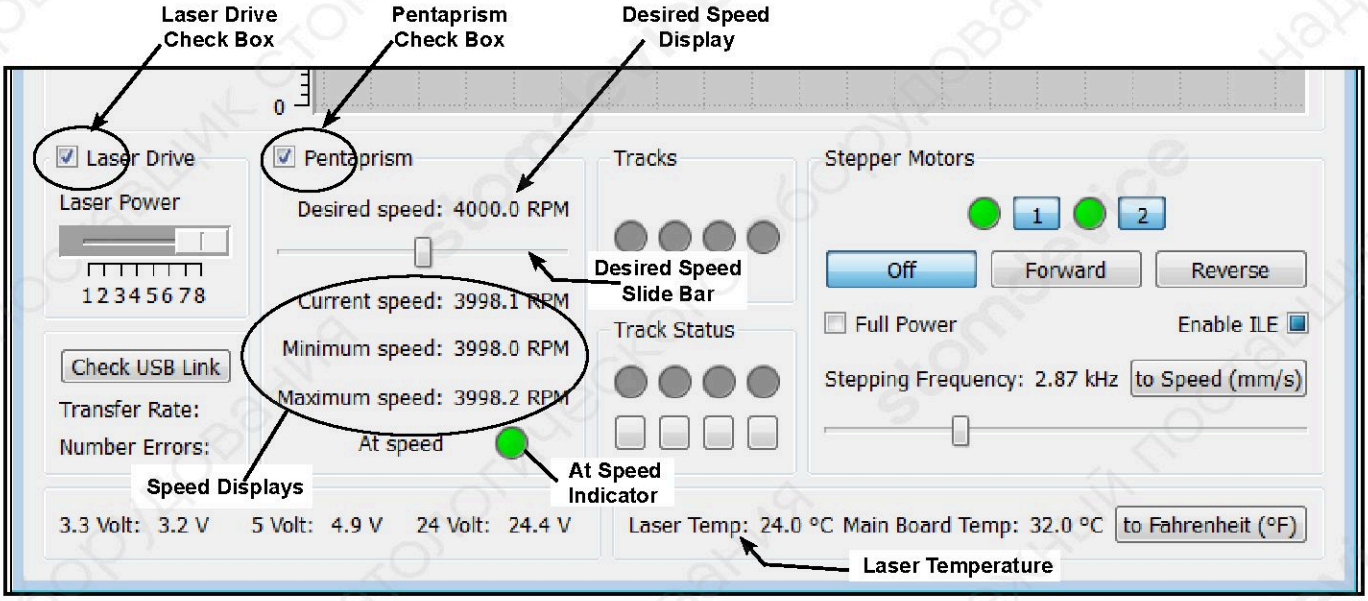


Figure 10. ScanX Laser Drive, Pentaprism Motor and SOL Board Test Sections

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