

# The Better Way of Connecting External Storage

Oxford Semiconductor

Shenzhen, China

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# Introduction

- Headline Data Rate – 1394 vs USB 2.0
- Bus Efficiency – 1394 vs USB 2.0
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- Other Comparison – Bus Power, Cable Length, Application
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- Oxford Semiconductor 93x Overview

# Data Rate – 1394 vs USB 2.0

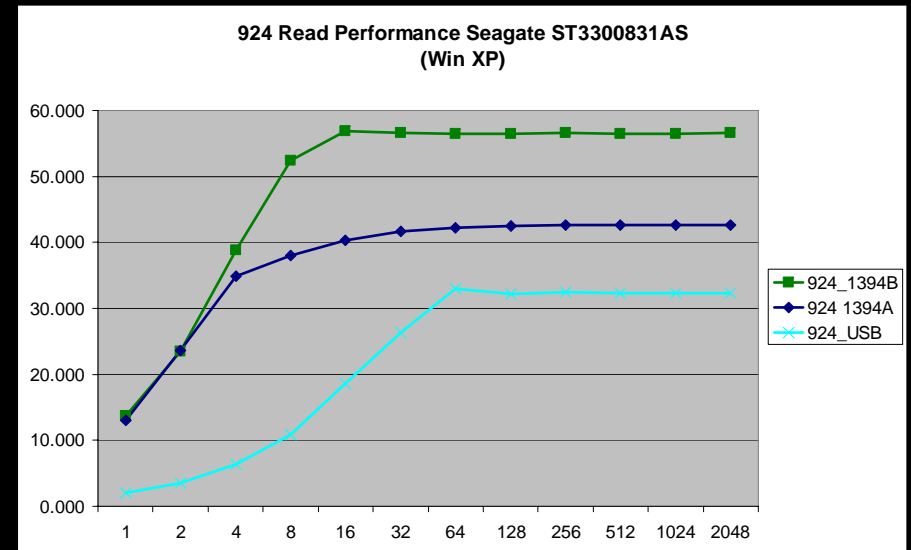
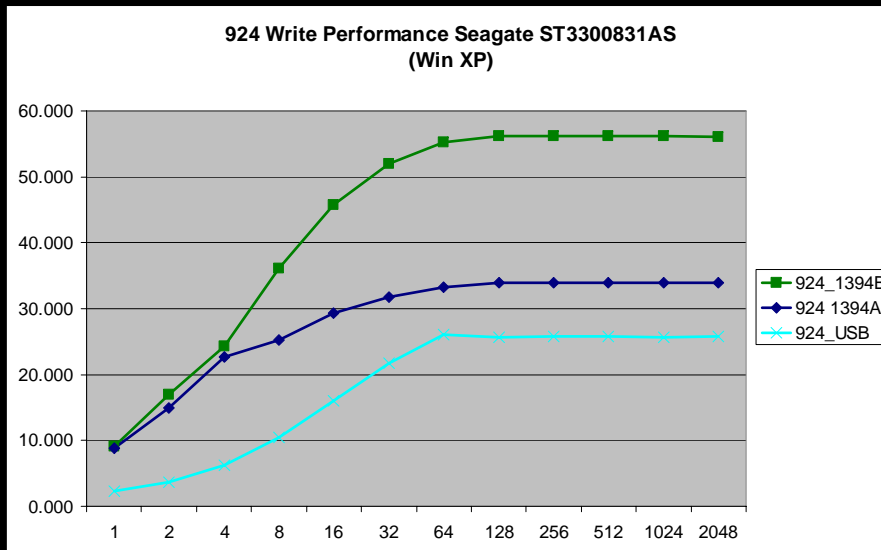
- **Headline Rate rates**
  - USB2.0 480 Mbits/s
  - 1394A (aka FireWire400) 400 Mbits/s
  - 1394B (aka FireWire800) 800 Mbits/s
- **BUT**
  - Headline data rates are deceiving & hide the actual performance of systems
  - USB uses a Master/Slave topology
  - USB Host controllers have low efficiencies low effective data rates
  - 1394 (FireWire) uses Initiator/Target topology

# Bus Efficiency – 1394 vs USB 2.0

	Headline	Actual Read	Actual Write	Efficiency (Average)
USB2.0	480	264	208	49%
1394A	400	332	264	75%
1394B	800	712*	496*	76%

- Even though USB2.0 has higher headline data rates than 1394A, in reality it delivers much lower data rates due to poor efficiency

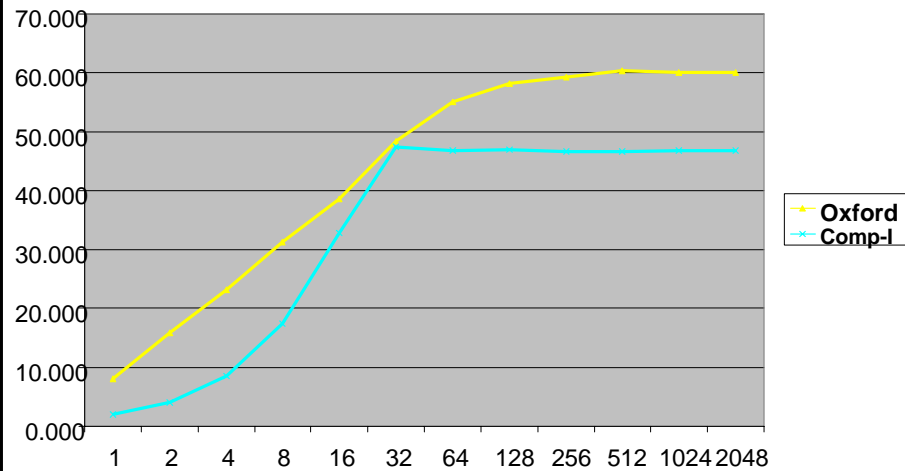
# Why is 1394 Gaining Ground ?



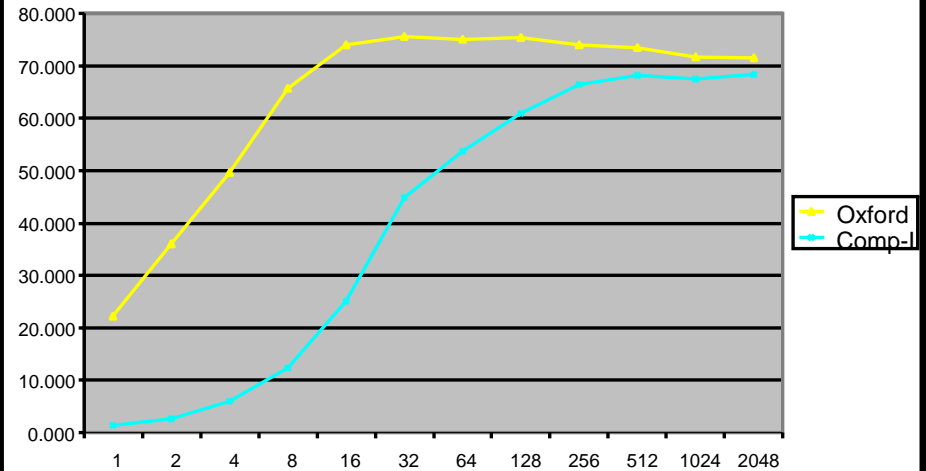
Improvements in HDD performance means that *even* for Single Disc systems USB and FW400 now become bottlenecks. FW800 has the bandwidth to meet the maximum HDD performance.

# Oxford Performance with 1394B

Write Performance Seagate 7200  
(Win XP)

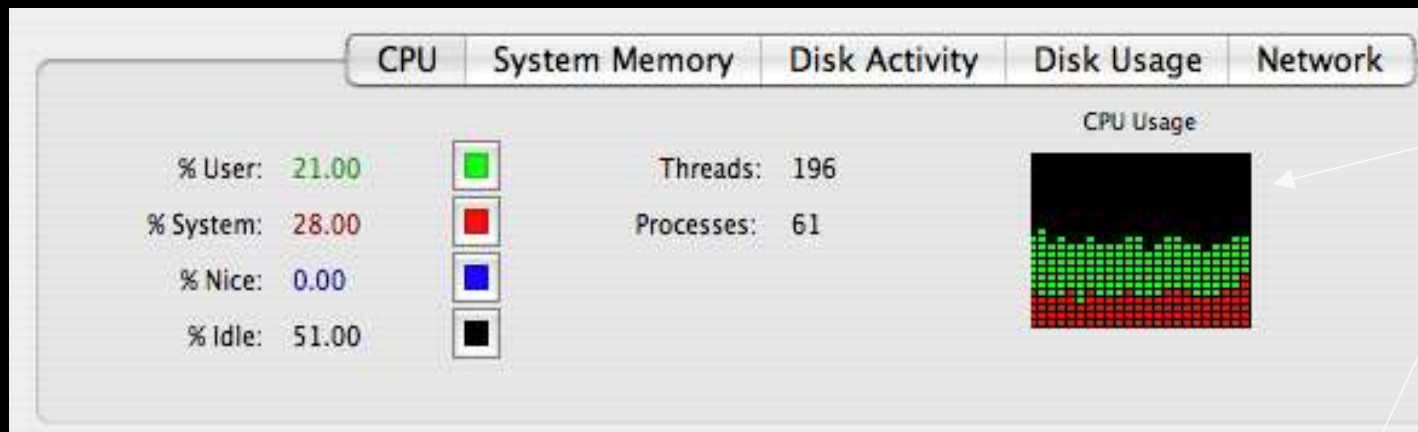


Read Performance Seagate 7200  
(Win XP)



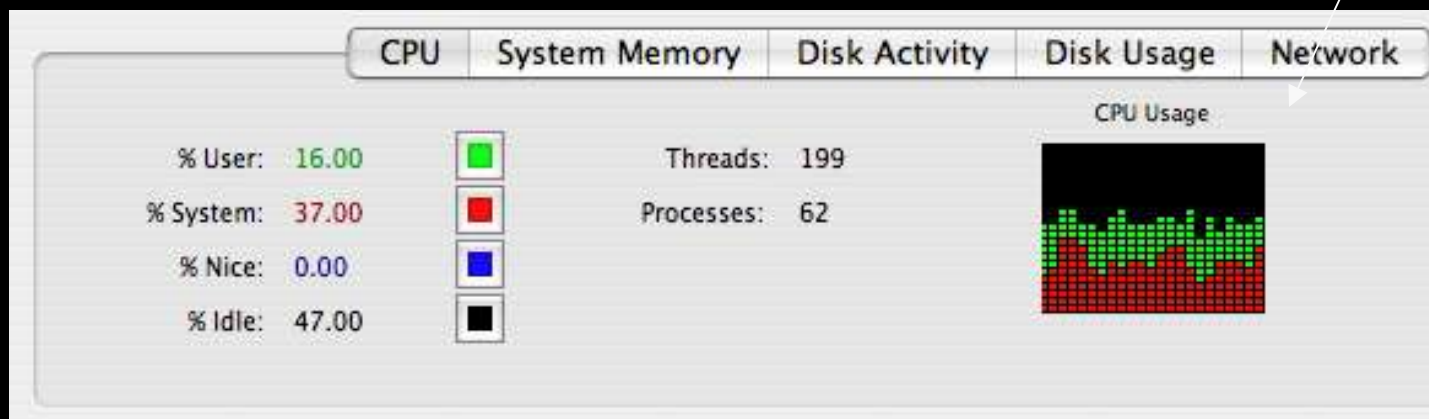
# CPU Loading – 1394 vs USB 2.0

FireWire



USB2.0 has bigger average cpu loading and larger Variation in loading

USB2.0



# Other Comparison

	1394	USB2.0	eSATA
Bus Powered	8V-27V@1.5A	<u>5V@0.5A*</u>	None
Cable Length	4.5m-100m	3m - 5m	2m
Application	Various	Various	HDD Data Transfer Only

\* USB Bus Power will not be able to drive 3.5" hard disk drive and will need 2 USB ports to drive 2.5" hard disk drive



# Oxford Semiconductor

## Enabling System Solutions

**Storage Solutions**

- Direct-Attach Storage Controllers
- Network-Attached Storage Controllers

**Connectivity Solutions**

- Serial Communication Bridges
- USB (Host, Peripheral, OTG)
- Network Connectivity Controllers

**Emerging Solutions**

- Connected Digital Lifestyle Future

## Defacto Supplier of Market Leading Solutions

## Worldwide Coverage



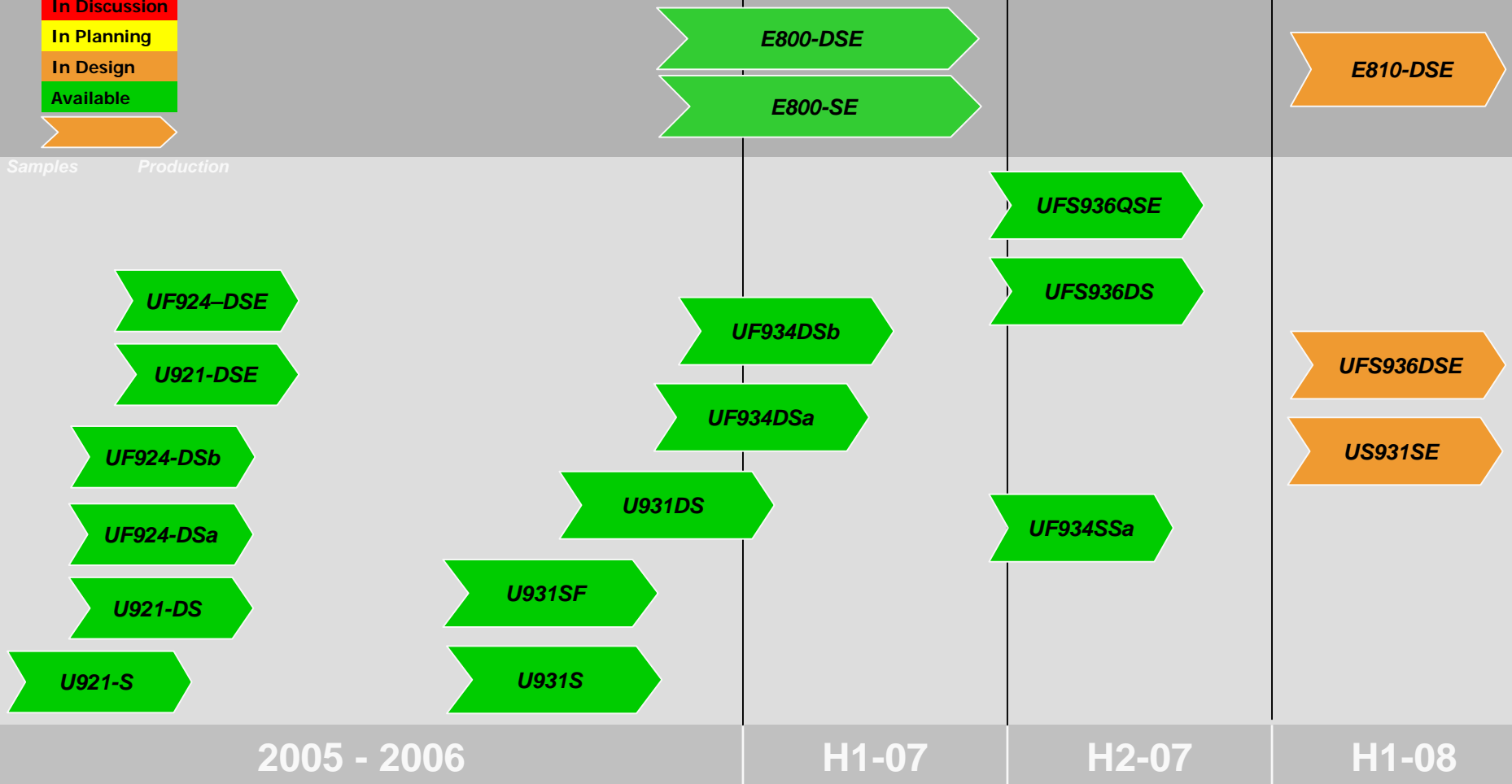
## The Oxford Solution Advantage

Easy to design-in, high-performance solutions...	
<b>Performance</b>	Standard compliant, proven, high performance solutions with certified device drivers for a broad range of operating systems
<b>Differentiation</b>	Flexible customization and advanced feature capability
<b>Time-to-Market</b>	Fast time-to-market with complete platform solutions – drivers, reference designs, evaluation boards, design kits, and dedicated applications support
<b>Quality</b>	Eliminate risk with devices rigorously designed for reliability and verified to meet all compliance, certification, interoperability, performance, and data integrity requirements
<b>Leadership</b>	Over 15 years of industry firsts and high-performance leadership solutions

# Oxford Semiconductor Storage Product



Samples      Production



# Oxford Semiconductor 93x Overview

	USB Family				FireWire			RAID controllers		
	U931-S	U931-SF	U931-DS	US931-SE	UF934-SSa	UF934-DSa	UF934-DSb	UFS936-DS	UFS936-DSE	UFS936-QSE
USB2.0										
eSATA			S-S OR DS			SATA to SATA OR dual SATA				
FW400										
FW800										
RAID 0										
RAID 1										
RAID 3, 5, 10										
Encryption										
Application	USB to SATA bridge	USB to SATA bridge with external flash for product customisation	USB / eSATA to SATA or USB to Dual SATA with disk striping	USB / eSATA to SATA bridge with encryption	USB / FW400 / to SATA bridge	USB / FW400 / eSATA to SATA or USB to Dual SATA with disk striping	USB / FW400 / FW800 / eASTA to SATA or USB to Dual SATA with disk striping	USB / FW400 / FW800/ eSATA to SATA bridge with disk striping and disk mirroring	USB / FW400 / FW800/ eSATA to dual SATA bridge with, RAID 0 or 1 and encryption	USB / FW400 / FW800/ eSATA to quad SATA with, RAID 0, 1, 3, 5 and 10 and encryption



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