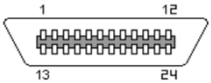
IEEE 488 (GPIB / HPIB)

The **IEEE 488** ia a common parallel interface standard that was originally developed by the Hewlett-Packard Corporation in 1974. Hewlett-Packard called their interface the **HPIB** (**H**ewlett-**P**ackard **I**nterface **B**us). This interface became so popular that it was adopted by the IEEE (Institute of Electrical and Electronics Engineers) in 1975 and designated the IEEE-488. In common practice, it is referred to as the **GPIB** interface (**G**eneral **P**urpose **I**nterface **B**us). In other words, IEEE-488, GPIB, and HPIB all refer to the same parallel interface standard. The primary purpose of the GPIB is to interface laboratory instruments with each other and with computers. In order for a computer to be connected to an instrument using the GPIB interface, both devices must have a GPIB interface card installed. In addition, the computer must also be running a GPIB controller program to control the flow of data to and from the various devices connected to the GPIB. The GPIB standard will allow up to 15 devices on the same cable (daisy-chained). Like most parallel interfaces, the GPIB is limited to rather short distances, each instrument in the chain must be no more than 2 meters apart and the total length of cable cannot exceed 20 meters. A GPIB interface is capable of transferring data at rates up to 1 MB/second. GPIB defines three types of devices:

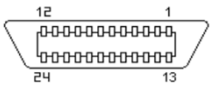
1. **Controller**: typically the microcomputer in the system, manages the GPIB bus. It determines which devices will be talkers and listeners and connects (or disconnects) them accordingly.
2. **Talker**: is a device that is capable of sending data or instructions to other devices. A voltmeter would be a talker since it can send voltage readings to another device.
3. **Listener**: is a device that can receive data or instructions. Printers and plotters are examples of listeners.

Some devices, such as voltmeters and computers, can be both talkers and listeners. They can both send and receive data or instructions. Each instrument on the GPIB bus is assigned its own device number. The control software addresses each device by number and assigns it either talker or listener status. There are 24 lines in the GPIB interface bus and cable. Eight of these lines carry data, five lines are for device control, three are handshaking lines, and eight are signal grounds.

IEEE 488 24 PIN CONNECTOR



MALE



FEMALE