



# CNIC-A2PU4

## Dual Port ARINC 664 Four Lane PCI Express Interface

### Features

- AFDX/ARINC 664 dual port interface (two independent 10/100 MHz full duplex ports)
- 4 Lane PCI Express
- 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 from host
  - Full throughput capability
  - Link level error injection
- 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 discretizes
- Input and output triggers per channel
- Built-in test features
- Supportable throughout program lifetime with Product Lifetime Management (PLM) program

### Architecture

GE Intelligent Platforms CNIC-A2PU4 is a high performance interface for monitoring, generating or analyzing full-bandwidth AFDX/ARINC 664 protocol traffic. GE 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. Real 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-A boards. In addition, I/O triggers, error detection/injection, BIT, and link/protocol level statistics are provided.

### Advanced Software Support

Multiple CNIC-As in the same PC have been benchmarked at full bandwidth supporting all channels with 2000 VLs (Virtual Links), multiple Ports on each VL and minimum payloads (17 bytes).

### Advanced Software Support

The CNIC-A2PU4 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 functions 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.



# CNIC-A2PU4 – Dual Port ARINC 664 Four Lane PCI Express Interface

## Specifications

### Physical

- PCI Express Interface board (PMC on Carrier) Standard height, half length (4.376 x 6.600 inches)

### Environmental

- Commercial operating temp. range: 0° C up to +70° C
- Optional temperature range: -40° C up to +85° C
- Relative humidity: 5 to 90% (non-condensing)

### Software

- Microsoft® Windows® 7, XP, 2000, 2003 and Linux support. Contact factory about availability of support for additional operating environments (including Linux, VxWorks and LabVIEW).
- Cpcap API Library
- CFDX API Library
- Ethernal GUI for ntar file analysis.

### Connections

- 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 Transmit

### Transmit Statistic (64-bit counters)

- Total packets transmitted
- Total bytes transmitted

### Receive Statistics (64-bit counters)

- Separate counters for Link level errors
  - Physical symbol
  - Invalid preamble symbol
  - Invalid or missing SFD
  - Preamble length too short
  - Unaligned frame
  - IFG too short
  - Frame too short
  - Frame too long
  - CRC errors
- Total bytes received
- Total count of error free packets received
- Total count of packets with errors received
- Dropped packets

### 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 on user-identified frames Error

### Error Injection

- Physical symbol error
- Preamble (symbol and length) errors
- Framing (byte alignment) error
- SFD (Start frame delimiter) error
- CRC error Optional

### Optional Configurations

- Conformal coating
- Extended Temperature

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## Ordering Information

<b>CNIC-A2PU4</b>	Dual port 10/100 full duplex 4 lane PCI Express interface card (PMC on carrier) for ARINC 664/AFDX support
<b>CNIC-A2PKU4</b>	Dual port 10/100 full duplex 4 lane PCI Express interface card (PMC on carrier) for ARINC 664/AFDX support with ext temp
<b>CNIC-A2PEU4</b>	Dual port 10/100 full duplex 4 lane PCI Express interface card (PMC on carrier) for ARINC 664/AFDX support with ext temp
<b>CNIC-A2PEKU4</b>	Dual port 10/100 full duplex 4 lane PCI Express interface card (PMC on carrier) for ARINC 664/AFDX support with ext temp and conformal coating

## Optional Software

<b>BT-AFDX-A</b>	ARINC 664 part 7 traffic analyzer
<b>BT-AIL-A2</b>	ARINC 429 and 664 part 7 (with generic EDE) traffic analyzer

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## About GE Intelligent Platforms

GE Intelligent Platforms is a division of GE that offers software, control systems, services, and expertise in automation and embedded computing. We offer a unique foundation of agile and reliable technology providing customers a sustainable competitive advantage in the industries they serve, including energy, water, consumer packaged goods, oil and gas, government and defense, and telecommunications. GE Intelligent Platforms is headquartered in Charlottesville, VA. For more information, visit [www.ge-ip.com](http://www.ge-ip.com).

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