Series 300 Model R/332 Instrument Controllers
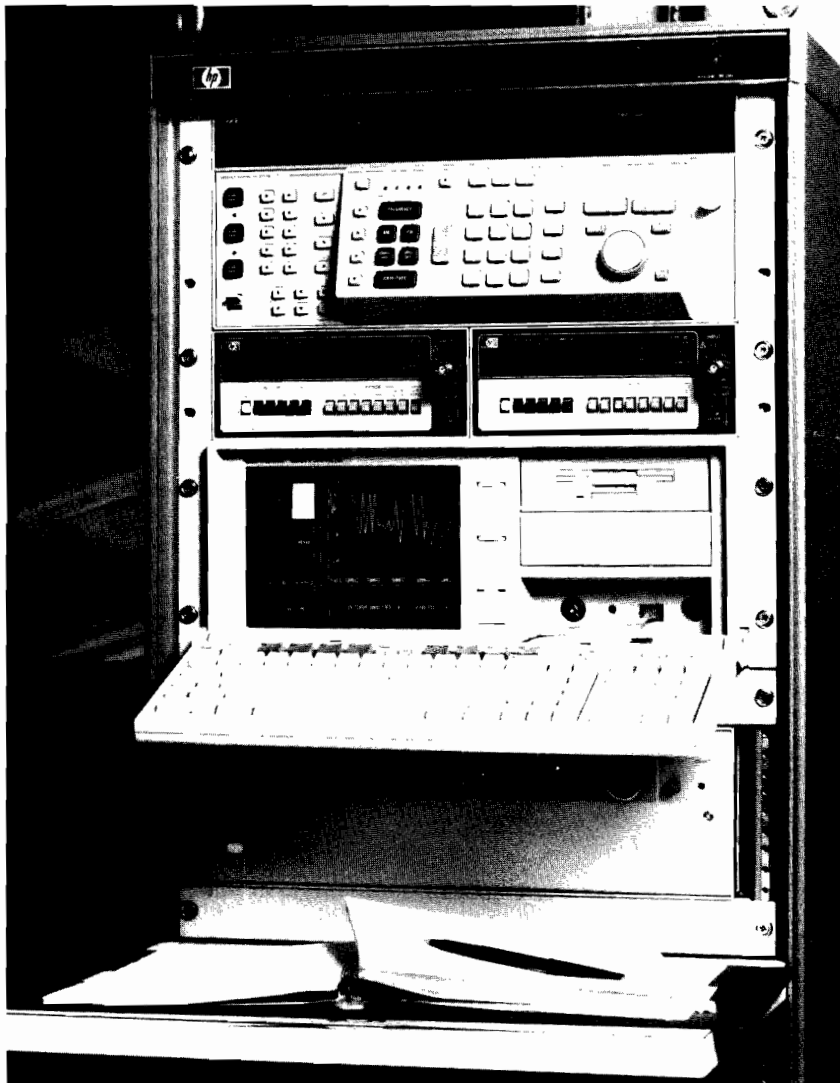
Computer
Museum

Technical Data*

Introduction

Now engineers and scientists have a new choice for measurement automation and process control. The Model R/332 Controller gives you the computer power you want in a form ideally suited for control applications. The Model R/332 is fully compatible with Series 300 software and enhancement accessories. In addition, it is designed to survive in demanding applications and difficult environments. And, the controller can easily be mounted in an EIA 19-inch rack, requiring only 7 inches of rack height.

* Data subject to change without notice.

The Model R/332 contains HP's Model 332 CPU board, a built-in display, hinged keyboard, built-in flexible and hard disk drives, and a touch-screen input device. Construction includes a cast-aluminum frame for strength, and double-wall shielding throughout to minimize electromagnetic emissions and susceptibility. The Model R/332 runs HP BASIC.

The Model R/332 CPU board features Motorola's 68030 processor with up to 8 Mbytes of memory and an optional 68882 math co-processor. On-board interfaces connect to HP-IB (IEEE-488), RS-232, and all internal peripherals and user interface devices. Eight expansion slots are available for additional interfaces and accessories.

The hard disk drives built into the R/332 are exceptionally rugged by design. In addition, special shock mounting is provided for failure-free operation in the most demanding environment. The flexible disk drive will read single- and double-sided 31/2-inch disks as well as newer, 2 MByte (unformatted capacity) 3 1/2-inch disks.

The R/332 display is a 9-inch diagonal monochrome CRT with 80-column alpha and 512x400 graphics resolution. This resolution corresponds to the monochrome monitor most commonly used with Series 300 controllers. The touch-screen input device, while smaller than the HP 35723A Touchscreen bezel, has equal resolution and is software-compatible.
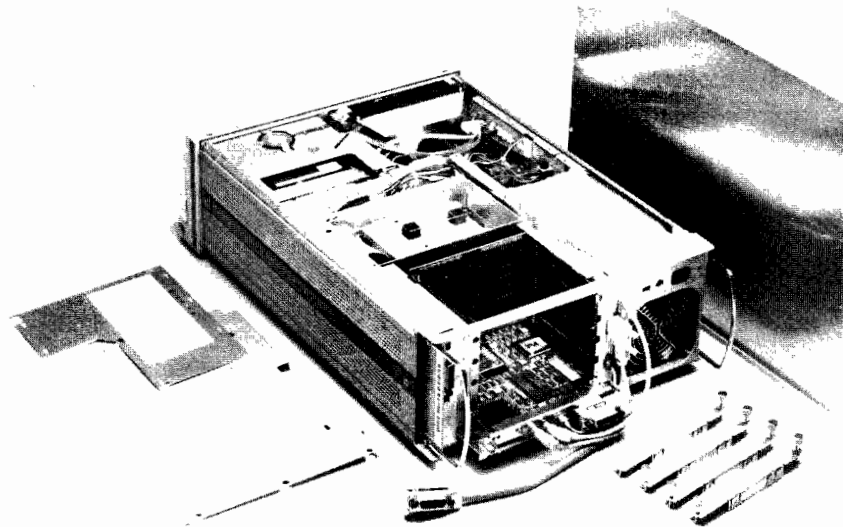
R/332 SPU Configuration
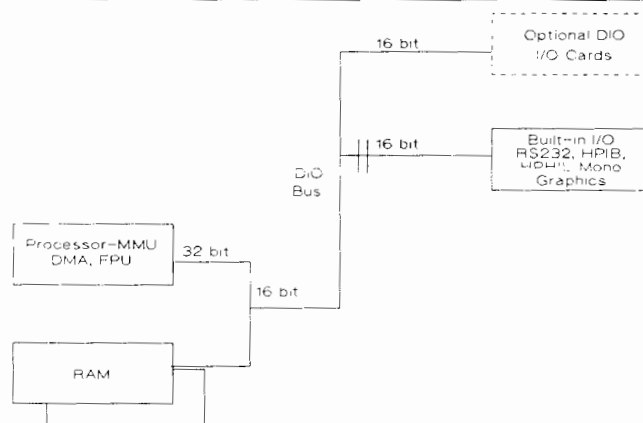
Functionality diagram of R/332

The ITF-style keyboard is designed for use in a rack. It swings up to protect the front panel when not in use and can be locked in any of several convenient positions. Or, remove the keyboard entirely and use the touch-screen display or other input device.

Eight DIO expansion slots (behind four interface panels) allow you to add standard HP Series 300 interfaces and expansion accessories.

To customize the Model R/332 controller, a space below the flexible disk drive may be modified using parts from the Custom Engineering Kit. This space may be used as a storage compartment or for custom circuitry. The front surface of the drawer may serve as a panel to mount knobs, lights, switches, connectors, or other devices.

Technical Specifications

System Processing Unit

Central Processor	MC68030
Clock	16.7 MHz
Wait states	0
Floating Point	MC68882 (optional)
Clock frequency	16.7 Mhz
Accelerator	N/A
Memory Management Unit	
Type	on CPU chip
Virtual memory (HP-UX only)	4 Gbytes/process
Contexts	84 default, user-settable
Cache Memory	
Type	InStruction cache and data cache on CPU chip
Size	512 bytes
Main Memory	
Type	Byte parity error checking
RAM	1, 2, 4, 5 or 8 Mbytes via daughter boards
Bus width	32b address 32b data
Additional Memory	98269A/B
Maximum Memory	8 Mbytes

Standard System Interfaces and Features

Interface	DIO Equivalent	Model R/332
HP-IB	98624A	Yes
RS-232C	98644A	Yes
HP-HIL	—	Yes
RS-422	98628A	No
LAN	98643A	Optional
DMA	98620B	Yes
High-speed HP-IB disk	98625B	Optional
SCSI	98658A	Optional
System timer	—	Yes
User timer	—	Yes
Battery-backed real-time clock	—	Yes

Physical and Environmental Specifications
SPU Power Specifications

Source Consumption	5.5A @ 100 – 120V 2.5A @ 220 – 240V
Line Frequency	50/60 Hz (400 Hz with higher leakage current)
Power Consumption:	
Watts maximum	375
BTU/hour	1280
Kcal/hour	375
Power Availability:	
Power supply maximum:	244 Watts
At + 5 volts	25 Amps
At - 5 volts	1 Amp
At + 12 volts	8 Amps
At - 12 volts	1.5 Amp
DIO Backplane Power:	25 Watts per 2-slot pair
DIO II Backplane Power:	N/A

Physical Dimensions

Model R/332

Height	189 mm (7.5 in.)
Width	440 mm (17.3 in.)
Depth, keyboard up	704 mm (27.7 in.)
Minimum inside dimensions of rack:	
Height	177 mm (7.0 in.)
Width	425 mm (16.7 in.)
Depth	653 mm (25.7 in.)
Net weight	20 kg (45 lbs.) typical

Environmental Range

Operating temperature	5°C to +50°C to 2286m (7500 ft.)
Storage temperature	-40°C to +60°C
Maximum wet-bulb temperature	40°C
Humidity:	
Operating	40°C 5% to 95% R.H.
Non-operating	40°C 95% R.H.
Altitude:	
Operating	4,570m (15,000 ft.) at 25°C
Non-operating	15,240m (50,000 ft.) at 25°C
EMI	Certified to FCC Part 15, subpart J, Class B; VDE 0871, Class B; CISPR 22, Class B.
Regulatory Compliance	UL certified, CSA certified, certified to IEC 950

Clock and Timers

Real-time Clock

Resolution	10 milliseconds
Accuracy	+5 seconds/day
Battery backup	Lithium, expected life=1 year
Expected run time after power loss	12 hours

Timers

Match interrupt	Match on time of day 0.00 to 84600.00 sec.
Delay interrupt	10 msec. to 1.94 days
Cyclical interrupt	10 msec. to 1.94 days
System timer	4msec. resolution accurate to 25 ppm

Audio

Three independent tone generators controllable over 30 db.

Frequency range	81.46 Hz to 83.3 KHz
Resolution	Capable of approximate chromatic scale over five octaves
Duration	.01 sec. to 2.55 second/tone

Model R/332 (A1303A)

The A1303A is a pre-configured R/332 rack-mount controller that includes the following:
- Model R/332 SPU with 1 Mbyte RAM
- 3 1/2-inch 1.4 Mbyte flexible disk drive
- 9-inch monochrome CRT (512 x 400) with Touchscreen surface
- HP BASIC Language System software on 3 1/2-inch double-sided disks
- Removable keyboard

Options

- Opt. 001 – Delete Touch
- Opt. 102 – 2 Mbyte total RAM
- Opt. 104 – 4 Mbyte total RAM
- Opt. 105 – 5 Mbyte total RAM
- Opt. 108 – 8 Mbyte total RAM
- Opt. 882 – MC68882 floating-point co-processor
- Opt. 908 – Add A1309A Rack Mount Flange kit (see below).

Accessories

There are several accessories that you can purchase to enhance your A1303A R/332 controller. These include:

General

- A1308A Custom Engineering Kit
- HP 98269A 1 Mbyte parity RAM daughterboard
- HP 98269B 4 Mbyte parity RAM daughterboard
- HP 98284A MC68882 Floating-Point Coprocessor
- HP 46060A HP-HIL 2-button mouse
- HP 46080A HP-HIL keyboard extension cable
- HP 46084A HP-HIL ID module

Interfaces

- HP 98622A GPIO interface
- HP 98623A BCD interface
- HP 98625B HP-IB disk interface, high-speed
- HP 98629A Shared Resource Manager interface
- HP 98640A analog input, 7-channel A to D interface
- HP 98658A DIO-I SCSI host adaptor
- HP 98643A LAN/300 Link with ThinMau

Rack Mounting

- A1309A Rack Mount Flange Kit
  Use in combination with one of:
    1494-0059 standard slide kit
    1494-0063 standard tilting slide kit
    12679B stationary rails for HP rack

Suggested Peripherals

- HP 2225A ThinkJet printer
- HP 7475A plotter

Model R/332 (A1305A)

The A1305A is a pre-configured R/332 rack-mount controller that includes the following:
- Model R/332 SPU with 1 Mbyte RAM
- 3 1/2-inch 1.4 Mbyte flexible disk drive
- 20 Mbyte hard disk subsystem
- 9-inch monochrome CRT (512 x 400) with Touchscreen surface
- HP BASIC Language System software on 3 1/2-inch double-sided disks
- Removable keyboard

Options

- Opt.001 – Delete Touch
- Opt. 102 – 2 Mbyte total RAM
- Opt. 104 – 4 Mbyte total RAM
- Opt. 105 – 5 Mbyte total RAM
- Opt. 108 – 8 Mbyte total RAM
- Opt. 882 – MC68882 floating-point co-processor
- Opt. 908 – Add A1309A Rack Mount Flange Kit (see below)

Accessories

There are several accessories that you can purchase to enhance your A1305A R/332 controller. These include:

General

- A1308A Custom Engineering Kit
- HP 98269A 1 Mbyte parity RAM daughterboard
- HP 98269B 4 Mbyte parity RAM daughterboard
- HP 98284A MC68882 Floating-Point Coprocessor
- HP 46060A HP-HIL 2-button mouse
- HP 46080A HP-HIL keybaord extension cable
- HP 46084A HP-HIL ID module

Interfaces

- HP 98622A GPIO interface
- HP 98623A BCD interface
- HP 98625B HP-IB disk interface, high speed
- HP 98629A Shared Resource Manager interface
- HP 98640A analog input, 7-channel A to D interface
- HP 98643A LAN/300 Link with ThinMau
- HP 98658A DIO-I SCSI host adaptor

Rack Mounting

- A1309A Rack Mount Flange Kit
  Use in combination with one of:
      1494-0059 standard slide kit
      1494-0063 standard tilting slide kit
      12679B stationary rails for HP rack

Suggested Peripherals

- HP 2225A ThinkJet printer
- HP 7475A plotter

Model R/332 (A1307A)

The A1307A is a pre-configured R/332 rack-mount controller that includes the following:
- Model R/332 SPU with 1 Mbyte RAM
- 3 1/2-inch 1.4 Mbyte flexible disk drive
- 40 Mbyte hard disk subsystem
- 9-inch monochrome CRT (512 x 400) with Touchscreen surface
- HP BASIC Language System software on 3 1/2-inch double-sided disks
- Removable keyboard

Options

- Opt. 001 – Delete Touch
- Opt. 102 – 2 Mbyte total RAM
- Opt. 104 – 4 Mbyte total RAM
- Opt. 105 – 5 Mbyte total RAM
- Opt. 108 – 8 Mbyte total RAM
- Opt. 882 – MC68882 floating-point co-processor
- Opt. 908 – Add A1309A Rack Mount kit (see below)

Accessories

There are several accessories that you can purchase to enhance your A1307A R/332 controller. These include:

General

- A1308A Custom Engineering Kit
- HP 98269A 1 Mbyte parity RAM daughterboard
- HP 98269B 4 Mbyte parity RAM daughterboard
- HP 98284A MC68882 Floating-Point Coprocessor
- HP 46060A HP-HIL 2-button mouse
- HP 46080A HP-HIL keyboard extension cable
- HP 46084A HP-HIL ID module

Interfaces

- HP 98622A GPIO interface
- HP 98623A BCD interface
- HP 98625B HP-IB disk interface, high speed
- HP 98629A Shared Resource Manager interface
- HP 98640A analog input, 7-channel A to D interface
- HP 98643A LAN/300 Link with ThinMAU
- HP 98658A DIO-I SCSI host adaptor

Rack Mounting

- A1309A Rack Mount Flange Kit
  Use in combination with one of:
    1494-0059 standard slide kit
    1494-0063 standard tilting slide kit
    12679B stationary rails for HP rack

Suggested Peripherals

- HP 9122C dual 3 1/2-inch flexible disk drive
- HP 9153C 10-40 Mbyte fixed hard disk (with or without built-in 3 1/2- inch flexible disk drive)
- HP 2225A ThinkJet printer
- HP 7475A plotter