AFDX®

**AFDX End System A664 Pro (PMC)**

The Certifiable 10/100 Mbit/s AFDX®/ARINC 664 part 7 Network Board

**Key Benefits**

- RTCA DO-254/DO-160G/DO-178C certifiable end system card for use in flight programs
- Fully compliant with ARINC 664 part 7 standard
- Redundancy management and traffic shaping fully implemented in hardware
- Safety assessment according to SAE ARP 4754/4761

Avionics full-duplex switched Ethernet (AFDX®) technology enables Deterministic Ethernet networking for avionics and aircraft systems. The AFDX® End System A664 Pro board supports speeds up to 100 Mbit/s and is certifiable to civil aerospace standards. This PMC card supports rate-constrained traffic shaping to ensure bounded latency and jitter for Deterministic Ethernet networking, as described in the ARINC 664 part 7 standard. The network board can be used for production system integration and provides redundancy management as well as an IP/UDP profiled communication layer fully implemented in hardware.

**PCI Mezzanine Card for Network Communication**

This PCI mezzanine card with AFDX® technology is designed for network communication in safety-critical systems. Three ARINC 664 channels enable the design of fault-tolerant systems, and provide on-board integrity checking, redundancy and flow control.

Communication properties for all virtual links can be adjusted for different application requirements for various port configurations. The end system card hardware and all its embedded software is certifiable according to highest civil aerospace standards (DAL A).

**Support for User Applications**

The AFDX® End System A664 Pro card supports 256 simultaneous transfer (Tx) virtual links (VLs) and 512 simultaneous receive (Rx) VLs. Additionally, up to 2,048 input buffers and up to 4,096 output buffers are available. Drivers are available for VxWorks 653 and PikeOS. This board fully supports ARINC 664 part 7 requirements.

**Efficient Hardware Implementation**

For efficient protocol processing, all IP/UDP profiled communication layers are implemented in hardware and off-load host processors executing user applications.

**Application Fields**

- Aircrafts
- Rotorcrafts
- Ground Stations

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| End system capabilities | - The NIC controller implements the ARINC 664 part 7 end system IP with 3 channels  
- 256 send VLs, 512 receive VLs  
- 2,048 send ports, 4,096 receive ports  
- 8 output memory partitions/access points, 8 input memory partitions/access points  
- Flexible configurable periods (μs granularity)  
- Profiled IP/UDP, sampled and queued ports  
- IP/UDP handled on hardware  
- Diagnosis and status registers  
- Embedded CPU for BITs  
- 95% detection of internal failures  
- Provide BITs results every 500 ms  
- Ability to store BIT status and error logging information |
| Certifiability | - NIC controller according to RTCA DO-254 DAL A  
- Embedded software according to RTCA DO-178C DAL A  
- Environmental ratings according to RTCA DO-160G  
- Safety assessment according to SAE ARP 4754/4761 |
| Supported standards | - IEEE 802.3  
- ARINC 664 part 7  
- SAE AS6802 |
| Software driver support | - RTCA DO-178C certifiable software driver and driver certification package are available for VxWorks 653 v2.2.4 and PikeOS 5 |
| Network connectivity | - 3 ports 10/100 Mbit/s |
| Hardware connectivity | - 32-bit, 66 MHz PCI revision 2.2 compliant interface |
| Dimensions | - Size: 143.75 x 74 (mm)  
- Weight: 115 g |
| Form factor | - PCI Mezzanine Card (PMC)  
- IEEE 1386.1-2001 PMC 143.75 x 74 (mm)  
- Vita 20-2001 Conduction Cooled PMC with rear I/O |
| Power supply | - +3.3 V external power supply |
| Power consumption | - 3 W for ARINC 664 part 7 traffic for temperatures within the -40°C to +85°C range |
| Environmental operating ranges | - Operating temperature range: -40°C / +85°C  
- Altitude: 7,600 m (25,000 ft) MSL  
- Relative humidity: 95% +/- 4%  
- Environmental tests: DO160G compliant |
| Packaging contents | - TTEthernet PMC card hardware board  
- User manual  
- Driver CD |
| Order number | - 13121: TTEnd System A664 Pro (please note that the hardware board of the AFDX End System A664 Pro is the same as for the TTEnd System A664 Pro, thus the same material number is used; the only difference is in the configuration of the board, which is done by the user) |