

8 Adjustment Procedure

INTRODUCTION

You can use this procedure to adjust the HFP2500 probe to meet the warranted specifications. This procedure should only be performed if the probe fails to meet the Performance verification tests for Output Zero or Offset Accuracy.

Gain which affects LF attenuation accuracy cannot be adjusted during routine calibration. Probes which fail LF frequency accuracy during performance verification must be returned to the factory for rework.

If the probe cannot be adjusted to meet the Performance verification limits, repair may be necessary.

To assure probe accuracy, check the calibration of the HFP2500 every 1000 hours or once a year if used infrequently. Before calibration, thoroughly clean and inspect the probe as outlined in the Care and Maintenance section.

To assure the probe will meet the published specifications over the entire temperature range, adjustment must be performed in a controlled ambient environment with temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$.



Caution

The adjustment procedure will require removal of the probe control circuit cover. This cover is part of the ESD protection system of the HFP2500. To protect the probe, you should perform the entire procedure on a static dissipating work surface. Wear an antistatic wrist strap and follow standard static control procedures.

TEST EQUIPMENT REQUIRED

Table 8-1 lists the test equipment and accessories (or their equivalents) that are required for complete calibration of the HFP2500 Probe. Specifications given for the test equipment are the minimum necessary for accurate calibration. All test equipment is assumed to be correctly calibrated and operating within the specification listed. Detailed operating instructions for the test equip-

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ment are not given in this procedure. Refer to the test equipment manual if more information is needed

If alternate test equipment is substituted, control settings or calibration equipment setups may need to be altered.

Table 8-1. List of Required Equipment

Description	Minimum Requirements	Test Equipment Examples
Digital Oscilloscope	ProBus interface	LeCroy WavePro960 or LeCroy LT344
Digital Multimeter (DMM) with test probe leads	4.5 digit DC: 0.1% Accuracy AC: 0.1% accuracy	Agilent Technologies 34401A or Fluke 8842A-09 or
Power Supply	0-12 V, settable to 10 mV	HP E3611A
BNC Coaxial Cable (2 ea.)	Male to Male, 50 Ω , 36" Cable	Pomona 2249-C-36 or Pomona 5697-36
BNC Tee Connector	Male to Dual Female	Pomona 3285
Calibration Fixture	ProBus Extender Cable	LeCroy PROBUS-CF01
Terminator, Precision, BNC	50 $\Omega \pm 0.05\%$	LeCroy TERM-CF01
Banana Plug Adapter (2 ea.)	Female BNC to Dual Banana Plug	Pomona 1269
BNC to Mini-grabber	BNC Male to Mini-grabber Cable, 36"	Pomona 5187-C-36

PRELIMINARY PROCEDURE

1. Remove the two screws that secure the plastic cover on the cable end of the ProBus interface housing.
2. Gently pull on the probe cable to slide the circuit board assembly from the metal housing.
3. Connect the HFP2500 probe to the female end of the ProBus extension cable, being careful to line up all six pins of the probe connector. Connect the male end of the ProBus extension cable to channel 1 of the oscilloscope.
4. Apply power to the oscilloscope and test equipment.
5. Allow at least 30 minutes warm-up time for the HFP2500 and test equipment before starting the calibration procedure.

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PROCEDURE

A. Adjust Output Zero Voltage

1. Connect one end of a BNC cable to the probe end of the Pro-Bus extension cable. Connect the Precision 50 Ω Terminator to the other end of the BNC cable.
2. Connect the banana plugs of the precision 50 Ω terminator to the input of the DMM. Make sure the plug corresponding to the BNC shield (marked 'Ground') is connected to the **LO** or **COMMON** input of the DMM. Refer to figure 8-1 for setup information.

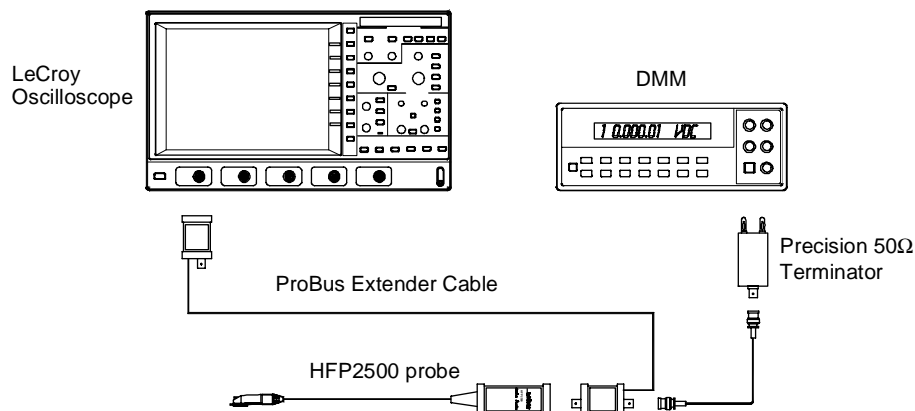


Figure 8-1. Output Zero Voltage Adjustment Setup

3. Select the channel to which the probe and ProBus extender is connected. Set **OFFSET** on the oscilloscope to zero as indicated on the on-screen display.
4. Set the DMM to read DC Volt on the most sensitive range.
5. Verify that the probe inputs are not connected to any signal.
6. Adjust **OFFSET ZERO** on the board until the DMM reads 0 V $\pm 100 \mu\text{V}$. Refer to figure 8-2 for adjustment location.
7. Leave the setup connections in place for the next step.

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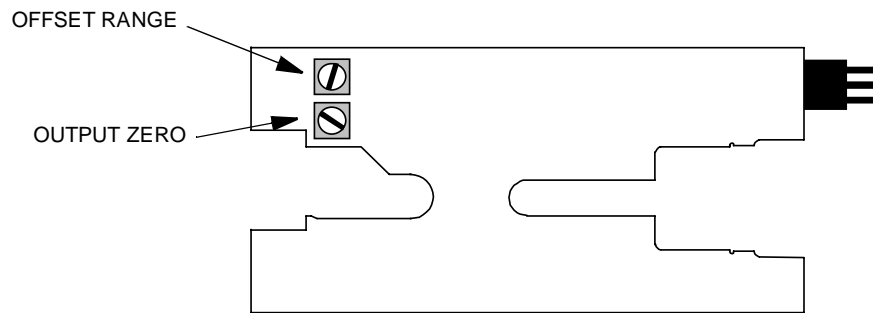


Figure 8-2 Adjustment Locations

B. Adjust Offset Range

1. Connect the BNC end of the BNC to mini-grabber cable to a female end of the BNC tee adapter and a female BNC to dual banana plug adapter to the male end of the BNC tee.
2. Carefully insert Straight Tips (supplied in the accessory kit) into the HFP2500 probe head sockets. Attach the red lead of the mini-grabber to the signal input and the black lead to the ground input of the probe.
3. Set the power supply for approximately 0 Volt.
4. Plug the dual banana plug adapter, with the probe attached, into the output terminal of the power supply. Make sure the side of the banana plug corresponding to the probe ground and BNC ground is connected to the **negative** terminal of the power supply.
5. Attach a BNC cable to the unused female port of the BNC tee and a dual banana plug adapter to the other end of the BNC cable and plug this into the DMM. Make sure the side of the banana plug corresponding to the BNC shield (marked 'GROUND') is connected to the **LO** or **COMMON** input of the DMM. Refer to figure 8-3 for setup information.
6. Using the DMM to monitor the voltage, adjust the power supply to an output of 10.00 V \pm 10 mV. Record the reading.

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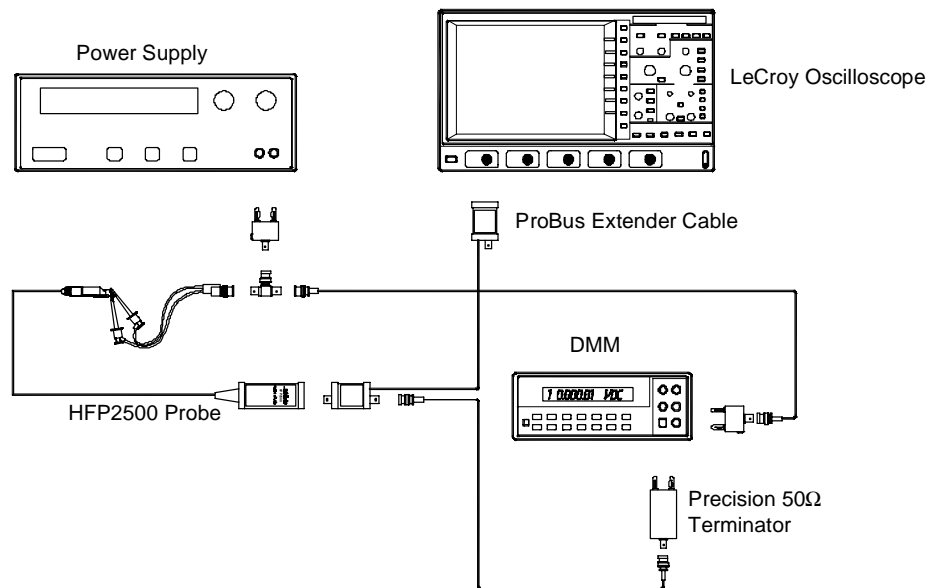


Figure 8-3. Offset Range Adjustment setup.

7. Remove the banana plug adapter from the DMM connect the precision 50 Ω terminator into the DMM Input. Make sure the side of the banana plug corresponding to the BNC shield (marked 'GROUND') is connected to the **LO** or **COMMON** input of the DMM.
8. Verify that the display for channel 1 is turned on. Set the oscilloscope **OFFSET** knob to -10.00 V. as read on the oscilloscope screen.
9. Set the DMM to read DC Volt on the most sensitive range.
10. Subtract 10.0 V from the power supply output voltage recorded in step B-7. Be sure to keep track of the sign of the result.
11. Adjust **OFFSET RANGE** until the DMM reads the same voltage ± 1 mV as calculated in step B-11. Be sure the sign agrees.
12. Repeat steps A-3 through A-7 of the Adjust Offset Zero procedure.

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13. Disconnect the probe from the ProBus extender and re-install the circuit board into the probe case, being careful to align the ProBus interface connector with the opening on the other end of the case.

C. Verify Calibration

Repeat the Performance Verification procedure to ensure compliance with the warranted specifications.

Apply a calibration sticker, if required, in accordance with your quality control procedures.

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