csa engineering

CURTIS INSTRUMENTS

Program in a modular, quick and safe manner.

MEDICAL
TECHNO-
LOGY

Our commitment to the medical sector makes daily life easier for people.

The greatest possible independence with help from modern control systems

Curtis Instruments AG is a subsidiary of Curtis Instruments Inc., headquartered in New York. It specialises in the development of control systems for complex high-end wheelchairs and rehabilitation vehicles.

The Curtis development department relies on the building block framework from CSA Engineering AG to enable it to program in a modular, quick and safe manner. By using this framework, dependencies can be reduced and a high level of reusability of entire functional units can be guaranteed thanks to the clear interfaces.

CSA supported the project from the concept and architecture development to specification, design and implementation and right up to approval by the customer. The focus was on advice relating to the architecture and methodology during the first project phase, later switching to support for the design and implementation of the embedded software.

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Services provided by CSA as part of the project

Definition >>> **Specification** >>> **Realisation** >>> **Transfer**

Feasibility study
Implementation concept

System specification
Software specification

Design specification
Embedded software development
Software development
Documentation verification and validation

Products developed

Project

A completely new embedded system was developed and distributed over several units within the framework of this development project. CANopen was used to provide communication between the units and extended with the "Plug & Play" feature.
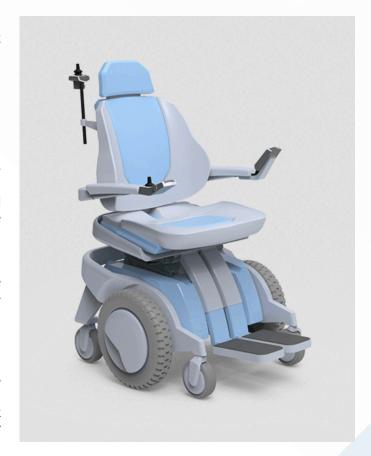
Technology

It was possible to implement the object-oriented design conveniently and efficiently by using the C++ programming language. CAN-based communication based on CANopen was used to link the individual control components. Communication with the environment either occurs via a CANopen connection too, or alternatively via Bluetooth and infrared.
The real-time kernel used enabled the implementation of the real-time requirements on the new hardware platform specially developed by Curtis, based on micro-controllers from the ARM Cortex-M1/M3/M4 family.

Methodology

Unified Modelling Language (UML) was used for the software design and parts of the project documentation. It was possible to use the CSA building block framework, which had already proven its worth in other development projects, for the efficient implementation of the software architecture and the modularisation of the components. By doing this and using further software design patterns, it was possible to divide the complexity of the overall system into manageable blocks and components and to implement it.
During the entire development period, an "agile software development" process was used to be able to provide regularly executable software releases for testing as well as for the customer during later phases of the project.

Summary

Thanks to excellent cooperation and direct contact with the CSA development engineer at Curtis Instruments AG, it was possible to bring about the development of the new enAbleX1 product on schedule.

Innovationen für Menschen