Thesis Tiltle   The Development of a CANopen-based Sensor Network

for Structural Testing

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Year Submiited   2005

ABSTRACT

In general, engineering measurement system still uses copper wire to take analog signal from node sensors. In structural testing, almost sensors are far away from the computer. In order to reduce the distortion, it needs to increase the copper wire's dimension and install a high-performance signal conditioner. Absolutely, those distortion reductions come with extra cost and disheveled configuration. We introduce CANopen protocol, which realizes CAN to interface with application software, into the structural testing system.

The thesis covers study real-time performance of CANopen protocol for structural testing system. Data are sent from node sensors to a server on time. Four factors are investigated for their influence for real-time performance including SYNC period, PDO width, PDO period and Node delay. We improved the performance by increasing time delay of PDO (PDO period). As a result, the maximum node numbers in this system is 19 and each node send 4 PDO under sampling frequencies rate is 100 Hz, support condition the structural testing.