

REPAIR MANUAL

LSX4081B — Self-Test and Repair Manual



Simulate, Stimulate, Test...

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Revision History

Version	Date	Author	Change Summary
0.3	2026-05-09	Jonathan Netzer	Draft for engineering review.
0.4	2026-06-09	Jonathan Netzer	§8 (Calibration Adjustment) removed — covered by the separate Calibration Manual. §1, §5, §12 updated; sections renumbered.
0.5	2026-07-12	Arie Oster	Add debug and repair flow charts
0.7	2026-07-13	Arie Oster	Assembly instructions and pictures

1. Scope and Purpose

This manual defines the procedures required to verify, diagnose, and repair the LSX4081B signal generator in the field or at a service depot, without returning the unit to the factory for routine maintenance. It is intended for a technically qualified maintainer.

Companion documents are the Lucid-X Benchtop User Manual (operation), the Lucid-X Programming Manual (remote control), and the LSX4081B Calibration Manual (calibration adjustment and calibration data). This manual covers self-test, module-level fault isolation, and repair.

2. Safety

- Disconnect power and allow internal capacitors to discharge before removing any cover or module.
- The RF output can reach levels that require attenuation before connecting sensitive test equipment. Verify the configured output power before connecting a power meter or spectrum analyzer directly.
- Use an ESD-safe workstation (wrist strap, grounded mat) when handling internal boards or modules.

3. Product Identification

Field	Value
Model	LSX4081B
Product family	LucidX
Frequency range	9 kHz to 4 GHz
Channel count	1
Form factor	Benchtop
Serial number location	Rear panel

4. Module Architecture

The LSX4081B is built from field-replaceable modules. Fault isolation in this manual works at the module level: a fault is isolated to a module, and the module is replaced. Modules are not repaired in the field.

Module	Function
RF Module	Generates the RF output signal. The RF Module is a sealed unit and is not field-serviceable — a faulty RF Module is replaced as a complete assembly.
Main Board	Houses the embedded controller and interfaces the RF Module to the front panel, rear-panel connectivity (LAN/USB), and remote control.
Embedded CPU	RSPI module, connected to the main board
Power Supply	Provides regulated DC power to the Main Board and RF Module.
Front Panel	Touch display, control buttons, power switch, and front overlay.
Rear Panel	Reference in/out, LAN/USB connectivity, power entry, and fuse.
Chassis	Enclosure and cooling. The chassis is not a replacement module, but the cooling fan is a serviceable item.

5. Required Test Equipment

Equipment required for the fault-confirmation checks in §7: Spectrum Analyzer

Equipment required to run ATP on device after repair: power meter and spectrum analyzer, reference standard.

General-purpose bench equipment (DMM, ESD workstation) is assumed and not listed.

Equipment required for calibration adjustment is a computer with SW installed and Power meter.

6. Power-On Self-Test

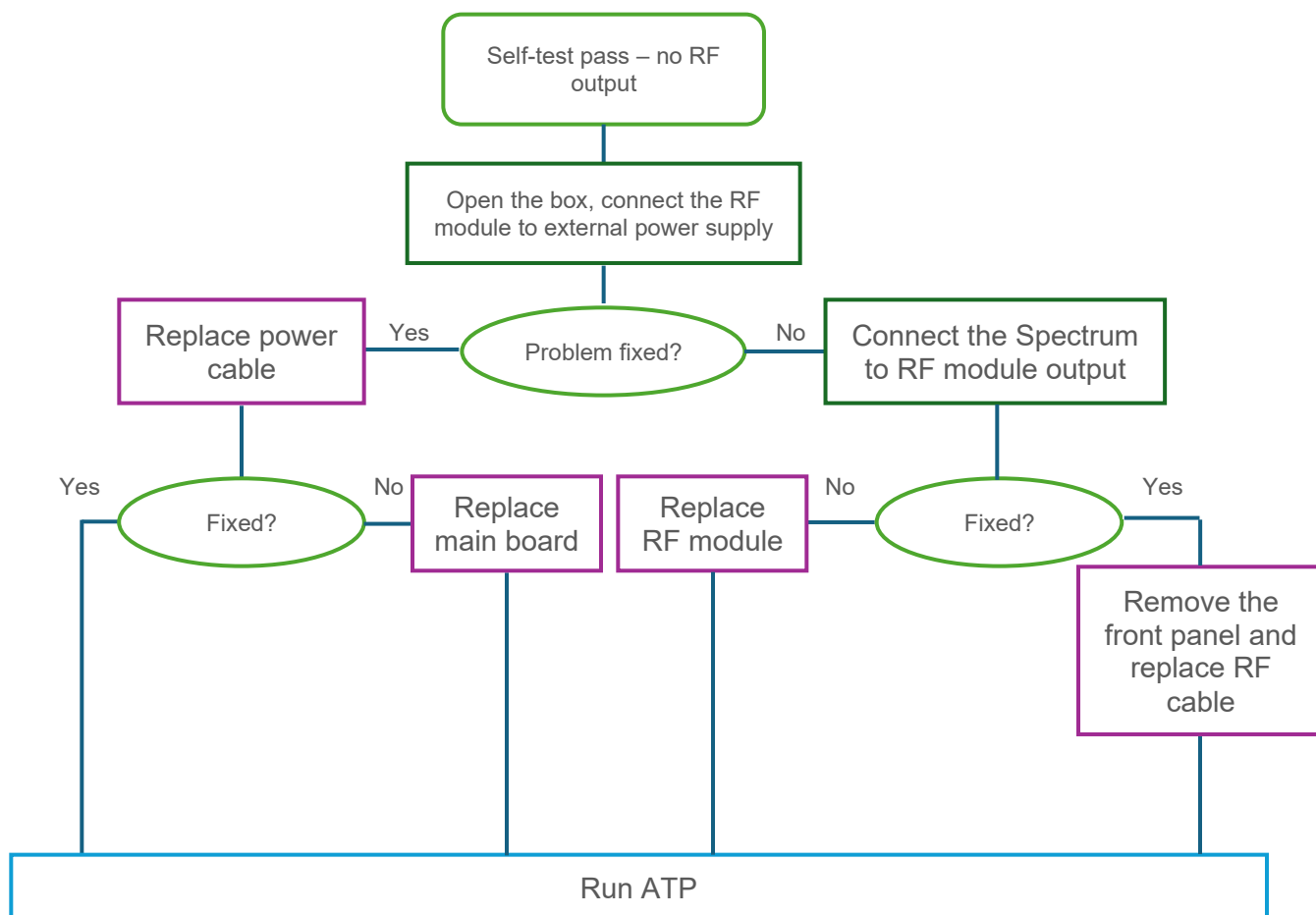
During power on the device is tested for the connectivity to the RF module, the functionality of the embedded CPU and the device connectivity to LAN or USB-B.

The `*TST?` remote query initiates the internal self-test and returns `0` if all tests passed or `1` if one or more tests failed. See the Lucid-X Programming Manual.

7. Troubleshooting / Fault Isolation

Use the table below to isolate a fault to a replaceable module (§4), confirm the diagnosis, and replace the module per §10.

a) No RF output



Procedure 1: RF signal debug

b) Output power out of specification

If RF output is out of specification by less than $\pm 5\text{dBm}$, run calibration process, if RF output is out of specification by more than $\pm 5\text{dBm}$, use procedure 1 above (same as “no RF output”).

c) Reference will not lock (internal or external)

If the signal is not locked on internal or external reference use procedure 1 above.

d) No communication (LAN/USB)

If the LAN communication is not working, replace the LAN cable. If the problem still exists, check if the device is configured to DHCP or static IP and that all network configurations are correct. If it is still not working, open the case and connect the LAN cable directly to the RSPI interface. If problem still not fixed, replace the SD card and update FW to latest. If the problem still exists, replace the RSPI module and its cables.

e) Unit does not power on

If the unit is not power on, check for the power cable connection. If the problem exists, disconnect the power cable and replace the fuse. If the problem exists, disconnect the power cable, open the box and replace the power supply connectors and cables to the main board. If the problem exists, replace the power supply module.

f) Front-panel display or buttons unresponsive

If the front panel display or keyboard is unresponsive and the self-test pass, remove the cover and replace the cables from the front panel to the main board (USB cables, HDMI, flat cable). If the issue remains, replace the front panel.

8. Fuse Replacement

The power fuse is located on the rear panel, in the fuse holder adjacent to the power entry connector.

- **Fuse type:** T6.3A/250V, glass, 5×20 mm, Slo-Blo.

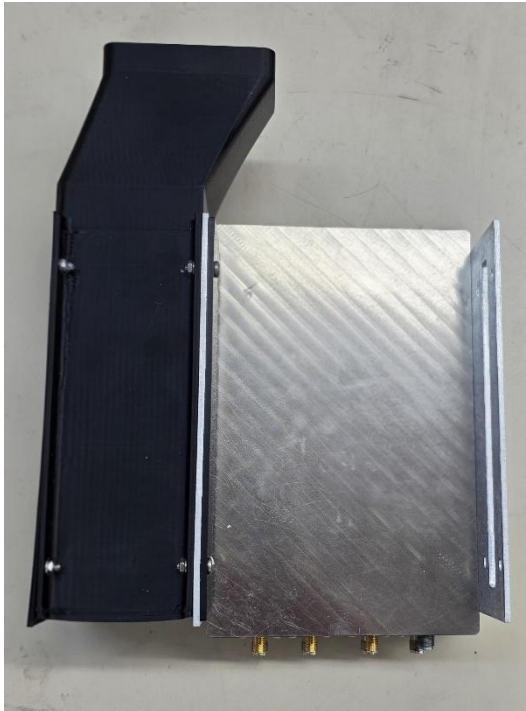
To replace:

1. Disconnect the power cord.
2. Open the fuse holder and remove the failed fuse.
3. Insert a new fuse of the exact type listed above. Never fit a fuse of a higher rating.
4. Close the fuse holder and reconnect power.

9. Disassembly and Module Replacement

Disconnect power and observe the ESD precautions in §2 before starting.

1. **Cover removal.** Remove the perimeter screws securing the top cover and lift the cover off.
2. **RF Module.** The RF Module is secured to support brackets and is connected to cooling pipes from the vent. Disconnect its cables, open the connection to the vent, unbolt the brackets, and slowly lift the module out with the cooling pipe. Note that the cooling pipe is fragile.

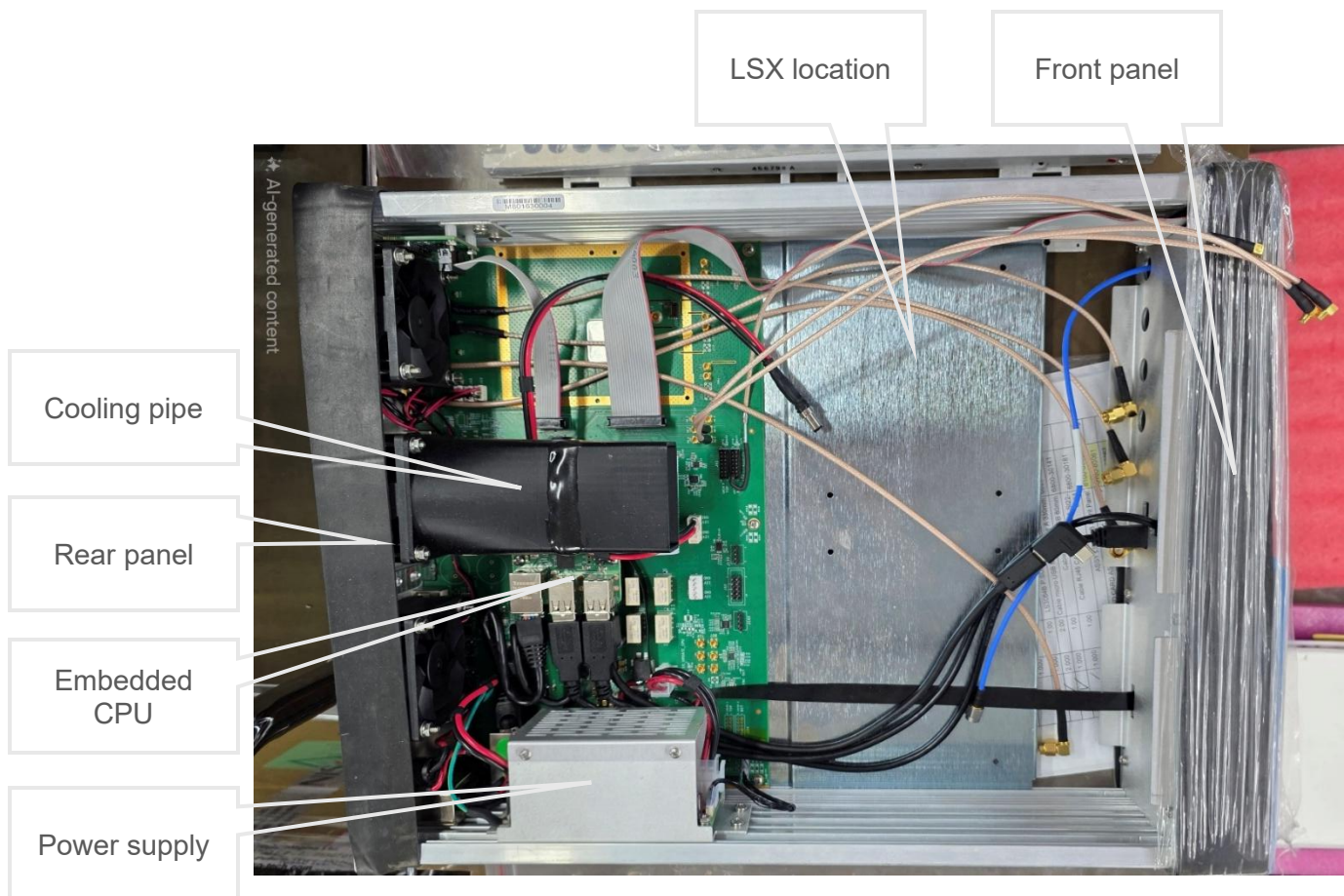


LSX with cooling pipe



LSX module

3. **Embedded CPU board.** The embedded CPU board is located on top of the main board and is connected to the main board with bracket. Remove the cables that connect the embedded CPU to the main board, USB and LAN and remove the screws. Pull it up slowly.
4. **Main Board.** The Main Board sits beneath the RF Module, connected to it by a usb-c cable and power cable. To disassemble the main board, need to remove the screws securing the board to the chassis, open the cables from the RF modules and pull out the rear panel with the board. Disconnect all cables before unbolting the board from its standoffs.



5. **Power Supply.** The Power Supply is a separate boxed module with its own cover, mounted on standoffs. Disconnect its DC harness and unbolt the box as a unit.
6. **Front Panel.** The front panel assembly (display, buttons, switch, overlay) unbolts from the chassis independently of the electronics. Disconnect the cables from the front panel before removing it. Disconnect the display and button harnesses before removal.
7. **Reassembly** is the reverse order. **[TBD]** Fastener torque values and thread-locker requirements.

10. Parts List

Field-replaceable units for the LSX4081B:

Item	Description	Part Number
RF Module	Single-channel RF generator module, 9 kHz – 3 GHz	6100-80102
Main Board	Main board with embedded controller	6800-80070
Power Supply	110V AC to 12V DC power supply module	6200-11500
Front Panel assembly	Display, buttons, switch, overlay	4500-6210A
Power fuse	Glass, T6.3A/250V, 5×20 mm, Slo-Blo	1100-15620
Cooling pipe and fan	Plastic pipes and fans	6700-00004/5

11. Returning the Unit for Factory Service

8. Use the original shipping materials if available; if not, use adequate packaging and mark the carton with the model and serial number.
9. Record before shipping: model and serial number, installed options and firmware version, a detailed description of the symptom, and whether the unit worked before failing.
10. Include the sending and return address on the carton.

12. Related Documents

Document
Lucid-X Benchtop User Manual
Lucid-X Programming Manual
LSX4081B Calibration Manual