

# Portable & Rugged RAID

# Series RU5e

## 5 TB Compact RAID for Harsh Environments

Now you can take your demanding enterprise data-intensive application on the road! The rugged RU5e is a lightweight portable RAID subsystem built to extreme military standards to withstand any harsh field environment - a perfect companion for the Panasonic Toughbook. It's easy to deploy: simply plug and play with any rugged or standard laptop, desktop or server host having an XpressCARD-to-eSATA adapter, a USB 2 port or a FireWire 800 port. Ideal for transportable ground, shipboard or airborne data applications for emergency, military, police, oil exploration, mining, field studios, mapping, video, data acquisition and field data analysis.

### Portable & Rugged RU5e

#### Transportable

- Compact and lightweight - 23 pounds
- Large recessed handle with rubber grip
- Can be stacked two high

#### Ruggedization

- MIL-STD-810E, 461D, 1472F
- Operates from 0° to 120°F
- Thumbscrew lock-down drive carriers
- Robust aluminum chassis and cage
- Redundant ultra-quiet fans
- EMI shielded, gaskets and line filter
- Front and rear serviceable dust filters

#### Performance

- Embedded hardware RAID controller
- Three high speed host ports:  
eSATA 1.5G - Up to 187.5 MB/sec.  
USB 2 - Up to 60 MB/sec.  
FireWire 800 (IEEE 1394b) - Up to 95 MB/sec.
- High speed hardware ASIC parity engine
- 5 SATA drive channels, 300 MB/s each
- Up to 24,000 disk I/Os per second
- 128 MB cache with ECC

#### Capacity

- Five disks per enclosure
- 500 GB, 750 GB, 1 TB per disk drive
- Up to 5 TB with 1 TB disk drives
- On-line automatic capacity expansion

#### Reliability

- Hot-swap disk drives
- RAID 1, 3, 5, 6, 1+0, 15 protection
- Hot-spare on-line drive rebuild
- Remote diagnostic capability
- Individual drive thumbscrews and IDs
- Failure alarm -- visual/audible/remote
- 1.2 million hour MTBF drives
- 24x7 call center

#### Compatibility

- Any host with eSATA, USB 2 or FireWire
- Windows, Vista, Mac OS X, Linux
- No software drivers required on host

### Ruggedization

RU5e is designed to meet MIL-STD-810-E for environmental compliance and MIL-STD-461-D for Electromagnetic Interference (EMI). The solid seam welded sturdy aluminum construction throughout is designed to withstand very vigorous handling. The hinged front door is secured with two thumbscrews and provides easy access to the "hot-swap" drive carriers.

Individual drive lockdown thumbscrews secure each drive to the chassis to minimize vibration avoiding potential read/write errors. With this sturdy protection, RU5e has been deployed by the military at hundreds of installations worldwide with field proven reliability and performance.

### RAID Data Protection

RU5e is typically configured as a RAID 5 array with single parity, RAID 6 array with dual parity or as RAID 1+0 arrays (striped mirror sets). The high speed hardware ASIC parity engine automatically rebuilds data on a "hot-spare" disk or when a drive is replaced.

### Ease of Use

The RU5e is "plug and play" with eSATA, USB 2 and FireWire 800, using any operating system and with no host software to load. It incorporates best practices in military design storage, emissions, and environmental. Storage is managed securely from the RU5e Web GUI via the LAN port, the front LCD console or from the RS232 port with error reporting in easy-to-understand terms.



The RU5e is 8" x 9" x 14" in size and weighs only 23 pounds making it easily transportable with the folding rubber grip handle.



Panasonic mil-spec Toughbook CF-52

The RU5e easily connects to your rugged or standard laptop. The eSATA connection delivers up to 187.5 MB per second data throughput - enough for any portable application.



Ruggedized unit holds up to five drives secured with unique lockdown thumbscrews to minimize shock and vibration. The RU5e provides up to 5 TB of storage with 1 TB SATA disk drives.

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## Overall Performance

Max. sustained I/O rate  
Host data transfer rate

24,000 read/write operations per second  
eSATA 1.5G - Up to 187.5 MB/sec.  
USB 2 - Up to 60 MB/sec  
FireWire 800 (IEEE 1394b) - Up to 95 MB/sec.

## Tabletop

Max. drives/Max. capacity  
Removable drive trays

5 drives / 5 TB  
Hot-swap all-metal carriers, drive lockdown thumb-screws, drive ID  
200W Hi-rel, UL, MIL-STD compliant  
Redundant 65 cfm fans, thermal-controlled

Power supply  
Fans

## SATA Disk Drives

Capacity per drive  
Access time  
Disk MTBF

500 GB, 750 GB, 1 TB; 7,200 rpm  
8.5 msec.  
1.2 million hours

## Controller

RAID levels supported  
On-line capacity expansion  
Cache algorithms

1, 3, 5, 6, 1+0, 15, 16  
Automatically adds new drives to existing array  
Intelligent multi-threaded, write-back and write-through caching algorithms with dynamic read lookahead for multi-user/multi-tasking servers  
128 MB with ECC  
5; flexible binding/partitioning of physical disks  
1 eSATA, USB 2 or FireWire for host; 5 SATA for drives  
2 m eSATA, 6 m USB 2, 100 m FireWire 800  
2x16 character display, push button controls  
Web GUI over LAN, LCD front panel, local terminal  
View and edit logical RAID/physical drives, setup hot-spare drives, map hosts, check parity, enable write-back cache, rebuild failed drive, view logs...  
Display cache and disk read/write statistics

Cache memory capacity  
Max. logical units  
Host and disk channels  
Max. external cable length  
LCD front panel  
Operating consoles  
Operating console functions

Performance monitoring

## Compatibility

Operating systems supported  
(No software drivers required)

Any OS that supports eSATA, USB 2 or FireWire 800

Platforms supported  
Cluster supported  
Remote monitoring ports  
SCSI compliance

Any OS that supports eSATA, USB 2 or FireWire 800  
Any cluster  
Ethernet and RS-232  
ANSI standard SCSI-1, SCSI-2, SCSI-3

## General

AC power  
Dimensions  
Weight  
Standard warranty  
Installation and service

90 - 260 VAC, auto-ranging, 6 amps peak  
8"h x 9"w x 14"d  
23 lbs.  
One year, next day on-site and "800-Hotline" in U.S.  
On-site installation, 24x7 service available in U.S.



**The RU5e ships in a ruggedized Stormcase\* wheeled transport case with telescopic handle.**

winsys.com

## APPROVALS PENDING

**Environmental Specifications**  
**MIL-STD-810E**

### Vibration

Transport in wheeled and tracked vehicles

### Altitude

Operating: 15,000 ft  
Non-Operating: 40,000 ft

### Temperature

Operating: 0° F to 120° F  
Non-Operating: -25° F to 150° F

### Temperature Shock

0° F to 70° F and 120° F to 70° F  
in 10 minutes

### Rain Test

Operates in conditions of blown precipitation and spillage

### Humidity

10% to 95% (mist and fog)

### Inclination

30° on any axis

### Bench Handling

30° rotation drop from each bottom edge

### Electromagnetic Compliance

**MIL-STD-461-D**

CE102, CS101, CS114, RE102, RE103

### HEMP

**MIL-STD-2169B**

### Human Factor Engineering

**MIL-STD-1472F**

Meets all general human engineering design criteria for military subsystems, such as grips, thumbscrews, door, weight, etc.

## RU5e Rear View



**WINCHESTERSYSTEMS®**

Purpose-Built Storage

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