

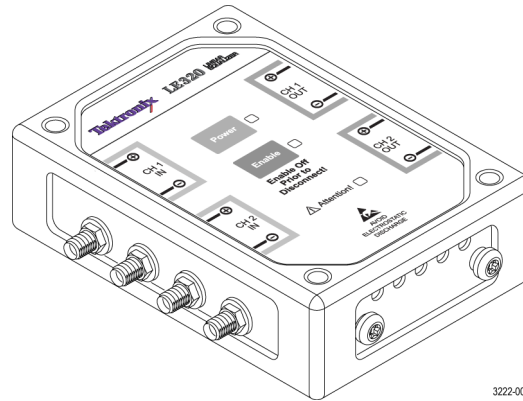
LE160 & LE320 Linear Equalizers Testing Application

Installation Instructions



Overview

The LE160 and LE320 Linear Equalizers are designed for use with BERTScopes and performance oscilloscopes up to 32 Gb/s. They include two independent, fully differential, 9-tap FIR channels that implement a fixed tap-to-tap delay of 18 ps (LE320) or 24 ps (LE160).



3222-001

Use this document to get the hardware connected and the application software installed. See your instruction manual for more details and for other test configurations.

LE160 and LE320 standard accessories

The LE160 and LE320 Linear Equalizers are shipped with the following accessories:

- 12 VDC power supply
- Installation instructions
- Two coaxial cables – 0.15 meter (6 in) length
- Phase-matched coaxial cable pair – 1.0 meter (39 in) length
- USB cable, A-to-mini-B

Installation

The procedures that follow should be done in the order they are presented:

1. Verify that all required equipment is available. (See *Required equipment*, below.)
2. Make the hardware connections between the instruments.
3. Download and configure the application software on your BERTScope or PC. (See *Load the BERTScope software* on page 2.)
4. Verify the system functionality.

Required equipment

You need the equipment and software listed below to complete these procedures.

BERTScope, model BSA175C or BSA286C

LE160 or LE320 Linear Equalizer unit

SMA cable, coaxial, male-to male (BSA accessory)

USB cable, A-to-mini-B ¹

(2) 2.92 mm cable, 0.15 m (6 in), coaxial ¹

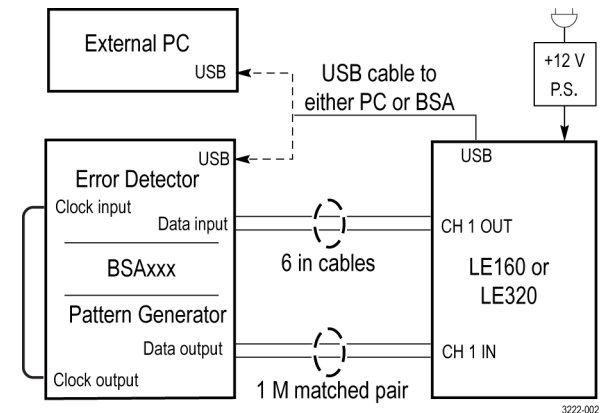
2.92 mm cable, 1 m (39 in), coaxial, skew-matched pair ¹

(Optional) PC w/Windows XP or Windows 7 32-Bit, or 64-Bit OS

¹ Standard accessory with the LE160/320

Make the hardware connections

Refer to the instrument connection diagram shown below when doing the following steps.



3222-002

1. Using the 6 in, 2.92 mm cables, connect the CH 1 output from the linear equalizer to the input of the BERTScope.
2. Connect the data output from the BERTScope to the CH 1 differential input on the linear equalizer.
3. On the BSA instrument, connect the Clk out from the pattern generator to the Clk in on the error detector.
4. Insert the mini-B end of the USB cable into the USB-mini-B connector on the linear equalizer. Connect the other end of the cable into the USB-A connector on the BERTScope (or PC, if using as the controller).
5. Connect the power supply to the linear equalizer. Note: The power supply must be connected to warrant proper operation.
6. Power on all of the equipment and allow it to warm up for 20 minutes.



071-3222-00

Tektronix

Load the BERTScope software

The BERTScope or PC must be loaded with Linear Equalizer application software. To load the software, do the following:

1. Go to the Tektronix Web site at www.tek.com.
2. Enter **Linear Equalizer** in the search field and click **Go**.
3. Locate and double-click the link for the LE application software.
4. Follow the on-screen instructions to download and install the software.
5. After a successful install, test the functionality using the procedure below.

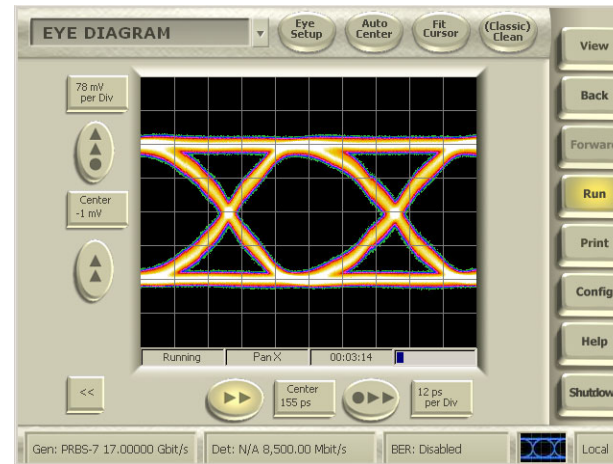
Verify test functionality

1. Make the following settings on the BSA pattern generator:
 - 17 GHz
 - PRBS-7
 - Clock 1.0 V
 - Data 500 mV
2. Launch the Linear Equalizer application.
3. Set the display to eye mode.
4. Look for jitter and an eye pattern @16 Gb; signal presence indicates that the settings will work for the LE160, LE320 and other BSA instruments.
5. Verify that you can connect to the LE using the GUI **Connect** button.
6. On the 4-tap panel, select the **16Gbps_0dB_Setup** from the drop-down list and then click the **LOAD** button as shown.



3222-003

7. Enable the BertScope channel and make the following settings:
 - CH1 to LE320 CH1 +
 - CH2 to LE320 CH1 -
 - Horizontal: 20 ps/div
8. Set the BSA scope data output level to 250 mV_{pp}.
9. The screen shot below shows the expected open eye and parameters.



NOTE. For an optimal eye display, you may need to adjust the taps to account for unit-to-unit and cabling setup variations.

Safety and compliance information

Use only the power supply provided with the product. Use of other power supplies may damage the product.

Refer to the complete safety information before using this product. Read the safety information in the instruction manual, on the CD included with the product.

EMC information and requirements. This product is intended for use in non-residential areas only. Use in residential areas may cause electromagnetic interference.

Emissions that exceed the limits of applicable EMC standards may occur when the equipment is connected to a test object.

Interface cables attached to this instrument must be of high quality, shielded construction to ensure compliance with regulatory EMC requirements.



Equipment Recycling. This product complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). For more information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).



Contacting Tektronix

Web site: www.tektronix.com

Phone: 1-800-833-9200

Address: Tektronix, Inc.
Technical Support Center
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

Email: techsupport@tektronix.com

Warranty Information

For warranty information, go to www.tektronix.com/warranty