



## Product Family Overview

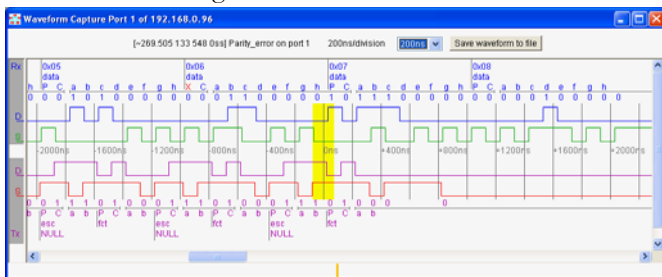
4Links' family of SpaceWire equipment has been acclaimed as the "Gold Standard" for test and development of SpaceWire devices and systems. Products from the family have, many times, detected errors not seen by simulation or other suppliers' equipment, and fixing such problems has resulted in major savings of time and cost. 4Links products are being used by the agencies and prime contractors in Europe, USA and Japan, and by many more companies and institutions world wide.

**Platforms and memory cards:** Products are supplied as a hardware platform with a firmware memory card. The platform is a rack mounted unit with SpaceWire connections on either the front or rear panel. The user can change the product function by plugging in an alternative memory card, or can use one platform with several memory cards as a spare for a set of these products in a test-bench. All units provide a user interface via Gigabit (or slower) Ethernet.

**Software** provided with the products includes a C-API, Java-API, data recording and analysis utilities, example programs and a comprehensive command line / script-driven interactive interface. RMAP is supported, either directly or via plug-ins. Source code for most software, including APIs, is supplied as well as compiled code. Communicating via Ethernet, the only drivers required, TCP/IP, are part of all major operating systems – no additional drivers need to be installed. 4Links products and software have been successfully used with Windows™, Linux™, Real-Time Linux™, VxWorks™, Solaris™ and MacOS™ (trademark ownership is acknowledged).

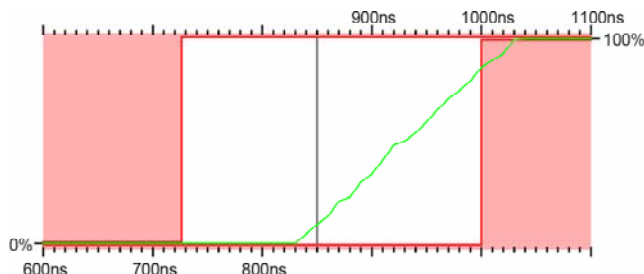
### Simple Data Interface (ESL)

Single active SpaceWire port, including autonomous time-code generator, accurate (8ns) time tags, error waveform recording.



### Diagnostic Data Interface (DSI)

Up to 8 active ports at link speeds from 2Mb/s to 400Mb/s. Precise (<2ns) synchronized time tags, error injection and detection, waveform recording. Ideal for larger systems and for conformance testing of devices and routers.



### Multi-function Router (FSR)

Eight SpaceWire ports can be configured as one or more routers, or cascaded with other units for larger routers.

### Link Analyzer (MSA)

Monitors up to 4 links, analyzing and recording statistics of token flows. Can also record link signal waveforms.

### Data Recorder (MSR)

Monitors up to 4 links, recording traffic to a data file for later analysis.

### Monitored RMAP target (SRR)

A firmware implementation of multiple RMAP targets where traffic is monitored, data inspected and activity reported to the user. Ports can be individually switched to Diagnostic SpaceWire Interface mode.

### Absolute Time Synchronizer (ATI)

4Links products, and their time-tags, can be synchronized to each other. This product synchronizes them to an external IRIG-B time source. This allows timing information to be consistent between 4Links units and the real-world. It includes an accurately synchronized pulse-per-second time-code generator.

Day:hh:mm:ss	ms	us	ns	Flow	Activity
288:15:19:31.000	000	000	5s	1-->2	Time Code 00
288:15:19:32.000	000	000	5s	1-->2	Time Code 01
288:15:19:33.000	000	000	5s	1-->2	Time Code 02
288:15:19:34.000	000	000	5s	1-->2	Time Code 03
288:15:19:35.000	000	000	5s	1-->2	Time Code 04
288:15:19:36.000	000	000	5s	1-->2	Time Code 05
288:15:19:37.000	000	000	5s	1-->2	Time Code 06
288:15:19:38.000	000	000	5s	1-->2	Time Code 07
288:15:19:39.000	000	000	5s	1-->2	Time Code 08
288:15:19:40.000	000	000	5s	1-->2	Time Code 09

### Cables

SpaceWire compatible cables are available in various standard lengths, or to order.

