# Model 3500 Ethernet Data Recorder

**AMPEX**

**The Model 3500 Ethernet Data Recorder is a high data rate, large capacity streaming network recording system.**

The Model 3500 utilizes mature and field-proven recording technology from Ampex Data Systems Corp. to deliver consistent, reliable recording and playback of streaming IP telemetry data. The Model 3500 has been designed for Telemetry over IP (TMoIP), Voice over IP (VoIP) and Video over IP streaming data recording and reproduction applications. Additional operational modes are available for collecting Ethernet traffic for subsequent analysis by industry-standard tools such as "Wireshark".

## Performance and Capacity

The Model 3500 is available in a standard 2U 19 inch rack mount unit. The unit provides two 10 Gigabit Ethernet interfaces configurable as optical (e.g. 10GBase-SR) or copper (10GBase-T, 10GBase-CX, and capable of auto-negotiation down to Gigabit Ethernet) plus two 1Gigabit Ethernet interfaces (1000Base-T), as well as expansion capability for 40-GigE, 100-GigE and even WiFi networking. These network interfaces can be configured for Management, Record Data, Playback Data or any combination. The unit leverages reliable COTS solid state drive and server technology with over 70 years of AMPEX recording experience and expertise, to meet your challenging requirements. It provides for up to 16 high-capacity, high-performance, removable Solid State Devices, with total capacity up to 32TB today and higher tomorrow as drive technology evolves. The Model 3500 offers raw record and playback performance in excess of 1Gigabyte/second sustained, providing a recording duration of more than eight hours, even at the maximum operational rate.

### Features

- *Greater than 1GB/s sustained payload recording rate*

- *Separable Management and Data Network Interfaces*

- *Standard Dual 10 Gigabit and Dual 1 Gigabit Ethernet Interfaces*

- *Storage Capacities to 32TB*

- *AES Encryption\**

- *Built for High Reliability and Availability 24/7 operation*

- *Options for Additional I/O*

*\* Option*

## Open System, Trusted Environments

The Model 3500 is integrated into GDP Space Systems' Telemetry Range Management Software (TRMS) control architecture which provides complete range control of acquisition, distribution, recording and processing functions in an intuitive user interface.

The system runs an approved COTS operating system, Red Hat Enterprise Linux, to ensure that connectivity with sensitive networks is straightforward and that information assurance and cybersecurity policies are consistent with use in government and aerospace environments.

The SSDs support 256 bit AES encryption, and some configurations are available with FIPS 140-2 certification. The system uses components sourced through U.S. supply chains.

## Standards Compliance and Interoperability

In addition to supporting GDP's enhanced protocols, the Model 3500 also supports the standard IRIG 218 TMoIP, IRIG 106 Chapter 10/11, MISB MPEG-2 Transport Stream over UDP and other streaming data protocols. The Model 3500 is designed to be flexible and versatile. Optional post recording file conversion utilities can be used to provide the data file and output stream conversion necessary to support interoperability with legacy or future systems.

The front panel display and keys provide an easy-to-use local interface. Web browser control provides extensive setup, configuration, record and playback control. Integration with the GDP TRMS provides system level integration with other range equipment.

## Specifications[1]

| | |
|---|---|
| CPU Subsystem | 8 Core (16 thread) Xeon D-1537, 1.7GHz (2.3GHz boost), 12MB cache, 32GB, 2133MHz DDR4 with ECC, TPM 1.2 |
| Network Interface | Two 10 Gigabit SFP+ Ethernet ports plus two 1000Base-T Gigabit Ethernet |
| Fixed Storage | Separate Firmware/OS Device (can be write-protected) Plus optional separate Configuration/Logging Device |
| Removable Storage | 16 Removable Solid State Drives |
| Network Protocols | NFSv4, NFSv3, CIFS/SMB, FTP, TCP, UDP |
| Data Protocols | IRIG 218, IRIG 106 Chapter 10/11, MISB Xon2 |
| Control Protocols | HTTP, Command Line, TRMS, all optionally with SSL encryption |
| Time Input | IRIG B, NTP, PTP |
| Operating System | Red Hat Enterprise Linux 7 (DISA STIG compliant) |
| Encryption | Advanced Encryption Standard (AES), 256 bit keys |

**Performance**

| | |
|---|---|
| Payload Data Rate | 1 Gigabytes/sec (sustained) |

**Power**

| | |
|---|---|
| Voltage | 120/240V 50/60 Hz AC |
| Dissipation (Full Load) | 130W |

**Mechanical**

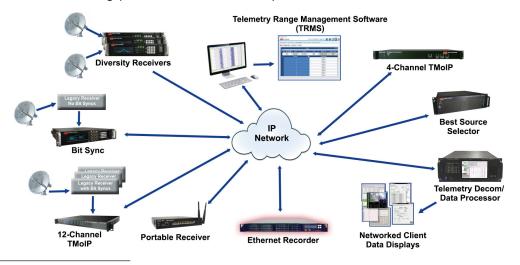| | |
|---|---|
| Dimensions | Standard 19 inch 2U Rackmount Chassis, 22.4 inches deep; 3.5" (88mm) H x 19.0" (483mm) W x 22.4" (570mm) D |
| Mounting | Mounting ears, optional chassis slides or tray |
| Weight (System) | 25lbs (11.3Kg) |

**Environmental**

| | | |
|---|---|---|
| Temperature | Operating | 0° C to +45° C |
| | Non-operating | -10° C to +60° C |
| Humidity | 25% to 75% RH | |
| Vibration | 0.25 grms (active 5 - 350Hz) | |
| Shock | 20g (half sine, 2ms, calculated) | |



[1] Specifications subject to change without notice.
[2] Contact Ampex for availability of options.
[3] Preliminary data.