

Agilent 81250 Parallel Bit Error Ratio Tester

## **Installation Guide**



**Agilent Technologies**

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## Safety Symbols



Caution (refer to accompanying documents)



Protective earth (ground) terminal

In the manual:

## WARNING

Warnings call attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury or loss of life. Do not proceed beyond a Warning until the indicated conditions are fully understood and met.

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Cautions call attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the equipment. Do not proceed beyond a Caution until the indicated conditions are fully understood and met.

## Document Status

The first Edition of this manual is Edition 1. The Edition number increments by 1 whenever the manual is revised. New Editions are complete revisions of the guide reflecting alterations in the functionality of the instrument. Updates are occasionally made to the guide between editions.

This is Edition 2.1, February 2002

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# About this Guide

This installation guide leads you through the steps to identify, install and configure the Agilent 81250 ParBERT or any component of this system.

This guide covers primarily the standard, recommended installation. The configurations described in this guide provide the full functionality of ParBERT.

This chapter gives you an overview of the structure and contents of the installation guide.

**NOTE** Several optional as well as standard system components are delivered with their own dedicated user manuals. Such components are for example:

- E8403A/E8404A VXI mainframe
- E9850A embedded VXI controller
- E8491B IEEE 1394 PC link to VXI
- VXI bus extenders

Before you start with the installation, it is therefore recommended that you inspect the shipment for additional documentation that may be required for a successful setup and installation.

**e-mails** If you need special support, you can also contact the ParBERT support under [parbert\\_support@agilent.com](mailto:parbert_support@agilent.com).

# Contents of This Guide

The following is a summary of the chapters and their contents:

**Getting Started** This chapter provides an overview of the hardware and software components that build an Agilent 81250 Parallel Bit Error Ratio Tester. It also explains some of the operating principles and terms, like “clockgroups” or “ParBERT systems”.

Additionally, it contains some setup examples. The examples include local and completely self-contained testers as well as testers prepared for operation over the local area network.

The requirements for installing the ParBERT user software are also stated in this chapter.

**Setting Up ParBERT** This chapter deals with the hardware. You may have received one or several VXI mainframes. You may wish to set up a multi-mainframe system or change the hardware of an existing system. All this is covered in this chapter.

**Setting Up ParBERT 43G** The Agilent 81250 ParBERT 43G is a special solution for stimulating and analyzing electrical 16:1 OC-768 multiplexers and 1:16 demultiplexers at data rates of 2.7 Gbit/s and 43.2 Gbit/s.

This chapter explains the setup procedure and the wiring.

**Software Installation and Update** If you are installing an Agilent 81250 Parallel Bit Error Ratio Tester with embedded VXI controller, then the ParBERT software is readily installed. You can ignore this chapter unless you receive a new software release.

But if you have received a ParBERT with the E8491B IEEE 1394 PC link to VXI (opt. #013), you have to install a PCI board and the ParBERT software on a separate PC designated to be the ParBERT controller.

In addition, if you wish to operate the ParBERT via the LAN, you have to install the ParBERT software also on any PC that shall be used for operating the system.

The procedures for first-time installation and update are essentially the same. They are described in this chapter.

**Starting ParBERT for the First Time** This chapter explains how to configure the system using the Agilent 81250 Configuration Tool and how to configure the user interface. It explains also how to start the available system self-test functions.



- Connecting ParBERT to the LAN** ParBERT can be set up and used as a stand-alone instrument. But connecting its controller to the LAN allows you to operate it from almost any workstation. This chapter describes the necessary steps under Windows NT.
- Troubleshooting the ParBERT Installation** Generally, ParBERT is delivered ready-to-use. But if you have installed a multi-mainframe system or changed an existing system, you may run into problems that can be avoided. This chapter deals with such problems.

## Document History

All editions and updates of this manual and their creation date are listed below. The first edition of the manual is Edition 1. The edition number increments by 1 whenever the manual is revised. New editions are complete revisions of the guide reflecting alterations in the functionality of the instrument. Updates are occasionally made to the guide between editions.

- Edition 1, July 2000, related to Agilent E4875A Software Release 1.0 and higher.
- Edition 1.1, March 2001. Update to cope with added functionality, related to Agilent E4875A Software Release 3.0 and higher.
- Edition 1.2, April 2001. Update with special focus on clockgroups and their implementation.
- Edition 2, October 2001. Installation of ParBERT 43G systems added. Enhanced Agilent 81250 Configuration Tool and user interface configuration. Related to Agilent E4875A Software Release 4.0 and higher.
- Edition 2.1, February 2002. Update with special focus on replacement instructions of 3.35 Gbit/s. frontends. Updated software start procedure (Agilent 81250 Configuration Tool). Related to Agilent E4875A Software Release 4.2 and higher





# Getting Started

Before you start with the installation, it may be a good idea that you get to know ParBERT.

This chapter explains:

- What are the main components of ParBERT (see *"ParBERT Overview" on page 12*).
- Which tools and accessories are needed for installing ParBERT (see *"Installation Prerequisites" on page 28*).

# ParBERT Overview

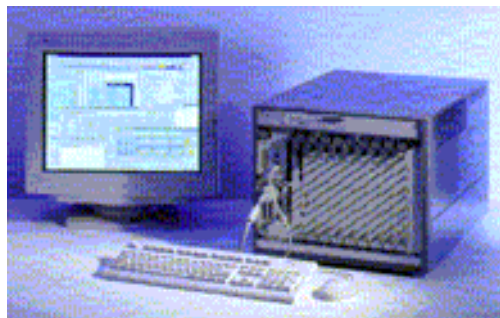
This section also introduces and explains the terms that are used in this installation guide.

**NOTE** The ParBERT components are described here, not the installation procedures.

## What is ParBERT

ParBERT is the term for Agilent Technologies' 81250 Parallel Bit Error Ratio Tester systems. ParBERT is a VXI-based solution for high-speed digital component testing. It is a modular system of hardware and software that can be easily modified to fit specific needs.

An Agilent 81250 Parallel Bit Error Ratio Tester consists of one or several mainframes, a controller, and modules plugged into the mainframe.



**Figure 1** E4860A System Configuration

## Mainframes

The standard mainframe is the E8403A or E8404A VXI mainframe with 13 VXI slots.



**Figure 2** E8403A VXI Mainframe with Embedded Controller and Modules

The figure above shows a mainframe with embedded controller (which occupies the leftmost slots), one clock module (the first module at the right-hand side of the controller), and eight data generator/analyser modules. This is a self-enclosed, single ParBERT system. One or two expander frames can be added.

**ParBERT systems** It is also possible that one mainframe holds more than one ParBERT system. One controller can operate several systems. A ParBERT system consists of an independent clock module (which generates the system master clock) and associated data generator/analyser modules.

## Controller Options

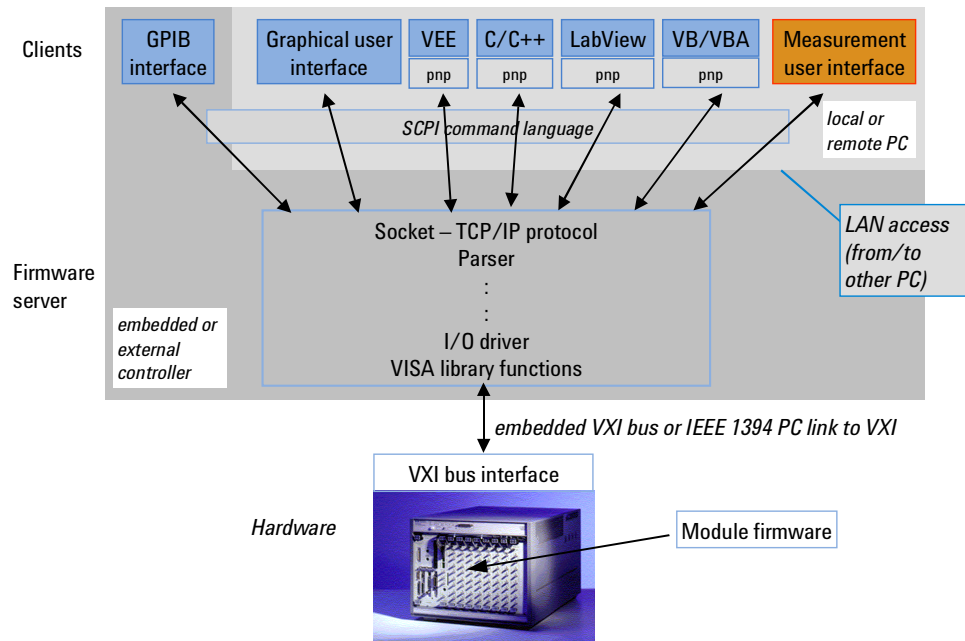
A ParBERT controller is the computer on which the ParBERT firmware server runs. All interfaces—graphical user interface, LAN, GPIB, programming interfaces—communicate through the firmware server with the hardware.

The ParBERT controller can be a VXI module plugged into the mainframe (as shown in *Figure 2*), or an external PC located nearby the mainframe.

User interfaces as well as user-written programs can be run on the ParBERT controller. This is called *local* operating mode.

But if the ParBERT controller is connected to the local area network, user interfaces and user-written programs can also be run on any other suitable user PC. In this case, the software on the user PC is operated in *remote* mode, and the ParBERT controller in *controlled* mode.

The central role of the firmware server is illustrated in the following figure:



**Figure 3 ParBERT Control Options**

All clients of the firmware server—the graphical user interface and all programming interfaces—use the firmware server to communicate with the hardware. As the interfaces use the TCP/IP protocol, they can talk with the firmware server directly (local operation) or via the LAN (remote operation). Only the GPIB interface cannot be used from a remote PC.

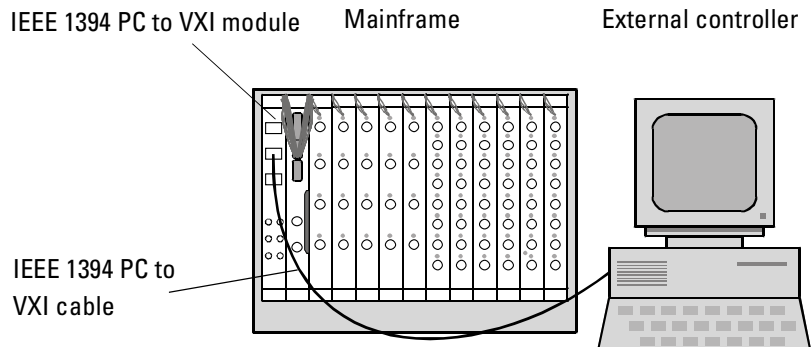
The firmware server accesses the hardware either directly via the VXI bus (if it runs on an embedded controller) or via the IEEE 1394 PC link to VXI (if it runs on an external PC).

So, two alternatives are available for controlling the system:

**External controller** • The E8491B IEEE 1394 PC link to VXI (opt. #013)

This option allows to use an external PC running under Windows NT or Windows 2000 as the ParBERT controller. The option includes a PCI board that is installed in the computer, a 1-slot VXI module which is plugged into the mainframe, connection cable, and all required software.

Opt. #013 is also called FireWire interface. It leaves 12 mainframe slots for modules.



**Figure 4 ParBERT With External Controller**

Multiple IEEE 1394 PC to VXI modules allow you to control from one PC up to three independent ParBERT systems installed in their own mainframes.

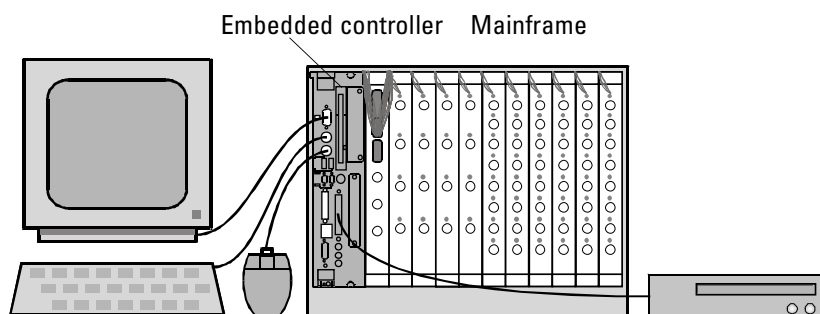
If a ParBERT system with external controller needs to be expanded, you can add up to two E8403A/E8404A expander frames. For each expander frame, you need one 1-slot IEEE 1394 VXI module. The IEEE 1394 VXI module of the basic mainframe can control up to two slave modules and hence expander frames.

**Embedded controller** • The embedded controller E9850A (opt. #012)

This controller is a Pentium-class PC built up as a 2-slot VXI module that includes hard disk, diskette drive, serial and parallel interface, SCSI controller, GPIB and LAN interface. Operating system and ParBERT user software are readily installed.

Opt. #012 leaves 11 mainframe slots for modules.

A system with embedded controller requires a monitor, keyboard and mouse (Opt. #010). For software update, a SCSI CD-ROM drive is also needed. This drive can be shared with other systems.



**Figure 5 Configuration With Embedded Controller**

If this type of system needs more slots, then one or two expander frames E4848B can be added.

The first expander frame consists of a mainframe, two E1482B VXI bus extender modules, and connection cables. The VXI bus extender modules require one slot in both the basic mainframe and the expander frame.

The second expander frame needs only one E1482B VXI bus extender module and connection cables. The second expander frame is connected to the first expander frame.

A VXI bus extender extends the VXI bus of a mainframe by connecting it to a second mainframe. As an alternative to the E1482B VXI bus extender module, the NI VXI-MXI-2 Bus Extenders can also be used.

For a system with external controller, the bus extenders can be replaced by IEEE 1394 VXI modules in the expander frames.

## Modules

A ParBERT system comprises at least one clock module and one data generator/analyzer module with frontends.

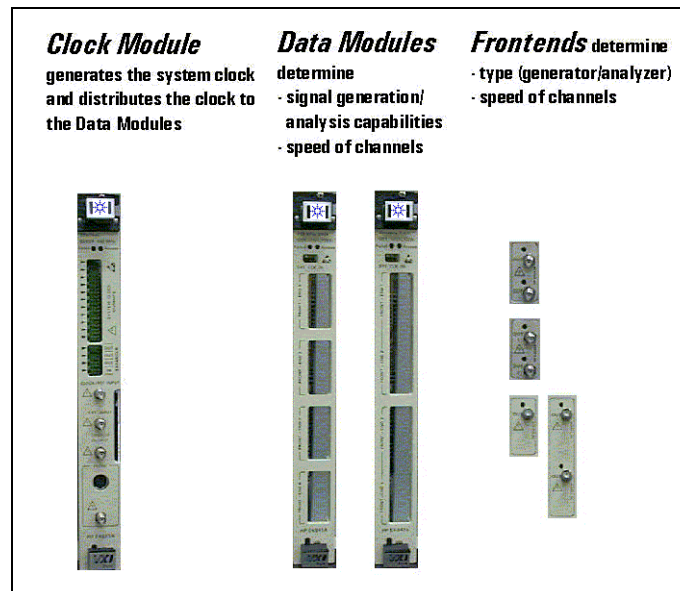


Figure 6 Modules and Frontends (Example)



**Clock Modules** Every ParBERT system requires one master clock module which generates the system clock and synchronizes all data generator and analyzer channels of the system.

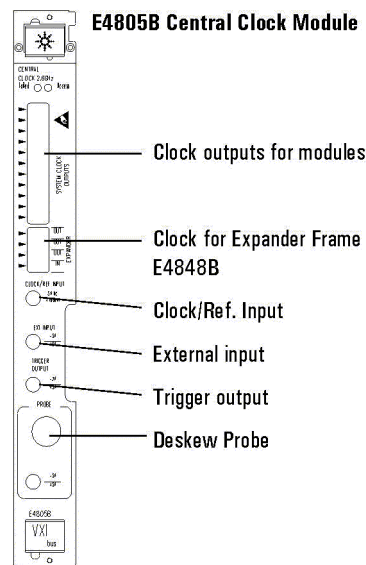
One clock module can supply its clock to up to 11 data generator/analyzer modules. The combination of a clock module and its attached data modules is called a **clockgroup**. Clockgroup #1 is present in every ParBERT system.

The master clock module can also control up to two slave clock modules. Slave clock modules are needed if a system consists of more than 11 data generator/analyzer modules. This leads to the clockgroups #2 and #3.

A deskew probe can be connected and the Agilent 81200 Trigger Pod can be attached to the master clock module.

The deskew probe is used for compensating for internal signal delays. The trigger input pod allows to control test execution by applying external signals.

Supported are the E4805B and the E4808A clock modules. The latter is required for ParBERT 43G systems (see also "ParBERT 43G Components" on page 58) and systems containing 3.35 Gbit/s modules.

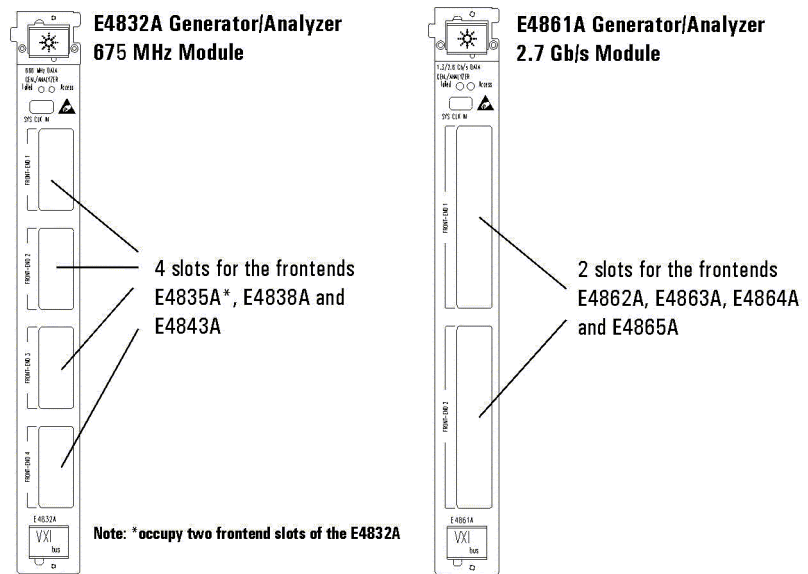


**Figure 7 E4805B Clock Module**

It is also possible to install two or more master clock modules in one mainframe. This results in mutually independent ParBERT systems which share only the housing.

**Data generator/analyzer modules** Most often, the following data generator/analyzer modules are used:

- E4832A Data Generator/Analyzer Module (up to 675 MHz):  
This module provides four slots for four generator or analyzer frontends.
- E4861A Data Generator/Analyzer Module (up to 2.7 GHz):  
This module provides two slots for two frontends with maximum data rates of up to 1.65 Gbit/s or 2.7 Gbit/s.



**Figure 8 Data Generator/Analyzer Modules**

**Overview of modules and frontends** The following table summarizes the presently supported hardware components. The table is sorted according to frequency requirements.

**Table 1 Supported Modules and Frontends**

Max. data rate	Generator	Analyzer	Clock module	Comment
<b>43.2 Gbit/s</b> Modules:	E4868A MUX	E4869A DEMUX	E4808A	ParBERT 43G special
<b>10.8 Gbit/s</b> Modules:	E4866A	E4867A	E4808A	No frontends—one module per channel
<b>3.35 Gbit/s</b> Modules: Frontends:	E4861B E4862B	E4861B E4863B	E4808A	Two frontends per module
<b>2.7 Gbit/s</b> Modules: Frontends:	E4861A E4862A	E4861A E4863A	E4808A, E4805B	Two frontends per module
<b>1.65 Gbit/s<sup>a</sup></b> Modules: Frontends:	E4861A E4864A	E4861A E4865A	E4808A, E4805B	Two frontends per module
<b>675 Mbit/s</b> Modules: Frontends:	E4832A E4838A, E4843A	E4832A E4835A	E4808A, E4805B	Four frontends per module E4835A means 2 frontends

<sup>a</sup> E4864A and E4865A frontends delivered before February, 2002, are confined to 1.35 Gbit/s.

For details please refer to the *Agilent 81250 ParBERT Technical Specifications*.

## Software Components

The software necessary for using ParBERT is delivered on the **User Software CD** (Agilent E4875-10001) with the following:

- ParBERT User Software  
The ParBERT user software (Agilent E4875A) provides an easy-to-use, intuitive graphical user interface for setting up, running and analyzing tests.
- ParBERT Measurement Software.  
The measurement software gives you a fast and easy-to-use graphical access for running and evaluating complex bit error measurements, for example, DUT output timing measurement or eye opening measurement. For further information, refer to Agilent ParBERT 81250 Measurement Software in the online help.
- Plug and Play drivers
- Microsoft Internet Explorer 4.01 or higher
- Adobe Acrobat Reader 4.05 or higher

The **ParBERT Tutorial CD** is delivered with the system. You can use this CD to learn the basic steps of using ParBERT.

If you have ordered a system with the E8491B IEEE 1394 PC link to VXI, the **Agilent Technologies Universal Instrument Drivers CD** is additionally delivered. It contains the Agilent **I/O libraries**. The I/O libraries provide the drivers for the I/O interfaces.

## Not Recommended Combinations

### Operating ParBERT via GPIB interface

An embedded controller can be operated remotely through its built-in GPIB interface. This, however, is *not* recommended.

As the embedded controller has also a LAN interface, the preferred method for remote operation is via the LAN. LAN access has the following advantages:

- The graphical user interface can be run on the remote PC.
- Plug and play drivers are available.
- The ParBERT Measurement Software can be run on the remote PC.

### Not supported configurations

The following configurations are *not* supported:

- E1406A GPIB Command Module as controller
- E4849C (opt. #11) three-slot embedded controller
- E4840A three-slot VXI mainframes
- VXI mainframes with the E1482B VXI bus extender modules, when the external PC is connected with a National Instruments (NI) MXI card
- External PCs, where both the Agilent IEEE 1394 PC link to VXI card and the NI GPIB card are installed

## The ParBERT Approach

It has been mentioned that a single Agilent 81250 system can comprise up to three clock modules in a master-slave configuration. Such a configuration uses expander frames and has up to three clockgroups or up to 33 data generator/analyzer modules.

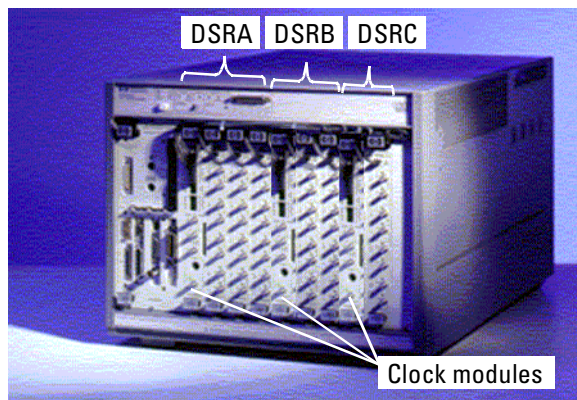
It has also been mentioned that one mainframe can house several Agilent 81250 systems. They consist of *independent* clock modules with associated data generator/analyzer modules. Such configurations make it possible to test a device under asynchronous conditions using independent clock pulses.

The concept of the Agilent 81250 Parallel Bit Error Ratio Tester is to create so-called **virtual systems** from the system's present hardware resources (clock modules, data modules, generator and analyzer frontends).

## Virtual Systems

The basic (default) system is called DSRA (DSR = digital stimulus and response, system A).

If the hardware comprises several independent clock modules—not connected as slaves—then additional systems are available. By default, they get ascending names, such as DSRB, DSRC, and so on.



**Figure 9** Virtual Systems in One Mainframe

Separate systems are widely used for testing multiplexers or demultiplexers. Such devices generally require different clock frequencies at the generating and analyzing sides. MUX/DEMUX tests can be performed by one system, if the ratio of these frequencies is  $2^n$ , such as 2, 4, 8, 16, and so on. If it is not, separate data generating and data analyzing systems will do the job.

If the hardware has been changed by adding or removing modules or frontends, new virtual systems can be automatically created with the Agilent 81250 Configuration Tool.

**NOTE** The user interface and remote control commands enable you to load and operate any of the configured systems.

You can even operate several virtual systems in parallel by starting the user interface more than once. Every user interface indicates the chosen system in the bottom line of its main window.

## What Makes up a ParBERT System

If the Agilent 81250 Parallel Bit Error Ratio Tester has only one clock module, then you have a system that comprises all data generator/analyzer modules installed directly to the right of the clock module, up to the next empty slot.

If the Agilent 81250 Parallel Bit Error Ratio Tester has two or three clock modules connected in master-slave combination, then you have a system that comprises more than one clockgroup. Each clockgroup includes all modules that are located directly to the right of the clock module, up to the next clock module or empty slot.

**NOTE** Only systems with expander frames (that means, more than 10 or 11 data generator/analyzer modules are needed) require the clockgroups 2 and 3. These clockgroups are automatically identified by the Agilent 81250 Configuration Tool.

If the Agilent 81250 Parallel Bit Error Ratio Tester has more than one independent clock module—one that is not connected in master-slave combination—then you have more than one independent systems. Each system contains at least one clockgroup.

**NOTE** Independent systems are also automatically identified by the Agilent 81250 Configuration Tool. After starting the ParBERT user software, you have to decide which system you wish to control.

## Using Multiple Systems

You have to configure the mainframe for multiple systems for tests of the following types:

- Multi-frequency tests  
If the ratios of the test frequencies are not  $2^n$ , you have to set up a different system for each clock frequency.
- Tests using Automatic Bit Synchronization with memory-based data  
In this case, separate systems are needed for the data generators and for the data analyzers.

## Basic Installation Procedure

Each ParBERT configuration has the same basic installation procedure. Any variations from this procedure are mentioned with the description of the configuration.

The basic installation procedure is as follows:

1. Unpack the system and check to make sure all parts are there.
2. Inspect the component-related documents.
3. Connect the peripherals, if required.
4. If your Agilent 81250 Parallel Bit Error Ratio Tester system has expander frames, you have to connect these to the master mainframe. The necessary steps for this are described under *"Setting Up a System with Expander Frames"* on page 35.

The following sections explain what has to be done to get the Agilent 81250 Parallel Bit Error Ratio Tester up and running.

## ParBERT Local Configurations

The following question helps you to identify your configuration:

### Embedded controller

Does the mainframe have an embedded controller?

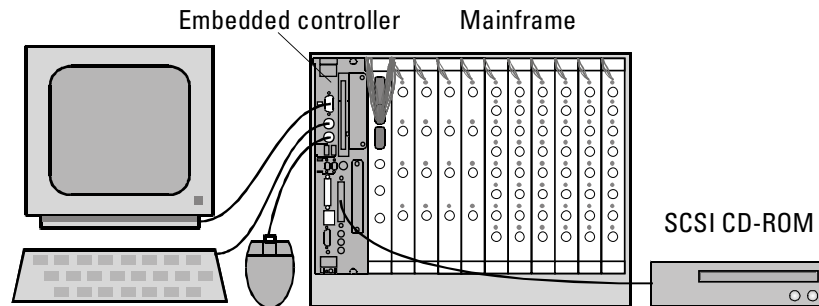
- *Yes*  
Proceed with *"ParBERT with Embedded Controller"* on page 24.

- *No*  
You have to set up and connect an external controller. This PC will contain the Agilent I/O libraries and the ParBERT user software. Proceed with *"ParBERT with External Controller"* on page 25.

**LAN Connection** After that, you may decide whether you wish to operate your Agilent 81250 Parallel Bit Error Ratio Tester directly or via your local area network. See *"Operating ParBERT via the LAN"* on page 26.

## ParBERT with Embedded Controller

If you have ordered ParBERT with an embedded controller, you receive a self-enclosed test system that you simply can connect to mains power.



**Figure 10 Self-enclosed ParBERT System**

After you have followed the basic installation procedure (see *"Basic Installation Procedure"* on page 23), you can connect the mainframe to mains and turn it on. The user software automatically starts, and a selftest checks all the components.

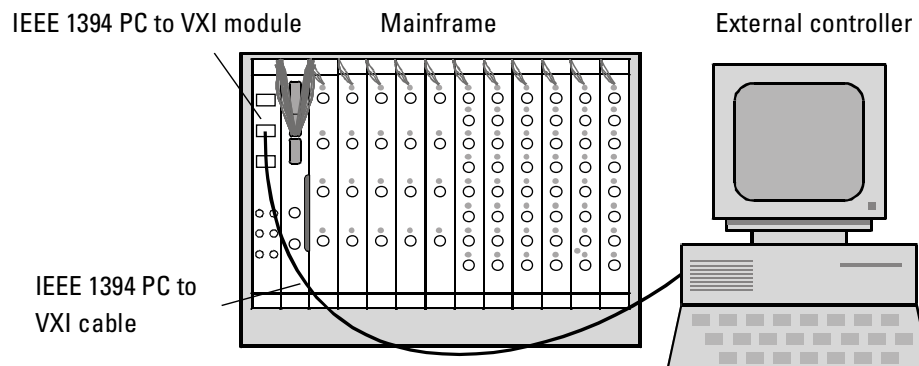
If ParBERT is supposed to be connected to the LAN, you can do that after the selftest has finished. The embedded PC has a standard LAN interface. See *"Connecting ParBERT to the LAN"* on page 91 for instructions.



## ParBERT with External Controller

For this configuration, the IEEE 1394 PC to VXI module is installed in the mainframe. An IEEE 1394 PC to VXI card is delivered with the mainframe—this must be installed in the controlling PC.

**NOTE** If you are installing a ParBERT system with expander frames, you have to connect the expander frames before you connect the basic mainframe to the external controller.



**Figure 11 ParBERT With an External Controller**

Before you can set up ParBERT with an external controller, this PC must be correctly running, and it must have TCP/IP installed. See also *"Requirements for External Controller and User PC"* on page 29.

Additionally, you have to perform the following steps to set up ParBERT with an external controller:

1. You have to install the IEEE 1394 PC to VXI card in the PC, and connect it to the corresponding module in the master mainframe. It does not matter which ports you use for this.  
See the Installation Guide that was delivered with the IEEE 1394 PC to VXI card for instructions.
2. You can now install the ParBERT software components (both delivered CDs) on the PC.  
See *"Software Installation and Update"* on page 69 for instructions.
3. The I/O libraries that are delivered with the IEEE 1394 PC to VXI card must also be installed on the PC.  
See the instructions that were delivered with the I/O libraries.

**CAUTION**

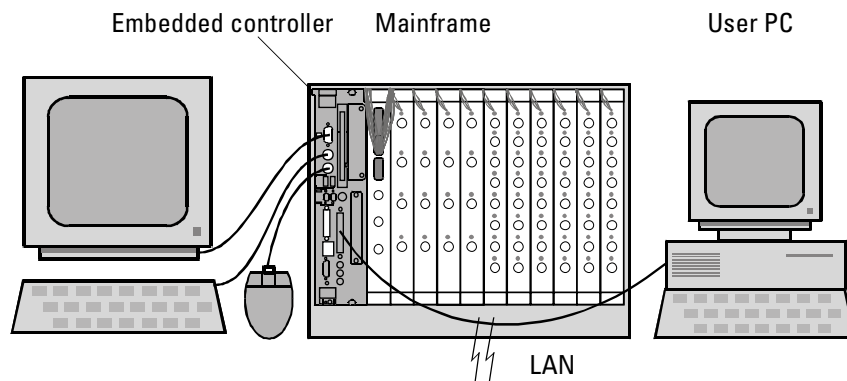
If you are setting up a ParBERT system on an external PC, and you want to connect additional test equipment to this PC using a GPIB interface, it is *highly* recommended that you use an Agilent GPIB card for this purpose.

The reason is that there could be conflicts between the Agilent I/O libraries and those from other manufacturers. It is *not* recommended to install more than one I/O library on one system.

## Operating ParBERT via the LAN

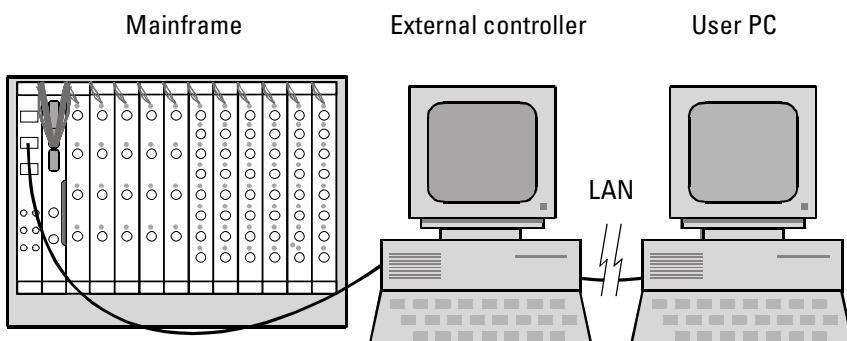
ParBERT can be configured for LAN operation. In such a configuration, the ParBERT firmware server and I/O libraries run on the embedded or external controller, and the user software runs on another PC.

*Figure 12* shows the configuration with an embedded controller.



**Figure 12 Self-enclosed ParBERT With a Separate User PC**

*Figure 13* shows the configuration with an external controller.



**Figure 13 ParBERT With an External Controller and Separate User PC**

In either case, the installation process is basically the same:

1. You have to get the mainframe (and, if applicable, the external controller) running.

For a self-enclosed ParBERT, you have to connect the mainframe to mains power.

For a ParBERT system with an external controller, follow the procedure described under "*ParBERT with External Controller*" on page 25.

2. You have to connect the controller (either the embedded or the external controller) to the LAN.

For ParBERT systems with an embedded controller, see "*Connecting ParBERT to the LAN*" on page 91 for instructions.

See the user documentation delivered with the external PC to connect it to the LAN.

3. You have to get the user PC running and connected to the LAN.
4. You can now install the ParBERT user software on the user PC.

See "*Installing/Updating the ParBERT User Software*" on page 70 for instructions.

## Once You are Finished ...

No matter what the configuration is, once you are finished with the installation, ParBERT is ready for operation. The standard installation saves comprehensive documentation on your PC, which you can use to find out more about ParBERT:

**ParBERT online help** ParBERT features a context-sensitive online help. You just have to position the cursor in a window and press the F1 key, or click *Help* in the ParBERT user software, to open up the online Help Desk.

**Measurement software online help** The Agilent 81250 ParBERT Measurement software comes with its own graphical user interface which includes also a context-sensitive online help.

**Printable documents** Printable documents are delivered as PDF files. They can be read on the screen and printed with the Acrobat Reader. Acrobat Reader is included in the ParBERT software.

The printable documents include user guides, programming guides, and additional documents. You can directly open up these documents in the online help, or you can find them on the "Data" disk in a subdirectory named "..doc".

**Tutorial CD** The ParBERT Tutorial CD that was delivered with the system helps you to get started with using ParBERT.

**Internet** For latest information, frequently asked questions, and related documentation, please check the following URL:

- <http://www.agilent.com/find/parbert>

You can also contact the ParBERT support via e-mail, using the following address:

- [parbert\\_support@agilent.com](mailto:parbert_support@agilent.com)

## Installation Prerequisites

This section lists the requirements for the installation.

### Power Requirements

The mainframe has the following power requirements:

**Table 2 Mainframe Power Requirements**

Voltage	Current
100 V	18 A
120 V	15 A
200 – 240 V	12 A

### Tools Required

The following tools are required to install ParBERT:

- 2-mm flathead screwdriver or size 1 Pozidrive screwdriver
- Torx T-10 screwdriver (delivered with the system)

## Requirements for External Controller and User PC

**NOTE** The external controller and the LAN-connected user PC have almost the same requirements.

The external controller has to meet the following requirements:

- Pentium-class CPU with at least 200 MHz
- 128 MB RAM
- 200 MB of free disk space
- CD-ROM drive
- Agilent E8491B IEEE 1394 PC link to VXI card installed (controller only)
- Windows NT 4.0 or Windows 2000 (or higher) operating system  
For Windows NT 4.0, Service Pack 5 or higher is recommended. For Windows 2000, Service Pack 2 or higher is recommended.
- When using Windows NT, a TCP/IP network must be set up, even if the controller is not connected to the LAN. TCP/IP support is required by the Agilent 81250 firmware server.

If the controller is not connected to the LAN, you can use the “MS Loopback” adapter and specify a “private LAN” IP address, such as 192.168.0.1 (no DNS or WINS).

If the controller shall be connected to the LAN, contact your network administrator for the correct settings.

- Agilent E4875A User Software on CD-ROM



# Setting Up ParBERT

Now that you have a better idea of the possible ParBERT configurations, you can go ahead with the actual installation.

This chapter explains:

- How to inspect the shipment (see *"Unpacking ParBERT" on page 32*).
- How to check the external cable connections between the modules (see *"Checking the Clock Distribution Cables" on page 32*).
- How to connect monitor, keyboard, mouse, and CD-ROM drive (only for systems with embedded controller—see *"Connecting the Peripherals" on page 34*).
- How to connect a multi-mainframe system (see *"Setting Up a System with Expander Frames" on page 35*).
- How to exchange ParBERT modules and frontends (see *"Modifying an Existing ParBERT System" on page 43*).

**NOTE** If you have received a ParBERT 43G system, only the first two sections are initially relevant. After that, continue with *"Setting Up ParBERT 43G" on page 57*.

# Unpacking ParBERT

When you receive ParBERT, it is recommended that you inspect the container and its contents.

**NOTE** If the contents are incomplete, if there is mechanical damage or if any of the instruments does not pass the selftest, notify your nearest Agilent Technologies office. Keep the shipping materials for inspection by the carrier. The Agilent office will arrange for repair or replacement without awaiting settlement.

- Inspect the shipping container and its contents for damage.

If the container or cushioning material is damaged, keep it until the contents of shipment have been checked for completeness and the instrument has been verified both mechanically and electrically.

## WARNING

To avoid the hazard of electric shock, do not perform electrical tests when there are signs of shipping damage to any of the instrument's outer covers or panels.

- Check the contents of shipment.  
See the packing list for exact details.

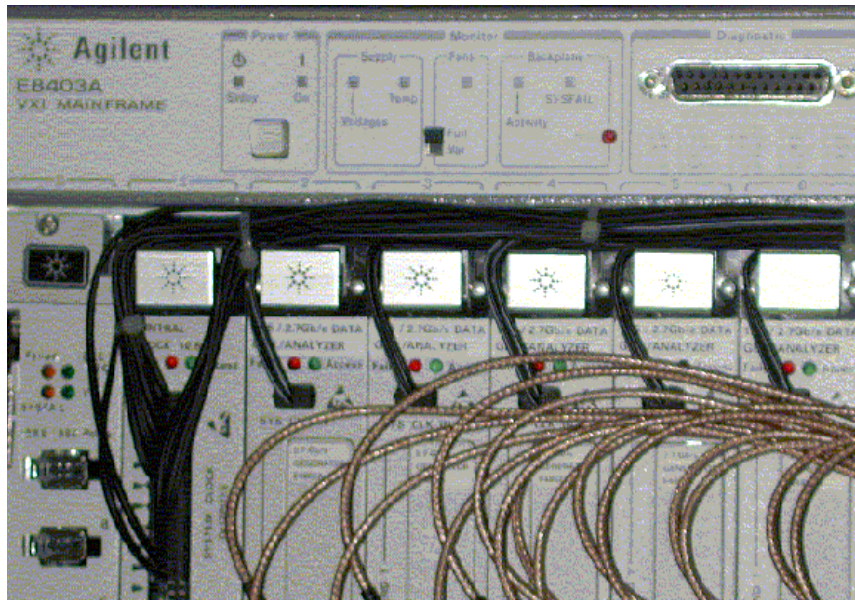
## Checking the Clock Distribution Cables

The clock distribution cables supply the clock pulse from the clock module to the other modules of the clockgroup.

The clock distribution cables connect the SYSTEM CLOCK OUTPUTS of the clock module (up to eleven) with the SYS CLK IN ports of the data generator/analyzer modules.



The figure below shows the installation.



**Figure 14** Connections of the Clock Distribution Cables

Make sure that all connectors are firmly in place. They may have loosened during transportation. If any clock distribution cables are missing, contact Agilent Technologies for replacement (E4805-61601).

**NOTE** The clock distribution cables are of equal length. In order to reduce crosstalk and radiation to a minimum, they have to be bundled and installed as shown in the figure above.

Please keep this in mind if you are changing the hardware of an existing system.

# Connecting the Peripherals

**NOTE** This step is only necessary for self-enclosed ParBERT systems (with embedded controller).

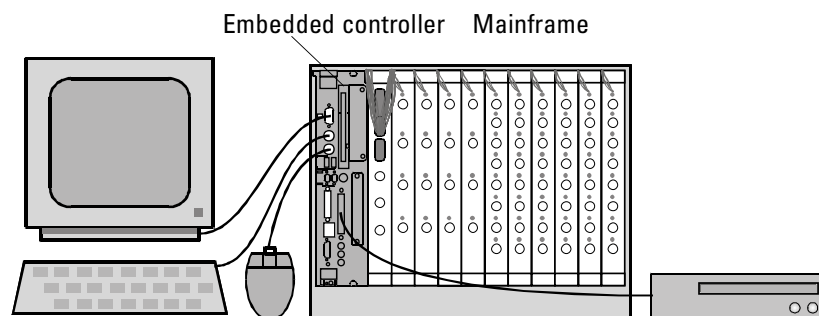
You need to connect the following items to ParBERT's embedded PC:

- SVGA monitor
- Keyboard with PS2 connector
- Mouse with PS2 connector

The embedded controller also provides the following connections:

- Ultra-wide (68-pin) SCSI connector (for example, for external CD-ROM drive)
- Standard PC connections (serial port, parallel port, USB port)

Plug your peripherals into the appropriate connectors located on the front of the embedded PC, as shown in *Figure 15*.



**Figure 15** Connections for Peripherals

# Setting Up a System with Expander Frames

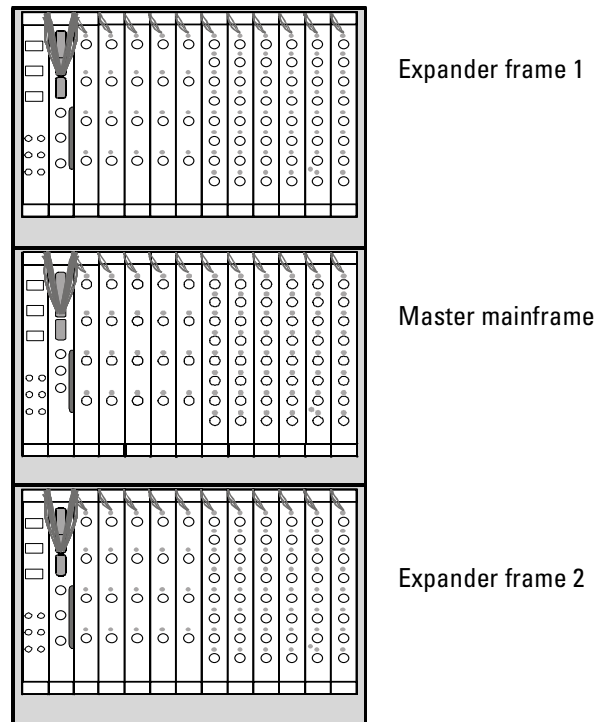
If you want to set up a ParBERT system with expander frames, you have to connect these to the master mainframe.

This consists of the following steps:

1. The mainframes (expander frames and master mainframe) have to be placed in their operating position.
2. The mainframes have to be connected. They get connected with
  - synchronization cables,
  - clock reference cables, and
  - bus extender or IEEE 1394 link cables.

## Placing the Mainframes

The mainframes have been designed to be mounted vertically, with the master mainframe in the middle, as shown in *Figure 16*.



**Figure 16** ParBERT System With Multiple Mainframes

## Installing the Synchronization Cables

The clock modules of the expander frames have to be connected to the clock module of the master mainframe with synchronization cables. The synchronization cable makes it possible to synchronize the VXI bus of the expander frame with the VXI bus of the master mainframe.

To make the connections, you have to do the following:

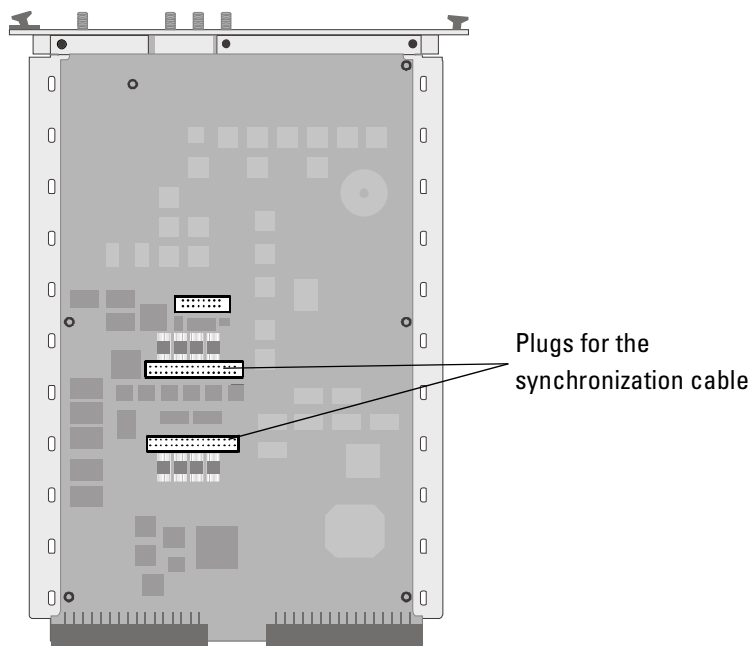
1. If not already done, you have to add the synchronization cable to the expander frames, as described in *"Adding the Synchronization Cable to the Expander Frame"* on page 37.
2. You connect the synchronization cables to the master mainframe, as described in *"Connecting the Synchronization Cables to Master Frame"* on page 38.

## Adding the Synchronization Cable to the Expander Frame

If you have a mainframe without synchronization cable (this is the bus cable that comes out at the front of the clock module), you need to add the synchronization cable to use it as an expander frame.

To add the synchronization cable to an expander frame:

- 1 Remove the first clock module of the mainframe, as described in "How to Remove a Module" on page 44.
- 2 Open the clock module, as described in "How to Open a Module" on page 47.
- 3 Plug the synchronization cable into either one of the corresponding plugs in the clock module, as shown in *Figure 17*. It does not matter which one you use.



**Figure 17** Plugging the Synchronization Cable into the Expander Frame

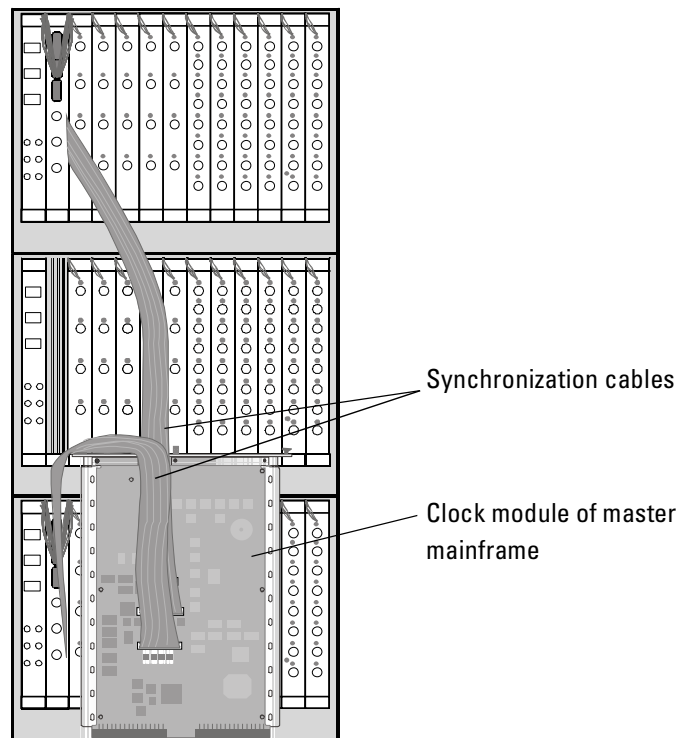
- 4 Close the clock module, and reinsert it in the mainframe. See "How to Add a Module" on page 44.

## Connecting the Synchronization Cables to Master Frame

The synchronization cables from the expander frames have to get connected to the first clock module of the master mainframe.

To connect the synchronization cables:

- 1 Remove the first clock module from the master mainframe, as described in *"How to Remove a Module"* on page 44.
- 2 Open the clock module, as described in *"How to Open a Module"* on page 47.
- 3 Plug the synchronization cables from the expander frames onto the clock module, as shown in *Figure 18*.



**Figure 18** Connectors of the Master Mainframe's Clock Module

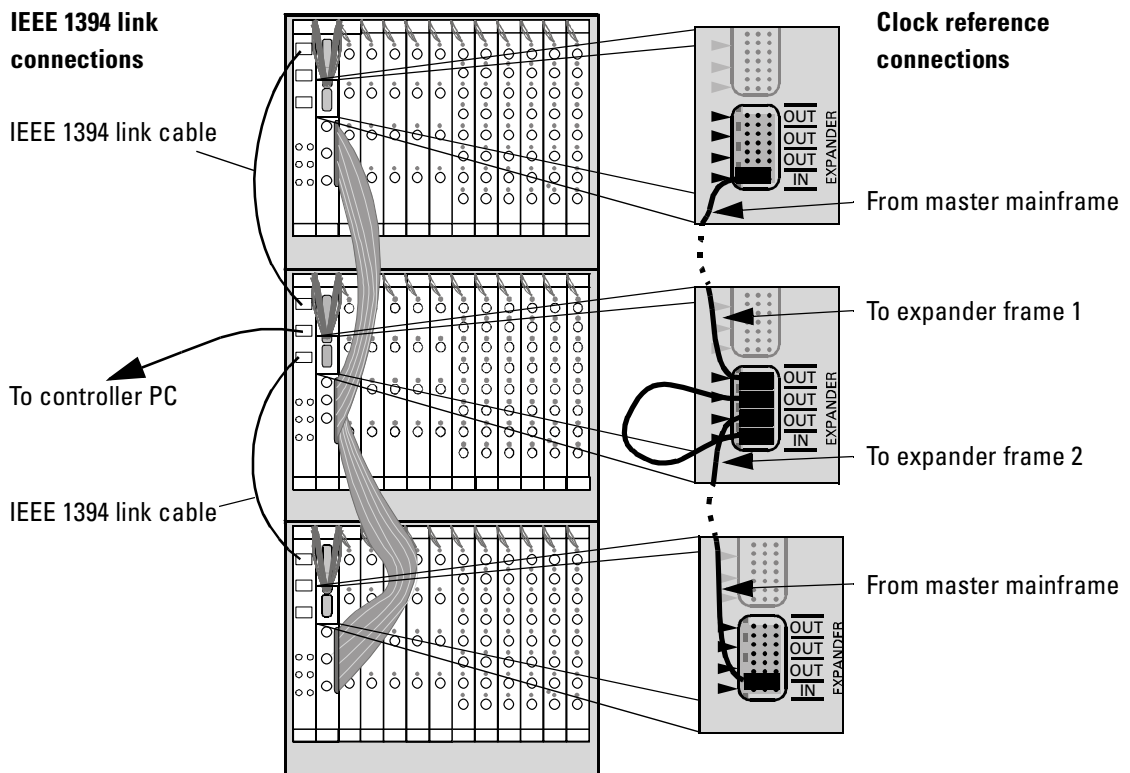
- 4 Close the clock module and re-insert it in the mainframe. See *"How to Add a Module"* on page 44.

## Connecting the Clock Reference and IEEE 1394 Links

**NOTE** This section describes the final connections for a standard multi-mainframe configuration with the IEEE 1394 PC link to VXI interface. If your installation has VXI bus extender modules, see also "Connecting Mainframes with VXI Bus Extenders" on page 41.

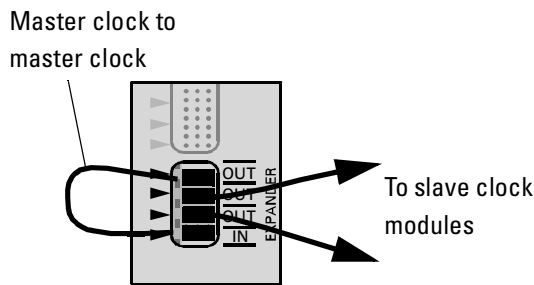
Now you have to make the final connections between the expander frames and the master mainframe. These consist of the clock reference cables and the IEEE 1394 link cable.

The connections between the mainframes are shown in *Figure 19*.



**Figure 19** Clock Reference and IEEE 1394 Connections

**Clock module connections** The IN port of the EXPANDER connectors of each mainframe is connected to one of the OUT ports of the master mainframe. This means that the master clock module is also connected to itself. These connections are once more shown in *Figure 20*.



**Figure 20 Master-Slave Connection of Clock Modules**

**NOTE** The setup shown in *Figure 19* refers to one single, fully synchronized ParBERT system. The EXPANDER clock connectors of the master clock module provide the clock reference for all three mainframes. There are one master clock module and two slave clock modules.

A setup like this results in a system with three clockgroups and up to 33 data generator/analyzer modules.

If you do not connect the clock modules, then you set up an Agilent 81250 Parallel Bit Error Ratio Tester that comprises three independent ParBERT systems. In this case, each system has one clockgroup and up to 11 data generator/analyzer modules.

**TIP** Independent ParBERT systems can be frequency-synchronized by connecting the TRIGGER OUT port of one system to the CLOCK/REF INPUT port of the second system. This requires that the parameters of the clock modules are set accordingly with the ParBERT user software. Frequency-synchronization does not mean phase-synchronization.

**IEEE 1394 link connections** It is important that you connect the IEEE 1394 link modules of the expander frames to the IEEE 1394 link module of the master mainframe. It does not matter which ports you use. *Do not* connect the expander frames directly to the IEEE 1394 PC to VXI card in the controller PC.

The IEEE 1394 link cables and clock reference cables are delivered with the system.

You can now continue with the normal installation (there are no more special instructions for ParBERT systems with expander frames).



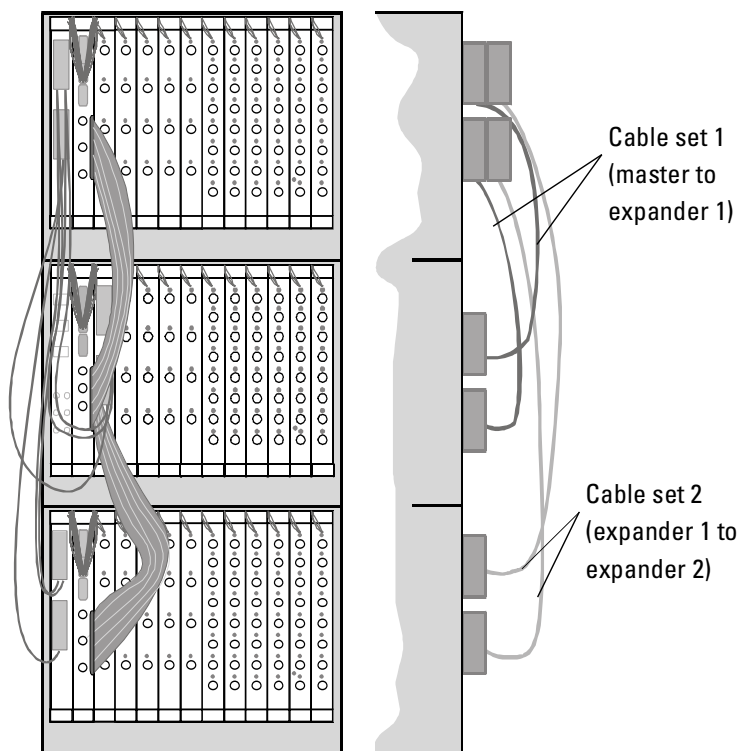
## Connecting Mainframes with VXI Bus Extenders

**NOTE** This section does not apply to standard configurations (mainframes with Agilent E8491B IEEE 1394 PC to VXI module). You only have to do the work described here if your mainframes have VXI bus extender modules.

**Agilent E1482B bus extenders** This option includes two sets of MXI and INTX cables. The mainframes get connected with these cables as follows:

- 1 The first set of cables connects the master mainframe to the expander frame 1.
- 2 The second set of cables connects expander frame 1 to expander frame 2 (the second set of cables piggybacks the first set of cables at expander frame 1).

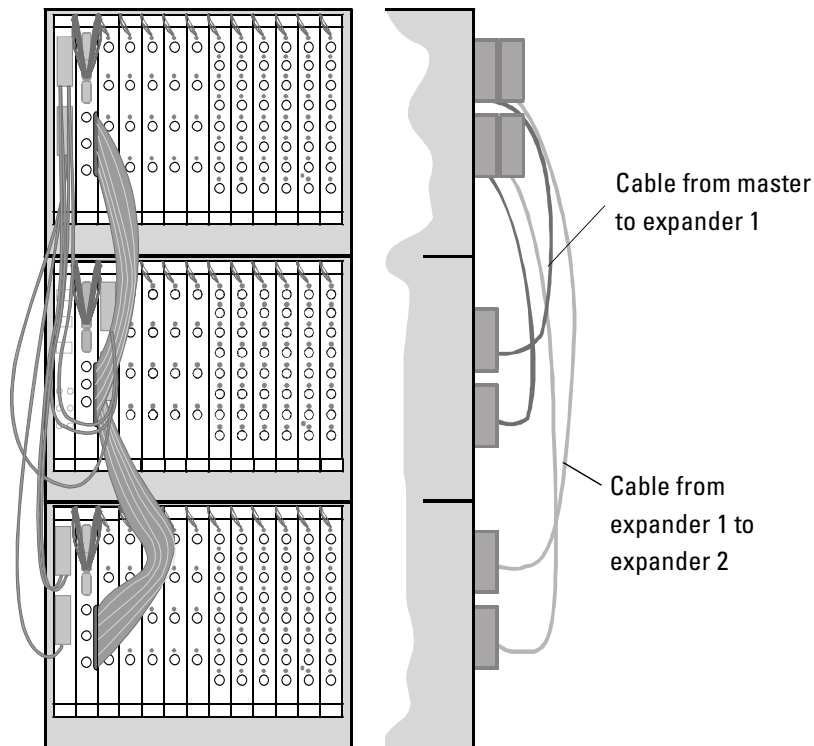
These connections are shown in *Figure 21*.



**Figure 21** Connections for Agilent E1482B Bus Extenders

**NI VXI-MXI-2 bus extenders** As an alternative, your expander frames may also be equipped with National Instruments VXI-MXI-2 bus extender modules. In this case:

- 1 Connect the master mainframe to the expander frame 1.
- 2 Connect expander frame 1 to expander frame 2. Plug the cable from expander frame 2 onto the connector of expander frame 1 as illustrated in *Figure 22*.



**Figure 22** Connections for NI VXI-MXI-2 Bus Extenders

Please refer to the VXI-MXI-2 documentation for more details.

# Modifying an Existing ParBERT System

This section provides the information you need if you are changing the configuration of an existing ParBERT system.

The information is organized as follows:

- *"How to Remove a Module" on page 44*
- *"How to Add a Module" on page 44*
- *"How to Set the Logical Addresses" on page 45*
- *"How to Open a Module" on page 47*
- *"How to Add or Exchange a Frontend" on page 48*
- *"How to Connect the Trigger Input Pod" on page 54*
- *"How to Proceed After Changing the Hardware" on page 56*

It is recommended that you keep track of the modules in each mainframe with a table similar to the one shown below. This table then has to be updated whenever the ParBERT configuration is changed.

**Table 3 Mainframe Configuration Table**

Slot	Model number	Instrument name	Logical address	Serial number
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

## How to Remove a Module

To remove a module from the mainframe:

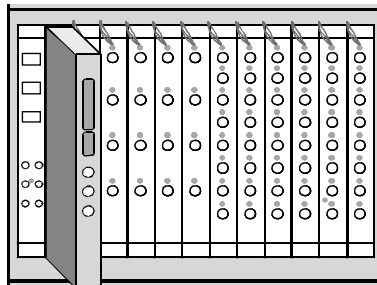
- 1 Shut down ParBERT.

### CAUTION

Some modules, particularly the E4861B modules, can reach a front panel temperature of more than 50 °C. This is not unusual, because the complete housing is used as a huge heat sink.

It may be wise to let the mainframe cool down before continuing.

- 2 Unplug all connections from the front of the module.
- 3 Using a 2-mm flathead screwdriver, remove the two screws at the top and bottom of the front panel that hold the module in place.
- 4 Flip the module handles until the module moves.
- 5 Pull the module out of the mainframe, as shown in *Figure 23*.



**Figure 23** Removing a Module From the Mainframe

- 6 If you want to replace the previous module, insert the new module now, as described under *"How to Add a Module"* on page 44. Otherwise, finish up as described under *"How to Proceed After Changing the Hardware"* on page 56.

## How to Add a Module

Most ParBERT modules are one-slot, C-size VXI modules that are to be plugged into the ParBERT mainframe.

To install a ParBERT module:

- 1 Shut down ParBERT.
- 2 Select an empty mainframe slot.

The module has to be added to a clockgroup. See *"What Makes up a ParBERT System"* on page 22 for information on setting up a clockgroup.

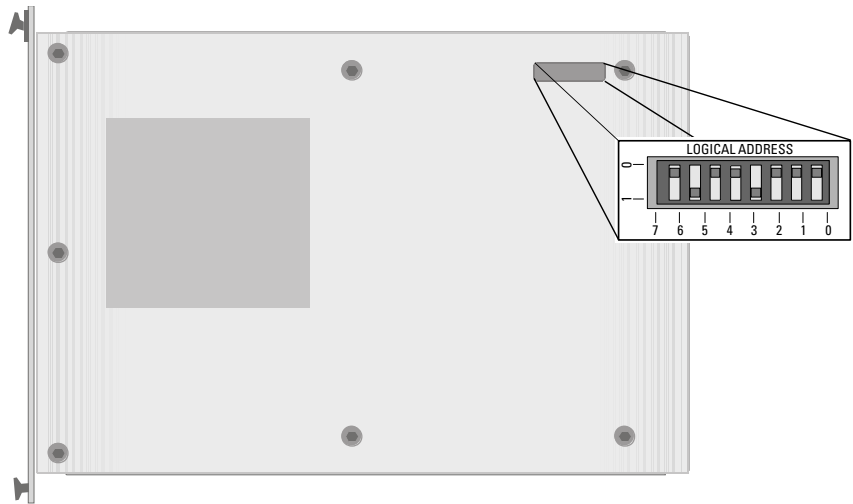
- 3** Set the module's logical address (LADDR).  
See *"How to Set the Logical Addresses"* on page 45 for instructions and the recommended logical address.
- 4** Insert the module into the mainframe.  
Make sure that the central clock module is at the left-most position and that all ParBERT modules are installed next to each other.
- 5** Using a 2-mm flathead screwdriver, secure the module to the mainframe with the two retaining screws on top and bottom of the front panel.
- 6** Connect the clock distribution cable from the module to its clock module. Make sure that the clock distribution cables are properly bundled.  
See also *"Checking the Clock Distribution Cables"* on page 32.
- 7** Finish up the changes as described under *"How to Proceed After Changing the Hardware"* on page 56.

## How to Set the Logical Addresses

Communication inside the system is coordinated by the modules' logical addresses. These are defined by setting DIP switches on each module.

**NOTE** Any time you rearrange the modules of a mainframe, you also have to make sure that they have the correct logical addresses. Ignore the address and ON/OFF information on the DIP switch—watch the numbers printed on the module's side cover.

Figure 24 shows an example of the logical address switch.



**Figure 24** Logical Address Switch

The coding is 8-bit binary. The example above refers to an address of 72, which means  $2^3 + 2^6$  or 01001000 in binary notation.

Table 4 shows the logical addresses to be used.

**Table 4** Recommended Logical Addresses

Slot	Master Mainframe	Expander Mainframe 1	Expander Mainframe 2
0	0	128	192
1	24	132	196
2	32	136	200
3	40	140	204
4	48	144	208
5	56	148	212
6	64	152	216
7	72	156	220
8	80	160	224
9	88	164	228
10	96	168	232
11	104	172	236
12	112	176	240

It is strongly recommended that you use the addresses listed in the table above.

**NOTE** The embedded PC has a logical address of “0”.

For master mainframes with VXI bus extender, the Agilent E1482B module or National Instruments VXI-MXI-2 module has a logical address of “2”.

The supported address ranges are.

**Table 5 Logical Address Ranges**

Master	Expander 1	Expander 2
0 – 127	128 – 191	192 – 254

Only if you are using the IEEE 1394 PC link to VXI and are setting up independent systems in the master and the expander frames (no master-slave configurations), then you may use the master’s address range also for the expander frames.

After you have set the logical address, record it in the mainframe configuration table.

## How to Open a Module

When you are connecting synchronization cables to a clock module or exchanging frontends of an analyzer/generator module, you have to open the module.

**WARNING**

Do **not** open one of the following modules:

E4866A 10.8 Gbit/s data generator module

E4867A 10.8 Gbit/s data analyzer module

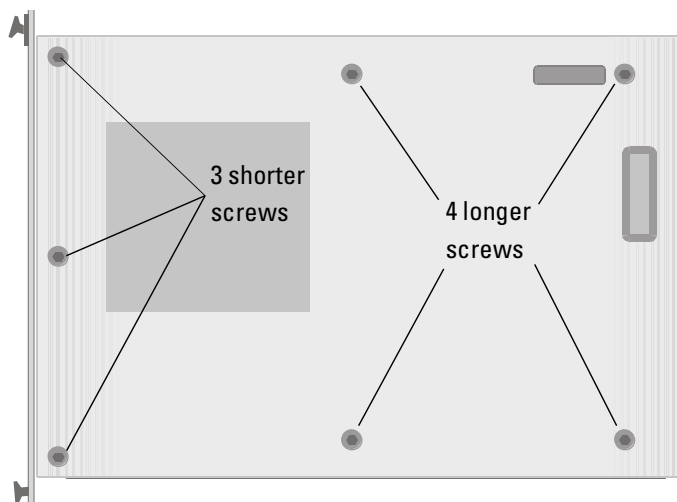
E4868A 43.2 Gbit/s MUX module

E4869A 43.2 Gbit/s DEMUX module

These modules contain neither frontends nor other field-replaceable parts.

To open a module:

- 1 Using a T-10 size Torx screwdriver, remove the seven screws from the side panel of the module. The locations of the screws are shown in *Figure 25*.



**Figure 25** Cover Screws of ParBERT Modules

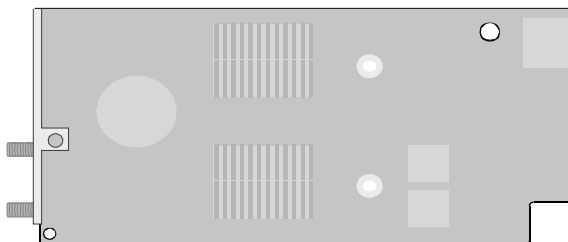
- 2 Set the cover and screws to the side.

## How to Add or Exchange a Frontend

This section describes the work necessary to exchange frontends of the delivered ParBERT modules.

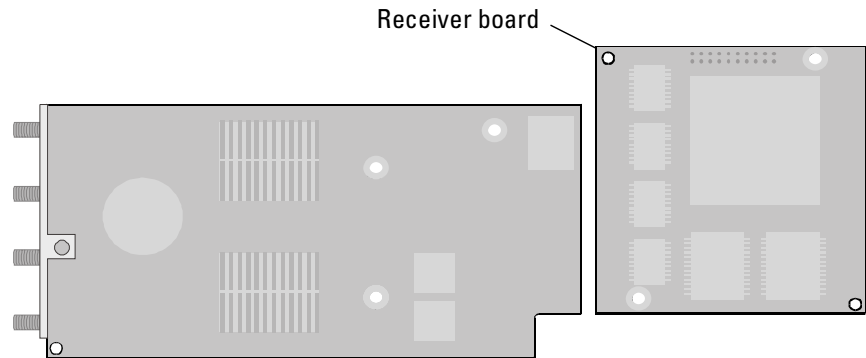
**NOTE** After adding or exchanging frontends, make sure you finish up according to the description under *“How to Proceed After Changing the Hardware”* on page 56.

There are two types of frontends for ParBERT: generator frontends and analyzer frontends. These are shown in the following illustrations.



**Figure 26** Generator Frontend of an E4861A Module

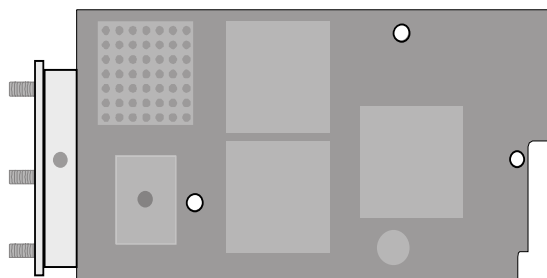




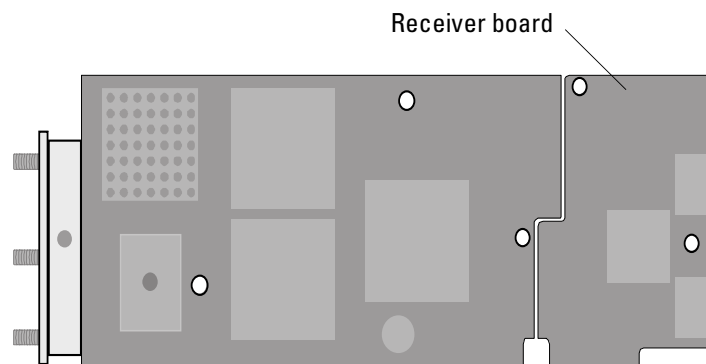
**Figure 27 Analyzer Frontend of an E4861A Module**

Your frontends may appear differently than shown in the above figures. For example, frontends for E4832A modules are much smaller.

Frontends for E4861B modules look as illustrated below:



**Figure 28 Generator Frontend of an E4861B Module**



**Figure 29 Analyzer Frontend of an E4861B Module**

**NOTE** A main difference between generators and analyzers is that analyzer frontends have also a receiver plug-in board.

When you are removing an analyzer frontend, make sure that you also remove the receiver board.

Note also that the E4835A 675 MHz analyzer frontends are always installed in pairs, where two frontends share a common receiver plug-in board.

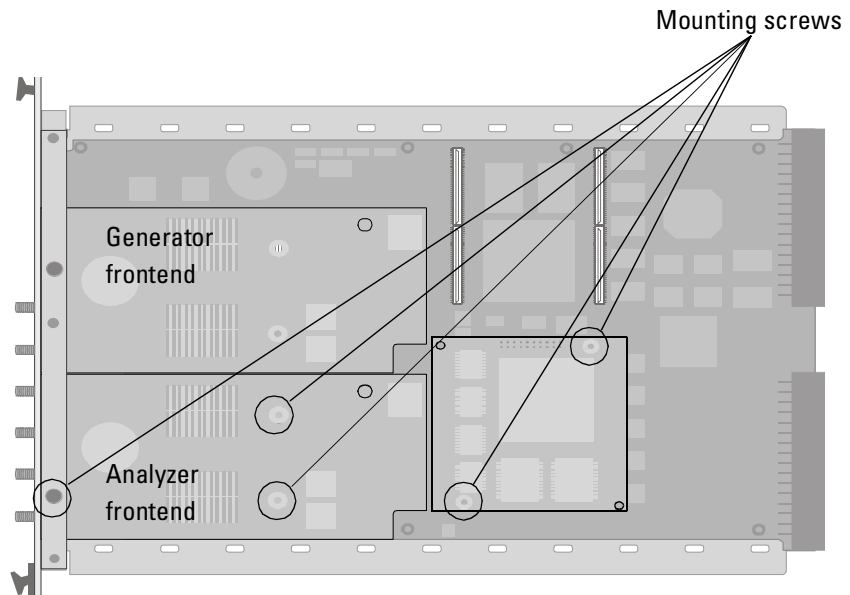
To exchange the frontends, you need the following:

- Either a generator frontend or an analyzer frontend
- The label delivered with the frontend
- A Torx T-10 size screwdriver (delivered with the mainframe)

## Removing a Frontend

To remove a frontend:

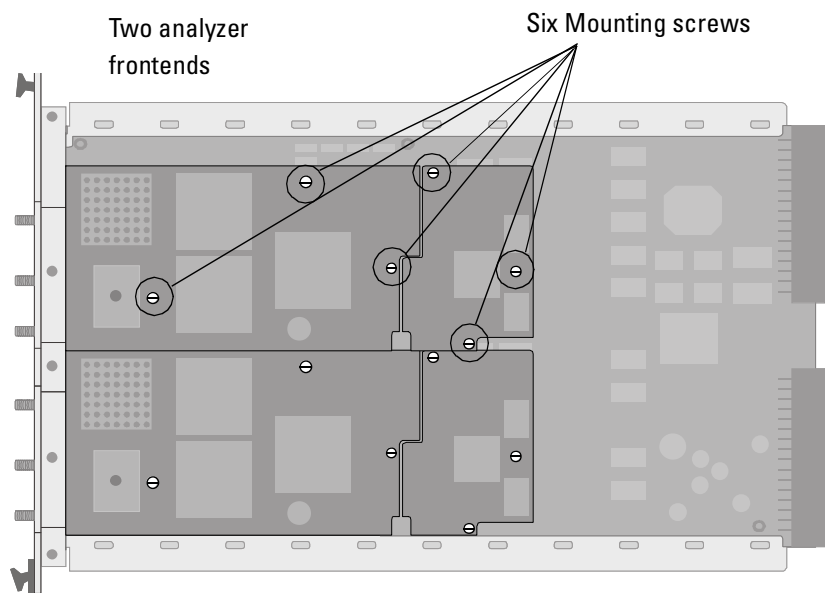
- 1 Shut down the mainframe and remove the ParBERT module, as described in *"How to Remove a Module"* on page 44.
- 2 Using the Torx T-10 size screwdriver, remove the seven screws that hold the side cover. See *Figure 25* on page 48 for the location of the screws. An E4861A module will appear as shown in *Figure 30*.



**Figure 30** ParBERT E4861A Module With Cover Removed

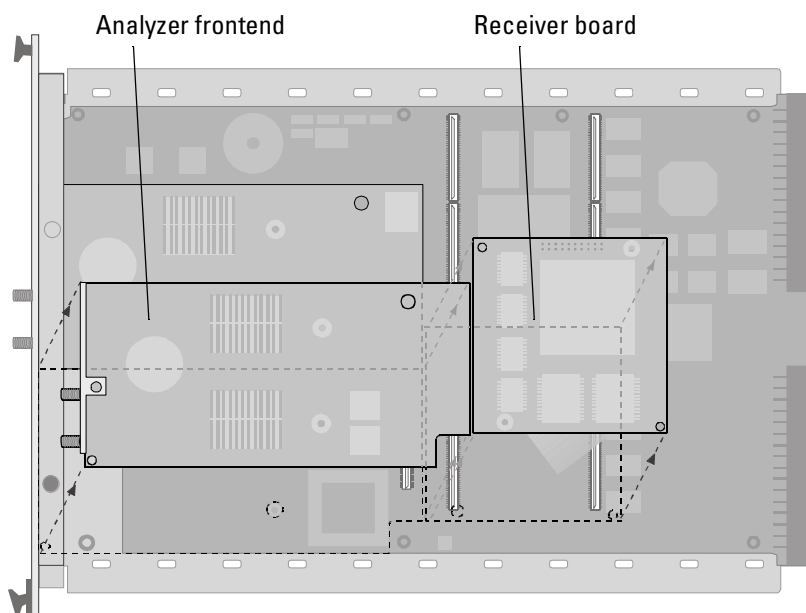
Note the positions of the mounting screws.

Figure 31 shows an E4861B module.



**Figure 31 ParBERT E4861B Module With Cover Removed**

- 3 Using the Torx T-10 size screwdriver, remove the mounting screws that hold the frontend in place. There are three screws for the frontend, and two or three screws for the receiver board (analyzer frontends only).
- 4 Lift off the frontend from the module, as shown in *Figure 32*. If you are removing an analyzer frontend, make sure you also remove its receiver board.

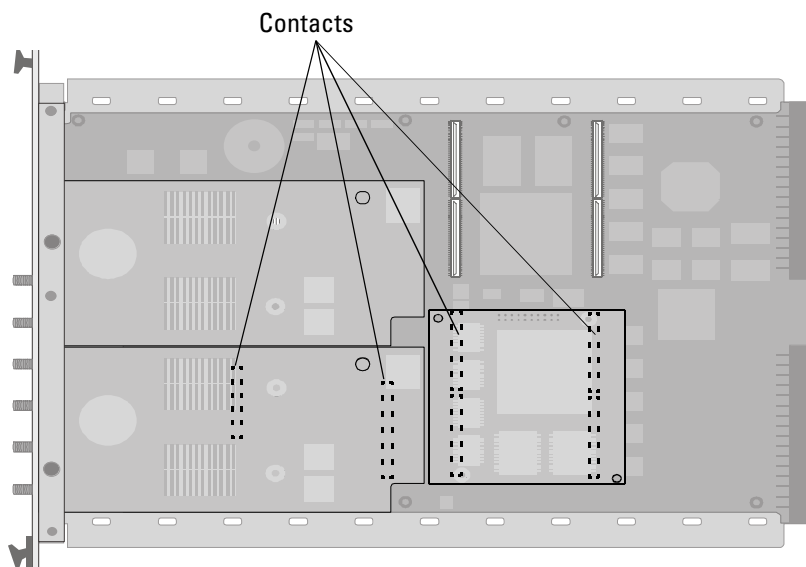


**Figure 32** Removing an Analyzer Frontend

## Installing a Frontend

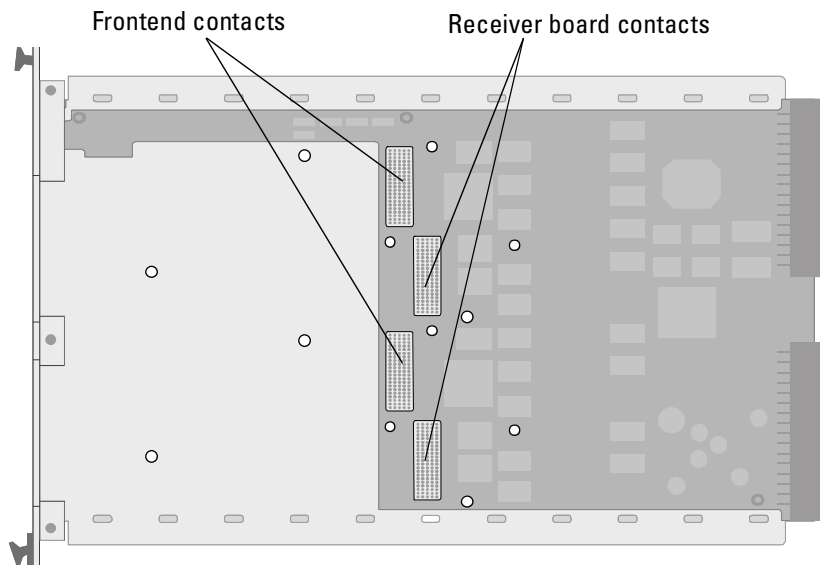
To install a frontend:

- 1 Carefully insert the new frontend into place. Its front panel has to be aligned with the front panel of the module, and it has to be aligned with the contacts to the main board.



**Figure 33** Frontend Contacts of an E4861A Module

E4861B modules use different multi-pole connectors, as shown below:



**Figure 34 Frontend Contacts of an E4861B Module**

**NOTE**

When you insert the new frontend, make sure that you press it completely into place. Mind the position of the connectors and press on them—it is important that these contacts are made. As the boards are flexible, tightening the mounting screws does not guarantee good contacts.

- 2 Secure the frontend to the main board using the screws that were delivered with the frontend. See *Figure 30 on page 50* and *Figure 31 on page 51* for the locations of the screws.
- 3 If you are installing an analyzer frontend, insert the receiver board into place and secure it with its screws.
- 4 Remount and secure the side cover. See *Figure 25 on page 48* for the location of the screws.
- 5 Attach the label that was delivered with the frontend at the side of the module.
- 6 Re-insert and reconnect the module, as described in *"How to Add a Module" on page 44*.
- 7 Finish the configuration according to *"How to Proceed After Changing the Hardware" on page 56*.

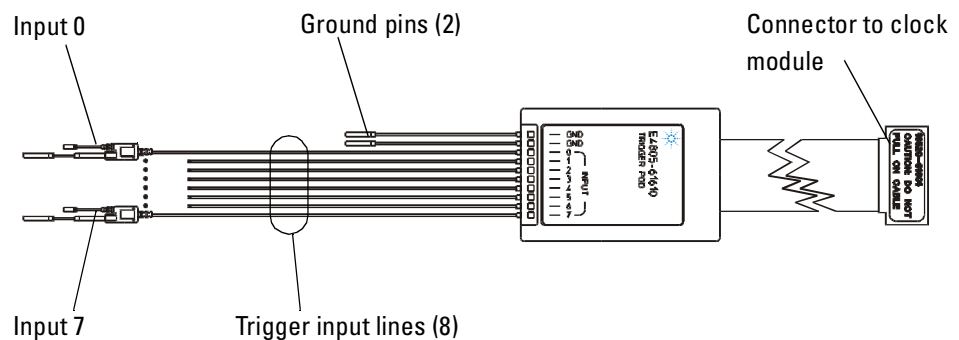
## How to Connect the Trigger Input Pod

The trigger input pod has eight sense lines which allow to control test execution by applying external signals.

If you ordered the 8-line Trigger Input Pod E4805B Option #002 separately, you need to connect it to the master clock module.

Prerequisites for this installation are:

- An Agilent E4805B/E4808A clock module
- The ParBERT user software
- A 2-mm flathead screwdriver and a Torx T-10 size screwdriver

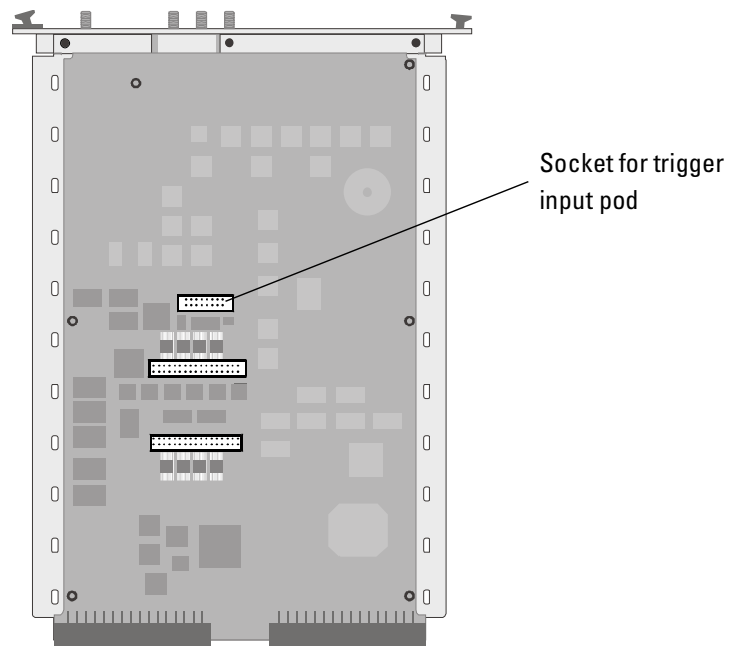


**Figure 35** Trigger Input Pod

To connect the trigger input pod:

- 1 Shut down and unplug the mainframe.
- 2 Remove the clock module from the mainframe and open it, as described under "How to Remove a Module" on page 44 and "How to Open a Module" on page 47.

- 3 Plug the trigger input pod into the appropriate 16-pin socket on the clock card, as indicated in *Figure 36*.



**Figure 36** Clock Module Connections

- 4 Reattach the side cover with the screws you removed earlier (see *Figure 25 on page 48* for the location of the screws), and reinsert the clock module into the mainframe.
- 5 Re-connect all cables disconnected earlier.

Call the Agilent support if you need additional probe leads. The required part number is 16520-62102.

**NOTE** You need to remove the leads from the probe adapter header before plugging them into the pod housing.

## How to Proceed After Changing the Hardware

**NOTE** Whenever you change the hardware configuration, a selftest is run when you turn ParBERT on (the green Access LEDs flash). This is normal, and you have to let the complete selftest get carried out.

After the selftest is finished, the following must be done:

1. The systems must be rebuilt (new configuration files generated). See *"Build Systems" on page 81* for more information.
2. The outputs and inputs have to be deskewed.

This means adjusting the instrument connectors and compensating for internal and external delays.

See *How to Adjust the Instrument Connectors* and *How to Compensate for Internal and External Delays* in the ParBERT User Guide or in the online Help.



# Setting Up ParBERT 43G

This chapter describes how to set up ParBERT 43G systems.

The Agilent 81250 ParBERT 43G is a solution for generating and analyzing electrical data streams of 38 Gbit/s up to 43.2 Gbit/s.

It allows you to stimulate and analyze 16:1 multiplexers and 1:16 demultiplexers at data rates of 2.7 Gbit/s and 43.2 Gbit/s, according to the OC-768 and SFI-5 (Serdes Framer Interface 5) data range.

It allows you also to determine the bit error rate of transmission lines or serial devices operated at 43.2 Gbit/s. It supports the investigation of FEC devices at 43.01841 Gbit/s to include the FEC rate resulting from 255/236 overhead.

For data generation, sixteen 2.7 Gbit/s data generators are multiplexed to create a 43.2 Gbit/s data stream.

On the analyzing side, a 43.2 Gbit/s data stream is demultiplexed and fed into sixteen 2.7 Gbit/s data analyzers.

The data streams to be generated or expected, as well as the signal frequencies and levels, are controlled by the ParBERT user software.

This chapter explains:

- What constitutes a ParBERT 43G system (see *"ParBERT 43G Components"* on page 58).
- How to set up a ParBERT 43G system (see *"Setup Procedure"* on page 60).
- How to connect all the frontends to the MUX or DEMUX module (see *"Connections of the MUX/DEMUX Modules"* on page 61).
- How to set up ParBERT 43G systems that exceed the capabilities of a bundle (see *"Special Configurations"* on page 63).
- How to connect the internal or an external clock to ParBERT 43G systems (see *"Clock Connections"* on page 64).

# ParBERT 43G Components

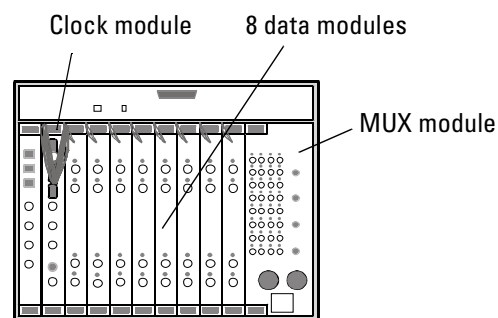
Two preconfigured bundles are available for 43.2 Gbit/s key applications:

- Agilent E4894A 43.2 Gbit/s pattern generator bundle
- Agilent E4895A 43.2 Gbit/s error detector bundle

## 43.2 Gbit/s Pattern Generator Bundle

The Agilent E4894A 43.2 Gbit/s pattern generator bundle multiplexes sixteen 2.7 Gbit/s data generators to create a 43.2 Gbit/s data stream. The bundle includes:

- One 13-slot VXI mainframe
- One IEEE 1394 PC link to VXI
- One E4808A high performance clock module
- Sixteen 2.7 Gbit/s generator frontends E4862A built into eight E4861A 2.7 Gbit/s data modules
- One 43.2 Gbit/s multiplexer module, including 32 cables to connect to the 2.7 Gbit/s channels (SMA to MCX), and a cable pair to connect to the DUT (1.85 mm to 1.85 mm)
- 15446A 8-line trigger input pod
- E4875A ParBERT software

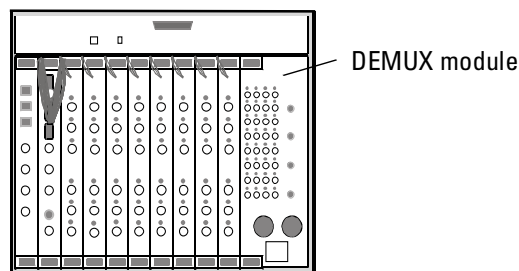


**Figure 37** ParBERT 43G Pattern Generator Bundle

## 43.2 Gbit/s Error Detector Bundle

The Agilent E4895A 43.2 Gbit/s error detector bundle demultiplexes a 43.2 Gbit/s data stream and provides the data to sixteen 2.7 Gbit/s data analyzers. The bundle includes:

- One 13-slot VXI mainframe
- One IEEE 1394 PC link to VXI
- One E4808A high performance clock module
- Sixteen 2.7 Gbit/s analyzer frontends E4863A built into eight E4861A 2.7 Gbit/s modules
- One 43.2 Gbit/s demultiplexer module, including 32 cables to connect to the 2.7 Gbit/s channels (SMA to MCX), and a cable pair to connect to the DUT (1.85 mm to 1.85 mm)
- E4875A ParBERT software



**Figure 38** ParBERT 43G Error Detector Bundle

## Additional Hardware Requirements

These two bundles require an external PC that runs the ParBERT software.

The external PC is not included. You may run both bundles from the same PC.

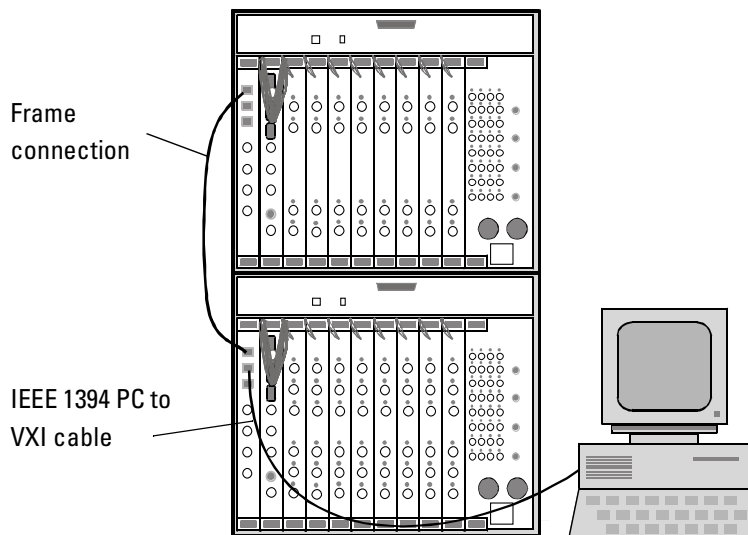
For best jitter/phase noise performance, it is recommended that a signal generator (like Agilent E8244A) is used as an external clock source.

# Setup Procedure

ParBERT 43G systems are generally delivered as bundles, completely wired and ready to be connected to a PC on which the IEEE 1394 PC to VXI interface card is installed.

When you receive such a bundle, proceed as follows:

- 1 Inspect the shipment (see *"Unpacking ParBERT"* on page 32).
- 2 Check the clock distribution cables (see *"Checking the Clock Distribution Cables"* on page 32).
- 3 If you have received two mainframes, a pattern generator and an error detector, interconnect their IEEE 1394 PC to VXI modules (see also *Figure 19* on page 39). Then both mainframes can be controlled by one PC. Do not interconnect their clock modules.



**Figure 39 Configuration for Testing Multiplexers and Demultiplexers**

- 4 Prepare a suitable PC or workstation to be used as the ParBERT controller (see *"Requirements for External Controller and User PC"* on page 29).
- 5 Install the IEEE 1394 PC to VXI interface card on that PC.
- 6 Connect the PC to the IEEE 1394 PC to VXI module of the mainframe (see *Figure 39*).
- 7 Connect the PC and the mainframe(s) to mains and switch them on.

- 8 Install the ParBERT software (see *"Software Installation and Update"* on page 69).
- 9 Start the software (see *"Starting ParBERT for the First Time"* on page 75).

Note that you can operate a pattern generating and an error detecting system in parallel from one PC by starting the user interface twice. This can be specified with the ParBERT Configuration Tool (see *"Starting more than One User Interface"* on page 79).

## Connections of the MUX/DEMUX Modules

The sixteen 2.7 Gbit/s channels of a ParBERT 43G system—installed in eight data generator/analyzer modules—generate or expect differential signals.

A multiplexer module has therefore 16 pairs of input connectors which are connected to the generator frontends. A demultiplexer module has 16 pairs of output connectors which are connected to the analyzers.

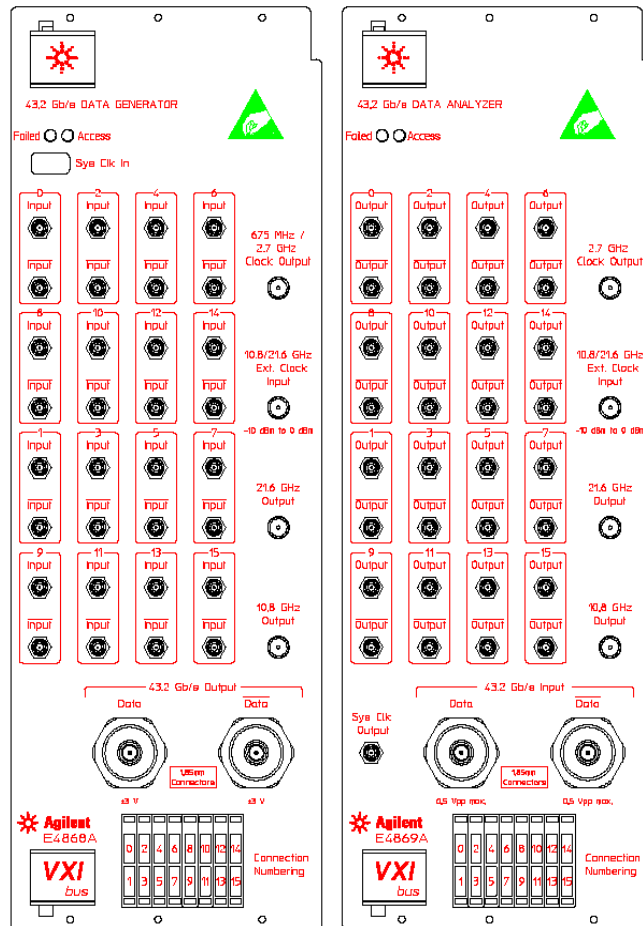


Figure 40 ParBERT 43G MUX and DEMUX Modules

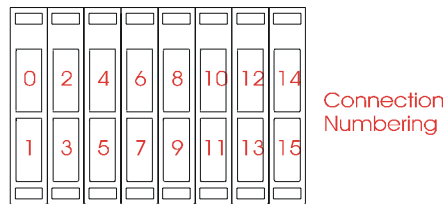
The generators and analyzers can be disconnected from the MUX or DEMUX module. If this is done, they can be used for generating or analyzing digital signals as with any Agilent 81250 Parallel Bit Error Ratio Tester.

For example, you will disconnect the generators from the MUX module, if you have to stimulate a multiplexing device under test.

**NOTE** When you disconnect frontends from a MUX/DEMUX module, do not pull off the cables from the MUX/DEMUX module. Unscrew the cable connectors from the frontends instead.

Reconnecting the frontends to a MUX/DEMUX module requires a certain order. This order is printed graphically on the front panel of every MUX/DEMUX module.

The graphic shows eight consecutive E4861A data generator/analyzer modules with two frontends each.



**Figure 41** Numbering of Connections

As the ports of the MUX/DEMUX modules are numbered, this drawing makes it very simple to establish the connections correctly:

- 1 Connect the two cables of port #0 of the MUX/DEMUX module to the upper frontend of the leftmost data generator/analyzer module. Connect “normal” to “normal” and “inverted” to “inverted”.
- 2 Connect port #1 of the MUX/DEMUX module to the lower frontend of the leftmost data generator/analyzer module.
- 3 Connect port #2 of the MUX/DEMUX module to the upper frontend of the next data generator/analyzer module.
- 4 Follow that scheme until all ports of the MUX/DEMUX module are connected.

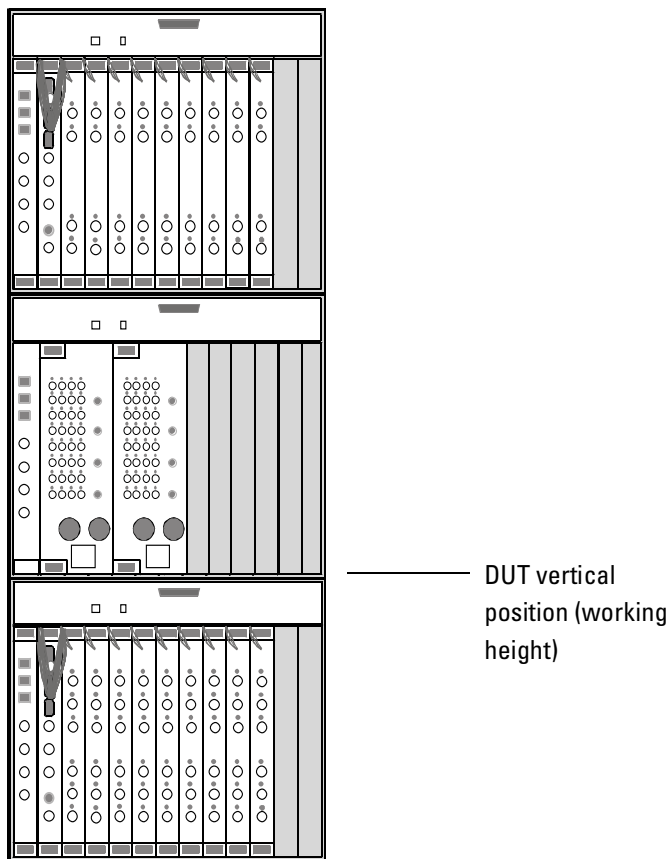
## Special Configurations

There may be situations where you need more than 16 data generators or analyzers.

For example, you may need an extra generator for sourcing a clock pulse to the device under test. Or, if you are testing a demultiplexer device with built-in clock recovery circuits, you may need an extra analyzer for conditioning the recovered clock signal.

Testing SFI-5 multiplexer and demultiplexer devices generally requires more than 16 generator/analyzer channels at 2.7 Gbit/s. So this would require more room than two VXI frames can provide.

In such cases it is recommended to add a third frame in the middle between the pattern generators and the analyzers. This frame should house the MUX and DEMUX modules.



**Figure 42 Setup Using More than 16 Data Modules**

A setup like this can hold a total of up to 22 data generator/analyzer modules.

To keep the high-speed cables as short as possible, the working height for placing the DUT should be established between the bottom and the middle frame.

## Clock Connections

The MUX module requires a clock signal. It has to be synchronized with the generator frontends.

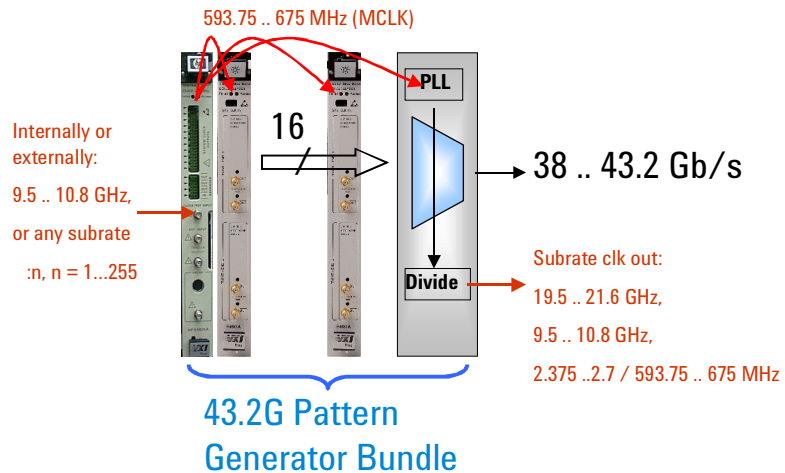
The DEMUX module has a built-in clock data recovery (CDR) circuit that allows to recover the clock from the incoming data. But the DEMUX module can also be controlled by an external clock.



Both modules have clock input and output connectors. With ParBERT 43G, there are many ways for generating and connecting clock pulses.

## Using the Built-in Clock Module

The simplest clock source is the E4808A clock module. Its use is illustrated in the figure below.



**Figure 43 Using the Built-in Clock Module**

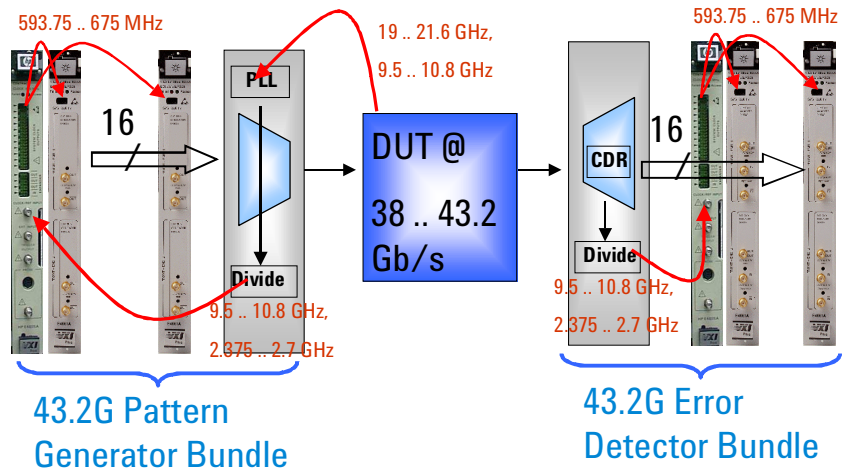
The clock module can use its own oscillator, or it can lock to an external clock source. It has a clock multiplier and a clock divider that allow it to use a variety of source frequencies. Its output is connected to the data generator/analyzer modules and can also be connected to the MUX module. Its output clock rate is limited to 675 MHz.

The MUX module has four clock output connectors that can provide four subrates of the generated serial-line frequency: 1/2, 1/4, 1/16th, and 1/64th. If the serial-line frequency is set to 43.2 GHz, you can get clock rates of 21.6 GHz, 10.8 GHz, 2.7 GHz, and 675 MHz.

**NOTE** 43 Gbit/s devices generally require clock frequencies of 2.7 GHz or a multiple thereof. If the ParBERT shall source such a clock pulse, an additional generator frontend is needed. This in turn requires an additional data module and results in a configuration as shown in *Figure 42 on page 64*.

## Clock Provided by the DUT

The device under test may have its own clock generator. The figure below shows a setup example.



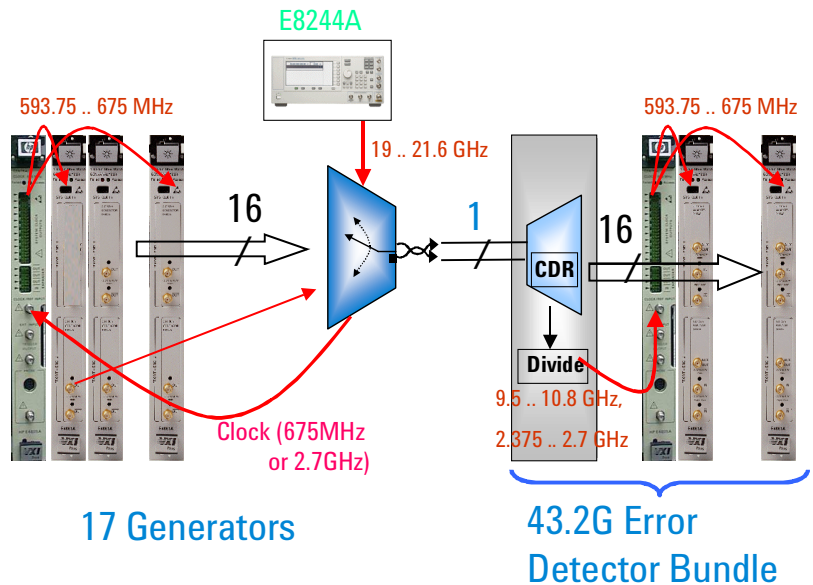
**Figure 44 DUT Clock and Clock Data Recovery (CDR)**

The clock from the DUT is fed into the MUX module. The clock output of the MUX module is connected to the CLOCK/REF INPUT of the clock module.

On the receiver side, the DEMUX module recovers the DUT clock pulse and uses this as an external clock source for the analyzer system's clock module (CLOCK/REF INPUT).

## Using an External Clock Generator

For precision measurements, it is recommended to use an external precision clock generator. The following example assumes that the DUT needs also a 2.7 GHz clock.



**Figure 45 External Clock Generator**

The connection of the pulse generator to the DUT and from there to the CLOCK/REF INPUT of the clock module helps to eliminate undesired signal delays.

**NOTE** It is possible to connect the pulse generator also to the DEMUX module in order to create a fully synchronized setup. In this case, a pulse delay unit has to be inserted between the pulse generator and the DEMUX module.





# Software Installation and Update

This chapter describes the steps necessary to install the following ParBERT software components:

- The user software
- The firmware of the modules

**NOTE** You do not have to update the software if you are installing a self-enclosed ParBERT system delivered from Agilent with embedded controller. Such a system comes ready to use, and you can directly proceed to *"Starting ParBERT for the First Time"* on page 75.

But if you ordered a system with the IEEE 1394 PC link to VXI interface, you have to install the interface software and the ParBERT software on the PC designated as the ParBERT controller.

Also, no matter, whether you are using an embedded or external controller—if the controller is connected to the LAN, you can operate the system via the LAN. In this case, you have to install the ParBERT software on the user PC you are going to use.

# Installing/Updating the ParBERT User Software

You should follow this procedure in the following cases:

- You are upgrading from a previous version
- You are setting up an external ParBERT controller
- You wish to use a remote PC for operating ParBERT over the LAN

## Prerequisites

For the requirements the PC has to meet see *"Installation Prerequisites"* on page 28.

## Installation/Update Procedure

**NOTE** Microsoft Internet Explorer 4.01 or higher is required for the online help. The installation procedure checks your system for an appropriate version and suggests installing Internet Explorer if that is not available. Please follow the instructions on the screen, reboot the system when it is requested and log on as administrator again to finalize the installation.

To install or update the user software:

### 1 Prepare the PC.

If you are updating the user software on the embedded controller, do the following:

- Power down and switch off the system.
- Connect the separate CD-ROM drive to the appropriate SCSI connector of the controller.
- Make sure you have selected a free SCSI ID number, ID #3 is recommended.
- Switch on the CD-ROM drive.
- Switch on the mainframe and wait until the boot is finished.

### 2 Log on as the administrator, as described under *"Logging on as the Administrator"* on page 71.

**3** Verify your display properties:

*Start -> Settings -> Control Panel -> Display -> Settings.*

Your setting should be:

- *Color Palette:* 65536 colors
- *Font Size:* Small fonts

**4** Install the ParBERT user software.

Insert the Agilent 81250 User Software CD into the CD-ROM drive. Wait a minute. If the installer does not start automatically, execute `setup.exe` from the CD, and follow the instructions on the screen.

**5** When you are finished, reboot your PC.

## Logging on as the Administrator

Administrator access privileges are required for installing the ParBERT software. These privileges allow you to create or modify directories and files on the hard disc.

By default, the ParBERT embedded controller is configured with the auto-logon and auto-start feature activated. That means, a self-enclosed ParBERT system is ready for use after power on.

The default user is "dvt", the default password for this user is "DVT". Whenever ParBERT is powered up, it automatically logs on as the user "dvt" and starts the user software.

This is usually different for an external controller and generally not desired for a remote user PC.

**NOTE** The password and user name are case sensitive.

To log on as the administrator:

- 1** If the user software is running, close it.
- 2** Click *Start*, point to *Shut Down*, and select the *Close all programs and log on as a different user* in the Shut Down window.
- 3** Now press and hold the Shift key until the new Login dialog box appears.

- 4 Click *Yes* in the Shut Down window (you still have to keep the Shift key depressed).
- 5 When the new Login dialog box is displayed, release the Shift key.
- 6 In the new Login dialog box, enter “Administrator” as the *User name* and “DVTADM” as *Password*.

**NOTE** The next time you power on the mainframe, an error message pops up, stating that the password was not typed correctly. This is because Windows NT logs on as the last known user, in this case, “DVT”.

All you have to do is close the error prompt, and reenter *User Name* and *Password*.

**NOTE** All user names and passwords used in this manual are the defaults. It is recommended to change these passwords.

## Updating the Firmware (BIOS)

If you have upgraded from a previous version, the new ParBERT user software may be incompatible with the firmware version installed in your modules.

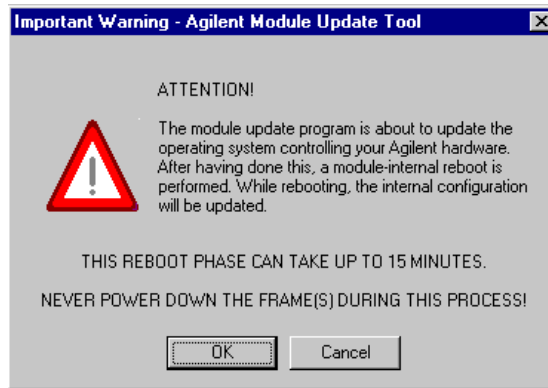
Depending on the start-up settings (see “*How to Select the Start-Up Settings*” on page 77), the user software automatically checks the firmware of the modules to determine whether a firmware update is necessary.

If a version conflict is detected, a window pops up letting you know that a firmware update is highly recommended.

- 1 Click *OK* to start the firmware update.



2 Observe the warning that appears on the screen:



**Figure 46 Do not Power Down the System!**

3 After the firmware update, the user software opens.

**NOTE** For downgrading the BIOS to be used with a previous version of the user software, refer to the Agilent 81250 Support page on the Internet.

- <http://www.agilent.com/find/parbert/>





# Starting ParBERT for the First Time

This chapter covers the work that you have to do in the following cases:

- You are setting up a new ParBERT system
- You have modified an existing ParBERT system
- You have added ParBERT modules to a VXI mainframe

For details see:

- *"General System Start Procedure" on page 76* gives an overview of the steps to be performed
- The Agilent 81250 ParBERT Configuration tool is described in *"Configuring ParBERT" on page 76*
- The ParBERT user interface can be started from the Windows desktop. As you can start more than one instance of the ParBERT user interface, *"Starting the ParBERT User Software" on page 84* explains how to configure a user interface.
- The ParBERT user software includes a variety of system test functions. *"Testing ParBERT's Integrity" on page 89* explains how to start these functions.

# General System Start Procedure

The basic procedure is as follows:

1. Make sure that all peripherals—external PC (if applicable), monitor, printer, expander mainframes, CD-ROM drive, etc.—are switched on.
2. Switch on the mainframe itself.

For the embedded controller, the Windows NT automatic log-on script is enabled. After you turn on the mainframe, you are automatically registered as user DVT and the Windows desktop appears.

3. You then have to log on as a user. The default user name on an embedded controller is DVT, and the password is “DVT”.

If ParBERT is controlled from an external PC (an IEEE 1394 PC link to VXI module is plugged into the mainframe and the corresponding card into the PC), you have to log on at the external PC.

4. You have to configure the embedded or external controller and user PC, as explained in *“Configuring ParBERT” on page 76*.
5. You have to start the user software at the user PC. Refer to *“Starting the ParBERT User Software” on page 84* for more information.
6. From the user PC, you have to verify that ParBERT is correctly installed and configured. *“Testing ParBERT’s Integrity” on page 89* explains how you do this.

## Configuring ParBERT

When you are installing a new ParBERT system, or modifying an existing ParBERT system, you have to configure the ParBERT software. The following must be configured:

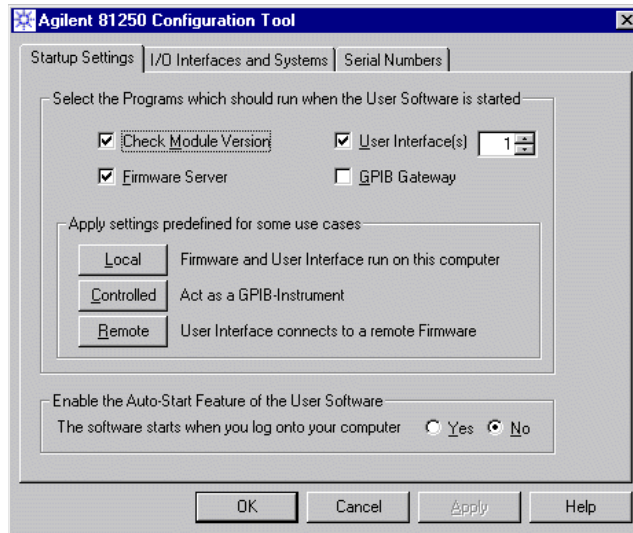
- The start-up settings
- The I/O interfaces and systems

For new installations or after software updates, the Agilent 81250 Configuration Tool dialog box automatically pops up after the installation.



For existing installations, you can open this window by double-clicking the *Agilent 81250 Config* icon on the Windows desktop, or by selecting *Agilent Digital Verification Tools -> Config* in the *Start* menu.

The Configuration Tool appears as shown in *Figure 47*.



**Figure 47** Agilent 81250 Configuration Tool Startup Settings Page

## How to Select the Start-Up Settings

The start-up settings depend on the ParBERT configuration. For normal applications, the ParBERT features three convenient operating modes: *Local*, *Controlled* and *Remote*. When you select one of these modes, the recommended programs required for that mode are automatically selected to be started every time ParBERT is started.

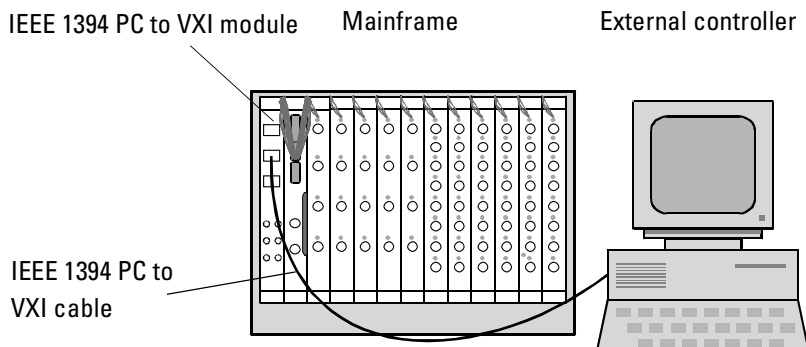
### Selecting the Operating Mode

Depending on which configuration you have, you need to make the following settings:

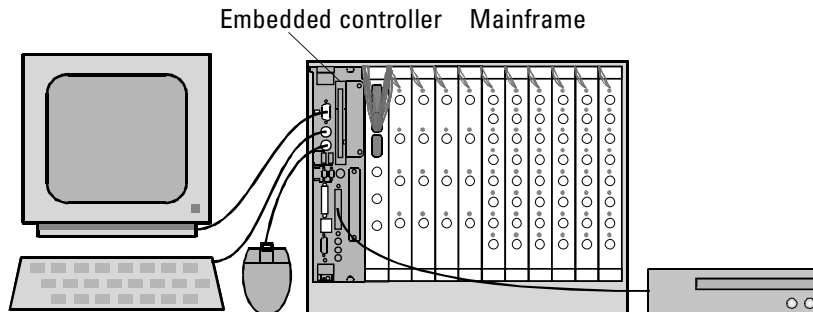
**Table 6** Configuring the Operation Mode

User interface running on ...	Controller PC	User PC
a) embedded or external controller	Local	n/a
b) remote PC, connected via LAN	Controlled	Remote

**Local mode** Local mode (case a) is used, if the system is operated from the ParBERT controller. This refers to the following configurations:



**Figure 48 ParBERT With External Controller**



**Figure 49 Configuration With Embedded Controller**

Local mode starts both the Agilent 81250 firmware server and the user interface.

If the system is operated via LAN (case b), the controller has to be put into controlled mode and the user PC into remote mode. For configuration examples see *"Operating ParBERT via the LAN"* on page 26.

**Controlled mode** Controlled mode mode starts the Agilent 81250 firmware server only. It is used if the hardware shall be controlled by the built-in or external controller, but the user interface shall run on a remote computer. The system can then be operated via GPIB or LAN.

**Remote mode** This mode starts the Agilent 81250 user interface only. It is used on a remote computer to operate an Agilent 81250 firmware server which is in controlled mode.

When you are clicking the mode buttons, the checkboxes indicate which software components will be started.

## Setting the Auto-Start Feature

The Auto-Start feature defines whether the ParBERT software automatically starts after logon.

If *Yes* is selected, the user software starts automatically after logon.

You can select *No* if you use the PC for other work. Then you can start the user software from the Windows desktop or the *Start* menu.

The setting takes effect as soon as the DVT user logs in.

## Starting more than One User Interface

In the *User Interface(s)* box, you can specify that more than one user interface is started. This is quite useful if you are operating two or more independent ParBERT systems.

Your setting applies to both manual and automatic start.

## Individually Configuring ParBERT (for Experienced Users Only)

**NOTE** It is recommended that only *experienced* users change the automatic settings.

You can define which of the following programs are started on each PC automatically when ParBERT starts:

- *Check Module Version*

If this option is activated, the ParBERT software on the PC checks the firmware of the hardware module for consistency with the current revision of the user software whenever ParBERT is started. In case of inconsistency, a BIOS update program is activated to guide you through the procedure.

This option should only be active on the ParBERT controller.

- *Firmware Server*

This option *must* be activated only for the ParBERT controller, because it builds the connection between the hardware modules and the interfaces.

- *User Interface(s)*

This checkbox enables the user interface on the PC. It has to be activated for the PC that is going to be used for operating the system via the user interface. In the *User Interfaces(s)* box, you can specify that more than one user interface is started.

- *GPIB Gateway*

This option defines whether the ParBERT controller operates as a GPIB instrument. It has to be selected for a PC that will be controlled by another PC.

This also applies to configurations with the IEEE 1394 PC link to VXI option. In this case, the firmware server communicates with the modules through the IEEE 1394 PC link to VXI and with the user's program through the GPIB interface card. See also *Figure 3 on page 14*.

## How to Set the I/O Interfaces and Systems

Setting the I/O interfaces and systems requires two steps:

1. You have to select the interface to be used for communication.
2. You have to build the systems.

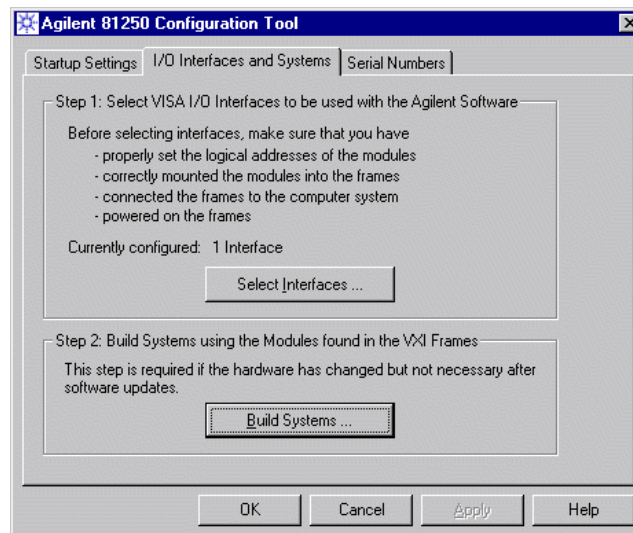
### Selecting the I/O Interface

This procedure defines the I/O interfaces that the PC uses.

To select the I/O interface:

- 1 In the Agilent 81250 Configuration Tool window, click the *I/O Interfaces and Systems* tab.

The *I/O Interfaces and Systems* page comes to the top.



**Figure 50** Selecting the I/O interface



**2** Click *Select Interfaces...*

The *VISA Interfaces available for use* window opens with the available I/O interfaces.

**3** Select the I/O interface you will be using. The default is VXI0.

If you are using an external controller connected to more than one IEEE 1394 PC to VXI module, you have to select the interfaces you wish to control.

**NOTE** If you are upgrading from a previous software version, you must make sure you use the same interface type as before. This ensures that existing programs will still run after the upgrade.

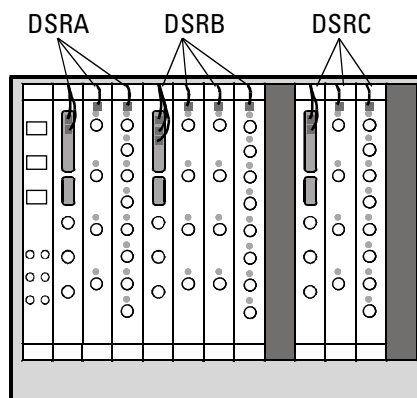
## Build Systems

When you click *Build Systems* in the Agilent 81250 Configuration Tool dialog box, the Configuration Tool checks which hardware is installed, how the clock groups are configured, and creates the new configuration files `dvtsys.txt` and `dvtits.txt`. The current configuration files are backed up (renamed `*.bak`).

**CAUTION**

If you execute *Build Systems* twice, the backup configuration files are overwritten.

The default generated system name is DSRA. If the mainframe contains more than one system, as shown in the figure below, additional systems (DSRB, DSRC, ...) are automatically set up.



**Figure 51** Automatic Assignment of System Names

**NOTE** You need to run *Build Systems* after any changes in the hardware. You do not need to run *Build Systems* if you are upgrading the user software version without changing hardware.

After any changes of the system configuration you have to adjust the instrument connectors. See the online Help, *How to Adjust the Instrument Connectors* for instructions.

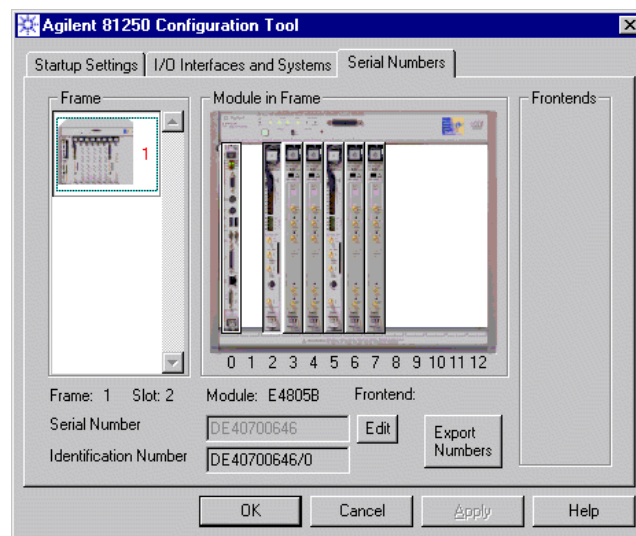
**NOTE** The Configuration Tool also creates for each real system an offline system and additionally some demo systems.

An offline system reflects the actual system configuration. As it does not access the hardware, it can be operated on any PC and used for training purposes.

The demo systems provide simple system configurations and can be used for demonstrating ParBERT features to newcomers.

## How to Check the Serial Numbers

The *Serial Numbers* page of the Configuration Tool can be used to query and archive the serial numbers of the installed modules and frontends.

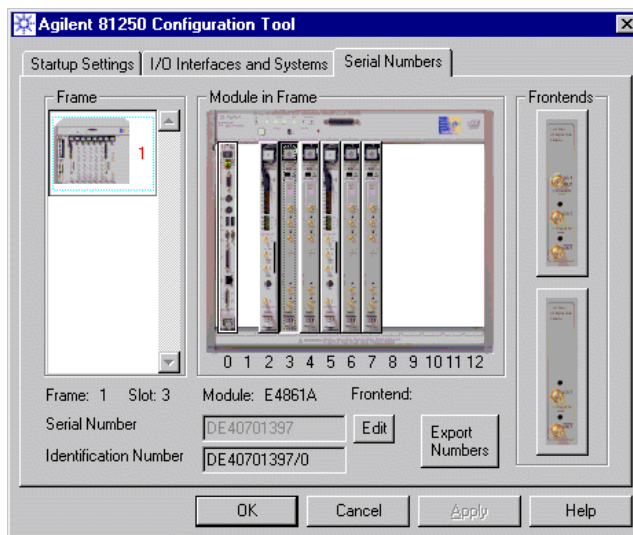


**Figure 52** Serial and ID Numbers of the Master Clock Module

By default, the numbers of the master clock module are displayed.

The *Identification Number* is the hardware manufacturing number. The *Serial Number* can be edited. This may support your asset administration. If you have received a module from repair which has a new number, you can assign the old serial number to that module.

To view the type and numbers of a different module, click on that module.



**Figure 53** Serial and ID Numbers of a Data Generator/Analyzer Module

To view the type and numbers of a frontend plugged into a data module, click the frontend.

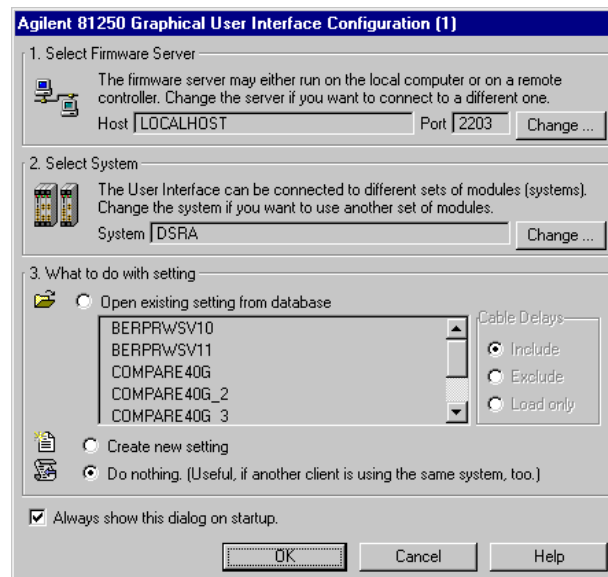
To archive the present system configuration in an ASCII file, click the Export Numbers button.

# Starting the ParBERT User Software

You start the user software manually by double-clicking the Agilent 81250 User Software icon on the Windows desktop.

When you start the user software for the first time, you have to configure the user interface.

The configuration window looks as shown below:



**Figure 54** Agilent 81250 User Interface Configuration Window

**NOTE** You can start the user software more than once—either manually or automatically after logon. In this case you get several user interfaces, and each of them has to be configured.

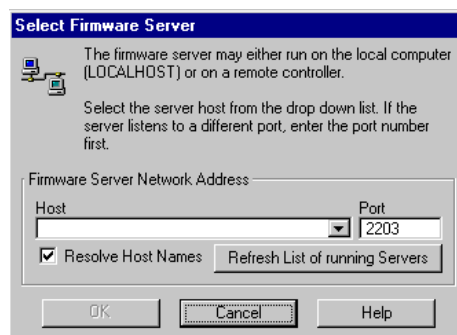
For example, using two user interfaces, you can operate two independent systems through one firmware server running on one ParBERT controller. You can also communicate with different firmware servers of different systems which are connected to the LAN.

## How to Select the Firmware Server

If you are running the ParBERT user software in *local* mode, the firmware server is found on the same PC which is called LOCALHOST.

If you are running the ParBERT user software in *remote* mode, LOCALHOST is not available. You have to specify the network node on which the firmware server is running. This requires that the ParBERT controller has been connected to the LAN (see "Connecting ParBERT to the LAN" on page 91).

The selection is made by clicking the *Change* button.



**Figure 55** Selecting a PC on which the Firmware Server is Running

In this window, you can enter the computer name or the IP address and the associated port of the ParBERT controller you would like to connect to.

You can update the list of hosts by clicking *Refresh List of running Servers*. Depending on the checkbox, the list shows names or IP addresses. Note that only hosts running in the same subnet as the computer running the ParBERT user interface are recognized.

## How to Select the System

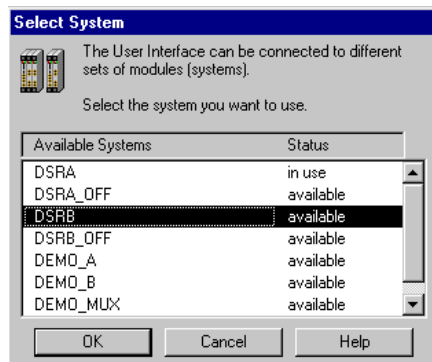
The basic (default) system is DSRA.

You may wish to operate a different ParBERT system from this user interface.

If you start the user interface more than once, you have to choose a different ParBERT system for each user interface.

To select the system:

- 1 Click the *Change* button.



**Figure 56** Selecting a System

- 2 Choose from the list of available systems.

The list includes also demo and offline systems (see *"Build Systems"* on page 81).

Systems already in use by an active user interface cannot be chosen.

- 3 Confirm.

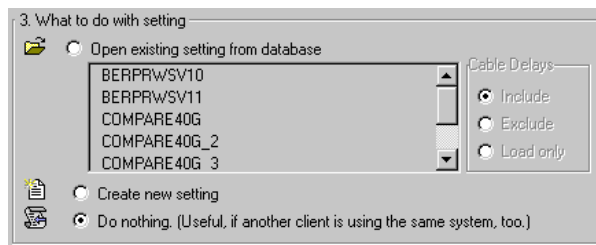
## How to Specify a Start Setting

This section of the Agilent 81250 User Interface Configuration Window applies only to systems that have already been in use.

The complete setup for a system and a device to be tested including all parameters as well as references to the data to be sent or expected is called **setting**.

This section allows to load one of the stored settings of the chosen system automatically with the user interface.

That means, you need only start the user software and all systems of the Agilent 81250 Parallel Bit Error Ratio Tester are ready for testing a particular device.



**Figure 57** Selecting a Setting

To load one of the stored settings automatically:

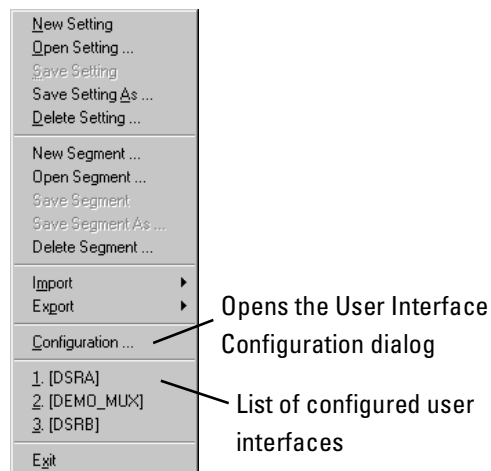
- 1 Enable the checkbox.
- 2 Choose from the list.
- 3 Decide on loading also the cable delays.

## How to Disable the UI Start Dialog

The user interface (UI) configurations are automatically stored. They are identified by numbers, starting from one.

Once the Agilent 81250 Parallel Bit Error Ratio Tester has been set up, you may wish to disable the User Interface Configuration dialog. This is done by disabling the *Always show this dialog on startup* checkbox.

When the user interface is active, the User Interface Configuration dialog can be started from the *File* menu, item *Configuration*.



**Figure 58 ParBERT File Menu**

The *File* menu shows also a list of the systems for which user interfaces have been configured. If you wish to keep the present user interface but operate a different system, you can choose from this list.

The list keeps up to four entries. The following actions lead to a new entry:

- Closing the Agilent 81250 Graphical User Interface Configuration dialog with OK
- New Setting
- Open Setting
- Save Setting

- Save Setting As

The new entry is put in position 1. The numbers of the other entries are incremented by 1. If the entry is identical to another entry in the list, this entry is removed.

The list of the recently used startup configurations is shared among all user interfaces, independent of the startup parameter set they use.

## How to Get Help



For context-sensitive help press F1, the *Help* button in the dialog boxes or the button shown here in the margin column.

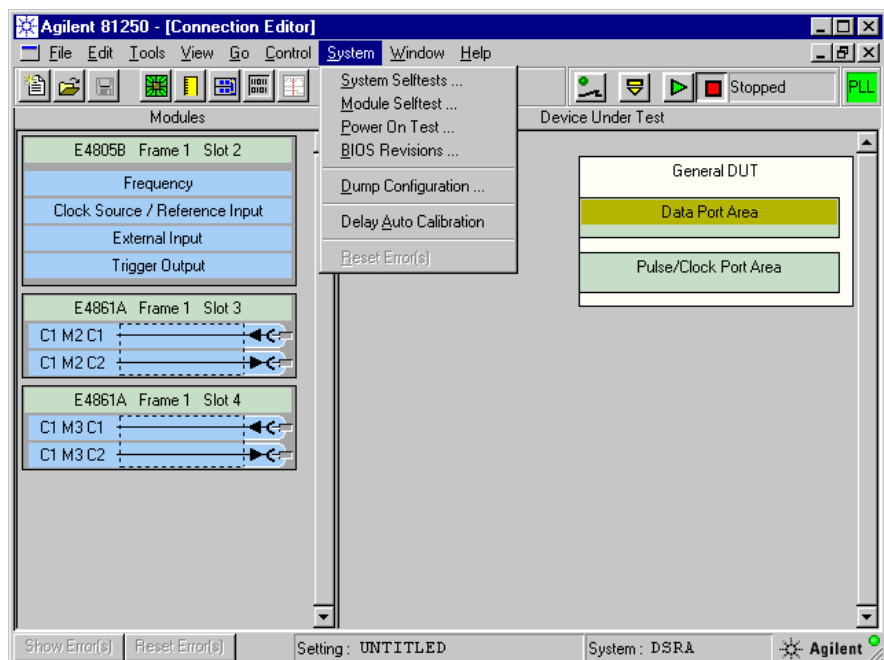
The Help menu is self-explanatory. You can also start with the table of contents or search from the alphabetical index.



# Testing ParBERT's Integrity

The user software menu has functions for testing the system's integrity. These selftests can be performed at any time, as long as no test is running. It is highly recommended to execute these tests after changing the hardware components or after software upgrades.

The tests are located in the *System* menu, as shown in *Figure 59*.



**Figure 59** System Menu

**NOTE** See the online Help in the ParBERT software and the *Agilent 81250 ParBERT System User Guide* for assistance with running the tests.

**System Selftests** When you select *System Selftests*, the Instrument Diagnostic / Selftest window opens to the *System Selftest* tab. When you run the system selftest, the following are checked:

- Responses from all modules
- Current firmware revisions of the modules
- Identification numbers of installed frontends

- Module Selftest** When you select *Module Selftest*, the Instrument Diagnostic / Selftest window opens to the *Module Selftest* tab. When you run the module selftest, front-ends built into the modules are checked. This selftest may take a minute.
- Power On Test** This selftest is automatically performed at power on. You can view the results of the last power on test by clicking *View Results*. You can then save these results to a log file for documentation purposes.
- BIOS Revisions** This function returns the current firmware revisions of the modules.



# Connecting ParBERT to the LAN

This chapter describes the work necessary to connect the embedded PC to the LAN.

**NOTE** For instructions on how to connect an **external** PC to the LAN, please see the user documentation that came with the external PC. If you need additional information, it is recommended that you contact your network administrator.

**NOTE** You need administrator privileges to connect the **embedded** PC to the LAN. See *"Logging on as the Administrator"* on page 71 for instructions.

Windows NT 4.0 installed in ParBERT's embedded PC supports the following network protocols:

- TCP/IP
- NetBIOS

**NOTE** This section describes the installation steps for the TCP/IP network protocol. If your network uses the NetBIOS protocol, contact your network administrator for assistance.

# Factory Default Settings

Before you get started, contact your network administrator for the necessary network information. The factory defaults are shown in the following table:

**Table 7 Embedded PC default settings**

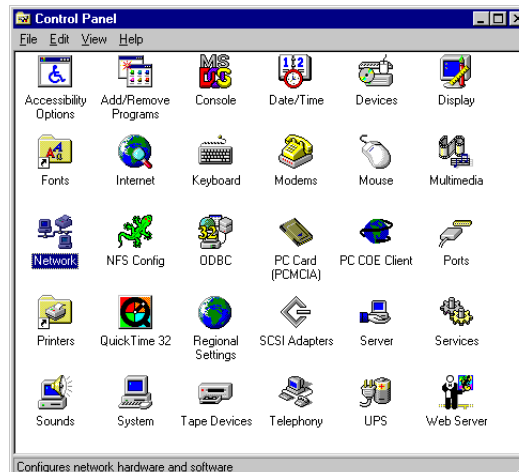
Network parameter	Factory default
Computer name	E9850A-SNxxx
Work group	– empty –
IP Address	192.0.0.1
Subnet mask	255.255.255.0
Default gateway	none
Domain	standalone

## Configuring ParBERT for LAN

When you have collected all the data, follow the following steps:

- 1 Click *Start*, point to *Settings*, and then click *Control Panel*.

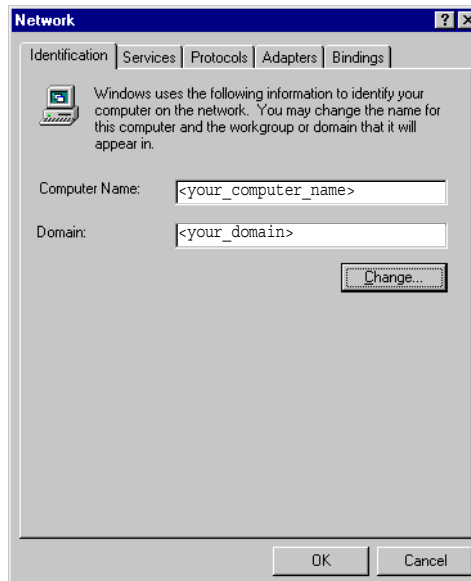
The Control Panel window opens.



**Figure 60 Windows NT Control Panel**

**2** Double-click *Network*.

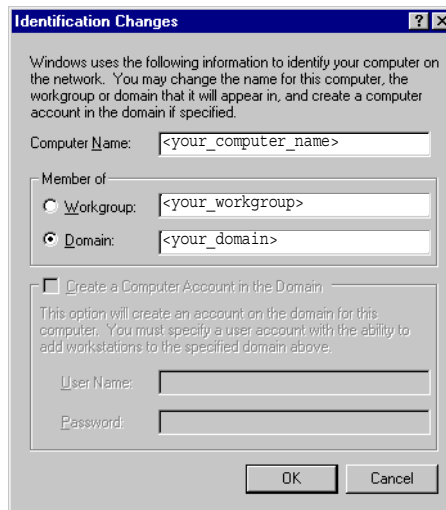
The Network dialog box opens with the *Identification* page on top.



**Figure 61** Network dialog box opened to Identification page

**3** If necessary, enter a new *Computer Name* and *Domain*. Click *Change* to change the computer identification.

The Identification Changes dialog box appears.

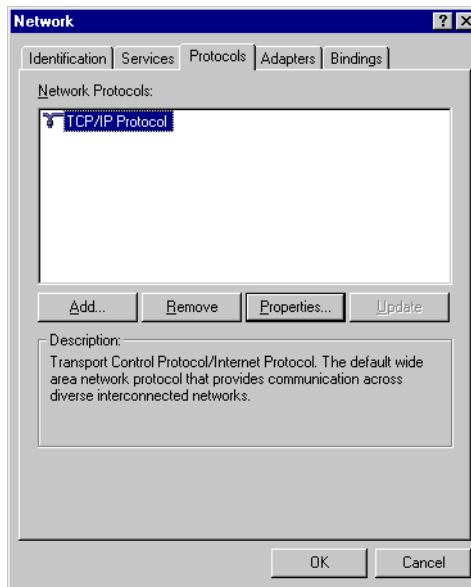


**Figure 62** Identification Changes dialog box

**4** Make the necessary changes and click *OK*.

The Identification Changes dialog box closes.

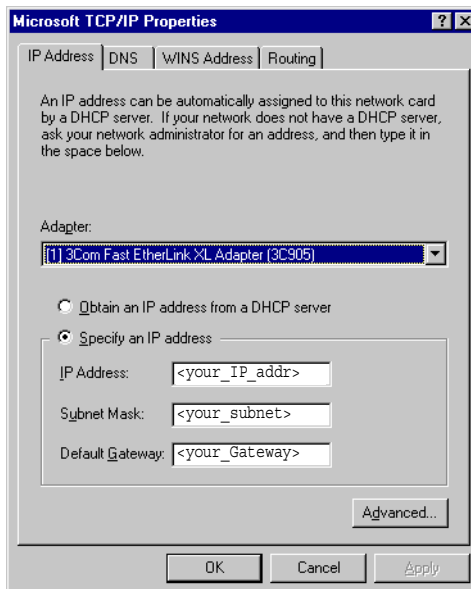
5 Open the *Protocols* page.



**Figure 63** Network dialog box opened to *Protocols* page

6 Click *Properties*.

The Microsoft TCP/IP Properties dialog box opens with the *IP Address* page on top.



**Figure 64** Microsoft TCP/IP Properties dialog box

7 Enter the *IP Address*, *Subnet Mask* and *Default Gateway*.

8 Click *OK* to close all remaining setup windows.

# Troubleshooting the ParBERT Installation

This chapter describes some possible problems you could run when you are installing ParBERT, and provides some basic tips for correcting them.

**NOTE** This chapter provides only tips for troubleshooting the ParBERT components from Agilent Technologies. If there are problems from the external equipment, you have to check the user documentation of this equipment.

You can also check the ParBERT Web site for frequently asked questions at the following URL:

- <http://www.agilent.com/find/parbert/>

## Problems at the Power-On Selftest

Depending on the start-up configuration, ParBERT runs a selftest at power on (see "*How to Select the Start-Up Settings*" on page 77 for more information).

If any conflicts are found during the power-on selftest, ParBERT notifies you. Depending on the problem found, it is recommended that you run the complete set of selftests to specifically identify the problem.

You can start the selftests from the *System* menu in the ParBERT user software. See the online Help for more information about the available selftests.

# Problems after Changing the Hardware

Check the following points if you modified the hardware and are experiencing problems:

**LED Problem:** The green Access LED of a module lights up, apparently without any reaction.

**Solution:** This is due to an internal update of the reconfigurable logic circuitry. Do not power down unless all green LEDs are off! Wait at least 12 minutes before switching the mainframe off.

**Unrecognized modules Problem:** ParBERT does not recognize newly inserted modules, or the modules are not in any easy-to-follow order.

**Solution:** Any time you change the system configuration, you have to make sure that the correct logical addresses are used. See *"How to Set the Logical Addresses"* on page 45.

Ensure also that the modules are correctly plugged into the VXI frame. The front panels of all modules together must form a plane, uniform surface. Tighten the arresting screws.

Check the ASCII file `dvt.sys.txt`. This file informs you about the systems that have been built and their configurations. `Dvt.sys.txt` is located in the directory `hp81200\cfg`.

Run the utility `SURM.EXE`. `SURM` checks the mainframe configuration and reports for each module:

- Current VXI logical address
- Slot number
- Manufacturer and model
- and much more

`SURM.EXE` is located in the directory `sic1nt\vxi`.

**No synchronized tests Problem:** After adding modules or front-ends, the system can no longer run synchronized tests.

**Solution:** After changing any hardware in the system, it is absolutely necessary that you deskew the system.



This consists of adjusting the instrument connectors and compensating for internal and external delays. See *How to Adjust the Instrument Connectors* and *How to Compensate for Internal and External Delays* in the *Agilent 81250 ParBERT System User Guide* or in the online Help.

## Problems with Clockgroups

Check the following if you are having problems setting up clockgroups:

**Master clockgroup not found** **Problem:** For a multi-mainframe configuration, the software does not recognize the master clockgroup.

**Solution:** Have you rebuilt the systems?

When you change the configuration of the clock modules (for example, when you set up one master clock module and one or two slave clock modules), you have to reconfigure the systems in the software. See *"Build Systems" on page 81* for instructions.

**Solution:** Are all the slave clock modules correctly connected to the master clock module?

When you set up a single system with several clock modules, it is important that there is only one clock source. You have to set up a module as a master clock generator. See *"Setting Up a System with Expander Frames" on page 35* for more information.



# Declaration of Conformity

## DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014



**Manufacturer's Name:** Agilent Technologies Deutschland GmbH  
**Manufacturer's Address:** Boeblingen Verifications Solutions (BVS)  
Herrenberger Str. 130  
D-71034 Boeblingen

### Declares, that the product

<b>Platform Name:</b>	<b>81200</b>	<b>Data Generator / Analyzer Platform</b>
<b>System Names:</b>	<b>81250</b>	<b>Parallel Bit Error Rate Tester (ParBERT)</b>
<b>Module Names:</b>	E1401B+E4807A	C-Size VXI Hi-Power Mainframe, 13-Slot with Controller
	E4801A+E4806A	VXI Mainframe with embedded Controller
	E8403A	C-size VXI Mainframe, 13-slot
	E4805A	Central Clock Module, 667 MHz
	E4805B	Central Clock Module, 2,67 GHz
	E4808A	Central Clock Module, 10,8 GHz
	E4832A	Generator/Analyzer Module 667 MHz
	E4835A	2 Differential Analyzer Front-Ends, 667 Msa/s
	E4837A	Differential analyzer front-end, 667 Msa/s
	E4838A	Generator front-end, 667 Mbit/s
	E4843A	Generator front-end, 667 Mbit/s
	E4844A	Single analyzer front-end, 667 Msa/s
	E4846A	Dual generator front-end, 200 Mbit/s
	E4861A	Generator/Analyzer Module 2,67 Gb/s
	E4861B	Generator/Analyzer Module 3,35 Gb/s
	E4862A	Generator Front-End 2,67 Gb/s
	E4862B	Generator Front-End, 3,35 Gb/s
	E4863A	Analyzer Front-End, 2,67 Gsa/s
	E4863B	Analyzer Front-End, 3,35 Gb/s
	E4864A	Generator Front-End 1,33 Gb/s
	E4865A	Analyzer Front-End, 1,33 Gsa/s
	E4866A	10.8G Generator Module
	E4867A	10.8G Analyzer Module
	E4868A	43.2G Multiplexer Module
	E4869A	43.2G DeMultiplexer Module

### Conforms with the following European Directives:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC (including 93/68/EEC) and carries the CE Marking accordingly.

<p><b>DECLARATION OF CONFORMITY</b> According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014</p>	
--	---

**Conforms with the following product standards:**

**EMC (Technical Construction File)** *The product herewith complies with the requirements of the EMC Directive 89/336/EEC (including 93/68/EEC) and carries the CE Marking accordingly (European Union).*  
 Against: *EMC test specification EN 55011:1991 (Group 1, Class A)*  
 As detailed in *Electromagnetic Compatibility (EMC) Certificate of Compliance No. 01-075*  
 Assessed by: *CETECOM GmbH, D-45219 Essen*

EMC	Standard	Limit
	IEC 61326-1:1997+A1:1998 / EN 61326-1:1997+A1:1998	
	CISPR 11:1997 / EN 55011:1998	Group 1 Class A
	IEC 61000-4-2:1995+A1:1998 / EN 61000-4-2:1995	4kV CD, 8kV AD
	IEC 61000-4-3:1995 / EN 61000-4-3:1995	3 V/m, 80-1000 MHz
	IEC 61000-4-4:1995 / EN 61000-4-4:1995	0.5kV signal lines, 1kV power lines
	IEC 61000-4-5:1995 / EN 61000-4-5:1995	0.5 kV line-line, 1 kV line-ground
	IEC 61000-4-6:1996 / EN 61000-4-6:1996	3V, 0.15-80 MHz
	IEC 61000-4-11:1994 / EN 61000-4-11:1994	1 cycle/100%
	Canada: ICES-001:1998	
	Australia/New Zealand: AS/NZS 2064.1	
<b>Safety</b>	IEC 61010-1:1990+A1:1992+A2:1995 / EN 61010-1:1993+A2:1995	
	Canada: CSA C22.2 No. 1010.1:1992	

**Supplemental Information:**

*The product was tested in a typical configuration with Agilent Technologies test systems.*

2002-February-05  
Date

  
Hans-Martin Fischer  
Name

Product Regulations Engineer  
Title

For further information, please contact your local Agilent Technologies sales office, agent or distributor.  
 Authorized EU-representative: Agilent Technologies Deutschland GmbH, Herrenberger Strasse 130, D-71034 Boeblingen, Germany

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