User Manual

Tektronix

OTS9040
Optical Test System

071-1042-00

CE

This document supports device type PO81.

www.tektronix.com

Tektronix Berlin, Wernerwerkdamm 5, 13629 Berlin, GERMANY

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.

Do Not Look into the End of a Fibreglass Cable. With some boards: Never look into the end of a fibreglass cable or a single fibre which could be connected to a laser source. Disconnect the power supply. Laser radiation can damage your eyes because it is invisible and your pupils do not contract instinctively as with normal bright light. If you think your eyes have been exposed to laser radiation, you should have your eyes checked immediately by an eye doctor. The optical output's radiation power corresponds to laser class I in accordance with IEC 825-1, 11.93.

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:

WARNING
Laser Radiation

Protective Ground
(Earth) Terminal

CAUTION
Refer to Manual

Preface

The OTS9040 Optical Test System is a portable mainframe on CompactPCI basis. It is designed for high performance measurement applications.

The OTS9040 consists of a chassis, power supply, CPU, hard disk, backplane, CD Read-Write drive, floppy drive, display, and keyboard with pointing device. It carries up to five cPCI application modules.

The portable mainframe is intended for field service but not for outdoor and mobile use. A carry-and-tip-up handle allows transportation.

Main Features

High Measurement Capacity. The OTS9040 Optical Test System provides high measurement capacity. Seven application slots on one cPCI bus segment are available for measurement boards. Modules with high power consumption are supported by the high-performance power supply and cooling system.

High-performance "Integrated PC". The system slot is equipped with a cPCI PC board with a Pentium processor. Additionally, the PC board provides one free PMC slot. Thus, one optional PMC module, such as a GPIB module, can be installed.

Full Support of DWDM Test Application Board. The portable mainframe provides the special supply voltages and interconnections between adjacent slots (THRU-bus and up/down local) required by optical test boards.

Windows-based Operator Interface. A complete operator interface is provided to support applications based on Microsoft Windows 2000: TFT LC color display, full QWERTY keyboard and touch pad. Side access is provided for CD Read-Write 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.

Prerequisites

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

- Knowledge of PC and Microsoft 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 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 This Manual is Organized

The first part of this manual contains information on your portable mainframe. It is divided 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 of the product and of this manual.
- *Getting Started* provides a device description and tells you how to prepare the device for start-up, for example, how to set up and turn on the device, and how to create 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, interfaces and user service information.

Conventions

This manual uses the following conventions:

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

Contacting Tektronix

Phone	1-800-833-9200*
Address	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
Web site	www.tektronix.com
Sales Support	1–800–833–9200, select option 1*
Service Support	1–800–833–9200, select option 2*
Technical Support	Email: techsupport@tektronix.com 1–800–833–9200, select option 3* 1–503–627–2400 6:00 a.m. – 5:00 p.m. Pacific time

* This phone number is toll free in North America. After office hours, please leave a voice mail message.
Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.

Getting Started

Product Description

This chapter provides an overview of the main components of the OTS9040. It describes mainframe, card cage, CPU, interfaces, keys and indicators. Additionally, this chapter provides information on the basic configuration and on how to install application modules.

Main Components

Each portable mainframe consists of a chassis which is equipped with a powerful CPU and hard disk. It features a display, a full-QWERTY keyboard with integrated touch pad, a CD Read-Write and floppy disk drive.

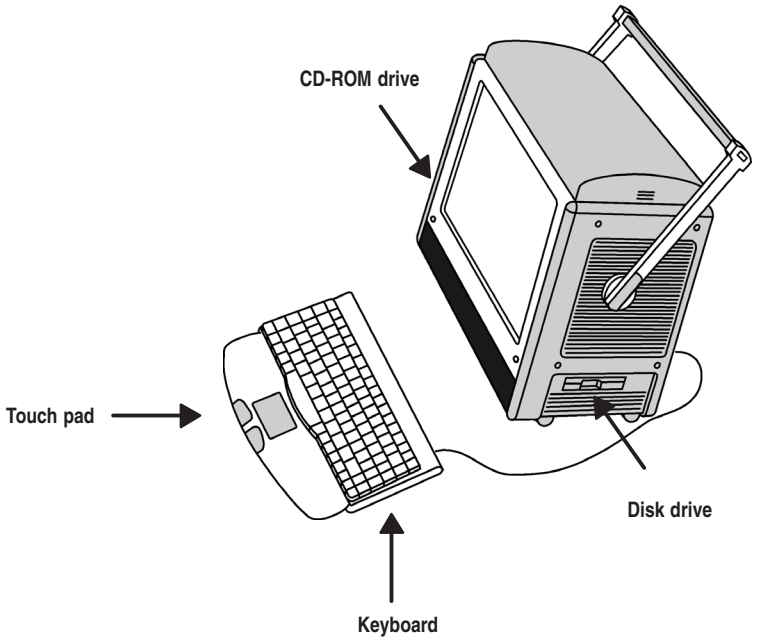


Figure 1–1: Front View of the Portable Mainframe

The keyboard of the portable mainframe has an integrated touch pad as an alternative to the mouse. To move the pointer, slide your finger lightly over the surface of the pad. Tap the surface to simulate a click of the left mouse button, or use the control buttons to select the type of operation.

The floppy disk drive is located on the right bottom side of the device, the CD-ROM drive on the left bottom side.

CAUTION. *Insert the 3.5” diskettes into the floppy drive with the label field facing up.*

To avoid equipment damage, do not insert foreign objects into the disk drive.

Card Cage

The card cage can be accessed by removing the device cover. The PC board is located in slot 8.

Slots 1 to 7 are available for seven application modules.

CAUTION. *To avoid equipment damage, do not insert foreign objects into the PC board slot.*

Only qualified personnel should open the card cage.

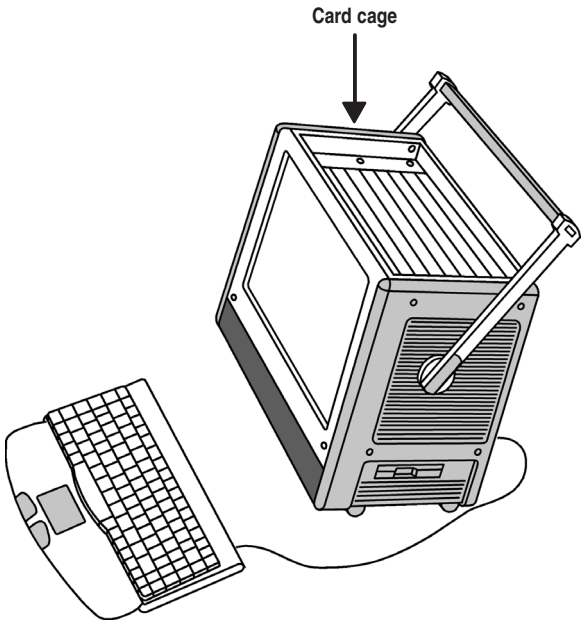


Figure 1–2: Card Cage of the Portable Mainframe

CAUTION. *To avoid equipment damage, do not insert or remove module cards while power is on. The module cards are NOT hot-swappable.*

CPU

The CPU is located on the PC board in slot 8. The PC board is a CompactPCI board with Intel Mobile Pentium III CPU.

One optional PMC plug-in module can be installed to provide additional I/O (for instance, the GPIB interface). The PMC slot supports 64-bit data bus width with a frequency of 33 MHz. There are +5, +3,3, and +/- 12 V available at the PMC slot.

On its front panel, the PC board provides two 10/100 BaseT interfaces (Ethernet 1 and Ethernet 2), one VGA interface, one serial interface (COM1) and one USB interface. Additional front panel features are a RESET key and several LEDs.

The following figure shows interfaces, reset key and LEDs of the PC board front panel.

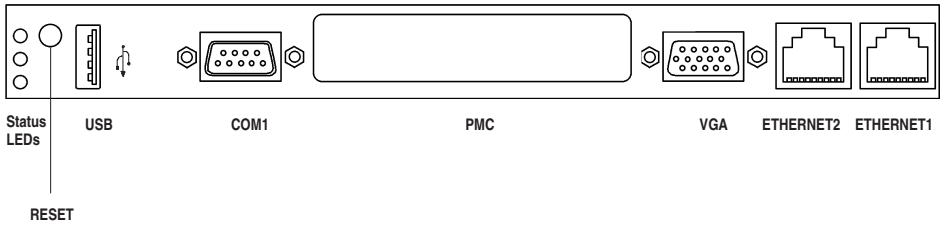


Figure 1–3: Front Panel of the PC Board

GPIB Interface

The GPIB interface is an optional PMC plug-in module. It is delivered with a connector cable of the National Instruments Corporation and with a 24-pin connector according to the IEEE 488 standard.

Interfaces, Keys and Indicators

The portable mainframe provides interfaces on the front panel of the PC board and on the rear panel of the device.

Front Panel Interfaces on the PC Board

The following interfaces are located on the front panel of the PC board:

- USB interface
- Serial interface (COM1)
- PMC slot
- VGA interface
- 10BaseT and 100BaseTX sockets for LAN connection

NOTE. *Further information on the pin assignment of the individual interfaces can be found in Appendix B.*

Reset Key

To reset the instrument in an emergency, use a pointed tool and insert it into the RESET key located on the front panel of the PC board.

When enabled and toggled, the mechanical reset key instantaneously generates a PCI reset. The key can be programmed to reset globally or locally 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 power-up – both lasting at minimum 200 ms to 300 ms – also force a reset to start the CPU.

Indicators

The following indicators (LEDs) are located on the front panel of the PC board:

Table 1–1: LEDs on the Front Panel of the PC Board

Color	Function
Blue (EXT)	Hot Swap LED: The PC board is not hot-swappable. This LED is never active.
Red (PWR)	Fail: Possible LED status red or off. During power up BIOS turns this LED off to indicate the CPU has started. During operation the LED status depends on the user software.
Green (STAT)	Run: Possible LED status green or off. During power up BIOS turns this LED off to indicate the CPU has started. Before entering the OS boot sequence the green LED is turned on. During operation the LED status depends on the user software.

Rear Panel Interfaces

Additional interfaces can be found on the rear of the device.

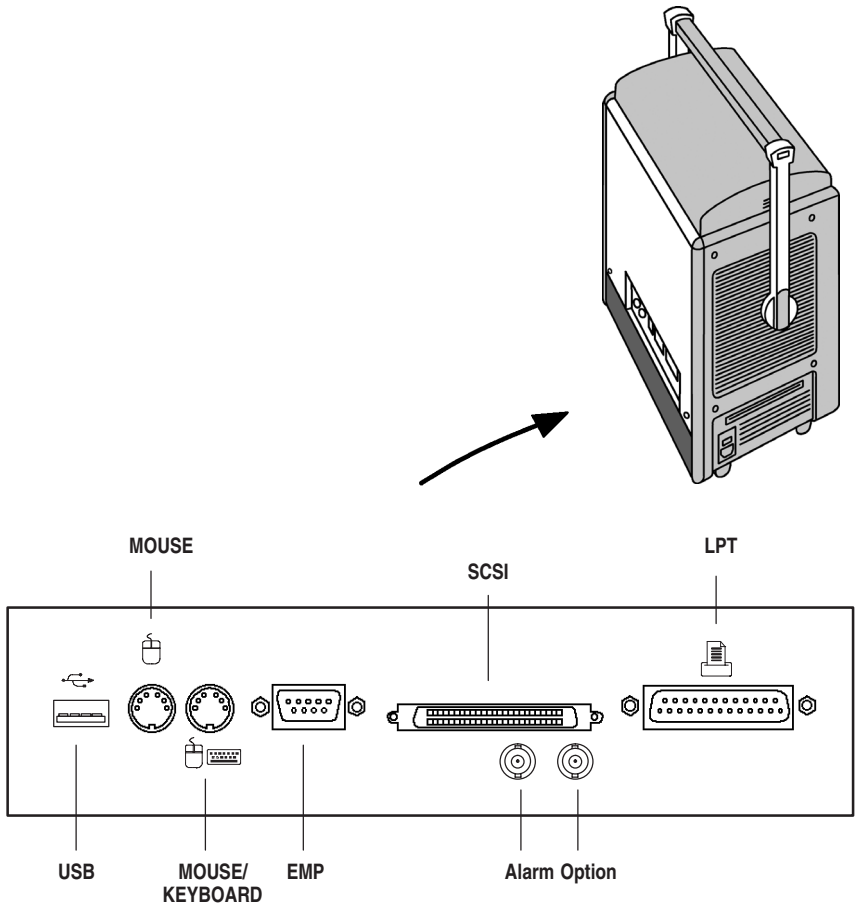


Figure 1–4: Rear View of the Portable Mainframe

The following interfaces are located on the rear of the device:

- USB interface for connecting external devices
- MOUSE interface for connecting an external mouse
- MOUSE/KEYBOARD interface for connecting an external keyboard
- Emergency management port (EMP) for modem connection
- Alarm option as user definable relais connection
- SCSI interface, for example, for use with an external CD-ROM drive
- LPT interface for printer connection

***NOTE**. Further information on the pin assignment of the individual interfaces can be found in Appendix B.*

Basic Configuration

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

BIOS Standard Settings

With the BIOS (Basic Input/Output System) Setup Utility you can configure the operations of the PC board. To access the Setup Utility, press the DELETE key when prompted during the Power-On Self Test (POST).

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

The setup item default setting is as follows (these tables list all optional on-board peripherals installed; the Boot and Exit menus do not have “default” values):

Table 1–2: Standard CMOS Setup

Setting	Default Setting
System Date	mm/dd/yyy
System Time	hh:mm:ss
Floppy Drive A	1.44 MB 3 1/2”
Floppy Drive B	not installed
Primary Master	Auto On
Primary Slave	Not installed
Secondary Master	Auto On
Secondary Slave	Not installed
Boot Sector Virus Protection	Disabled

Table 1–3: Advanced CMOS Setup

Setting	Default Setting
Quick Boot	Enabled
Primary Master ARMD emulated as	Auto
Primary Slave ARMD emulated as	Auto
Secondary Master ARMD emulated as	Auto
Secondary Slave ARMD emulated as	Auto
1st Boot Device	Floppy
2nd Boot Device	ATAPI CD-ROM
3rd Boot Device	1st IDE-HDD
Try other Boot Devices	Yes
Initialize I2O Devices	Yes
Initial Display Mode	BIOS
Floppy Access Control	Read-Write
Hard Disk Access Control	Read-Write

Table 1–3: Advanced CMOS Setup (Cont.)

Setting	Default Setting
S.M.A.R.T. for Hard Disks	Enabled
BootUp Num–Lock	On
PS/2 Mouse Support	Enabled
System Keyboard	Present
Primary Display	VGA/EGA
Password Check	Setup
Boot to OS/2	No
Wair for “F1” if error	Enabled
Internal Cache	WriteBack
External Cache	WriteBack
System BIOS Cacheable	Enabled
OnBoard VGA	Enabled
OnBoard VGA Display Mode	CRT+ DFP
OnBoard VGA Panel Type	1024x768 T24
Stretch Text Modes	Yes
Stretch Graphics Modes	No
Symbios SCSI BIOS	Disabled

Table 1–4: Advanced Chipset Setup

Setting	Default Setting
USB Function	Enabled
USB KB/Mouse Legacy Support	Auto
Port 64/60 Emulation	Enabled
SERR#	Enabled
PERR#	Enabled
USWC Write Post	Enabled
BX Master Latency Timer (Clks)	64
DRAM Integrity Mode	ECC Hardware
Power Down SDRAM	Disabled
PIIX4 SERR#	Enabled
TypeF DMA Buffer Control1	Disabled
TypeF DMA Buffer Control2	Disabled
DMA-0 Type	Normal ISA

Table 1–4: Advanced Chipset Setup (Cont.)

Setting	Default Setting
DMA-1 Type	Normal ISA
DMA-2 Type	Normal ISA
DMA-3 Type	Normal ISA
DMA-5 Type	Normal ISA
DMA-6 Type	Normal ISA
DMA-7 Type	Normal ISA
PCI Downstream Window 1 Type	Disabled
PCI Downstream Window 1 Size	N/A
PCI Downstream Window 2 Type	Disabled
PCI Downstream Window 2 Size	N/A
PCI Downstream Window 3 Type	Disabled
PCI Downstream Window 13 Size	N/A
PCI Upstream Window 0 Type	Disabled
PCI Upstream Window 0 Size	N/A
PCI Upstream Window 1 Type	Disabled
PCI Upstream Window 1 Size	N/A
PCI Upstream Window 2 Page Site	Disabled
VMEbus System Controller State	Auto
VMEbus DTACK# Inactive Filter	Disabled
VMEbus Access Windows Size	512MB
Spread Spectrum Clock Modulation	High

Table 1–5: Power Management Setup

Setting	Default Setting
Power Management / APM	Disabled
Green PC Monitor Power State	Suspend
Video Power Down Mode	Stand By
Hard Disk Power Down Mode	Suspend
Hard Disk Time Out (minute)	Disabled
Standby/Suspend Timer Unit	4 min
Standby Timer Out	Disabled
Suspend Timer Out	Disabled
Slow Clock Ratio	50% - 62.5%

Table 1–5: Power Management Setup (Cont.)

Setting	Default Setting
Display Activity	Ignore
Device 6 (Serial port 1)	Ignore
Device 7 (Serial port 2)	Ignore
Device 8 (Parallel port)	Ignore
Device 5 (Floppy Disk)	Ignore
Device 0 (Prim Master IDE)	Monitor
Device 1 (Prim Slave IDE)	Ignore
Device 2 (Sec Master IDE)	Ignore
Device 3 (Sec Slave IDE)	Ignore
Processor Temperatur Limit	100 C
Thermal Duty Cycle	87.5 %

Table 1–6: PCI / Plug and Play Setup

Setting	Default Setting
Plug and Play Aware O/S	No
PCI Latency Timer (PCI Clocks)	64
PCI VGA Palette Snoop	Disabled
PCI IDE BusMaster	Disabled
DMA Channel 0	PnP
DMA Channel 1	PnP
DMA Channel 3	PnP
DMA Channel 5	PnP
DMA Channel 6	PnP
DMA Channel 7	PnP
IRQ3	PCI/PnP
IRQ4	PCI/PnP
IRQ5	PCI/PnP
IRQ7	PCI/PnP
IRQ10	PCI/PnP
IRQ11	PCI/PnP
IRQ14	PCI/PnP
IRQ15	PCI/PnP

Table 1–6: PCI / Plug and Play Setup (Cont.)

Setting	Default Setting
Reserved Memory Size	Disabled
Reserved Memory Address	C8000

Table 1–7: Peripheral Setup

Setting	Default Setting
OnBoard FDC	Auto
Drive and Port Interface	A:FDC, B:FDC
Swap Floppy Drives	No
OnBoard Serial Port1	3F8
OnBoard Serial Port2	2F8
OnBoard Serial Port2 CIR	N/A
Serial Port2 Mode	Normal
Serial Port2 IR DMA Channel	N/A
Serial Port2 Duplex Mode	Half
Serial Port2 Receiver Polarity	High
Serial Port2 Xmitter Polarity	High
Serial Port2 IR Interface	RX2/TX2
OnBoard Parallel Port	378
Parallel Port Mode	Normal
EPP Version	N/A
Parallel Port IRQ	7
Parallel Port ECP DMA Channel	N/A
OnBoard IDE	Both
CompactPCI sideband INTP IRQ	Auto
OnBoard High-res Timer IRQ	Auto
Onboard Ethernet #1 connector	Front
Onboard Ethernet #2 connector	Front

Operating System

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

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

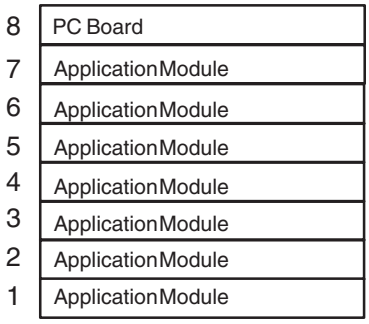
Installing Application Modules

Upon delivery, all modules are preinstalled in your mainframe. Modules must be installed in the correct slot for the proper operation of the instrument.

CAUTION. *To avoid equipment damage, do not put the PC board in any other slot than slot 8 and do not put other boards in slot 8.*

Only qualified personnel should install application modules.

The following figure illustrates the slot assignment:



Detailed information on how to install or change the application module 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 swappable, doing so can damage the modules and the whole unit.

Always power down the unit before removing or inserting modules.

First Time Operation

This chapter describes all steps needed to install your portable mainframe 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 this software.

Information on switching off the device and on how to prepare the device for transport is included at the end of this chapter.

Checking 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.

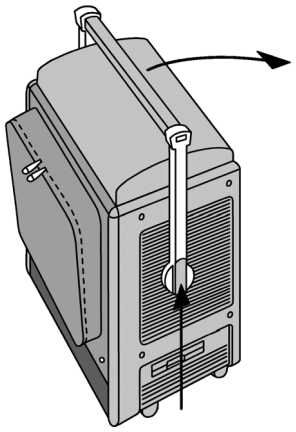
Setting Up the Device

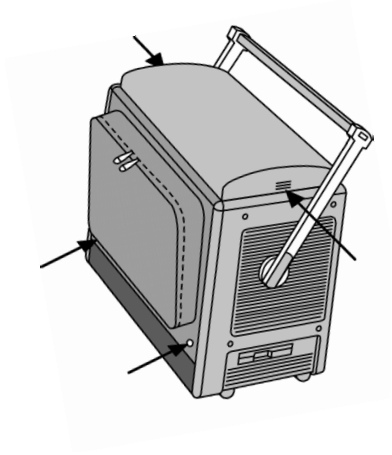
Read this section before starting any installation procedures. This section describes site considerations, power requirements, and ground connections for your device.

The portable mainframe is designed for field service but not for outdoor or mobile operation. For proper cooling, at least 5 cm of clearance is recommended from both sides of the mainframe.

Proceed as follows when setting up the device:

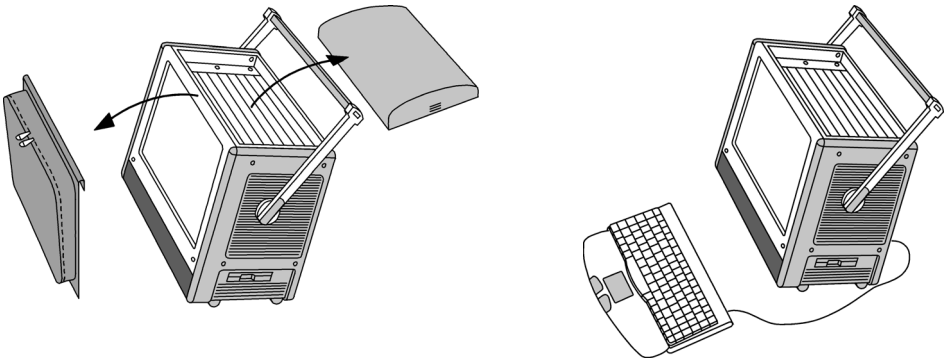
1. Move both of the lateral handle hinges (handle variant: push up hinges) upwards, fold back the handle until it locks and set the device in the desired position.
2. Push the cover latches and lift up the top cover. Loosen the quarter-turn fasteners on the bottom at the front of the device.





3. Lift the keyboard plate from the device and zip the keyboard out of its case.

4. Place the keyboard in front of the device. Connect the keyboard cable to the right PS/2 connector (MOUSE/KEYBOARD) at the rear of the device and the touch pad cable to the EMP connector.



5. 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. Additional accessory connection information can be found in the following table.

Table 1–8: 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.
Mouse	If you want to use an external mouse, choose a standard Windows mouse and connect it directly to the left PS/2 connector (MOUSE) on the rear of the device.
Printer	Connect the printer directly to the LPT interface on the rear of the device.

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.

Turning On the Device

Perform the following steps to turn on the device for the first time.

1. Connect the proper power cord. See Figure 1–5. The power cord connector and the power switch are both located on the left side of the device.
2. Press the power switch to turn on the device (see Figure 1–5 for the switch location). The LED on the front panel of the power supply indicates that the portable is powered up.

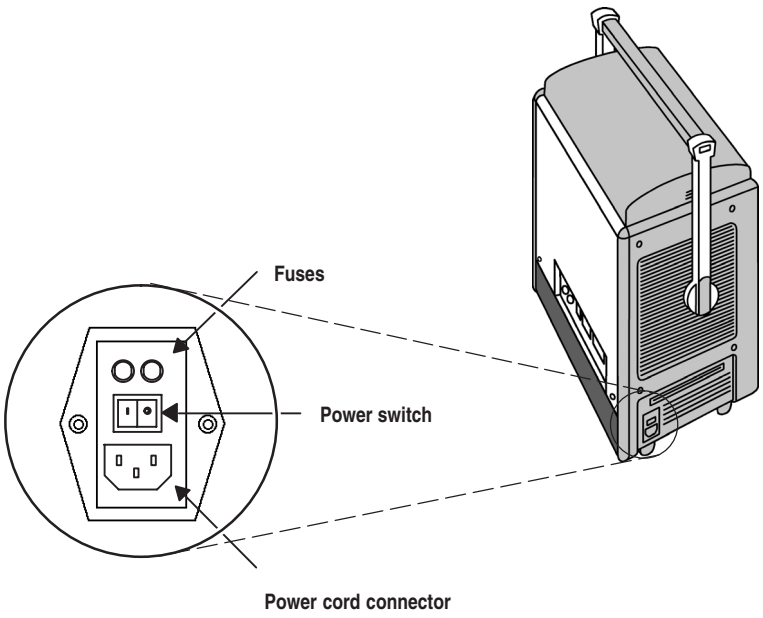


Figure 1–5: Power Switch, Line Fuse, and Power Cord Connector

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 the Windows help for more information.

Follow these steps to create the emergency disk:

1. Exit all applications.
2. Click the Windows *Start* button select *Run* and click *Run*.
3. Enter *Open: rdisk /s*
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.

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

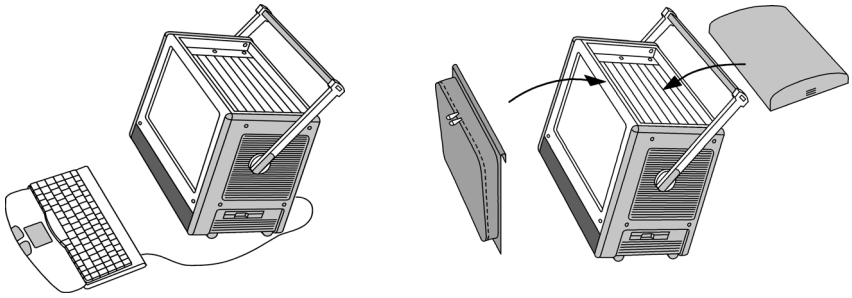
To install new software, system updates or upgrades, proceed as follows:

1. Insert the installation CD into the CD-ROM drive. If installation does not start automatically go to step 2.
2. Start `SETUP.EXE` on the CD-ROM via the Windows `Start` menu with `Run`.
3. Follow the setup program instructions.

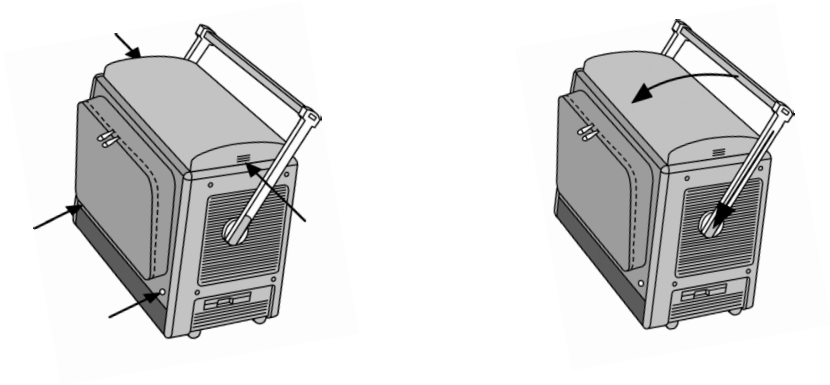
Switching Off and Transporting the Device

Before you switch off the device, shut down the operating system, and then switch off the device using the power switch (see figure 1–5).

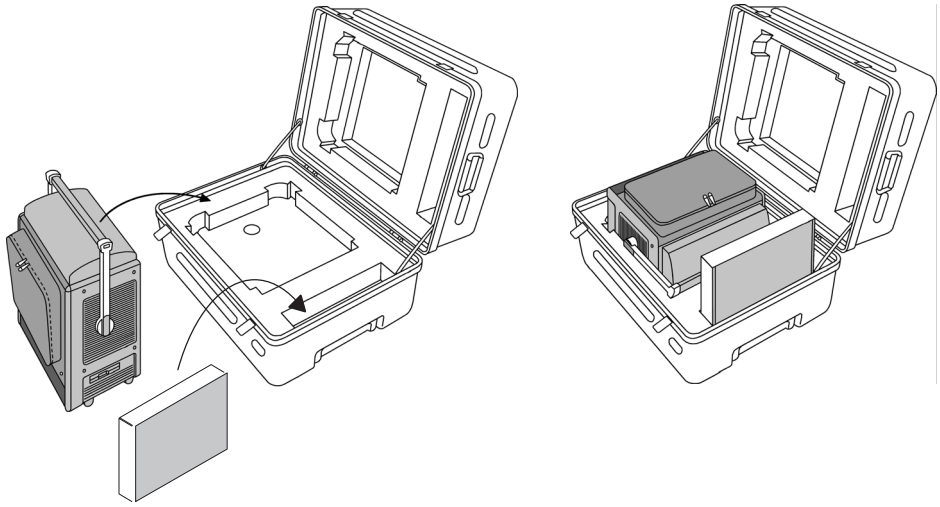
1. For transport purposes, fold the cover over the slots.
2. Disconnect the keyboard and put it into the keyboard case. Hook the keyboard plate in front of the display to protect it against damage.



3. Tighten the quarter-turn fasteners at the front and close the top cover. Move the lateral handle hinges downwards and put the handle into a vertical position.



4. Use the transport case in which the device has been delivered to transport the device over long distances. Put device and accessories box into the transport case as shown below.



In Case of Problems

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 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 2–1 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 2–1 to help isolate and eliminate problems. This list is not exhaustive, but it may help you eliminate problems that are quick to fix, such as a blown fuse.

Table 2–1: Failure Symptoms and Possible Causes

Symptom	Possible causes and recommended action
Device does not turn on	Verify that the power cord is connected to the device and to the power source. Press the Power switch and verify that the instrument receives power by listening for the fans to start and checking that some front-panel indicators light up. Check that power is available at the power source. Check for incorrect or failed fuse. The fuse is located beside the power switch on the rear of the device (see figure 1–4). If needed change the fuse as follows: 1. Remove the fuse holder at the rear of the device 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. 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 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 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.
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.

Appendices

Appendix A: Specifications

This chapter lists all general specifications for the portable mainframe. Additional technical data of the CPU can be found in Appendix B.

Characteristic Tables

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

The performance limits in this specification are valid with these conditions: The portable mainframe must be in an environment with temperature, altitude, humidity, and vibration within the operating limits described in these specifications. The portable mainframe is not designed for mobile use while operating (like in cars or aircrafts).

Table A–1: Environmental Specifications

Characteristic	Description
Temperature: Operating and non-operating	Operating (no media in floppy disk drive): 0°C to +40°C Non-operating: -20°C to +70°C
Relative humidity: Operating and non-operating	Operating: 5% to 85% , non-condensing Non-operating: 5% to 95%, non-condensing
Altitude: Operating and non-operating	Operating: To 3000 m Non-operating: 15 000 m
Shock Operating and non-operating	Operating: Half-sine 11 ms, 1 g Non-operating: Half-sine 11 ms, 30 g
Vibration	Sine: 0.015” pk pk 10...55 Hz Random: 0.00015 g^2/Hz 5...500 Hz
Acoustic noise	≤ 63 dBa

Table A–2: Internal Controller

Characteristic	Description
Operating system	Microsoft Windows 2000
CPU	Mobile Pentium III, ≥ 500 MHz
Hard disk drive	IDE (Integrated device electronics) hard disk drive ≥ 9 GByte, 2.5”

Table A–2: Internal Controller (Cont.)

Characteristic	Description
CD Read-Write drive	CD-R 24x / CD-RW 4x / CD-W 10x located at the left side of the unit
Floppy disk drive	Standard 3.5” 1.44 MByte, located at the right side of the unit

Table A–3: CPU Characteristics

Characteristic	Description
Processor	Mobile Pentium III, ≥500 MHz 256 KByte L2 cache on chip, full speed
Memory	≥256 MByte SDRAM ECC 4 Kbit serial EEPROM ≥114 Byte NVRAM-10year
RT clock	User programmable, allows real time functions
Bus interface	PICMG 2.0 R3.0 (cPCI) compliant, 64 bit, 33 MHz
Ethernet interface	Two 10/100 BaseT connectors on the PC board front panel
Serial interface	RS-232; one connector on the PC board front panel
PMC slot	One, on the PC board front panel
VGA interface	One connector on the PC board front panel
USB interface	One connector on the PC board front panel

Table A–4: Systems Connections

Characteristic	Description
USB interface	One, on the rear of the unit, providing connection to an external keyboard, mouse, scanner
PS/2 interface	One, on the rear of the unit, providing connection to an external keyboard/mouse One, on the rear of the unit, providing connection to an external mouse
IPMI emergency management port	One, on the rear of the unit, providing modem connection
SCSI interface	40 Mbit/s, one wide connector on the rear of the unit
LPT interface	One, on the rear of the unit, providing printer connection
Alarm options	Two, on the rear of the unit, providing potential free connection to external devices

Table A–5: Display System

Characteristic	Description
Type	TFT LC active-matrix color display with backlight
Dimensions	14.1” diagonal
Resolution	1024 x 768 pixel, XGA compliant

Table A–6: Keyboard

Characteristic	Description
Type	Full-QWERTY keyboard
Dimensions	27 mm (H) x 289 mm (L) x 227 mm (W)
Weight	0.72 kg
Pointing device	Built-in touch pad for pointing input device Two programmable buttons

Table A–7: Backplane Characteristics

Characteristic	Description
Features	Passive; 8 slots; one cPCI segment PICMG 2.0 R3.0 (cPCI) compliant, 64 bit, 33 MHz PICMC 2.1 R1.0 (cPCI Hot Swap) compliant
THRU bus	On P4, between slots 2 and 3
H.110 bus	On P4, not on slot 1 thru 3
UP/DOWN bus	On P3/P5, respectively
Clock / Sync.	Distributed on P2, 4 signals (1PPS/10MHz from external reference and NetSync1/2)
IPMI (Intelligent Platform Management Interface)	PICMG 2.9 D1.0 (IPMI) compliant

Table A–8: Power Supply

Characteristic	Description
Type	Open frame, 600 W nominal With over-temperature protection
AC input	100 ... 240 VAC, 47...63 Hz, max. 550 VA

Table A–8: Power Supply (Cont.)

Characteristic	Description
DC output	50 W per application slot DC output for client modules: +5 V, +3.3 V, +12 V, -12 V, -5.2 V 50 A, 30 A, 8 A, 3 A, 35 A
Fuse data	6.3 A Time, 250 V AC

Table A–9: Cooling

Characteristic	Description
Cooling system	Forced air circulation (negative pressurization) utilizing four fans operating in parallel
Cooling clearance	50 mm from both sides of mainframe; unit should be operated on a flat, unobstructed surface

Table A–10: Mechanical

Characteristic	Description
Overall dimensions	280 mm H x 350 mm W x 210 mm D (without top cover and keyboard) 340 mm H x 395 mm W x 255 mm D (with top cover, handle, and keyboard)
Weight	Approx. 14 kg without application boards, cabels and accessories
Top cover	Detachable plastic cover, providing 67 mm space for interconnections over front panels of boards
Transport handle	Plastic, with metal rail, rotating handle
Hard shell transport box (with wheels and retractable handle)	Overall: 520 mm H x 695 mm W x 405 mm D

Table A–11: 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 — CISPR 16: 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 A) IEC 1000-4-5 — Power Line Surge Immunity (Performance Criterion A) 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 comply to the standards above. For minimum RF emissions, it is essential that the conditions above are implemented. Failure to do so could compromise the EMC compliance of the equipment containing the board. Unused cPCI module slots are covered with blank front panels.	
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 amended 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 Pollution Degree 2 Safety Class I	

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

Appendix B: Interfaces

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

Ethernet Twisted Pair Interface 10BaseT and 100BaseTX

The ethernet twisted pair interfaces 10BaseT and 100BaseTX are on top of the device on the PC board front panel.

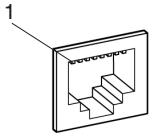


Table B–1: Pin Assignment for 10BaseT and 100BaseTX Interfaces

Pin	Assignment	Pin	Assignment
1	TxD +	5	BIAS1 –
2	TxD –	6	RxD –
3	RxD +	7	BIAS2 +
4	BIAS1 +	8	BIAS2 –

The four BIAS lines are not used internally but pairwise shorted and 50 Ohm terminated.

External Monitor Interface (VGA)

The external monitor interface (VGA) is located on top of the device on the PC board front panel. It supports a resolution of up to 1600 x 1200.

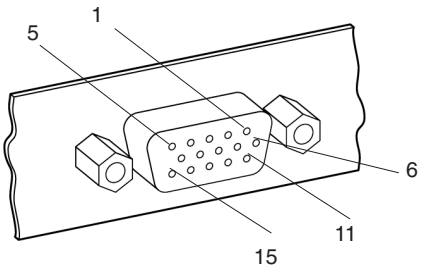


Table B–2: Pin Assignment for Interface VGA

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

Serial Interface (COM1 and EMP)

The serial interface COM1 is located on top of the device on the PC board front panel. The serial interface EMP (Emergency Management Port) is on the rear of the device, on the rear panel.

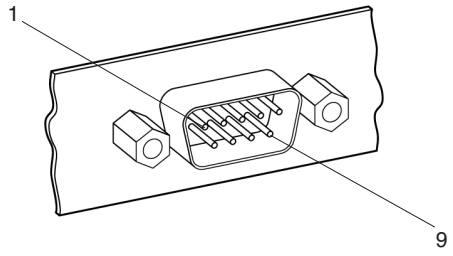


Table B–3: Pin Assignment for Interface COM1 and EMR

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)

One USB interface is located on top of the device on the PC board front panel. Another USB interface is on the rear of the device, on the rear panel.

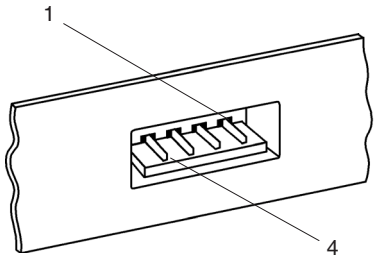


Table B–4: Pin Assignment for the USB Interface

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

PS/2 Interface (MOUSE)

One PS/2 interface (MOUSE) is on the rear of the device, on the left side of the rear panel.

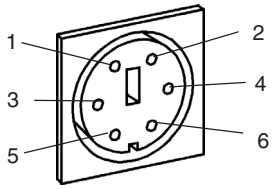


Table B–5: Pin Assignment for the PS/2 Interface (MOUSE)

Pin	Assignment	Pin	Assignment
1	Mouse data	4	+ 5 V
2	Not connected	5	Mouse clock
3	Ground	6	Not connected

PS/2 Interface (MOUSE/KEYBOARD)

One PS/2 interface (MOUSE/KEYBOARD) is on the rear of the device, second on the left side of the rear panel.

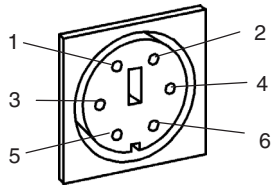


Table B–6: Pin Assignment for the PS/2 Interface (MOUSE/KEYBOARD)

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

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

SCSI Interface

The SCSI interface (SCSI) is located on the rear panel of the device, on the rear panel.

Up to six peripheral devices can be connected to the controller of the system processor via the SCSI interface. Each peripheral device must be assigned an individual address (SCSI ID). The controller occupies address 7 as standard. When not connected with a peripheral device the SCSI socket is terminated automatically.

***NOTE**. Assign one of the free addresses 2 - 6 to the devices that you want to operate via the external SCSI connection. Do not assign address 1.*
If you want to boot from an external device, set the SCSI address to 0.
Switch on the device first and before switching on the SCSI connected device.

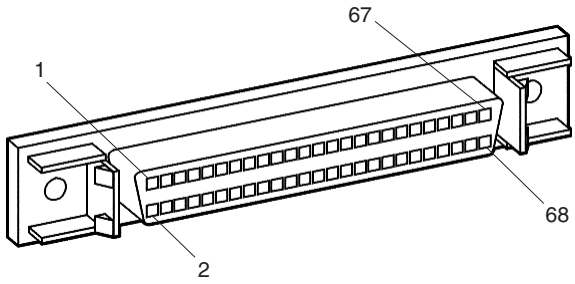


Table B–7: Pin Assignment for the SCSI Interface

Pin	Assignment	Pin	Assignment
1	Ground	35	Data 12
2	Ground	36	Data 13
3	Ground	37	Data 14
4	Ground	38	Data 15
5	Ground	39	DP1
6	Ground	40	Data 0
7	Ground	41	Data 1
8	Ground	42	Data 2
9	Ground	43	Data 3
10	Ground	44	Data 4
11	Ground	45	Data 5
12	Ground	46	Data 6

Table B–7: Pin Assignment for the SCSI Interface (Cont.)

Pin	Assignment	Pin	Assignment
13	Ground	47	Data 7
14	Ground	48	DP 0
15	Ground	49	Ground
16	Ground	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Not connected	53	Not connected
20	Ground	54	Ground
21	Ground	55	ATN
22	Ground	56	Ground
23	Ground	57	BSY
24	Ground	58	ACK
25	Ground	59	RST
26	Ground	60	MSG
27	Ground	61	SEL
28	Ground	62	CD
29	Ground	63	REQ
30	Ground	64	IO
31	Ground	65	Data 8
32	Ground	66	Data 9
33	Ground	67	Data 10
34	Ground	68	Data 11

LPT Interface

The LPT interface (LPT) is located on the rear of the device, on the rear panel.

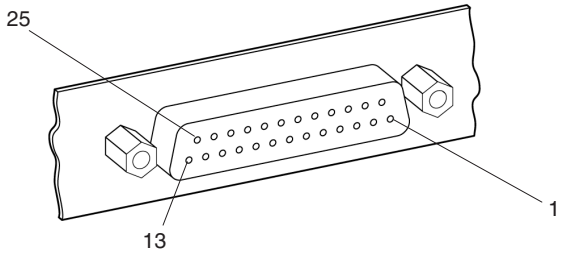


Table B–8: Pin Assignment for the LPT Interface

Pin	Assignment	Pin	Assignment
1	STROBE	14	Auto feed
2	DB0	15	Error
3	DB1	16	Initialize
4	DB2	17	Select input
5	DB3	18	Ground
6	DB4	19	Ground
7	DB5	20	Ground
8	DB6	21	Ground
9	DB7	22	Ground
10	ACK	23	Ground
11	BSY	24	Ground
12	Paper end	25	Ground
13	Select		

Alarm Option (RELAIS)

Two alarm and synchronizing sockets are on the rear of the device on the rear panel.

The following maximum turn-off voltages you may apply:

42 V AC with maximum turn-off current 1.5 A or
30 V DC with maximum turn-off current 1,5 A or

60 V DC with maximum turn-off current 1.5 A resistive load or
60 V DC with maximum turn-off current 0.5 A non-resistive load.

The maximal relay ratings are:

250 V AC with 5 A or
30 V DC with 5 A or

60 V DC with 1.5 A resistive load or
60 V DC with 0.5 A non-resistive load.

For applications running on this interface, an additional fuse is installed on the transition board. This 1.5 A / 115 V fast blow fuse can be replaced by service technicians if needed.

***NOTE**. The described option will need to be enabled by the appropriate software.*

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 chance 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 excessive 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; use only enough solution to dampen the cloth or swab.*

Do not wash the power switch at the rear of the device. Cover the switch while washing the mainframe.

Use deionized water when cleaning only if needed, 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; use only enough solution to dampen the cloth or swab.*

Use deionized water when cleaning only if needed, 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.

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.

Index

Index

M

O

P

R

S

T

W