Products Overview

STAR-Dundee provides a complete range of well proven SpaceWire and SpaceFibre products, helping to reduce risk in development of instrument interfaces, data-handling equipment and related EGSE. Our leading expertise in SpaceWire technologies and focus on engineering support helps customers meet demanding design, validation and integration schedules. We are flexible in supporting customers offering consultancy, training and design services.

SpaceFibre Products

SpaceFibre is a very high-speed serial data-link intended for use in data-handling networks for high data-rate payloads. SpaceFibre is able to operate over fibre-optic and electrical cable and support data rates of 2.5 Gbits/s. Multi-laning extends the data-rate further to over 20 Gbits/s. It aims to complement the capabilities of SpaceWire: increasing the data rate, reducing cable mass and providing galvanic isolation, while also including a coherent quality of service (QoS) mechanism and fault detection, isolation and recovery (FDIR) capability.

SpaceFibre IP Core

The SpaceFibre IP core provides a SpaceFibre interface fully compliant to the most recently published draft of the SpaceFibre standard specification.

STAR Fire

STAR Fire is designed to support the evaluation and early adoption of SpaceFibre technology with a comprehensive test and development platform. STAR Fire can operate as a bridge between SpaceWire and SpaceFibre, as a SpaceFibre link analyser, as a rapid SpaceFibre packet generation and checking unit, and as a decoder of SpaceFibre signals for operation with a logic analyser. The STAR Fire unit provides two SpaceFibre interfaces each running at 2.5 Gbits/s, two SpaceWire interfaces and a USB 2.0 interface for host PC connection.

SpaceWire Products

STAR-Dundee provide an extensive range of products that covers all levels of the SpaceWire standard, including everything needed to design, develop, integrate and test SpaceWire sub-systems.

SpaceWire Development Kits

SpaceWire RTC Development Kit

The SpaceWire RTC Development Kit is designed specifically to support the development of hardware and software for the Atmel AT7913E SpW-RTC, a Radiation-Hardened SPARC® V8 processor for space applications. With CAN, FIFO, ADC/DAC and SpaceWire interfaces it provides a bridge for traffic from sensor networks to a high speed SpaceWire network. The RTC Development Kit consists of a well-engineered AT7913E processing board and a complete all-in-one SPARCv8 Software Development Environment.

SpaceWire Interface Devices

Our SpaceWire interface devices provide a variety of ways to add SpaceWire functionality to a PC. Each interface device also contains a SpaceWire router function. Comprehensive APIs and extensive source code examples provided with the devices make application programming straightforward. Windows and Linux drivers are provided, with other platforms available separately.

SpaceWire Brick Mk3 (NEW 2015)

The SpaceWire Brick Mk3 connects to a PC via USB 3.0 providing a high speed connection to the two SpaceWire ports, each capable of operating at over 200 Mbits/s. The Brick is powered from the USB cable making it ideal for easily portable SpaceWire test equipment.

SpaceWire PCI Mk2

The SpaceWire PCI Mk2 board provides three SpaceWire ports on a PCI board. Each interface operates independently at up to 200 Mbits/s. Drivers for VxWorks, QNX and RTEMS are available separately.

SpaceWire cPCI Mk2

The SpaceWire cPCI Mk2 board is functionally the same as the SpaceWire PCI Mk2 board, providing three SpaceWire interfaces. It can be provided with a 3U or 6U front panel.
Drivers for VxWorks, QNX and RTEMS are available separately.

SpaceWire PCI Express

The SpaceWire PCI Express board is a single-lane PCI express board that provides three SpaceWire interfaces, each capable of operating at over 200 Mbits/s. Powerful routing capabilities and error injection are all provided on this interface device.

SpaceWire Routers

STAR-Dundee's SpaceWire interface devices all include SpaceWire router functionality allowing packets to be routed from one SpaceWire port to another, and to the host. Path and logical addressing are supported along with group adaptive routing and many advanced router features designed and proven by STAR-Dundee. When a routing device is required with more than two or three interfaces a range of router devices are available: from versatile lab and EGSE units to flight ASIC development kits.

SpaceWire Router Mk2S

The SpaceWire Router Mk2S is an eight-port SpaceWire router with a ninth port connected to a USB 2.0 interface for connecting a host PC to a SpaceWire network. The router inside this unit is compatible with the SpW-10X radiation tolerant router, the Atmel AT7910E. The SpaceWire interfaces operate at up to 200 Mbits/s and a pair of external FIFO ports are ideal for connecting the router to a hardware breadboard during instrument development. The SpaceWire, USB, external FIFO, and time-code ports are all available on external connectors.

SpaceWire SpW-10X Development Kit

The ESA SpW-10X ASIC is a high performance, versatile, radiation tolerant SpaceWire router device. Designed by the Dundee team for flight use, it is available from Atmel as the AT7910E ASIC device. With eight SpaceWire ports, two external FIFO ports, a time-code port, and an internal RMAP configuration/control/status port, the SpW-10X is an advanced and well tested SpaceWire router device available for flight applications. The SpW-10X Development Kit provides an AT7910E ASIC device in a ready to use unit.

SpaceWire Analysis Tools

To support the test and development of SpaceWire equipment, networks and related software, STAR-Dundee provides a comprehensive set of analysis tools designed to rapidly pinpoint problems and validate that equipment is working as designed. When pressure to deliver to schedule is on, our analysis tools really help and often form a crucial part of EGSE for flight systems.

SpaceWire Link Analyser Mk2

The Link Analyser Mk2 is an extremely powerful debug and test tool, which includes many features requested by our customers. It is able to trigger from an external trigger source, on specific data patterns flowing through the SpaceWire link or on error conditions, and can capture the data flowing through the link before and after the trigger occurred. With the ability to store millions of data characters and to display them in terms directly related to the SpaceWire or RMAP standards, the Link Analyser Mk2 is able to rapidly detect problems and help identify the cause. To facilitate operation with other test equipment a standard logic analyser connector is provided, together with input and output triggers.

SpaceWire Conformance Tester

The Conformance Tester provides a wide range of tests to probe the compliance of SpaceWire devices against the SpaceWire ECSS standard. The Conformance Tester is used by chip designers and system integrators to validate SpaceWire interface designs.

SpaceWire RMAP Tester

The SpaceWire RMAP Tester is a powerful software application that provides the means to validate RMAP target implementations and to test the functionality of SpaceWire equipment using RMAP commands. The RMAP Tester is supplied with a GUI that provides the environment to construct sophisticated test and configuration scenarios, and an interpreter for command line operation for automated testing using test case and configuration files.

SpaceWire Physical Layer Tester (NEW 2015)

The SpaceWire Physical Layer Tester (SPLT) is a tool designed to test, validate and verify a SpaceWire system across all levels of the SpaceWire standard. Two SpaceWire ports employ a special LVDS interface which allows the transmitted signals to be deliberately and measurably manipulated to test the capability of a unit under test to receive signals of varying quality. The SPLT SpaceWire drivers offer full, independent control of LVDS common-mode and amplitude for data and strobe pairs, and additional manipulation of skew and jitter characteristics can be introduced between data-strobe and in-pair. To facilitate acquisition of an eye-diagram, the analogue LVDS signals received on these ports are buffered onto external connectors for easy interfacing to an oscilloscope.

SpaceWire IP-Tunnel

The IP-Tunnel provides a means by which "Virtual Spacecraft Integration" can be performed: the ability to test components of a spacecraft together, despite those components being a great distance apart. The IP-Tunnel software achieves this through use of the Internet (or some other network). Traffic normally exchanged between components over a SpaceWire link is instead tunnelled through the Internet.

Protection

SpaceWire Isolator (NEW 2015)

The Isolator provides isolation for two SpaceWire links. Isolation is rated to 60 Volts between the Test and Flight interfaces and 1 Volt between SpaceWire links 1 and 2 on these interfaces.

Instrument Simulation

SpaceWire EGSE

The SpaceWire EGSE is a test and development unit that simulates instruments or other SpaceWire equipment in real-time. The EGSE is configured using a simple, powerful scripting language designed specifically for SpaceWire applications. Once configured the EGSE operates independent of software resulting in real-time performance. The SpaceWire EGSE can generate detailed packets in pre-defined sequences at specific times and data rates, controlled by state machines and events.

Software

Our new range of SpaceWire interface and router devices are supported by STAR-System; our API and driver system that presents a common interface across operating systems, and allows different types of SpaceWire devices to be accessed in a consistent manner. It includes extensive example software with source code, GUI applications and drivers for both Windows and Linux platforms, all supplied as standard. VxWorks, QNX, RTEMS and LabVIEW VISA drivers are available separately for some devices.

SPARCv8-SDE Software Development Environment

The SPARCv8-SDE is designed to support the development of software for the SPARC V8 series of processors, SoC devices and FPGA cores targeted for on-board spacecraft. The SDE consists of: Eclipse IDE software development platform, GNU Compiler Collection (GCC), and custom plugins to provide seamless access to peripherals and other components on the target platform, including display and control of all device registers, processor caches and trace buffers through graphical views in Eclipse.

SpaceWire IP Cores

STAR-Dundee provides a range of well tested, widely used, IP cores that provide a cost effective, low risk way of adding SpaceWire capability to your instruments, processors, memory systems and other spacecraft on-board data-handling equipment. We provide a complete family of SpaceWire IP cores which have been implemented in Xilinx and Microsemi FPGA and ASIC technologies.
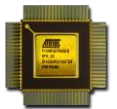
SpaceWire CODEC

The CODEC IP core provides a SpaceWire interface fully compliant to the SpaceWire standard.

SpaceWire RMAP Target

The RMAP Target IP core provides a flexible RMAP target together with a SpaceWire CODEC. The RMAP target can be used with or without a processor in the SpaceWire RMAP target device.

SpaceWire RMAP Initiator

The RMAP Initiator IP core offloads RMAP command and reply processing from a host processor. It provides effective generation of RMAP commands and automatic handling of the subsequent replies. The Initiator can also be used without a host processor to send repeated patterns of SpaceWire RMAP commands on request and to collect the responses.

SpaceWire Router

The Router IP core provides proven SpaceWire router technology in a form easily customized for specific applications, whether a standalone router device, or an embedded router core. Generics control the number of SpaceWire and external FIFO ports.

SpaceWire Cables

STAR-Dundee provides a range of SpaceWire cables suitable for laboratory use. SpaceWire lab cable assemblies are available in lengths of 0.5, 1, 2, 3, 5, and 10 metres.