iSAFT SpaceWire Front-End / Link Analyser

The iSAFT SpaceWire Front-End is a SpaceWire data interface with advanced asynchronous transmission and traffic generation capabilities that simulates SpaceWire devices or Instruments, enabling S/C integration tests before the availability of Flight Models.

It also constitutes a high performing SpaceWire Link Analyser with modern network traffic capture, recording and analysis capabilities for the validation of satellite/spacecraft flight devices or ground testbed devices implementing the SpaceWire protocol family.

It is provided as a rack mount system with 4 – 20 SpaceWire ports with advanced traffic generation and asynchronous transmission capabilities. It is capable of transmitting/receiving data packets over multiple SpaceWire 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 & recording (locally or remotely). It is a powerful device for the validation of on-board data networks at early stages, minimizing costs and schedule. It can be seamlessly integrated with customer software, supporting well defined APIs in C++, Python and Java.

As a Link Analyser (passive monitoring), it is capable of capturing data packets on multiple SpaceWire links, time stamping, recording, 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 twenty (4-20) SpaceWire ports, with programmable link speed up to 400 Mbits/s
- Complete graphical software environment for controlling and monitoring the hardware
- Fully graphical Packet Editors (SpaceWire, RMAP, PTP CCSDS TM/TC)
- Error injection (EEP, Time Code, parity, ESC error, disconnect, credit error, etc.), programmable fault tolerance modes
- User selectable capture triggers / filters, Real-Time Statistics per port / link
- User configurable operation of SpaceWire interfaces for simulation (transmission/reception of packets and TimeCodes) or recording (passive monitoring of SpaceWire links, packets archiving, decoding and analysis of SpaceWire traffic at SpaceWire character level)
- Decoding & analysis of SpaceWire, RMAP, PTP CCSDS TM/TC, Integrated Wireshark Protocol Analyser
- Recordings management, export to XML, Postscript, etc.
- Remote Access APIs in C++, Python, Java (Windows, Linux)
- IRIG support for time synchronization with other components in a testbed (8 ns timestamp resolution)
- Expandable with additional interfaces (MIL-STD-1553, CAN/CANOpen, SpaceFibre, WizardLink)
- Fully certified for connection to space flight equipment (FMEA)
- Proven solution in multiple EGSE test benches across Europe, Japan, South Korea

Key Benefits

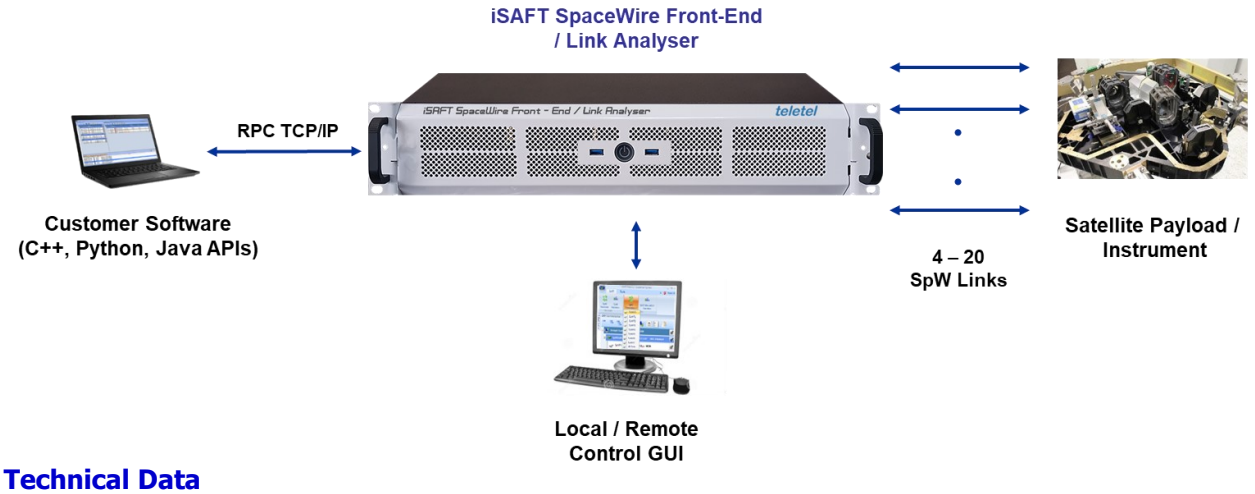
- Modern graphical user interface with packet editors
- Powerful remote control APIs supporting rich functionalities
- Dual use - switch of operation from simulation to recording with a simple reconfiguration
- 100% internal design, can be customised to customer needs
- First class support at both SW & HW level

Application Areas

- Design & development of on-board data networks
- Simulation / Recording / Error Injection / 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



Technical Data

General	1U	2U	3U
Dimensions (W x D x H)	448x357x44.5 mm	448x370x89 mm	448x457x133 mm
Interfaces	4 x USB 3	4 x USB 3	6 x USB 3
	1Gbps Ethernet Display Port / HDMI		
PCI slots	1 x PCIe	2 x PCIe	4 x PCIe
CPU	12 to 24 core i7 or i9 intel processor		
Memory	32 to 64GB		
Storage	128GB SSD drive for OS 1TB M2 SSD for data 2TB SSD for Archive		
Power supply	110-230V 250W	110-230V 450W	110-230V 850W
Operating temp range	0°C to 50°C		
Storage temperature / humidity	-40°C to 85°C 10 ~ 95%		
Standards	CE, RoHS, FMEA available		

SpaceWire Interface	1U	2U	3U
Number of ports	4	4 to 12	4 to 20
Connector	9-pin micro-D		
Link speed	Up to 400Mbps per port (programmable)		
IP Core	TELETEL SpaceWire IP core (ECSS-E-ST-50-12C compliant)		
Protocols	SpaceWire which can be extended with RMAP, NDCP, PTP CCSDS TM/TC		
Functionalities	Simulation, Recording, Error Injection, Traffic Generation, Timestamping support		
Electrical standards	LVDS signaling (galvanically isolated)		
LED indicators	Status / activity LED per port		

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

IRIG Interface	
Type	IRIG-B002/006 (DCLS)
Functionality	IRIG generator, IRIG receiver, 8 ns timestamping resolution
Electrical standards	TTL / RS-422 (selectable)
Connector	Omnetics MNCP-06-WD Circular Nano connector

Order Information

- iSAFT06.CS-07-YXX (Y indicates the form factor: 1, 2, 3 - XX indicates the number of ports: 04, 08, 12, 16, 20)

Contact

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