TTEEnd System A664 Pro (PMC)

The Certifiable 10/100 Mbit/s TTEthernet Network Board

Key Benefits

- RTCA DO-254/DO-160G/DO-178C certifiable end system card for use in flight programs
- Fully compliant with Ethernet (IEEE 802.3), rate-constrained (ARINC 664 part 7) and time-triggered traffic (SAE AS6802)
- Redundancy management and traffic shaping fully implemented in hardware
- Safety assessment according to SAE ARP 4754/4761

The TTEEnd System A664 Pro board brings the full power of deterministic Ethernet communication technology to aerospace certifiable hardware. TTEthernet technology enables hard real-time operation in distributed systems based on Ethernet networks. The end system uniquely supports three standard traffic classes: Ethernet (IEEE 802.3), rate-constrained (ARINC 664 part 7) and time-triggered (SAE AS6802) traffic in parallel on one physical media. It offers redundancy management, as well as an IP/UDP profiled communication layer fully implemented in hardware.

PCI Mezzanine Card for Network Communication

The TTEEnd System A664 Pro card supports three Ethernet traffic classes:

- Time-triggered (SAE AS6802) traffic with hard real-time guarantee and transport delay jitter in sub-microsecond range
- Rate-constrained traffic (ARINC 664 part 7 compliant)
- Standard (IEEE 802.3) Ethernet traffic

The TTEEnd System A664 Pro network interface card implements the distributed fault-tolerant clock synchronization algorithm of TTEthernet in hardware.

100% Deterministic Data Transmission

It is a PCI mezzanine card for network communication and combines the IEEE 802.3 Ethernet standard with safety-critical time-triggered technology.
It enables real-time Ethernet communication between an embedded computer and TTESwitches for redundant channels in a safety-critical system.

The card transmits time-critical and safety-critical data in a 100% deterministic way and according to a pre-defined schedule. The card is designed for safety-critical applications and fully complies with DAL A levels of RTCA DO-254 and DO-178C.

Application Fields

- Aircrafts
- Rotorcrafts
- Ground Stations

End System Capabilities	– The NIC controller implements the TTEthernet End System IP with 3 channels – Three configurable traffic classes: ✓ Time-triggered (SAE AS6802) traffic ✓ Rate-constrained (ARINC 664 part 7) traffic ✓ Standard Ethernet (IEEE 802.3) traffic – 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
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: TTEEnd System A664 Pro

TTTech Europe, Austria (Headquarters)
Phone: +43 1 585 34 34-0

TTTech North America Inc.
Phone: +1 978 933-7979

TTTech Japan
Phone: +81 52 485-5898

products@tttech.com www.tttech.com