SpaceWire Conformance Tester Mk2

The SpaceWire Conformance Tester Mk2 connects to a SpaceWire device and, through the host software, executes a variety of tests to check the unit under test's (UUT) compliance to the SpaceWire Standard. It is supplied as a single instrument specifically designed to support hardware and software engineers developing and using SpaceWire systems. The SpaceWire Conformance Tester Mk2 comprises a SpaceWire interface unit and software running on a host PC. The unit is connected to the host PC by USB cable.

SpaceWire Conformance Tester Mk2 front view

SpaceWire Conformance Tester Mk2 rear view

Key Features

The SpaceWire Conformance Tester Mk2 provides the following groups of tests and facilities for the unit under test (UUT).

Link/bit-level: Link initialisation testing, disconnection timeout measurement, link start-up speed and waveform analysis, link shut-down analysis and simultaneous Data Strobe (D/S) transition detection.

Exchange level: Validate the response to parity and escape errors in ErrorWait, Ready, Started, Connecting and Run states, along with the response to FCTs (Flow Control Tokens), N-Chars (Normal Characters) and time-codes in those states. Estimates of the 12.8 µs Started/Connecting timeouts can be made.
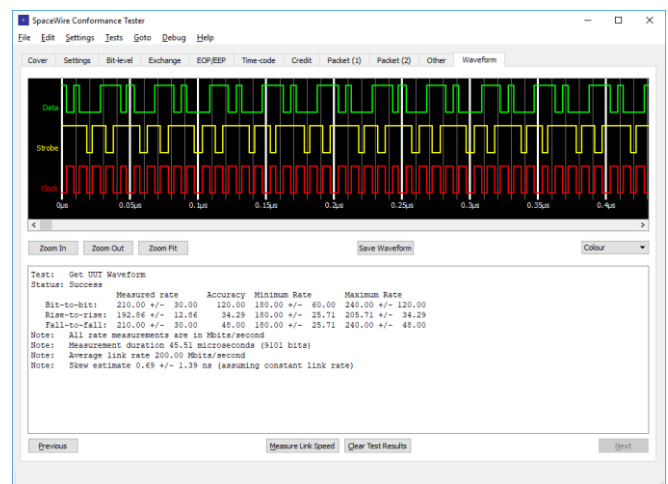
Credit checking: Validate the UUT response to excess FCTs and N-Chars, empty packet testing and monitoring UUT signals for credit errors.

Time-codes: Determine whether time-codes are accepted, probe the response to valid and invalid time-codes and measure the UUT time-code generation frequency.

Empty packets: Investigate the effect of sending empty packets terminated by EOPs (End Of Packet markers) and EEPs (Error End of Packet markers) .

Packet level: Test the transmission and reception of packets with different types of UUT: loop-back, data-sink, data-source, command-sender and command-receiver.

Waveform trace: A waveform display of the UUT data and strobe signals sampled over a period of 40 µs at 1.4 ns intervals is provided.
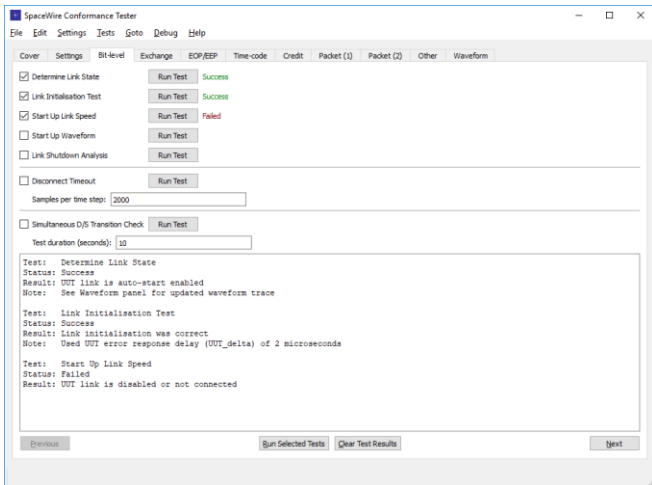

Waveform trace and rate analysis

Key Benefits

Ease of use: The user interface is on a host PC attached to the SpaceWire Conformance Tester Mk2 hardware by a USB interface. The graphical user interface has been designed with SpaceWire users in mind.

Link to ECSS Standard: Each test in the user manual specifies the clauses in the SpaceWire ECSS standard that it is designed to check. A separate table provides a mapping between SpaceWire ECSS standard clauses and tests performed by the SpaceWire Conformance Tester Mk2.

Detailed test reports: Each of the 59 tests provides a simple pass/fail indication along with details of the expected and measured UUT response. The results can be saved to a text file for future reference and/or analysis.

Example bit-level test results

Loop-back operation: One of the SpaceWire links on the device can be used as a data/time-code sink or as a data/time-code loop-back.

19" rack mountable: Readily mounted in a 1U high, 19" rack alongside other STAR-Dundee products using STAR-Dundee's rack mounting kit. Up to four SpaceWire Conformance Tester Mk2 units can be mounted on a 1U shelf.

USB 3.0 interface: This provides a high-speed connection to a host PC or laptop to configure and control the SpaceWire Conformance Tester Mk2.

Usability

Ease of use: The SpaceWire Conformance Tester Mk2 is easy to use, enabling spacecraft system and software engineers to rapidly test compliance to the SpaceWire standard throughout development.

Field upgradability: The SpaceWire Conformance Tester Mk2 supports field upgradeability of the unit's functionality. Any upgrades can be downloaded from the STAR-Dundee website and installed quickly and efficiently.

Latest Operating System Support: The SpaceWire Conformance Tester Mk2 software utilises STAR-Dundee's common software suite, STAR-System, which is frequently updated to support the latest Windows and Linux releases, if required. Updates to STAR-System and the SpaceWire Conformance Tester Mk2 software are made available to download from the STAR-Dundee website.

First class support: As with all of STAR-Dundee's products, a year's support and maintenance is included with the SpaceWire Conformance Tester Mk2. Support is provided directly from the team that developed the product allowing us to respond quickly with answers to technical questions, give assistance with application development, and resolve any problems quickly.

Specifications

Size: 110 x 30 x 112 mm (excluding feet).

Power: +5V DC, power brick supplied.

SpaceWire Ports:
- Compliant to ECSS-E50-12A and ECSS-E-ST-50-12C.
- Maximum Speed: 400 Mbit/s.

USB Port:
- Micro B USB 3.0 (compatible with USB 2.0).
- Type A to Micro B USB 3.0 Cable included.

Trace Memory:
- 40 µs of Data/Strobe samples for trace display.

EMC: CE/FCC certified.

Operates under Windows (Windows 10, 8, 7, Vista, XP) and Linux (4, 3 and 2.6 kernels).

A FMECA report is available on request.

STAR-Dundee
STAR House, 166 Nethergate
Dundee, DD1 4EE, Scotland, UK
Tel: +44 1382 201 755 Fax: +44 1382 388 838
Email: enquiries@star-dundee.com
Web: www.star-dundee.com