VTrak E-Class *Fibre Channel*

:::::: *4Gb Fibre Channel-to-SAS/SATA High Availability RAID6 Storage Systems with JBOD Expansion*

High Availability
The Promise VTrak E-Class is a family of intelligent, dual controller, SAS/SATA based storage arrays that fundamentally changes storage economics from purchase and set up to operation and upgrades. Dual 4Gb Fibre Channel (FC) host interface ports per controller provide connectivity into widely deployed Fibre Channel storage networks, perfect for supplementing existing or building new storage networks. Each standard 3U 19" rack unit supports up to 16 off-the-shelf 3.5" SAS or SATA 3Gb/s drives. Attach up to four cascaded SAS JBODs to deliver over 80 bays of networked storage.

4G Fibre Channel Performance and Reliability
SAN technology has revolutionized the way data moves throughout the enterprise. VTrak E-Class joins this revolution by exceeding the performance and bandwidth requirements of even the most data intensive applications. Fibre channel's flexible, mature technology and wide interoperability makes it the first choice for mission critical applications.

No single point of failure
This enterprise-class, cable-less system design includes fully redundant, hot-swappable controllers, power and cooling units. All system components are constantly monitored using industry standard protocols to ensure continuous operation in case of failure or component malfunction. Dual active-active, failover/failback RAID controllers provide redundant data paths to further help ensure availability.

RAID 6
RAID 6 (double parity) delivers the highest level of reliability and data protection in a cost-effective solution. As the capacity of storage arrays increases, so does the risk of encountering unrecoverable read errors with single parity RAID levels. RAID 6 can handle double drive failures, thereby providing greater protection against data loss. This also dramatically reduces the risk of catastrophic data loss during RAID rebuilds.

Easy to install and manage
The VTrak line features Promise's embedded browser based management interface, WebPAM PROe, eliminating the need to install additional software. All VTrak systems on the network can be configured and monitored using a single, easy-to-manage interface through an out-of-band Ethernet port. By using industry-standard management protocols, Promise simplifies integration with third-party management applications.

Service and Support
Every VTrak is backed by the Promise 3-Year limited warranty with 24/7 telephone and email support (Americas & EMEA). When our support confirms a failure in the field, advanced replacement parts are always available to eliminate down time.

VTE610fS and VTE610fD

Highlights

:: Dual/Redundant RAID controllers with two 4Gb FC host interface ports per controller

:: 16 hot-swappable drive bays in a robust 3U chassis

:: Supports Serial Attached SCSI (SAS) and SATA 3Gb/s drives simultaneously

:: RAID Levels 0, 1, 1E, 5, 6 10, 50, 60

:: One SAS-wide (x4) expansion port per controller supports up to four VTrak JBODs (80 bays total)

:: Out-of-band Ethernet or RS-232 management using standards based protocols including pop-up messages, event logging, and email notification.

Fully Redundant Hot-Swap Field Replaceable Units

Serial Attached SCSI

SERIAL ATA

RoHS 2002/95/EC

VTrak E-Class
Fibre Channel -to- SAS / SATA RAID Storage System

System and Controller Features

E-Class 3U/16-Bay FC Models	VTE610fD	Dual Controller Configuration Active/Active, Failover/Failback Flexible controller configurations; LUN affinity, enable/disable RCC
	VTE610fS	Single Controller Configuration, Upgradeable to redundant
Drive Support	Up to sixteen 3.5" hard drives: SAS 3Gb/s SATA II 3Gb/s-- direct connect in single controller configuration or uses the Promise SATA MUX Adapter in dual I/O module configuration Supports any mix of SAS and SATA II 3Gb/s drives simultaneously in the same system; Direct SATA LED support Staggered physical drive spin-up	
External I/O Ports (per controller)	Dual 4Gb Fibre Channel host ports One external 3Gb/s SAS x4 ports for JBOD expansion (up to 4 VTrak JBOD Systems)	
Data Cache	Shared 512MB predictive data cache (max. to 2GB per controller - purchase through Promise), Automatic write cache de-staging, 72-hour battery backup	
Command Queue Depth	512 commands per controller (1024 in some dual controller configurations)	

Operational Features

RAID Level	RAID 0, 1, 1E, 5, 6, 10, 50, 60– Any combination of these RAID levels can exist at the same time; Configurable RAID stripe size: 64K, 128K, 256K, 512K and 1MB stripe size per disk Background task priority tuning, adjustment of minimum I/O reserved for server use during all background tasks
Hot spares	Multiple global or dedicated hot-spare drives with revert options
Max LUNs per subsystem	256 in any combination of RAID levels and array types
Max LUNs per array	32 logical drives (LUNs); Supports LUN carving by allowing an array to be divided into multiple logical drives, RAID level, stripe size, sector size and cache policy can be configured per LUN. Supports out of order logical drive deletion and re-creation
Max LUNs per Target ID	Up to 256, depending on host side driver and operating system
LUN Masking and Mapping	Supports multiple hosts and initiator lists
Disk data formats	Supports Disk Data Format (DDF) for industry wide standardization and drive roaming between Promise RAID products
Background Activities	Media Patrol; Background synchronizing; Foreground initialization; Rebuild; Redundancy Check; SMART condition pooling; OCE (Online Capacity Expansion); RLM (RAID Level Migration); Priority Control, Rate Control and watermarking per BGA in Disk and NVRAM
PerfectRAID Data integrity functions	Physical Drive Error Recovery: PDM (Predictive Data Migration): Replace un-healthy disk member in array, and keep array on normal status during the data transition between healthy HD and replaced HD, Bad Sector Mapping, Media Patrol, SMART, Hard/Soft Reset to recover HD from bad status, HD Power-control to recover HD from hung status. Array Error Recovery: Data recovery from bad sector or failed HD for redundant RAID, RAID 5/6 inconsistent data Prevent (Write Hole Table), Data content Error Prevent (Read/Write Check Table) NVRAM event logging
SCSI Commands	Supports extended SCSI command set equivalent to SCSI/FC hard disk drives; Variable sector size (512Byte to 4kB) to break legacy limitation; 16Byte CDB support for 64-bit LBA addressing

System Management

Supported Operating Systems	Windows 2003, Linux (Red Hat, SuSE)
Management Tools/Interfaces	Operating System independent; Localized in multiple languages; SSL Security support; WebPAM PROe via out-of-band Ethernet; Command Line Interface or Command Line Utility via RJ-11 Serial Port or Ethernet (Telnet); Standard Management Protocols: SNMP, WBEM/CIM; Auto, Express and Advanced configuration support for novice and skilled users Embedded Web server and mgmt support – No host agent is needed Ethernet, RJ-11 Serial Port; SNMP, SSL, Telnet; Email, audible (buzzer), and visible (LED) indicators

Mechanical Specification

Voltage	100-240 Vac Auto-Ranging
Current (Maximum)	8 A @ 100 Vac; 4 A @ 240 Vac (current rating with two power cords)
Power Supply	Dual 500W, 100-240 Vac auto-ranging, 50-60 Hz, dual hot swap and redundant with PFC, N+1 design
Power Consumption	108.38 Watts (under load w/o HDD), 523.91 Watts (under load with SAS HDD)
Operating Temperature/ Humidity	5°~40°C (-40°~60°C non operational) / Maximum 95%
Vibration	Random, 0.21 grms, 5-500Hz, X, Y, Z axis
Dimensions (H x W x D)	13.1x 44.65x 56.1 cm (5.2 x 17.6 x 22.1in)
Weight *Assume each hard drive = 0.5 kg*	Net weight: 30.5 kg (67.2 lbs) without drives, 38.5 kg (84.9 lbs) with 16 drives* Gross weight: 37.5kg (82.7 lbs) without drives
Safety	CE, FCC ClassA, VCCI, cUL, TUV, CB, BSMI, C-Tick, MIC

Warranty and Support

Warranty	Three years complete system limited warranty**

*Assume each hard drive = 0.5 kg
** Battery backup unit is covered by a one year limited warranty
Specifications subject to change without notice.

About Promise

Promise Technology provides a comprehensive SAS/SATA RAID storage product line including rack mount RAID enclosures, PCIe RAID, SOHO-NAS and SATA RAID ASICs for embedded applications. Headquartered in Milpitas, CA, the company has ISO-9001 certified R & D centers in the USA, Taiwan and China, For more information, visit: www.promise.com