



RAF-EC-2P

RoHS Dual Port ARINC 664 ExpressCard Interface

Features

- AFDX/ARINC 664 dual port interface (two independent 10/100 MHz duplex ports)
- RoHS Compliant
- Includes AFDX and low-level Software Developer's Kit (SDK) at no additional charge
- Advanced reception features
 - 20 nsec time-tags
 - IRIG-B synchronization
 - DMA transfer to host
 - Full throughput capability
 - Link level error detection
- Advanced Transmission Scheduling
 - Highly accurate
 - Flexible scheduling modes
 - DMA transfer to host
 - Full throughput capability
 - Link level error detection
- Advanced Software Support
 - Flexible packet capture API
 - AFDX/ARINC 664 API
 - XML configuration format
 - Integrated log file format
 - Berkeley packet filter engine
- Four bi-directional avionics level discrettes
- Two input and output triggers per channel
- Built-in test features

Architecture

GE Fanuc Intelligent Platforms' RAF-EC-2P is a high performance interface for monitoring, generating or analyzing full-bandwidth AFDX-ARINC 664 protocol traffic. GE Fanuc Intelligent Platforms' exclusive pipeline architecture maximizes packet throughput using parallel controllers and efficient DMA transfers, thereby avoiding the bottlenecks of CPU-based interface solutions.

Configurable as either one dual-redundant AFDX/ARINC 664 interface or two independent ports, users have complete access to all frame and header data. Each incoming packet is tagged with a 20 nsec resolution, 64-bit time-tag. Read time traffic generation is highly accurate. An IRIG-B receiver/generator is included for synchronization to external IRIG-B time sources and for synchronizing multiple CNIC boards. In addition, I/O triggers, error detection/injection, BIT, and link/protocol level statistics are provided.

AFDX/ARINC 664 Performance

The RAF-EC-2P features two independent 10/100 MHz duplex ports, capable of simultaneously receiving back to back Ethernet frames with 12 byte interframe gaps at a rate of 100Mbps each. Each port is capable of transmitting back to back Ethernet frames with 12 byte interframe gaps at a rate of 100Mbps; with both ports transmitting simultaneously, current express card technology limits the total rate to not less than 50% rate for two channels simultaneously or 100% performance for one channel at a time.

Software

The RAF-EC-2P comes with all the software development tools needed for user application development at no extra charge. The Cpcap, packet capture library, provides a complete set of function for transmitting and receiving Ethernet frames. Frames from multiple ports can be logged or replayed using the open-source ntar log-file format. CFDX implements the ARINC 664/AFDX protocol stack including End Systems, redundancy management, Virtual Links and Ports. An advanced XML-based Configuration File format is used to specify End Systems, and an AFDX-aware version of Ethernet is included to provide GUI analysis of logged files.



RAF-EC-2P: RoHS Dual Port ARINC 664 ExpressCard Interface

Specifications

Physical

- ExpressCard
- Dimensions: Standard 54mm Express Card dimensions

Environmental

- Operating Temp Range: 0°C to 55°C
- Relative humidity: 5 to 90%

Software

- Windows XP support. Contact factory about availability of support for additional operating environments (including LabVIEW.)
- Cpcap API Library
- CFDX API Library
- Ethernet GUI for ntar file analysis

Connections

- Transition cable is provided
- Two IEEE 802.3 compliant Ethernet RJ-45 connectors
- High density 15-pin D-sub connector for In/Out triggers per port and four bi-directional avionics-level discretes

Timing Reference

- 64-bit time tag
- IRIG-B receiver (AM or TTL/DC)
- IRIG-B generator (TTL/DC)
- IRIG-B PPS synchronization with time tag
- Software-selectable internal wrap

Triggering

- Wait for external trigger to transmit
- Output when marked frame is transmitted
- Output when error-free packet received
- Output when error packet received

Port Parameters

- Full Duplex IEEE 802.3 compliant ports
- Software-selectable 10/100 Mbps data rates
- Software-selectable auto-negotiation
- Software-selectable internal wrap

Ethernet Frame Reception

- Ethernet frames transferred to host buffers via DMA
- Min-to-copy capability
- High resolution time-tagging with 20 nsec resolution
- Link level error detection

Receive Statistics (64-bit counters)

- Separate counter for Link level errors
 - Physical symbol
 - Invalid preamble symbol
 - Invalid or missing SFD
 - Unaligned frame
 - IFG too short
 - Frame too short
 - Frame too long
 - CRC errors

Ethernet Frame Transmission

- Ethernet frames transferred from host buffers via DMA
- Transmission scheduling with 20 nsec resolution
- Flexible scheduling modes
 - Minimum IFG delay (960 nsec between frames)
 - Per-frame specified delays (multiple conditions)
 - On external trigger
 - Playback delay modes
- Interrupt generation or user-identified frames

Transmit Statistics (64-bit counters)

- Total packets transmitted
- Total bytes transmitted

Error Injection

- Physical symbol error
- Preamble (symbol and length) errors
- Framing (byte alignment) error
- SFD (Start Frame Delimiter) error
- CRC error

Power (max.)

- 3 Watts max

Ordering Information

RAF-EC-2P

AFDX Express Card, dual port interface, RoHS compliant

Optional Software

BT-AIL

AFDX traffic analyzer

BT-AIL-FAN

AFDX traffic analyzer file analysis

About GE Fanuc Intelligent Platforms

GE Fanuc Intelligent Platforms is a leading global provider of embedded computing solutions for a wide range of industries and applications. Our comprehensive product offering includes many types of I/O, single board computers, high performance signal processors, fully integrated, rugged systems including flat panel displays, plus high speed networking and communications products. The company is headquartered in the U.S. and has design, manufacturing and support offices throughout the world. Whether you're looking for one of our standard products or a fully custom solution, GE Fanuc Intelligent Platforms has the breadth, experience and 24/7 support to deliver what you need. For more information, visit www.gefanuc.com.

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Additional Resources

For more information, please visit the GE Fanuc Intelligent Platforms web site at:

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