

# WS4/WS8 High Performance Computer Workstation



Workstation Includes Keyboard and Mouse - Not Pictured

## WS Overview

The TDT WS computer workstations are rack-mountable and purpose-built for research applications, experiment control and data analysis. Each WS is equipped with a TDT PO5 Optibit interface and 240 GB Solid State Drive (SSD) with preinstalled TDT software, and 64-bit Windows 7® or Windows 10® for fast system booting, reliable operation, and easy set-up.

In addition to the primary hard drive, the WS includes at least one removable 1 TB hard drive. Using a removable drive for data storage enables users to take their data with them or swap out storage drives for each experiment, student, or research team in a lab. Additional storage drives are available from TDT.

The WS is available in two configurations each with an optimized combination of processor, memory, and graphics. The WS-8 is optimized for the most demanding applications, including high-channel count neurophysiology, and includes premium peripherals. The WS-4 is targeted for less demanding applications, such as ABR and DPOAE testing with BioSigRZ software, while still tailored to the lab environment. Both form factors include two Gigabit Ethernet network ports for flexible integration to existing lab infrastructure or external device support.

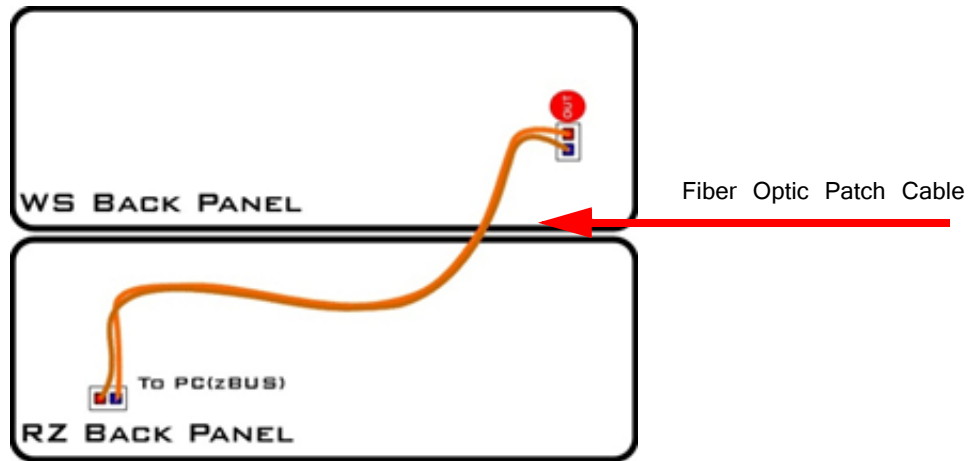
## Power and Interface

The WS's factory installed, Optibit optical interface card ensures fast and reliable data transfer from the WS to the TDT system. Connectors are provided on the back panel. The red OUT sticker is provided for correct wiring.

The power supply is auto-switching for 110 V or 220 V. A soft on/off button is provided on the front panel and a hard power cutoff switch is provided on the back panel.

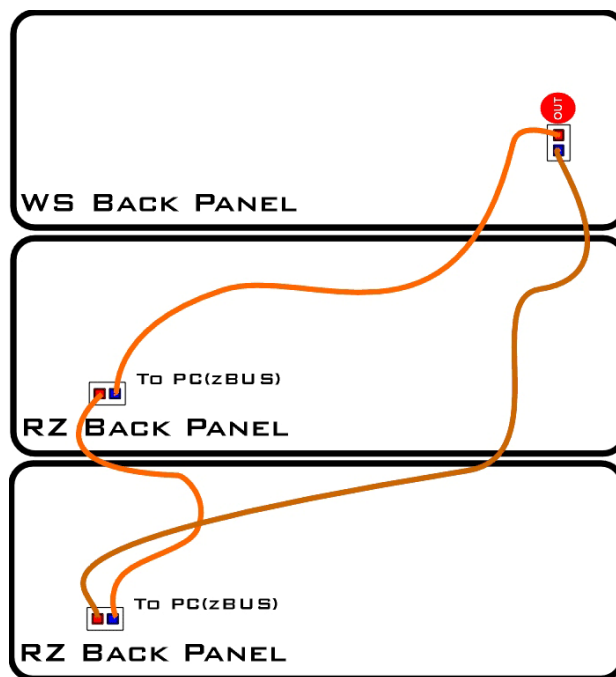
# WS Hardware Setup

Use the provided duplex fiber optic patch cables (orange) to connect the WS's factory installed, Optibit optical interface card to a TDT processor device. The fiber optic ports on each device and the patch cables are color-coded and use key and notch connectors to ensure correct wiring.

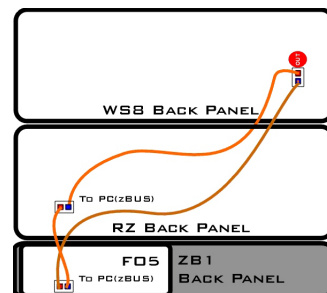


## Connecting Multiple Devices

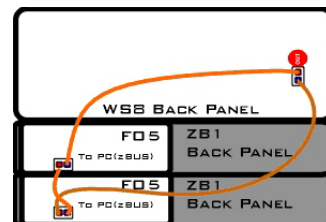
Multiple processors (or other interface-dependent devices mounted in a zBus chassis) can be connected to the WS's Optibit interface in a communications loop. The most common configuration consists of multiple RZ devices, such as multiple RZ2s used for processing higher-channel counts. The strands of the duplex cable can be separated as needed to make the required connections. See the diagrams below for additional configurations.



Multiple RZ Processors



Mixed RZ and RX or RP Processors



Multiple ZB1 Mounted Devices (RX, RP, PA5)

# WS Features

## LED Display

The LED display provides visual representation of system performance. The display includes 12 angled lines of LEDs representing percentage of performance capacity in use, from 0 – 100%, for each system element. Lines are labeled for quick identification and include indicators for the system elements listed below.

<b>NET-A</b>	Ethernet Port A
<b>NET-B</b>	Ethernet Port B
<b>1-4</b>	Processor Threads 1 – 4
<b>5-8</b>	Processor Threads 5 – 8 (WS-8 only)
<b>HDD</b>	System Hard Drive
<b>MEM</b>	RAM Usage

## System Hard Drive (C:)

The system hard drive is pre-loaded with Windows 7® or Windows 10® and TDT Software. It is labeled as the C: drive and is accessible from the front panel. This is a removable drive, but must be in place for system operation. A blue LED indicates connection and a purple LED indicates when the drive is being accessed.

## Data (D: & E:)

The WS supports up to two removable data drives for storage of experiment data. The drives slots are accessible from the front panel and are labeled D: and E:. The standard system ships with one storage drive and additional drives may be purchased separately. A blue LED indicates connection and a purple LED indicates when the drive is being accessed.

### To remove/insert drives:

1. Turn off the WS.
2. Press upward on the silver button near the bottom of the drive door then lift the door up to open.
3. Pull the drive out or push it into place.
4. Close the drive door, pressing firmly until it snaps into place.



**CAUTION!** Do not remove or insert drives while the WS is running.

## USB Ports

The WS includes one front panel USB 2.0 port and four USB 3.0 ports accessible from the back panel. See the Connector Panel diagram below for port location. Two USB extension cables are provided for maximum flexibility in your lab set-up.

## Video Support

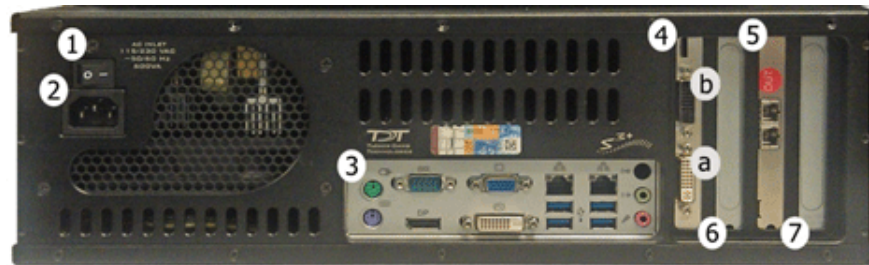
The WS-8 and WS-4 each include a high-performance video card. The WS-8 card supports up to two monitors, with a 'primary' port that must always be used and a second port to be used for a second monitor. One or two DVI cables are provided.

**Important!** Standard video connections are disabled when the video card is in use.

## Input/Output Connections

The WS includes standard connections for keyboard, mouse, and audio input/output lines. Two Gigabit Ethernet ports and an RS232 type serial port are also provided.

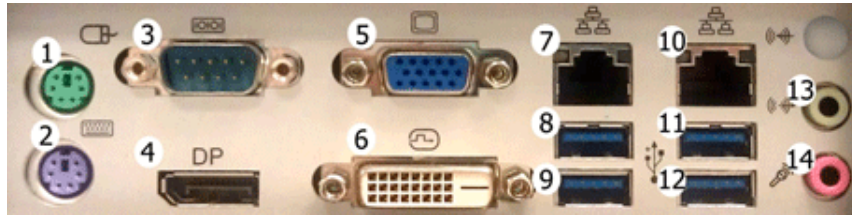
## Back Panel Connections



1. On/Off Switch
2. AC Power Cord Input
3. Connector Panel (see below)
4. Video Card with Dual (WS8 only) Link DVIs and HDMI-mini
  - a. Primary Video Connection
  - b. Secondary Video Connection
5. PO5 Optical Port
6. Unavailable
7. Open PCIe x4, Half -Length Slot

**Note:** The provided keyboard and mouse connect via USB ports.

# Connector Panel



- |                        |                                    |                    |
|------------------------|------------------------------------|--------------------|
| 1. PS/2 – Mouse        | 6. DVI-D Digital Visual Interface* | 11. USB 3.0        |
| 2. PS/2 – Keyboard     | 7. Gigabit Ethernet                | 12. USB 3.0        |
| 3. Serial (RS232) Port | 8. USB 3.0                         | 13. Audio Line Out |
| 4. Display Port*       | 9. USB 3.0                         | 14. Mic In         |
| 5. VGA Monitor*        | 10. Gigabit Ethernet               |                    |

\*Note: 4, 5, and 6 are disabled, when using the video card.

## WS-8 Technical Specifications

<b>CPU</b>	3.4 GHz Intel® Core™ i7 (4 SMT Cores for 8 processor threads running at 3.4 GHz in parallel)
<b>Memory</b>	8 GB DDR3 SDRAM
<b>Video Card</b>	GeForce GTX 650 with 2 GB RAM
<b>OS Hard Drive</b>	240 GB Solid State Drive (SSD)
<b>Data Storage</b>	1 TB, 7200RPM removable hard drive (1 included)
<b>Network</b>	Two Gigabit Ethernet ports
<b>TDT Interface</b>	P05 card
<b>Open Slot</b>	PCIe x4, half-length
<b>Keyboard</b>	Das Keyboard Model S Professional Click Pressure Point Mechanical Keyboard with two port USB hub
<b>Mouse</b>	Mad Catz R.A.T.3 Optical Gaming Mouse
<b>Operating System</b>	64-bit Windows 7® Professional or Windows 10®
<b>Software</b>	TDT Drivers, RPvdsEx, and other TDT software as requested

# WS-4 Technical Specifications

<b>CPU</b>	3.4 GHz Intel® Core™ i5-3570
<b>Memory</b>	4 GB DDR3 DRAM
<b>Video Card</b>	GeForce GT 730 with 2 GB RAM
<b>OS Hard Drive</b>	240 GB Solid State Drive (SSD)
<b>Data Storage</b>	1 TB, 7200RPM removable hard drive (1 included)
<b>Network</b>	Two Gigabit Ethernet ports
<b>TDT Interface</b>	P05 card
<b>Open Slot</b>	PCIe x4, half-length
<b>Keyboard/Mouse</b>	Microsoft USB Keyboard and Mouse
<b>Operating System</b>	64-bit Windows 7® Professional or Windows 10®
<b>Software</b>	TDT Drivers, RpvdsEx, and other TDT software as requested