HEWLETT® PACKARD

HP Precision Bus HP-IB Interface

Technical Data

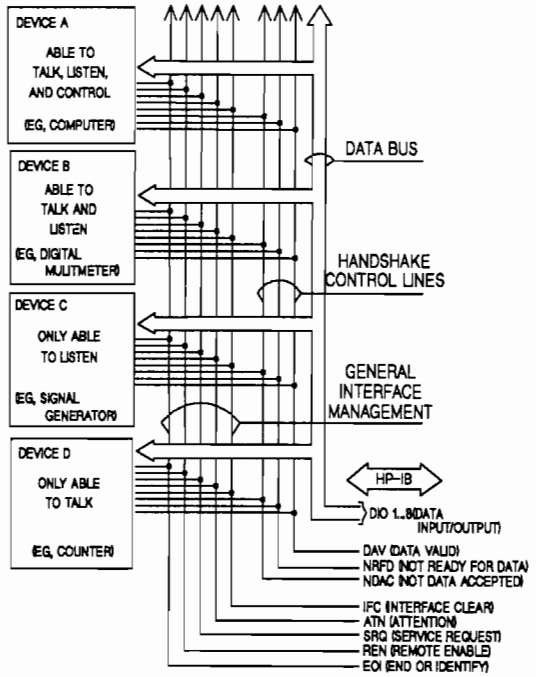
For HP-PB based HP 9000 Series 800 Computer Systems Product Number HP 28650B

The HP 28650B** HP-IB* Interface allows connection of up to 14 HP-IB compatible devices to HP 9000 Series 800 systems that use the HP Precision Bus backplane. HP-IB compatible devices include flexible and hard disks, printers, plotters, graphics digitizers, magnetic tape devices, and an extensive list of instruments.

Features

- 1 Mbyte/s high speed, 500 Kbytes/s standard speed
- Fully IEEE-488-1978 compatible
- Support of up to 14 standard-speed devices, 8 high-speed devices
- Simple implementation of computer-controlled instrumentation and peripheral systems
- Selectable HP-IB controller or slave capabilities
- Parallel poll mode can be programmatically enabled or disabled
- Self-test to help assure interface integrity

Figure 1



* The Hewlett-Packard Interface Bus (HP-IB) is HP's implementation of IEEE Standard 488-1978: "Digital Interface for programmable instrumentation" and identical ANSI Standard MS 1.1. The term "HP-IB" is also used to identify Hewlett-Packard instruments conforming with this standard.

** The HP 28560B is a replacement for the HP 28650A on systems with HP-UX 8.02 or later.

HP-IB Capabilities

The HP 28650B HP-IB Interface connects to the signal lines shown in figure 1, acting as DEVICE A. Eight bidirectional data bus lines carry coded messages in bit-parallel, byte-serial form to/from other devices on the bus, with each byte transferred from one "talker" to one or more "listeners." Data is exchanged asynchronously using interface messages to set up, maintain, and terminate an orderly flow of device-dependent messages. Three handshake control lines control the transfer of each byte of coded data on the eight data lines. The five general interface management lines ensure an orderly flow of information within the HP-IB.

Functional Specifications

Capacity

High-Speed Devices per 28650B Interface: Up to eight with load resistors installed up to 14 without

Standard-Speed HP-IB Devices per Interface: Up to 14

Operating Modes

High-Speed Mode: Operation at data rates to 1 Mbyte/s

Standard-Speed Mode: Operation at data rates to 500 Kbytes/s

Note: Attainable speed for a particular system is dependent on such factors as cabling length, type of external device, system level software and number of devices. Higher transfer rates can be achieved when using less than maximum cable lengths and devices. Consult system documentation for further information or the HP-IB tutorial, P/N 5952-0156.

System Controller Mode: IO-CTL call enables HP 28650B operation as system controller or disables such operation.

Bus Characteristics

HP-IB Signal Lines:

DIO1	Data Input/Output 1
DIO2	Data Input/Output 2
DIO3	Data Input/Output 3
DIO4	Data Input/Output 4
DIO5	Data Input/Output 5
DIO6	Data Input/Output 6
DIO7	Data Input/Output 7
DIO8	Data Input/Output 8
DAV	Data Valid
NRFD	Not Ready for Data
NDAC	Not Data Accepted
IFC	Interface Clear
ATN	Attention
ASRQ	Service Request
REN	Remote Enable
EOI	End or Identify

Logic Levels: High >2.4 V; Low <0.5 V; all signals are low true

Supported HP-IB Functions: C1-C5, SR1, RL1, PP1, DC1, SH1, AH1, T1, TE4, L1, LE4, DT1, E2.

Logic Levels, Line Terminations, Line Drivers, and Line Receivers: All characteristics conform to IEEE Standard 488-1978.

Maximum Cable Length for Standard Operation: 2 meters (6.5 ft) per device connected, with a 20-meter (65 ft) total length. The maximum number of devices is accommodated by interconnections using shorter than maximum cable length.

Maximum Cable Length for High-Speed Operation: Interconnecting cable links should be as short as possible, with a maximum of 15 meters total length per system, and should have at least one equivalent resistive load per meter of cable (the high-speed resistor pack adds seven equivalent resistive loads).

Number of Devices	Maximum Total Cable Length (meters)
1	8
2	9
3	10
4	11
5	12
6	13
7	14
8 (maximum)	15

No more than eight devices are allowed in the system. A maximum system would be composed of a system controller, with its high-speed resistor pack, and eight peripherals. Load resistors may need to be repositioned on the interface card for high-speed operation. Refer to the installation guide.

Note: For high- and low-speed cabling guidelines, refer to the installation guide (P/N 28650-90101).

Error Detection

Data errors can be detected using Cyclic Redundancy Check-16 on all data messages sent or received. CRC-16 can be used if the other participating device supports CRC-16. See system documentation for details. Errors are also detected using odd byte parity.

Diagnostic Support

An online diagnostic executable at the system level is supported. Refer to the System Administration Guide for details.

Electrical Specifications

Voltage: +5 volts
Current: 0.45 amps
Power Dissipation: 2.25 watts

Physical Characteristics

Size: 24.4 cm long by 13 cm wide (9.6 in by 5.1 in)

Weight: 257 g (9 oz) without HP-IB cable

I/O Channel Interconnects: 96-pin connector, J1

Device Interconnects: 26-pin connector, P1

Environmental Characteristics

Operating Temperature: 0°C to 55°C (32°F to 131°F)

Operating Relative Humidity: 5% to 95% at 40°C (104°F)

Operating Altitude: 4600 m (15,000 ft) maximum

Ordering Information

The HP 28650B requires operating system HP-UX 8.02 or later.

The HP 28650B includes:

28650-60101 HP-IB Interface Card for HP Precision Bus
5181-6128 2-meter straight-exit HP-IB Cable
28650-90101 Installation and Service Guide

HP 28650B Options

0B0 Delete Installation and Service Guide
001 Delete Cable