User's Guide

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For Warranty and Regulatory information, see the pages behind
the Index.

HP 34812A
BenchLink Software

The HP 34812A BenchLink Software (HP BenchLink/Meter) package
provides a communication link between a personal computer (PC) and
the HP 34401A Multimeter (multimeter) or HP 53131/2A Universal or
HP 53181A RF Counter (counters). HP BenchLink/Meter allows you to
acquire, analyze, and save measurement data in a Windows
environment. HP BenchLink/Meter's key functions are:

- Acquire measurements from the instrument for real time or
  post-test analysis.

- Display measurement data graphically in real time strip charts
  or histograms.

- Scale measurements to reflect engineering units such as temperature,
  pressure, etc.

- Perform software limit testing on the measurement data.

- Display statistical information.

- Automatic and manual entry of information in the journal while
  acquiring measurement data.

- Copy measurement data and graphs to the Clipboard.

- Print measurement data as graphs.

- Import data from other BenchLink applications for analysis
  (.CSV or .PRN format).

- Export measurements as .CSV or .PRN files that may be read by
  external analysis/charting software applications.

This block diagram shows the flow of data within HP BenchLink/Meter.
Solid blocks indicate the components and processes of the application.
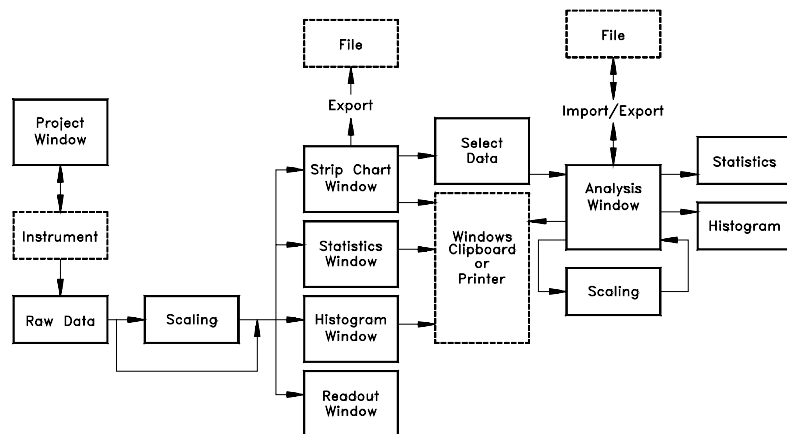
HP 34812A BenchLink Software

Conventions Used in this Guide

Throughout this guide the following typeface and icon conventions are maintained to improve readability and enable you to quickly find the information you need.

Ctrl+C   Italics are used to indicate a hot key (shortcut) to perform a task or to give some useful information.

The Toolbar and some paragraphs in this guide contain icons to represent an action.

CANCEL   This typeface is used to indicate the label on a button or other control.

b:\setup   This typeface indicates that input from the keyboard can be typed literally or indicates a menu command to be selected. For example: "Type **b:\setup**" or "Select **File | Open Project...** from the Menu Bar". **File | Open Project...** is separated by a bar because you must first select the File menu, then select Open.

Recommended Reading

This guide assumes that you have some experience using Microsoft Windows. If you don't know how to use the basic features of Windows or are unfamiliar with terms such as click, double-click, resizing, and dragging, you may want to consult your Microsoft Windows User's Guide.

If you are new to the HP 34401A Multimeter, HP 53131/2A Universal or the HP 53181A RF Counter, please read your user's guide before using HP BenchLink/Meter.

The READBLM.WRI file

This file contains up-to-date information about the HP BenchLink/Meter application. It is installed as an icon in the BenchLink program group during installation. Double-click the icon to view the contents of the file.

In This Book

Chapter 1 - Installation describes how to install HP BenchLink/Meter and configure your instrument for operation.

Chapter 2 - Quick Start describes how to start the software and provides a brief exercise to help you get started using HP BenchLink/Meter.

Chapter 3 - Using HP BenchLink/Meter describes how to use HP BenchLink/Meter for the acquisition and scaling of measurement data. Limit testing is also detailed.

Chapter 4 - Feature and Function Reference describes the features and functions available in HP BenchLink/Meter. Special file formats are described.

Chapter 5 - Using with Other Applications describes how to use HP BenchLink/Meter with other Windows applications. Copying, importing, and exporting data are explained.

Chapter 6 - Error and Information Messages lists possible HP BenchLink/Meter error and information messages with explanations and suggested solutions.

Table of Contents

1

Installation

Equipment Required

Personal Computer Requirements

- IBM (or compatible) 386 or 486 PC.

- 3.5" 1.44Mb floppy disk drive (high density).

- Microsoft compatible mouse (bus or serial).

- Color VGA or SVGA display.

- 4 MB memory.

- 2 MB free disk space
  (additional space is required for storage of project and data files).

- Microsoft Windows version 3.1 or higher.

- Microsoft MS-DOS version 5.0 or higher.

- Either RS-232 or IEEE-488 (HP-IB/GPIB) interface
  (as described below).

Computer Interface Requirements

IEEE-488 Interface Requirements. To use an IEEE-488 interface with
HP BenchLink/Meter you must have an HP-IB cable (HP 10833X) and one
of the following IEEE-488 interface cards already installed in your computer:

- HP 27209A HP-IB

- HP 82335A/B HP-IB

- HP 82341A and HP 82340A HP-IB

- National Instruments AT-GPIB

- National Instruments AT-GPIB/TNT

- National Instruments GPIB-PCII/IIA

RS-232 Requirements (HP 34401A Multimeter only). To use RS-232
with HP BenchLink/Meter you must have an RS-232 cable and an
available Asynchronous Serial (COM) port on your PC.

To connect the PC COM port to the HP 34401A Multimeter use an
HP 34398A cable kit. See the READBLM.WRI file for more information
on the RS-232 cable pinout configuration.

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[1] HP-IB is Hewlett-Packard's implementation of IEEE-488.2

Installing the HP BenchLink/Meter Software

1 Insert the HP BenchLink/Meter floppy disk in your computer disk drive.

2 Save any work in progress. Close unneeded applications. Select
File | Run... at the Program Manager. Type **a:\setup** in the
COMMAND LINE text box and press ENTER or click OK. Change the
drive letter if needed (i.e., **b:\setup**).
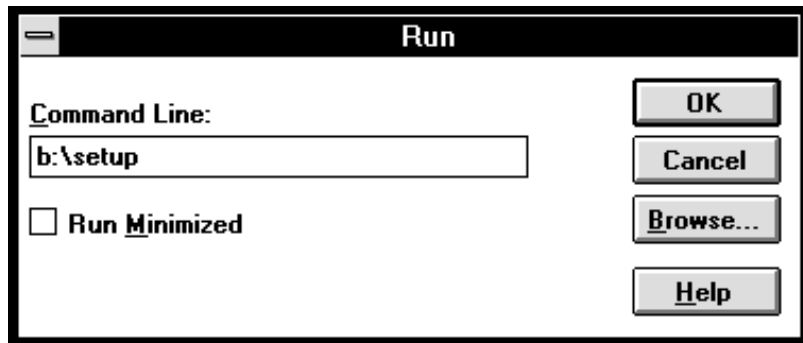
3 During the installation process, the setup program will prompt you for the directory to receive the files. Click INSTALL to accept the default installation directory. Click SET LOCATION and type a new drive and directory in the INSTALL TO text box if needed.

HP BenchLink/Meter's installation program displays the size of the files you elect to install. It also verifies that your destination disk drive has space available for those files.

```
┌─────────────────────────────────────────────────────────────┐
│ ─        HP 34812A BenchLink/Meter Installation             │
├─────────────────────────────────────────────────────────────┤
│  ┌─ Install to: ──────────────────────────────────────────┐ │
│  │  C:\BENCH                              [ Set Location ] │ │
│  └────────────────────────────────────────────────────────┘ │
│                                                              │
│  ┌─ Installation Options: ────────────────────────────────┐ │
│  │  ☒ HP BenchLink/Meter Application            1447KB    │ │
│  │  ☒ HP BenchLink/Meter Help                     83KB    │ │
│  │  ☒ HP BenchLink/Meter Sample Projects           1KB    │ │
│  │  ☒ HP BenchLink/Meter HP-IB DLL                33KB    │ │
│  │  ☒ Launch Application                          73KB    │ │
│  └────────────────────────────────────────────────────────┘ │
│                                                              │
│  Installation Drive:   C:           Windows Drive:   C:     │
│    Space Required:       1637KB       Space Required:  299KB │
│    Space Available:     24348KB       Space Available:24348KB│
│                                                              │
│  [   Install   ]      [    Exit    ]      [    Help    ]     │
└─────────────────────────────────────────────────────────────┘
```

4 The installation program will create a new program group in the Program Manager and add the HP BenchLink/Meter, Help, and Readme icons to the group.

> *During the setup program, you will be prompted to enter your name and your company name. This information will appear in the banner screen each time you start HP BenchLink/Meter.*

If you encounter problems

- Check the READBLM.WRI file for last-minute developments.

- Check the system and interface requirements listed on page 8.

- If you are using RS-232, be sure you are using the correct cable. Cable configurations and model numbers are described in the READBLM.WRI file.

- Check the error messages described in Chapter 6.

- If your PC is configured to use extended memory management (such as EMM386.EXE) and you are using a Hewlett-Packard HP-IB interface card, you must ensure that the memory management does not conflict with the interface card. This is accomplished by inserting an exclusion statement such as X=DC00–DFFF in your CONFIG.SYS file. See the installation section of your HP-IB interface card user's manual for steps to avoid this problem.

- If you are using an IEEE-488 interface card, ensure you have correctly installed the interface software before running HP BenchLink/Meter. Either an HPIB.DLL or GPIB.DLL file must be located in your HP BenchLink/Meter directory, the Windows directory, or a directory included in the PATH command in your AUTOEXEC.BAT file. (If you are using the HP 82341A or HP 82340A HP-IB card, you must have the SICL16.DLL and SICLUT16.DLL files in your Windows directory.) For specific details, refer to your IEEE-488 interface card installation guide.

To Change the HP BenchLink/Meter Icon

You can change the HP BenchLink/Meter icon appearance in the BenchLink program group.

1 Click the HP BenchLink/Meter icon in the BenchLink program group to select it (do not double-click to start the application).

2 Select **File | Properties...** in the Windows Program Manager Menu Bar. The Program Item Properties dialog box is displayed.

Program Item Properties		
Description:	HP BenchLink/Meter	**OK**
Command Line:	C:\BENCH\meter.EXE	**Cancel**
Working Directory:	C:\BENCH	
Shortcut Key:	None	**Browse...**
	☐ **Run Minimized**	**Change Icon...**
		Help
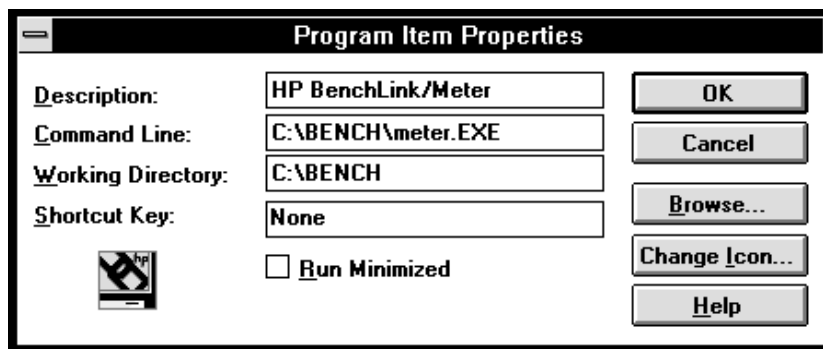
3 Click the CHANGE ICON... button. The Change Icon dialog box is displayed.

Change Icon	
File Name: C:\BENCH\METER.EXE	**OK**
Current Icon:	**Cancel**
	Browse...
	Help
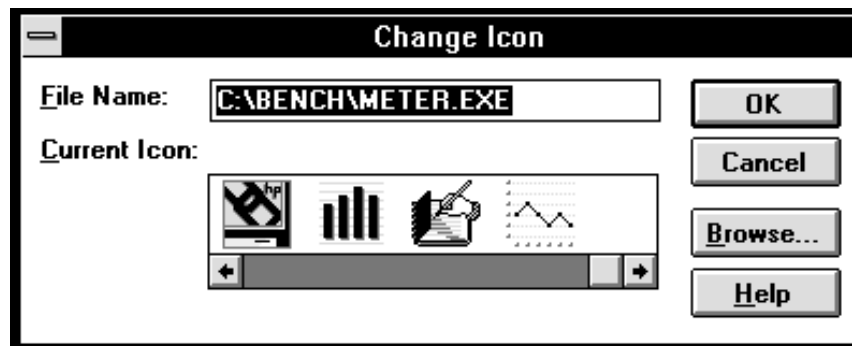
4 Scroll through the available icons and double-click the icon you want or highlight the icon and click OK. You will be returned to the Program Manager Items Properties dialog box which will now show the new icon. Click OK.

You can also select other icons from other program files. Refer to your Windows documentation for complete details about changing icons.

Freeing Disk Space

After installation you may wish to remove unnecessary files to free hard disk space on your computer. The following table describes files installed by HP BenchLink/Meter that may be safely removed to recover disk space.

File	Directory[1]	Use	When to remove
.	\BENCH\LAUNCH	Program files used to launch executable file upon certain conditions	If you do not wish to use the launch program in HP BenchLink/Meter
*.PRJ *.DAT *.TST	\BENCH\SAMPLES\	Sample project files	If you no longer need sample project files.
READBLM.WRI	\BENCH\	Configuration information about HP BenchLink/Meter and product information added or changed since this manual was printed	After HP BenchLink/Meter has been successfully installed and you do not plan to change your computer configuration (removal not recommended).
METER.HLP	\BENCH\	Help File	If you do not wish to use on-line help (removal not recommended).

[1] These listed directories assume the default directories were used for installation of Windows and HP BenchLink/Meter.

To Remove HP BenchLink/Meter

> *CAUTION* *Do not delete the Bench directory or files with the*
> *.INI, .DLL, .CSV, or .PRN extensions if you have other BenchLink*
> *applications installed on your PC.*

To remove the HP BenchLink/Meter program from your computer hard disk:

1 Delete the following files from the listed directories:

BENCH directory (or user specified installation directory):

METER.EXE	BenchLink/Meter executable
METER.HLP	BenchLink/Meter Help file
LOOKUP.TBL	Lookup table file
READBLM.WRI	BenchLink/Meter read me file
UNITS.CST	BenchLink/Meter file
UPDT_INI.EXE	INI file update program

BENCH\LAUNCH directory (or user specified installation directory):

.	MS Visual C++ source code files
	for launch application

BENCH\SAMPLES directory (or user specified installation directory):

*.PRJ	Sample test project files
*.DAT	Sample test project files
*.TST	Sample test project files

WINDOWS directory:

BENCHLNK.INI	Benchlink initialization file
BLSCALE.DLL	Dynamic Link Library
HPIB.DLL	Dynamic Link Library
QCBASED.DLL	Dynamic Link Library
SVIEWHP.DLL	Dynamic Link Library
SVIEWNI.DLL	Dynamic Link Library
UPDTBLNK.INI	Benchlink update file
SEMAPHOR.DLL	Dynamic Link Library
SVSICL.DLL	Dynamic Link Library

WINDOWS\SYSTEM directory:

|	
CTLSDV2.DLL	Dynamic Link Library
MSCOMM.VBX	Custom control used by Benchlink
SSBC.VBX	Custom control used by Benchlink
TOOLHELP.DLL	Dynamic Link Library

2 Delete the \BENCH directory.

2

Quick Start

2

This chapter provides an overview of HP BenchLink/Meter and gives a few exercises to help you get started using the software. This chapter does not describe all the features and functions of HP BenchLink/Meter. See Chapter 4 for more details.

HP BenchLink/Meter Components

Title Bar
Menu Bar
Toolbar

Status Bar
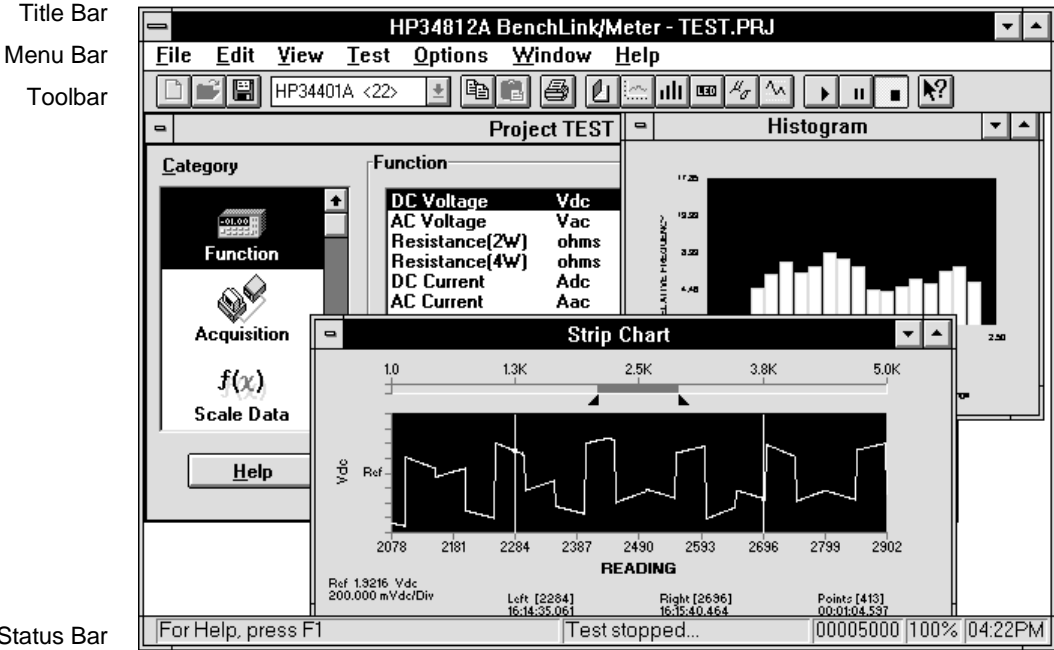
Title Bar

The Title Bar provides the standard Windows Control-menu box and sizing buttons. In the Title Bar, HP BenchLink/Meter also displays the name of the open project (.PRJ) file.

2

Menu Bar

The Menu Bar contains pull-down menus. Position your cursor over a menu item and click the mouse button to view the menu choices. You can also access the menus by holding the Alt key down and typing the underlined letter of the menu choice (for example, *Alt+F* will display the **File** menu).

Toolbar

The Toolbar contains icons for quick display of dialog boxes and rapid execution of HP BenchLink/Meter menu options. The icons on the Toolbar perform the same tasks as the pull-down menus in the Menu Bar, but do so with a single mouse click.

Status Bar

The Status Bar provides brief descriptions of the Menu Bar and Toolbar items currently selected as well as the test status and current time. It appears at the very bottom of the HP BenchLink/Meter screen and dynamically changes as the various menu commands are selected.

Project Window

This window is where you configure a test. It contains five categories of setup information. The project window also displays a button for category help. When you click the HELP button, information for the selected category is displayed. The following categories are available:

Function - This category allows you to configure measurement type, range, and resolution. This category varies according to the type of instrument selected.

Acquisition - This category allows you to configure acquisition and timing criteria.

Scale Data - This category allows you to scale incoming data and specify display units.

Limit Testing - This category allows you to set limit values, enable limit testing, and failure options.

Journal - This category allows you to automatically or manually document important information about the current project.

Each project has only one project window. The Title Bar at the top of the window contains the word 'Project' and the name you entered when you created the project.

Except for adding journal entries, editing of project information is disabled while a test is running.

For more information on the content and functionality of project window categories, see Chapter 4 - Feature and Function Reference.

Strip Chart Window

The strip chart window is the data acquisition window in HP BenchLink/Meter. It receives and displays the data as a line graph with the number of measurements on the X-axis and measurement values on the Y-axis. The data in the window is automatically scrolled as new data is acquired. You have the capability to scroll and zoom in on the data when the test is paused or stopped.

Histogram Window

This window provides the capability to histogram data acquired from the instrument. Histogram parameters such as data range and number of bins can be specified.

Readout Window

The readout window is a 'simulated LED' window that displays the current measurement value from the front panel of the connected instrument.

Statistics Window

This window displays statistical information for the acquired data.

2

Analysis Window

The analysis window can be used to display and analyze data copied from the strip chart window or from imported data files. This window's primary purpose is to provide a temporary workspace for data analysis. The contents of this window is not saved with the test project.

Starting and Closing HP BenchLink/Meter

Starting. HP BenchLink/Meter can be started in one of three ways:

- From the BenchLink program group, double-click the BenchLink/Meter icon.

- From the Windows **File** menu, choose **Run...** and, assuming HP BenchLink/Meter was loaded in a directory named 'bench', enter: **\bench\meter.exe**.

- From the DOS prompt, assuming HP BenchLink/Meter was loaded in a directory named 'bench', type: **win \bench\meter.exe.**

Once started, the HP BenchLink/Meter screen can be positioned, sized, maximized, or reduced to an icon using the standard Windows controls on the Title Bar.

Closing. You can exit from HP BenchLink/Meter in one of two ways:

- From the HP BenchLink/Meter Menu Bar, choose **File | Exit**.

- Double-click the Windows Control-menu box.

HP BenchLink/Meter will prompt you to save a new or unsaved project window.

2

Running a Sample Test Project

This exercise demonstrates how to use HP BenchLink/Meter. A sample test project for an HP 34401A Multimeter is created, displayed, and saved using the default parameters in the project window. Before attempting the sample test, it is recommended you have an instrument connected and configured. For information on interface configuration, See Configuring the Interface in Chapter 3.

Creating a Sample Test Project

1 To create a new project, click the New Project icon or select **File | New Project...** from the Menu Bar. The New Project dialog box will be displayed. The PROJECT TYPE drop-down list displays the instrument types for which a project can be created. Projects can be opened without an attached instrument.

The BROWSE... button can be used to display a list of existing test projects. Use the **File | Open Project...** command to open existing projects.

Only one project may be opened at a time. If a project is already opened, this command will not be available. Close the current test project and try step 1 again.

New Project		
Project Name: [ ]	**Browse...**	**OK**
Project Type: HP 34401A Multimeter ▼		**Cancel**

2 Type a filename in the PROJECT NAME text box and click the OK button. The project window will be displayed, indicating your selected filename in the Title Bar. Project categories are displayed on the left side of the window and the options on the right.

If you type a filename that already exists, HP BenchLink/Meter will warn you that it exists and ask if you want to overwrite it. If you select YES, then the data and project information from that previous test will be deleted and the project becomes a new one.
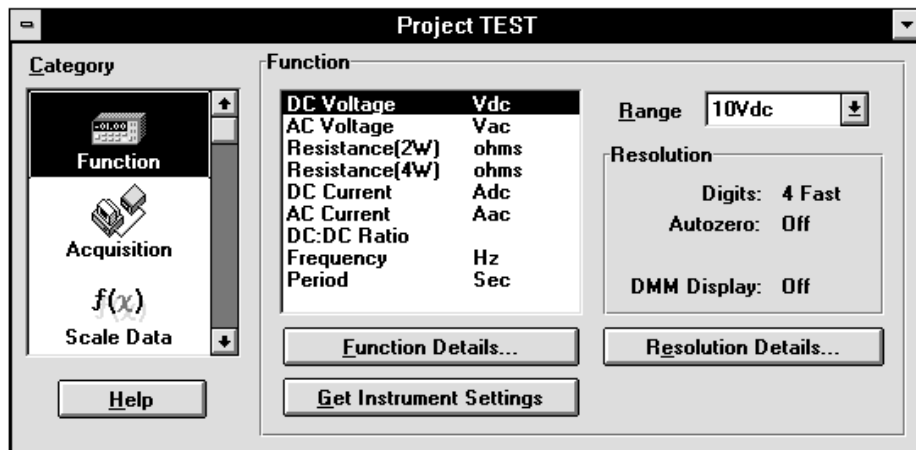
3   The first category displayed is the Function Category, listing appropriate options for the measurement functions, ranges and instrument resolution. This example of the Function Category displays options for the multimeter. Counter functions are different. For this sample project, do not change any of the default parameters.

4   Resolution can be optimized for speed or for accuracy in the Function Category. Click the RESOLUTION DETAILS... button to display the Resolution Options dialog box. Individual options may be selected or the ACCURACY or SPEED buttons may be selected. The ACCURACY button selects the greatest amount of resolution. The SPEED button selects the fastest acquisition. Resolution options are downloaded to the attached instrument when the test is started. Do not change any of the options and click the OK button to close the dialog box.

2

5 Click the GET INSTRUMENT SETTINGS? button to query the attached instrument and display the results in HP BenchLink/Meter. This will automatically change the function, range, and resolution to match those values presently in the instrument.

6 Select the Acquisition icon from the category list. The options available for this category include trigger setup, completion criteria, and the ability to set a delayed start time. Do not change any of the default parameters for the sample test.
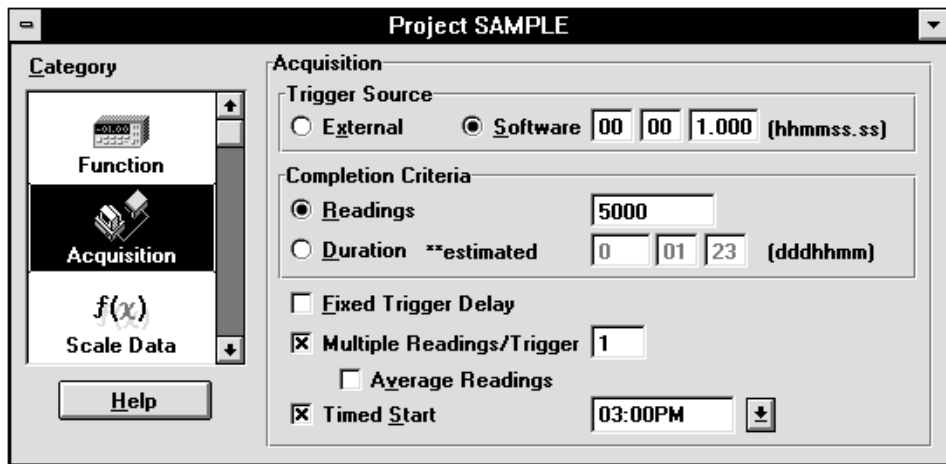
The TIMED START check box is used when you want to delay the start of the test. The delayed start time can be up to 24 hours in advance. Current time is always shown in the lower right corner of HP BenchLink/Meter's Status Bar.

You are now ready to collect measurement data from the attached instrument with default project parameters.

2

If you do not have an instrument attached via IEEE-488 or RS-232 cable, you cannot perform the next two sections - Displaying and Saving the Sample Test.

Displaying Measurement Data

1 Click the Strip Chart icon or select **Window | Strip Chart** from the Menu Bar to display a strip chart window.

2 Click the Histogram icon or select **Window | Histogram** from the Menu Bar to display the histogram window.

3 Click the Statistics icon or select **Window | Statistics** from the Menu Bar to display the statistics window.

4 Click the Readout icon or select **Window | Readout** from the Menu Bar to display the readout window.

5 Click the Run icon or select **Test | Run** from the Menu Bar to start the test. The Run icon is depressed and the data will be displayed in the windows that you have opened.

6 The test can be paused and resumed at any time during the collection of data by clicking the Pause/Resume icon or by selecting **Test | Pause/Resume** from the Menu Bar. When a test is temporarily paused, the strip chart window will adjust the display to show the last points acquired. The Pause/Resume icon remains depressed until the test is resumed.

CAUTION When a test is paused, measurements taken by the attached instrument are not saved.

When displaying real time histogram and statistics windows simultaneously, the information in the histogram may not match the statistics displayed in the statistics window. This is because the default number of bins and data range parameters in the histogram window may not be optimized for your data. To make the information in these windows match, the histogram should be closed and reopened after the test has concluded.

2

7 Important information about the project such as reasons to perform the test and particular test conditions can be entered in the journal. The Journal Category is accessed by clicking on it in the project window or by typing 'J' when the category list of the project window is active. Journal entries are automatically made upon the following conditions:

- the test is started

- the test is paused

- the test is resumed

- the test is stopped

- limit testing is enabled/disabled

- limit values have been changed

- a limit value has been exceeded (if limit testing is enabled and logging of failures has been selected)
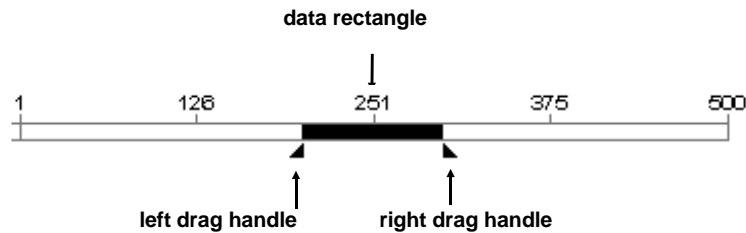
Manual entries can be made in the journal at any time even while running a test. To add an entry, click the ADD ENTRY button, enter the text and click OK.

2

8   Click the Stop icon or select **Test | Stop** from the Menu Bar to stop the test. Once you stop the test it cannot be resumed (only a paused test can be resumed).

Within the strip chart window, an interactive 'control bar' provides browsing and zooming capability on the acquired data. The control bar consists of three mouse-interactive objects - a data rectangle and a drag handle on each side of the rectangle. The data rectangle is a visual reference used to indicate the location of the strip chart window's data in relation to the entire data set.

data rectangle

Browsing and/or paging is accomplished by clicking and dragging the rectangle or using the PAGE UP, PAGE DOWN, END, and HOME keys on your keyboard. You can zoom in and out of the data by using a click and drag motion on either drag handle. Moving a drag handle changes the number of measurements viewed in the window, effectively changing the X-axis scale.

9   Select **View | Markers** from the Menu Bar to enable vertical markers in the strip chart window. (You can also use the Chart Parameters dialog box to enable markers) Vertical markers in the strip chart window are used to specify selection boundaries for **Edit | Copy** operations and to specify time and reading value information. The time locations of the markers and the value of the readings are displayed at the bottom of the strip chart window. The markers can be moved by clicking and dragging them with your mouse, or you can use the left/right arrow keys on your keyboard when you have selected a marker. Use *Alt+L* to select the left margin and *Alt+R* to select the right margin. For exact marker placement, select **View | Modify Parameters...** and type the reading numbers in the LEFT and RIGHT text boxes of the Chart Parameters dialog box.

Data between the markers is copied to the Clipboard when the **Edit | Copy** command is selected. A maximum of 4000 readings can be copied at one time. This data can then be pasted into the analysis window.

2

Saving Project and Measurement Data

The entire test project can be saved as a .PRJ file, which can be reopened at a later date. HP BenchLink/Meter automatically saves the measurement data in the project as a .DAT file and the test definition information in a .TST file. These internal file formats are usable only by HP BenchLink/Meter.

Measurement data can also be saved in ASCII files. This data is saved from the strip chart window in two columns containing time, reading number, and measurement value format. The two ASCII formats are: .CSV (separated by a comma) and .PRN (separated by a tab).

Saving the entire project file

1 Click the Save icon or select **File | Save Project** from the Menu Bar. The Save As dialog box is displayed using the filename you typed when the project was created. Type in the desired filename if it is different than the one shown.
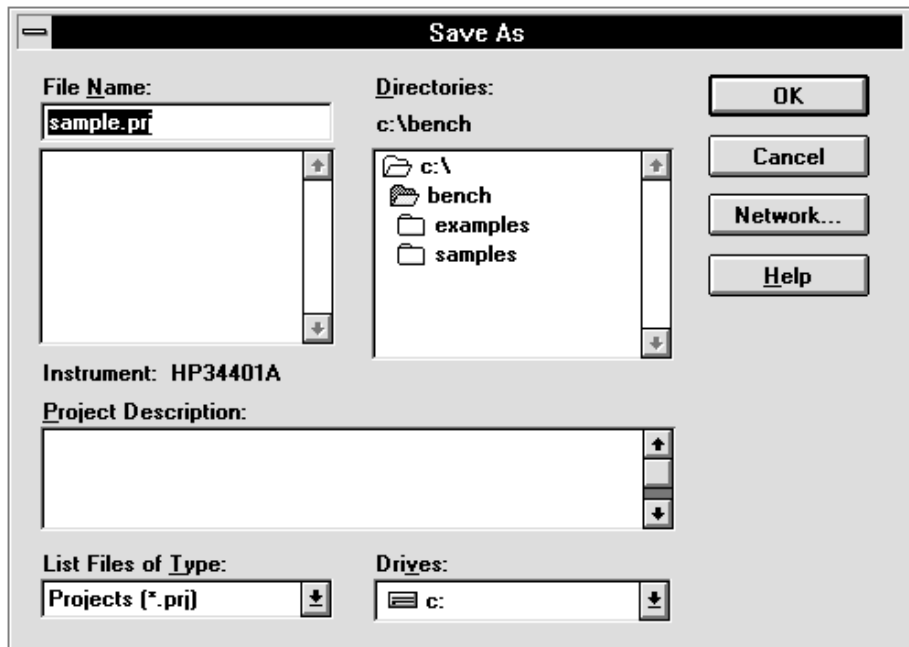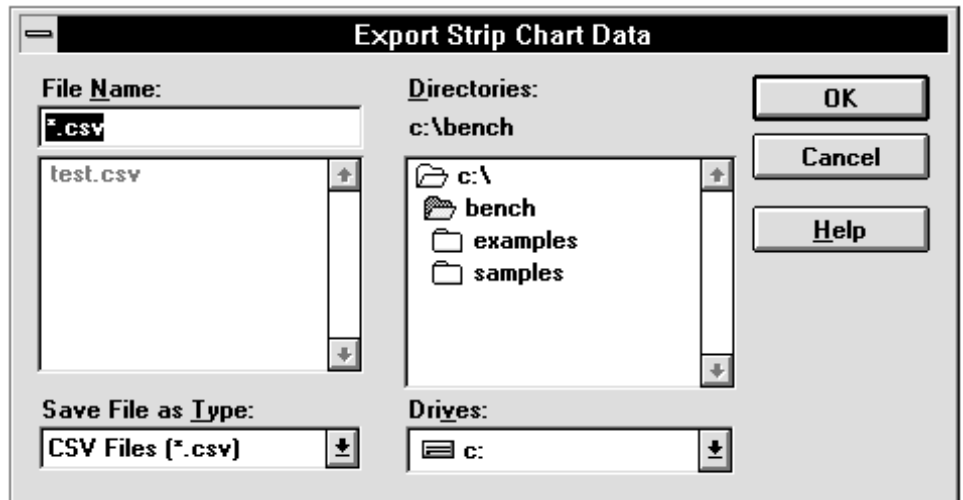
2 A description of the project can be typed in the PROJECT DESCRIPTION text box. This information is available for display or modification when you reopen the file at a later date.

3 When you have finished with the Save As dialog box options, click the OK button to save the project file.

The .PRJ project file can be reopened at a later date and the test run again using the same parameters.

Saving measurement data

1 With the strip chart window as the active window, select **File | Export Data...** from the Menu Bar. The Export Strip Chart Data dialog box is displayed.

```
┌─────────────────────────────────────────────────────────────┐
│ ═                    Export Strip Chart Data                 │
├─────────────────────────────────────────────────────────────┤
│  File Name:              Directories:         ┌──────────┐   │
│  ┌──────────────┐        c:\bench             │    OK    │   │
│  │ *.csv        │                             └──────────┘   │
│  ┌──────────────┐ ▲     ┌─ c:\        ▲       ┌──────────┐   │
│  │ test.csv     │ █     ├─ bench       █      │  Cancel  │   │
│  │              │       │  examples             └──────────┘   │
│  │              │       │  samples            ┌──────────┐   │
│  │              │       │                     │   Help   │   │
│  │              │ ▼     │             ▼       └──────────┘   │
│  └──────────────┘       └───────────┘                       │
│  Save File as Type:      Drives:                            │
│  │CSV Files [*.csv]  ▼│   │ 💾 c:          ▼│               │
└─────────────────────────────────────────────────────────────┘
```

2 Select either .PRN or .CSV from the SAVE FILE AS TYPE drop-down list. Select the correct drive, directory and type a name in the FILE NAME text box.

3 After your choices have been selected or typed, click the OK button. The new file will be saved in the specified directory.

The .CSV or .PRN file can be opened in another application such as Microsoft Word or Excel to display or annotate test results.

3

Using HP BenchLink/Meter

This chapter describes procedures, components, and features you will use in HP BenchLink/Meter.

About the HP BenchLink/Meter Application

The acquisition of test measurement data is the ultimate goal of the HP BenchLink/Meter application. The project window is the control center. From this window you can configure virtually all aspects of the test - from measurement data type to the time interval and number of readings in the test.

The measurement data can be acquired from a Multimeter (HP 34401A), a Universal Counter (HP 53131/2A), or an RF Counter (HP 53181A). While the data is being captured, it may be viewed graphically by opening a strip chart or histogram window. This data can be scaled using linear or other custom algorithms. Limit testing may be performed while the test is running with various responses available upon test failure. Statistics information is also available on the data.

After the data has been acquired, it can be copied to and analyzed in the analysis window, copied to the Clipboard as data & graphics, printed, or saved as an ASCII data file.

All information in the project window is saved in a proprietary .TST file as part of the project (.PRJ) file. Desktop information such as window size and placement in the HP BenchLink/Meter screen is also saved as part of the project. Existing projects can be reopened, modified, and saved for later use; or, the project can be saved as another filename using the **File | Save As...** menu command. This allows you to create standard test project windows for reuse without performing all the steps necessary to create a new project.

Saving and opening project files from a floppy disk can be very slow. It is recommended that all project files be saved on your hard disk.

Making Standard Measurements

HP BenchLink/Meter collects measurement data from both counters and multimeters. Running a test project is essentially the same for counters and meters, but configuration options such as measurement functions, ranges, resolutions, and acquisition information vary between the two types of instruments. This section explains the operation of HP BenchLink/Meter when configuring measurement functions and acquisition options for both counters and multimeters.

3

Function and Range Options

When a test project is opened in the HP BenchLink/Meter application, it must be configured just as you would configure your instrument to run a test. The first category that must be addressed is the Function Category, which controls measurement functions, ranges, and resolution options available for the selected function.

HP BenchLink/Meter normally uses the settings you define when creating a project to configure an instrument. When a test starts, this configuration is written to the instrument, overwriting any settings made from the instrument's front panel. If you want to set up the instrument from the front panel and use those settings, simply configure your instrument and click the GET INSTRUMENT SETTINGS button in the Function Category. This will upload the instrument's front panel settings to HP BenchLink/Meter for use in your project.

If you select a scaling option from the Scale Data Category, you must also select the appropriate function to display the test results. For example, when using the thermistor scaling option, you should select the 2-wire resistance function. BenchLink/Meter will ask if it can do this for you.

1 Select a measurement function from the FUNCTION list.

2 In addition to the measurement function, a valid range value must be selected when using the multimeter. Range values are saved with the measurement function. When switching between functions, the last range for that particular function is automatically displayed. Selecting the AUTO option enables autoranging on the attached multimeter.

Click the FUNCTION DETAILS... button to display additional details and options for the selected function. Counter details include channel or trigger setup, input impedance, and coupling options. For measurements that use two channels, you must select a start source for configuration, then select the stop source for configuration.

Measurement functions and ranges for the HP 34401A Multimeter include:

Function	Range
DC Voltage	AUTO, 0.1, 1.0, 10.0, 100.0, 1000.0
AC Voltage	AUTO, 0.1, 1.0, 10.0, 100.0, 750.0
Resistance (2-wire)	AUTO, 100, 1K, 10K, 100K, 1M, 10M, 100M
Resistance (4-wire)	AUTO, 100, 1K, 10K, 100K, 1M, 10M, 100M
DC Current	AUTO, 0.01, 0.1, 1.0, 3.0
AC Current	AUTO, 1.0, 3.0
DC:DC Ratio	AUTO, 0.1, 1.0, 10.0, 100.0, 1000.0
Frequency	AUTO
Period	AUTO

Measurement functions for the HP 53131/2A Universal or HP 53181A RF Counters include some or all of the following:

Functions	
Frequency	Frequency Ratio 1,2
Period	Phase 1,2 [2]
Risetime [2]	Period 2
Falltime [2]	Frequency 2
Positive Width [2]	Period 3 [1,2]
Negative Width [2]	Frequency 3 [1]
Duty Cycle [2]	Frequency Ratio (1 to 3) [1]
Totalize [2]	Frequency Ratio (3 to 1) [3]
Time Interval 1,2 [2]	Frequency Ratio (2 to 1) [3]

[1] Channel 3 is an option for the HP 53131/2A Universal Counters.

[2] These options are not available for the HP 53181 RF Counter.

[3] These options are available for the HP 53131/2A Counters with the latest firmware revision.

3

Resolution Options

Resolution options are also selected in the Function Category. HP BenchLink/Meter's resolution options contain more than just the number of digits resolution to be used. This area also includes other information such as autozero or automatic interpolation mode and enabling/disabling the instrument's front panel display. When you are using one of the counters, you can define resolution in terms of gate time or digits of resolution. Default buttons for speed and accuracy are provided to automatically select the fastest or most accurate acquisition of measurement data.

1 Select resolution options for the attached instrument.

Resolution options for the multimeter include:

- Autozero Off - enables/disables autozero mode on the attached multimeter. Autozero mode is off when this check box is checked.

- Instrument Display Off - enables/disables the multimeter's front panel display when running a test. Instrument display is disabled when this check box is checked. Acquisition of measurement data is faster when the instrument display is disabled.

- Digits - selects number of digits resolution (and integration time) used by the multimeter. Select one of the following options from the drop-down list:

DIGITS	INTEGRATION TIME (number of power line cycles - NPLC's)
4 Fast	.02 PLC
5 Fast	.2 PLC
5 Slow	1 PLC
6 Fast	10 PLC
6 Slow	100 PLC

Resolution options for the counters include:

- Gate Setup - selecting the Stop Source helps determine the resolution of your measurement. AUTO provides the fastest possible measurements. TIME lets you define resolution by setting the counter's gate time. DIGITS lets you directly set the digits of resolution you want.

3

- Instrument Display Off - enable/disable the counter's front-panel display when running a test. Acquisition of measurement data is faster when the instrument display is disabled.

- Set Expected Range After First Reading - This option instructs the counter to look at its first reading and estimate the frequency range from that reading. Selecting this option increases accuracy at the expense of a slower first reading.

- Disable Automatic Interpolator Calibration - the automatic interpolator helps maintain frequency accuracy for precise measurements. Disabling allows faster measurements at the expense of a small amount of accuracy.

- Choosing the "Speed" default setting for the counters also changes the triggering function from AUTO to ABSOLUTE. AUTO triggering mode tells the counter to check trigger levels and adjust them if needed to a new level. The ABSOLUTE setting gives the counter a defined voltage to trigger on, and you may need to set this trigger voltage for correct triggering on your circuit. Since the counter does not examine the incoming signal in ABSOLUTE mode, this mode is much faster.

Acquisition Options

After the Function Category has been configured, the Acquisition Category information should be selected. This category contains information on triggering, the total number of readings to be taken, and the option to delay the start time of the test. The length of the test can be specified in time duration or as a total number of readings.

1 Select triggering options:

Triggering for a multimeter or gate arming for a counter can be performed by the HP BenchLink/Meter application or by a source external to the instrument. The interval between software triggers (or gates) can also be specified.

Other trigger options for the multimeter include trigger delay (up to 3600 seconds), and multiple readings per trigger (1 to 512). Multiple readings can also be averaged into one reading for each trigger.

2   Select readings or duration options:

To configure the test length according to total number of readings to be acquired, click the READINGS button and type a number in the text box. The number of readings in a test is limited to 10 million. This number may be further limited by the amount of disk space available on your PC. Before the test is started, HP BenchLink/Meter will approximate the space required to run the test and verify that enough disk space is available. If a conflict is detected, a warning message will be displayed indicating the potential problem. HP BenchLink/Meter then estimates the duration of the test and displays it in the DURATION text boxes in hours, minutes, and seconds.

Duration. To configure the test length in time duration, you must click the DURATION button and type the desired numbers in the days, hours, and/or minutes text boxes. HP BenchLink/Meter then estimates the total number of readings to acquire and displays it in the READINGS text box.

Timed Start. Test projects in HP BenchLink/Meter can be configured to use a delayed start time (up to 24 hours). The clock used for the start time of the test is the PC clock time displayed in the right corner of the Status Bar. HP BenchLink/Meter uses the time format currently selected for your PC (12 or 24 hours). A start time may be selected from the TIMED START drop-down list, or you may type a time in the text box. The time format must be the same as the format displayed in the Status Bar. After selecting a time from the drop-down list or entering the time you wish the test to start, you must click the Run icon or select **Test | Run** from the Menu Bar to activate the timed start option. The Run icon remains depressed and the countdown to the delayed start time is displayed in the Status Bar. The timed start option can be canceled at any time by clicking the Stop icon or by selecting **Test | Stop** from the Menu Bar.

If you are working in other applications while running a test, there is a possibility that some readings may not be acquired. This situation occurs when the PC's CPU is busy with other operations and communications with the attached instrument is delayed.

3

Running a Test with Limits Enabled

HP BenchLink/Meter provides the ability to perform limit testing on
measurement data acquired from the connected instrument. Upper and
lower limits can be specified in addition to steps to be taken when a limit
failure occurs.
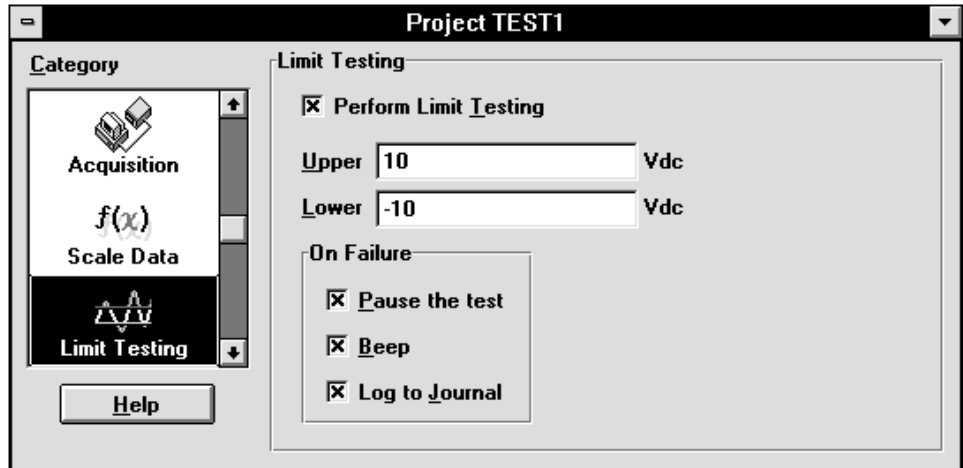
Configuring Limit Testing

1 In the Limit Testing Category of the project window, click the
PERFORM LIMIT TESTING check box. This enables limit testing when
the test is started and displays limit markers in the strip chart window.

2 Type an upper limit value in the UPPER text box and a lower limit value
in the LOWER text box. The limits can be set to any value between
the lowest and highest values for the present function.

*Limit values should be entered in scaled units if scaling is enabled. For
example: if you are using a thermocouple and have configured
HP BenchLink / Meter to scale volts to degrees C, you would enter limit
values as degrees C, not volts.*

3 Choose an option to be performed upon failure of the limit test.
Any combination or all of the options may be selected for limit testing.
The options are:

- PAUSE THE TEST - pauses the test, displays a warning dialog,
  and updates the Status Bar test condition when a limit failure
  has been detected. The test can be resumed by clicking OK in
  the dialog box, and clicking the Pause/Resume icon (or select
  Test | Pause/Resume from the Menu Bar).

*If you select this option with multiple readings per trigger,
HP BenchLink/Meter will pause the test immediately after the limit
failure. If there were more readings to be taken for the current trigger,
those readings will not be captured or displayed.*

- BEEP - causes your PC to beep each time a limit failure has been
  detected. The test will continue to run if this is the only option
  selected.

- LOG TO JOURNAL - an entry will be recorded in the journal to
  indicate the type of failure, the time it occurred, and the reading that
  failed. A maximum of 50 failures are logged, but this default can be
  changed. See the READBLM.WRI file for instructions to change this
  parameter.

4 HP BenchLink/Meter is now ready to perform limit testing on the data
acquired from your connected instrument. The failure options you have
selected will be implemented when you start the test.

*HP BenchLink/Meter allows you to change limit values while a test is
paused, but statistics for the data continue to accumulate. Failures
after the new limit values have been specified will be combined with
previous failures. Limit failure statistics are available through the
statistics window.*

Using the BenchLink/Launch Program

HP BenchLink/Meter provides the capability to launch another software application when a limit test failure or other selected criteria occurs. This is accomplished by running the BenchLink/Launch application, which is installed as an icon in your BenchLink program group. This program is installed as an option during HP BenchLink/Meter's installation.

The launch program relies on status messages sent from HP BenchLink/Meter to start your selected application. When the launch program detects a selected criteria status message, it sets the state for that criteria item, and executes the application. The application can be either a DOS or Windows application, but must have an EXE, BAT, or COM file extension. After a status message has been detected, that criteria item will remain in that state until the launch program is stopped and started again (or the criteria item status is reset). For example: after a high limit failure has been detected and the selected application launched, the state for high limit failure remains the same until the launch program is terminated and run again. If you are using a stopped test as the launch criteria, the stopped test state is reset when the test in HP BenchLink/Meter is restarted.

If you wish to start the selected program upon a limit failure, limit testing must be enabled in HP BenchLink / Meter before running the launch program. You do not have to enable limit testing if you wish to launch a program based on other non-limit criteria.

1 To start the launch program, double-click the BenchLink/Launch icon. The following application box is displayed. This box can be minimized or left open and placed by the HP BenchLink/Meter screen.
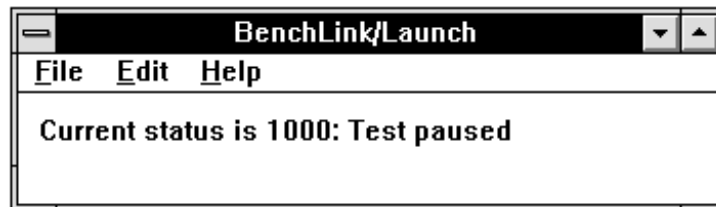
2 Select **Edit | Launch Options...** from the Menu Bar to display the
Launch Options dialog box. From this dialog you can select the
application you wish to start and choose the applicable launch criteria.
Type the path and filename of the application in the
PROGRAM TO LAUNCH text box. Click the check box(es) of the
applicable criteria and click the OK button when you are finished.
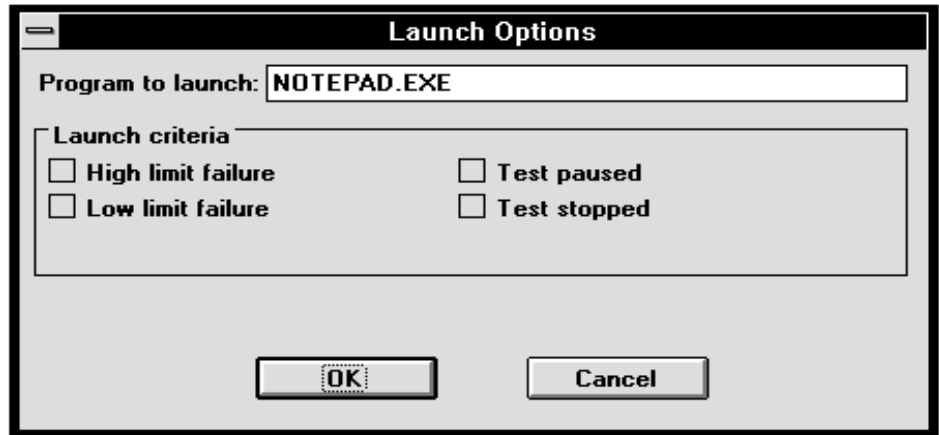
The launch program is now ready to start the selected application upon a
limit failure or other selected criteria in HP BenchLink/Meter. The
current status is displayed in the application box.

*Included with the launch program is the source code for the executable,
written in Microsoft's Visual C++. The files are located in the*
\bench\launch *directory (assuming the default bench directory was
used). The source code is provided in the event you would like to modify
the operation of the program on your own.*

3

Using HP BenchLink/Meter to Scale Data

HP BenchLink/Meter provides three methods to scale the measurement data in the strip chart window: linear, lookup tables, and equation libraries. Scaling must be chosen before the test is started and data is collected.

Linear Scaling

Linear scaling uses the equation $(f(x) = mx + b)$ where m is the slope and b is the y-axis intercept.
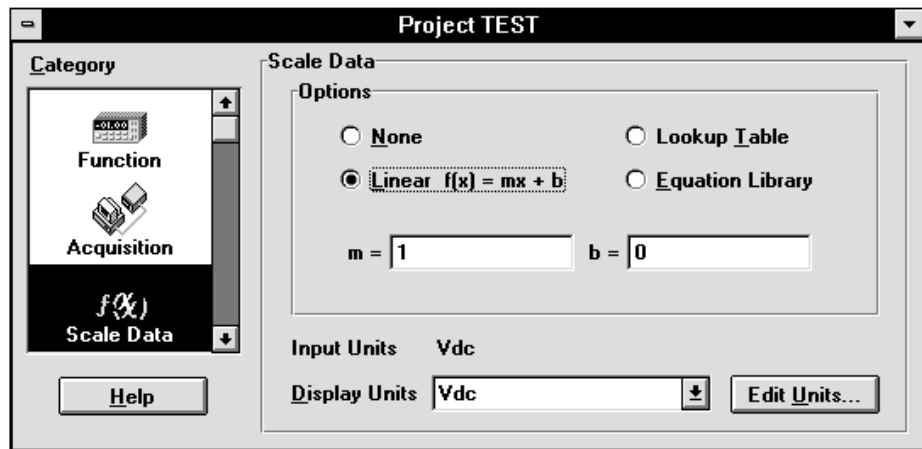
To select linear scaling:

1 In the Scale Data category of the project window, click the LINEAR button. This selects linear scaling as the active scaling method.

2 Type values for 'm' and 'b' in their respective text boxes and press ENTER. These linear scaling values will be used with the next acquisition of data.

3 If necessary, change the units displayed in the strip chart window to reflect the new values. This is accomplished in the Function category options.

Linear scaling can be used in the same manner as the null math function. Simply type the null value in the b = text box.

Lookup Tables

Lookup tables are similar to the linear scaling method. This spreadsheet type of table contains two columns - the first for the input value and the second for the output value. HP BenchLink/Meter uses piecewise linear interpolation between two lookup table values or the slope of last two data points for values outside the table range. Files from applications such as Microsoft Excel in .CSV or .PRN file format can be used as lookup tables by saving them with a .TBL extension.
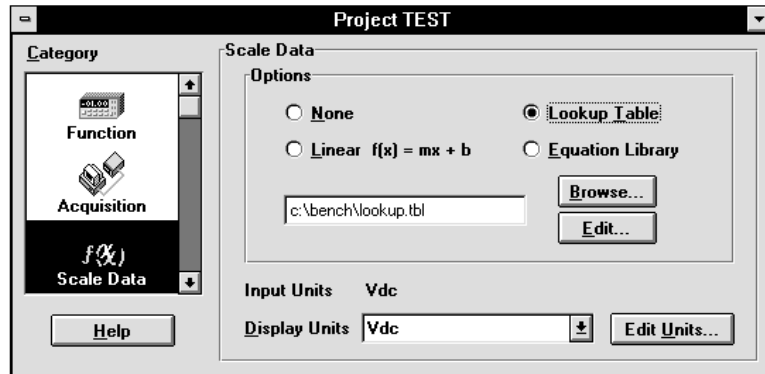
To select scaling with a lookup table:

1   In the Scale Data category of the project window, click the LOOKUP TABLE button. This selects lookup table scaling as the active scaling method for the measurement data.

2   Click the BROWSE... button to open an existing lookup table. A sample .TBL file is included with your HP BenchLink/Meter application. If the desired file is not listed in the FILE NAME box, you may select another directory or drive to search for the file. Click the OK button after selecting your file.
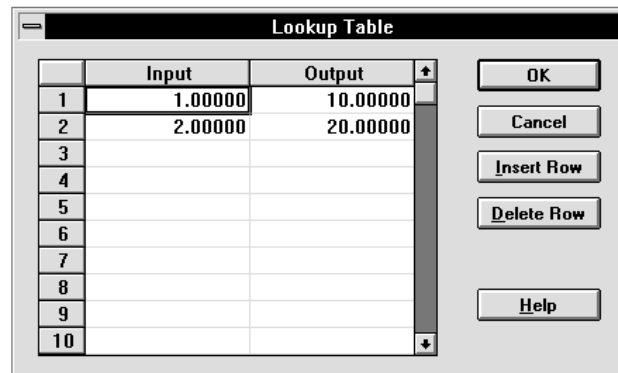
3 Click the EDIT... button to view and change values in the currently selected table. For every input value there must be an output value specified.

The following keys can be used for navigation within the scaling lookup table:

Up Arrow	Move to the cell above the active cell
Down Arrow	Move to the cell below the active cell
Right Arrow	Move to the cell to the right of the active cell
Left Arrow	Move to the cell to the left of the active cell
Shift+Arrows	Extend the cell selection
PgUp	Move one page up
PgDn	Move one page down
Ctrl+PgUp	Move one page to the left
Ctrl+PgDn	Move page to the right
Home	Move to the first cell in the row
End	Move to the last column that has data, staying within the current row
Ctrl+Home	Move to row one, column one
Ctrl+End	Move to the last row and column that has data
Tab	Move to the next cell. The order is right, then down
Shift+Tab	Move to the previous cell. The order is left, then up
Shift+Space	Select the current row
Ctrl+Space	Select the current column
Shift+Ctrl+Space	Select the entire table
Enter	Enters data in the active cell
Esc	Clears entered data from the active cell

4 When you have finished entering the input and output values for your lookup table, click the OK button to close the table. The selected lookup table scaling will be used when the next acquisition of data is performed.

Lookup table input values do not have to be entered in sorted ascending or descending order; HP BenchLink/Meter will automatically sort the table information and check for inconsistencies.

Equation Libraries

The third type of scaling used in HP BenchLink/Meter is the equation library. Equation libraries consist of pre-determined equations to scale measurement data for thermocouples, thermistors, RTD's (resistance temperature detectors), and power (dBm).
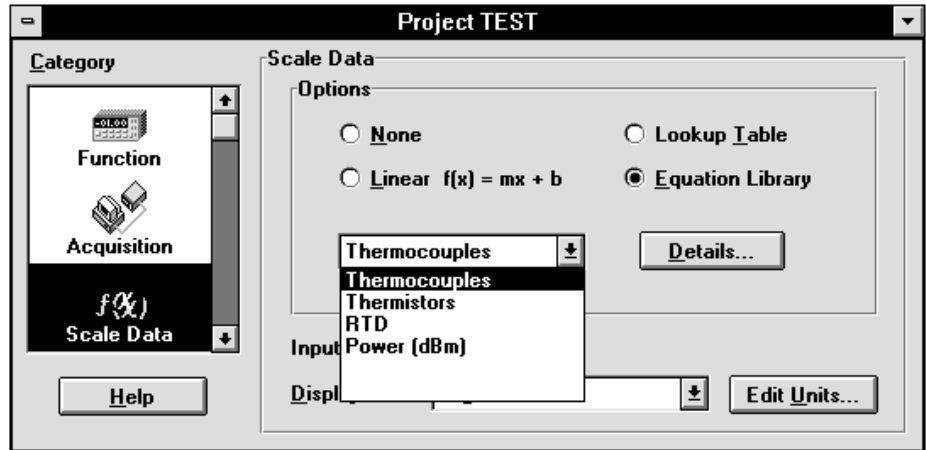
To select equation library scaling:

1 In the Scale Data category of the project window, click the EQUATION LIBRARY button. Select your choice from the drop-down list by clicking on it. Each scale equation is intended to be used with a particular type of measurement. HP BenchLink/Meter will check the selected measurement type and prompt you to change if the selected equation does not match the selected measurement.

2 Click the DETAILS... button to display options for the selected equation.

> *The power scaling option can be used in the same manner as the dBm math function from the multimeter.*

Printing Windows and Measurements

The strip chart, histogram, and analysis windows can be printed when actively displayed in HP BenchLink/Meter. Journal and statistics window data can be copied to the Clipboard and printed from other applications. Measurements exported as time or reading number/measurement value files (.CSV or .PRN) can also be opened and printed by other applications.

Printing Strip Chart, Histogram, or Analysis Windows

1 Click on the strip chart, histogram, or analysis window to make it the active window.

2 Select **File | Print** from the Menu Bar or click the Print icon. The active window is automatically printed.

Printer information such as default printer, orientation, and paper size can be selected in the **File | Print Setup...** dialog box.

Printing Journal or Statistics Window Information From Other Applications

Information in the journal or the statistics window can be copied to the Clipboard and pasted into other applications for printing.

Journal

1 Select the information in the journal by highlighting the information with your mouse (click and drag). If you wish to print the entire contents of the journal do not select anything.

2 Click the COPY button at the bottom of the journal options box. This copies the selected data (or all of it) to the Clipboard as text.

3 Open the destination application (such as Microsoft Word or Write) and select **Edit | Paste** from the Menu Bar.

The information is now available to save as a file or print. Consult your application's documentation for instructions on how to save or print the data.

Statistics Window

1 Click the statistics window to make it the active window in
HP BenchLink/Meter.

2 Copy the information to the Clipboard by selecting **Edit | Copy** from the
Menu Bar. The data is copied in text format.

3 Open the destination application (such as Microsoft Word or Write) and
select **Edit | Paste** from the Menu Bar.

The information is now available to save as a file or print. Consult your
application's documentation for instructions on how to save or print the data.

Saving Project Information

Information from the project window, strip chart data, and the location and
sizes of open windows are saved as parts of the HP BenchLink/Meter
project. Three files make up the project; .PRJ is the main project file, .TST
contains the test definition and desktop information, and the .DAT file
contains the data. This desktop information will remain with the project
when it is closed and reopened at a later date. The analysis window is not
saved as part of the desktop because of its temporary nature.

Measurement data in the current project can be exported as time or
reading number/measurement value files (.CSV or .PRN). These ASCII
data files can be imported into an open HP BenchLink/Meter analysis
window or imported into other applications such as Microsoft Excel,
Microsoft Word, or Mathcad.

Saving the Project as a .PRJ File

If you have opened a new or previously saved project in
HP BenchLink/Meter, any new information can be saved by selecting
File | Save Project from the Menu Bar or by clicking the Save icon.
The .PRJ file created from the open project can be opened and modified at
a later date.

Saving Measurement Data as .CSV or .PRN Files

The measurement data will be saved as two columns of data separated by commas or tabs. The first column is time, which includes the date and time the measurement was acquired. The second column displays the measurement value. The data in the strip chart or analysis window can be saved (exported) in a .CSV or .PRN file format with the following steps:

1 With the data displayed in the active strip chart or analysis window, select **File | Export Data...** from the Menu Bar. The Export Strip Chart Data dialog box will be displayed.
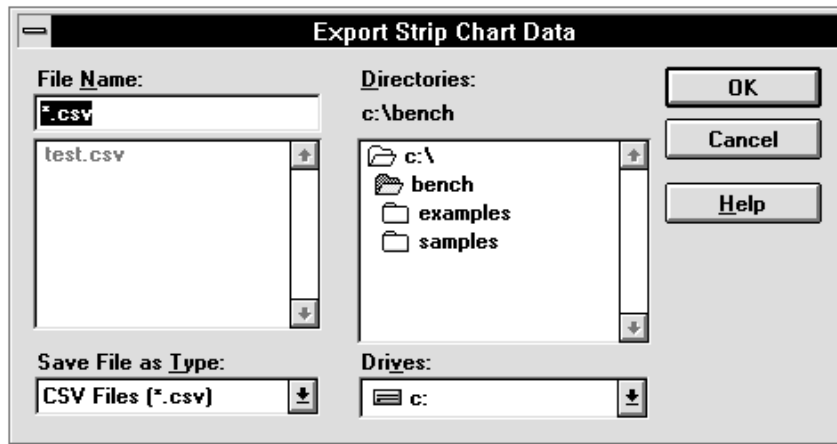
2 Select the desired file format type by clicking on the SAVE FILE AS TYPE drop-down list and click on your choice of .CSV or .PRN.

3 Enter the desired filename and click the OK button to save the file.

Data exported from the analysis window contains two columns: date/time and measurement value.

Using HP BenchLink/Meter Help

HP BenchLink/Meter provides an extensive, easy-to-use, context-sensitive help system. Help is available to guide you through the use of dialog boxes and to explain the function of menu commands.

HP BenchLink/Meter help is accessed by selecting **Help | Index** from the Menu Bar. Choosing this command will display a list of key topics and allow you to perform a search of help topics or allow you to jump to others. Jump topics are green, underlined words found in various areas of the help system.

The Help Search menu can also be displayed by selecting **Help | Search...** from the Menu Bar.

To obtain help on specific menu commands or icons, first select the Help icon from the Toolbar, then move the help cursor to the desired menu command or icon and click. The information for that topic is displayed.

Many of the dialog boxes contain a HELP button. This button provides on-line help for the options in the dialog box. Help can also be obtained by pressing the *F1* key at any time.

If you are new to Help systems and would like a quick, easy-to-use tutorial, select **Help | Using Help** from the Menu Bar. This is a useful guide to using the Help system written by Microsoft Corporation.

3

Configuring the Interface

When the HP BenchLink/Meter application is started, it searches for any supported IEEE-488 interface hardware and software installed in your PC and any instruments connected to the interface. If no IEEE-488 interface card with connected devices is found, HP BenchLink/Meter checks the serial ports for any devices.

HP BenchLink/Meter will try to connect to a multimeter using HP-IB at address 22 or on serial port COM2 at 9600 baud. If any of these default settings do not match the actual interfaces or devices, select **Options | Configure Interface...** to display the Configure Interface dialog box. This dialog contains information relating to the interface type and any devices connected to your PC.
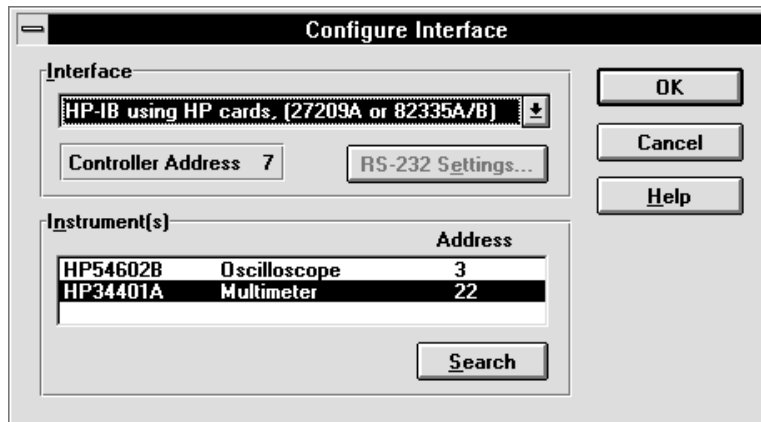
Select the interface type by clicking the arrow of the INTERFACE drop-down list and clicking on your choice. The controller address or serial port displayed is the IEEE-488 controller address or serial port that HP BenchLink/Meter will use to communicate with your multimeter or counter. Only IEEE-488 interface cards that have been detected in your PC will be displayed.

> *If you are using an IEEE-488 interface card, ensure you have correctly installed the interface software before running HP BenchLink/Meter. Either an HPIB.DLL or GPIB.DLL file must be located in your HP BenchLink/Meter directory, the Windows directory, or a directory included in the PATH command in your AUTOEXEC.BAT file (If you are using the HP 82341 HP-IB card, you must have the SICL16.DLL and SICLUT16.DLL files in your Windows directory.) For specific details, refer to your IEEE-488 interface card installation guide.*

The RS-232 Settings... option is for RS-232 use with the multimeter only and is also grayed out when IEEE-488 interface cards are selected. The RS-232 Settings dialog displays serial port (COM2), baud rate (9600), and parity (even: 7-bits) parameters.

Devices found by HP BenchLink/Meter are displayed in the INSTRUMENT(S) list box according to the selected available interface. Select the multimeter or counter by highlighting the choice. If you are using RS-232 (multimeter only), the address refers to the serial port it is attached to.

3

The SEARCH button is used to initiate a search for all instruments attached via HP-IB cables or a single multimeter attached to the COM port identified in the Settings dialog box. All identified instruments will be displayed in the INSTRUMENT(S) list of the Configure Interface dialog box.

Choose OK to accept changes to the Configure Interface dialog box or CANCEL to abort. Changes made in the Configure Interface dialog box will be used as the default settings the next time you run HP BenchLink/Meter.

3

Configuring Your Instrument

HP 34401A Multimeter

HP BenchLink/Meter supports both RS-232 and IEEE-488 communications from the PC to the HP 34401A Multimeter. This section describes how to setup your multimeter so that communications can be established when you run HP BenchLink/Meter.

Shift

Menu On/Off **1** Turn on the Multimeter menu.

> A: MEAS MENU

<   < **2** Move across to the I/O Menu.

> E: I/O MENU

∨   > **3** Move down and across to the Interface command.

> 2: INTERFACE

∨ **4** Move down to select HP-IB or RS-232 interface parameters. If choosing RS-232, you must also check the baud rate and parity commands in the I/O Menu. The baud rate default is 9600; the parity default is even with 7 data bits.

Enter **5** Save the changes. For more information on accessing these menus, see your multimeter's user's guide.

HP 53131A/53132A/53181A Counters

HP BenchLink/Meter supports only IEEE-488 communications from the PC to the HP 53131/2A Universal Counters or the HP 53181A RF Counter. No interface configuration is needed for these instruments, except to ensure that, if multiple instruments are connected to the bus, each instrument has its own unique HP-IB address.

4

Feature and Function Reference

HP BenchLink/Meter Screen Components

A typical HP BenchLink/Meter screen is shown on page 16.

Title Bar

In the Title Bar, HP BenchLink/Meter displays HP 34812A
BenchLink/Meter and the name of the open project file.

Menu Bar

The Menu Bar offers the following pull-down menus:

- **File Menu** - contains commands for opening/importing, closing,
  saving/exporting, and printing project windows.

- **Edit Menu** - contains commands for copying data to the Clipboard
  and pasting data into and deleting data from the analysis window.

- **View Menu** - contains commands for viewing various options in the
  strip chart, histogram, and analysis windows.

- **Test Menu** - contains commands for running, pausing/resuming,
  and stopping the acquisition of measurement data, and for clearing
  the data from a previous test.

- **Options Menu** - contains a command to configure the
  PC-to-instrument interface.

- **Window Menu** - contains commands for standard Windows
  operations such as cascade, tile, and arrange icons. Also contains
  commands to enable/disable the viewing of the Toolbar, Status Bar,
  project window, strip chart, histogram, readout, statistics, and
  analysis windows.

- **Help Menu** - contains commands for the HP BenchLink/Meter Help
  system including an index, search capability, a help system tutorial,
  and information about the HP BenchLink/Meter application.

*The menus in HP BenchLink/Meter vary depending upon the view or
window that is currently active.*

Toolbar

The Toolbar contains icons for quick display of dialog boxes and rapid execution of HP BenchLink/Meter commands. The following icons are displayed in the Toolbar:

Performs the **File | New Project...** command.

Performs the **File | Open Project...** command.

Performs the **File | Save Project** command.

HP34401A <22>
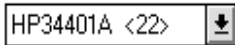
The Instrument drop-down list displays the model number of all devices found on the IEEE-488 bus or serial port. It can also be used to change instrument connections. If another BenchLink application is installed and a supported instrument is selected from this list, HP BenchLink/Meter will attempt to switch to that application and, if necessary, load and start the application. Instruments not supported by BenchLink software will display the device's model number and address. Devices that are not compatible with the IEEE-488.2 standard will be displayed as UNKNOWN with their address. Attempts to switch to non-supported or unknown devices will display a warning dialog.

4

Performs the **Edit | Copy** command.

Performs the **Edit | Paste** command.
(Available for the analysis window only.)

Performs the **File | Print** command.

Performs the **Window | Project** command.

Performs the **Window | Strip Chart** command.

Performs the **Window | Histogram** command.

Performs the **Window | Readout** command.

Performs the **Window | Statistics** command.

Performs the **Window | Analysis** command.

Performs the **Test | Run** command.

❚❚ Performs the **Test | Pause/Resume** command.

■ Performs the **Test | Stop** command.

▶? Provides context-sensitive help for selected items.

Status Bar

The Status Bar is a helpful tool designed to provide brief descriptions of
the Menu Bar and Toolbar items currently selected and also provides
specific measurement data information. It appears at the bottom of the
HP BenchLink/Meter screen and dynamically changes as the various
menu commands or icons are selected.

menu command information	test status	reading number	% test complete	current time
For Help, press F1	Receiving data...	00002813	56%	02:09PM
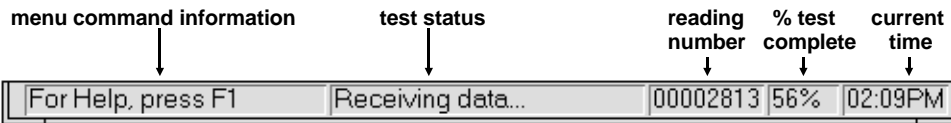
The Status Bar is separated into 5 different sections:

- menu command information - displays description of the selected
  menu item or other information including the status of limit testing.

- test status - reflects the current status of the test (running, paused,
  stopped, countdown to a future start time, etc.)

- reading number - reflects the total number of readings received.

- % test complete - displays the percentage of the test that has been
  completed.

- current time - displays the current time.

Project Window

The project window contains five categories for test configuration. Each of the categories, when selected, displays individual characteristics and options on the right side of the window. Categories can be selected by clicking the appropriate icon or by typing the first letter of the category when this section of the project window is active.

The project window also displays a button for category help. Help information on the selected category will be displayed when this button is clicked.

The following categories are available in the project window:

4

Function. The Function Category contains information about the measurement function, range, and resolution options. Current function and range settings can be queried from the attached multimeter or counter by clicking the GET INSTRUMENT SETTINGS button. This is useful if you have configured your instrument function and would like HP BenchLink/Meter to use those settings.
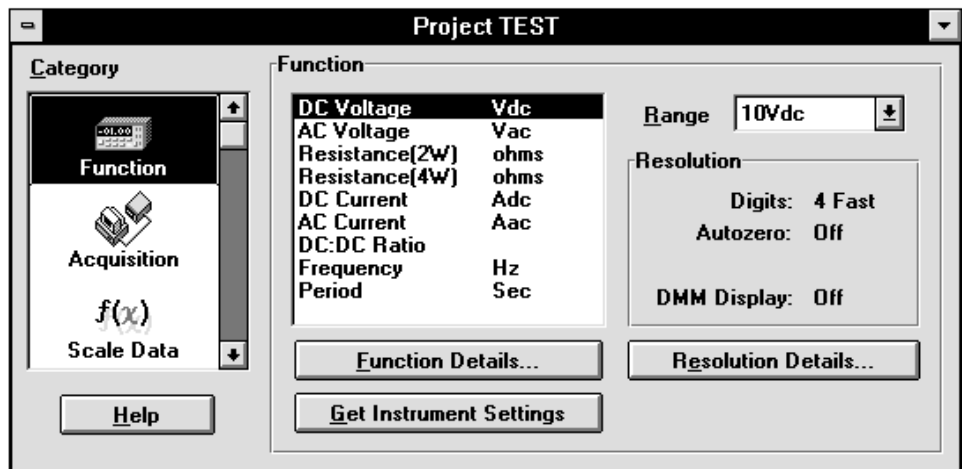
Click the FUNCTION DETAILS... button to display additional details for the selected function. Resolution options are displayed by clicking the RESOLUTION DETAILS... button. For more information regarding functions, see Making Standard Measurements in Chapter 3.

Acquisition. The Acquisition Category contains information about the trigger, number of readings or duration of the test, and the ability to start the test at a later time. The following options are displayed:

TRIGGER SOURCE - select a trigger from HP BenchLink/Meter or an external source.

COMPLETION CRITERIA - select the number of readings (limit of 10 million or less depending upon your available disk space) or the duration of the test. When numbers are entered in one text box, HP BenchLink/Meter estimates the other.

TIMED START - provides the ability to start the test up to 24 hours later.

FIXED TRIGGER DELAY (multimeter only) - delay the trigger up to a maximum of 3600 seconds.

MULTIPLE READINGS/TRIGGER (multimeter only) - specify the number of readings per trigger from 2 to 512.

AVERAGE READINGS (multimeter only) - average the readings for each trigger event.

4

Scale Data. The Scale Data Category contains choices for scaling the measurement data when it is acquired in the strip chart window. Available choices are: none, linear scaling ($f(x)=mx+b$ where m is the slope and b is the y-intercept), lookup table, and equation library (contains thermocouples, thermistors, RTD's, and power (dBm)).

The units displayed in the open windows are selected by clicking the DISPLAY UNITS drop-down list. Units can be added to the list by clicking the EDIT UNITS... button.

The Scale Data Category can be used to perform null and dBm functions in HP BenchLink/Meter similar to the math functions used in the multimeter. Use linear scaling for the null math function and power (dBm) scaling for the dBm math function.

4
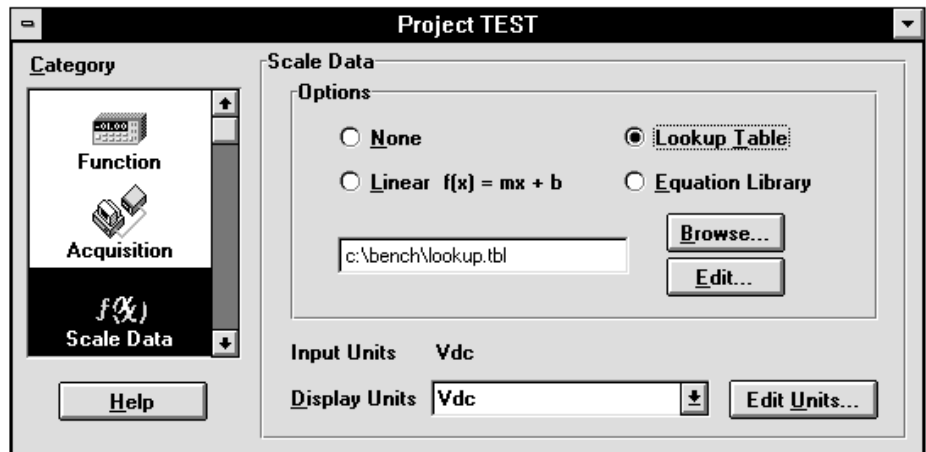
Limit Testing. The Limit Testing Category provides the capability to perform limit testing, set upper and lower limits, and select optional events when a failure occurs.
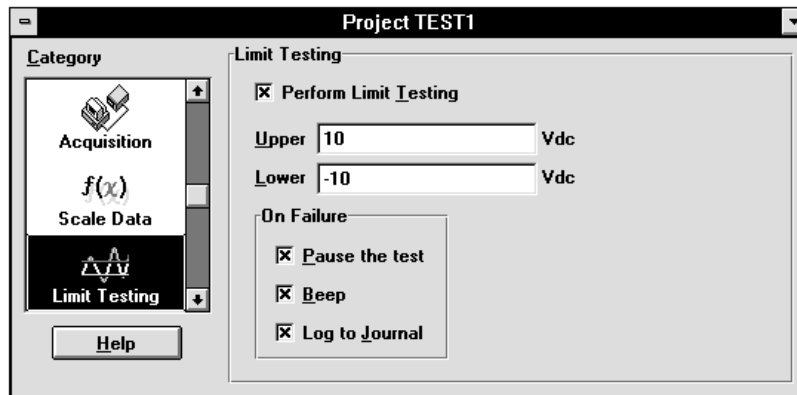
Limit testing provides the following failure options:

• PAUSE THE TEST - pauses the test, displays a warning dialog, and updates the Status Bar test condition when a limit failure has been detected. The test can be resumed by clicking OK in the dialog box, and clicking the Pause/Resume icon (or select **Test | Pause/Resume** from the Menu Bar).

> *If you select this option with multiple readings per trigger, HP BenchLink/Meter will pause the test immediately after the limit failure. If there were more readings to be taken for the current trigger, those readings will not be captured or displayed.*

• BEEP - causes your PC to beep each time a limit failure has been detected. The test will continue to run if this is the only option selected.

• LOG TO JOURNAL - an entry will be recorded in the journal to indicate the type of failure, the time it occurred, and the reading that failed. A maximum of 50 failures are logged, but this default can be changed. See the READBLM.WRI file for instructions to change this parameter.

HP BenchLink/Meter is now ready to perform limit testing on the data acquired from your connected instrument. The failure options you have selected will be implemented when you start the test.

> *HP BenchLink/Meter allows you to change limit values while a test is paused, but statistics for the data continue to accumulate. Failures after the new limit values have been specified will be combined with previous failures. Limit failure statistics are available through the statistics window.*

Journal. This category displays a journal in which automatic entries are made when the test is started, paused, resumed, stopped, a change to the upper or lower limits, or a limit failure occurs. Once 50 limit failures have been logged, a log entry will indicate that too many limit failures have occurred. This is done to prevent the journal from filling up with limit failures.

Manual entries may be made by clicking the ADD ENTRY... button and are allowed a maximum of 1,000 characters per entry. Manual entries also contain the date and time the information was logged in the journal.

The journal may contain a maximum of 30,000 characters. After this maximum has been reached, no further entries will be recorded.

4

CAUTION The journal entries are permanently erased when the current test has been stopped and a new test is restarted.

Project TEST1

Category

$f(x)$

Scale Data

Limit Testing

Journal

Help

Journal

08:22:32 05/02/94	Limit Testing ENABLED
08:22:36 05/02/94	TEST STARTED
08:22:58 05/02/94	TEST PAUSED Pts = 1000
08:23:02 05/02/94	TEST RESUMED
08:23:10 05/02/94	TEST STOPPED Pts = 1350

Add Entry...   Copy   Cut   Undo
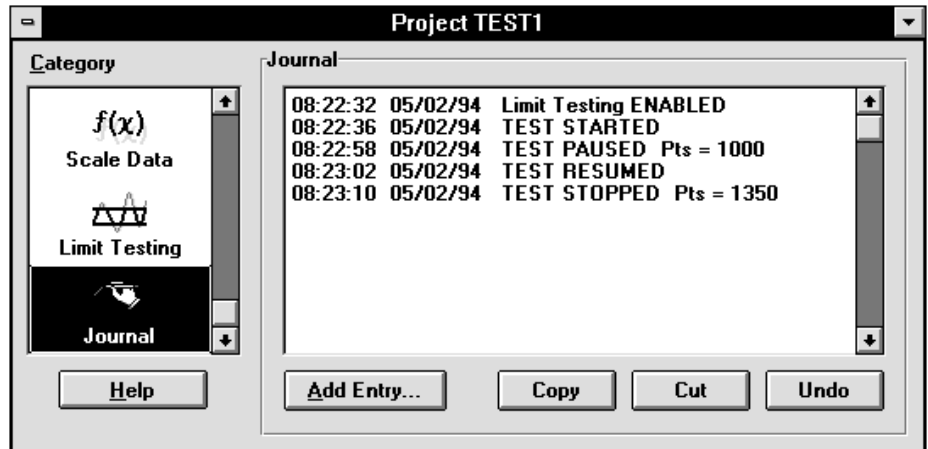
Information from the journal may be copied to the Clipboard and pasted into other applications for printing and file saving purposes by clicking the COPY button. This button will copy any selected text, or if no text is selected, the entire contents will be copied. If you wish to delete text from the journal, select the text by clicking and dragging your mouse, then click the CUT button. The UNDO button will undo the cut command only.

Strip Chart Window

The strip chart window is the data acquisition window in
HP BenchLink/Meter. It receives all the readings and displays the data
as a line graph with the number of measurements on the X-axis and
measurement value indicators on the Y-axis. The center indicator is the
reference value. The reference value and units per division are displayed
in the lower left corner of the strip chart window.

The data enters the window from the left and is scrolled off the window to
the left as the data fills the window. You have the capability to scroll and
zoom in on the data when the test is paused or stopped.
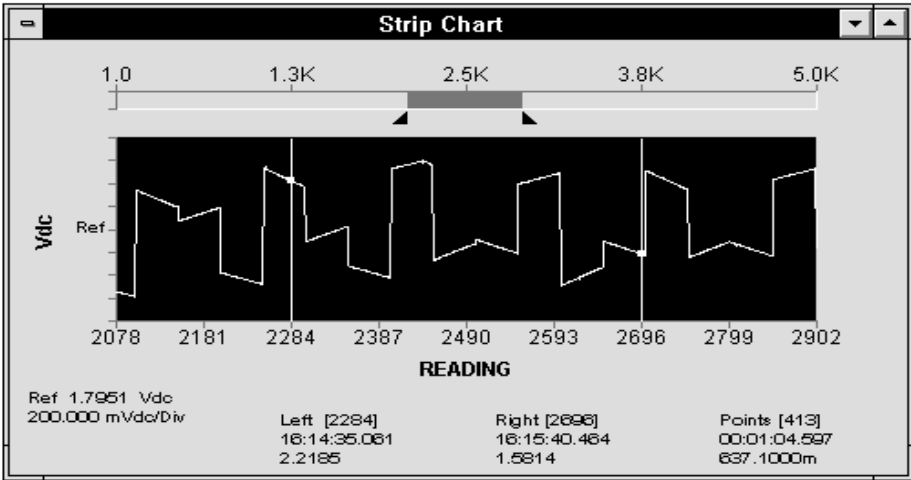
Within the strip chart window, an interactive control bar provides
browsing and zooming capability on the acquired data. The control bar
consists of three mouse-interactive objects - a data rectangle and a drag
handle on each side of the rectangle. The data rectangle is a visual
reference used to indicate the location of the strip chart window's data in
relation to the entire data set.

Browsing and/or paging is accomplished by clicking and dragging the rectangle or using the PAGE UP, PAGE DOWN, END, and HOME keys on your keyboard. You can zoom in and out of the data by using a click and drag motion on either drag handle. Moving a drag handle changes the number of readings viewed in the window, effectively changing the X-axis scale.

Vertical markers in the strip chart window are used to select data readings. Select **View | Markers** from the Menu Bar or press *Ctrl+M* to enable vertical markers in the strip chart window. The time locations and data values of the markers and the difference between them are displayed at the bottom of the strip chart window. The markers can be moved by clicking and dragging them with your mouse, or by using the left/right arrow keys on your keyboard when you have selected a marker. For exact marker placement, select **View | Modify Parameters...** from the Menu Bar to display the Chart Parameters dialog box, then type the reading numbers in the POSITION MARKERS text boxes.

Data between the markers is copied to the Clipboard when the **Edit | Copy** command is selected. This data can then be pasted into the analysis window.

The specific behavior of the strip chart window depends on the state of a test. When a test is running, data is placed in the window from left to right with the rightmost data being the most current. As data is acquired, the control bar objects (data rectangle and drag handles) show the progress of the test and their current position relative to the entire test. When a test is paused, the control bar rescales itself and repositions the rectangle and drag handles to reflect the current number of measurements and the relative position within the data. For example, if a user is running a 5000 reading test and decides to pause after half the data has been collected, the control bar will scale the X-axis to 2500 and position the rectangle and drag handles at the end so the user is viewing the most current page of data. In pause mode, users are allowed to zoom and browse the acquired data. After a test is resumed, the control bar will normalize back to the pre-paused state, showing the progress of the test.

Selecting the **View | Zoom To Fit** command for the strip chart window, when a test is running, calculates the reference value (the center of the minimum and maximum values) from all acquired data, then calculates the units per division in a 1-2-5 sequence. The reference value is displayed in the center of the window. When the test has been paused or stopped, the zoom to fit command calculates the reference value and units per division from only the data displayed in the window.

Upon completion of the test the control bar stops incrementing and goes into the zoom and browse mode of operation. The strip chart window can display a maximum of 16,000 readings.

Select **View | Modify Parameters...** from the Menu Bar or press *Alt+Enter* to display strip chart window parameters. The Chart Parameters dialog box provides the following capabilities:

- Specify the first reading to be displayed

- Specify the number of readings to be displayed (maximum of 16,000)

- Enable/disable vertical markers and define their positions

- Enable/disable the grid

- Change the reference value

- Change the units per division value

Chart Parameters

X Axis

First Reading
2078

Display Width
825

Y Axis

Reference Value
1.795

Units / Division
0.2

Features

[X] **Markers**   Left 2089   **Right** 2878

[ ] **Grid**

OK   Cancel

Histogram Window

This window provides the capability of displaying a real time histogram while the measurement data is being acquired from the connected instrument. The histogram shows the percentage of readings that fall within a particular bin range.
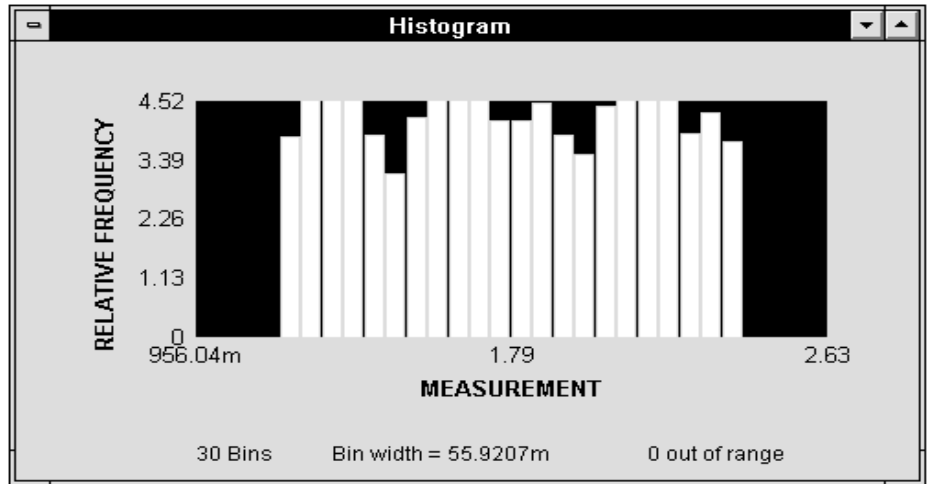
The number of bins, their size, and the number of out of range readings is displayed at the bottom of the window. (Bin size is the range of the histogram divided by the number of bins.)

To view the bin's relative frequency, and the actual count in spreadsheet format, select **View | Data...** from the Menu Bar or press *Ctrl+D*. To rescale the data in the window, select **View | Zoom To Fit** or press *Ctrl+F*. The zoom to fit command recalculates the minimum and maximum values of all the data, then re-bins the data according to the new range.

Select **View | Modify Parameters...** from the Menu Bar or press
Alt+Enter to display histogram window parameters. The Histogram
Parameters dialog box provides the following capabilities:

- Change the number of bins

- Specify the maximum Y-axis value

- Specify the range of the histogram by changing X Min and X Max values

- Change the number of labels displayed on the X- and Y-axes

4
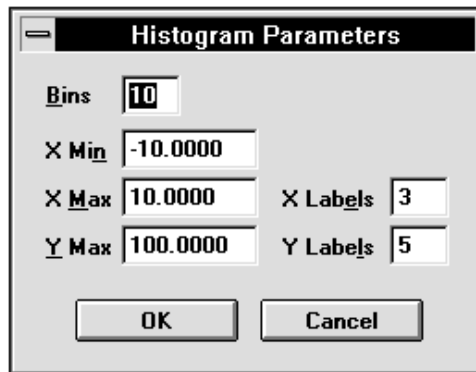
Readout Window

The instrument readout window displays the current measurement value
from the front panel of the connected instrument. This window can be
resized, minimized, or moved anywhere in the HP BenchLink/Meter
screen. User-defined units are displayed when the data is using a scaling
equation.

To select automatically adjusting units for the readout window, select
View | Auto Adjust Units from the Menu Bar. This will display units
such as 1KVdc instead of 1000 Vdc.

μ_σ

Statistics Window

The statistics window allows you to display statistical information
for the acquired measurement data. The statistics are calculated
simultaneously during measurement acquisition from the attached
instrument. Statistics information displayed includes:

- Total readings - total number of measurements currently in the strip
  chart window

- Overload - number of overload measurements acquired during the
  test. (Overload conditions occur when the input signal is greater
  than the present range can measure.) Overload measurements
  received from the multimeter or counter do not contain an actual
  value, so HP BenchLink/Meter calculates the value as an order of
  magnitude greater than the currently selected range. These values
  are not used in the calculation of statistical data, but they will be
  displayed in the test data.

- Units - type of measurement units

- Maximum - maximum measurement value in the acquired data

- Minimum - minimum measurement value in the acquired data

- Mean - average value of the total readings

- Standard deviation - amount of deviation from the mean value

- Upper limit - upper limit value specified for limit testing (if enabled)

- % above upper - percentage of measurements that exceeded the
  upper limit value

- Lower limit - lower limit value specified for limit testing (if enabled)

- % below lower - percentage of measurements that exceeded the lower
  limit value

4

Statistics	
Total Readings	500
Overload	0
Units	Vdc
Maximum	0.42152
Minimum	-0.42787
Mean	-0.00939
Standard deviation	0.22516
Upper limit	
% above upper	
Lower limit	
% below lower	

Statistics can be copied to the Clipboard as text information using the
Edit | Copy command from the Menu Bar when the statistics window is
the active window.

---

*Changing limit test values when a test is paused does not clear the
statistics already accumulated. The statistics will display a combination
of limit test failures from before and after the changes were made.*

Analysis Window

The analysis window is a temporary workspace used to analyze data
copied from the strip chart window, import previously saved
HP BenchLink/Meter .DAT files, or to import data saved from other
applications in .CSV or .PRN file format. New data pasted (using the
Edit | Paste command) or imported (**File | Import Data...**) into this
window is appended to the end of any existing data.
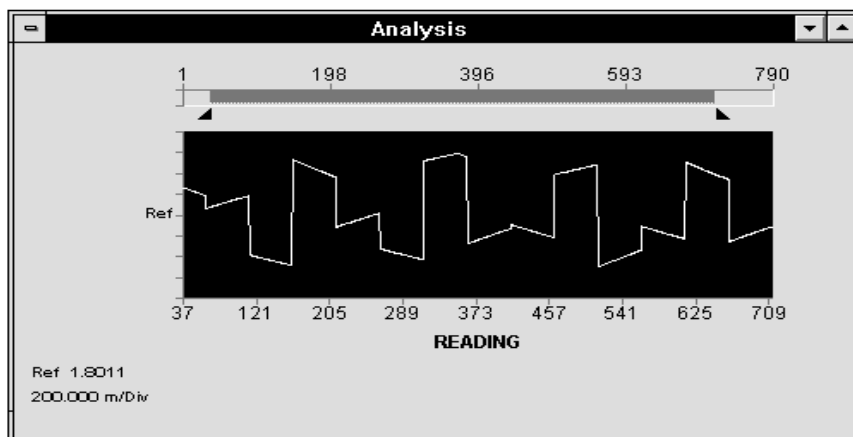
The bottom of the analysis window displays the reading number and
value of the vertical markers, when they are enabled.

To view the actual reading number and data values in spreadsheet
format, select **View | Data...** from the Menu Bar or press *Ctrl+D*.
To rescale the analysis window, select **View | Zoom To Fit** or press
Ctrl+F. The zoom the fit command calculates the reference value (the
center of the minimum and maximum values) from the data displayed in
the window, then calculates the units per division in a 1-2-5 sequence.
The reference value is displayed in the center of the window.

Select **View | Modify Parameters...** from the Menu Bar or press
Alt+Enter to display the analysis window parameters. The Chart
Parameters dialog box provides the following capabilities:

- Specify the first reading to be displayed

- Specify the number of readings to be displayed

- Enable/disable grid and number of lines

- Enable/disable vertical markers and define their positions

- Change the reference value

- Change the units per division value

4

Chart Parameters

X Axis

First Reading
37

Display Width
678

Y Axis

Reference Value
1.801

Units / Division
0.2

Features

☐ **Markers**   Left [   ]   **Right** [   ]

☐ **Grid**

[**OK**]   [**Cancel**]

Before the data is displayed in the analysis window, it is processed
through the existing scaling algorithm and statistics are calculated.
To view the statistics, select **View | Statistics...** from the Menu Bar or
press *F7*. A histogram of the data can also be displayed by selecting
View | Histogram... from the Menu Bar or pressing *F6*.

The data in the window can be cleared by selecting **Edit | Delete** from
the Menu Bar. This command deletes all of the data from the window.

*This error message occurs when you have tried to copy more than 4000
readings to the Clipboard. Use the vertical markers to decrease the selection or
use the analysis window and its contents are not saved as part of the
desktop workspace when the project is saved as a file. You must copy
the window to the Clipboard as a graphic or export the data to an
ASCII .CSV or .PRN file if you wish to save the information.*

File Descriptions

HP BenchLink/Meter File Formats

HP BenchLink/Meter uses a variety of proprietary and common file formats. The entire project can be saved as a .PRJ file with proprietary data and test definition files included. Lookup tables can be created in other applications and saved for use in HP BenchLink/Meter.

.PRJ

This file extension is used to designate a binary project file. This file can be reopened in HP BenchLink/Meter for later use. The project file consists of desktop window placement in addition to the two following files:

.DAT - This file extension is used to designate binary test data saved from the test.

.TST - This file extension is used to designate a test definition file.

.TBL

This file extension is used to designate an ASCII scaling lookup table. Custom lookup tables can be created in other applications such as Microsoft Excel or Word as two-column files (such as raw value/scaled value pairs) and can be separated by either a tab or a comma. Columns in excess of two will be ignored. The file must be saved with the .TBL extension for use in HP BenchLink/Meter.

Export Data File Formats

Data can also be exported from HP BenchLink/Meter as .CSV or .PRN files for use in other applications.

.CSV

The comma-separated values file format includes date/time and measurement value for each reading in the test. Data exported from the analysis window contains two columns: reading number and measurement value. The two columns are separated by a comma.

.PRN

The PRN file format includes date/time and measurement value for each reading in the test. Data exported from the analysis window contains two columns: reading number and measurement value.
The two columns are separated by a tab.

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Using With Other Applications

The HP BenchLink/Meter application can copy measurement data to the Clipboard for use in other applications, export measurement data as .CSV or .PRN files, or import data saved from another application in .CSV or .PRN file format. It also can switch to other BenchLink applications by selecting another instrument from the Instrument list on the Toolbar.

Copying Data to the Clipboard

The **Edit | Copy** command copies the active strip chart, histogram, or analysis window to the Clipboard in a graphical Windows Metafile format and as text. This graphic or text can be pasted into another application for annotation or display. The statistics window is copied as text only. When markers are displayed in the strip chart or analysis window, only the data between the markers (maximum 4000 readings) is copied as text to the Clipboard, in addition to the graphical format.

Copying information from the journal requires that you use the COPY button located at the bottom of the journal. This button copies the selected text to the Clipboard. If no text is selected, the entire contents of the journal are copied.

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 1 Click on the desired window (strip chart, histogram, analysis, or statistics) to make it the active window.

 2 Click the Copy icon, select **Edit | Copy** from the Menu Bar, or type *Ctrl+C*. The selected window is copied to the Clipboard in a Windows Metafile graphical format and/or as text). The maximum number of readings that can be copied as text is 4000.

 3 Open the destination application and paste the graphic or text into it. Check your application's user's manual for instructions on pasting information from the Clipboard. In some applications, using the **Edit | Paste Special...** command will give you a choice of picture or text format.

*In the strip chart window, the copy command copies data located between the vertical markers. This data can then be pasted into the analysis window using the **Edit | Paste** command.*

Exporting Data as .CSV or .PRN Files

Information may be exported from HP BenchLink/Meter in comma-separated value (.CSV) or tab separated (.PRN) file format. These files may be opened in other applications for display. Data exported from the strip chart window contains two columns: date/time and measurement value. Data exported from the analysis window contains two columns: reading number and measurement value.

1 Click on the strip chart or analysis window to make it the active window. (You must have measurement data in the window).

2 Select **File | Export Data...** from the Menu Bar or press *Ctrl+E*. The Export Data dialog box will be displayed, prompting you to select a filename and type of format (.CSV or .PRN) in which to save the data. You may also change the drive and directory in which the file is saved.
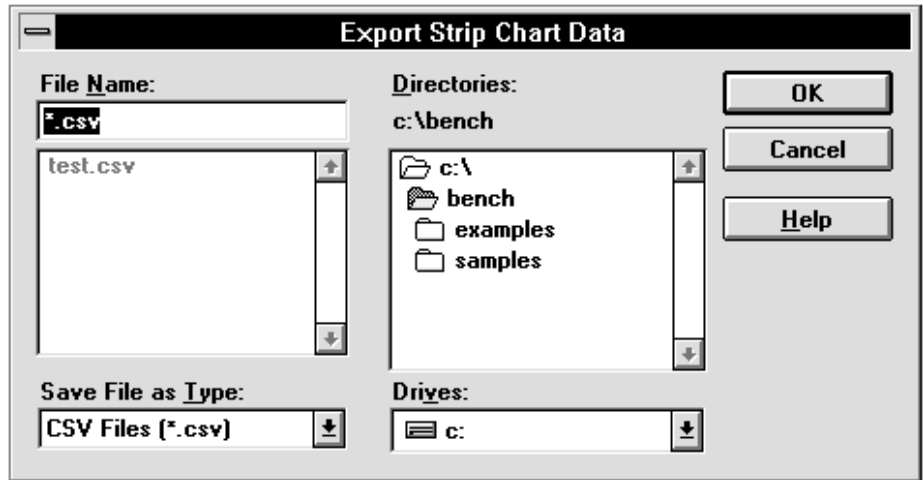
3 After you have made your choices, click the OK button to export the data or CANCEL to abort the process.

The data will be saved in the selected file format. This file can then be opened in another application such as Microsoft Word or Excel.

Importing Data to the Analysis Window

Importing .CSV or .PRN Files

Data saved in time/measurement data value pair format from other applications such as Mathcad or Excel can be imported and appended to other measurement data in the analysis window. Data must be saved in the .CSV or .PRN format. To import the data file into the analysis window:

1 Click the analysis window to ensure it is the active window.

2 Select **File | Import Data...** from the Menu Bar. The Import Analysis Data dialog box will be displayed, prompting you to enter the name of the file you wish to open.
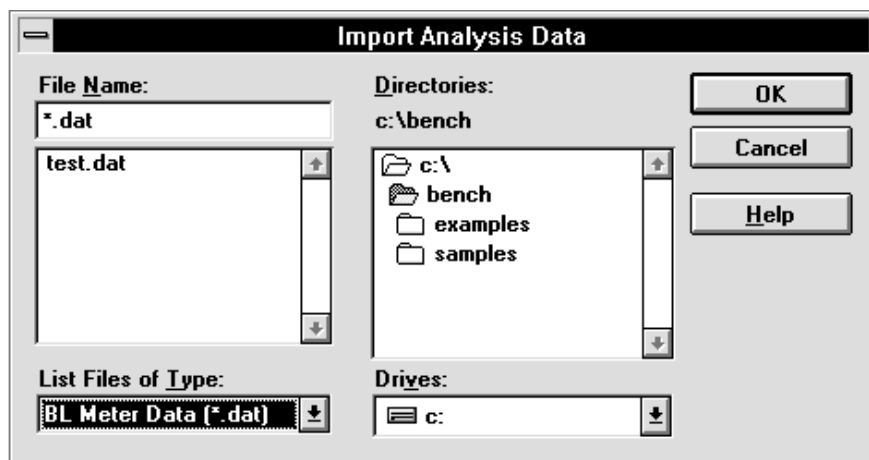
Choose the appropriate file extension from the LIST FILES OF TYPE list, select the desired file, and click the OK button. If the file is displayed in the FILE NAME list, double-click on it to open the file. Click the CANCEL button to abort the command or the HELP button for more information.

4 The file information will be imported into the analysis window and scaled according to the previous scaling information. Units displayed in the analysis window can be changed by selecting **View | Scale...** from the Menu Bar. The data can also be rescaled by selecting a scaling option from this dialog box.

A histogram or statistics chart of the data may be displayed by selecting **View | Histogram...** or **View | Statistics...** from the Menu Bar.

Importing .DAT Files

Measurement data from a previous HP BenchLink/Meter session is automatically saved as a .DAT file when the project is saved. The .DAT files may be imported into the analysis window:

1   Select **File | Import Data...** from the Menu Bar or press *Ctrl+I*. The Import Analysis Data dialog box will be displayed, prompting you to enter the filename of the file you wish to open.
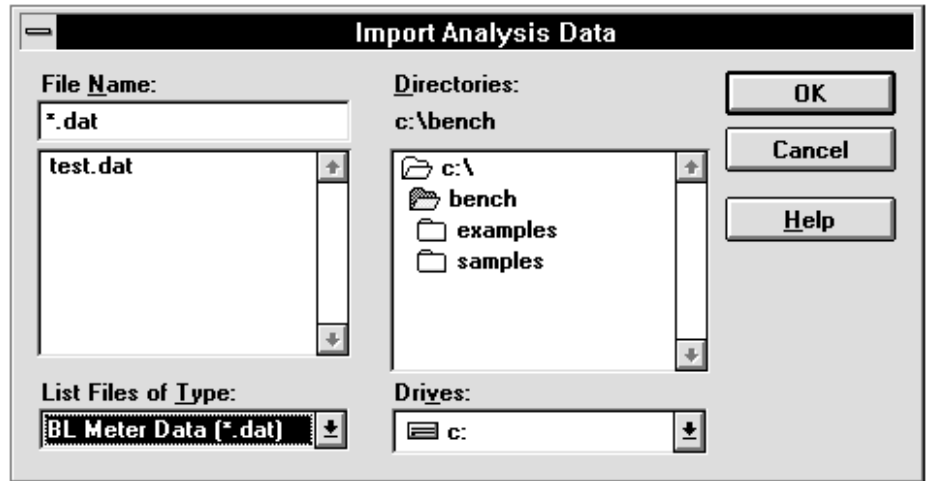
3   Choose the .DAT file extension from the LIST FILES OF TYPE list, select the desired file and click the OK button. If the file is displayed in the FILE NAME list, double-click it to open the file. Click the CANCEL button to abort the command or the HELP button for more information.

4   The file information will be imported into the analysis window and scaled according to the previous scaling information. Units displayed in the analysis window can be changed by selecting **View | Scale...** from the Menu Bar. The data can also be rescaled by selecting a scaling option from this dialog box.

A histogram or statistics chart of the data may be displayed by selecting **View | Histogram...** or **View | Statistics...** from the Menu Bar.

Starting Other BenchLink Applications

`HP34401A <22>`
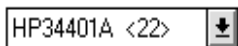
IEEE-488 Interface Only. If you select another instrument in the Instrument drop-down list, HP BenchLink/Meter will attempt to switch to a BenchLink application that supports the instrument chosen. For example, selecting an HP 54602A Oscilloscope will switch to the HP BenchLink/Scope application. If the application is not already running, HP BenchLink/Meter will load the application. A warning dialog is displayed if the selected instrument is not supported or the application could not be found.

The BenchLink applications must be located in the current working directory, the Windows directory, or a directory in the path section of your AUTOEXEC.BAT file.

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Error and Information Messages

This chapter lists error and information messages to assist you in the operation of HP BenchLink/Meter. The words in bold type are the message content. The type of message is indicated in the middle column and is followed by the explanation and/or suggested action to be taken. Number or name indicates that there is more than one number or name that can appear in the message.

Message	Type	Suggested action
Couldn't copy data (image) to the file (clipboard) - Low Memory.	Error Message	This error message indicates that the attempted copy operation failed due to low memory resources available in your PC. Close other applications, and if necessary, restart Windows and HP BenchLink/Meter.
Couldn't start application: *name.exe.*	Error Message	This error message indicates HP BenchLink/Meter could not find an application corresponding to the instrument selected from the Toolbar Instrument list. If the instrument is supported by a BenchLink family software product and you have the software installed, try starting the named application and try again. The application must be installed in the current working directory, the Windows directory, or a directory in the path section of your AUTOEXEC.BAT file.
Couldn't write to the file - Low Memory.	Error Message	This error message indicates that the attempted operation failed due to low memory resources available in your PC. Close other open applications, and if necessary, restart Windows and HP BenchLink/Meter
Data is inconsistent: Multiple outputs with same input. Return to edit mode?	Error Message	The lookup table you've selected contains more than one input value with the same number. Click YES to correct the file or NO to select another lookup table.

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Message	Type	Suggested action
Details do not apply to this function.	Information Message	This message indicates that there is no further information to be displayed for the selected function.
Initialization is taking longer than expected. This may be due to a long gate time or a missing input signal.	Information Message	This message indicates that the attached counter is waiting for a gate or is not receiving an input signal. Click OK to continue waiting for the gate, or stop the test and find the cause of the delay. You may also receive an HPIB error 230 on the counter, but this error should be ignored.
Instrument address or controller settings do not match initialization file. Do you want to change interface settings now?	Information Message	This information message indicates that upon startup, HP BenchLink/Meter did not find the controller or instrument default address(es) as listed in the initialization file. Choose YES to display the Interface Setup dialog box or NO to cancel.
Instrument at address *number* **not responding.**	Error Message	HP BenchLink/Meter was unable to perform the attempted operation with the displayed instrument. Select **Options	Configure interface...** from the Menu Bar and establish communications to that instrument before resuming.
Insufficient disk space to export data (or store readings).	Information Message	This warning indicates that there is not enough disk space available on your PC to perform the requested command. Free some disk space and try again.
Low/High limit test value exceeded. Test paused.	Information Message	HP BenchLink/Meter detected a limit failure while running a test and paused the test. Click the OK button and resume the test by clicking the Pause/Resume icon on the Toolbar.

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Message	Type	Suggested action
Modifying the test definition after data has been acquired will erase the existing test data. Are you sure you want to modify the test definition?	Information Message	Changing test definition parameters in the project window after data has been acquired requires you to either erase the data or cancel the changes to the test definition.
No instruments found. Make sure all cables are properly installed and instruments are powered-on.	Error Message	This error message indicates HP BenchLink/Meter cannot find an attached instrument. If you are using RS-232 with a multimeter, be sure the correct 9- or 25-pin cables have been used, the instrument is powered on, and the RS-232 settings of the multimeter match the settings in the **Configure Interface | RS-232 Settings...** dialog box. If you are using HP-IB, ensure that the cables are securely fastened and the instrument is powered on. Also verify that the instrument interface is set to HP-IB and all attached instruments contain a unique address.
Please enter a number between *number* **and** *number***.**	Error Message	This error message indicates the number entered in the text box is not valid. Change the number to a valid one and click OK.
Please enter a valid measurement range.	Error Message	This error message indicates that the value entered in the RANGE text box is not a valid range for the selected function. Select a value from the drop-down list.
Please enter a valid start time.	Error Message	This error message indicates that the time entered in the TIMED START text box is not recognizable. Type a number and use a colon between the hour and minutes, or select a time from the drop-down list.

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Message	Type	Suggested action
Save changes to *name***?**	Information Message	This information message indicates that the specified project you wish to close is new or has been changed. Click YES to save the new project information, NO to delete or not make changes, or CANCEL to cancel the command.
The current project (instrument) is not compatible with the selected instrument (project type).	Information Message	This information message indicates that the instrument in the Toolbar Instrument list is not compatible with the current project. HP BenchLink/Meter will allow you to view and change the project information, but you cannot acquire more data until you select another instrument or open another project.
The data file requires *number* **KB of disk space. There are only** *number* **KB available. Change drives or make space available and try again.**	Error Message	This error message indicates there is not enough disk space available on the drives selected drive to save the HP BenchLink/Meter data file. Select another drive or free some disk space before you continue.
The following required files were not found in your \windows\system directory: (*Names***).**	Error Message	This error message indicates that the named files should be installed by HP BenchLink/Meter. Reinstall HP BenchLink/Meter.
The selected instrument is not compatible with this application. Use the Instrument list in the Toolbar to switch to other BenchLink applications.	Information Message	This information message indicates that the instrument selected in the Configure Interface dialog box is not supported by HP BenchLink/Meter. Choose another instrument (multimeter or counter). If you wish to switch to another BenchLink application, use the Instrument list on the Toolbar.
This file already exists. Replace existing file?	Error Message	This error message indicates that the named file will be overwritten by new data if you choose YES.

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Message	Type	Suggested action
This file does not contain a valid BenchLink/Meter project.	Error Message	This error message indicates that the file selected is not a previously saved HP BenchLink/Meter project file. The project file must have a .PRJ file extension.
This file does not contain a valid lookup table. Edit contents now?	Error Message	This error message indicates that the lookup table file you've selected is incorrect. A lookup table must have two columns of data - an input value and an output value. Input values must not have the same number. Click YES to edit the file or NO to select another lookup table.
This instrument is not supported by HP BenchLink/Meter and no other application was associated with this instrument.	Error Message	This error message indicates there is an instrument on the bus that is not supported by an HP BenchLink software product. Select a valid instrument before attempting any operations.
This project was created for a different instrument. Continue?	Information Message	This information message indicates that the selected project file was saved from an instrument different than the one you are currently connected to. If you select YES, the old project contents are destroyed and the project becomes a new one. Select NO to cancel the opening of the selected file.
Too many points to copy - Export as CSV or PRN File.	Error Message	This error message occurs when you have tried to copy more than 4000 readings to the Clipboard. Use the vertical markers to decrease the selection or use the **File	Export Data...** command to export the data as an ASCII file.

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Message	Type	Suggested action
Too many readings expected in this test. Decrease the test length.	Error Message	This error message indicates that the specified duration and reading interval of the test will exceed the maximum number of readings HP BenchLink/Meter can acquire (10 million). Decrease the duration or the time between reading intervals to proceed.
Unable to import this file. It's not a BenchLink/Meter .DAT file.	Error Message	This error message indicates that the selected file cannot be imported because it's not a proprietary HP BenchLink/Meter file. If you are trying to import a .CSV or .PRN file, change the file type in the Import Analysis Data dialog box before trying again.
Unsuccessful copy to the Clipboard - Low Memory (or Try again).	Error Message	This error message indicates that the attempt to copy information to the Clipboard failed. Try closing all open applications and restart Windows.
Unsuccessful export to file - Low Memory.	Error Message	This error message indicates that your PC does not have enough memory available to export the data to a file. Try closing other open applications and try again.

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Printing History

The Printing History shown below lists all Editions and Updates of this manual and the printing date(s). The first printing of the manual is Edition 1. The Edition number increments by 1 whenever the manual is revised. Updates, which are issued between Editions, contain replacement pages to correct the current Edition of the manual. Updates are numbered sequentially starting with Update 1. When a new Edition is created, it contains all the Update information for the previous Edition. Each new Edition or Update also includes a revised copy of this printing history page. Many product updates or revisions do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

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