ReliaCal User's Guide

This User's Guide provides the basic instructions on contents, configuration, and implementation of CMM calibration fixtures for use in the LRS-9434 Laser Reliability and Burn-In Test System.

Product Overview

The CMM Calibration Fixture is designed to allow on-site, customer applied calibrations to the individual zones and channels of the LRS-9434 series of test equipment systems.

With the calibration fixture, end users can perform up-to-date calibrations on their burn-in systems, at any desired interval, without having to return individual CMM units to the factory site for calibration. This allows for greatly reduced downtime on the production equipment, saves on transportation costs, and ensures calibration results are recorded and traced for each lot production.

Utilizing a computer terminal, the calibration fixture software, ReliaCal, provides the stand-alone interface, separate from the system ReliaTest software package.

Calibration Hardware Set-Up Procedure

Unpacking and Inspection

Carefully remove the packing from around the calibration fixture and inspect the equipment for any signs of physical damage or impact.

If any damaged containers or system components are found, notify the shipping courier and ILX Lightwave immediately.

Below is the physical appearance for two of the calibration fixtures that ILX offers. One is the standard calibration fixture for LDI and LDV calibration, and the other is the optional calibration fixture for EAM devices:
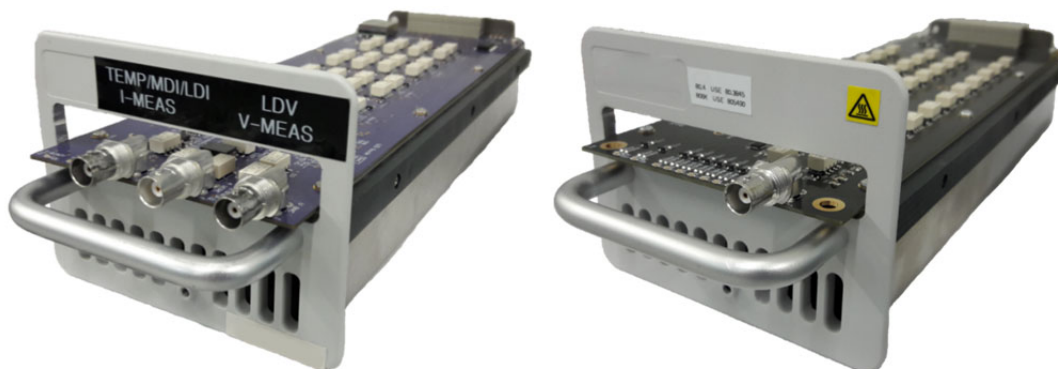

Figure 1. Standard and EAM Calibration Fixtures, respectively

Hardware Required List

In order to perform the requisite calibration, the following hardware and equipment is required and provided (using the previously supplied LRS-9434 System Computer[1]):

- Keysight 34470A Digital Multimeter (Configured for 220V operation)
- Standard Calibration Fixture
- EAM Calibration Fixture (Optional)
- External flash drive with ReliaCal and Keysight IO Libraries installers
- LRS-9434 Computer[1] with ReliaCal and Keysight IO Libraries Suite installed[2]
- LRS-9434 Rack with two available CMM shelves[3]
- Ethernet Cable
- USB Cable (A-Male to B-Male)
- BNC to Dual Banana Plug Cable

Notes:
1. Original PC laptop from previous LRS-9434 system order to be used for calibration, not provided in the ReliaCal package.
2. Flash drive includes proper IO Libraries installer, otherwise contact Keysight for current version and driver downloads.
3. If calibrating an LRS-9434SS Sentry, contact your local ILX Lightwave representative for more information.

Hardware Set up Instructions

1. On the LRS-9434 Rack system, disconnect a CMM that is not in use and power the Keysight 34470A with the disconnected AC cable. **Using a separate AC line for the Keysight multimeter as the CMM to be calibrated will cause an improper calibration.**

2. Ensure that the CMM to be calibrated is plugged into the rack and powered on. **WARNING: loss of power during calibration will require re-initialization of the CMM by an ILX Service team member.**

3. Connect the USB cable from the calibration computer to the Keysight 34470A DMM, then enable the power to the DMM via the front panel power button.

4. Install the calibration fixture into the desired zone to be calibrated, pressing firmly for a proper connection.

5. Verify that the calibration fixture is fully seated and powered on. The fixture's LED indicator lights should be visible.

6. Connect the ethernet cable from the calibration computer directly into the CMM.
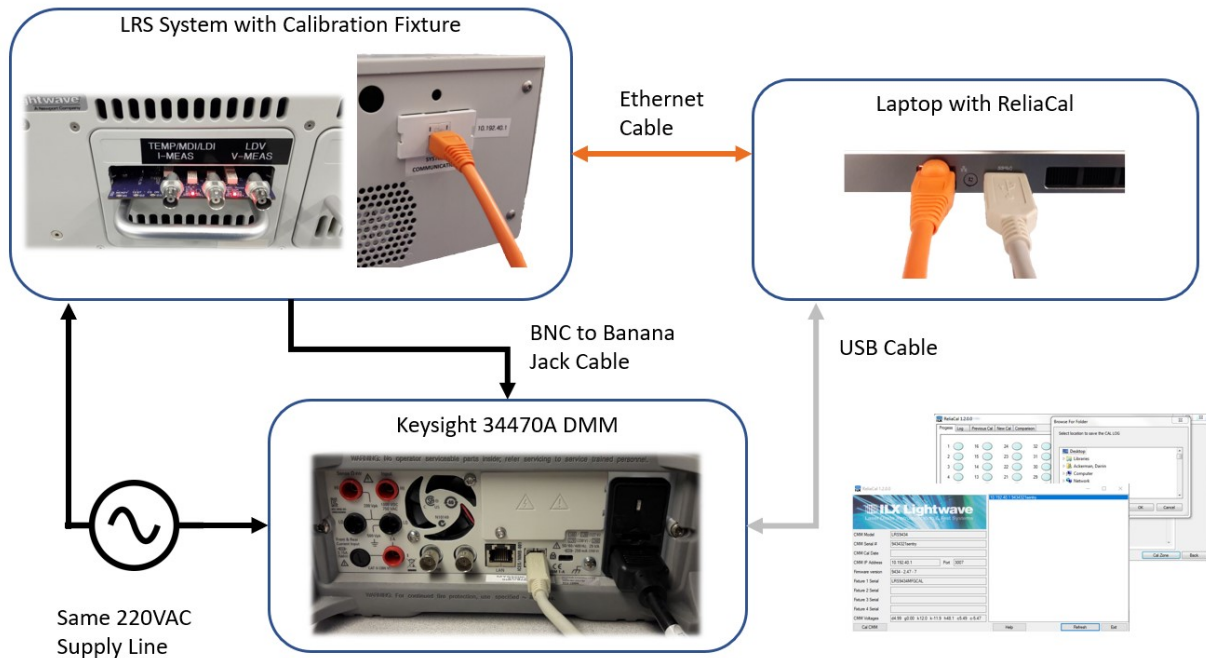

Figure 2. Hardware Connection Diagram

7. When running the software, follow the ReliaCal on-screen instructions during calibration for proper connection of the BNC to Dual Banana plug cable. Note the location of the ground tab on the dual banana plug and its installation orientation. The following pictures note the necessary calibration fixture and Keysight DMM hardware connections for each indicated calibration:
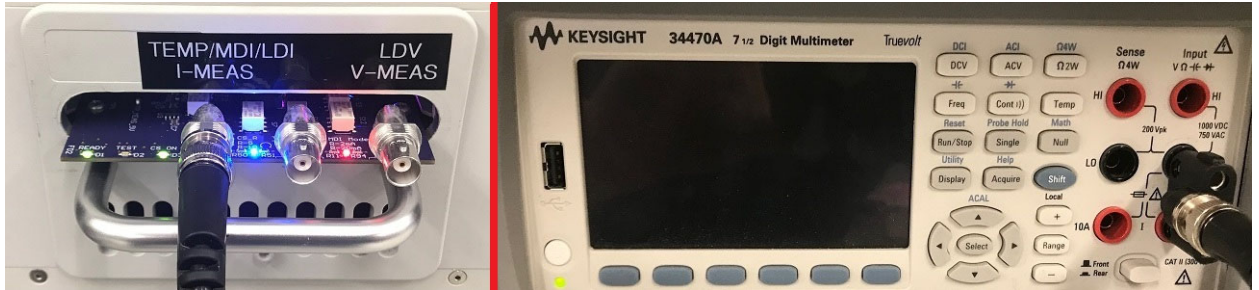

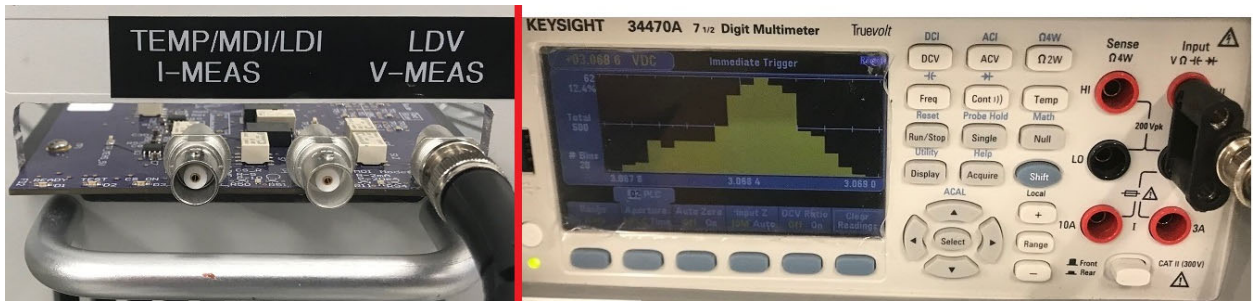Figure 3. TEMP / MDI / LDI Calibration Connection
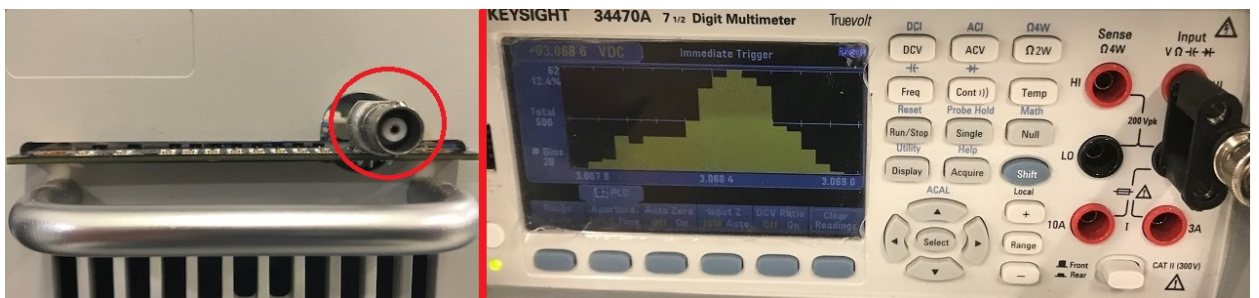

Figure 4. LDV Calibration Connection

Figure 5. EAM Calibration Connection (Optional)

Computer and Software Configuration

1. Verify that the ethernet connection from the calibration computer is setup as a static IP, on the same subnet as the CMM (e.g., 10.192.40.x). **CAUTION: Do not use the same end-number ('x') as other CMMs.**

2. Verify that ReliaTest is not connected to the CMM to be calibrated. This can be done either by closing ReliaTest (if no tests are running) or plugging the CMM directly into the calibration computer.

3. Open the ReliaCal calibration software. The home screen is displayed below.
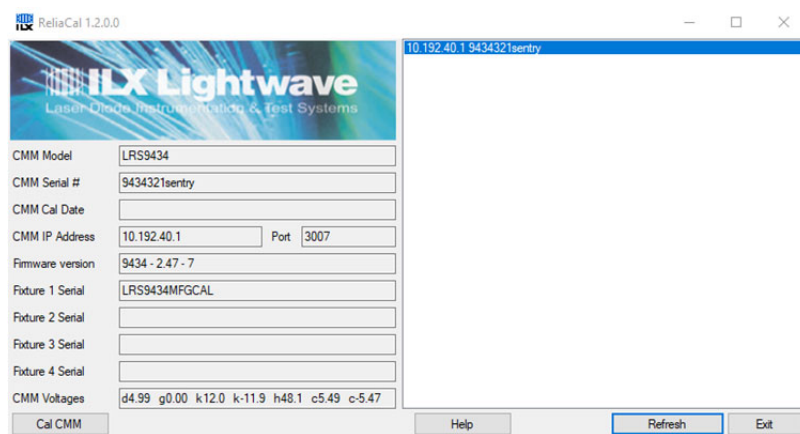

Figure 6. ReliaCal Home Screen

Note that the CMM Model, CMM Serial Number, and Calibration Fixture serial number should display in the appropriate fields. The 'Cal CMM' button in the lower left should also be enabled.

4. If 'Cal CMM' button is disabled, click the 'Refresh' button. Once it is active, pressing the 'Cal CMM' button will display the Cal Zone screen as shown below.
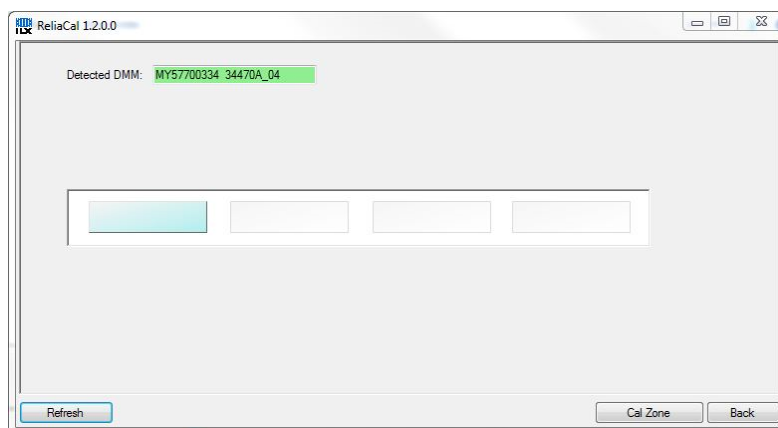

Figure 7. Cal Zone Screen

5. The proper zone for calibration will be highlighted, with the associated Keysight Digital Multimeter (DMM) shown as well. Press the 'Refresh' button to recheck for the attached DMM, the 'Cal Zone' button to proceed with the calibration, or the 'Back' button to return to the Home Screen.

6. After pressing the 'Cal Zone' button, the following windows will be displayed. You will be prompted to save a log file of the calibration by selecting the file destination. You can also press 'Cancel', and the calibration will continue as normal without saving a log file.
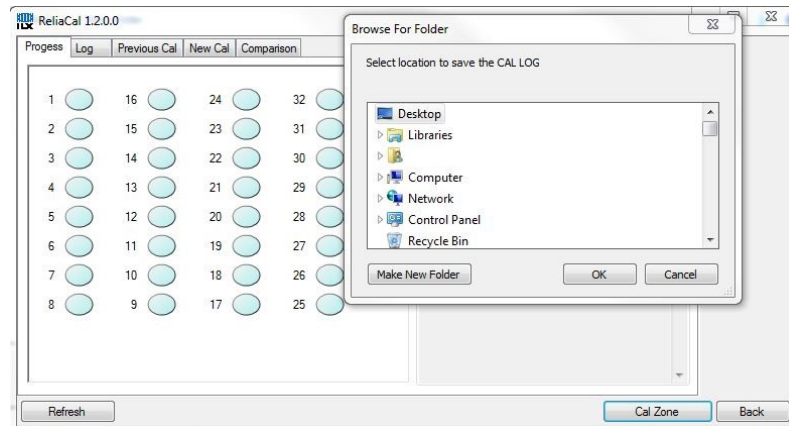

Figure 8. Cal Log and Initial Calibration Screen

Continue to follow the on-screen software prompts and directions for the proper DMM and Calibration BNC port hardware connections. During the calibration process, you can select the individual tabs from the Initial Calibration Screen to review the progress and results of the zone calibrations.

7. If there is a need to stop the calibration mid process, press the 'Abort' button in the lower right corner of any of the calibration screens.

8. When the final screen (actual calibration) is displayed, re-calibrate any failed positions by clicking the 'Cal Zone' button again.

9. Move the fixture to the next zone to be calibrated. Press the 'Cal Zone' button to begin calibration in the new zone.   Repeat the process until all zones are properly calibrated as desired.

10. (Optional) If calibrating an EAM CMM, use the EAM calibration fixture. Perform steps 3 through 9 of the Software Configuration section, with the specific fixture properly installed.

11. When all the zones of a CMM shelf are properly calibrated, return to the ReliaCal Home screen by pressing the 'Back' buttons, and then press the 'Exit' button to close the software. Repeat the Hardware and Software Configuration steps for additional CMM shelves to calibrate in the LRS-9434 test system.

Troubleshooting Procedures

Refer to the chart below for solving the most common issues observed while performing the calibration process. If any issue is observed that is not covered by the listed symptoms and solutions, please contact your ILX Lightwave service team representative for further action.

Problem / Symptom	Possible Causes	Action
Error message result during the ReliaCal procedure	Hardware disconnection during calibration process (Ethernet, USB, or BNC to Banana Plug terminal)	Re-connect all physical terminals and ports in question. Close and restart ReliaCal software; perform the calibration procedure again.
	Power loss of equipment during calibration	If a power loss is suspected during the calibration process, contact your ILX Lightwave service team to provide remote support/training to re-initialize digital board or analog boards. This requires full calibration of zones for analog boards, or temperature calibration across all zones.
A single zone or channel consistently fails calibration, despite success with other zones or channels	Improper cabling performed during hardware procedure	Check all physical external connections; remove and re-insert fixture making sure that the fixture is properly seated in the appropriate slot.
	Potential hardware problems	Contact ILX Lightwave service team to provide remote support and determine if an RMA is necessary.
Unable to find any CMMs in the first screen of ReliaCal, even after the refresh button is pressed	Ethernet cable is not plugged into CMM	Check ethernet cable to CMM and press the ReliaCal refresh button.

Unable to find any CMMs in the first screen of ReliaCal, even after the refresh button is pressed	Rack power is not supplied properly	Check all AC power connections and supply levels, then press the ReliaCal refresh button.
	Ethernet set-up has incorrect IP assignment	Ensure ethernet connection is setup as a static IP on the same subnet.
	ReliaTest is directly connected to CMM	Check hardware / software connections for proper configurations.
ReliaCal stops communicating with the control measure module	CMM firmware is locked up	System power must be cycled in order to reset the CMM firmware.
	Processor module has failed	If communications are not restored after cycling the system power, or if the CMM does not respond to the PING command from the DOS prompt, the processor module may have failed. Contact ILX for in-depth troubleshooting help.
No Multimeter is Detected	Keysight IO Libraries not installed / outdated drivers	Proceed to Keysight's IO Libraries installer on the appropriate website, ensuring updated instrument drivers are included as well.
	Multiple Multimeters are connected to PC	Ensure only one multimeter is connected, disconnect other DMM devices.

Returning Components for Repair

If troubleshooting has failed to remedy the problem, return of one or more components of the system for repair may be required. Before returning parts or equipment, a Return Material Authorization (RMA) number must be obtained from ILX Lightwave. The equipment must be shipped in the original packing carton or one that will provide equivalent protection with freight and insurance prepaid by the customer. The equipment should be sent to the factory at the address below, referencing the Return Material Authorization number.

ILX Lightwave
ATTN: RA# _____
31950 East Frontage Road
Bozeman, MT 59715 USA

Repairs are warranted for the remainder of the original warranty or for 90 days, whichever is greater.