User Manual

Tektronix

OTS9010
Optical Test System

071-0823-02

This document supports device type BT100.

Tektronix, Inc., 14200 SW Karl Braun Drive, Beaverton, OR 97077

HARDWARE WARRANTY

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If a product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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Contents

General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and marking on the product. Consult the product manual for further ratings information before making connections to the product.

The common terminal is at ground potential. Do not connect the common terminal to elevated voltages.

Do Not Operate With Open Slots. Use blank panels to fill all unused slots.

Use Proper Fuse. Use only the fuse type and rating specified for this product.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:

WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*

CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:

CAUTION
Laser Radiation

Protective Ground
(Earth) Terminal

CAUTION
Refer to Manual

Preface

The benchtop mainframe is a CompactPCI compliant platform for operating a great variety of high performance measurement applications.

High measurement capacity. The benchtop mainframe provides high interface and measurement capacity. Eight application slots on two cPCI bus segments are available for measurement boards. Modules with high power consumption are also supported by the powerful power supply and cooling system.

High performance “integrated PC”. The two central slots are equipped with a powerful Pentium processor and the companion I/O board. Furthermore, the CPU is equipped with a GPIB module.

Full support of OTS9xxx modules. The benchtop mainframe provides a fast THRU-bus connection between slot 2 and 3 and an Up/Down local bus between adjacent slots.

Fully-functional operator interface on the front panel. A complete operator interface is provided on the benchtop front panel, to support applications based on Windows 2000: SVGA color display, mini QWERTY keyboard and trackball. Front access is provided for CD ROM and floppy drives. A parallel printer connector is available on the rear panel; optionally, an external monitor and keyboard/mouse can also be connected. Additionally Ethernet, USB and serial interfaces are available.

Rackmount option. The benchtop can be operated either on a desk or in a rack. With the optional installation kit, it can be mounted and operated in a standard industrial rack.

Prerequisites

You should have the following qualifications to work with the unit:

- Knowledge of PC and Windows 2000
- Experience with communications test applications
- Familiarity with the safety requirements for electrical equipment for measurement, for laser issues, control and laboratory use.

Getting Help

This section lists sources for you to get more information.

Online Help

Look in the online help for details about user interface selections that are not described in this manual.

Windows Online Help. Information about Windows features is available through the Windows help system. Access Windows help as you would with any Windows application.

Release Notes

The Release Notes contain information about this release of the OTS application. Check the Release Notes for information such as software compatibility and software version differences from last release.

How is This Manual Organized

The first part of this manual contains information on your benchtop mainframe. It is devided into the following sections:

- The *General Safety Summary* is the most important part of the manual. You should read it before you start working with the equipment and you should always follow the safety instructions.
- *Preface* provides an overview on the product and on this manual.
- *Device Description* provides an overview on mainframe chassis, CPU and basic configuration.
- *Getting started* tells you how to make the device ready for start-up, for example how to set up and turn on the device, how to back up user files and creating an emergency startup disk.
- *In case of problems* provides information that addresses problems you may encounter while installing your device.
- In the *Appendices* you will find technical data, PC card and User Service information.

Conventions

This manual uses the following conventions:

- The names of front panel connectors and LEDs appear in the manual in the same format as found on the front panel label.
- In reference to the instrument, the following conventions apply:
  - When referring to the mainframe, the name benchtop (BT) is used.
  - When referring to a module, the nomenclature for the individual module is used.

Contacting Tektronix

Product Support	For application-oriented questions about a Tektronix measurement product, call toll free in North America: 1-800-TEK-WIDE (1-800-835-9433 ext. 2400) 6:00 a.m. - 5:00 p.m. Pacific time Or contact us by e-mail: tm_app_supp@tek.com For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Tektronix offers a range of services, including Extended Warranty Repair and Calibration services. Contact your local Tektronix distributor or sales office for details. For a listing of worldwide service centers, visit our web site.
Website	www.tektronix.com

Device Description

Each benchtop mainframe consists of a chassis which is equipped with a powerful CPU and a hard disk of ≥ 3.2 GB. It is delivered with a transport case for all necessary accessories.

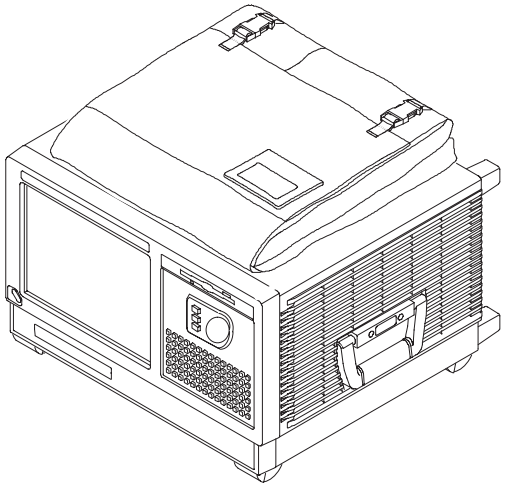


Figure 1–1: Benchtop mainframe

The benchtop mainframe is designed to operate on a bench or in a rackmount environment. For the operation in a rackmount environment, a rackmount kit is optionally available. The installation of this rackmount kit is described in Appendix C.

Main Components

Each benchtop mainframe also features a TFT LC display, a Mini-QWERTY keypad, an integrated trackball, a CD ROM and floppy disk drive.

With the benchtop mainframe 8 free slots are available for application boards.

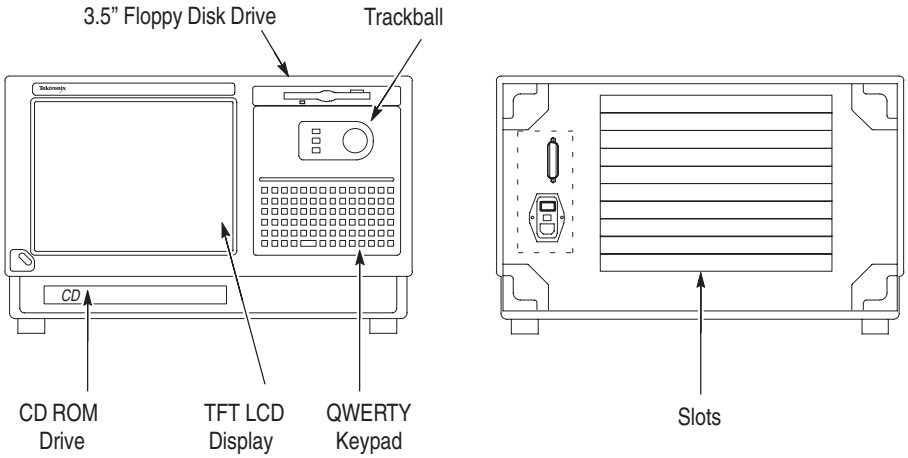


Figure 1–2: Front and rear view of the benchtop mainframe

For more information about availability, contact your Tektronix representative and view the Tektronix website at: www.tektronix.com.

Front Panel Controls

For the benchtop you can use the front panel keys as an alternative to an external keyboard. Most keys and key combinations are available using the front panel. See Figure 1–3.

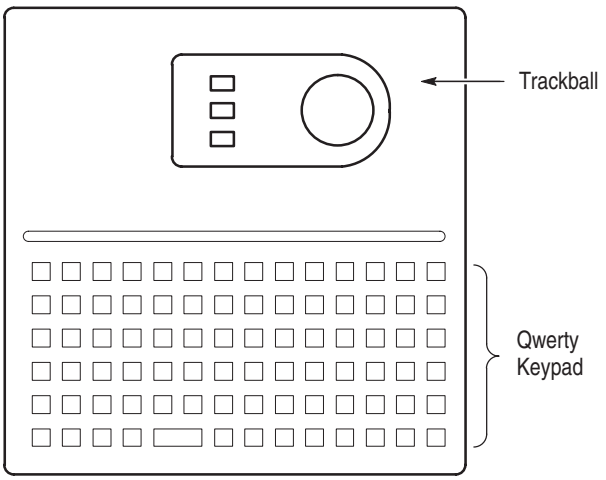


Figure 1–3: Benchtop front panel

For key combinations, it is not necessary to hold down more than one key at a time. For example, you can press the SHIFT key on the hexadecimal keypad, and then press a keypad key to accomplish a Shift+key combination. The same is true for other key combinations, such as CTRL and ALT keys.

CPU

The CPU consists of a powerful Pentium III processor and a companion I/O board. Up to two optional PMC plug-in modules can be installed to provide additional I/O (for instance, the GPIB interface).

By default, the OTS9010 CPU consists of a base board, an I/O board and a GPIB module.

Base Board

The base board is a CompactPCI board with Intel Mobile Pentium III CPU.

On its front panel this board provides connectors for two 10/100 BaseT interfaces (Ethernet 1 and Ethernet 2), for keyboard and mouse (PS/2), for one serial interface COM1 and one USB interface. Additional front-panel features are a RESET key and several LEDs.

The following figure shows interfaces, keys and LEDs of the base board front panel.

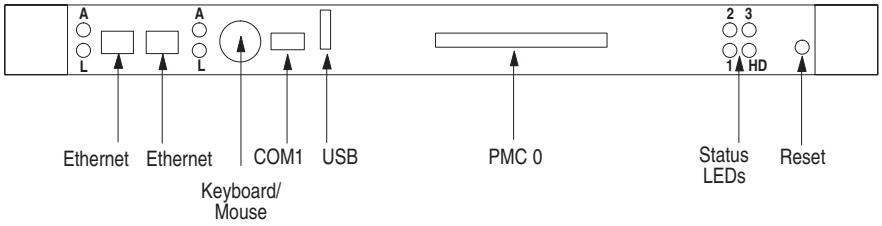


Figure 1–4: Front panel of the base board

Table 1–1: Front Panel Keys and LEDs

Name	Description
RESET Key	Mechanical reset key: When enabled and toggled, it instantaneously affects the board by generating a reset. The reset generates a PCI reset and is programable to be globally or local to the base bord via the PCI Bus Control Register. A reset of all on-board I/O devices and the CPU is performed when the reset key is pushed to the active position. RESET is held active until the key is back in the inactive position, however at least 200 ms are guaranteed by a local timer. Power fail (below approximately 4.7 V) and powerup – both lasting at minimum 200 ms to 300 ms – also force a reset to start the CPU. For information on disabling the key, see ”SW1C”.
LED 1, 2, 3	User LEDs: Software programable by the LED Control Register. Possible LED status: green, red, or off.
LED HD	”Hard disk” LED: signals accesses to devices connected via IDE. Possible LED status: flickering during access activity, else off. The LED color is customizable via the LED Control Register.
LED L	”Link” LED: Signals successful connection to a network. Possible LED status: green or off.
LED A	“Activity” LED: Signals Ethernet network transfers. Possible status: yellow or off.

The base board provides a PMC slot, referred to as PMC slot 0. PMC slot 0 supports 32-bit data bus width with a frequency of 33 MHz. +/- 12 V are available at the PMC slot 0. This slot is always occupied by a PMC VGA card.

Further information on the connector pin assignments can be found in Appendix B.

I/O Board

The I/O board provides functionality extending the baseboard functionality. Over an additional PCI-to-PCI bridge the entire CPU can support additional application boards.

The I/O board features include:

- CompactPCI peripheral board
- Equipped with in-rush current protection
- SCSI Interface
- 2 PMC slots
- Additional front panel features include an LED for signaling accesses to devices connected via SCSI and 1 user LED

NOTE. Always install the base board in CompactPCI bus segment A and the I/O in CompactPCI segment B.

The following figure shows connectors, keys and LED of the I/O board front panel.

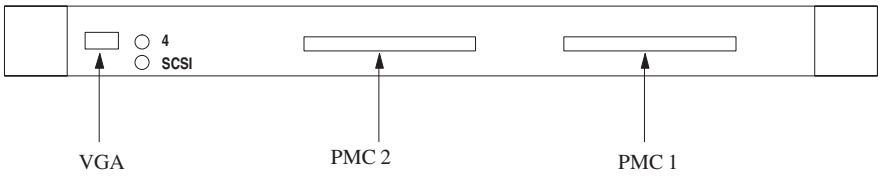


Figure 1–5: Front panel of I/O board

Table 1–2: Front Panel Connectors and LEDs

Name	Description
VGA Connector	Not connected
LED 4	User LED: Software programmable by the I/O board LED Control Register. Possible LED status: green or off.
LED SCSI	“Hard Disk” LED: signals accesses to devices connected via SCSI. Possible LED status: flickering during access activity, else off.

The I/O board provides one PMC slot with two PMC interfaces (PMC 1 and PMC 2). The PMC slot supports 32-bit data bus width with a frequency of 33 MHz. +/- 12 V are available at the PMC slot. By default, the I/O board is shipped with a GPIB module installed in PMC 1.

GPIB Module

Up to two optional PMC plug-in modules can be installed on the I/O board.

The ANSI/IEEE Standard 488.1-1987, also known as General Purpose Interface Bus (GPIB), describes a standard interface for communication between instruments and controllers from various vendors. It contains information about electrical, mechanical, and functional specifications.

GPIB is a digital, 8-bit parallel communications interface with data transfer rates of 1 Mbyte/s and higher, using a three-wire handshake. The bus supports one System Controller, usually a computer, and up to 14 additional instruments. The ANSI/IEEE Standard 488.2-1992 extends IEEE 488.1 by defining a bus communication protocol, a common set of data codes and formats, and a generic set of common device commands.

By default, one GPIB module is installed in the PMC 1 interface. Instrumentation systems or other controllers can use this interface for remote control of the OTS9010.

Basic Configuration

This chapter provides an overview on the basic default settings of the benchtop mainframe. It includes information on the BIOS default settings and of the main settings of the operating system.

Switch Settings

The CPU base board is configurable via switches. The switches are located at the very left edge on the board with switch 1 (SW1) on the top and SW 3 (SW3) on the bottom.

The default switch settings can be found in the following table:

Table 1–3: Switch 1 Settings

Name and Default Setting	Description
Switch 1A ON	Flash disk IDE mode OFF = The flash disk is master of the primary IDE devices. The other primary IDE device (if installed) must be configured as slave. ON = The flash disk is slave of the primary IDE devices. The other primary IDE device (if installed) must be configured as master.
Switch 1B OFF	Keyboard control OFF = Keyboard enabled ON = Keyboard disabled
Switch 1C OFF	Reset key control OFF = Reset key enabled, if not disabled via custom configuration of the switch and Interrupt Control Register ON = Reset key disabled
Switch 1D OFF	Abort key control OFF = Abort key enabled, if not disabled via custom configuration of the switch and Interrupt Control Register ON = Abort key disabled

Table 1–4: Switch 2 Settings

Name and Default Setting	Description
Switch 2A OFF	BIOS flash write protection OFF = writing enabled ON = write-protected
Switch 2B ON	On-board flash disk OFF = enabled ON = disabled

Table 1–4: Switch 2 Settings (Cont.)

Name and Default Setting	Description
Switch 2C OFF	Ehernet 1 connector selection OFF = Ethernet via front panel connector ON = Ethernet via the CompactPCI connector
Switch 2D OFF	BIOS flash bootblock write protection OFF = write-protected ON = writing enabled

Table 1–5: Switch 3 Settings

Name and Default Setting	Description
Switch 3A OFF	Monitoring of +/- 12 V OFF = disabled ON = enabled
Switch 3B OFF	FPGA serial download OFF = On-board flash ON = JTAG connector

BIOS Standard Settings

The BIOS (Basic Input/Output System) Setup Utility allows you to configure the operations of the CPU card. To access the Setup Utility, press F2 when prompted during the Power-On Self Test (POST).

The Setup Utility displays the configuration options and values that apply to all installed components. The Setup Utility display allows you to access all possible settings via appropriate menus.

The setup item default setting is as follows (This table lists all optional on-board peripherals installed. The Boot and Exit menus do not have ”default” values):

Table 1–6: Bios Standard Settings

Main	System Time System Date Legacy Diskette A Legacy Diskette B Primary: Master, slave Secondary: Master, slave	xx:xx:xx xx/xx/xx 1.44 MB 3 1/2” Disabled AUTO AUTO	
	System Memory Extended Memory	640 KB xxxx KB	
Advanced	Installed O/S Reset Configuration Data	Other No	
	PCI Configuration	PCI/PNP ISA UMB Region Exclusion PCI/PNP ISA IRQ Resource Exclusion PCI IRQ Routing Control	All Available All Available All Auto Select
	I/O Device Configuration	Local Bus IDE Adapter Large Disk Access Mode	BOTH DOS
		Floppy Disk Controller PS/2 Mouse Serial Port A Serial Port B Parallel Port MODE	Enabled Auto Detect AUTO AUTO AUTO ECP
		Local Bus IDE Adapter Large Disk Access Mode Floppy Disk Controller PS/2 Mouse Serial Port A Serial Port B Parallel Port MODE	BOTH DOS Enabled Auto Detect AUTO AUTO AUTO ECP
	Advanced Chipset Control	ECC Config SERR Signal Condition	ECC Scrub Multiple Bit

Table 1–6: Bios Standard Settings (Cont.)

	Cache Memory	Memory Cache Cache System BIOS Area Cache Video BIOS Area Cache Base 0–512k Cache Base 512k – 640k Cache Extended Memory Area	Enabled Write Protect Write Protect Write Back Write Back Write Back
	POST Options	Boot Without VGA&Keyboard Summary Screen QuickBoot Mode POST Errors Setup Prompt Execute SCSI Option ROM	Enabled Enabled Enabled Disabled Enabled Disabled
	Console Redirection	Com Port Address Baud Rate Disable Before Boot Flow Control	3F8 / IRQ 4 38,4K Yes CTS / RTS
	Keyboard Features	NumLock Key Click Key. auto–repeat rate Key. auto–repeat delay	Auto Disabled 30 / sec 1/2 sec
Security	Supervisor Password Is User Password Is Set Supervisor Password Set User Password Password on Boot Fixed Disk boot sector Diskette access	Clear Clear Enter Enter Disabled Normal Supervisor	
Power	Power Savings Stand by Timeout Auto Suspend Timeout Hard Disk Timeout	Disabled OFF OFF Disabled	
	Advanced Options	IRQ DRIVE 0 Monitoring IRQ DRIVE 1 Monitoring IRQ DRIVE 2 Monitoring IRQ DRIVE 3 Monitoring PCI Bus Monitoring	Disabled Disabled Disabled Disabled Disabled
Boot	1. Hard Drive 2. Diskette Drive 3. ATAPI CD–ROM Drive 4. Removable Devices		
	Hard Drive	FUJITSU MHH... Bootable Add–In Cards	
	Removable Devices	Legacy Floppy Drives	

Operating System

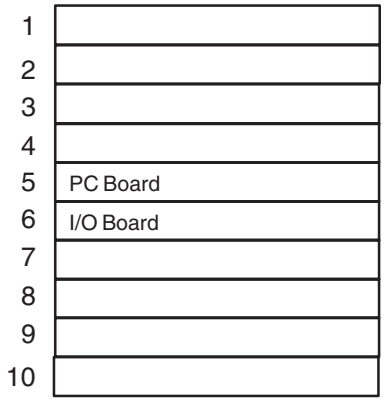
The unit is delivered completely configured. The following software components have already been pre-installed:

- Windows 2000
- Acrobat Reader 4.0
- Measurement applications as ordered

Installing the Interface Modules

Normally, all modules are preinstalled in your mainframe. The slot in which each module card is installed is very important to the proper operation of the instrument.

The following figure gives you an example which interface board is situated in which slot:



Detailed information on how to install or change the modules can be found in the software description.

CAUTION. *Do not install or remove any modules while the mainframe is powered on.*

The modules are not hot swapable, doing so can damage the modules and the whole unit.

Always power down the unit before removing or inserting modules.

Getting Started

This chapter describes all of the steps needed to install your benchtop for the first time. It is written from the perspective that you purchased most of the items uninstalled and you intend to install all of the different items.

This chapter deals mainly with hardware installation. The basic operating software is already installed on the hard disk.

If you ordered additional software, such as microprocessor or bus support, you will need to install it. Refer to the installation instructions that are shipped with that product.

Check the Shipping List

Verify that you have received all of the parts of your order. Use the shipping list to compare against the actual contents of your order. You should also verify the following:

- Verify that you have the correct power cords for your geographical area.
- Verify that you have backup copies of the installed software. Store the backup software in a safe location where you can easily retrieve the software for maintenance purposes.
- Verify that you have all the standard and optional accessories that you ordered.

***NOTE**. Keep the software packaging available because you will need it to enter the Windows software registration number when you first turn on the device.*

Fill out and send in the customer registration card which is packaged with this manual.

Setting Up the Device

Read this section before attempting any installation procedures. This section describes site considerations, power requirements, and ground connections for your device.

The benchtop mainframe is designed to operate on a bench or in a rackmount environment. For proper cooling, at least 5 cm of clearance is recommended on both sides of the mainframe.

WARNING. *Because of the size and weight of the benchtop mainframe, use care when lifting or moving the mainframe to avoid personal injury while performing the installation procedures.*

You can also operate the device while it rests on the rear feet. If you operate it while it is resting on the rear feet, make sure that you properly route any cables coming out of the rear of the device to avoid damaging them.

Table 1–7: Additional Accessory Connection Information

Item	Description
Monitor	If you use a non-standard monitor, you may need to change the Windows display settings to achieve the proper resolution for your monitor.
Keyboard / Mouse	If you want to use an external keyboard or mouse, choose a standard Windows keyboard or mouse and connect it directly to the PS/2 Keyboard connector on the front panel of the CPU board.
Printer	Connect the printer to the ECP (enhanced parallel port) connector directly. If your printer has a DB-25 connector, use the adapter cable that came with your device to connect to the ECP connector.

Turning On the Device

Follow the following steps to turn on the benchtop for the first time:

CAUTION. *Connect the keyboard, mouse, and other accessories before applying power to the mainframe.*

Connecting the accessories after turning on the device can damage the accessories.

1. Check if your system contains the right fuse. By default, different fuse types are mounted for the different countries. The "Fuse Rating Indicator" (see Figure 1–6) indicates which kind of fuse is mounted. If needed change the fuse:
   - Remove the red fuse holder with a flat-head screw driver.
   - Remove the fuse.
   - Install the clip on the other side of the fuse holder.
   - Rotate the fuse holder 180 degrees.
   - Install the new fuse:

     For applications running on 115 V AC use TEK PN 159-0201-00.
     For applications running on 230 V AC use TEK PN 159-0352-00.

2. Connect the proper power cord. See Figure 1–6.

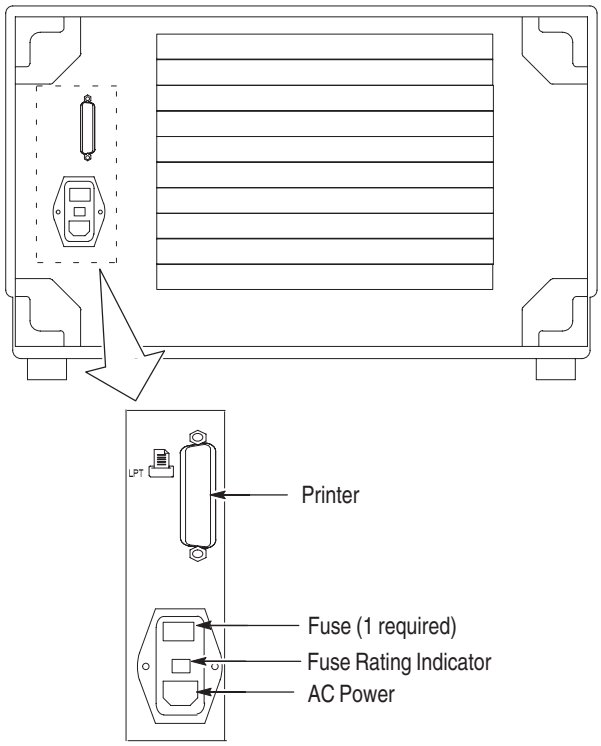


Figure 1–6: Line fuse and power cord connector locations

3. If you have an external monitor, connect the power cord and turn on the monitor.

4. Turn on the benchtop as follows: Press the On/Standby switch to turn on the device (see Figure 1–7 for the switch location). The benchtop is set ready-to-run upon delivery.

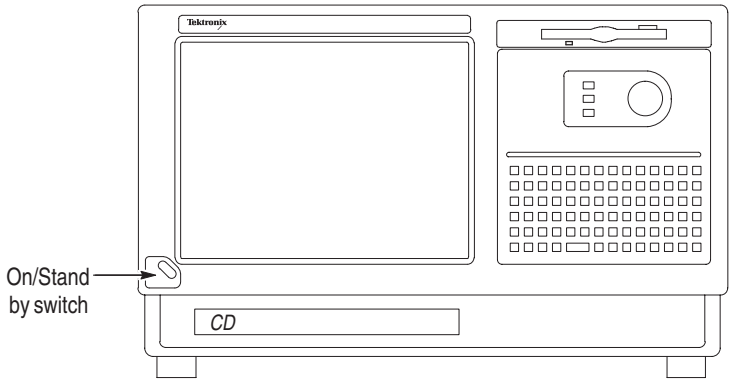


Figure 1–7: On/Standby switch locations

Backing Up User Files

You should always back up your user files on a regular basis. Use the Windows Back Up tool to back up files stored on the hard disk. To locate the Back Up tool click `Start`, point to `Programs`, `Accessories`, `System Tools` and click `Backup`.

Creating an Emergency Repair Disk

The emergency repair disk can be used to restart the device in case of a major hardware or software failure. Create this disk and then store it in a safe place.

The emergency repair disk contains the state of the device at the time of production. With this emergency repair disk you can reproduce the user accounts and the driver configuration that existed when the device was produced. The reproduction of the user accounts is necessary if the passwords have been lost (after being changed).

You should create a new emergency repair disk whenever you change the user accounts or install new or different device drivers (“Devices”). You can update this emergency repair disk whenever your system is stable. Read Windows help for more information.

Follow these steps to create the emergency disk:

1. Exit the application.
2. Click the Windows *`Start`* button point to *`Run`* and click *`Run`*.
3. Enter *`Open: rdisk /a.`*
4. Insert a floppy disk into the disk drive and follow the on-screen instructions to create the emergency disk.

Software Installation

System updates and upgrades or new software programs are supplied on CD-ROM with a setup program and a Readme file. You should read the Readme file before installing the software.

CAUTION. *The device is ready for use upon delivery. Windows 2000 and the application have already been installed.*

To install the software, proceed as follows:

1. Insert the installation CD into the CD-ROM drive that is either networked to your instrument or is the optional external CD-ROM that is directly connected to it.
2. Start *SETUP.EXE* on the CD-ROM via the Windows *Start* menu with *Run*.
3. Follow the setup program instructions.

   The setup program will ask you which type of basic software you want to install. If you want to install new basic software all previous installations are deleted, that means additional software packages have to be reinstalled.

In Case of Problems

This chapter provides information that addresses problems you may encounter while installing your device.

Software Problems

Your instrument comes with all basic software already installed. Before running any of the applications, you should check the online release notes to verify the software is compatible with the firmware.

Many software problems can be due to corrupted or missing software files. In most cases the easiest way to solve software problems is to reinstall the software and follow the on-screen instructions.

Refer to Table 1–8 on the following page for a list of software and hardware troubleshooting information and recommended action.

If you suspect problems with the application software, contact your Tektronix Service Center.

Common Problems

Use Table 1–8 to help isolate problems. This list is not exhaustive, but it may help you eliminate problems that are quick to fix, such as a blown fuse.

Table 1–8: Failure Symptoms And Possible Causes

Symptom	Possible causes and recommended action
Device does not turn on	Verify that all power cords are connected to the device and to the power source. Check that the instrument receives power when you press the On/Standby switch. Check that fans start and that front-panel indicators light. Check that power is available at the power source. Check for correct or failed fuses. By default, different fuse types are mounted for the different countries. On the rear of the device, the “Fuse Rating Indicator” shows “115 V” or “230 V”. If needed change the fuse as follows: 1. Remove the fuse holder with a flat-head screw driver. 2. Remove the fuse. 3. Install the clip on the other side of the fuse holder. 4. Rotate the fuse holder 180 degrees. 5. Install the new fuse: For applications running on 115 V AC use TEK PN 159-0201-00. For applications running on 230 V AC use TEK PN 159-0352-00. Check that the power entry module is configured for the correct input voltage (110/230). Software failure: contact your Tektronix service center.
Display is blank	If display is blank, try connecting external monitor; if both displays are blank, contact your Tektronix service center. Check the controller BIOS setups for the monitor.
Device turns on but does not complete the power-on sequence	Check for disk in floppy disk drive; make sure the device boots from the hard disk drive. Possible software failure or corrupted hard disk; see *Software Problems* at the beginning of this chapter.
Device does not recognize accessories such as monitor, printer, or keyboard	Check that accessories are properly connected or installed. Try connecting other standard PC accessories or contact your Tektronix service center.
Windows comes up but the application does not	Device not set up to start the application at power-on. Start application from the desktop, by double-clicking on the Final Setup icon located on the desktop. Faulty or corrupt software; reinstall the application software.
Windows comes up in Safe mode	Exit the Safe mode and restart the device. Incompatible hardware and hardware driver software. Either install the hardware driver or remove the incompatible hardware.

Appendix A: Specifications

This chapter lists all general specifications for the benchtop mainframe. Technical data of the CPU can be found in Appendix B.

Characteristic Tables

The following specifications apply to all benchtop mainframes unless otherwise noted.

The performance limits in this specification are valid with these conditions:

The benchtop mainframe must be in an environment with temperature, altitude, humidity, and vibration within the operating limits described in these specifications.

Table A–1: Atmospheric Specifications

Characteristic	Description
Temperature: Operating and nonoperating	Operating (no media in floppy disk drive): +5°C to +35°C Nonoperating (no media in floppy disk drive): -20°C to +70°C
Relative Humidity: Operating and nonoperating	Operating (no media in floppy disk drive): 5% to 90% , non-condensing. Nonoperating (no media in floppy disk drive): 0% to 95%, non-condensing.
Altitude: Operating and nonoperating	Operating: To 2000 m Nonoperating: 15 200 m

Table A–2: Internal Controller

Characteristic	Description
Operating System	Microsoft Windows 2000
Microprocessor	Mobile Pentium III, ≥400 MHz
Hard Disk Drive	Standard PC compatible IDE (Integrated device electronics) hard disk drive residing on an EIDE interface ≥3.2 GByte, 2.5” Continually subject to change due to the fast-moving PC component environment. These storage capacities are valid at product introduction.
CD ROM Drive	Standard PC compatible IDE (Integrated device electronics) ≥24, accessible from the front panel
Floppy Disk Drive	Standard 3.5” 1.44 MByte, accessible from the front panel

Table A–3: CPU Characteristics

Characteristic	Description
Processor	Mobile Pentium III, ≥400 MHz 256 KByte L2 cache on chip, full speed
Memory	≥256 MByte SDRAM ECC ≥512 KByte BIOS flash ≥8 KByte NVRAM-10year ≥4 MByte IDE flash disk
RT Clock	Motorola 146818 compatible; 5 year battery
Bus interface	PICMG Rev.2.1 compliant; 32-bit wide
EIDE interface	On-board connector
Ethernet interface	Two 10/100 BaseT connectors on the board panel

Table A–3: CPU Characteristics

Characteristic	Description
PS/2 interface	Connector on the CPU board panel (one 2-input adapter is provided as accessory)
Serial interface	Two RS-232; one connector on the board panel
Parallel interface	IEEE 1284 compatible; connector on rear panel
USB interface	Two, one connector on the board panel
Floppy interface	On-board connector
VGA interface	Connector on the board front panel
PMC slots	One, used for VGA interface, with front panel I/O

Table A–4: I/O Board Charisteristics

Characteristic	Description
I/O board	CompactPCI peripheral board (without VGA circuitry)
Bridge	PCI-to-PCI bridge, to allow control of two cPCI bus segments
SCSI interface	Available on the backplane
PMC slots	Two with front panel I/O

Table A–5: Display System

Characteristic	Description
Type	TFT LCD active-matrix color display with backlight
Dimensions	10.4 in diagonal
Resolution	800 x 600 pixel
Option	External monitor can be connected to the rear VGA interface.

Table A–6: Keyboard

Characteristic	Description
Type	Mini-QWERTY keypad
Dimensions	Approximately 80 mm x 130 mm
Options	External keyboard can be connected to the rear PS/2 connector through a PS/2 adapter.

Table A–7: Pointing Device

Characteristic	Description
Type	Trackball with 3 keys
Dimensions	38.1 mm diameter (1.5”)
Options	External mouse can be connected to the rear PS/2 connector through a PS/2 adapter.

Table A–8: Backplane Characteristics

Characteristic	Description
Features	Passive; 10 slots; two 5-slot bus segments
THRU Bus	On P4, between slots 2 and 3
UP/DOWN Bus	On P3/P5, respectively
ATM pos-phy BUS	On P3/P5
Clock Signals	Distributed on P3
JTAG Signals	Distributed on P1 for EPLDs programming

Table A–9: Power

Characteristic	Description
Type	Industrial grade, 500 W for application modules (50 W for each slot)
AC Input	500 VA, 100 ... 240 VAC (+/- 10%), 50/60 Hz
DC Output	+5 V, +3.3 V, +12 V, -12 V, -5.2 V 50 A, 30 A, 8 A, 3 A, 35 A
Fuse Data	10 A, Fast, 250 V for 115 V Range (TEK P/N 159-0201-00) 6.3 A, TIME, 250 V for 230 V Range (TEK P/N 159-0352-00)

Table A–10: Cooling

Characteristic	Description
Cooling System	Forced air circulation (negative pressurization) utilizing six fans operating in parallel
Cooling Clearance	51 mm (2 in), sides; unit should be operated on a flat, unobstructed surface

Table A–11: Mechanical

Characteristic	Description
Overall Dimensions	Overall: 282 mm H x 457 mm W x 414 mm D (Case: 257 mm H x 445 W x 360 mm D) (See Figure below)
Weight	15.4 kg (34 lbs.) without application boards, cabels and accessories
Front cover	Plastic
Support feet	- 25 mm on the bottom side; front feet can reach 70 mm, allowing front panel inclination - 54 mm on the rear, to allow vertical-from-floor-operation
Transport handle	Plastic on the right side; small plastic scuff pads on the left side
Soft Pouch	Snapped on the top
Options	Hard shell transport case (with wheels and retractable handle, 456 mm H x 610 mm W x 660 mm D) Rackmount kit

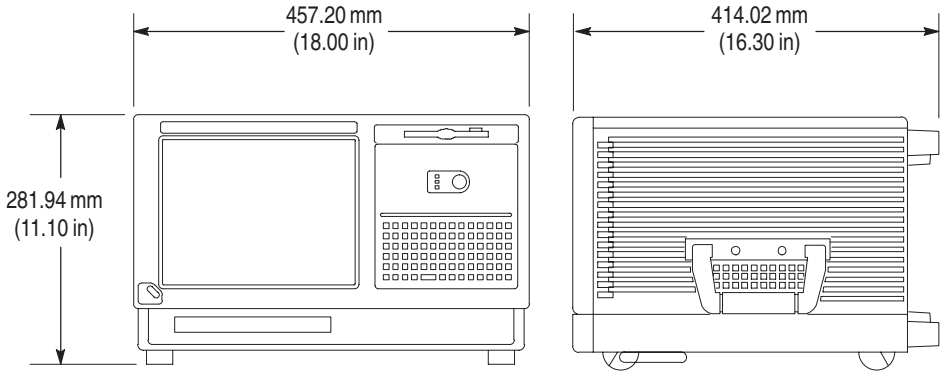


Figure A–1: Dimensions of the benchtop mainframe

Table A–12: Certifications and Compliances

EC Declaration of Conformity - EMC	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities: EN 61326/A1 1998 — CISPR: EMC requirements for Class A electrical equipment for measurement, control and laboratory use. IEC 1000-4-2 — Electrostatic Discharge Immunity (Performance Criterion B) IEC 1000-4-3 — RF Electromagnetic Field Immunity (Performance Criterion A) IEC 1000-4-4 — Electrical Fast Transient / Burst Immunity (Performance Criterion B) IEC 1000-4-5 — Power Line Surge Immunity (Performance Criterion B) IEC 1000-4-6 — Conducted RF Immunity (Performance Criterion A) IEC 1000-4-11 — Power Line Dips and Interruptions Immunity (Performance Criterion B) EN 61000-3-2 — AC Power Line Harmonic Emissions Compliance was achieved under the following conditions: Shielded cables on all external I/O ports; front panel screws properly tightened; conductive chassis rails of the boards connected to chassis ground; cable shields connected to chassis ground via metal shell connectors bonded to a conductive module front panel; all peripherals conformed. For minimum RF emissions, it is essential that the conditions above be implemented. Failure to do so could compromise the EMC compliance of the equipment containing the board.
EC Declaration of Conformity - Low Voltage	Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities: Low Voltage Directive 73/23/EEC as ammended by 93/68/EEC EN 61010-1/A2 1995 — Safety requirements for electrical equipment for measurement, control, and laboratory use
Approvals	UL3111-1 - Standard for electrical measuring and test equipment CAN/CSA C22.2 No. 1010.1 - Safety requirements for electrical equipment for measurement, control and laboratory use
IEC Characteristics	Equipment type: Test and Measurement Installation Category II Pollution Degree 2 Safety Class I

CAUTION. *EN 55022: This is a class A product. In a domestic environment, this product may cause radio inteference in which case the user may be required to take adequate measures.*

Appendix B: Interfaces

This chapter provides an overview on the pin assignments for all connectors which are located on the CPU front panels.

Ethernet Twisted Pair Interface (10Base-T)

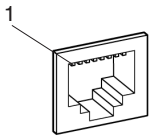


Table B–1: Pin assignment for interface 10Base-T

Pin	Assignment	Pin	Assignment
1	TxD +	5	GND
2	TxD –	6	RxD –
3	RxD +	7	GND
4	GND	8	GND

Keyboard / Mouse Interface (PS/2)

***NOTE**. If the additional keyboard interface is used with an external keyboard, the keyboard connector must not be plugged in.*

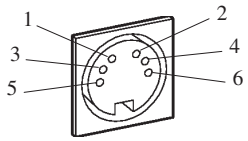


Table B–2: Pin assignment for the KEYBOARD interface

Pin	Assignment	Pin	Assignment
1	Keyboard data	4	+ 5 V
2	PS/2 Mouse data	5	Keyboard clock
3	Ground	6	PS/2 Mouse clock

Serial Interface (COM1)

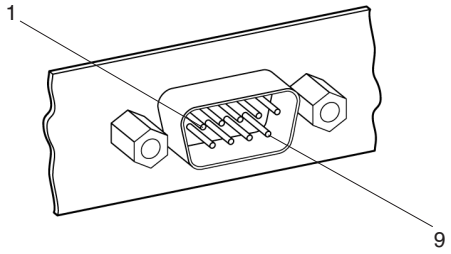


Table B–3: Pin assignment for interface COM1

Pin	Assignment	Pin	Assignment
1	DCD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	Ground		

USB Interface (USB)

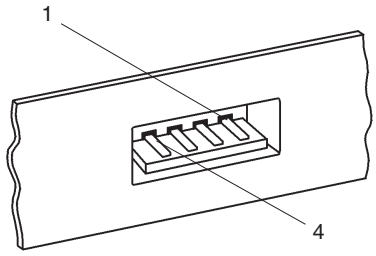


Table B–4: Pin assignment for the USB interface

Pin	Assignment	Pin	Assignment
1	Vcc	3	Data+
2	Data–	4	Ground

External Monitor's Interface (VGA)

The External Monitor's Interface supports a resolution of up to 1024x768 with 60 Hz.

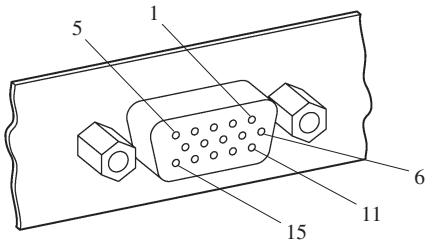


Table B–5: Pin assignment for interface VGA

Pin	Assignment	Pin	Assignment
1	Red	9	+ 5 V
2	Green	10	Ground
3	Blue	11	Not connected
4	Not connected	12	Monitor data
5	Ground	13	HSYNC
6	Red Ground	14	VSYNC
7	Green Ground	15	Monitor data
8	Blue Ground		

Appendix C: User Service

This appendix describes general care and service procedures for the unit.

Mainframe and module service troubleshooting procedures are located in the service manuals.

General Care

Protect the instrument from adverse weather conditions. The instrument is not waterproof.

Do not store or leave the portable mainframe where the LCD display will be exposed to direct sunlight for long periods of time.

CAUTION. *To avoid damage to the instrument, do not expose it to sprays, liquids, or solvents.*

Preventive Maintenance

Once a year the electrical performance should be checked. This service should be performed by a qualified service technician.

Preventive maintenance mainly consists of periodic cleaning. Periodic cleaning reduces the change of instrument breakdown and increases reliability. You should clean the instrument as needed, based on the operating environment. Dirty conditions may require more frequent cleaning than computer room conditions.

Flat Panel Display Cleaning

The LCD flat panel is a soft plastic display and must be treated with care during cleaning.

CAUTION. *Improper cleaning agents or methods can damage the flat panel display.*

Do not use abrasive cleaners or commercial glass cleaners to clean the display surface.

Do not spray liquids directly on the display surface.

Do not scrub the display with excessive force.

Clean the flat panel display surface by gently rubbing the display with a clean-room wipe.

If the display is very dirty, moisten the wipe with distilled water or a 75% isopropyl alcohol solution and gently rub the display surface. Avoid using excess force or you may damage the plastic display surface.

Exterior Mainframe

Clean the exterior surfaces of the mainframe with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is useful for cleaning in narrow spaces around the controls and connectors. Do not use abrasive compounds on any part of the mainframe.

CAUTION. *Avoid getting moisture inside the mainframe during external cleaning; and use only enough solution to dampen the cloth or swab.*

Do not wash the front-panel On/Standby switch. Cover the switch while washing the mainframe.

Use only deionized water when cleaning. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.

Do not use chemical cleaning agents; they may damage the instrument. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Floppy Disk Drive

The floppy disk drive requires routine maintenance to operate at maximum efficiency. The disks can be damaged if dirt and dust accumulate on the recording surfaces. To prevent damage, the disks should be properly stored in their protective containers where they will not be exposed to dust or dirt. In addition, the head should be cleaned periodically.

You will need a 3.5-inch floppy disk head-cleaning kit for routine maintenance. Perform the routine maintenance as follows:

- Clean the face of the floppy disk drive monthly with a dampened cloth.

CAUTION. *Do not allow moisture to enter the disk drive. When power is applied, the internal components may be damaged.*

- Clean the head monthly. Follow the instructions provided with the head-cleaning kit.

External Monitor, Keyboard, and Mouse

Clean the exterior surfaces of the monitor, keyboard, and mouse with a dry, lint-free cloth or a soft-bristle brush. A swab is useful for cleaning in narrow spaces around the controls and connectors. Do not use abrasive compounds on any part of the instrument.

CAUTION. *Avoid getting moisture inside the terminal during external cleaning; and use only enough solution to dampen the cloth or swab.*

Use only deionized water when cleaning. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.

Do not use chemical cleaning agents; they may damage the instrument. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Repacking for Shipment

If a mainframe or module is to be shipped to a Tektronix field office for repair, attach a tag to the mainframe or module showing the owner's name and address, the serial number, and a description of the problem(s) encountered and/or service required. If you are returning a module, always return both the module and the mainframe so that the entire unit can be tested.

When packing an instrument for shipment, use the original packaging. If it is unavailable or not fit for use, contact your Tektronix representative to obtain new packaging.

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