



White Paper

Cost-efficient Control Systems Development

How To Deliver High-Quality Control System Solutions

INTRODUCTION

In view of the financial challenges and ongoing credit-crisis in the world today, it is more important than ever to make well adjusted decisions in order to be able to continue developing and delivering advanced control systems. Cost-control will become increasingly important, but cannot impact the quality of the delivered solutions.

COST-EFFICIENT CONTROL SYSTEM DEVELOPMENT

REDUCE DEVELOPMENT-COST, SHORTEN TIME-TO-MARKET, IMPROVE QUALITY

How is it possible to deliver cost-efficient solutions without negatively impacting the quality? How can distributed control systems still meet all the requirements, be delivered on-time, on budget and with a decreased cost?

Industrial Control Design – ICD – has the answer to these questions and more.

ICD has been delivering control systems in all forms and shapes for years. Over the time, the internal methodology for developing such solutions was structured into a platform for control system development. The platform was a result of hundreds of successful control system projects. All the practical knowledge about best-practices in relation to cybernetics, control algorithms, programming structures and methodologies flowed into a control design platform – which is still being widely used to develop cost-efficient control systems based on standardized hardware and software.

In the following we will give you our recipe for how to develop control systems faster and better without losing out on quality.

- Use inexpensive standardized industry hardware
 - Avoid proprietary all-in-one solutions from big providers – they may offer you cheap introductory offers but down the line you'll be trapped and they will rip you off
- Use all the free tools you can come across
 - Use Linux as Operating System for your controllers and avoid expensive run-time licensing schemes
 - Use the free versions of development tools, e.g. Microsoft's VisualStudio Express
- Reuse already developed, tested and verified components
 - Object-oriented development will facilitate your reusability strategy
- Avoid 3rd party products with expensive licensing schemes
 - Search alternative providers with development licenses

INTRODUCING CDP

ICD followed its own recipe for making cost-efficient solutions, and came up with a platform for making control systems – CDP, Control Design Platform.

CDP is a design framework for making control systems. It supports the developer during the full software life-cycle from design and implementation, through verification and testing to installation, commissioning and live operations. The CDP software is also a middleware solution which enables developers to focus on the algorithms and software functions leaving the communications and protocol translation to the CDP libraries.

How can CDP facilitate cost-efficient control systems development? CDP has powerful features, enabling fast and inexpensive development through:

Inexpensive Setting

- Use of inexpensive x86 or ARM9 architecture
 - System requirements are minimal: 133Mhz, 8Mb Disc-space, 16Mb RAM
 - Hardware from Wago, IEL, Moxa, Beckhoff, Icop etc tested and verified
- Use of free Linux distribution
- Support for WindowsXP, Windows2000, WindowsVista
- Support for hard real-time requirements through RTOS-32
- Close integration with Microsoft's VisualStudio C++ development environments
 - Including the free Express version
- CDP has no run-time licenses attached
 - Comes as a developer's package
 - Includes no hidden costs

Extensive Features

- Extensive C++ Code generation
 - Application framework is auto-generated
 - Extensive support for designing and implementing advanced finite-state-machines
 - First application prototype up and running in minutes
- Automatic generation of code-documentation
- Object-oriented design facilitating reuse of already tested components
- Allows cross-compilation directly on developer's station - running Windows or Linux
 - Software available for upload to controller running Linux, RTOS-32 or Windows
- Supports multiple different field-buses and hardware units
 - Modbus, CANbus, Ethernet UDP
- Sophisticated GUIs produced in no time with internal tool or through using Qt plug-in
- Replace PLC systems with industrial PCs and reuse existing CoDeSys-code through Soft-PLC and C++ containers
- Extensive support for redundant applications

- Double, triple or even quadruple redundancy supported
- Run redundant controllers on different hardware and/or OSs
 - Avoid dual failures due to OS software faults
 - Secure installation by using different hardware
- Add redundancy to existing applications
 - Recompile software with redundancy libraries, upload and restart is enough

Extensive set of tools

- Signal generator
- Troubleshooting tools
 - Integrated web-browser in all applications
 - CDP Browser gives access to all applications/controllers in distributed solution
 - Debugging through VisualStudio
- Controller set-up wizard
- CDP File manager
 - Facilitating installation and commissioning through upload of applications to networked controllers
- Extensive set of built-in libraries
 - Facilitating development of advanced distributed control systems
 - Communication between controllers transparent to developer
 - Auto-detection of new controllers introduced in distributed systems
 - Dynamic routing of signals
- Multiple add-ons available
 - Advanced event manager – makes alarm- and monitoring-application development swift, secure and easy
 - Logging facilities
 - Enables logging to file and optional sending via email
 - Enables logging to SQL database
 - Facilitates Black-box logging function

Advanced development and testing facilities

- Simulate large dynamic systems directly in CDP
 - Use actual control code
 - No need for external simulation software
- Perform advanced HIL – Hardware-In-the-Loop – testing by replacing selected component with simulated input/output

BUSINESS BENEFITS

Real experiences have shown us that using CDP in control systems development have lead to shorter development cycles, reduced time-to-market and improved quality. CDP is one-of-a-kind software on the marketplace today and is providing its users enormous benefits compared with competitors' offerings or do-it-yourself-type of approaches.

CDP is used in thousands of applications in the offshore-industry today, with the highest standards of security, safety and redundancy.

Listen to what Rolls-Royce Marine says about their use of CDP:

“Rolls-Royce Marine has chosen CDP as an integral part of its Common Control platform. Rolls-Royce puts emphasis on standardising the use of software and hardware. The Marine branch has progressed far in this aspect, putting emphasis on choosing components and sub-contractors that display stability, are robust and give fast response when called upon.

- Without CDP, development of our systems would extract a heavier toll on internal resources, according to Rune Volden, technical product manager of Rolls-Royce Marine.

- ICD has been very welcoming in the situations where we have needed assistance for development of complex systems. We have chosen the CDP software and ICD as our provider due to their product and service-minded attitude. “

OUR GUARANTEE

Through using the extensive CDP libraries and integrated tools, developers can produce more advanced applications in less time. As a result, CDP helps decrease development costs, reduce time-to-market and improve quality.

Due to CDPs numerous features and benefits and tried and tested technology, we can guarantee you that your control system development will be faster, cheaper and better with CDP.

You have our word for it. If this turns out not to be the case, we will reimburse you the full amount you've spent on purchasing CDP software.

ABOUT INDUSTRIAL CONTROL DESIGN

Industrial Control Design – ICD – is a software house located in Aalesund on the west-coast of Norway. ICD develops and maintains a software package named CDP – Control Design Platform – which has been used to develop numerous on- and off-shore automation systems.

ICD possess a deep and profound know-how in the domain of control systems design and has developed several high complexity, state-of-the-art solutions. In addition to developing and maintaining the software package itself, the company's highly skilled resources have been supporting clients with their control system development. These

activities have covered the full development cycle – from concept to completed systems, including advanced control algorithm design.