

Low-Cost Parallel GPIB Extender

GPIB-130

Extends the maximum GPIB cable distance to 300 m
High-speed parallel transmission
Transfer rate
900 kbytes/s (assuming 1 Mbytes/s without extenders)
Choice of buffered or unbuffered transfers
Expands the number of GPIB devices to 28
Compact size
Software transparent – no software modifications required
Transparent passing of control to remote GPIB devices
Complete parallel polling
115 or 230 VAC wall-mount power supply
UL, CSA, TUV listed
FCC Class A verified

Applications

Control remote printers or plotters as if they were next to your computer
Interface to devices located in noisy or hazardous environments
Interface up to 28 devices on one logical GPIB system
Control factory floor tests from a remote office



Overview

The GPIB-130 bus extender removes the restrictions on cable length and device loading imposed by the IEEE 488 (GPIB) standard. The compact size of the GPIB-130 makes the extension of the GPIB simply an extension of the GPIB cable itself, and requires virtually no desktop space. The IEEE 488 standard specifies that the total cable length for a GPIB system cannot exceed 20 m and the maximum number of devices is 15. A pair of GPIB-130 bus extenders can extend the cable length to 300 m without compromising the integrity of the GPIB or requiring any application program modifications. In addition, you can expand the GPIB to 28 devices because you can attach 14 devices to each extender. The ability to respond to parallel poll commands is maintained, even at the extension distance of 300 m.

The GPIB-130 uses a parallel extension bus to transfer data at very high rates. The actual rate depends on the transfer rate of the system without extenders. To meet your system requirements, transfers can take place in one of two selectable

modes – buffered or unbuffered. Buffered transfers, which use FIFO buffers, have the highest transfer rates. In unbuffered mode, the IEEE 488 handshaking is maintained so each byte is confirmed by both sender and receiver.

Software

Figure 1 shows a possible configuration in which two GPIB-130 units are used to extend the GPIB to 300 m. In this configuration, all devices on the two GPIBs are logically inter-fused to a single System Controller. That is, the GPIB-130 units are software transparent to the user. When you add the GPIB-130 extenders to a system, existing programs work properly without modification. You can even retain the ability to respond to a parallel poll Identify (IDY) message.

Hardware Capabilities

The GPIB-130 bus extender is compatible with ANSI/IEEE Standard 488.1-1987. The GPIB-130 is a high-performance bus extender that converts the 16 IEEE 488 signals to parallel differential signals for transmission to a matching GPIB-130. The receiving extender converts the signals back to IEEE 488 signals. The GPIB-130 has two data transfer operating modes – buffered and unbuffered. In the unbuffered mode, the GPIB-130 maintains the IEEE 488 double-interlocked handshake across the extension. Each byte is held on the transmission cable until both the sender and receiver confirm that it has been transmitted correctly. In the buffered mode, the GPIB-130s use high-speed buffers (FIFOs) to increase data transfer rates.

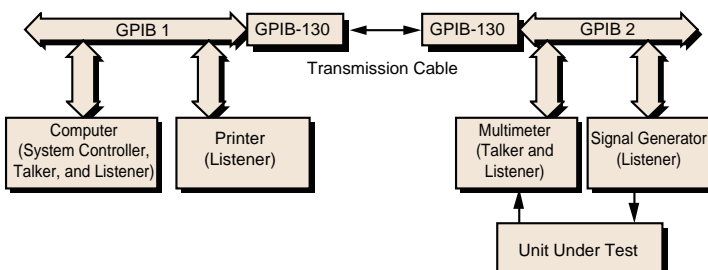


Figure 1. Typical Configuration

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The buffering, which is managed completely by the hardware, requires no modification of user software.

The GPIB-130 has two selectable modes to handle parallel polls – immediate and stored. In the immediate mode, valid parallel poll responses from remote devices are returned within the required time period for cable lengths of 100 m and below. For longer distances, you can use the parallel poll stored mode. In stored mode, the response to the previous parallel poll is returned. To obtain the most current parallel poll response, you issue successive parallel poll commands.

Cables

There are three transmission cables for the GPIB-130 extender. The T6 cable is National Electric Code CL2P plenum rated. You use the CL2 rated T2 cable for distances above 50 m to a maximum length of 300 m. The CL2 rated T5 cable is a smaller, lighter, less expensive replacement for the T2 cable for distances up to 50 m.

Performance

Any bus extender or bus expander degrades normal system performance. This degradation is caused by the propagation delay introduced by the extender itself and the distance between the extenders. The data transfer rate without buffering between the extenders decreases as the length of the cable increases. Table 1 shows the normal transfer rate between an AT-GPIB and a GPIB-410 bus analyzer as compared to the transfer rates of a system that uses a pair of GPIB-130 extenders. Figure 2 illustrates the test setup.

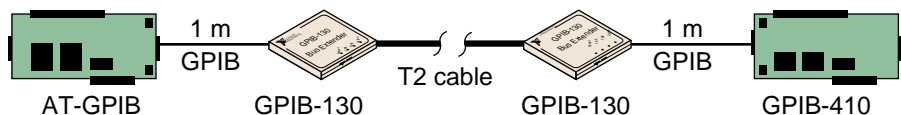


Figure 2. Performance Test Configuration

Configuration	Extender Cable Length	Transfer Rate
Without Extenders	N/A	1 Mbytes/s
Extenders, Buffered Mode	All lengths	900 kbytes/s
Extenders, Unbuffered Mode	5 m	790 kbytes/s
	20 m	640 kbytes/s
	50 m	460 kbytes/s
	100 m	315 kbytes/s
	300 m	140 kbytes/s

Table 1. Performance Test Results

Part Numbers

GPIB-130

U.S. 120 VAC	776526-01
Swiss 220 VAC	776526-02
Australian 240 VAC	776526-03
Universal Euro 240 VAC	776526-04
North American 240 VAC	776526-05
United Kingdom 240 VAC	776526-06
T5 cable up to 50 m, XX m	181563-0XX
T2 cable 50 m to 300 m, XXX m	178056-XXX
T6 cable (CL2P plenum rated) up to 300 m, XXX m	181564-XXX

Specifications

Maximum Sustained Transfer Rates

(assuming 1 Mbytes/s transfer rate without extenders)

Buffered mode 900 kbytes/s
Unbuffered mode

5 m 790 kbytes/s

300 m 140 kbytes/s

Power Requirement

+5 VDC 3.3 VA

Physical

Dimensions.....	9.5 by 7.6 by 2.4 cm (3.8 by 3.0 by 1.0 in.)
Weight.....	170 g (6 oz)
Transmission connector	50-pin D subminiature
GPIB connector	IEEE 488 standard 24-pin
Safety Agency Approval Listings	UL 1950 CSA 22.2 No. 950 TUV EN60 950