^{AFDX}End System Rugged (XMC)

The Ruggedized 10/100/1000 Mbit/s AFDX® Network Board

The ^{AFDX}End System Rugged is fully compliant to the ARINC 664 p7 standard and specifically designed to meet the challenges of the harshest aerospace environments. It uniquely supports AFDX traffic on 2 channels with up to 1000 Mbit/s full-duplex Ethernet speed over P14 rear-I/O. The board operates under the harshest conditions: withstanding forces up to 40G, vibrations of 2000 Hz, temperatures of up to +85 °C while remaining fully operational at an altitude of 18,300 m (60,000 ft). This AFDX end system is ideally suited for building robust and reliable networks in rotor- and aircraft vehicles.

KEY FEATURES/BENEFITS

- **Ruggedized deterministic Ethernet NIC**
- **Fully ARINC 664 p7 / AFDX compliant**
- **2 x 10/100/1000 Mbit/s full-duplex Ethernet links over P14 rear-I/O**
- **Standard XMC form factor for use in harsh aerospace environments**
- **Environmentally tested according to MIL-STD-810G**
- **Conduction cooled board design**
- **DMA support**

10/100/1000 Mbit/s
ARINC 664 p7 (AFDX) Networking

Full AFDX compatibility of the ruggedized end system allows for seamless integration into existing 10/100 Mbit/s AFDX networks.

Future upgrades of the entire network to 1 Gbit/s speeds were taken into consideration as the ^{AFDX}End System Rugged supports 10/100 as well as 1000 Mbit/s already today.

Full Application Area Flexibility

The ^{AFDX}End System Rugged can be used in PCI, CPCI, VME, VPX and VXS; plugged on various PCs or embedded systems for deployment in ruggedized systems.

End System Capabilities

The ^{AFDX}End System Rugged supports 128 simultaneous transmit (Tx) virtual links and 512 simultaneous receive (Rx) virtual links.

Two ARINC 664 channels enable 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 all ports, or for each port separately.
The periodicity settings for different VLs can be in the range of 0.5 ms to 1.6 seconds.

Key Features
- Fully compliant to ARINC 664 p7 (AFDX)
- 2 x 10/100/1000 Mbit/s full-duplex Ethernet links
- Standard XMC form factor end system
- 128 send VLs, 512 receive VLs
- 1024 send COM ports, 4096 receive ports
- 256 Mbit Flash
- Supported software driver (PCI/Linux)
- Profiled IP/UDP, sampled and queued ports
- Redundancy management and rate-constrained traffic shaping fully implemented in hardware
- Profiled IP/UDP, sampled and queued ports
- IP/UDP handled on hardware
- ICMP handling
- DMA support
- JTAG support on board
- Conduction cooled board design
- Variant suitable for use in flight tests possible

Supported Standards
- ARINC 664 p7 (AFDX)

Network Connectivity
- Up to 2 Ports with 10/100 Mbit/s and 1-Gbit/s over P14 rear-I/O

Hardware Connectivity
- Host Interfaces:
  PCIe 1.1 x4 Gen1 (2.5 Gbit/s)
- P14 rear-I/O: Up to 2 ports with up to 1-Gbit/s

Bus Interfaces
- 32 or 64-bit 33 MHz PCI 3.3 V

Software Driver Support
- Ubuntu Linux 14.04 LTS (64bit)
- Other drivers on request possible

Physical Specifications
- IEEE Standard 1386.1-2001 compliant
- Vita 42 Conduction Cooled XMC with faceplate I/O
- Size: 144 x 74 (in mm)
- Weight: 120 g

Power Supply
- +12 V supply from J2 connector
- +3.3 V Supply from J2 connector

Power
- Power consumption: 7.5 W

Environmental Operating Ranges
- Operational temperature: -40 °C to +85 °C
- Storage temperature: -55 °C to +105 °C
- Operating/non-operating humidity: 95 %
- Vibration (random, all axis): 0.1 g²/Hz, 15 Hz to 2000 Hz
- Operating shock: 40 g/11 ms half-sine
- Altitude above sea level: 18,300 m (60,000 ft)
- Environmental tests according to MIL-STD-810G

Packaging Contents
- ^{AFDX}End System Rugged hardware board
- User Manual
- Driver CD

Order Number
- 12129: ^{AFDX}End System Rugged (XMC)

Other Recommended Products
- ^{TTE}Build Device Configuration

Optional Products
- ^{TTE}Plan Starter
- ^{TTE}Build Network Configuration