

Test-Um Validator



What is the main difference between the Validator™ and a traditional certifier?

Traditional certifiers use analogue frequency sweep signals to measure likely conditions for failure against a set of predetermined metrics (TIA568). The Validator uses digital signal generation to measure the actual noise levels on a cable and also runs a BERT test.

What is a BERT Test?

A BERT (Bit Error Rate Test) dispatches millions of live data packets in both directions (full duplex) at the maximum data throughput possible (98.5%) and reports the error rate. This test guarantees the ability of the cable to perform at a specific data speed up to 1 gigabit. The specification as stated in IEEE 802.3 for 1 gigabit data speed is not more than one error in 10Gbits transferred. Validator will only perform a BERT test at 100 and 1000 Mb speeds.

Does the Validator measure how much headroom there is on a cable?

No. Headroom is also known as Attenuation to Cross Talk Ratio (ACR) and it is the difference between the signal attenuation (loss) on a cable and the near end cross talk, expressed in db. It basically measures how much margin there is in the cable's performance before the signal becomes distorted. By performing a Bit Error Rate Test (BERT), Validator reports the number of errors encountered when live data packets are sent down the cable and returned and provides a speed rating. If the BERT test results are acceptable, that means the attenuation and cross talk are minimal.

What are the test limits a Pass test result is based on?

Skew is a maximum of 35 nanoseconds and Signal to Noise ratio is a minimum of 20db. The acceptable data error rate (BERT) for data communications is 1 error in 10E10 bits (100 gigabits).

What is SKEW and SNR?

SKEW: Gigabit Ethernet systems carry data on all four pairs. The four pairs are in use at all times and each pair must be in synch with the other pairs. SKEW is the time difference in delay between pairs measured in nanoseconds. A SKEW greater than 45nS may cause information disparities. The 35nS limit is used to provide margin for temperature and other factors.

SNR: Signal to Noise Ratio is a compilation of measurements that test noise on cable that includes NEXT, Channel Response, Return Loss, and signal levels, which includes Attenuation, Amplitude and bandwidth. A SNR of less than 20 db will cause a cable to fail to carry 100Mb/1Gb data without errors. This is the real measurement TIA568 is inferring with their headroom number.

What is the accuracy of length and SKEW measurements?

The length accuracy on Validator or any other length measurement device has two components, the accuracy of the instrument's circuitry to measure the parameter that infers the length and the accuracy to which the cable parameter or constant is known. The accuracy of the Validator is specified as $\pm 3\%$, which is the parameter measurement accuracy. Add the cable constant accuracy for a general overall accuracy of 5%. This is competitive with most devices that measure length.

SKEW is measured using a crystal-controlled time base and is accurate to $\pm 0.2\text{ns}$.