

NEOSEM

NEOSEM TECHNOLOGY, INC.

97-62404-00: MANUFACTURING TEST INSTRUCTIONS FOR 01-62404-00

REVISION HISTORY

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DOCUMENT:	97-62404-00
REVISION:	A
REVISION DATE:	5/26/2023

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01-62404-00 Manufacturing Test Instructions

REV	ECO #	DATE	DESCRIPTION OF CHANGE	WRITTEN BY:
A	5284	6/1/2023	Initial Document Release	SJM

Approval process: The author will select and list organizations that have responsibilities for implementing each new procedure and meet with each department to obtain approvals. An entry in the approval date column reflects the date of approval by that department.

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1. DOCUMENT OVERVIEW

1.1. Scope

This document conveys instructions for verifying correct functionality of 01-62404-00 FX7 calibration board assembly.

2. REQUIRED HARDWARE, SOFTWARE AND EQUIPMENT

2.1. Materials:

- Qty 1 FX7 Calibration Diagnostic Module assembly, 01-62404-00 (unit under test)
- Qty 1 FX7 Midplane assembly, 01-61586-00
- Qty 2 FX6 Tester Power Board (TPB) assembly, 02-57499-0
- Qty 1 FX7 CMD with LB, 01-61869-00
- Qty 1 FX7 Desktop Chassis or Frame

2.2. Reference Document:

- 76-XXXX-00, FX7 TPB 57499 Calibration Procedure

2.3. Software:

- H4 Controller containing 10Gbps Ethernet with W10 DNA Controller configuration
- Tera Term or similar terminal emulator program
- DNA3 Base install version 2.1.0 or later
- FX7 Server software version 1.1.5.100 or later installed on PC controller

2.4. Equipment:

- USB-TCP232-302 RS232 to Ethernet Converter
- Qty 1 Straight-thru Serial Cable (DB9 female to DB9 male)
- Qty 1 Null Modem Serial Cable (DB9 female to DB9 male to 10-pin ribbon cable header)
- Qty 1 five port 1Gb Ethernet switch
- Qty 3 Ethernet cables
- Qty 1 USB Type A male to micro USB cable
- Fluke 45 with current NIST traceable calibration
- Benchtop Fans if not using a chassis with fans.

3. TEST SETUP

- 3.1. Install the DNA3 version and Application version listed at the start of the Test Procedure.
- 3.2. Perform a visual inspection of the FX7 Calibration Board to make sure the connectors are intact, that there are no damaged pins in the connectors, that there are no solder shorts present.
- 3.3. With the 01-62404-00 board disconnected from all other boards, check the DC resistance reading listed in the table below with respect to GND. If any resistance is out of range, stop, troubleshoot and repair before continuing.

Measurement Points	DC Resistance	Allowed Voltage Range
+20V	Greater than 10K ohms	+18V to +22V
N5V	Greater than 1K ohms	-5.2V to -4.8V
REF14000MV	Greater than 10K ohms	+13.8V to +14.2V
REF7000MV	Greater than 500K ohms	+6.93V to +7.07V
REF4391MV	Greater than 500K ohms	+4.34V to +4.44V
REF1782MV	Greater than 500K ohms	+1.76V to +1.80V
REF1782MV_TP	Greater than 500K ohms	+1.76V to +1.80V
REF218MV_TP	Greater than 500K ohms	+0.215V to +0.220V

TABLE 1

- 3.4. Install the 01-61586-00 Midplane onto the FX7 Chassis.
- 3.5. Install the 01-62404-00 Calibration Diagnostic Module (board under test) onto the front of the Midplane.
- 3.6. Install the 01-61869-00 CMB into the FX7 Chassis from the rear panel.
- 3.7. Install the two 02-57499-0 TPBs into the FX7 Chassis from the rear panel.
- 3.8. Attach the +48V power cables to the FX7 CMB (PWR2), TPBs (J1), and Logic Board connector.
- 3.9. Connect the 1G Ethernet switch to the PC Controller's Tester Ethernet port with an Ethernet cable.
- 3.10. Connect an Ethernet cable from the 1G Ethernet switch to the FX7 CMB connector LAN1.
- 3.11. Connect the USB cable from the PC Controller to the FX7 CMB connector M_USB1.
- 3.12. Open a Tera Term terminal emulator window. Choose the COM port number assigned to this cable.
Setup the serial port configuration to 115200 baud.

4. EEPROM PROGRAMMING PROCEDURE

Commands shown in bold below are to be typed into the linux command prompt.

- 4.1. Power on the chassis and allow the system to boot.
- 4.2. Once the CPU has booted, login into FX7 CMB as **root**. Enter password as **ntlinux**
- 4.3. Change to the directory: **cd /mnt/M550/Bin**
- 4.4. Enter the following commands in the TeraTerm window.
- 4.5. **./ftdiags 99**

This will start the diagnostics. Wait for diagnostic prompt (>).

Enter the commands as shown and verify no errors are reported for each command.

- 4.6. **i2cwrch**

Enter the data as requested to write into the FX7 Calibration Board. The assembly revision and serial number entered should match the serial number sticker on the Board Assembly.

- 4.7. **i2crdcb**

Verify data just written is read back properly.

4.8. X

Exit diagnostics.

4.9. Power off the Chassis

5. SYSTEM VOLTAGE TESTS

5.1. Power on the Chassis.

5.2. Wait for FX7 Blade to boot.

5.3. Open the H4 GUI

5.4. Refresh the blade view in the GUI.

5.5. Lock all Slots in the GUI.

5.6. Using the Fluke 45 multi-meter, measure the voltage and compare the reading to the allowable voltage range in Table 1 above. If any voltage is out of range, stop, troubleshoot and repair before continuing.

5.7. Power off the Chassis.

6. CALIBRATE THE 62404 BOARD

This section will calibrate all four sections of the 62404 assembly. This can either be done in a frame on a bench or in a chassis.

6.1. Connect the RS232 to Ethernet Converter to the 1G Ethernet Switch using an Ethernet Cable.

6.2. Connect the RS232 to Ethernet Converter to the Fluke 45 Multimeter using the Straight Thru DB9 Serial Cable.

6.3. Connect the AC Power Adapter to the RS232 to Ethernet Converter and a wall outlet. Photo 1 below shows an example of the multimeter connections.

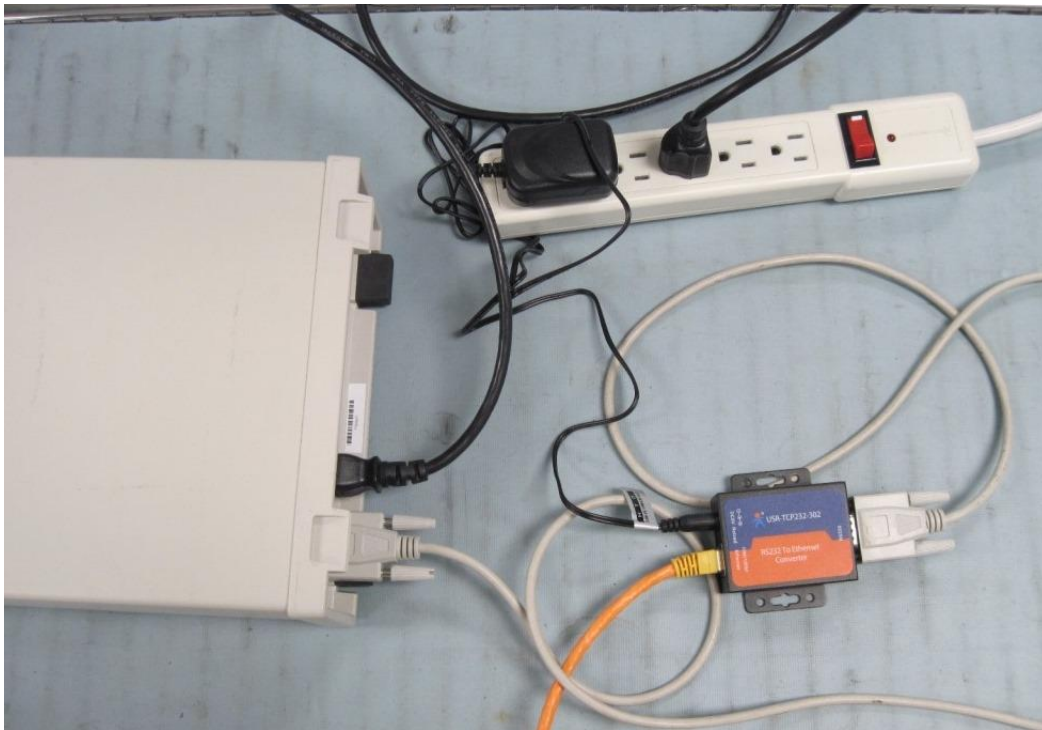


Photo 1

- 6.4. Power on the Chassis.
- 6.5. Wait for the Blade to boot.
- 6.6. Open the H4 GUI.
- 6.7. Refresh the blade view in the GUI.
- 6.8. Lock the Slot in the GUI.
- 6.9. Open a Tera Term terminal emulator window. Choose the COM port number assigned to this cable.
Setup the serial port configuration to 115200 baud.
- 6.10. In the TeraTerm window, login into the Blade as **root**. Enter password as **ntlinux**
- 6.11. Change to the directory: **/mnt/M550/Bin**
- 6.12. Connect the Fluke 45 test probes for voltage measurement. The Photo 2 below shows the proper connections to the Fluke 45.



Photo 2

6.13. Enter the following command.

6.14. `./fx7cals -r`

6.15. Calibration of the 62404 Board will start. Connect the negative probe of the Fluke 45 to the GND_REF test point. The console will prompt you connect the Fluke 45 Multimeter positive probe to the reference voltage test points. Follow the console prompts and press “Enter” after connecting to the requested reference voltage test point. The Photo 3 below shows the location of the reference voltage test points. After all voltage measurements are entered, the calibration code will calibrate and test the ADC for this section of the 62404.

6.16. When you see the prompt **“Far Left Section: Connect Ammeter to IDD_CAL_TP1 and IDD_CAL_TP2.”**, then configure the Fluke 45 to measure current on the 10A range. See Photo 4 below.



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Photo 4

6.17. Connect the Fluke 45 test probes to IDD_CAL_TP1 and IDD_CAL_TP2. See Photo 5 below for this connection.



Photo 5

- 6.18. After connecting the Fluke 45 test probes to the requested test points, press “Enter” on the keyboard to indicate that you are ready for the software to continue calibrating. The software will automatically control the 62404 cal board and the Fluke 45 to perform both calibration and verification of high current range of this section of the 62404 cal board. Wait for the calibration software to request you to reconfigure the Fluke 45 to low range.
- 6.19. When you see the prompt “**Connect positive probe of Fluke 45 to 100 mAmp Ammeter Jack.**”, then configure the Fluke 45 to measure current on the 100 mA range. See Photo 6 below.



Photo 6

6.20. After connecting the Fluke 45 test probes to the requested Fluke 45meter jacks, press “Enter” on the keyboard to indicate that you are ready for the software to continue calibrating. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of low current range of this section of the 62404 calibration board. Wait for the calibration software complete these operations.

6.21. Calibration of the next section of the 62404 Board will start. When you see the prompt “**Middle Left Section: Connect Ammeter to IDD_CAL_TP3 and IDD_CAL_TP4.**”, then configure the Fluke 45 as shown in Photo 4. Connect the probes to those test points, and then press “Enter” on the keyboard. Photo 7 shows the meter probes attached to the 62404 calibration board. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of high current range of this section of the 62404 calibration board. Wait for the calibration software to request you to reconfigure the Fluke 45 to low range.

6.22. When you see the prompt “**Connect positive probe of Fluke 45 to 100 mAmp Ammeter Jack.**”, then configure the Fluke 45 to measure current on the 100 mA range as shown in Photo 6 above.

6.23. After connecting the Fluke 45 test probes to the requested meter jacks, press “Enter” on the keyboard to indicate that you are ready for the software to continue calibrating. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of low current range of this section of the 62404 calibration board. Wait for the calibration software complete these operations.

6.24. Calibration of the next section of the 62404 Board will start. When you see the prompt “**Middle Right Section: Connect Ammeter to IDD_CAL_TP5 and IDD_CAL_TP6.**”, then configure the Fluke 45 as shown in Photo 4. Connect the probes to those test points, and then press “Enter” on the keyboard. Photo 8 shows the meter probes attached to the 62404 calibration board. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of high current range of this section of the 62404 calibration board. Wait for the calibration software to request you to reconfigure the Fluke 45 to low range.

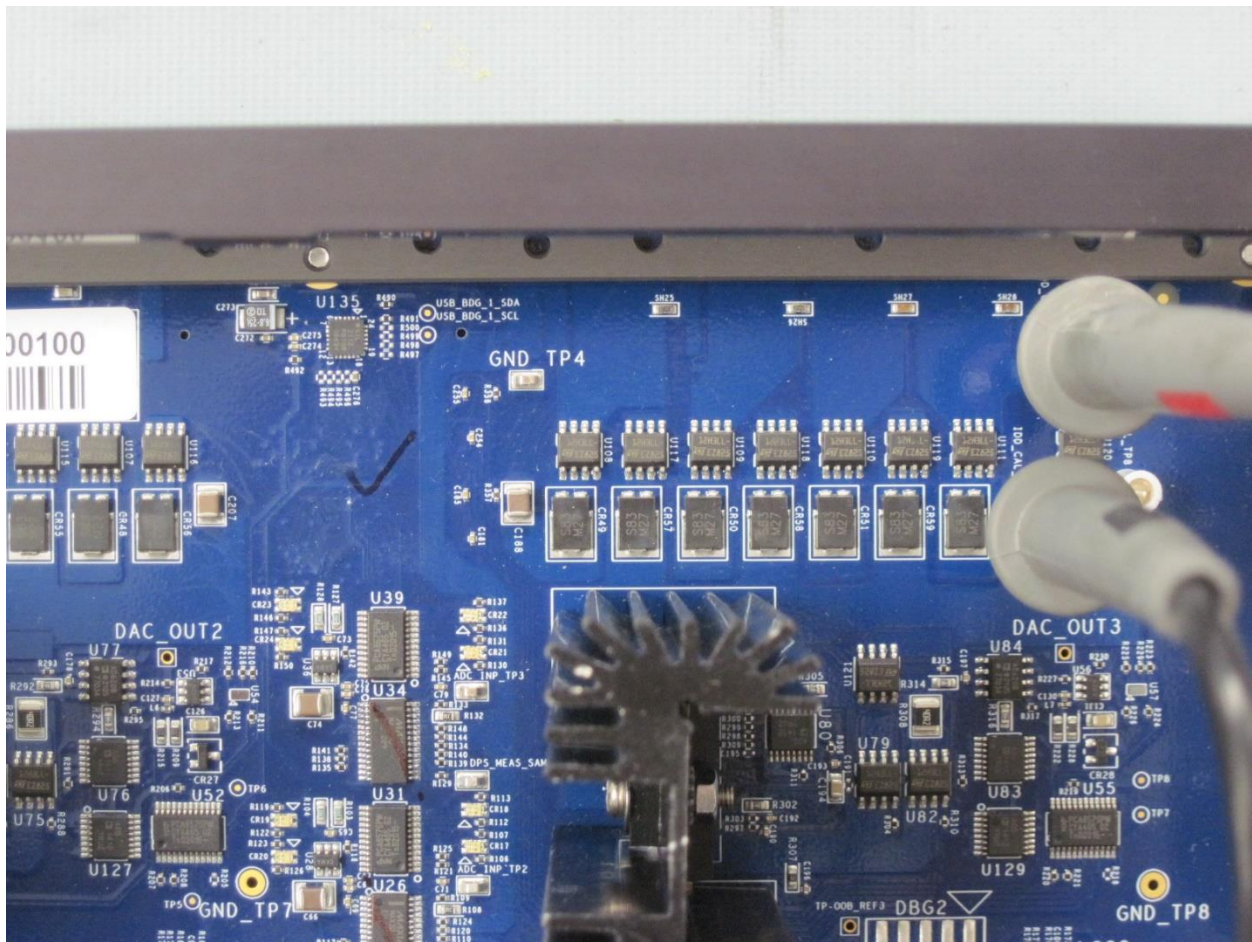


Photo 8

- 6.25. When you see the prompt “**Connect positive probe of Fluke 45 to 100 mAmp Ammeter Jack.**”, then configure the Fluke 45 to measure current on the 100 mA range as shown in Photo 6 above.
- 6.26. After connecting the Fluke 45 test probes to the requested meter jacks, press “Enter” on the keyboard to indicate that you are ready for the software to continue calibrating. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of low current range of this section of the 62404 calibration board. Wait for the calibration software complete these operations.
- 6.27. Calibration of the next section of the 62404 Board will start. When you see the prompt “**Far Right Section: Connect Ammeter to IDD_CAL_TP7 and IDD_CAL_TP8.**”, then configure the Fluke 45 as shown in Photo 4. Connect the probes to those test points, and then press “Enter” on the keyboard. Photo 9 shows the meter probes attached to the 62404 calibration board. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of high current range of this section of the 62404 calibration board. Wait for the calibration software to request you to reconfigure the Fluke 45 to low range.

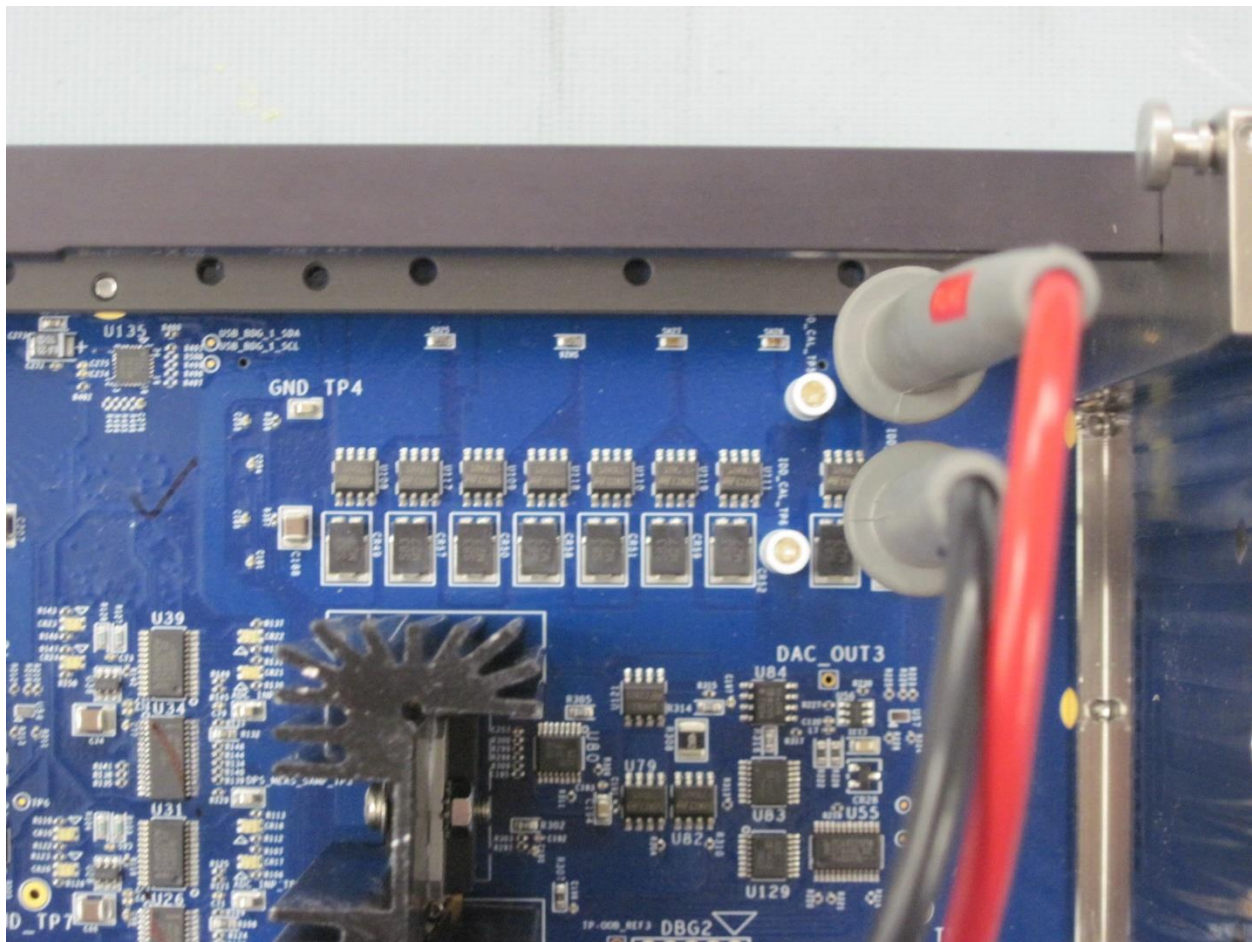


Photo 9

- 6.28. When you see the prompt **“Connect positive probe of Fluke 45 to 100 mAmp Ammeter Jack.”**, then configure the Fluke 45 to measure current on the 100 mA range as shown in Photo 6 above.
- 6.29. After connecting the Fluke 45 test probes to the requested meter jacks, press “Enter” on the keyboard to indicate that you are ready for the software to continue calibrating. The software will automatically control the 62404 calibration board and the Fluke 45 to perform both calibration and verification of low current range of this section of the 62404 calibration board. Wait for the calibration software complete these operations.
- 6.30. Once the calibration program exits, calibration for Slot 4 is complete. Should the final message indicate that calibration failed for this section, then repair the 62404 and recalibrate before continuing with the following steps.
- 6.31. A log file of the calibration values and the verification results is stored on the PC Controller in the folder, C:\Program Files (x86)\DNA2\User\CAL_Files. Please move this log file to your network storage so it can be used in the future to document the calibration and accuracy of this 62404 calibration board. The log filename will start with “CALBD_Cal” and then contain the serial number of this calibration board.
- 6.32. Power down the Chassis.

6.33. Complete the Calibration Certificate document for this calibration board.

7. CALIBRATION TEST

To test the calibration board functionality, perform a 57499 TPB calibration. The calibration procedure, 76-57499-00, has the detailed instructions performing this calibration test both from command line and the H4 GUI.

8. DIAGNOSTICS TEST OF CALIBRATION BOARD

8.1. TBD

TEST PROCEDURE IS COMPLETE

01-62404-00 FX7 Calibration Fixture Checkout Traveler**Initial Checkout:**

1. FX7 CDM DC Resistance Checks
2. Program and check EEPROM
3. Mark revision level per BOM
4. System Voltage Checks
5. Calibration of 62404 Calibration Fixture
6. Test Calibration of 62404

Completed by: _____
Completed by: _____
Completed by: _____
Completed by: _____
Completed by: _____
Completed by: _____

Repair Log:

DATE	REPAIR DESCRIPTION	DONE BY

Notes: