

# TuffCORD™ Mission Data Recorder

# AMPEX

## The TuffCORD™ is a rugged, efficient network recorder, file server and data loader.

Built for tough environments, the TuffCORD goes wherever operators need to go, and delivers consistent, reliable performance in challenging conditions. With its compact size, light weight, low power dissipation and mounting options, it can be installed wherever it needs to be.

### ***Designed for Information Assurance***

The TuffCORD has been designed from the ground up to provide cybersecurity capabilities that meet the real-world needs of operators. By leveraging world-class solutions from trusted suppliers, the system is straightforward to incorporate into a complete Operation Security plan.

### ***Performance and Capacity***

Gigabit Ethernet has become the default networking technology for onboard data storage applications, and the TuffCORD provides two 1000Base-T interfaces, as well as expansion capability for options for video and other bus types, including MIL-STD-1553B, CAN bus, and even WiFi networking.

To support this range of interfaces, the TuffCORD provides a single high-capacity, high performance removable memory module, with capacities from 240GB to 8000GB (8TB) and higher, as memory technology matures. The memory modules leverage rugged COTS media solutions, further qualified by Ampex to meet the requirements of challenging programs.

Each memory module offers raw performance in excess of 250MB/second sustained, providing a recording duration of more than four hours even at the maximum operational rate.



#### ***Features***

- ***Greater than 150MB/s sustained network throughput***
- ***Standard Dual Gigabit Ethernet Interfaces***
- ***Memory Module Capacities to 8TB***
- ***AES Encryption using FIPS 197 Validated Hardware & Software***
- ***Built for Rugged, MIL-STD-810 Environments with MIL-STD Power and Connectors***
- ***Options for Additional or Customized I/O***

### ***Open System, Trusted Environments***

The heart of the TuffCORD is a standardized, rugged pluggable processing module, integrating the CPU with memory and conventional I/O interfaces such as PCI Express, USB, Ethernet and serial ports. This module facilitates product reliability and long-term supply by isolating the intricacies of the CPU from the overall system; as CPU technology evolves, alternative modules can be used without changing the system's internal and external interfaces.

Multiple CPU models are available, each a member of the Intel Atom™ "Bay Trail-I" family; both CPUs feature 64 bit processing and, critically, the "AES New Instructions". Using validated software modules, this capability facilitates high-speed encryption and decryption in accordance with the Advanced Encryption Standard (AES, FIPS 197) and is therefore a part of a FIPS 140-2 solution.

### ***Expansion and Options***

The TuffCORD is designed to be flexible and versatile. In addition to the dual gigabit Ethernet interfaces, the system is designed to support expansion for additional interfaces, including more Ethernet interfaces, MIL STD 1553B, and even WiFi networking. The storage module has been designed to be modular, so that additional or different storage media types can be provided as required. As with all Ampex products, a complete ecosystem is available including ground support equipment to facilitate data transfer to and from the recording media. Contact Ampex for more information.

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## Specifications<sup>1</sup> System

CPU Subsystem:	Intel Atom E3800 Series: Baseline E3845, Quad Core, 2MB Cache, 1.91GHz, 4GB ECC DDR3L-1333 Memory, TPM 1.2 Option: E3805, Dual Core, 1MB Cache, 1.33GHz, 2GB ECC DDR3L-1066 Memory, TPM 1.2
Network Interfaces:	Two 1000Base-T Gigabit Ethernet
Optional Interfaces <sup>2</sup> :	Additional Gigabit Ethernet ports, Video, MIL-STD-1553B, Others
Fixed Storage:	Write-protected Firmware/OS Device Plus Separate Configuration/Logging Device
Removable Storage:	Removable Media Module
Network Protocols:	NFSv4, NFSv3, CIFS/SMB, FTP, TCP, UDP
Operating System:	Red Hat Linux 7 (DISA STIG compliant)
RMM Storage Capacity:	Up to 8000GB (8TB)
Encryption:	Advanced Encryption Standard (AES), 256 bit keys, FIPS 197 Validated

## Performance

Internal Data Rate:	250 Mbytes/sec (sustained, unencrypted), 150 MByte/sec (sustained, with encryption)
NFS Data Rate:	100 MByte/sec sustained (read or write with encryption)

## Power

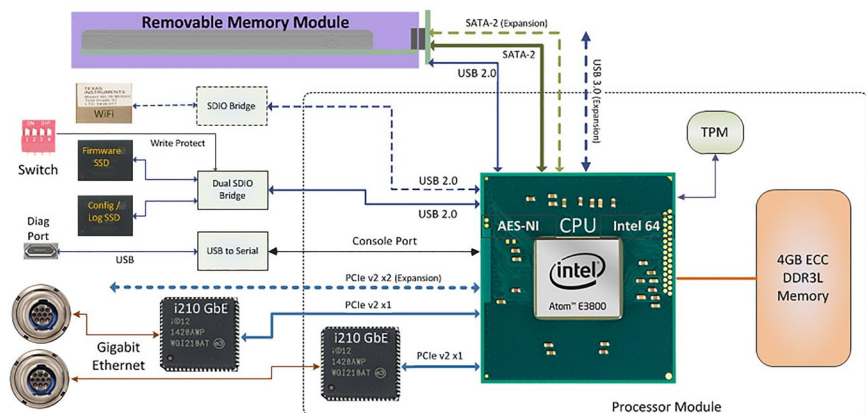
Power:	28VDC per MIL-STD-704A with under/over voltage protection
Dissipation (Full Load):	15W (E3845 CPU) / 8W (E3805 CPU)

## Mechanical

Dimensions:	3.6" H x 4.8" W x 6.3" D (92mm x 122mm x 160mm), extends 6.0" (152mm) behind mounting panel
Mounting:	Panel mount (6x standard "Quarter Turn" fasteners) or base mount
Weight (System):	5.5lbs (2.5Kg)

## Environmental

Temperature:	Operating -40°C to +55°C (Panel Mount) (Extended Range) -40°C to +71°C (Base Mount on Conduction Cooled Surface) Non-operating: -45°C to +85°C
Humidity:	0% to 95% RH (MIL-STD-810F, Procedure III)
Vibration:	4.6g <sub>rms</sub> (active) / 9.8g <sub>rms</sub> (endurance), MIL-STD-810Fv
Shock:	20g (half sine, 11ms), MIL STD-810F
EMI Compatibility:	MIL-STD-461F



**TuffCORD Block Diagram**

<sup>1</sup> Specifications subject to change without notice

<sup>2</sup> Contact Ampex for availability of options

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