



Gigabit-Ethernet to 4x SpaceWire Bridge

Part Number: BCAI-ETHS

Description

Introducing the **BCAI-ETHS** (Gigabit Ethernet to SpaceWire bridge), an essential piece of Electrical Ground Support Equipment (EGSE) for testing and simulation in complex SpaceWire networks. This device seamlessly connects a standard Ethernet interface to a fully embedded, ECSS-compliant 4-port SpaceWire Routing Switch. It facilitates massive data transfer, efficient troubleshooting, and true hardware-in-the-loop (HIL) testing. Unlike standard point-to-point node adapters, the BCAI-ETHS acts as a true central hub. It features a high-performance **Non-Blocking Crossbar Switch** (compliant with ECSS-E-ST-50-52C), enabling simultaneous, independent packet routing between the four external SpaceWire ports and the Host PC. This makes it ideal for aerospace engineers and system integrators who require reliable interfacing solutions to test multi-agent satellite architectures.

To support immense burst-data scenarios and prevent host-PC bottlenecks during simultaneous multi-port routing, the equipment is fortified with an onboard **512MB DDR3 SDRAM** buffer. Achievable transmit and receive speeds are up to **200MHz** per port, yielding a combined continuous throughput of up to **~115GigaBytes** per second over the Gigabit Ethernet backend.

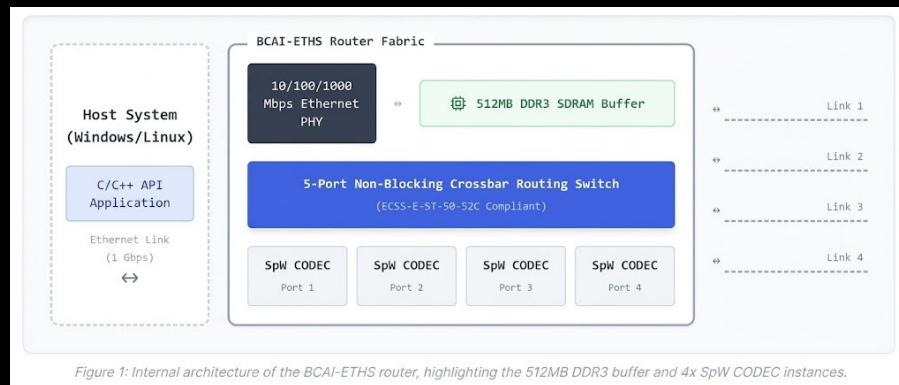
Specifications

Dimensions	85mm × 85mm × 50 mm
Data transfer & Power Supply	Via Registered Jack 45 connector for data and type-C USB plug transformer for power supply (provided)
Application Programming Interface	Lightweight DLL driver and documented C library: - bc_listdevices(); - bc_open(); - bc_close(); - bc_read(); - bc_write();
Software	Ready-to-use Application Example, incl. built-in self-test (internal loopback mode) and GUI application.
SpaceWire Port	4x bidirectional link (Designed with reference to the ECSS-E-ST-50-

	12C standard) with 9-contact micro-miniature D-type female receptacle Embedded 5-Port Non-Blocking Routing switch (4 Physical + 1 Host). Supports Path, Logical and Regional addressing. RMAP optional capability
SpaceWire Maximum Speed	200MHz On-board oscillator with configurable speed rates (SDR)
Achievable throughput	Up to 940Mbps over Ethernet computer with 4 spacewire links active at maximum speed.
On-board storage	512MB DDR3 SDRAM, which can be optionally used for time-triggered event or for SpaceWire cargo data storage. Optional Time-Event stamping with ~30ns precision (PTP / IEEE 1588)
Supported Operating System	Windows 11 Contact us for Linux Ubuntu or other OS support

System Block Diagram

The following diagram illustrates the Product interconnection between your software application and your 4x Devices Under Test.



blueconnect.ai@proton.me
www.blueconnect.ai

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