HP E2920 Computer Verification Tools, PCI Series

Installation Guide

HP E2925A, HP E2970A, HP E2971A
PCI Bus Exerciser and Analyzer

HP Part No. E2925-91010
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Edition: December 1996 (E1296)

The HP E2925A is a product of Böblingen Instruments Division.

Installing the
HP E2925A, HP E2970A, HP E2971A

Part Number E2925-91010

Notice

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Support Address: The HP E2920 PCI Series is a product of:

Hewlett-Packard GmbH
Boeblingen Instruments Division
Herrenbergerstrasse 130
71034 Boeblingen
Germany

If you need further information on how to install the HP E2920 PCI Series you can contact your nearest HP office, or the factory directly by:

Fax No: (+49) 7031-14-6532 or
E-mail address: pl24_support@bbn.hp.com

Precautions

- The operating temperature of the Altera IC's on the PCI Exerciser and Analyzer card may be in excess of 70 ^{o}C (158 ^{o}F). Please take care when handling the board during operation and when removing the card.
- The PCI Exerciser and Analyzer card is not designed for outdoor use. Do not expose it or any of its component parts to rain or other excessive moisture.
- Protect the PCI Exerciser and Analyzer card from humidity and temperature changes which could cause condensation on the modules.
- Do not operate the PCI Exerciser and Analyzer card in the presence of flammable gases, fumes or powders. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.
- There are no serviceable parts on the PCI Exerciser and Analyzer card. Do not attempt service or adjustment.
- The PCI Exerciser and Analyzer card or any of its component parts should not be exposed to excess shock or vibration and should therefore not be used for environmental testing.
- ATTENTION! STATIC SENSITIVE DEVICES:
  Because electrostatic sensitive components are exposed on the PCI Exerciser and Analyzer card, proper care should be taken when handling it. Handle the PCI Exerciser and Analyzer card as little as possible and with care.

Electrostatic Discharge (IEC 801-2:1991):

Under normal operating conditions an electrostatic discharge of up to 4kV contact-discharge or 8kV air-discharge may cause erroneous behavior of the E2925A.
Keep such electrical discharges away from operating instrument.

Electromagnetic Immunity (IEC 801-3:1992):

Under normal operating conditions an electrical field of up to 3 V/m may cause erroneous behavior of the E2925A.
Keep such electrical fields away from operating instrument.

Fast Transients (IEC801-4:1988):

Under normal operating conditions fast transients of up to 0.5kV applied to I/O-cables or up to 1kV to power line cables may cause an erroneous behavior of the E2910A.
Keep such fast transients away from cables on operating instrument.

Europe - Declaration Of Conformity

Manufacturer: Hewlett-Packard GmbH
Boeblingen Instruments Division
Herrenberger Str.130
D-71034 Boeblingen, Germany

We declare that the system:

HP E2925A PCI Exerciser & Analyzer Card

conforms to the following standards:

Safety:	IEC 1010-1:1990 +A1:1992	EN61010-1:1993

EMC:	EN 55011:1991 / CISPR 11 Group 1, Class A (1)	
	EN 50082-1:1992	
	IEC 801-2:1991	ESD: 4kV cd, 8kV ad
	IEC 801-3:1992	Radiated Immunity: 3V/m
	IEC 801-4:1988	Fast Transients: 0.5kV, 1kV

Supplementary Information:

The product herewith complies with the requirements of the
- Low Voltage Directive (73/23/EEC) and the
- EMC Directive (89/336/EEC).

(1) The product exceeds the requirements in setups given from the standards. A Technical Construction File (TCF) got a certificate (#K129923H) from a Competent Body. For installations in an EU country, the Site Attenuation Requirement must be attended to. They are stated in this Installation Guide E2925-91010, see “EU Regulatory Instruction - Site Attenuation Requirements” on page 27.

Boeblingen, 22nd November 1996

Hans Baisch
Regulations Consultant

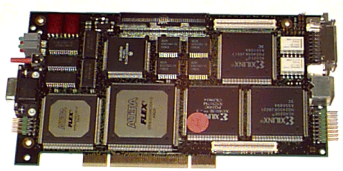
Table of Contents

Installation Procedure

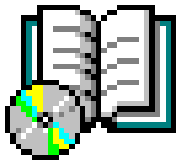
The following instructions relate to a first time installation of the HP E2925A PCI Bus card. In case of upgrading with new software add-on products, please see chapter , Licensing of Software Add-on Products, on page 19.

1 Check the Content of the Shipment

Verify that your shipment contains the following

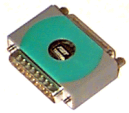


PCI Exerciser and Analyzer Card



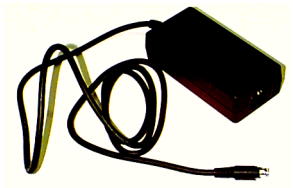
Installation CD and this Guide

RS232 Cable

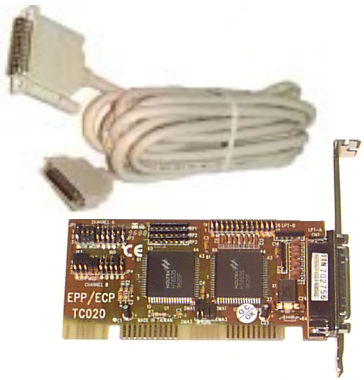


Hardware Dongle ID Module

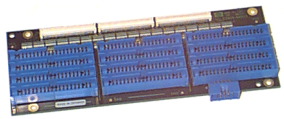
If ordered, the following options will be included:



Option 001:
External Power Supply



Option 002:
Fast Host Interface Card +
Bi-Directional Centronics Cable



Option 003:
HP Logic Analyzer Adapter
or:
Option 004:
Generic Logic Analyzer Adapter
(not shown)

2 Option 002 Only: Install Fast Host Interface Card

This option is designed for applications that require extensive data download/upload from the external test controller (host) to the E2925A card. It improves the data throughput by using a Bi-directional Centronics interface (peak datarate 150k byte/s) instead of the RS232 serial link (57k bit/s).With this option the ISA Fast Host Interface card must be installed in the host PC. This option is supported by Windows NT (GUI and C Application Programming Interface - C-API) and by DOS C-API programs. It is not supported under Windows 95.

The Fast Host Interface Card is shipped to you with the following settings:

- LPT2 enabled
- Address 278-27F\h
- EPP mode
- Channel A (Channel B is not supported)

The following tables show the card jumper positions for the above settings:

Table 1 Fast Host Interface Card Configuration for LPT1 and LP2

Channel A (LPT-A)	Address	JP1-A Position	JP1-B Position	JP1-C Position
LPT1	378-37F\h	2=3	2=3	2=3
LPT2 (default)	278-27F\h	1=2	2=3	2=3

Table 2 Fast Host Interface Card Configuration for Disabling Channel B

Channel B (LPT-B)	Address	JP3-A Position	JP3-B Position	JP3-C Position
Disabled		1=2	1=2	1=2

Table 3 Fast Host Interface Card Configuration for EPP Mode

Mode	JP1-D Position	JP1-E Position
EPP	2=3	1=2

If using the Fast Host Interface with the default settings, you must set the Test Card Configuration in the GUI to Bidirectional Centronics on LPT, see “Configure the Interface Port” on page 15

NOTE: If your host PC parallel port supports Centronics EPP 1.7 or EPP 1.8, then this can be used instead of the ISA Fast Host Interface card.

3 Install Software

The software media contains all software products. Running of these products is controlled from the Hardware Dongle ID module.

1 Insert the installation CD into your host computer CD drive

2 Access the CD-ROM drive and run the installation executable *setup.exe* by double clicking on the file. The directory structure on the CD-ROM is organized by installation platform. You will find a set of disks under the Windows NT and Windows 95 directories. The setup.exe file is located under DISK1. A set of installation floppy disks may be created by copying each DISK directory to a floppy disk.

   Follow the on-screen instructions to install the software.

The requirements to run Graphical User Interface software are:

Table 4 Host PC Requirements

Resource	Requirement/Recommendation
Computer	IBM-PC or 100% compatible with recommended minimum 90MHz Pentium CPU and CD-ROM drive.
Graphics	Graphics: 800 x 600 required, recommended 1024 x 768 SVGA
Operating System	Windows 95 or Windows NT for GUI. C-API sources available for compilation under other operating systems
Memory	16MB minimum, 24MB recommended
Hard Disk	Minimum of 50MB free disk space, 100MB recommended
ISA Slots	For option 002 Fast Host Interface, 1 ISA Slot is required to host the bi-directional Centronics Card. Not supported under Windows 95. Alternatively, if your host PC has a Centronics EPP 1.7 or 1.9 compatible parallel port then this may be used instead.
Interfaces	An RS232 port is required unless you are using the Fast Host Interface Option 002, or accessing the card through PCI. A parallel port is required for the Software ID module.

The files required by the DOS installation can be found in the DOS directory. To install the DOS files:

1 Create a directory on the destination drive.

2 Copy the DOS directory structure to the installation directory.

3 Uncompress the postscript User's Guide by typing 'install' in the \help subdirectory.

During installation the following directory structure is created in the installation directory:

NT and Windows 95 Platforms

Directory	File types	Description
\bin	.exe .dll .dat .ini	Executables and DLLs
\help	.pdf .ps	Acrobat readable and printable postscript files
\data		User data files
\capi\src	.c .h	The C-API source files
\capi\include	.h	For DLLs and DLL recompilation
\capi\ntdrv	.sys .h	For driver recompilation (NT Only)
\lib\bc		Borland C++ import library
\lib\ms	.lib	MS Visual C++ import library
\libdos\bc	.lib	Borland static library (currently not available)
\libdos\ms		Microsoft static library
\samples\capi	.mdp .c	MS Visual C++ template and examples
\samples\GUI	.tst	Sample Analyzer capture data
\hw\e2925a	.exo .hex	Hardware BIOS, and programmable hardware
\acrobat		acrobat reader executable, fonts and help files
\la\e2925a	._e	HP 16550 analyzer setup files. These contain the analyzer formats for option 003

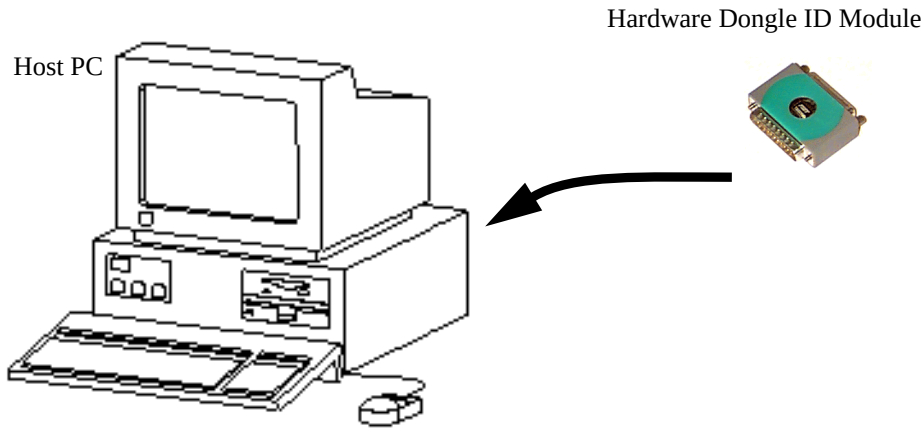
DOS Platforms

Directory	File types	Description
\capi\src	.c .h	The C-API source files
\capi\include	.h	For DLLs and DLL recompilation
\libdos\bc		Borland static library (currently not available)
\libdos\ms		Microsoft static library
\samples	.c	C++ template
\help	.p_	compressed postscript User's Guide
\readme.txt		information on installing and compiling the DOS libraries

The file readme.txt in the installation directory should be read before installing this product.

4 Connect Hardware Dongle ID Module to Host Computer Parallel Port

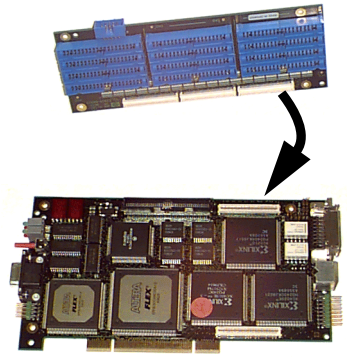
The Hardware Dongle ID module (or dongle) contains licensing information required to run software product add-ons such as options and additional Graphical User Interfaces (e.g. HP E2970A PCI Analyzer, and HP E2971A PCI Exerciser). It is not needed to run the basic E2925A product.



NOTE: The dongle must be connected to the parallel port of the host controller to enable the software add-ons to run. It is recommended to keep this in a safe place if no host PC is used in the current application.

5 Option 003 and 004 Only: Fix LA Adapter to the E2925A Card

The option 003 adapter allows you to connect a Logic Analyzer directly to the card



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Ensure that you have the correct adapter. There are two types:

Option 003 analyzer adapter for the HP 16550. The connections on this adapter have resistive terminations.

Option 004 for all other analyzers.

NOTE: The connections on the option 004 Generic Logic Analyzer adapter are not terminated and must be terminated in accordance with the requirements of the analyzer used.

Align the boards using the 3 edge connectors and press firmly together.

Fix the boards together using the screws provided.

Logic Analyzer Settings for 16550 HP analyzers are shipped as part of the software release. These can be found in the installation \la directory. Copy these on to floppy disk, and load the HP analyzer with the formats. For other logic analyzers the pinout information in the users guide can be used to set up the analyzer.

NOTE: The on-board logic analyzer must be running to enable the logic analyzer output buffers.

Open the Command Line Interface Editor Window (see item 12, Accessing the Command Line Interface, on page 16), and type “arun” at the ‘Best2’ prompt, then press the [Enter] or [Return] key.

6 Install the E2925A Card into your System Under Test

Insert the E2925A card (with LA Adapter, if fitted) into an empty PCI slot in your system under test.

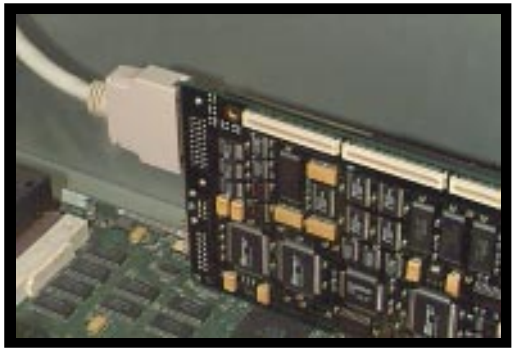
7 Connect Interface Cable (RS232 or Bi-Directional Centronics)

If using the serial RS232 interface, connect the RS232 Cable from a serial port on the host PC to the serial interface on the front of E2925A card.

If using the Fast Host interface, connect the Bi-directional Centronics cable between the interface card in the host PC and the Centronics connector on the back of the E2925A card.

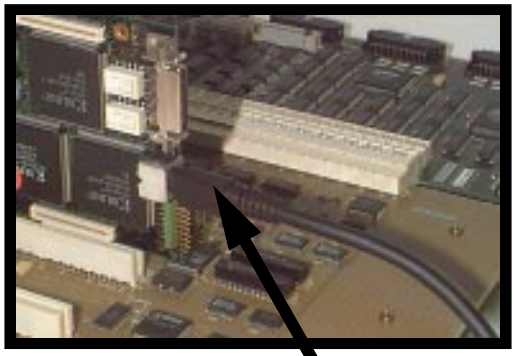
RS232 Connection

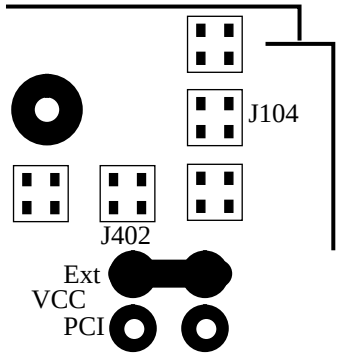
Bi-directional Centronics Connection



8 Option 001: Connect External Power Supply Unit (PSU)

If using the external power supply, connect the power cable from the PSU to the power connector on the back of the E2925A card.





The power supply used by the E2925A card is determined by the VCC jumper. Set this jumper to 'Ext' to enable the board to use the external power supply.

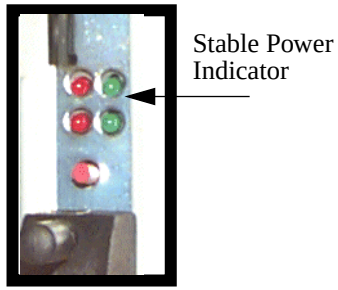
9 Apply Power

WARNING: **The operating temperature of the Altera IC's on the E2925A card may be in excess of 70 ^{O}C (158 ^{O}F). Please take care when handling the board during operation and when removing the card.**

If using the external power supply (option 001), connect the power cable and switch on the power.

If power is supplied from the system under test, switch on your system under test.

The top right LED on the E2925A card faceplate indicates that stable power is being applied to the card



10 Start the Software

The software installation creates a Windows Program Group which includes several icons:

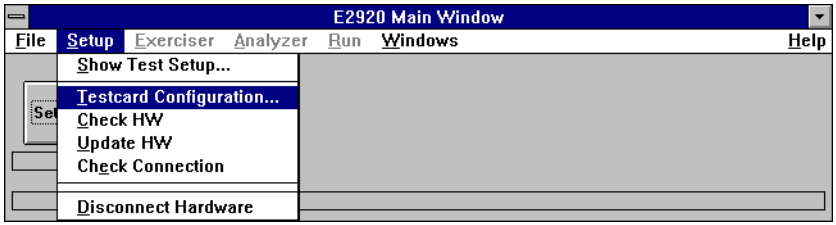
To start the software, double click on the “E2920 GUI” icon. This opens the E2925A Main Window.

The GUI provides as standard, a command line interface (CLI) for controlling the E2925A card and allows access to all E2925A functionality from the GUI. CLI commands can also be entered into an ASCII format file and run using the “do filename” CLI command. The additional GUI features depend on which add-on GUI products you ordered (for example, E2970A PCI Analyzer GUI and E2971A PCI Exerciser GUI).

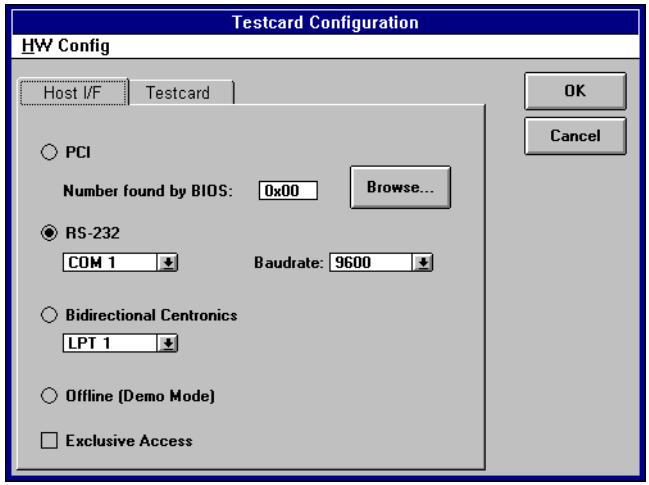
11 Configure the Interface Port

The standard GUI also provides some system setup windows. Before you can use the GUI to control the E2925A card, you must first configure the interface port you will use to communicate with the card.

1 From the Main Window Setup menu, select Testcard Configuration:



2 From the Testcard Configuration window, select the Host Interface port you are using:



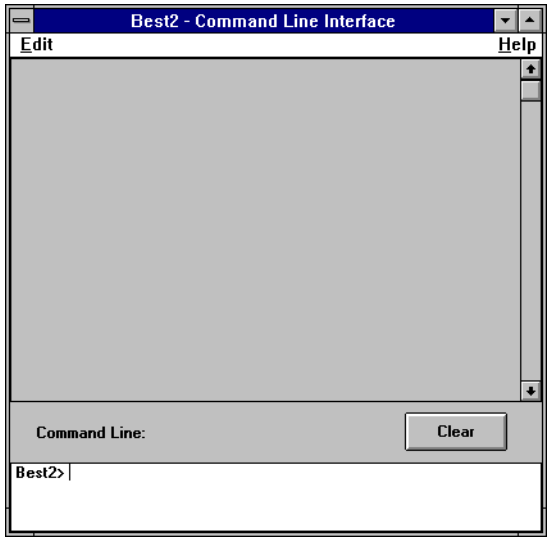
PCI
The system under test is the Host controller and communicates using PCI bios calls.

RS232
Host is an external controller communicating over the serial interface.

Bi-directional Centronics
Host is an external controller communicating using the Fast Host Interface Card.

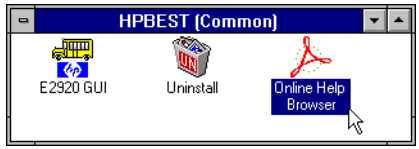
12 Accessing the Command Line Interface

The Command Line Interface can be accessed from the Windows->Command Line ... menu item. Help on using the CLI window is available from Help->Help on Window... For information on the available commands see the User's Guide C-API reference. Examples are also presented in the User's Guide.



13 Accessing User Documentation

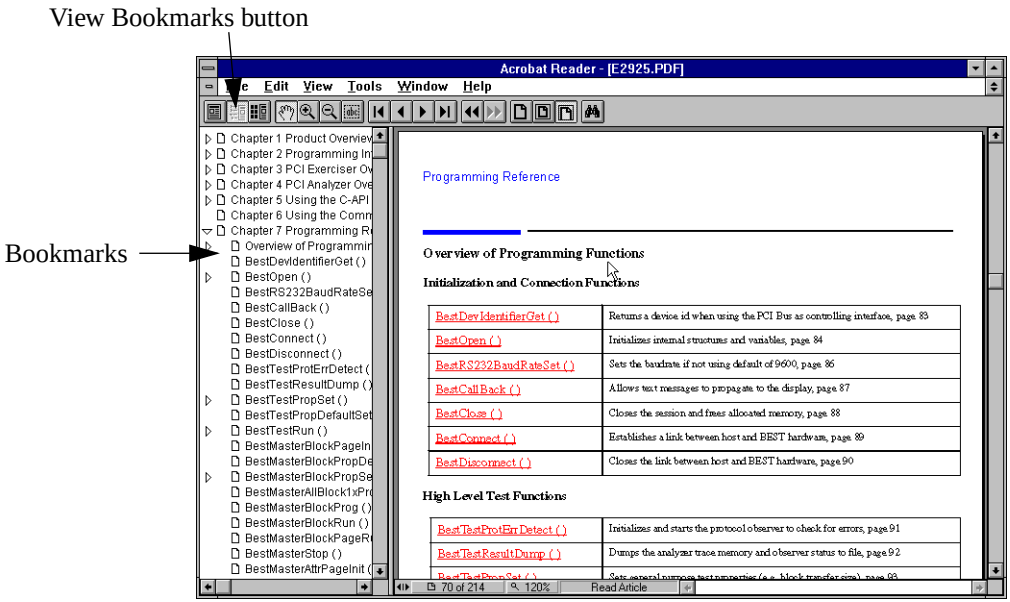
User documentation is delivered on-line in a "pdf" file format. This can read by double clicking on the User Guide icon in the HPBEST Program Group:



An Adobe Acrobat reader is shipped as part of the software release. If you prefer printed documentation, you can print this out on a local printer using the File>Print option of the Acrobat Reader. Alternatively, a postscript file is delivered in the documentation directory on the CD-ROM.

If you click the Help menu in the GUI, you get a Help topic relating to the window you are in.

When using the Acrobat Reader it is highly recommended to use the Bookmarks utility to navigate. To turn this option on, press <CTRL> 7, while running the Acrobat Reader. The bookmark utility consists of a list of hierarchical topic titles which can be clicked on to take you quickly to a section in the documentation. All main sections within the documentation are bookmarked. To maximize readability, View>Fit Width is also recommended:



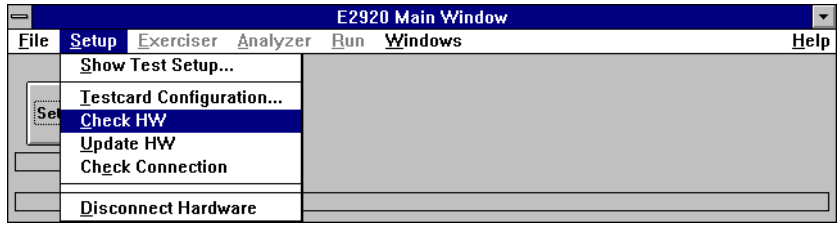
14 Performing Hardware Update after a Software Update/Upgrade

Software updates, including adding new product options or software add-on products should be installed in a separate directory for each installation. It is therefore recommended that you don't keep your data in the installation directory.

Software updates may require re-programming of the programmable hardware on the Main Board. Every software release is shipped with the corresponding programmable hardware files.

Product options and software add-ons can be enabled from the Register Product Options window. This window may be accessed from the Testcard Configuration window which is accessible from the Setup menu of the main window.

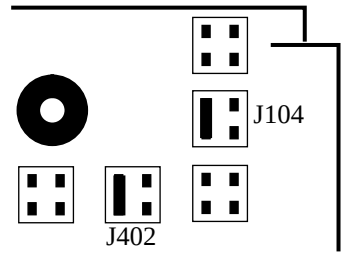
After making a new software installation, you can check if a hardware update is necessary using the Check HW menu option of the Setup menu, in the E2920 Main Window:



If the Check hardware fails then you need to perform an update of the Main Board programmable hardware:

To Update Programmable Hardware

The hardware update jumpers can be located in the top right hand corner of the Main Board



1 Set J104 and J402 to their programming position (left side):

2 If using the serial port interface, ensure that the baud rate is 9600.

3 Select the HW Config > Update menu option (see above)

4 Follow the on-screen instructions to reprogram the BIOS and on-board statemachines.

5 After the update is complete, remove power from the system, and set J104 and J402 to their passive position (right side)

6 Re-apply power, and perform a Check HW once again. Everything should pass this time.

Licensing of Software Add-on Products

In factory pre-configured systems all licenses are already installed and are ready to use.

When software add-on products are ordered separately, the license activation key must be entered on customer site, after installation of the software add-on.

NOTE: Make sure that the HW-Dongle is connected to the host PC. The HW-Dongle was shipped already with the HP E2925A card.

With the shipment of the software add-on product you receive:

- The latest software revision
- This latest Installation Guide
- License-to-Use for the software add-on
- License Activation Key Request Fax, see next page

Hewlett-Packard GmbH
BID PL24, Prod. W2 EG
Herrenberger Str. 130
71034 Boeblingen
GERMANY

HEWLETT® PACKARD

License Activation Key

HP E2920 Computer Verification Tool Series

Request FAX

To:	BID PL24, Product Support	Fax Number:
Company:	HEWLETT-PACKARD GmbH	(+49) 7031 14 6532

To receive your license activation key, please complete this request fax LEGIBLY in its entirety and fax it to the above number.

Contact Information

First Name _____
Last Name _____
Title _____
Phone No. _____
FAX No. _____
e-mail _____

Company Address

Company _____
Department _____
Street _____
Zip, City _____
Country _____

		Serial Number
Hardware	Hardware - Dongle	_____
Software	HP E2970A PCI Analyzer GUI	_____
	HP E2971A PCI Exercizer GUI	_____

Note Only one license for each software add-on may be activated for one HW-Dongle. If you have ordered multiple licenses for software add-ons, please send a separate request fax for each HW-Dongle, specifying the corresponding HW-Dongle serial number and the software serial numbers.

We will fax you the license activation key for activating your system within two working days of receiving this request.

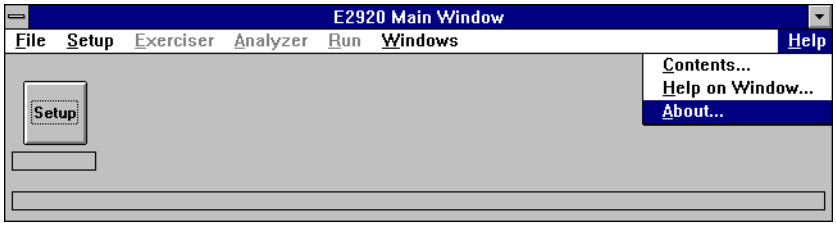
DVT

E2920-90001 **Digital Verification Tools** Product Support PL24
e-mail: pl-24support@hp.com

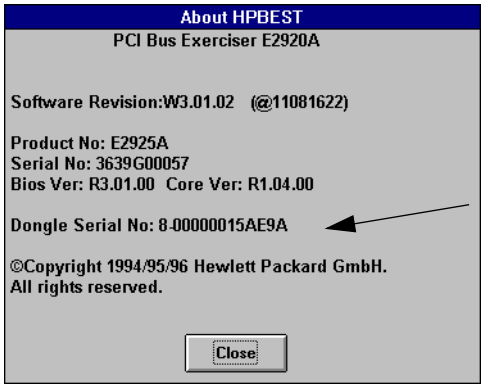
1 To get your license activation keys, return the filled out License Activation Key Request Fax to the fax number given on the fax.

NOTE: Only one license for each software add-on may be activated for one HW-Dongle. If you have ordered multiple licenses for software add-ons, please send a separate request fax for each HW-Dongle, specifying the corresponding HW-Dongle serial number and the software serial numbers.

2 If the HW-Dongle is connected to your host PC you can find the serial number of the HW-Dongle in the Help About menu option, in the E2920 Main Window



3 Copy the Dongle Serial No to the appropriate line of the fax sheet



Copy this Dongle Serial No to the fax:

4 The software serial numbers you can find on the License-to-Use Sheet

HEWLETT PACKARD

Software Certificate

This certificate evidences Hewlett-Packard Company's grant to customer of a license, as described below, subject to prior payment of the fee specified for the license.

HP E2970A PCI Analyzer GUI
License-to-Use

This software product includes a license enforcement mechanism. When the HP E2970A PCI Analyzer GUI was ordered separately, the license activation key must be entered on customer site.

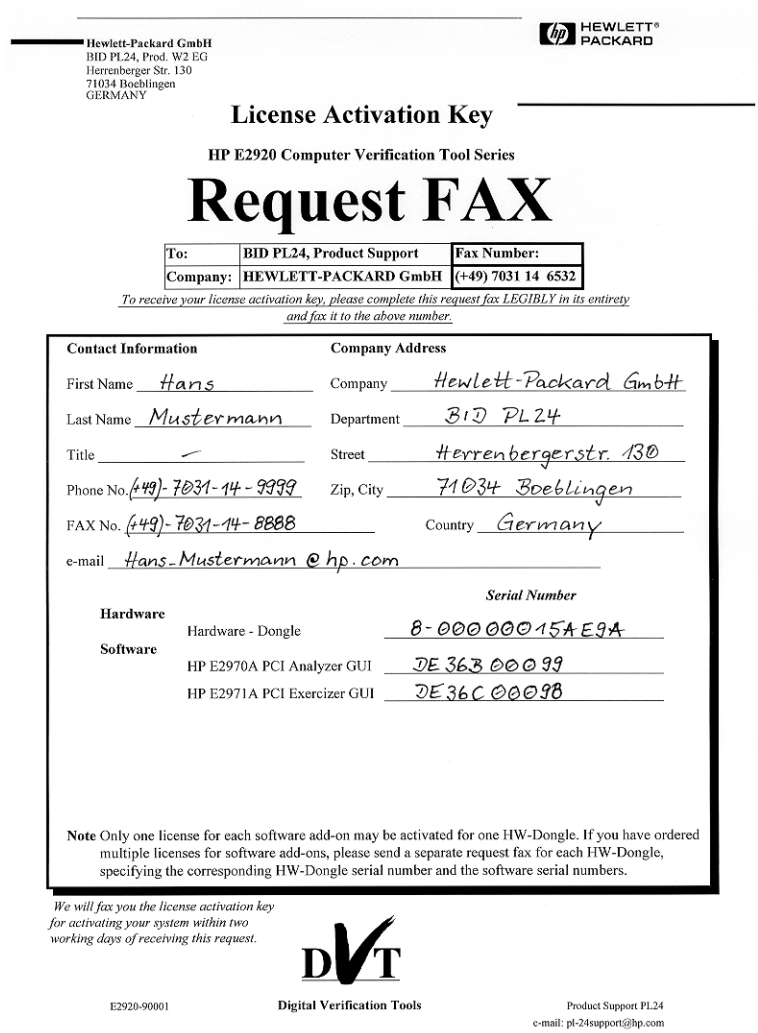
Please file this Software Certificate in a secure and familiar location.

Copy this serial number to the fax sheet

HP E2970A SN: DE36B00099

Rights and restrictions on the use, transfer, and copying of the software are set forth in the Hewlett-Packard Company's Software License Terms Agreement.

5 Here is an example of a completed request fax



Hewlett-Packard GmbH
BID PL24, Prod. W2 EG
Herrenberger Str. 130
71034 Boeblingen
GERMANY

HEWLETT PACKARD

License Activation Key

HP E2920 Computer Verification Tool Series

Request FAX

To:	BID PL24, Product Support	Fax Number:
Company:	HEWLETT-PACKARD GmbH	(+49) 7031 14 6532

To receive your license activation key, please complete this request fax LEGIBLY in its entirety and fax it to the above number.

Contact Information

First Name: Hans
Last Name: Mustermann
Title: –
Phone No.: (+49)-7031-14-9999
FAX No.: (+49)-7031-14-8888
e-mail: Hans_Mustermann@hp.com

Company Address

Company: Hewlett-Packard GmbH
Department: BID PL24
Street: Herrenbergerstr. 130
Zip, City: 71034 Boeblingen
Country: Germany

		Serial Number
Hardware	Hardware - Dongle	8-0000015AE9A
Software	HP E2970A PCI Analyzer GUI	DE363 00099
	HP E2971A PCI Exercizer GUI	DE36C 00098

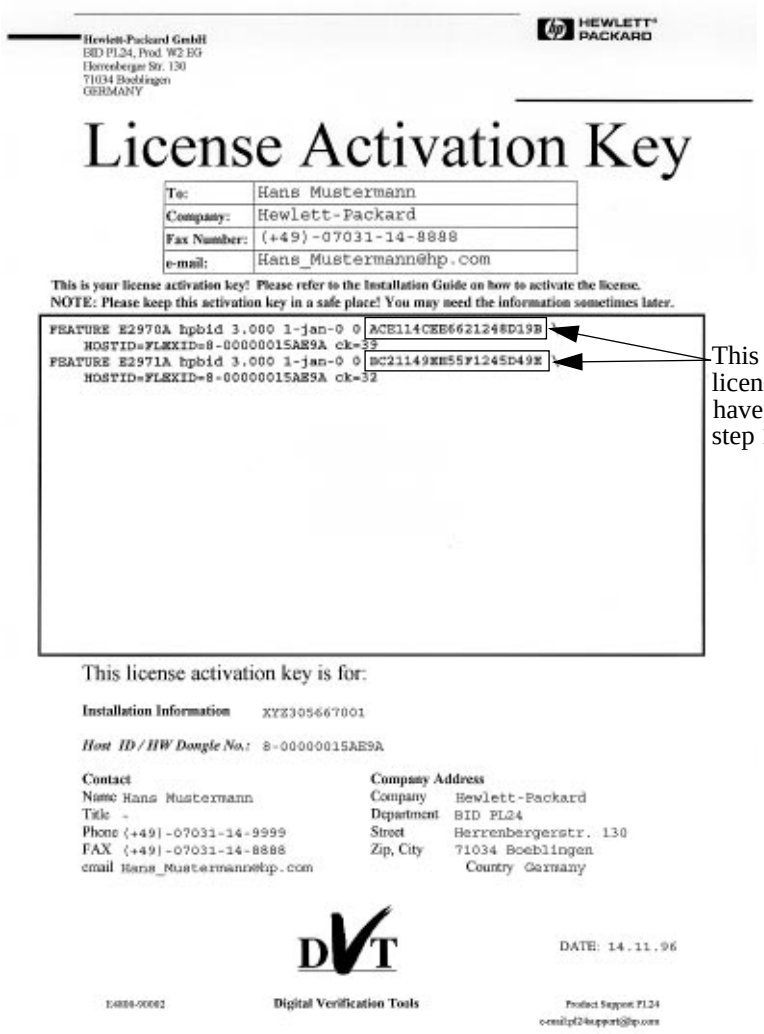
Note Only one license for each software add-on may be activated for one HW-Dongle. If you have ordered multiple licenses for software add-ons, please send a separate request fax for each HW-Dongle, specifying the corresponding HW-Dongle serial number and the software serial numbers.

We will fax you the license activation key for activating your system within two working days of receiving this request.

DVT

E2920-90001 **Digital Verification Tools** Product Support PL24
e-mail: pl-24support@hp.com

6 After we have received your request fax we will reply within two working days with the permanent license activation keys



Hewlett-Packard GmbH
BID PL24, Prod. W2 EG
Herrenberger Str. 130
71034 Boeblingen
GERMANY

HEWLETT PACKARD

License Activation Key

To:	Hans Mustermann
Company:	Hewlett-Packard
Fax Number:	(+49)-07031-14-8888
e-mail:	Hans_Mustermann@hp.com

This is your license activation key! Please refer to the Installation Guide on how to activate the license.
NOTE: Please keep this activation key in a safe place! You may need the information sometimes later.

```
FEATURE E2970A hpbid 3.000 1-jan-0 0 ACE114CEE6621248D19B
    HOSTID=FLEXID=8-00000015AE9A ck=39
FEATURE E2971A hpbid 3.000 1-jan-0 0 BC21149EE55F1245D49E
    HOSTID=FLEXID=8-00000015AE9A ck=32
```

This are the relevant license keys which have to be entered in step 10

This license activation key is for:

Installation Information XYZ305667001

Host ID / HW Dongle No.: 8-00000015AE9A

Contact
Name Hans Mustermann
Title -
Phone (+49)-07031-14-9999
FAX (+49)-07031-14-8888
email Hans_Mustermann@hp.com

Company Address
Company Hewlett-Packard
Department BID PL24
Street Herrenbergerstr. 130
Zip, City 71034 Boeblingen
Country Germany

DVT

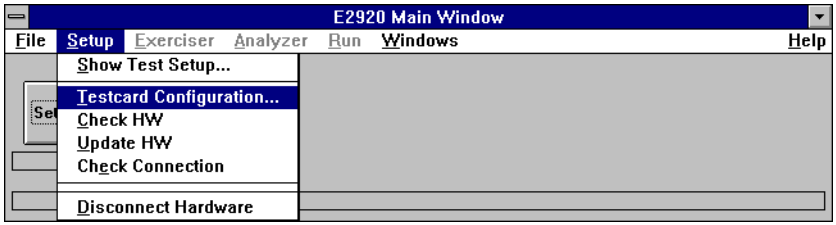
DATE: 14.11.96

E4888-00002

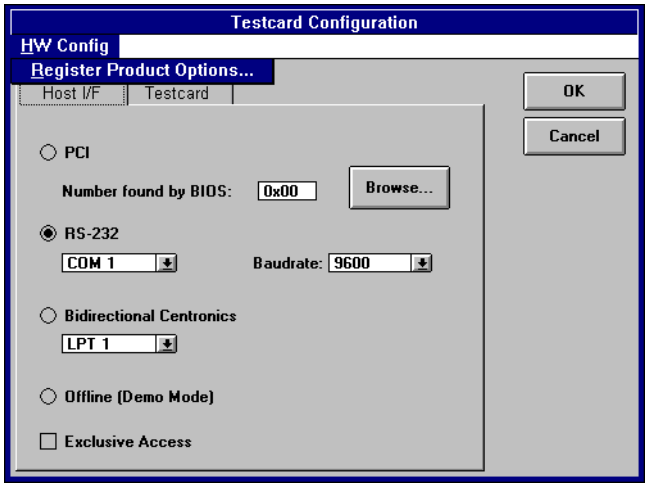
Digital Verification Tools

Product Support PL24
e-mail:pl24support@hp.com

7 When you have received the permanent license activation keys you have to enter the license activation keys in the registration window. First install the latest software revision, you have received on the CD-ROM, please see item 3, Install Software, on page 9. Second, update the hardware, please see item 14, Performing Hardware Update after a Software Update/Upgrade, on page 17.
Then select Testcard Configuration menu option of the Setup menu, in the E2920 Main Window



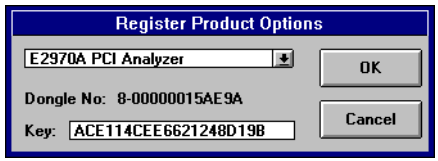
8 Then select 'Register Product Options...' menu option of the 'HW Config' menu.



9 Select the software add-on product in the pull-down menu.If there is no HW-Dongle No, then please connect the HW-Dongle and repeat from step 7.

10 Then type in the 20 character License Activation Key in the "Key" field and press the [OK]

button.

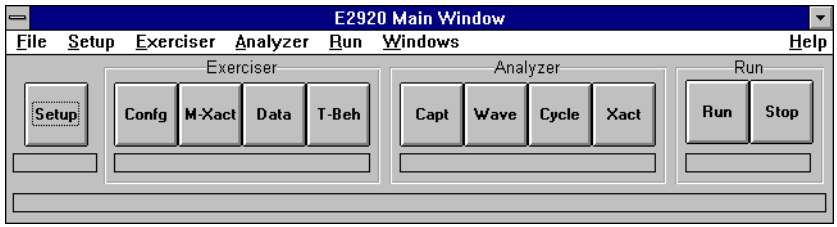


11 When the key is typed in correctly and the correct HW-Dongle is used a dialog window pops up stating that the software upgrade and licensing is successfully finished. Press the [OK] button in this dialog window.

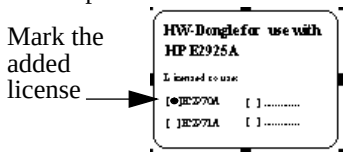
In cases where the licensing is not successful even after several times of repeating from step 7, please contact the e-mail address of Hewlett Packard shown on the request fax sheet, or use the support e-mail address shown on page 2 of this guide.

12 Repeat step 9 to step 11 for each software add-on to activate for the same HW-Dongle. For each HW-Dongle repeat step 7 to step 11.

13 After the upgrade and licensing the E2920 Main Window may look like the following.



14 After activation of software add-on license of a HW-Dongle, please mark the added license on the dongle's label. For example:



EU Regulatory Instruction - Site Attenuation Requirements

Introduction:
For all products installed in Europe (EEC Countries), the requirements of the EC Directive on EMC, 89/336/EEC have to be adhered to.
For this system, the derived standards as well as the classes are noted in the Declaration of Conformity in this guide.

Conformity from a Competent Body:
The EMC Directive (Para. 10.2) requires a Technical Construction File (TCF) with a Declaration of Conformity from a Competent Body (CB). For the Site Attenuation Requirements and the methods stated herein, a review by a CB is mandatory.

Technical Rational:
The product/system concerned here meets all requirements, except the Radiated Emissions of CISPR11/EN55011. This is mainly driven by cables, which provide limited shielding for higher frequencies and thus cause electromagnetic radiation like from an antenna.
In order to meet the requirements in situ, prevention has to be considered, before the product/system is turned on for its intended application. The methods described herein are sufficient to keep the system within the given limits of the standard.
For preparation of the data for the required site attenuation, the system was evaluated in a test site; the radiation values exceeding the limits were taken as reference of the required Target Values for this installation instruction. This way, the subtraction of the site attenuation from the measured radiation leads to a radiation level, requested by the standard.

Site Attenuation:
This document describes the methods for a Site Attenuation to meet the requirements of Class A. For:
HP E2925A PCI Exerciser & Analyzer Card System
the required value for Target Site Attenuation is: 16 dB

Installation Instruction:
If your site has got an allowance from a local (PTT) agency to exceed the levels of radiation, this exceeded level has to be considered. In case of i.e. +10 dB, subtract this ratio from the Target Site Attenuation.

Based on the location where the system is to be installed, obtain the Available Site Attenuation. The calculating method is described in the section *Calculating Method*. Some site preparations may have to be done. Try to optimize the location as well as the consideration of available walls or walls to be installed.

NOTE: When the location is finally determined, make an overall calculation of the Available Site Attenuation.

The Available Site Attenuation has to be greater than the Target Site Attenuation!

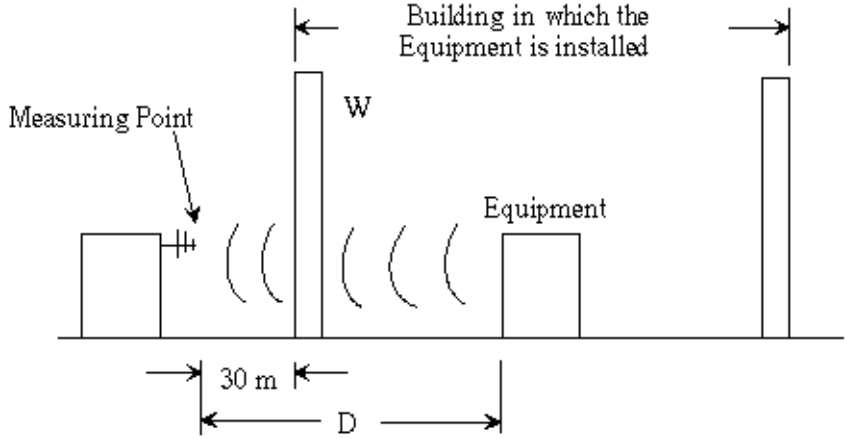
In case that this requirement is not achievable, consider other methods like the use of a Shielded Cabin with specified shielding performance. Other shielding methods like conductive wall paper, metal walls, etc. require an approval test ("in situ") by a local (PTT) agency. Appropriate arrangements have to be organized. Install the system as described in the Installation Manual.
The product installation then meets the requirements for radiation levels of Class A, of CISPR 11/ EN55011.

Calculating Method:
To obtain the necessary attenuation at the customer's site:

15 The attenuation of a concrete wall (W) (without any openings) = 10 dB

16 The distance (D) (the distance from the equipment to the exterior wall plus 30 meters) increases the attenuation by X and can be calculated as follows:
X = 20 * log (D/30) where: X = attenuation in dB, D= distance in meters

17 The total attenuation (A) is calculated as follows:
A= n * W + X
where:A= total attenuation in dB, n= number of concrete walls within distance D,
W = 10 (dB)



This method yields to the following requirements at the installation site:

Req. Site Attn./dB	Walls/n	Remaining Attn. Requirement/dB	Real Estate Border Distance/m
16	0	16	189
16	1	6	60
16	2	-4	19