GPIB Protocol & Devices

CDA 4170
Data Acquisition and Control Systems

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GPIB General Info 1/3

- GPIB stands for General Purpose Interface Bus. It was created as a standard interface for communication between instruments and controllers from various vendors. It uses the ANSI/IEEE Standard 488.1.
- GPIB has the ability to send data through a system controller, usually a computer, and receive data from up to 14 different additional instruments organized in a linear, or serial, fashion.
- The GPIB card can receive data from these 14 different instruments at speeds up to 1 mByte/s.
• The cord uses a three-wire handshake in 8-bit parallel communication.
• These ‘wire handshakes’ are the means for the data bits to be transferred from a device to the GPIB board efficiently. A handshake will actually determine if the 8-bit data transfer lines are in use or are not.
GPIB General Info 3/3

- Limitation on the 8-bit wire handshake in serial connection is that the performance of the entire system is limited to the performance of the slowest device.

- Limitation of the system is the maximum size of the connections can on sum to 15 meters.
GPIB 24pin connection (1/2)

- The GPIB has a 24 pin connection as outlined below:
  - 8 bits for data
  - 3 bits for handshake (NDAC, DAV, NRFD)
  - 1 for SRQ (service request interrupt)
  - 1 for ATN (state of attention ...data or command)
  - 1 for IFC (interface clear... initialization)
  - 1 for REN (remote enable)
  - 1 for EOI (end or identity of data or command)
GPIB 24pin connection (2/2)

- Pin 1 to Pin 4 Data input/output bit.
- Pin 5 EOI End-or-identify.
- Pin 6 DAV Data valid.
- Pin 7 NRFD Not ready for data.
- Pin 8 NDAC Not data accepted.
- Pin 9 IFC Interface clear.
- Pin 10 SRQ Service request.
- Pin 11 ATN Attention.
- Pin 12 SHIELD
- Pin 13 to Pin 16 DIO8 Data input/output bit.
- Pin 17 REN Remote enable.
- Pin 18 to Pin 23 Ground for pin 6 to pin 11
- Pin 24 Logic ground

http://en.wikipedia.org/wiki/GPIB
Project 1/3

• The goal of this project is to set up a program using LabView that can interface with a GPIB device through a GPIB protocol using a computer as the system controller.
Project 2/3

• Results achieved:
  – Established communication with one device HP 34401A Multimeter
Project 3/3

• Successfully read several sets of data
Resources Used

- http://cnx.org/content/m12283/latest/
- http://www.hit.bme.hu/~papay/edu/GPIB/tutor.htm