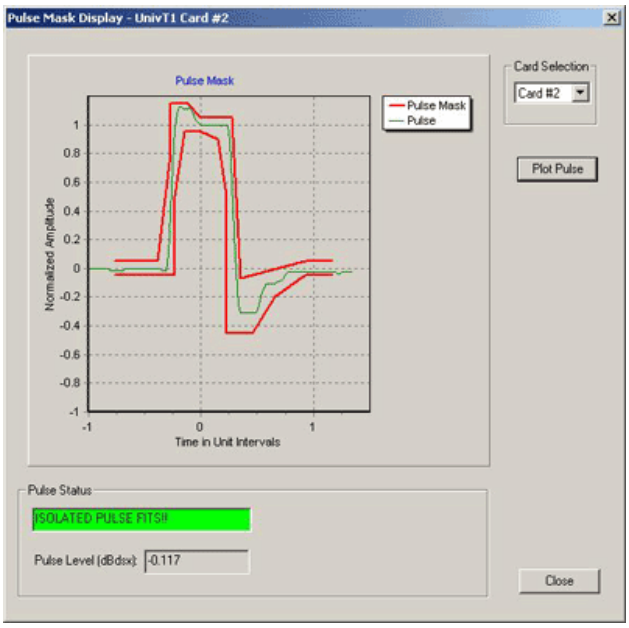
T1 E1 Pulse Mask Compliance



Verify Transmission at the Physical / Electrical Level

Verify Pulse Shape, Width, and Amplitude

Measure Pulse Shape of T1 and E1 Signals

Standards Compliance per ITU G.703 and ANSI T1.102-1993

T1 Pulse Masks Normalized to Pulse Amplitude of 1.0 V

E1 Pulse Masks Normalized to Pulse Amplitude of 2.37/ 3.0 V

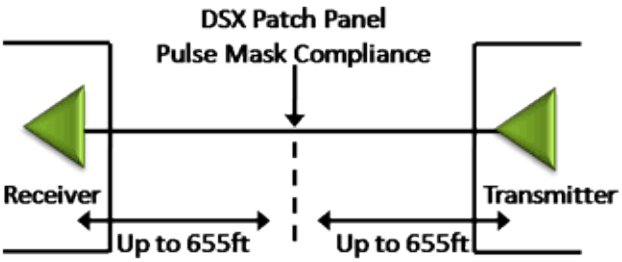
Overview

GL's Universal T1 E1 Cards have pulse shape measurement capability. Software has been developed to determine if the pulse shape fits within a "pulse mask" as specified by standards ITU G.703 and ANSI T1.102-1993. The software is available in both visual and tabular formats. Tabular formats are convenient for automation and scripted test environments.

It is quite common for T1 E1 signals, within a central office environment or an enterprise telecom room, to NOT meet pulse mask requirements due to interference, too long or short cable lengths, improper impedances, or simply poor transmitter design. In such cases, pulse mask compliance is very useful in diagnosing problems.

Background

In T1 E1 transmission systems, signals are dropped, inserted, and accessed at the electrical level at a point called DSX patch panel or at some similar point. To reliably receive, monitor, or access these signals, they must first conform to a standard that establishes parameters such as pulse width, rise time, amplitude, allowable undershoot and overshoot. If the pulse meets the pulse mask, then a properly designed receiver should be able to decode the bits transmitted. See diagram below.



Main Features

- Plots the pulse measured within a predefined template.
- Compares the incoming T1/E1 pulses against the pulse mask display.
- For T1 pulses, the x-axis measures time in unit intervals (UI), while for E1 pulse, the x-axis measures time in nanoseconds (ns),
- The y-axis measures the normalized amplitude in volts.

For more details, please visit our web page http://www.gl.com/pulse-mask-testing.html.

GL Communications Inc.

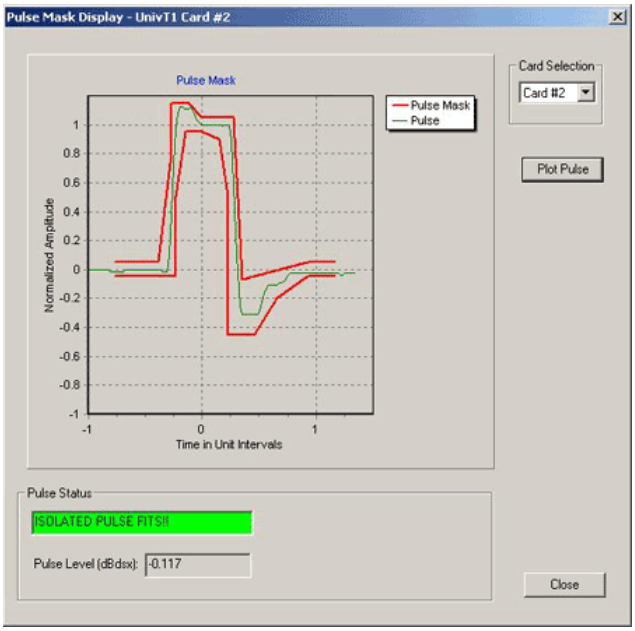
818 West Diamond Avenue - Third Floor. Gaithersburg, MD 20878 ● (V) 301-670-4784 (F) 301-670-9187
Web Page Address: http://www.gl.com/ ● E-Mail Address: gl-info@gl.com

T1 Pulse Mask Operation

The transmit data path is selected and measured at the end of the transmission line for each T1 line.

The specification for T1 requires that the T1 signal must fit within the pulse mask at the end of the line when transmitting an isolated pulse, regardless of the way the T1 device is configured. The amplitude of the isolated signal at time zero should be within 20% of 3.0 volts. If the amplitude requirement is met, then the signal is scaled linearly to determine if it fits the pulse mask.

Plots a pulse against the mask, with the pulse mask x-axis measures time in unit intervals (UI), where 1UI is the nominal time to transmit one T1 bit - 648ns. The y-axis measures pulse voltage in normalized amplitude: the pulse voltage is scaled to fit the mask.



Buyer's Guide

XX012 - Pulse Shape and Jitter Measurement - Easy, accurate, visual pulse shape and jitter measurement for T1 E1 signals

Related Hardware

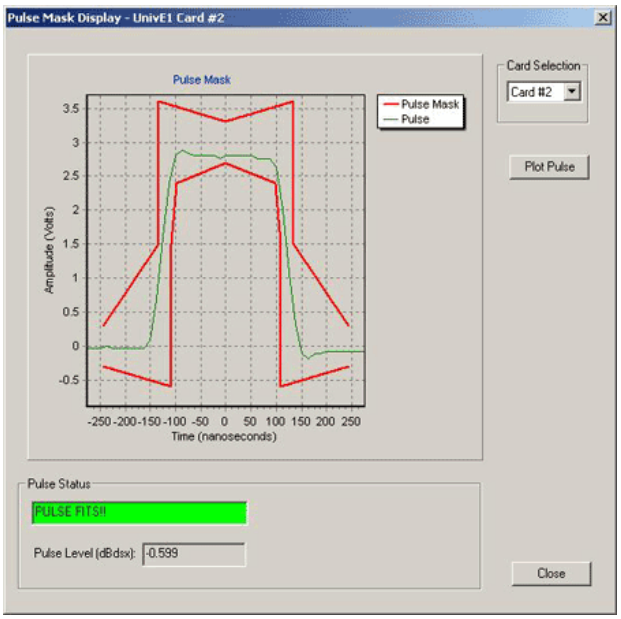
HTE001 - Universal HD T1 or E1 PCI Cards
HUT001/HUE001 – Basic Universal HD T1/E1 Software

* Specifications and features subject to change without notice.

E1 Pulse Mask Operation

The specification for E1 requires that all the pulses meet the template and not just an isolated pulse. Another difference is the fact that that pulses are measured at transmitter output, rather than after some length of cable, while T1 pulses must meet the template for the entire line length.

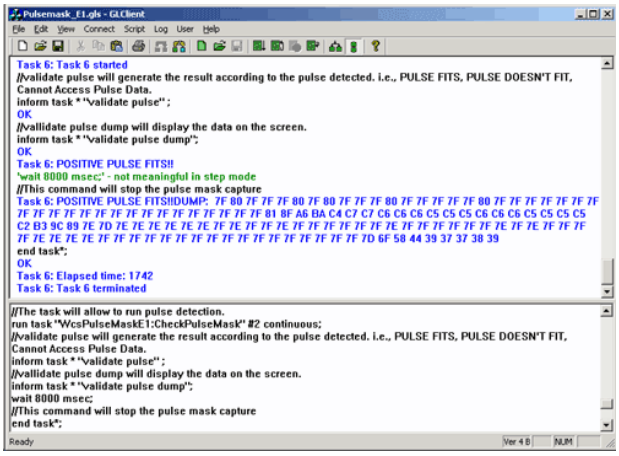
There are two types of cables used in E1 mode: 75 Ohm coax cable and a 120 Ohm twisted pair. Both cables have different nominal amplitudes associated with them. For the 75 Ohm coax cable, the amplitude must be 2.37V ± 10% at T0. For the 120 Ohm twisted pair, the amplitude must be 3.0V ± 10%.:



WCS Pulse Mask

The Pulse Mask compliance testing can be performed through commands with the Windows Client-Server application. The pulse mask can be remotely controlled using simple commands by client applications.

Some of the commands supported are CheckPulseMask, Validate pulse, Stop pulse mask validation, and so on. Pulse Mask will also return all error and warning message to WCS client as task error or warning message.



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