

**Description:**

The MultiChannel Bit Error Rate Tester combines up to 12 independent BERT channels in a 1U chassis and is controlled with a single USB/software application. Each channel is capable of operating at speeds from either 125Mbps to 4.25Gbps or 1.244G to either 14.5Gbps or 29Gbps.



**Warning, do not exceed the SFP manufacturer's maximum receive power specification. APD receivers commonly used in long range and tunable transceivers are easily damaged at power levels above -7dBm.**

**USB Driver:**

In order for Windows to recognize the device the USB driver must first be installed, after which the unit appears as an additional COM port on the computer. Currently Windows XP, Vista, and 7, 8, and 10 are supported.

1. Copy the file "cdc\_NTXPV764.inf" from the supplied CD to the hard drive.
2. Plug the device into a free USB port. When the hardware installation wizard asks for the driver location, browse to the "cdc\_NTXPVista.inf" file on the hard drive.
3. After the driver has been installed right click "my computer" and select "properties". In the properties window select the "hardware" tab. Click on "device manager" and expand the "Ports (COM & LPT)" item. Locate the "Spectronix, Inc." entry and note the assigned COM number, (ie "COM4"). This is the COM port that the software will use to communicate with the device.

Note, on some operating systems such as Window 7, manual USB driver installation may be necessary. If the hardware installation wizard fails, go to "My Computer" > "Properties" > "Hardware" > "Device Manager", and find the "Spectronix" or "SERIAL DEMO" entry under "Other Devices" and select "Update Driver". At this point you will be able to browse to the location of the driver.

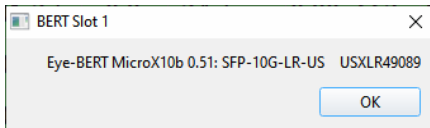
**Startup:**

When initially connected to a USB port, the front panel system LED will glow blue indicating the unit is in low power standby mode. Upon startup, the supplied Windows application will search for connected devices and populate the COM port field with each device found; the button to the left of the COM port box will refresh the list. Select the desired device and press the "Connect" button; if successful the USB symbol will turn green. Pressing the "BERT Power" button takes the BERT out of standby mode; the fans will turn on and the channel table will be populated within several seconds.

Type	BER	Errors	Count	Time	Rx (dBm)	Rx PRBS	Eye (UI,mV)	Rate (Gbps)	Tx PRBS	Tx (dBm)	WL(nm)	Temp (C)
10G	1.682E-11	5.099E+01	3.032E+12	0d 00:05:04	-2.3	2^11i	0.87, 625	9.953280	2^11i	-2.9	1310.00	40
10G	0.000E+00	0.000E00	3.685E+12	0d 00:05:07	-1.0	2^7i	0.90, 663	12.000000	2^7i	-1.0	1310.00	38
10G	0.000E+00	0.000E00	3.834E+11	0d 00:05:06	-17.3	2^9i	0.26, 663	1.250000	2^9i	1.7	1558.00	51
10G	0.000E+00	0.000E00	3.473E+12	0d 00:05:06	-40.0	2^11i	0.77, 553	11.317600	2^11i	-40.0	2000.00	50
2G	3.837E-02	2.635E+09	6.867E+10	0d 00:00:25	...82.3			2.666080	2^7i	...82.3	1310.00	29
2G	0.000E+00	0.000E00	8.513E+11	0d 00:05:19	-14.1	2^7i		2.666080	2^7i	-6.7	1310.00	35
2G	0.000E+00	0.000E00	1.324E+12	0d 00:05:11	0.0	2^23i		4.250000	2^23i	0.0		25
2G	1.019E-05	4.215E+05	4.127E+10	0d 00:05:30	-20.7	2^31i		0.125000	2^31i	-2.1	850.00	30

### Setting up the BERT Channels

BERT controls are located under the channel table. Parameters are configured by first selecting the appropriate channel (or channels) in the channel table, then setting the desired parameter using the controls. A channel is selected by clicking any cell in the channel's row; multiple channels can be selected by holding the control key while clicking on a cell. The first cell is highlighted blue/gray when a channel is selected; all channels can be deselected by pressing the "DeSelect All Channels" button.



Information about each BERT channel and its inserted SFP module can be displayed by selecting the first cell in a row. A popup window will display the channel slot, BERT speed grade and the SFP model and serial number.

### Configuring the Pattern Generator

With at least one channel selected, configure the generator for the desired bit rate using the dial or by entering a value in the rate box. The rate dial minimum and maximum values are determined by the values in the rate range drop down list. If the "Standard Rates Only" box is checked, the dial will snap to the closest standard rate. Setting the rate to a value above the channel's capability will cause the rate to be set to the maximum supported value. The pattern generator can be set to the one of the displayed PRBS patterns or to "Repeat" mode using the dropdown list. Only supported patterns will be displayed in the dropdown list depending on the type of channel(s) selected. An "i" is appended to the patterns in the table to indicate the pattern is inverted (standard). When using the Repeat mode, the pattern detector and error counters remain functional; refer to the Eye-BERT Micro and Eye-BERT Micro X documentation for more information on the repeat functions.

### Controlling the Transmitter

The reported transmitter wavelength is indicated in the table. If a tunable module is used, the output wavelength can be changed using the controls. Adjusting either the frequency or wavelength dial will change the other dial to the corresponding value. The dials snap to the nearest 50GHz channel. Depending on the SFP capabilities, the reported wavelength may not match the setting. Each transmitter can be enabled or disabled using the “Tx On” and “Tx Off” buttons.

### Resetting Errors and ReSync

The error counters of one or multiple channels can be reset using the “Reset Errors” button. This does not affect the transmitted signal or the receiver. Very long PRBS patterns can be difficult for the pattern detector to synchronize with; the “ReSync” button can be useful if synchronization is not achieved when changing rates or patterns.

### Eye Diagram

Real time eye opening measurements are displayed in the table for each 10G or 30G channel. The horizontal eye opening is displayed in unit interval (UI), and the vertical scale is displayed in mV. If the bit rate is greater than 4.975Gbps, pressing the “Scan” button will cause the selected BERT to acquire and display the eye diagram using the specified scale for 10 and 30G channels. If more than one channel is selected, the lowest numbered channel is used. Scan statistics and other information are listed in the plot legend. A contrast slider and several other options are available to adjust the image; these can be used before or after a scan. Pressing the disk icon, allows the user to save the scan as a bitmap image.

### Indicators and Various Options

By default, when the software application stops or is disconnected from the USB, the BERT power turns off causing all error counters to be cleared. Checking the “Retain power on disconnect” box, will cause the main power to remain on and all BERT channels to continue running. This feature is useful during long tests where there is a possibility that the computer may be turned off or the USB disconnected. Should this occur, the application can be restarted to view the cumulative test results which occurred during the disconnected period. Note, the front panel LEDs will only update if the application is connected and running.

Front panel LEDs and table row colors are used to indicate the lock and error status of each BERT channel as follows. Note colors change only when the application is running.

BERT State	LED Color	Table Row Color
Pattern not detected	Dark	Dark gray
Pattern detected, no errors	Green	Green
Pattern detected, new error(s)	Red	Red
Pattern detected, previous error(s)	Yellow	Yellow

### Statement of Volatility

This product contains both volatile and non volatile memory. Only the Device firmware application is stored in non volatile memory and program variables and settings are stored in volatile RAM which is cleared upon power down. The user has no means of altering the non volatile memory without opening up the unit and reprogramming the device using a special programming adapter.