EAGLE RLB150 Family: Calibration Procedure

1.0 Preface

The **EAGLE** Your RLB150 return loss bridge is a well constructed unit that should give years of trouble free service. The periodic calibration check verifies that the unit is operating within its specifications.

2.0 Calibration Cycle

The calibration cycle is as follows:

1. Bridges in storage for more than one year require calibration before they are used for the first time. There is no need to run calibration on bridges in long term storage.

2. Bridges in use require calibration at no later than one year from date of previous calibration.

3. If any of the following circumstances exist immediate recalibration is required:

The center pin was damaged and has been replaced.

The bridge was known to be subjected to reverse power in excess of its specified rating.

The results are questionable.

The open loss thru the bridge exceeds specification.

The bridge has been subjected to mechanical forces in excess of specification i.e. dropped.

3.0 Calibration Procedure

3.1 Caution: Missing Center Pins

On receipt of your equipment inspect all connectors. Insure that each center pin is present. If a pin is missing check the packing material and try to locate the pin. When the pin is located it may be installed using a common pin vice or with a kit can be ordered from EAGLE.

The three calibration parameters are:

1. The open loss of the bridge

2. The open/short ratio

3. The directivity of the bridge.

3.2 Open Loss Test

This test requires either a network analyzer or spectrum analyzer capable of spanning the rated frequency of your bridge.

Connect the generator to the receiver of your test instrument with the cables you will be using to connect to the bridge. Use a double "N" female adaptor to connect the cables.

Adjust sweep frequency to at least the specified limits of bridge.

Adjust the instrument according to the manufacturers specifications and make sure that the trace indicates 0 dB. Slight errors, say .02 dB or less are allowable.

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3.2 Open Loss-continued

Remove the adapter

Connect generator to Source Port.

Connect receiver(input to screen) to Reflected Port.

Leave the DUT Port open or connect an Open.

Note the loss on the analyzer. It should be less than the specified loss. Note: In some bridge specifications the overall loss is not specified if that is the case add the Source to DUT and DUT to Reflected together. This information is contained on the data sheet on this web-site.

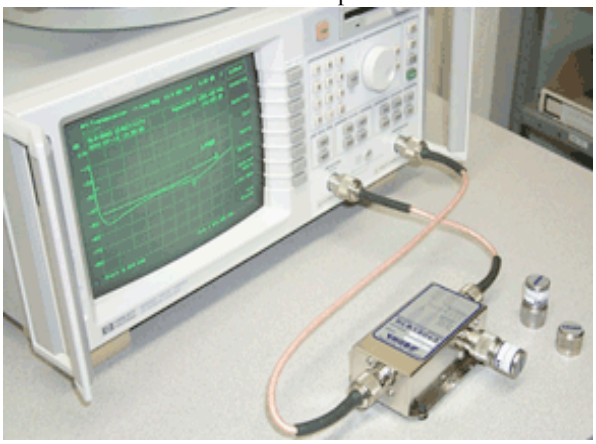
3.3 Open/Short Ratio Test

With everything set as in test above use the trace memory option for your analyzer to yield a trace of 0 dB. This is sometimes referred to as a trace math.

Connect a short to the DUT Port of bridge. Then observe the trace on the analyzer. It will be different, sometimes higher and sometimes lower than with the port open. Check data sheet to see the acceptable level.

3.4 Directivity

Following picture shows return loss bridge connected to network analyzer for the directivity test. Two EAGLE terminations and a short are also pictured.



Remove the short from the DUT Port of bridge.

Connect a precision load, rated at directivity of 50 dB or more

Observe level of the trace. It should be as good or lower than the specification in the data sheet (usually 45 dB).

It is advisable to test the bridge with two precision terminations as terminations are often out of calibration themselves. It is unlikely that two terminations and a bridge with errors would agree to 45 dB directivity. Also, in many cases a bridge reading out of spec is really due to a termination that is not good enough.

EAGLE does have a calibration service for bridges that you may want to consider.

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