IMPLEMENTATION OF A VERY LOW COST PORTABLE SPACEWIRE MONITOR AND DEBUGGER

Session: SpaceWire test and verification

Short Paper

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ABSTRACT

The advent of a wide range of USB peripherals for personal computers has altered the test and measurement landscape. In particular, easily portable and inexpensive USB logic analyzers, such as the DigiView™ DV1-100, have enabled a host of industry-specific test applications. Such a logic analyzer used in conjunction with the Dynamic Engineering SpaceWire BreakOut (DESWBO) and an inexpensive notebook computer allows users to implement a portable and capable SpaceWire troubleshooting tool. Support software included with USB logic analyzers typically provides a myriad of display options, large data capture buffers, specialized trigger functions, and a variety of data export alternatives, including waveform images and ASCII files. A logic analyzer with a suitable sampling rate can be selected depending on the rate of the SpaceWire link of interest. Configuration templates for specific test scenarios are easily stored. The DESWBO fits between two nodes of a SpaceWire link using standard 9-pin MDM connectors. Data, strobe, and recovered clock signals are made available as pin outputs that may be monitored by the logic analyzer. Additionally, pins corresponding to SpaceWire events and conditions allowing monitoring and triggering by the logic analyzer. These include the reception of nulls, flow control tokens, normal and error end-of-packets, and timecodes. Signals for monitoring credit, disconnect, escape, and parity errors are provided. Eight data bits and six credit count bits may also be monitored. All components of the system may be stored in a laptop computer bag and deployed at a moment's notice to debug a SpaceWire problem.