Industrial Interfaces and Protocols Laboratory

Overview

The Industrial interfaces and protocols laboratory is based on the NI PXI hardware platform and includes training software. The laboratory also includes simulators for demonstration of data transmission for some protocols.

The software has been developed in the LabVIEW graphical programming environment and provides an interactive communication interface for data transmission between hardware modules. The manual includes short theoretical descriptions of used interfaces/protocols and hands-on lab instructions. The software includes interactive demonstrations of data transmission between hardware modules.

Features

- Two labs for each interfaces and protocol (additional labs are available for some protocols)
- The testbench includes a PXI chassis, controller, and separate modules for each interface/protocol, simulators for GPIB, CAN protocols and SPI interface for demonstration purposes.
- A power meter is used for demonstration of the Modbus protocol.
- The training complex is intended for the study of the following industrial interfaces and protocols:
  - TCP/IP (Transmission Control Protocol),
  - UDP (User Datagram Protocol),
  - CAN (Controller Area Network),
  - DeviceNet (Industrial Application Layer Protocol),
  - Modbus (Serial Communication Protocol),
  - I2C (Inter-Integrated Circuit),
  - SPI (Serial Peripheral Interface),
  - GPIB (General Purpose Interface Bus, IEEE-488),
  - RS232 (Recommended standard RS232),
  - RS485/422 (Recommended standard RS485/422).
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Required Hardware and Software

▪ Windows 7
▪ LabVIEW Run-Time Engine 2011
▪ Adobe reader 9.5 or later
▪ Study guide and Operations manual
▪ NI PXI-1042 with corresponding modules
▪ Monitor

List of labs

1. I2C protocol
2. SPI protocol
3. CAN protocol
4. RS232 protocol
5. RS485/RS422 protocols
6. TCP protocol
7. UDP protocol
8. GPIB protocol
9. MODBUS protocol
10. DeviceNet protocol