

Developing and Testing SpaceWire ---Safely---

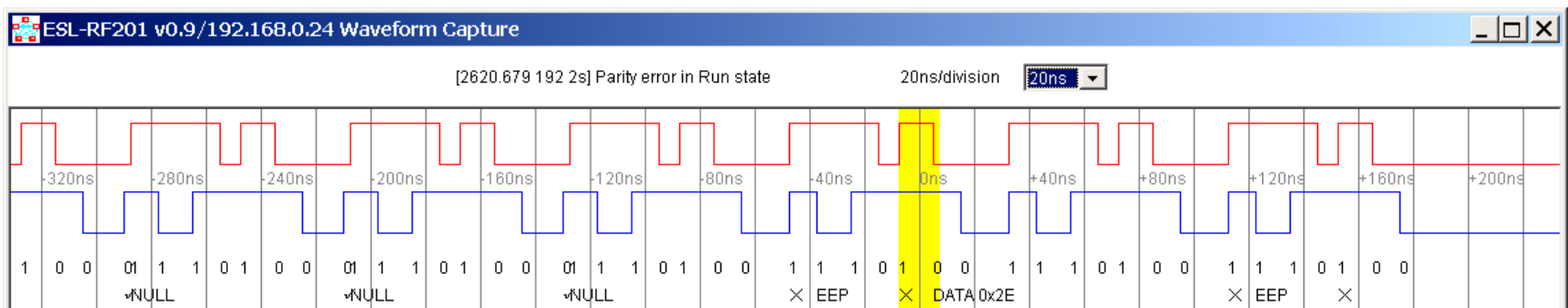
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Developing SpaceWire

4Links



- Ethernet family of SpaceWire test and simulation products, now with Gbit Ethernet
- Operating system independent (TCP/IP)
- Simple and powerful API, supplied with source
- Simple GUI for checking functionality
- Outstanding diagnostics, in place where and when you need them



Testing SpaceWire



- Testing also needs the monitoring and diagnostics to be in place for when something goes wrong
- Fully compliant with ECSS-E50-12A
- Interoperates with at least 9 SpaceWire cores
- Test scripts make repeatable tests
- Can provide access to monitor all SpaceWire traffic
- Can validate Links in Nodes (acting as switch)
- Can validate Network (acting as nodes)
- Gbit Ethernet can transfer data to and from, or can monitor or control, the network under test
- Stackable EGSE building block makes it easy to build 16-port, 24-port, 32-port (and larger) integrated, multi-function, test units

---Safely---

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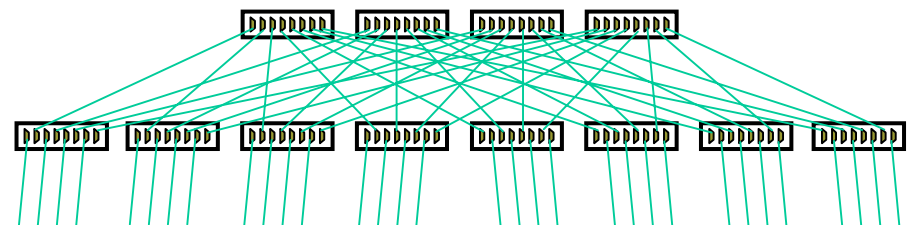
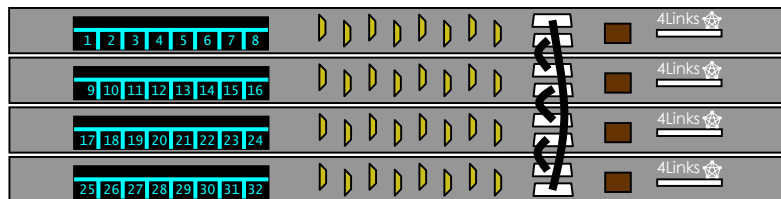
Many customers very concerned about the risk of damaging space-systems under test, so 4Links use:

- Individual LVDS buffers with current-limited outputs
- Individual current and voltage limits on power supply to each LVDS buffer
- Crowbar on 5V power supply
- Galvanic isolation on both power supply and Ethernet
- Optional optical fibre instead of copper Gbit Ethernet
- Ground wire in power cord
- TCP and Ethernet --- so tests can be done remotely

Quality costs less



- **Easy, proven, upgrades: Protect your investment**
- **One hardware platform: Many uses, just different memory card**
- **Locate problems quickly, solve them quickly, less risk of overruns from problems causing delays**
- **Stackable 8-port platform needs only four units to make 32-port router with full bandwidth**
- **Conventional 8-port router needs three times as many units to make full-bandwidth 32-port router**



Summary



- Information about errors must be gathered at the point of the error, not when (or if) they can be reproduced six months later
- 4Links' EtherSpaceLink product has demonstrated its ability not only to capture the details at the point of error, but also to provoke errors and to provide easily useful diagnostic information about those errors
- 4Links understand, and deliver to, the absolute need to protect irreplaceable systems under test
- Our move to Gbit Ethernet has been taken as an opportunity to create a stackable EGSE building block, which brings to SpaceWire EGSE the same modularity, reusability, scalability and cost-effectiveness as SpaceWire brings to spacecraft