WS4/WS8 Computer Workstation

Hardware Reference

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Table of Contents

WS4/WS8 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 Optibit interface and comes pre-installed with TDT software.

The WS also includes at least one removable 1 TB hard drive. Additional storage drives are available from TDT.

The WS is available in two configurations. The WS8 is optimized for the most demanding applications, including high-channel count neurophysiology. The WS4 is targeted for less demanding applications, such as ABR and DPOAE testing with BioSigRZ software or fiber photometry. Both form factors include two Gigabit Ethernet network ports for integration with existing lab infrastructure or external device support.

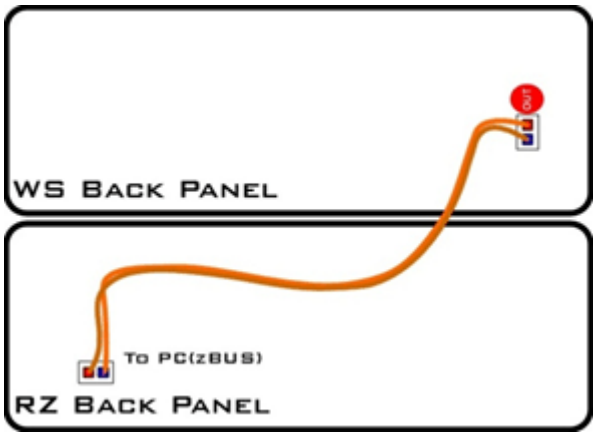
Power and Interface

The WS comes factory installed with an Optibit optical interface card.

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.

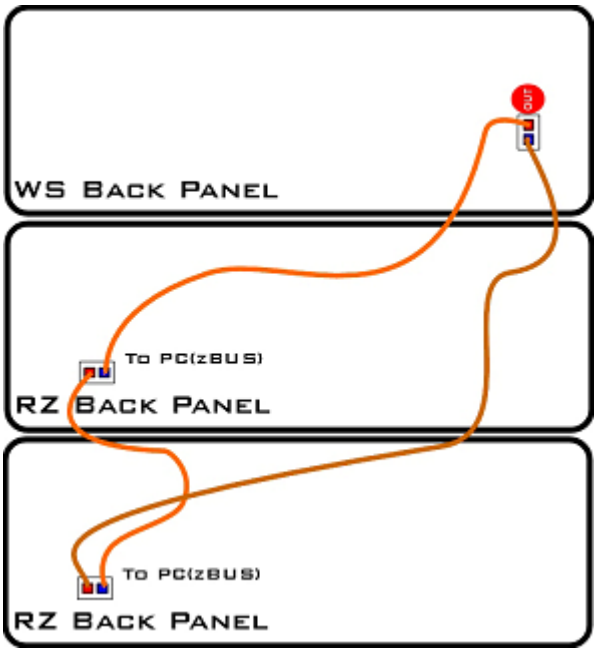
WS Hardware Setup

Use the provided duplex fiber optic patch cables (orange) to connect the WS's factory-installed 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.

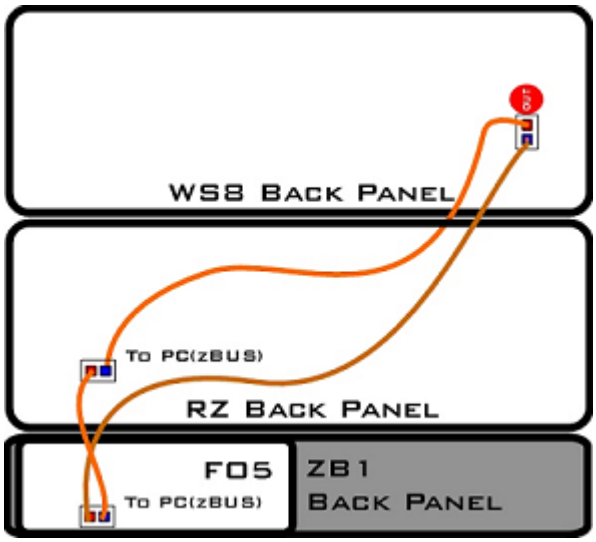


Connecting Multiple Devices

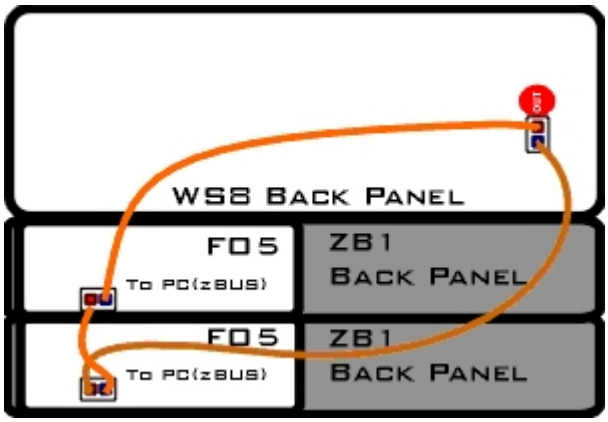
Multiple processors (or other interface-dependent devices mounted in a zBus chassis) can be connected to the WS's Optibit interface in a communications loop. The most common configuration consists of multiple RZ devices, such as multiple RZ2s used for processing higher-channel counts. The strands of 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.

NET-A	Ethernet Port A
NET-B	Ethernet Port B
1-4	Processor Threads 1 - 4
5-8	Processor Threads 5 - 8 (WS8 only)
HDD	System Hard Drive
MEM	RAM Usage

System Hard Drive (C:)

The system hard drive is pre-loaded with 64-bit Windows 10 or 11 and TDT Software that was purchased with the system. For WS SN > 3000, the operating system is on an NVMe drive installed on the motherboard.

For WS devices with SN < 3000, 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: (or DATA1 and DATA2). The standard system ships with one storage drive and additional drives may be purchased separately. Any 2.5" SATA hard drive is compatible. A blue LED indicates connection and a purple LED indicates when the drive is being accessed.

> **Caution**
>
> Do not remove or insert drives while the WS is running.

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.

USB Ports

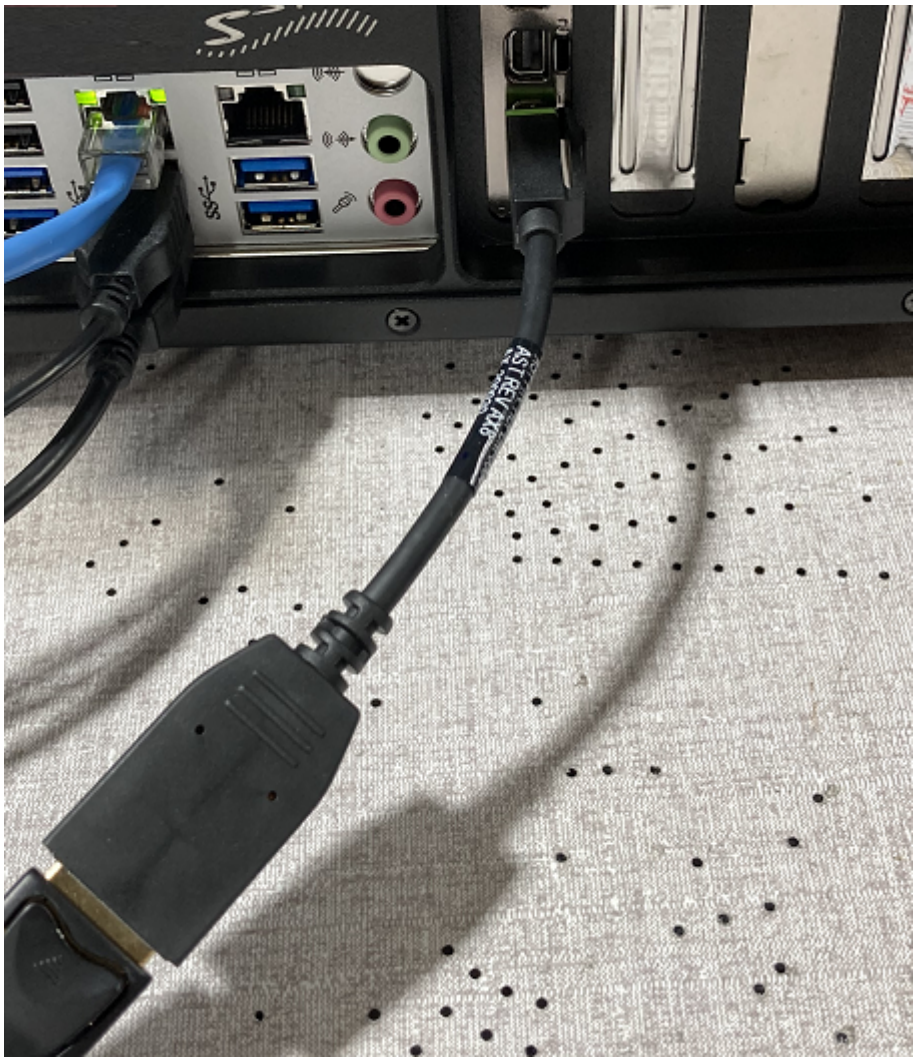
WS serial numbers 3000 and above include two front panel USB 3.2 ports, and four USB 3.2 ports on the back.

WS serial number 2000-3000 include one front panel USB 3.0 port, six USB 3.0 ports on the back, and two USB 2.0 ports on the back.

WS serial number <2000 include one front panel USB 2.0 port and four USB 3.0 ports on the back. See the Connector Panel diagram below for port location. Two USB extension cables are included so keyboard and mouse can be away from the WS.

Video Support

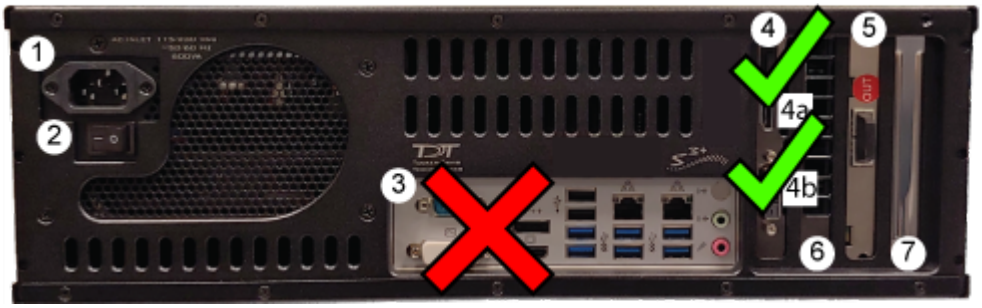
The WS8 and WS4 each include a high-performance video card. The WS8 (SN >3000) supports up to four monitors. The WS4 (SN >3000) supports up to three monitors. The latest WS models have a mini-Display Port to Display Port (DP) adapter and a DP-DP cable instead.



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



WS serial number 2000 and above

1. AC Power Cord Input
2. On/Off Switch
3. Connector Panel
4. Video Card with mini-DisplayPort*
5. PO5e Optical Card
6. Unavailable
7. Open PCIe x4, Half-Length Slot

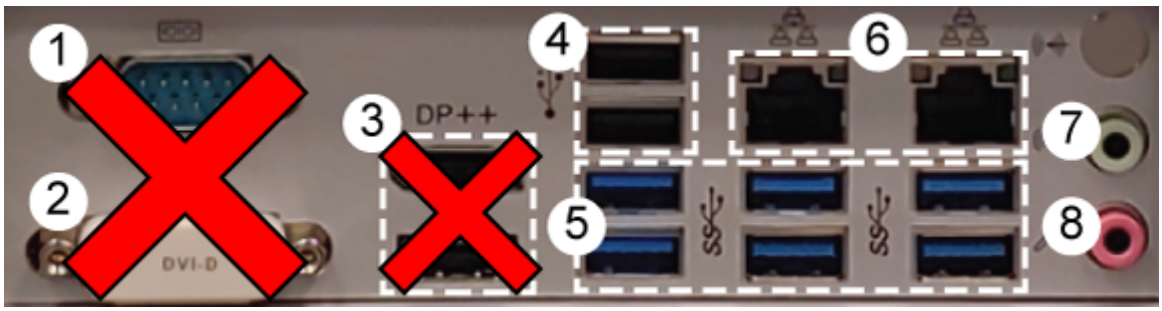
Warning

Do not connect to the motherboard video connections (labeled '3'). Only connect monitors to the graphics card (labeled '4').

Note

* Older WS models have DisplayPort (WS8 only), HDMI, and DVI. WS4 (SN >2000) built after approximately 29 June 2021 may have three mini-Display Port connectors instead. WS8 SN>3000 will have four.

Connector Panel



1. Serial (RS232) port
2. DVI-D *
3. Display Port / HDMI *
4. USB
5. USB 3.0
6. Gigabit Ethernet
7. Audio Line Out
8. Mic In

> **Warning**
>
> * Do not connect a monitor to the motherboard video connections (labeled '2' and '3'). Only connect monitors to the graphics card (labeled '4' in the Back Panel Connections).

WS8 Technical Specifications

CPU	SN >3000: Intel Core i7-12700K SN >2000: Intel Core i7-6700K SN <2000: Intel Core i7-3770
Memory	SN >3000: 32 GB DDR5-4400 SN >2000: 8 GB DDR4-2133 SN <2000: 8 GB DDR3-1600
Video Card	SN >3000: NVIDIA T1000 SN >2000: GeForce GTX 1050Ti with 4 GB GDDR5 SN <2000: GeForce GTX 650 with 2 GB RAM
OS Hard Drive	SN >3000: 1 TB NVMe SN <3000: 240 GB Solid State Drive (SSD)
Data Storage	SN >2000: 1 TB SSD, removable (1 included) SN <2000: 1 TB HDD, 7200 RPM, removable (1 included)
Network	Two Gigabit Ethernet ports
Power Supply	650 W
TDT Interface	SN >2000: PO5e card SN <2000: PO5 card
Open Slot	PCIe x4, half-length
Keyboard	Das Keyboard Model S Mechanical Keyboard with two port USB hub
Mouse	Logitech G502 SE
Operating System	64-bit Windows 10 or 11
Software	TDT Drivers, RPvdsEx, and other TDT software as requested

WS4 Technical Specifications

CPU	SN >3000: Intel Core i5-12400F SN >2000: Intel Core i5-6600K SN <2000: Intel Core i5-3570
Memory	SN >3000: 16 GB DDR5-4400 SN >2000: 4 GB DDR4-2133 SN <2000: 4 GB DDR3-1600
Video Card	SN >3000: NVIDIA T400 SN >2000: GeForce GT 1030 with 2 GB RAM Built after appox. 6/29/21: NVIDIA P400 or T400 with 2GB RAM SN <2000: GeForce GT 730 with 2 GB RAM
OS Hard Drive	SN >3000: 1 TB NVMe SN <3000: 240 GB Solid State Drive (SSD)
Data Storage	SN >2000: 1 TB SSD, removable (1 included) SN <2000: 1 TB HDD, 7200 RPM removable (1 included)
Network	Two Gigabit Ethernet ports
Power Supply	650 W
TDT Interface	SN >2000: PO5e card SN <2000: PO5 card
Open Slot	PCIe x4, half-length
Keyboard/Mouse	Microsoft USB Keyboard and Mouse
Operating System	64-bit Windows 10 or 11
Software	TDT Drivers, RPvdsEx, and other TDT software as requested