



NETX IN MOTION

NetX based modular motion-control architecture with RealTime EtherNet

Project Summary

The aim of this project was to develop a modular software and hardware architecture to develop quickly and efficiently low cost motion control solutions.

The project had 2 components:

- Aspects related to object oriented architecture within a hard real time environment. The goal was to demonstrate that with the growing performance of modern microcontrollers, it is realistic to take benefit of the object oriented features of the C++ language within a hard real time environment. This has been demonstrated by implementing I C++ regulation algorithms with sampling frequency as high as 24 kHz.
- Competence acquisition in the domain of Real-time Ethernet fieldbuses. Through this project, a deep knowledge of the EtherCAT technology has been acquired.

The result is an integrated motion control solution, with a firmware fully developed in C++ with extensive use of object orientation, based on the netX 100, that is able to drive DC brushes, Brushless and stepper motors, and that can communicate through EtherCAT or Ethernet.

Valorisation

This project demonstrates the mastering of the EtherCAT technology as well as the ability to develop flexible and evolutive software taking benefits of object oriented principles in real-time constrained environment.

Thanks to this competence acquisition, the Institute of Industrial Automation of HEIG-VD has already realized around 10 development projects for industrial companies, that needed custom solutions compatible with the EtherCAT Fieldbus.

This project has also helped to establish contacts relative to flexible automation software for several companies, who have started project with Industrial Automation Institute to create object oriented software solutions for machine control.

This project has also been a starting point to integrate the EtherCAT technology within the "fieldbus" teaching module of the Bachelor cursus.

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