iSAFT SpaceFibre Front-End

The iSAFT SpaceFibre Front-End provides SpaceFibre data interfaces with advanced asynchronous transmission and traffic generation capabilities that simulates SpaceFibre devices or instruments, enabling S/C integration tests before the availability of Flight Models.

It also includes a built-in recording function for received / transmitted packets (spy function), suitable for the validation of satellite/spacecraft flight devices and ground testbed devices implementing the SpaceFibre protocol family.

It is provided as a rackmount system with 4 or 8 port SpaceFibre interfaces with advanced traffic generation and asynchronous transmission capabilities. It is capable of transmitting/receiving data packets over multiple SpaceFibre links, time stamping received packets, and capturing transmitted/received traffic to a powerful Protocol Analyser. It is based on the iSAFT graphical tool chain, for the configuration/management of the simulation (locally or remotely). The iSAFT SpaceFibre simulator is a powerful device for the validation of on-board data networks at early stages, minimizing costs and schedule. It can be part of EGSE Data Front Ends and implements the core functionality of an EGSE controller.

Using its built-in recording function, it is capable of capturing data packets on multiple SpaceFibre links and delivering them to a powerful Protocol Analyzer for further processing & analysis. Operating on a multi-Gbytes powerful HW platform, the SW environment is based on the iSAFT graphical tool chain, thus allowing the management, filtering & searching of the recordings. It is used for troubleshooting and problem solving at various development stages, minimizing the impact on cost and schedule.

Main Features & Competitive Advantages

- Four to eight single lane data ports on QSFP+ connectors, supporting both electrical and optical interfaces
- Up to 32 VCs total with link rates of 1, 1.25, 2, 2.5, 3.125, 6.25 Gbps, according to ECSS-E-ST-50-11C
- Complete graphical software environment for controlling and monitoring the hardware
- Packet Editors (SpaceFibre, RMAP, CPTP)
- Asynchronous SpaceFibre transmission and traffic generation support
- Programmable packet-to-packet delay for link throughput control
- Built-in recording function for received / transmitted packets (spy function, various filters & triggers available)
- SpaceFibre physical link capturing and decoding of SpaceFibre characters for debugging purposes (various filters & triggers available)
- Integrated Wireshark Protocol Analyser
- Real-Time Statistics per port / virtual channel (packet and SpaceFibre characters statistics)
- Recordings management, export to XML, JSON, CSV or plain text
- Remote Access APIs in C++, Python, Java (Windows, Linux)
- EDEN / C&C CCSDS protocol & S2K MIB support for communication with a Central Checkout System (CCS)
- IRIG support for time synchronization with other components in a testbed
- Proven Technology in various space testbeds across Europe

Key Benefits

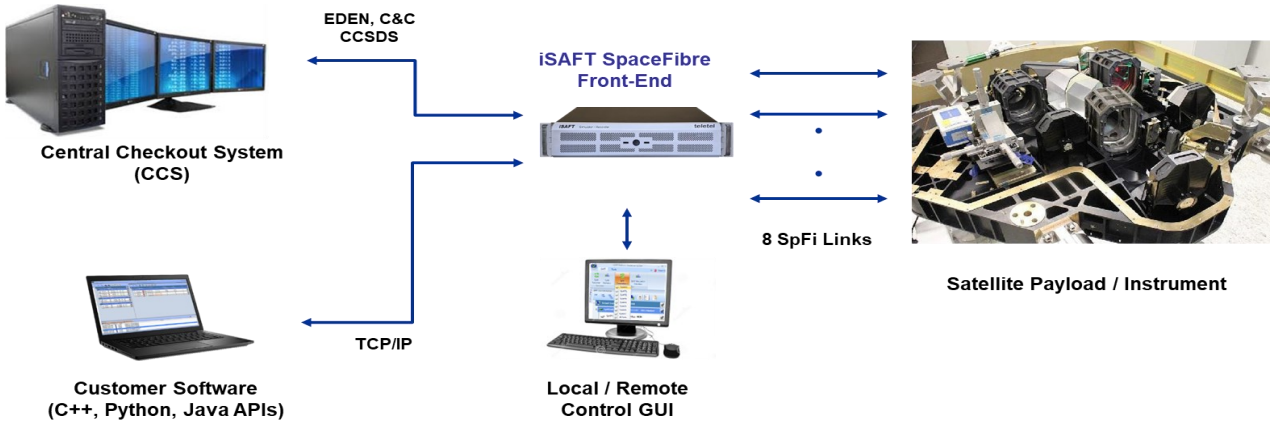
- Unique product in the market supporting SpaceFibre networks validation
- Optical or electrical interfaces via QSPF+ port
- Modern graphical user interface with packet editors
- Powerful remote control APIs supporting rich functionalities
- 100% internal design, can be customised to customer needs

Application Areas

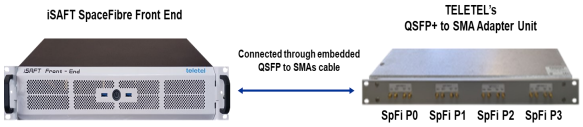
- Design & development of on-board data networks
- Simulation / Recording / Traffic Generation / Test equipment
- EGSE / Test Benches
- Data Front Ends
- Hardware in the Loop Simulation
- Experimentation with new protocols and various protocol features

Specifications

Use Case Example - Validating Scientific Payloads / Instruments



Electrical Connectivity (over copper)



The iSAFT SpaceFibre FE provides Electrical Interfaces (over copper) on a single QSFP port. For the adaptation of the QSFP to SMAs connectors, a QSFP+ to SMA Adapter can be provided as an Option.

Optical Connectivity

The iSAFT SpaceFibre Card provides Optical Interfaces over an Optical Transceiver Module on QSFP port. The recommended Optical COTS components include a 40GBASE QSFP transceiver and an MTP-8 UPC to 4 LC UPC, which can be provided as an Option.

Technical Data

General	
Dimensions (W x D x H)	448 x 370 x 89 mm (2U)
Operating temp range	0°C to 40°C
Standards	CE, RoHS, FMEA available

SpaceFibre Interface	
Number of ports / Connector	4 to 8 ports on QSFP+ Up to 32VCs
Link speed	From 1 to 6.25 Gbps per port (independently set per port)
IP Core / Protocols	ESA SpaceFibre IP
Functionalities	Simulation, Recording, Traffic Generation, Timestamping support
Electrical standards	CML signaling (galvanically isolated)

IRIG Interface	
Type / Connector	IRIG-B002/006 (DCLS) / QSFP+
Functionality	IRIG receiver

Software	
Built-In OS	Windows 10 64bit
Main features (supported by a modern GUI)	Board management, SpaceFibre / RMAP / CPTP packet editors, simulation, traffic generation, recording, off-line analysis, statistics, Wireshark protocol analyzer
Remote Access APIs	C++, Python, Java (Windows, Linux)

Options	
Software	iSAFT EDEN or CCSDS C&C Remote Control & S2K MIB - SpFi
	RMAP, CPTP protocols
Hardware	QSFP+ to SMA Adapter
	Optical interface components

Order Information

- iSAFT06.CS-07-20X (X indicates the number of ports: 4, 8)

Contact

TELETEL S.A., Athens, Greece
Tel.: +30 210 6983 393
Email: isaft@teletel.eu
Web: www.teletel.eu