

# HP-IB Interface for HP 3000 Series 900 Computer Systems

## Technical Data

For HP 3000 Series 900  
Computer Systems  
Product Number  
HP 27113A

The HP 27113A HP-IB\* Interface allows connection of up to 14 HP-IB-compatible devices to HP 3000 Series 900 systems that use the Channel I/O (CIO) backplane. HP-IB compatible devices include flexible and hard disks, printers, plotters, magnetic tape devices, graphics digitizers, and an extensive list of instruments.

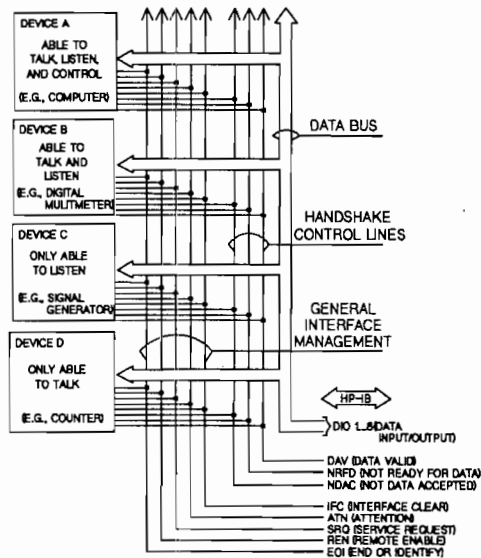
### Features

- 980 KB/s high-speed\*\*, 500 KB/s standard-speed
- Fully IEEE-488-1978 compatible
- Onboard intelligence off-loads the host computer, leaving more CPU resources for application-oriented tasks

\* 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 MC 1.1. The term "HP-IB" is also used to identify Hewlett-Packard instruments conforming with this standard.

\*\* Standard-speed devices cannot be mixed on a high-speed bus. High-speed devices can be mixed on a standard-speed bus if high-speed cabling rules are observed.

Figure 1



- Support of up to 14 standard devices, 8 high-speed devices
- Support of Command Set 80 protocol for CS/80-based disks and tapes
- Parity check and Cyclic Redundancy Check-16 for error detection
- Simple implementation of computer-controlled instrumentation and peripheral systems
- Selectable HP-IB controller or slave capabilities
- Programmatically-enabled or -disabled parallel poll mode
- Firmware-based self-test to help ensure interface integrity

---

## HP-IB Capabilities

The HP 27113A 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 setup, 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 HP 27110B Interface:** Up to 8 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 980 KB/s.

**Standard-speed Mode:** Operation at data rates to 500 KB/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:** A two-position switch enables HP 27113A 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
SRQ	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, RL2, PP1, DC1, SH1, AH1, T1, TE1, L1, LE1, DT1, E2. TE1 and LE1 require host system support.

**Logic Levels, Line Drivers, Line Terminations, 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	6
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 manual.

*Note:* For high- and low-speed cable length operation, refer to the installation manual (P/N 27113-90001).

### 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. CRC-16 is invoked by the system for each transaction. See system documentation for details. Interface message errors are detected using odd byte parity.

### Diagnostic Support

An interface resident self-test, initiated on reset, is provided in the firmware of the HP 27113A.

### Electrical Specifications

Voltage	Current	Power Dissipation
+5V	1.8A	9.0 watts
+12V	35 mA	0.42

### Physical Characteristics

**Size:** 172.7 mm (6.80 in) long by 172 mm (6.75 in) wide

**Weight:** 234 g (8.2 oz); 679 g (23.8 oz) with HP-IB cable

**I/O Channel Interconnects:** 80-pin connector, J1

**Device Interconnects:** 26-pin connector, J2

### Environmental Characteristics

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

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

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

### Ordering Information

The HP 27113A includes:

**27113-60301** HP-IB Interface Card for HP 3000 Series 900  
**27113-63001** 4-meter HP-IB Cable  
**27113-90001** Installation Manual for MPE/iX Systems  
**30070-00043** HP-IB Backplate

### HP 27113A Option

**001** Deletes manual  
**002** Firmware upgrade  
**003** Sliverspan adapter

Technical information in this document is subject to change without notice.

Copyright© Hewlett-Packard Company 1993. All rights reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

Printed in the U.S.A.