Performance of parallel port based remote data acquisition systems in real-time data processing

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A parallel port based remote data acquisition and process control system was built without on board RAM and programmable timer to test the effect on the performance when processing real-time data on a network environment. The controlling software was developed using Delphi and Assembler languages to achieve high speeds. The developed software use TCP/IP protocol for network operations.

It was found that the overall performance depends primarily on the parallel port. For different types of motherboards, the speed of the data transfer varied between 460 Kbps and 890 Kbps. A minimum deviation was observed when there were no processor-bounded applications running in the system concurrently. The port speed did not depend on the processor type or the processor speeds.

For the network transfer tests, client-server architecture was used. In order to increase the throughput, data compression (Zip method) was used. A data stream of 4.5 Kb (sampled data packet of 1500 byte) could be reduced to a 427 ± 27 bytes with this technique. The compression and de-compression time was negligible compared to the computer/network speeds. The client was able to communicate with the server at an approximate speed of 1.3 Kbps on a network with fiber optic backbone, which has a connection speed of 10 Mbps.