

SPACEFIBRE

Session: SpaceWire Standardisation

Long Paper

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ABSTRACT

SpaceFibre is a proposed very high speed serial data link intended to complement the existing SpaceWire high-speed data link standard. SpaceWire operates at speeds up to 200 Mbits/s in radiation tolerant technology. SpaceFibre will be able to operate over fibre optic and copper cable and support data rates of 2.5 Gbit/s and possibly higher.

SpaceFibre aims to extend the capabilities of SpaceWire: improving the data rate by a factor of 10, reducing the cable mass by a factor of four and providing galvanic isolation.

The principal requirements for SpaceFibre are listed below:

- Provide symmetrical, bi-directional, point-to-point link connection
- Operate at high speed (1-10 Gbits/s) with a target of at least 2.5 Gbits/s
- Operate over fibre cable lengths of up to 100 m
- Also operate over copper cable over shorter length of 5 m
- Have a fibre optic cable mass of less than 20 g/m for a full-duplex link
- Provide galvanic isolation
- Support arbitrary network architectures
- Support mixed SpaceWire-SpaceFibre networks using a SpaceWire-SpaceFibre router
- Be able to multiplex a scalable number of SpaceWire links over a SpaceFibre link

The full paper will describe the work done by University of Dundee in developing SpaceFibre. It will report the results of a survey of existing commercial high-speed networks, provide an introduction to the SpaceFibre interface, and conclude with an overview of the SpaceFibre demonstration system developed by University of Dundee.