ᵀᵀᴱEnd System A664 Lab (PCIe) v2.0

The new generation of deterministic Ethernet end system cards for evaluation and testing

Key Benefits

- Deterministic Ethernet evaluation and development platform for aviation applications
- Three supported traffic classes
  - Best-effort Ethernet (IEEE 802.3)
  - Rate-constrained (ARINC 664 part 7)
  - Time-triggered traffic (SAE AS6802)
- Two full duplex Ethernet ports 100/1000Mbit/s
- End System IP based on certifiable ᵀᵀᴱEnd System A664 Core IP Pro
- Maintain parity with flight grade XMC card solution via a PCIe lab adapter

ᵀᵀᴱEnd System A664 Lab (PCIe) v2.0 is the new generation of deterministic Ethernet end system cards for laboratory evaluation, development and testing applications, based on our RTCA DO-254 DAL A certifiable ᵀᵀᴱEnd System A664 Core IP Pro. It supports three configurable network traffic classes (time-triggered, rate-constrained, best-effort) in parallel on one physical infrastructure with 1 Gbit/s physical link speed.

Product Description

ᵀᵀᴱEnd System A664 Lab (PCIe) v2.0 is compatible with four-lane PCI Express Gen 3 motherboard edge card slots. It supports Ethernet connectivity via RJ-45 connectors accessed through the front bracket, or alternatively through the rear VME connector. Additional JTAG, IPMI I2C and VITA discrete interfaces are available for debugging and control.

It features eight active LEDs to visually indicate key VITA 42 signals and voltage status. Alternatively, DIP switches can toggle the state of their associated LED.
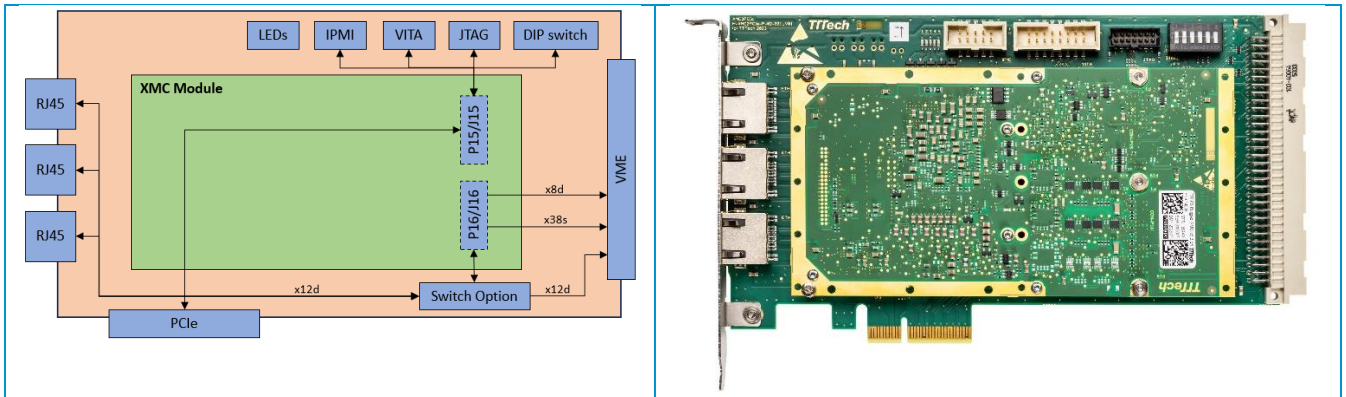
This product is intended for deterministic Ethernet evaluation and as a platform for early integration phase in aviation projects inside an air-cooled chassis.

TTEthernet® permits the integration of synchronized and non-synchronized functions in Ethernet-based distributed systems. While hard real-time applications enjoy reserved bandwidth, full determinism and delivery jitter below 1 µs by using TTEthernet®, standard IEEE 802.3 Ethernet traffic operates without impact on these time-critical and synchronized functions.

Application Fields

- Technology evaluation
- Product testing
- Architecture development

^{TTE}End System A664 Lab (PCIe) v2.0 - The new generation of deterministic Ethernet end system cards for evaluation and testing

^{TTE}End System A664 Lab (PCIe) v2.0, hardware architecture functional block diagram (left), top view (right)

End System Capabilities	– 2x 100/1000 Mbit/s full duplex Ethernet ports
	– Configurable Ethernet traffic classes and protocol services:
	    o Time-triggered (SAE AS6802) traffic
	    o Rate-constrained (ARINC 664 part 7) traffic
	    o Best-effort Ethernet (IEEE 802.3) traffic
	– 256 send VLs, 2048 receive VLs, 1024 send ports, 4096 receive ports
	– 2 output memory partitions/access points, 2 input memory partitions/access points
	– Flexible configurable periods (μs granularity)
	– Profiled IP/UDP, sampled and queued COM port network interfaces, handled in hardware
	– DMA support for optimized data throughput performance

Interfaces	– Ethernet: RJ-45 x3 connectors for data traffic – PCIe: x4 (64 pins) standard PCIe edge connector – VITA discretes: 16-pin 2x8 header for debugging and control – JTAG: standard 14-pin 2x7 header compatible with Xilinx Platform Cable USB II – IPMI I2C: standard 10-pin 2x5 header – VME: 96 pin connector for GPIO signal access, optional Ethernet data traffic
Supported Standards	– ANSI/VITA 42.0-2021 – ANSI/VITA 46.9-2018 (P16 connector P1w9-X12d+P2w3-X38s+X8d mapping) – ANSI/VITA 61.0-2014 – PCI Express® Base Specification Rev 3.0 – PCI Express® Card Electromechanical specification Rev 3.0 – SAE AS6802 – ARINC 664 part 7 – IEEE 802.3
Dimensions	201 x 123 x 22 (in mm)
Weight	255g
Power Supply	+3.3 V via PCIe interface
Power Consumption	6.5W max.
Environmental Operating Range	– Operating Temperature: 0°C to 55°C – Relative Humidity: 25-90%
Software Driver Support	^{TTE}COM Driver Linux Ubuntu 20.04 included (other distributions and OS optional)
Documentation	– User Manual – Example applications

Order Number	13435: ^{TTE}End System A664 Lab (PCIe) v2.0, made of:
	    13434: ^{TTE}End System A664 Lab (XMC) v2.0
	    14575: XMC To PCIe Carrier TTTech

Recommended products	13056: ^{TTE}Tools 5 Starter Edition (mandatory for configuration purposes, sold separately) 13057: ^{TTE}Tools 5 Expert Edition