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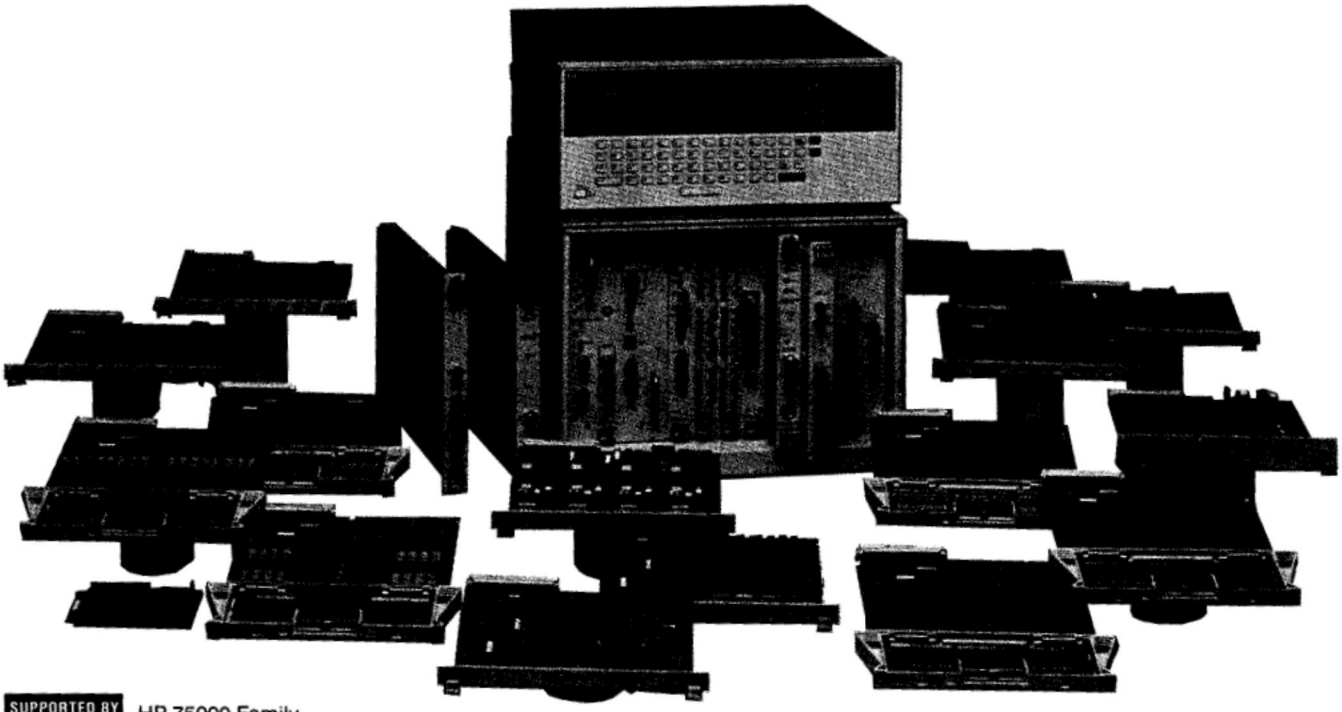
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Find the *Keysight / Agilent E3730A* at our website: *Click HERE*

- Two mainframe sizes (Series B and Series C)
- Over 70 modules available
- Core set of test and measurement instruments in VXI
- SCPI language for easy programming
- Instrument Drivers for HP Interactive Test Generator (HP ITG) software and HP Visual Engineering Environment (HP VEE)



SUPPORTED BY HP ITG SOFTWARE

HP 75000 Family

HP 75000 Family Reduces Test System Development Time

The HP 75000 family of VXIbus products is part of HP's measurement-systems architecture (MSA), providing benefits such as standardization, downsizing, throughput, and flexibility. Developing a test system involves much more than selecting hardware; it also requires software, systems integration, and support. The HP 75000 family is a fully compatible line of VXI products that reduces the development time for test systems. It includes computers, software, standardized instrument language, and services.

Hardware

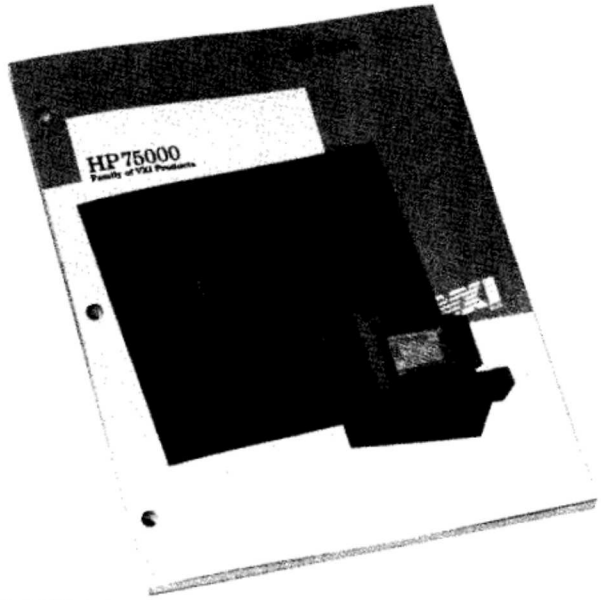
The HP 75000 family consists of two mainframes and over 70 modules. The HP 75000 Series B Mainframes are designed for low-cost data-acquisition and control applications, and include seven B-size VXI slots. The HP 75000 Series C Mainframe is designed for medium- to high-performance computer-aided test applications, and includes 13 C-size VXI slots. A broad line of HP 75000 B- and C-size modules such as switching, digital multimeters, counters, sources, power meters, and computers are also available.

Firmware and Software

HP 75000 products offer compatibility and a broad range of price versus performance. All members of the HP 75000 family use the Standard Commands for Programmable Instruments (SCPI), (formerly TMSL), a new industry standard programming language, to simplify programming. With SCPI, you can send commands to instruments in a consistent, readable form. It conforms to IEEE 488.2. For example, to trigger a reading, you would send the command "*TRG" to the appropriate instrument. All HP 75000 products support the HP Interactive Test Generator (HP ITG) interface. Hewlett-Packard added these capabilities to the VXI standard to help reduce test system development time.

System Support

Because getting a test system running quickly requires a solid base of support, Hewlett-Packard offers support services tailored to your needs. Support services in the U.S. include free 90-day phone-in support and optional 1-year additional support contracts. All HP 75000 Products have a standard 3-year warranty. HP also provides system services such as racking, custom products, and project management.



HP VXI Catalog

For full specifications, see the HP 75000 VXI Product Catalog (HP pub. no. 5091-1587).

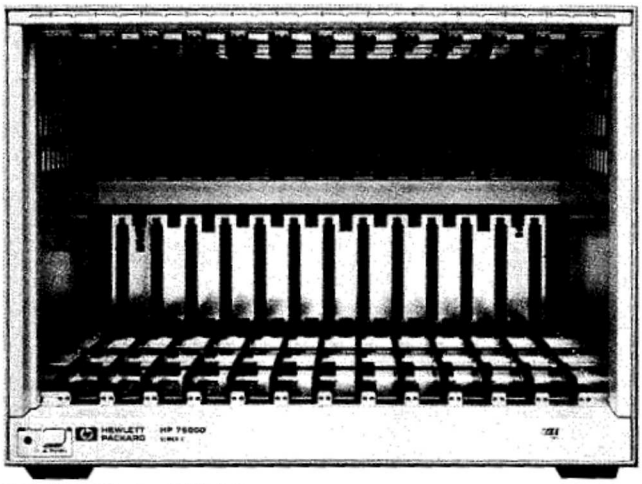
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MEASUREMENT SYSTEMS ARCHITECTURE

HP 75000 VXIbus Family

Series B and Series C Mainframes

Series C Mainframe
- High-performance computer-aided test
- Auto-configuring backplane
- Pressurized air channel for independent slot cooling
- Ultra-reliable power supply



HP 75000 Series C Mainframe

SUPPORTED BY HP ITG SOFTWARE

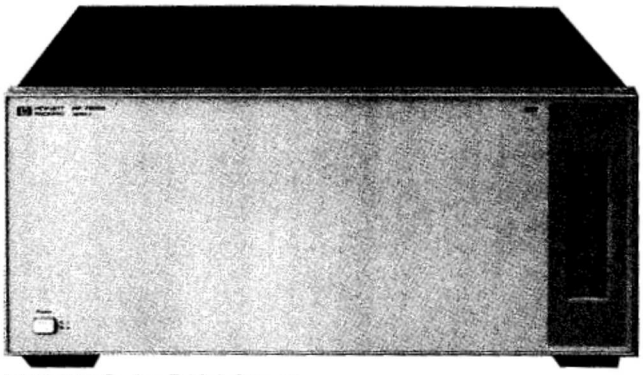
Series C Mainframe

The HP 75000 Series C mainframe provides high performance while allowing for system downsizing. The Series C mainframe has 13 C-size VXI slots. It is a high-performance platform that becomes the heart of a computer-aided test system.

With the Hewlett-Packard auto-configuring backplane, all you have to do is plug in a module, and the backplane does the rest. There is no need for jumpers or dip switches to bypass empty slots.

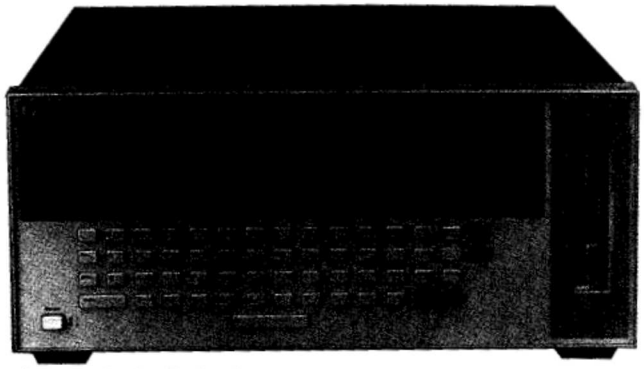
The new Hewlett-Packard power supply has a proven track record of greater than 1 million hours MTBF. It also has a third fan to provide up to 45 watt-per-slot cooling.

With the exclusive Hewlett-Packard pressurized air channel system, each slot is cooled independently. A pressurized plenum with channels delivers air to each slot, ensuring adequate cooling even with empty slots, and with or without faceplates.



HP 75000 Series B Mainframes

Series B Mainframes
- Low-cost switching and measurement
- Built-in command module (no Slot 0 required)
- Flexible, built-in pacer for timing external devices
- SCPI language eases programming



HP 75000 Series B Mainframes

SUPPORTED BY HP ITG SOFTWARE

Series B Mainframes

The two HP 75000 Series B mainframes provide a flexible, low-cost test system platform. Both include a built-in command module, eliminating the need for Slot 0 and resource manager functions, and providing an HP-IB (IEEE-488) interface. Series B mainframes have seven B-size and three A-size slots. To configure a test system, you plug in the individual instrument and switching modules you want. (The digital multimeter can also be mounted inside the mainframe.) The built-in pacer can generate timing and synchronizing signals by sending a TTL signal from the rear panel connector.

The HP E1300A and E1301A mainframes are identical except that the E1301A also includes a front-panel keyboard/display for direct command entry for troubleshooting wiring and connections, and for programming. You can use the HP E1300A (plain front panel) with turnkey software, such as HP 75000 System 10 software (see page 627), It will further lower the cost of duplicate systems.

Optional Internal Disk Drives

When the HP Instrument BASIC (IBASIC) controller is installed in a Series B mainframe, you can also add the Option 005, 3½-inch flexible disk drive and/or the Option 006, 20-MB hard disk drive. These ruggedized drives provide storage for programs, data, and auto-start routines. Both disk drives can be field-installed later. The 3½-inch flexible drive supports 256 KB, 720 KB, and 1.4 MB disks. Both LIF and DOS formats are recognized automatically.

Optional dc Power Operation

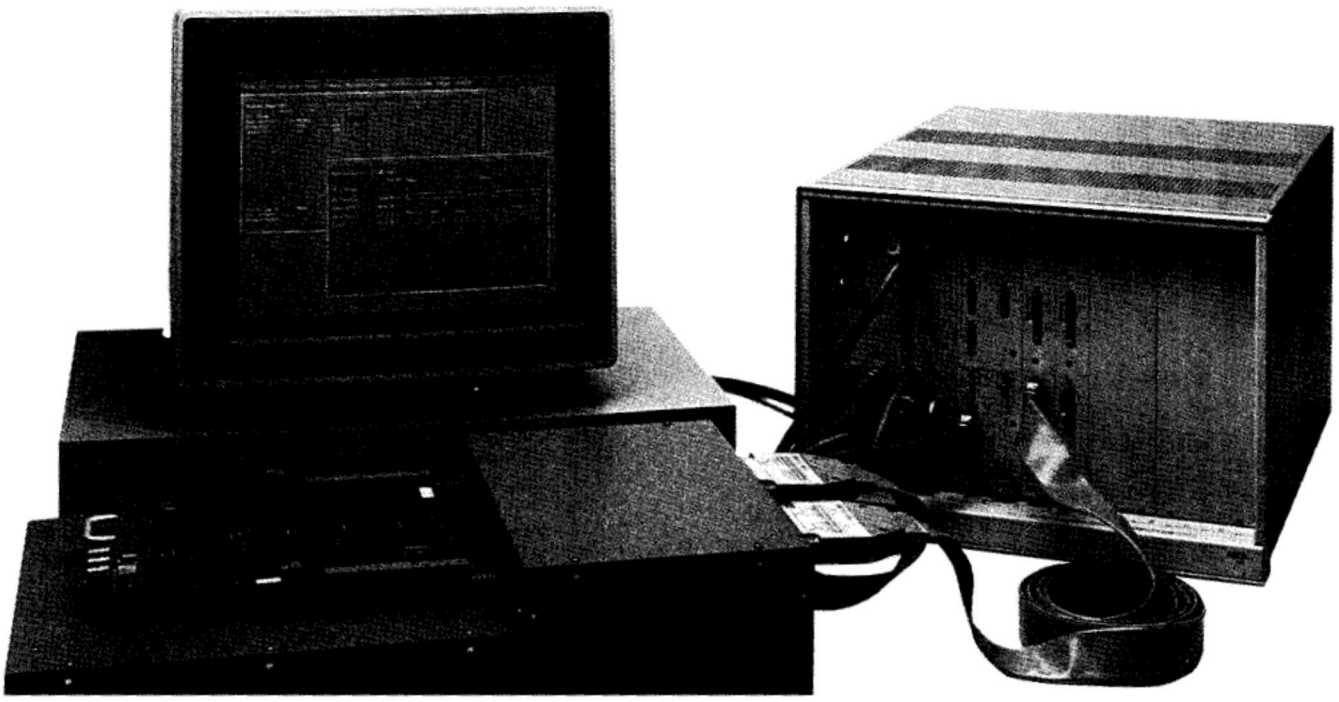
The Series B has the ability to operate on dc voltages from 10 to 30 volts. Using a typical 100 amp-hour auto battery, the operating time can range from approximately 6 to 24 hours, depending on configuration. This option can be used to provide uninterrupted power supply (UPS) capability since the switchover from ac to dc operation is made automatically, without resetting, whenever the ac power drops.

Optional RS-232 Ports

The HP E1324A RS-232C/422 Data Comm Module (A size) gives you the ability to control additional RS-232 peripherals at up to 19200 baud or to communicate over longer distances with RS-422. The internal 8-KB buffer reduces computer overhead for managing handshaking. Setup is easy with programmable baud rate, parity, and handshaking protocol.

For full specifications, see the HP 75000 VXI Product Catalog (HP pub. no. 5091-1587).

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NEW

HP 75000 Model D20
Digital Functional Test System

The HP 75000 Model D20 Digital Functional Test System can be used to functionally test your digital and mixed signal devices under test (DUTs). It has four major components: HP E1450A 160-MHz Timing Module, E1451A/E1452A 20-MHz Pattern I/O Modules, E1453A/E1454A pods, and E1496A Development Software.

Features

- Scalable architecture for the exact price and performance you need
- On-the-fly timing changes and multiple timing/control signals improve your testing capability
- Bus handshaking and wait-state capability
- Automatic pin-to-pin deskew and compensation for pod cable delays
- Comprehensive triggering for mixed-signal testing
- Optional development software with a menu-driven graphical interface

160-MHz Timing Module (HP E1450A)

The HP E1450A Timing Module is used with the HP E1451A/E1452A Pattern Modules to control the digital test. Up to three timing modules can be connected using the master/slave function.

The E1450A has three independent timing generators for controlling the pattern modules and creating bus control signals, strobes, and clocks. The module has up to 256 different timing sets. On-the-fly timing changes allow timing parameters to change from vector to vector. All timing signals can be placed with 6.25-ns resolution and 6-ns accuracy.

The timing module also allows the (DUT) or external instrumentation to drive the test.

20-MHz Pattern I/O Modules (HP E1451A/E1452A)

The HP E1451/E1452A Pattern I/O modules are used to send data to and receive data from the DUT at up to a 20-MHz data rate. Each pattern module contains 32 I/O pins arranged in 4 ports of 8 bits. Each port can be programmed to output, record, or perform a real-time compare. Ports can be paralleled for bidirectional data transfers. The pattern module contains 64 K of memory behind each I/O pin. When combined with the HP E1450A Timing Module, pin-to-pin skew is automatically compensated for during power on.

Timing and Pattern Pods (HP E1453A/E1454A)

The HP E1453A Timing Pod and HP E1454A Pattern Pod are optional active pods with 2-meter cables. One timing pod is used per timing module and each pattern I/O module uses two pods. These pods bring the system accuracy to your DUT. The delay of the pod cable is automatically compensated for by the HP E1450A Timing Module.

Digital Test Development Software (HP H1496A)

The HP E1496A Digital Test Development Software helps you quickly develop tests for the Model D20. The system software runs on HP-UX workstations and is based on the X Window System, Version 11, and OSF/Motif. It uses pop-up windows and pull-down menus in a mouse-driven environment.

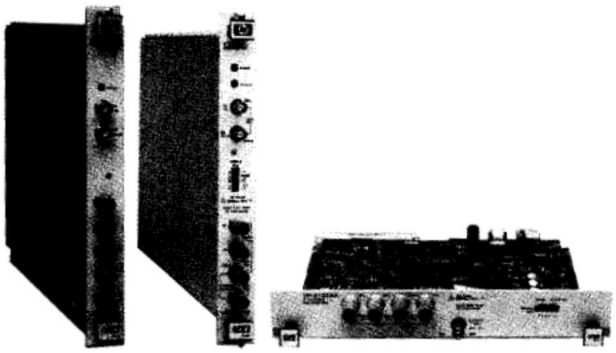
The software can be used standalone to develop the digital test and includes screens for developing timing cycles and editing vector files. In addition, the Model D20 hardware can be connected to the development workstation, providing online debugging of the digital test.

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MEASUREMENT SYTEMS ARCHITECTURE

HP 75000 VIXbus Family

Multimeters



HP E1410A, HP E1411B, and HP E1326B

5½-Digit Multimeters (HP E1326B, E1411B)

The HP E1326B and E1411B 5½-digit multimeters are well suited for data acquisition and computer-aided testing. These economical, versatile multimeters meet both high-accuracy scanning and high-speed measurement needs.

These two multimeters differ only in size; they are identical in electrical design. The HP E1326B multimeter is a 2-slot B-size module that can be plugged into the rear of the HP 75000 Series B Mainframe or mounted internally (saving two module slots) with the internal installation kit (HP E1326-80002). The HP E1411B multimeter is a 1-slot C-size module.

Features include:

- Dual A/Ds: A 5½-digit/low noise integrating A/D, and a high-speed (14 kHz) sampling A/D
- Balanced differential isolated inputs
- Functions: Vdc, Vac, 2- and 4-wire ohms, offset compensated ohms, thermocouples, thermisters, RTDs
- Autozeroing and autoranging
- Flexible triggering with built-in timer/pacer
- Software calibration

You can use the integrating A/Ds in these multimeters to make 5½-digit, low-noise measurements. Use the sampling A/Ds to make 14-bit readings at rates up to 14 kHz. The multimeters can be combined with any HP 75000 low-frequency multiplexer to create a multichannel scanning multimeter. A single SCPI command from the Series B Mainframe or HP E1405A Command Module can program both the multimeter and multiplexer channels.

Reading Rates and Resolution

Conditions: Autozero off, fixed range, default trigger delay, sample source "TIMER" for rates >15 readings/s.

Aperture:	320/267 ms	20/16.7 ms	2.5 ms	100 µs	10 µs
Typical reading rates (rdgs – sec)					
Vdc/Ω	3/3.5	49/59	365	3125	13,000
Vac	1.3	1.9	1.9	1.9	1.9
Resolution					
Bits	±22	±20	±18	±15	±14
Digits	6½	6	5½	4½	3½

Noise Rejection

Conditions: 50/60 Hz ±0.1%, 1 k Ω in both HIGH and LOW leads with 10% imbalance, LOW connected to COMMON at source. Measured with respect to earth ground.

Aperture:	320/267 ms	20/16.7 ms	2.5 ms	100 µs	10 µs
NPLCs	16	1	NA	NA	NA
NMR	84 dB	60 dB	0	0	0
DC CMR	150 dB	150 dB	150 dB	150 dB	150 dB

90-Day dc Voltage Accuracy

± (% of reading + volts)

Conditions: Autozero on, 1-hour warm up within ±5° C of cal temp

Aperture:	320/267 ms	20/16.7 ms	2.5 ms	100 µs	10 µs
Range					
125 mV	.023% + 5.0 µV	.023% + 5.0 µV	.023% + 10. µV	.065% + 30. µV	.115% + 60. µV
1 V	.013% + 10. µV	.013% + 15. µV	.013% + 15. µV	.055% + 100 µV	.100% + 200 µV
8 V	.010% + 50. µV	.010% + 50. µV	.010% + 80. µV	.055% + 750 µV	.100% + 1.5 mV
64 V	.015% + 1.0 mV	.015% + 1.0 mV	.015% + 1.0 mV	.055% + 5.0 mV	.100% + 20. mV
300 V	.015% + 5.0 mV	.015% + 5.0 mV	.015% + 5.0 mV	.055% + 30. mV	.100% + 80. mV

6½-Digit Multimeter (HP E1410A)

The HP E1410A 6½-Digit Multimeter is a full-function system DMM in a compact, single-slot C-size module. It is similar in design to the popular HP 3457A multimeter, and it is suitable for a wide variety of computer-aided test and manufacturing applications where high accuracy is required.

Features include:

- High accuracy/low noise 6½-digit integrating A/D
- 1,450 readings/second at 3½-digits
- Guarded high-impedance inputs
- Functions: Vdc, Vac (dc and ac coupled), 2- and 4-wire ohms, offset compensated ohms, frequency, period
- Autozeroing and autoranging
- Flexible triggering with built-in timer/pacer
- Software calibration

Reading Rates and Resolution

Conditions: Autozero off, fixed range, delay 0, ac slow filter on, offset compensation off.

Aperture:	200/167 ms	20/16.7 ms	2/1.67 ms	100 µs	10 µs
Reading rates (rdgs/sec)					
Vdc/Ω	4	47	312	1250	1450
Vac	.65	1.0	1.0	1.0	1.0
Resolution					
Bits	±22	±22	±19	±15	±12
Digits	6½	6½	5½	4½	3½

Noise Rejection

Conditions: 50/60 Hz ± .08%, 1 k Ω imbalance in low lead.

Aperture:	200/167 ms	20/16.7 ms	2/16.7 ms	100 µs	10 µs
NPLCs	10	1	NA	NA	NA
NMR	80 dB	60 dB	0	0	0
dc CMR	140 dB	140 dB	140 dB	140 dB	140 dB

90-Day dc Voltage Accuracy

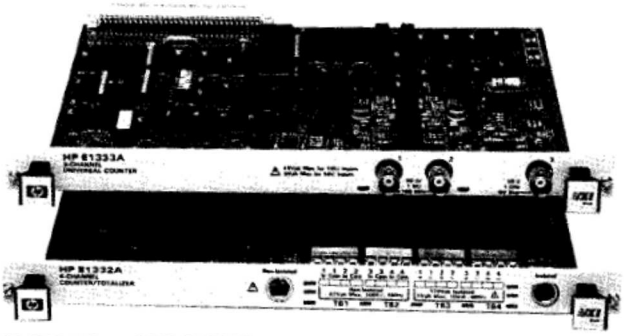
± (% of reading + volts)

Conditions: Autozero on, within ± 5° C of cal temp, 1-hour warmup.

Aperture:	200/167 ms	20/16.7 ms	2/1.67 ms	100 µs	10 µs
Range					
30 mV	.0053% + 5.6 µV	.0053% + 6.75 µV	.0053% + 8.8 µV	.0053% + 21 µV	.0053% + 70 µV
300 mV	.0038% + 5.8 µV	.0038% + 6.8 µV	.0038% + 11 µV	.0038% + 50 µV	.0038% + 400 µV
3 V	.0030% + 9.0 µV	.0030% + 9.0 µV	.0030% + 50 µV	.0030% + 400 µV	.0030% + 4 mV
30 V	.0048% + 230 µV	.0048% + 330 µV	.0048% + 800 µV	.0048% + 4 mV	.0048% + 40 mV
300 V	.0063% + 800 µV	.0063% + 800 µV	.0063% + 4 mV	.0063% + 40 mV	.0063% + 400 mV

For full specifications see the HP 75000 VXI Product Catalog (HP pub. no. 5091-1587).

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HP E1333A and HP E1332A

SUPPORTED BY HP ITG SOFTWARE

3-Channel Universal Counter (HP E1333A)

- Frequency, period average, ratio, pulse width, time interval, and totalize to 100 MHz
- 1-GHz frequency measurement available on channel 3
- Occupies only one B-size slot
- 1-ns time-interval resolution with averaging
- Features SCPI command language and ITG panels when used with the HP 75000 Series B mainframe or HP E1405A/B command module

Specifications

Accuracy: ± resolution ± time base error ± trigger noise error
Frequency Measurement
Range: 100 MHz (channels 1 and 2)
75 MHz to 1 GHz (channel 3)
Resolution: 1/(gate time) (gate time: 2^n ms, n = 1 to 16)
Period average measurement: Channels 1 and 2 average 2^N periods of the input signal.
Range of N: 1 to 16
Resolution: $1/(10 \times 10^6 \times 2^N)$ seconds
Time Interval (with average mode)
Range: Up to $6871/(2^N)$ seconds (where 2^N is the number of intervals to be averaged, N = 0 to 7)
Resolution: $(100 \text{ ns})/(2^N)$ (where 2^N is the number of intervals to be averaged, N = 0 to 7)
Pulse Width (with Average Mode)
Range: Up to $6871/(2^N)$ seconds (where 2^N is the number of intervals to be measured, N = 0 to 7)
Resolution: $100 \text{ ns}/2^N$
Frequency Ratio
Resolution: $1/(2^N)$ (2^N is the preset number of transitions, N = 6 to 36)
Totalizing Range: 1 to $2^{36} - 1$
Time Base
Frequency: 10 MHz
Accuracy: ± 2 ppm
Temperature drift: ± 5 ppm (0° to 50° C)
Aging: ± 2 ppm/yr
Trigger noise error (RMS) =
$\sqrt{(80\,\mu\text{V})^2 + (\text{en})^2}/(\text{input slew rate at trigger point in } \mu\text{V/s})$ where en = noise on input signal for 150 MHz bandwidth in μV

4-Channel Counter/Totalizer (HP E1332A)

- Totalize, up/down count, gated totalize, pulse width, time interval, period average, and frequency measurement up to 4 MHz
- Programmable direct or isolated inputs
- Programmable digital input filter
- Features SCPI command language and ITG panels when used with the HP 75000 Series B or C mainframe or HP E1405A command module

Specifications

Accuracy: ± resolution ± time base error ± trigger noise error
Frequency Measurement (requires 2 channels)
Range: 4 MHz
Resolution: 1/(gate time) (gate time: 2^N ms, N = 1 to 16)
Period measurement (requires 2 channels): Channels 1 and 3 measure 2^N periods of the input signal
Range of N: 1 to 16
Resolution: $1/(5 \times 10^6 \times 2^N)$ seconds
Time Interval
Measures the time interval between transition from channel 1 to channel 2 or channel 3 to channel 4
Range: Up to 858 seconds
Resolution: 200 ns
Pulse width (requires 2 channels)
Range: Up to 858 seconds
Resolution: 200 ns
Totalizing range: 1 to $2^{32} - 1$ counts (requires 1 channel)
Gated totalize range: 1 to $2^{16} - 1$ (requires 2 channels)
Up/down count range: ± (2^{31} -1) (requires 2 channels)
Time Base
Frequency: 5 MHz
Accuracy: ± 2 ppm
Temperature drift: ± 5 ppm (0° to 50° C)
Aging: ± 2 ppm/year
Trigger noise error (RMS) =
$\sqrt{(200\,\mu\text{V})^2 + (\text{en})^2}/(\text{input slew rate in } \mu\text{V/s})$ where en = noise on input signal for 5 MHz bandwidth in μV

SUPPORTED BY HP ITG SOFTWARE



HP E1420B

High-Performance Universal Counter (HP E1420B)

The HP E1420B universal counter offers the same exceptional performance as Hewlett-Packard's high-performance rack-and-stack universal counters.

- Full universal counter functionality
- 200-MHz frequency range with 9 digits/second resolution and optional high-frequency channel
- 2-ns time-interval resolution
- High measurement throughput
- Optional shared memory
- X10 attenuator
- Optional TCX0 time base with output for driving VXI CLK10
- Measurement synchronized to VXIbus or external trigger
- 100% backward compatible with E1420A
- Message based
- 1 slot, C-size

Specifications

Frequency range: .001 Hz to 200 MHz, high-frequency channel optional to 2.5 GHz
Frequency resolution: 9 digits in 1 second of measurement time
Period range: 5 ns to 1000 s
Period resolution: Same as frequency
Time interval (TI) range: −1 ns to 10^5 s (single-shot)
−1 ns to 10 s (averaging)
Time interval (TI) resolution: 2 ns single-shot, 200 ps averaging

For full specifications, see the HP 75000 VXI Product Catalog (HP pub. no. 5091-1587).

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MEASUREMENT SYSTEMS ARCHITECTURE

HP 75000 VXIbus Family

Sources, Digital I/O, Oscilloscope

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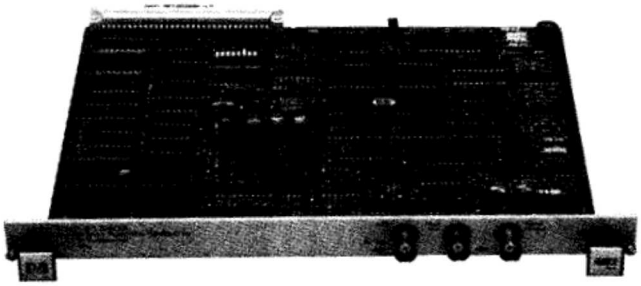
HP E1440A

21-MHz Synthesized Function/Sweep Generator (E1440A)

The HP E1440A 21-MHz Synthesized Function/Sweep Generator is a 2-slot C-size VXI module that offers five different waveforms with synthesizer accuracy. Frequency resolution down to 1 μHz, 5 ppm frequency accuracy/stability, and outstanding signal purity make this generator the ideal reference source for test equipment. Includes multi-interval sweep and multimarker mode sweep capabilities.

Specifications

Waveforms: Sine, square, triangle, negative and positive ramps, dc, TTL clock
Frequency ranges: Sine: 1 μHz to 21 MHz
square: 1 μHz 11 MHz
triangle/ramps: 1 μHz to 11 kHz
TTL clock: 1 μHz to 60 MHz
Frequency resolution: 11 digits



NEW

Arbitrary Function Generator (E1340A)

The E1340A provides standard functions and arbitrary waveforms. It includes sweep, FSK, and wave hop. Its 12-bit resolution produces low distortion ac and good dc accuracy. The register-based B-size format provides an inexpensive architecture for producing analog waveforms.

- Digital synthesis for precise frequency control
- B-size, register-based, SCPI-compatible when using E1300/1301A or E1405A
- HP 9000 Series 300 software E1340A Option 005 Arbitrary Waveform Generation

Specifications

Amplitude resolution: 12 bits
Internal time base: 42.9 MHz
Waveform memory: 16K samples
Built-in waveforms: Sine, square, ramp, triangle, sin(x)/x, noise, and haversine
Frequency sweep: 0.01 Hz to 15 MHz
dc accuracy: − + **(2% + 100 mV)**
Sine THD (<100 kHz @ 10 dBm): −60 dB

For full specifications, see the HP 75000 Product Catalog (HP pub. no. 5091-1587).



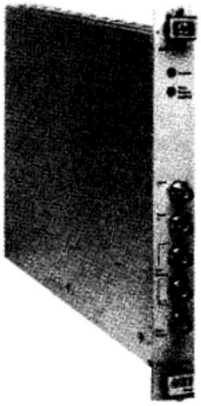
Arbitrary Function Generator (E1445A)

The E1445A produces arbitrary waveforms and standard analog waveforms with low distortion and high accuracy. The 256-K memory is controlled by a high-speed sequencer that stores waveforms in a very efficient manner. The triggering and clock circuits take advantage of the VXI architecture by connecting to the various VXI backplane lines.

- High resolution D/A converter
- Large memory with sequencer
- Digital synthesis for precise frequency control
- HP 9000 Series 300 software E1445A Option 005 Arbitrary Waveform Generation

Specifications

Amplitude resolution: 13 bits
Internal time base: Synthesizer 0.01 Hz to 10 MHz; 40 and 42.9 MHz crystal with dividers
Segment memory: 256K samples
Sequence memory: 32K
Built-in waveforms: Sine, square, ramp, and triangle
Frequency sweep: 0.01 Hz to 10 MHz
dc accuracy: 0.1% of full scale



NEW

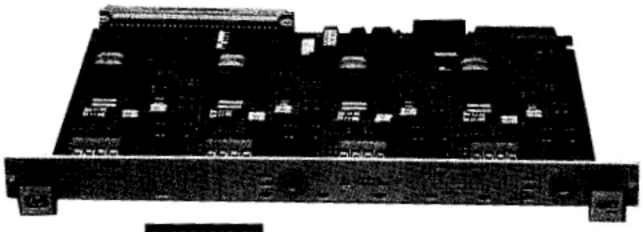
Summing Amplifier/DAC (E1446A)

The E1446A sums two inputs, provides DC offset, and raises signal power. Each input channel has a 31 dB-attenuator, and the output has a 20 dB–step attenuator. Two outputs drive single-ended and differential loads. The on-board D/A converter provides dc offset independent from the incoming signal. When no signals are attached to the input channels, the E1446A can be used as a power D/A converter.

Specifications

Input impedance: 50, 75, and 1 M Ω
Output impedance: 50 Ω single-ended and differential
Full power bandwidth: 10 MHz
Small signal bandwidth: 50 MHz
Output level: 40 V p-p into Hi-Z, 20 V p-p into 50 Ω
DAC resolution: 16 bits

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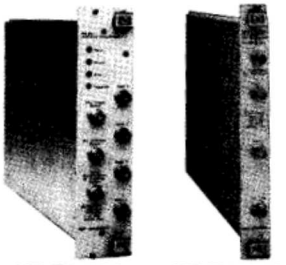
HP E1328A SUPPORTED BY HP ITG SOFTWARE *

4-Channel D/A Converter (E1328A)

The HP E1328A 4-channel D/A converter is a B-size VXI module that provides four independent, isolated channels of voltage or current output. Each channel is individually selectable for maximum flexibility. Software calibration is provided, eliminating the need for mechanical adjustments.

Specifications

Voltage output range: ± 10.92 V
Voltage accuracy: 24-hour: ± (0.05% + 3.3 mV)
90-day: ± (0.15% + 29 mV)
Current output range: ± 21.8 mA
Current accuracy: 24-hour: ± (0.05% + 7 μA)
90-day: ± (0.15% + 59 μA)
Settling time: 750 μs
Isolation: 120 VRMS, 170 V dc/ac peak
Programmable resolution: 333 μV/667 nA



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HP E1426A HP E1428A

500-MHz Digitizing Oscilloscope (HP E1426A)

The HP E1426A 500-MHz digitizing oscilloscope is a full-function digitizing oscilloscope similar in design to the HP 54503A oscilloscope. High precision and advanced triggering allows repeatable and accurate measurements on simple or complex waveforms.

- HP 54503A equivalent (see page 136)
- 500-MHz bandwidth
- 4 channels
- 8-bit vertical resolution
- 20-Msa/s digitizing rate
- Message-based module (send high-level, ASCII SCPI commands)
- 2-slot, C-size

Specifications

Bandwidth: dc to 500 MHz (−3 dB, dc-coupled)
Max sample rate: 20 Msa/s
Number of inputs: 4 (Simultaneous acquisition on two inputs are used; data is alternately acquired by inputs.)
Vertical sensitivity range: 1 mV/div to 5 V/div
Time base range: 200 ps/div to 5 s/div

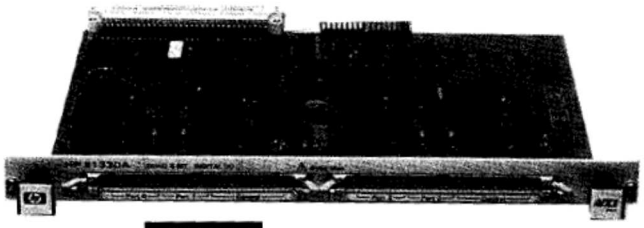
1 GSa/s Digitizing Oscilloscope (E1428A)

The HP E1428A 1 GSa/s digitizing oscilloscope is a full-function instrument similar in design to the HP 54510A oscilloscope. Two full-performance channels provide waveform capture confidence.

- 8-bit vertical resolution
- HP 54510A equivalent
- SCPI compatible
- Message-based module
- One-slot C-size

Specifications

Bandwidth: dc to 250 MHz
Max sample rate: 1 GSa/s
Number of inputs: 2
Vertical sensitivity range: 8 mV to 40 V full scale
Time base range: 10 ns to 50 s



HP E1330A SUPPORTED BY HP ITG SOFTWARE *

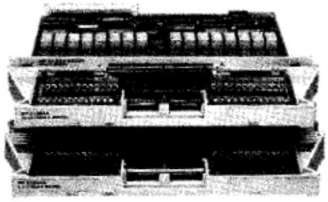
Quad 8-Bit Digital Input/Output (E1330A)

The HP E1330A digital I/O is a B-size VXI module that provides digital interfacing to special-purpose circuitry or external devices. Each block has dedicated control and handshake lines. The E1330A supports standard GPIO protocols and different data formats such as decimal, hexadecimal, octal, and binary.

Specifications

Data lines: 4 sets of 8 bidirectional lines, TTL compatible, jumper selectable pull-ups
Handshake lines: 4 sets of 3 lines each; Input/Output Status, Control, and Flag
Handshake modes: None, Leading Edge, Trailing Edge, Partial, Pulse, and Strobe

*When used with HP 75000 Series B or HP E1405A command module.



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HP E1361A and HP E1364A

4 × 4 Matrix Switch (HP E1361A)

The HP E1361A 4 × 4 matrix switch is a B-size VXI module that provides the 4 × 4 matrix switching capability to connect several instruments at once to several points on a device under test. Each cross point switches two wires with low differential offsets. Larger matrixes, such as 4 × 8 or 4 × 12, can be formed by linking 4 × 4 modules.

Specifications

Maximum input voltage: 250 Vdc or ac rms
Maximum input current: 1 A dc or ac rms
Maximum input power: 40 W or 40 VA
Thermal offset: < 7 μV per contact
Bandwidth: −3 dB @ 10 MHz
Crosstalk (Ch to Ch): < −80 db @ ≤100 kHz
< −30 db @ ≤10 MHz

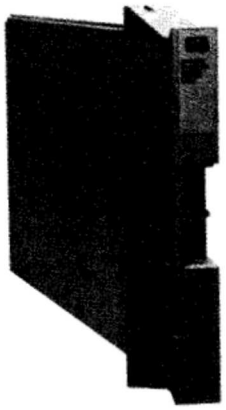
16-Channel Form-C Switch (HP E1364A)

The HP E1364A 16-channel form-C switch is a B-size VXI module that consists of 16 independent form-C relays, allowing a wide variety of devices and signals to be switched. Each channel has Common, Normally Open, and Normally Closed terminals for easy configuration. Power up and -down states can be chosen because the relays are latching.

Specifications

Maximum input voltage: 250 Vdc or ac rms
Maximum input current: 1 A dc or ac rms
Maximum input power: 40 W or 40 VA
Thermal offset: < 7 μV per contact
Bandwidth: −3 dB @ 10 MHz
Crosstalk (Ch to Ch): < −80 dB @ ≤100 kHz
< −30 dB @ ≤10 MHz

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HP E1463A

32-Channel 5 Amp, Form-C Switch (E1463A)

The HP E1463A 32-Channel 5-Amp Form-C Switch is a C-size VXI module that is perfect for switching high-power signals. Each channel has Normally Closed, Normally Open, and Common terminals for easy configuration. There is space available on the module for adding varistors (MOVs) for greater relay protection when switching inductive loads. At power up and power down, Common will be connected to Normally Closed because the relays are nonlatching.

Specifications

Maximum input voltage: 125 Vdc, 250Vac rms
Maximum current: 5A dc or ac rms
Maximum power:
Per switch: 150 W dc, 1250 VA ac
Per module: 900 W dc, 7500 VA ac (when plugged into the HP 75000 Series C Cardcage)
Thermal offset: $<7\,\mu V$ ($3\,\mu V$ typical) per channel
Bandwidth (−3 dB): > 10 MHz (typical)
Crosstalk (dB) (Ch to Ch): < −63 dB @ <100kHz
< −42 dB @ <1MHz

16-Channel Relay Multiplexer and 48-Channel Single-ended Relay Multiplexer (HP E1345A and E1346A)

The HP E1345A and E1346A relay multiplexers connect multiple analog signals to a DMM or other instrument. The HP E1345A switches three wires per channel with signals up to 170 V peak. The HP 1346A switches one wire per channel. It is designed for applications needing a large number of channels where all signals have a common ground. Both modules feature a removable terminal module for easy wiring.

Specifications

Maximum input voltage: 120 V dc, 170 V peak ac
Maximum input current per channel: 50 mA noninductive
Maximum power: 1 VA rms per channel
Maximum offset voltage per channel: $4\,\mu V$ (HP E1345A), $50\,\mu V$ (HP E1346A)
Bandwidth (−3 dB): >10 MHz

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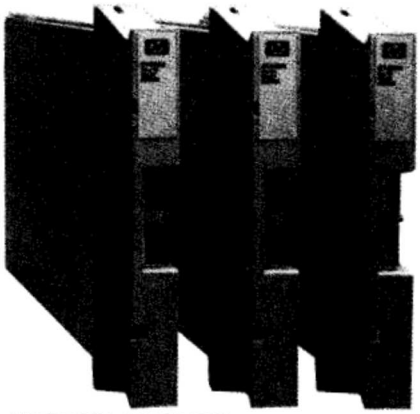
16-Channel Thermocouple Relay Multiplexer, 8-Channel 120 Ω Strain Gage Relay Multiplexer, and 8-Channel 350 Ω Strain Gage Relay Multiplexer (HP E1347A, HP 1355A, HP 1356A)

These multiplexers connect multiple analog signals to a DMM or other instrument, allowing temperature and strain measurements to be made. Three wires are switched per channel with signals up to 170 V peak. All three modules feature a removable terminal module for easy wiring.

- 16-channel thermocouple measurements with built-in thermistor reference junction.
- 8-channel strain measurements can be made with ¼-, ½-, and full-bridge configurations.

Specifications

Maximum input voltage: 120 Vdc, 170 V peak ac
Maximum input current per channel: 50 mA noninductive
Maximum power: 1 VA rms per channel
Maximum offset voltage per channel: $4\,\mu V$
Bandwidth (−3 dB): >10 MHz



HP E1465A, HP E1466A, HP E1467A

16 × 16 Relay Matrix (E1465A), 4 × 64 Relay Matrix (E1466A), 8 × 32 Relay Matrix (E1467A)

The HP E1465A, E1466A, and E1467A Matrix Cards offer the highest switch density available in an HP 75000 Series C plug-in module. The cards feature easy expansion to larger matrices via a chaining cable that allows interconnection of rows on different cards. A full HP 75000 Series C Cardcage can have up to 3072 two-wire crosspoints. These cards provide the best cost-per-cross-point solution for those requiring large matrices.

Specifications:

Maximum input voltage: 200 Vdc; 170 Vac rms
Maximum input current: 1 A dc or ac peak
Maximum power: 30 W dc, 62.5 VA ac resistive load
Thermal offset per channel: $< 5\mu V$ (diffferential H-L)
Bandwidth (−3 dB): > 2.5 MHz

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64-Channel Relay Multiplexer, 8 × 8 Matrix Switch, and 4 × 16 Matrix Switch (HP E1460A, E1468A, E1469A)

The HP E1460A 64-channel relay multiplexer is a C-size VXI module perfect for switching low-frequency voltage and 2- and 4-wire resistance signals. This module can switch either 64 two-wire or 128 one-wire channels. The HP E1468A 8 × 8 matrix switch and the HP E1469A 4 × 16 matrix switch are C-size VXI modules that provide flexible matrix switching capability required to connect several instruments at once to several points on a device under test.

Specifications

Maximum input voltage: 220 Vdc, 250 Vac rms
Maximum input current: 1 A dc or ac rms (V max < 30 Vdc or rms)
Maximum power: 40 VA
Maximum offset voltage: $7\,\mu V$

For full specifications, see the HP 75000 Product Catalog (HP pub. no. 5091-1587).

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HP E1357A, E1352A

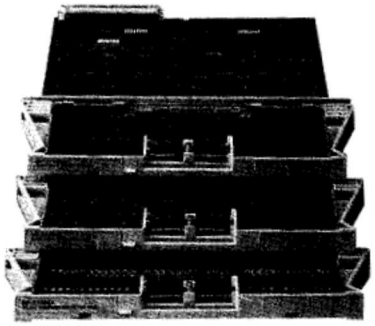
16-Channel FET Multiplexer and 48-Channel Single-Ended FET Multiplexer (HP E1351A and E1352A)

The HP E1351A and E1352A FET multiplexers connect multiple analog signals to a digital multimeter (DMM) or other instrument. The HP E1351A switches two wires per channel with the guard terminal common to all channels. The HP 1352A switches one wire per channel and is designed for applications needing a large number of channels where all signals have a common ground. You can use these multiplexers with the HP E1326A as a scanning voltmeter to achieve scanning rates of 10,000 channels/s. Both modules feature a removable terminal module for easy wiring.

Specifications

Maximum input voltage: 16 V peak
Maximum input current per channel: 1 mA noninductive
Maximum offset voltage per channel: 25 μV (0° to 28° C), 250 μV (28° to 50° C)
Closed channel resistance: <3.1 k Ω for high or low input
<2.1 k Ω for guard input
Bandwidth (−3 dB): 50 Ω source, 1 M Ω, termination > 200 kHz

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HP E1353A, 1357A, E1358A

16-Channel Thermocouple FET Multiplexer, 8-Channel 120 Ω Strain Gage FET Multiplexer, and 8-Channel 350 Ω Strain Gage FET Multiplexer (HP E1353A, HP 1357A, HP 1358A)

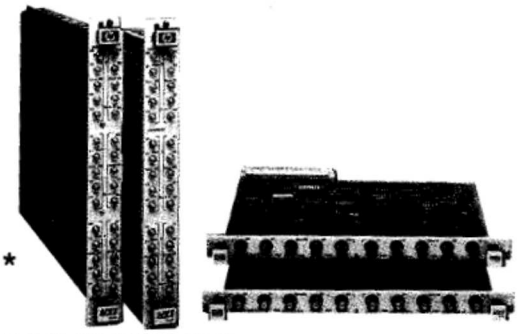
These multiplexers connect multiple analog signals to a DMM or other instrument, allowing temperature and strain measurements to be made. Two wires are switched per channel with the guard channel common to all channels. All three modules feature a removable terminal module for easy wiring.

- Fast thermocouple measurements: up to 10,000 channels per second
- Dynamic strain measurements: up to 10,000 readings per second

Specifications

Maximum input voltage: 16 peak
Maximum input current per channel: 1 mA noninductive
Maximum offset voltage per channel: 25 μV (0° to 28° C), 250 μV (28° to 50° C)
Closed channel resistance: <3.1 k Ω for high or low input
<2.1 k Ω for guard input
Bandwidth (−3 dB): 50 Ω source, 1 M Ω, termination > 200 kHz

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HP E1472A, E1473A, E1366A, E1367A

2x4:1 RF Multiplexers (HP E1366A and E1367A)

The HP E1366A and E1367A RF multiplexers are B-size VXI modules that provide broadband switching with two independent 1X4 multiplexers for signals from dc to 1.3 GHz. BNC connectors make configuration easy. These modules are identical except that the HP E1366A is 50-ohm and the HP E1367A is 75-ohm impedance.

Specifications

Maximum input voltage: 42 V peak
Maximum input current per channel: 1 A dc or ac rms
Maximum power per channel: 24 W or 24 VA

ac performance:	<10 MHz	<100 MHz	<1.3 GHz
Insertion loss (dB)	<0.3	<0.7	<3.0
Crosstalk (dB)	<−90	<−80	<−40
VSWR	<1.2	<1.25	<1.55

6x4:1 RF Multiplexers (HP E1472A and E1473A)

For larger channel 50-ohm RF switching, the HP E1472A and E1473A C-size VXI modules provide six independent 1X4 multiplexers for signals from dc to 3 GHz. Each HP E1472A multiplexer module can support up to two HP E1473A expander modules. Both modules use SMB connectors to assure high performance.

Specifications

Maximum input voltage: 42 V dc + ac peak
Maximum input current per channel: 1 A dc or ac rms
Maximum power per channel: 24 W or 24 VA

ac performance:	<10 MHz	<100 MHz	<1.3 GHz	<3 GHz
Insertion loss (dB)	<.1	<.4	<1.5	<8
Crosstalk (dB)	<−90	<−80	<−50	<−20 (typ)
VSWR	<1.05	<1.15	<1.35	<1.5

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HP E1368A, E1369A, E1370A

Microwave Switch and Driver (HP E1368A, E1369A, E1370A)

The HP E1368A 18-GHz microwave switch, E1369A microwave switch driver, and E1370A microwave switch/attenuator driver are B-size VXI modules that provide microwave switching and attenuator capability for test systems.

The HP E1368A has three independent SPDT 50 Ω coaxial switches with excellent performance from dc to 18 GHz. The HP E1369A allows you to mount three HP 3331xx coaxial switches for switching up to 26.5 GHz signals (switches must be ordered separately). The HP E1370A allows you to mount one HP 3336xx microwave switch or one HP 3332xx step attenuator for switching or attenuating signals up to 26.5 GHz (switches and attenuators must be ordered separately).

Specifications for the HP E1368A

Frequency range: dc to 18 GHz
Isolation: >90 dB
Characteristic impedance: 50 Ω
Insertion loss: <0.5 dB
VSWR: <1.4

For full specifications, see the HP 75000 VXI Product Catalog (HP pub. no. 5091-1587).

*When used with the HP 75000 Series B or C, or the HP E1405A Command Module

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MEASUREMENT SYSTEMS ARCHITECTURE

HP 75000 VXIbus Family

Power Meter, Development Tools

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HP E1416A

Power Meter (HP E1416A)

The HP E1416A power meter is a full-feature, message-based, single-channel average power meter. It has the capability of the popular HP 437B power meter in a single-slot C-size VXI module. The meter is compatible with HP 8480 thermocouple and diode sensors (see page 214).

Features:

- High accuracy
- 100 kHz to 50 GHz
- −70 to +44 dBm

The HP E1416A power meter combines exceptional meter linearity and low sensor SWR to provide outstanding measurement accuracy in demanding situations. Instrumentation accuracy is specified to be ±0.5 percent in linear mode or ±0.02 dB in logarithmic mode, making instrumentation uncertainty a negligible part of total measurement error. Features include automatic calibration and zeroing, frequency (and cal factor) entry, rel, offset, selectable resolution, duty cycle, range hold setting, save/recall of meter settings, and SCPI compatibility for easy programming.

Functions

Frequency: Allows entry of test signal frequency for cal factor selection.
Offset: Allows power measurement to be offset by ±99.99 dB.
Resolution: Selectable of 0.1, 0.01, and 0.001 dB or 1 percent, 0.1 percent and 0.01 percent of full scale. Auto filter mode automatically selects the required number of averages for the chosen range and resolution.
Averaging: Selectable from 1 to 512 readings (in powers of 2).
Duty cycle: Displays peak power representation of measured rms power for rectangular pulses.
Sensor tables: Allows entry and editing of up to 10 frequency versus cal factor sensor tables.
Save/recall states: Saves and recalls 10 complete HP E1416A operating states.

Specifications

Frequency: 100 kHz to 50 GHz, sensor-dependent
Power range: −70 to +44 dBm (100 pW to 25 W), sensor dependent
Power sensors: Compatible with all HP 8480 series sensors.
Dynamic range: 50 dB in 10 dB ranges
Display units: W, dBm (absolute); %, dB (relative)
Accuracy
Instrumentation: ±0.02 dB or ±0.5%
Zero set: ±0.5% of full scale on most sensitive range. Divide by 10 for each higher range.

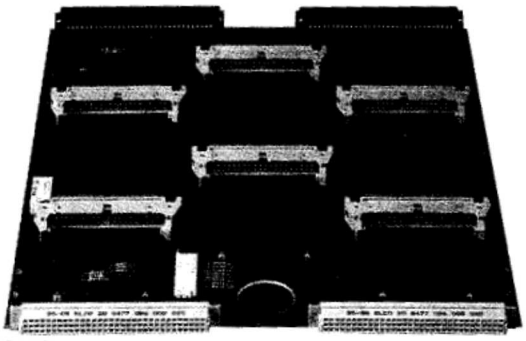
For full specifications, see the HP 75000 VXI Product Catalog (HP pub. no. 5091-1587).



HP E1400T

VXI Development Mainframe (HP E1400T)

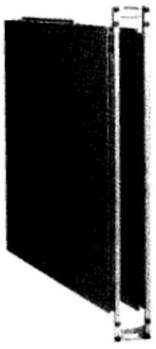
The HP E1400T development mainframe is a version of the HP E1400B Series C mainframe that can be used as a VXI development or repair station. The mainframe allows easy access to modules being developed or repaired. The HP E1400T mainframe meets all specifications of the HP E1400B mainframe, including power and cooling.



HP E1323A

VXI Preprocessor for HP Logic Analyzers (HP E1323A)

The HP E1323A VXI interface provides a complete mechanical and electrical connection between a VXI frame and an HP 16500 or HP 1650 series logic analyzer. With this equipment, you can monitor VXI cycle types and capture bus error conditions using the logic analyzer's state analysis with inverse assembly, or observe timing waveforms and bus handshakes with timing analysis.

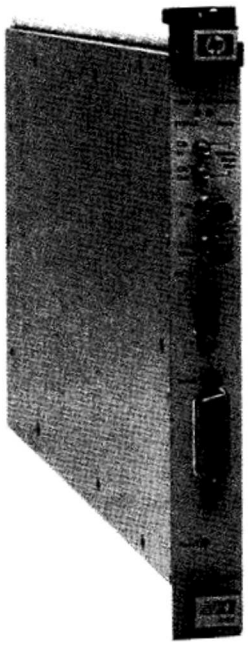


HP E1403A

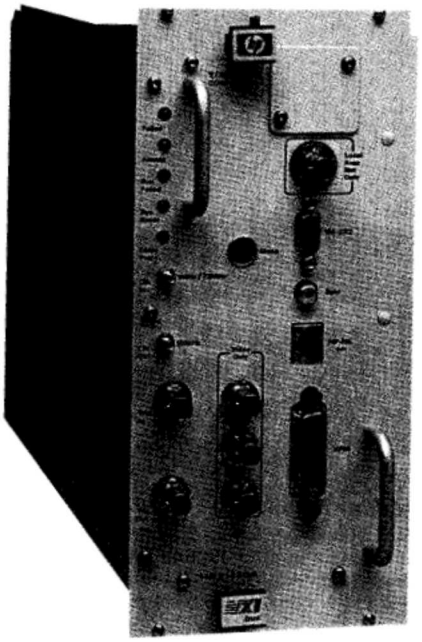
A/B-Size Active Module Carrier (HP E1403A)

The HP E1403A A/B-size Active Module Carrier extends the VXIbus backplane (P1 only) so VXIbus A and B-size modules can plug into the backplane of the HP 75000 Series C Mainframe and still mount with their front panels flush with other C-size modules.

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HP E1405B



HP E1480A

Command Module (HP E1405B)

The HP E1405B command module is a C-size VXI module that has all Slot 0 and resource manager capabilities required by VXI. This module is an HP-IB to VXI interface, and makes both register-based and message-based modules appear as HP-IB instruments to an external computer. Built-in SCPI language makes it easy to program HP register-based cards, including all HP B-size modules. Built-in SCPI also allows ITG to access register-based cards.

SCPI provides consistent commands across different types of instruments. The command module provides a compatible growth path from the low-cost HP 75000 Series B to the high-performance HP 75000 Series C. Users can send high-level IEEE-488.2-compatible commands to program modules instead of sending binary data to and from registers.

Features

- HP-IB to C-size VXI interface
- Slot 0 plus resource manager
- Use in the HP 75000 Series C mainframe to provide SCPI capability for all register-based modules
- Optional RAM
- MXI bus protocol support for extending to multiple mainframes
- New SCPI drivers for updating command module to accommodate future register-based products

HP IBASIC Controller (HP E1300A Options 020, 021, 022; HP E1301A Options 020,021, 022; HP E1405B Option 020)

Add computing power to your system with more than 150 HP IBASIC commands, a subset of the popular HP BASIC language.

- Use with Series B mainframes or Series C command modules
- Run programs standalone
- Autostart from flexible or hard disk
- Get standard 512 KB non-volatile RAM
- Use optional 1 MB or 2 MB nonvolatile RAM for Series B
- Use optional 512Kbyte RAM for Series C
- Use an RS-232 terminal for development and display
- Control other equipment with RS-232 or HP-IB
- Remotely control Series B mainframes or Series C command modules with RS-232/422

V/360 Controller (HP E1480A)

The HP E1480A V/360 controller occupies four C-size VXI slots and has all Slot 0 and resource manager capabilities required by VXI. It has built-in HP-IB, RS-232, LAN, keyboard, and display ports. This module can access message-based modules on the backplane, or access register-based modules by sending SCPI commands through the HP-IB port on the command module (HP E1405B).

This controller is a Motorola 68030–based computer that can run either the HP BASIC/WS or HP-UX operating systems. With HP BASIC/WS, instrument control for a single-user, single-tasking system is simplified through high-level commands optimized for I/O. With HP-UX, you can use industry-standard networking, windowing systems, and databases with automated test. (Additional specific information on Model 360 can be found on page 98.)

Features

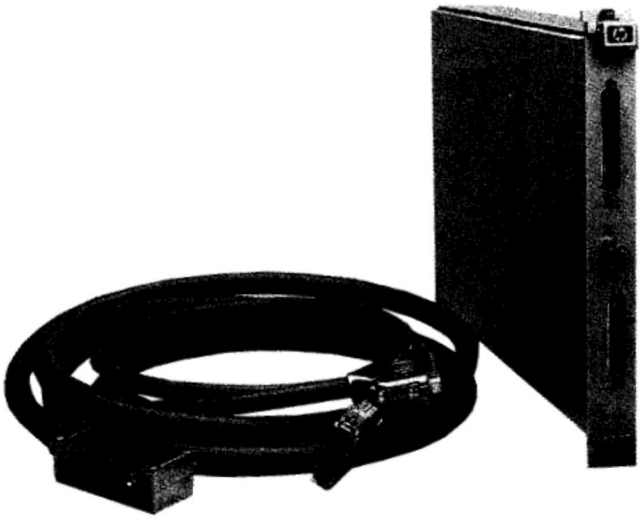
- Fast Motorola 68030-based CPU
- Runs either HP BASIC/WS or HP-UX (including HP BASIC/UX)
- Built-in HP-IB, RS-232, LAN, keyboard, and display ports
- HP-ITG compatible
- Disk interface
- 4 slots, C-size

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MEASUREMENT SYSTEMS ARCHITECTURE

HP 75000 VXIbus Family

Extender, Fixtures



HP E1482A

VXI-MXI Extender (E1482A)

The E1482A is a high-speed MXIbus interface that connects VXI mainframes. It uses the industry-standard MXIbus architecture that allows the system controller to treat all mainframes as a single unit. The trigger and clock lines are extended via the standard INTX connection.

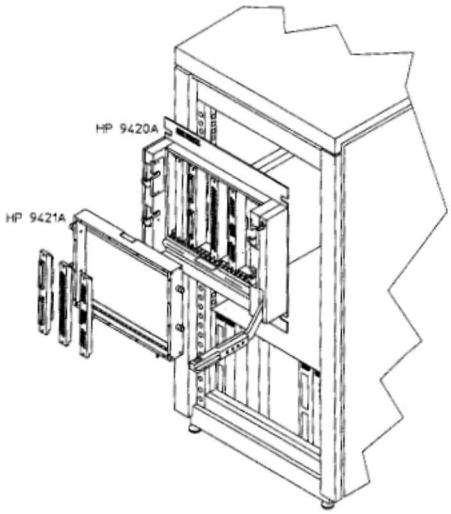
- Extends VXI mainframes and connects to MXIbus computer interfaces
- Has transparent interrupts and triggers
- Provides high-speed data link between computer and VXI mainframes

Specifications

I/O:	Trigger input/output and external clock via SMB connectors
Connectors:	MXIbus and INTX
VXIbus compliance:	Rev 1.3
Supported devices:	HP E1405B Command Module and E1480A Embedded Computer

HP 75000 System Resource Interface

The HP 75000 System Resource Interface (SRI) fixtures are designed to offer you high-density modular connections from your devices under test (DUTs) to your HP 75000 System. You can pick from three different versions of the fixture, depending on your configuration. These fixtures are manufactured to meet the requirements of the most demanding test environments. With all gold-plated contacts and a 25,000-plus interconnect cycle durability, they give you dependable connections time and time again. With the standard blocks for general-purpose, high-frequency coax, and power connections, these fixtures can accommodate thousands of possible configurations.



HP 9420A Interface Connector Assembly (ICA)

The HP 9420A Interface Connector Assembly is mounted in a fixed position onto the test rack. The HP 9421A Interface Test Adapter (ITA) is an interchangeable quick-disconnect panel that interfaces to your DUT. There are 21 slots available on the fixture for standard interchangeable connector blocks. This fixture should be used when the majority of connections come from places other than the VXI mainframe.

Specifications

HP 9420A Interface Connector Assembly (ICA)

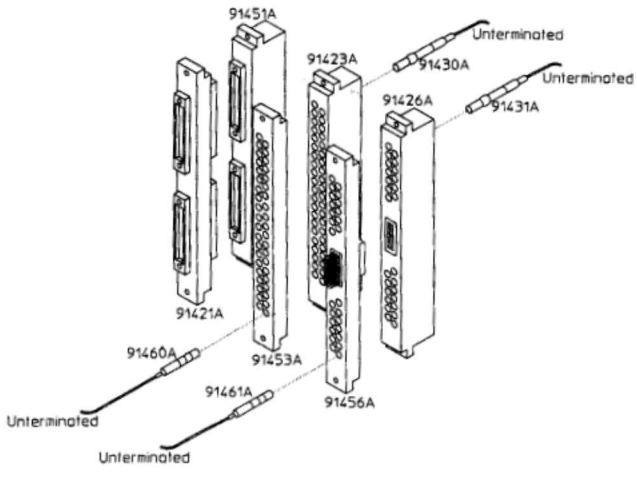
Height	40.00 cm (15.75 in)
Width	48.30 cm (19.00 in)
Depth	10.16 cm (4.00 in)
Connector slots	21
Connector spacing	19.05 mm (0.75 in)

HP 9421A Interface Test Adapter (ITA)

(without customer DUT fixture adapter)

Height	28.58 cm (11.25 in)
Width	41.91 cm (16.50 in)
Depth	3.81 cm (1.50 in)
Connector Spacing	19.05 mm (0.75 in)
Connector Slots	21 (mate with the slots on the HP 9420A and HP E3722A)

The following connector blocks and cable assemblies are used with all three fixtures. Note that the cable assemblies with connectors are not included with the connector blocks (except for the sense pins on the power connector block).

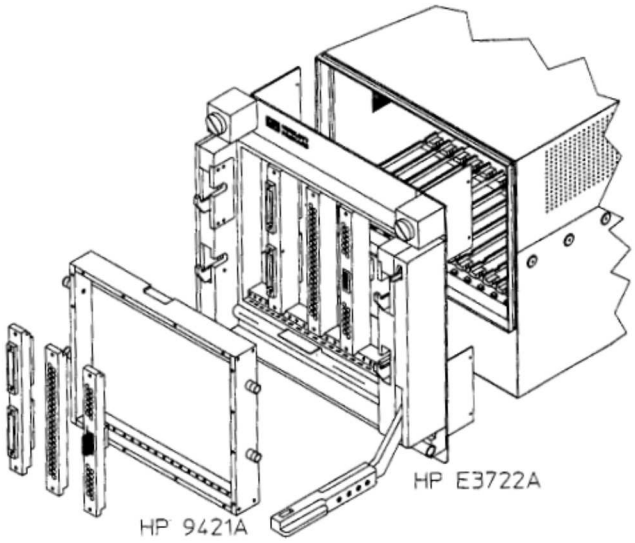


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Connector Block Specifications

General-Purpose Connector Blocks:
HP 91421A (for ICA, V/ICA, and H/ICA)
HP 91451A (for the ITA, and V/ITA)

No. of pins	192
Voltage	250 VDC max
Current	3 A max
Impedance	40 to 60 Ω
Bandwidth	100 MHz
Durability	25,000 cycles
Connector holes	36
Voltage	250 VAC max
Current	1.5 A max
Impedance	50 Ω
Bandwidth	500 MHz
VSWR	1.2 at 600 MHz
Durability	50,000 Cycles



HP E3722A Hinged Interface Connector Assembly (H/ICA)

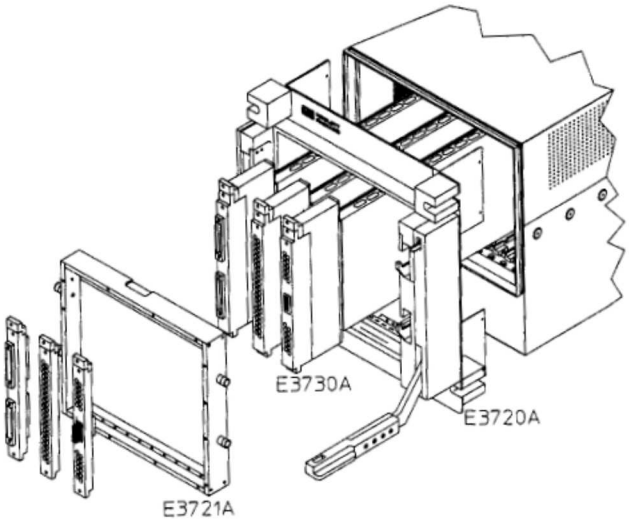
The HP E3722A Hinged Interface Connector Assembly mounts directly to the HP 75000 Series C Cardcage. The VXI plug-in cards are accessible when the ICA is opened to the horizontal position. The HP 9421A Interface Test Adapter (ITA) is an interchangeable quick-disconnect panel that interfaces with your DUT. There are 21 slots available on the fixture for standard interchangeable connector blocks. This fixture should be used when the majority of connections are wired directly to VXI plug-in cards.

Specifications

HP E3722A Hinged Interface Connector Assembly (H/ICA)

Height	40.00 cm (15.75 in)
Width	48.30 cm (19.00 in)
Depth	76.70 cm (30.20 in)
(including cardcage with rear feet)	
Connector slots	21
Connector spacing	19.05 mm (0.75 in)

Note: 88.9 mm (3.5 in) cable tray included. Uses HP 9421A ITA



HP E3720A VXI Interface Connector Assembly (V/ICA)

The HP E3720A VXI Interface Connector Assembly mounts directly to the front of the HP 75000 Series C Cardcage. Access to the VXI plug-in cards is available without removing the V/ICA. The HP E3721A VXI Interface Test Adapter (V/ITA) is an interchangeable quick-disconnect panel that interfaces to your DUT. There are 13 connector slots available on the fixture for standard interchangeable connector blocks. This fixture should be used when minimum lead lengths are required and the majority of fixtured connections are wired directly to VXI plug-in cards.

Specifications

HP E3720A VXI Interface Connector Assembly (V/ICA)

Height	40.00 cm (15.75 in)
Width	48.30 cm (19.00 in)
Depth	76.70 cm (30.20 in)
(including cardcage with rear feet)	
Connector slots	13
Connector spacing	30.48 mm (1.20 in)

Coax Connector Blocks:
HP 91423A (for ICA, V/ICA, and H/ICA)
HP 91430A Coax Terminal Cable Kit (ICA)
(12 cables with connectors for use with HP 91423A)
HP 91453A (for ITA and V/ITA)
HP 91460A Coax Terminal Cable Kit (ITA)
(12 cables with connectors for use with HP 91453A)

Power Connector Blocks w/sense:
HP 91426A (for ICA, V/ICA, and H/ICA)
HP 91431A Power Terminal Cable Kit (ICA)
(12 cables with connectors for use with HP 91431A)
HP 91456A (for ITA and V/ITA)
HP 91461A Power Terminal Cable Kit (ITA)
(12 cables with connectors for use with HP 91461A)

Connector holes	24
Sense pins	36
Resistance	6 m Ω
Voltage	250 VAC max
Current	30 A max per pin
Bandwidth	1 kHz
Durability	50,000 cycles

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MEASUREMENT SYSTEMS ARCHITECTURE

HP 75000 VXIbus Family

Ordering Information

Ordering Information	Price
Series C Mainframes	
HP E1492B HP 75000 Series C Starter System. Includes HP E1400B Mainframe with Opt 908 plus HP E1405B Command Module.	$8,750
HP E1400B HP 75000 Series C Mainframe	$6,350
Opt 907 Front Handle Kit	+$170
Opt 908 Rack Mount Flanges & Rails (includes hardware)	+$180
Opt 909 Rack Mount Flanges, Handles, & Rails (includes hardware)	+$350
E1400-80003 Rack Slide kit* (includes heavy-duty slides, cable tray, hardware, non-tilting)	
*The price of this product was not available at time of printing.	
Series B mainframes	
HP E1300A HP 75000 Series B Mainframe (without front panel)	$2,320
HP E1301A HP 75000 Series B Mainframe (w/front-panel keyboard/display)	$2,900
System Options Installed (choose one):	
Opt 020 HP IBASIC Controller w/512 KB nonvolatile memory	+$1,000
Opt 021 HP IBASIC Controller w/1 MB nonvolatile memory	+$1,600
Opt 022 HP IBASIC Controller w/2 MB nonvolatile memory	+$2,400
Opt 010 512-KB nonvolatile memory	+$600
Opt 011 1-MB nonvolatile memory	+$1,000
Opt 012 2-MB nonvolatile memory	+$1,800
Disk storage options installed (choose one); requires HP IBASIC):	
Opt 005 3½-in: flexible disk drive only	+$850
Opt 006 20-MB ruggedized hard disk only	+$1,900
Opt 007 20-MB ruggedized hard disk plus flexible disk	+$2,100
Opt 008 External dc power operation installed	+$700
Opt 009 HP E1326B 5½-digit multimeter installed internally	+$1,340
Opt 907 Front Handle Kit	+$80
Opt 908 Rack Mount Flanges & Rails (includes hardware)	+$130
Opt 909 Rack Mount Flanges, Handles, & Rails (includes hardware)	+$210
1494-0059 Rack Slide Kit (includes hardware, non-tilting)	$100
Interfaces	
HP E1482A Series C VXI Extender MXI bus	$2,754
HP E1324A RS-232C/422 Data Comm Module	$650
Field installation kits	
HP E1300-80001 HP IBASIC (requires at least 512-KB memory)	$700
HP E1300-80002 512-KB Nonvolatile Memory for Series B Mainframe (2-MB maximum per mainframe)	$600
HP E1300-80003 1-MB Nonvolatile Memory for Series B Mainframe (2-MB maximum per mainframe)	$1,000
HP E1300-80005 3½-in Flexible Disk Drive (requires HP IBASIC and disk controller)	$200
HP E1300-80006 20-MB Hard Disk (requires HP IBASIC and disk controller)	$1,250
HP E1300-80011 Disk Controller for Series B Mainframe (only one required per mainframe)	$650
HP E1300-80008 External dc Power Operation for Series B Mainframe	$700
HP E1326-80004 Internal Installation Kit for Series B Mainframe for HP E1326B 5½-Digit Multimeter	$142
Series C Command Module	
HP E1405B Command Module	$2,830
Opt 020 HP IBASIC Controller	$$1,000
Power meters	
HP E1416A Power Meter	$2,500
Opt 915 Service Manual	+$50
Opt 916 Additional Users' Manual	+$50
HP 11730A Accessories supplied: one 1.5-meter (5-ft) sensor cable	$0
Multimeters	
HP E1410A 6½-Digit Multimeter (includes bus cable)	$3,540
Opt 1BN MIL-STD-45662A Calibration Certification	+$200
HP E1411B 5½-Digit Multimeter, Series C (includes bus cable)	$1,600
Opt 1BN MIL-STD-45662A Calibration Certification	+$160
HP E1326B 5½-Digit Multimeter, Series B (includes bus cable)	$1,300
Opt 1BN MIL-STD-45662A Calibration Certification	+$120
HP E1326-80004 Internal Installation Kit for HP E1326B 5½-Digit Multimeter	$142
Oscilloscopes	
HP E1426A Digitizing Oscilloscope	$7,950
HP E1428A Digitizing Oscilloscope	$12,950
Counters	
HP E1420B High-Performance Universal Counter	$3,450
Opt 010 TCXO Time Base	$500
Opt 030 UHF Input Channel	$950
Opt 040 Shared RAM	$500
HP E1332A 4-Channel Counter/Totalizer	$910
Opt 1BN MIL-STD-45662A Calibration Certification	+$90
HP E1333A 3-Channel Universal Counter	$910
Opt 1BN MIL-STD-45662A Calibration certification	+$90
Sources	
HP E1440A 21-MHz Synthesized Function/Sweep Generator	$5,700
Opt 001 High-Voltage Output	$310
HP E1445A Arbitrary Function Generator	$7,000
HP E1446A Summing Amplifier/DAC	$2,750
HP E1340A Arbitrary Function Generator	$2,500
HP E1328A 4-Channel D/A Converter	$1,100
Digital	
HP E1493A HP 75000 Model D20 Digital Functional Test System (includes HP E1450A, HP E1452A, HP E1453A, two HP E1454A, and downloadable SCPI driver)	$11,455
Opt 001 Add an HP E1451A and two HP E1454As	$4,680
HP E1494A Model D20 Digital Test Development System (includes HP E1450A, HP E1452A, HP E1453A, two HP E1454As, HP E1496A, and downloadable SCPI driver)	$14,455
Opt 001 Add an HP E1451A and two HP E1454As	$4,680
The following components are orderable separately:	
HP E1450A 160 MHz Timing	$6,600
HP E1451A 20 MHz Pattern I/O	$3,500
HP E1452A Terminating 20 MHz Pattern I/O	$3,500
HP E1453A Timing Pod	$675
HP E1454A Pattern Pod	$590
HP E1496A Digital Test Development Software	$3,500
HP E1330A Quad 8-bit Digital Input/Output (includes interface cable)	$610

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Ordering Information	Price
Relay Multiplexers	
HP E1345A 16-Channel Relay Multiplexer (includes bus cable)	$660
HP E1346A 48-Channel Single-Ended Relay Multiplexer (includes bus cable)	$810
HP E1347A 16-Channel Thermocouple Relay Multiplexer (includes bus cable)	$760
HP E1460A 64-Channel Relay Multiplexer (includes bus cable)	$2,420
HP E1355A 8-Channel 120-Ohm Strain Relay Multiplexer	$925
HP E1356A 8-Channel 350-Ohm Strain Relay Multiplexer	$925
FET Multiplexers	
E1351A 16-Channel FET Multiplexer	$875
E1352A 32-Channel Single-ended FET Multiplexer	$1,000
E1353A 16-Channel Thermocouple FET Multiplexer	$975
HP E1357A 8-Channel 120-Ohm Strain FET Multiplexer	$1,125
HP E1358A 8-Channel 350-Ohm Strain FET Multiplexer	$1,125
RF Multiplexers	
HP E1366A 50-Ohm RF Multiplexer (2 × 4:1)	$860
HP E1367A 75-Ohm RF Multiplexer (2 × 4:1)	$860
HP E1472A 50-Ohm RF Multiplexer (6 × 4:1)	$2,530
HP E1473A 50-Ohm RF Multiplexer Expander (6 × 4:1) (includes cable)	$1,520
HP E1473-80002 Cable Extension Kit for RF Multiplexer Expander (2 cables)	$66
Microwave	
HP E1368A 18-GHz Microwave Switch	$2,120
HP E1369A Microwave Switch Driver (includes cable)	$510
HP E1370A Microwave Switch/Attenuator Driver	$500
Switches	
HP E1465A 16 × 16 Relay Matrix	$4,950
HP E1466A 4 × 64 Relay Matrix	$4,950
HP E1467A 8 × 32 Relay Matrix	$4,950
HP E1463A 32-Channel 5 Amp, Form C Switch	$1,600
HP E1468A 8 × 8 Relay Matrix	$2,400
HP E1469A 4 × 16 Relay Matrix	$2,400
HP E1361A 4 × 4 Relay Matrix	$660
HP E1364A 16-Channel Form-C Switch	$660
Development Tools	
HP E1400T VXI Development Mainframe	$6,275
HP E1323A VXI Preprocessor for HP Logic Analyzers	$1,200
HP E1402A VME Module Adapter	$560
HP E1399A Register-Based Breadboard, Series B	$400
HP E1490B Register-Based Breadboard, Series C	$900
HP E1403A A/B-Size Active Module Carrier	$298
HP E1408A A/B-Size Module Carrier	$298
HP E1409A Series C Chassis Shield	$150

System Computers	
HP E1480A HP V/360 Controller (Includes 4 MB RAM, HP-IB, RS-232, HP-HIL, audio, two-channel DMA, LAN, Slot 0 functionality as well as HP-UX and HP BASIC/UX License-to-Use. Monitor, keyboard and software must be ordered separately. You must also order one of Opts 500 through 550 below. Opts 010 & 011 cannot be ordered concurrently.	$9,950
Opt 010 98262A High-Speed HP-IB Disk Interface	+$990
Opt 011 98265A SCSI disk interface	+$400
Opt 108 Add 4 MB RAM for a total of 8 MB RAM	+$5,040
Opt 112 Add 8 MB RAM for a total of 12 MB RAM	+$9,780
Opt 116 Add 12 MB RAM for a total of 16 MB RAM	+$14,200
Opt 500 No graphics subsystem	$0
Opt 542 98542A Medium-Resolution Monochrome Graphics Board, 512 × 480	+$845
Opt 543 98543A Medium-Resolution 4-Plane Color Graphics Board	+$1,340
Opt 544 98544A High-Resolution Monochrome Graphics Board, 1024 × 768	+$1,610
Opt 549 98549A High-Resolution 6-Plane Color Graphics Board	+$2,140
Opt 550 98550A High-Resolution, High-Performance Color Graphics	+$4,140
If you plan to communicate directly across the VXI backplane from the V/360, order the following:	
HP E1481A V/360 VXIbus Drivers, Media, & Documentation	$200
HP E1481L V/360 VXIbus Drivers, License-to-Use	$350
HP E1404A Slot 0/Translator	$850
System Resource Interface	
HP 9420A Interface Connector Assembly	$3,425
HP E3720A VXI Interface Connector Assembly (V/ICA)	$4,500
HP E3722A Hinged Interface Connector Assembly (H/ICA)	$4,900
HP 91422A General-Purpose Connector Block	$190
HP 91423A Coax Connector Block	$122
HP 91430A Coax Terminal Cable Kit: 60 in (ICA) (12 each)	$389
HP 91426A Power Connector Block w/sense	$250
HP 91431A Power Terminal Cable Kit: 60 in (ICA) (12 each)	$313
HP 9421A Interface Test Adapter	$385
HP E3721A VXI Interface Test Adapter (V/ITA)	$450
HP E3730A VXI Interface Terminal Module	$310
HP 91452A General-Purpose Connector Block	168
HP 91453A Coax Connector Block	$105
HP 91460A Coax Terminal Cable Kit: 36 in (ITA) (12 each)	$302
HP 91456A Power Connector Block w/sense	$140
HP 91461A Power Terminal Cable Kit: 36 in (ITA) (12 each)	$184
HP 91455A Blank Connector Block	$33
HP 91439A Terminal Extraction Tool Kit	$207

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