

Open Core Engineering

freedom and efficiency redefined



Open Core Engineering: Software solutions for Industry 4.0

Open Core Engineering not only speeds up and simplifies your software engineering, it also gives you more freedom and flexibility for tomorrow's production. State-of-the-art software tools and technology-oriented function packages based on international standards increase efficiency.

Unique programming flexibility

Open Core Engineering bundles the engineering portfolio for all software-based and intelligent solutions together with all drive and control technologies. Consistent software tools such as IndraWorks cover the entire engineering workflow, while function toolkits simplify the engineering of complex machine processes and allow for faster integration of new and innovative machine functions. The Open Core Interface software technology also provides direct access to

drive and control functions with high-level language-based applications. Machine controls connect perfectly with devices, data and services of the IoT applications. Open Core Engineering provides new degrees of freedom in automation and bridges the previously separate worlds of PLC and IoT in a consistent portfolio.

Benefits

- ▶ Flexible: universal engineering framework for all automation tasks
- ▶ Efficient: technology-oriented function packages for reducing complexity
- ▶ Innovative: realization of new solutions by building a bridge to IoT applications
- ▶ Customized: high-level language applications (C/C++, MATLAB/Simulink, Java, Lua) directly on the control
- ▶ Future-proof: multi-technological solutions that support open standards and interfaces



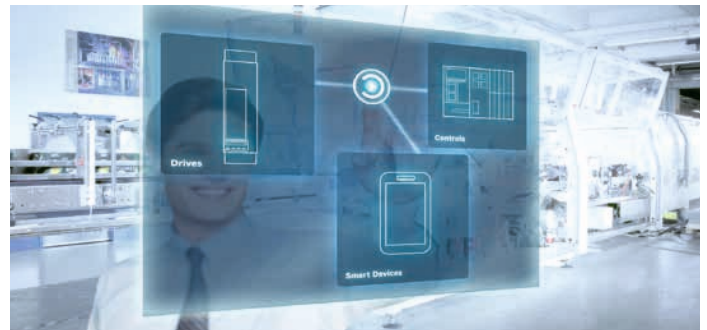
Software tools

Covering every step in the workflow – from planning to programming, to parameterization, commissioning, and service. Open standards are consistently applied to all engineering and communication interfaces to secure the investment and integration of future technologies. At the center is IndraWorks, the engineering framework: it provides all the basic tools for PLC-based automation, including the homogeneously integrated CODESYS V3. IndraWorks offers integrated operating based on the latest Windows technologies with centralized project management and wizard-supported project planning of control units, drives and peripherals.

Function toolkits

These expand the PLC-based engineering by means of function-oriented solution packages, accelerate the implementation of machine processes, optimize project workflows and enable the integration of advanced machine functions.

- ▶ Generic Application Template: automated, template-based creation of machine projects
- ▶ FlexProfile: toolbox for the implementation of nonlinear motion profiles
- ▶ Robot control: integration and programming of different types of robots
- ▶ Safety Manager: programming of the integrated safety control system SafeLogic
- ▶ Automation interface: open programming interface for creating new projects, configurations and other program parts
- ▶ Communication: for OPC/OPC UA communication
- ▶ Team engineering: integration of version control systems (VCS)
- ▶ Visualization: for creating user interfaces (HMI)



Open standards

Open standards for the automation, the IoT and IIoT (Industrial Internet of Things) are the basis for flexibly integrating software-based solutions in the engineering and system environments in mechanical engineering and for migrating new technologies into existing automation structures.

Open Core Interface

The software tools and function toolkits continue to bridge the gap between PLC-based and IT-based automation with innovative software interface. This gives high-level language-based applications on external devices flexible access to all control and drive functions.

- ▶ Extensive support for high-level language-based engineering platforms
- ▶ Customized smart devices and web apps for machine automation
- ▶ Simplified simulation and optimization of machine processes
- ▶ Simple connection to IoT applications from the area of Industry 4.0
- ▶ Direct integration of high-level language applications (C/C++, MATLAB/Simulink, Java, Lua)

Open Core Interface for Controls: New degrees of freedom for connecting PLC and IoT

With the expansion of the Open Core Interface for Controls software interface you now have even more options when developing plant and machinery. The Open Core Interface for controls gives you direct access to all control functions. And as a perfect base: now with support for MathWorks, Modelica-based tools and programming in Lua and Java.

More options, more flexibility

Model-based systems engineering and rapid control prototyping offer new ways to increase engineering efficiency. Along with the software platforms MATLAB by MathWorks and LabVIEW by National Instruments that are already supported by Open Core Engineering, developers can now also use MathWorks Simulink and environments based on the open source modeling language, Modelica.

Open Core Engineering already caters for early phases of machine workflow with the option of integration in PLM tools.

Open Core Interface for Controls opens up new degrees of freedom for users to directly program control systems with flexible access to functions via high-level languages outside of IEC 61131-3. As well as support for the C/C++ for VxWorks languages, applications written in Lua and Java can be run directly on the control systems. Java, as the most popular enterprise application language, and Lua, a powerful, script-based interpreter language, allow M2M applications to be integrated into the Industry 4.0 vision.

Benefits

- ▶ Complete system of hardware and software components for rapid control prototyping and model-based systems engineering
- ▶ Accelerated time-to-market thanks to extensive support of environments such as MATLAB, LabVIEW, Simulink and Modelica-based tools, such as OpenModelica
- ▶ Innovative programming of step-by-step instructions for robots or machines in Lua scripting language
- ▶ Implementation of web-based or company-wide M2M applications based on Java
- ▶ Innovative extensions with WebConnector to connect Node-RED and Node.js applications



Open Core Interface for Drives: directly connect IndraDrive to IT automation

Automation made easy

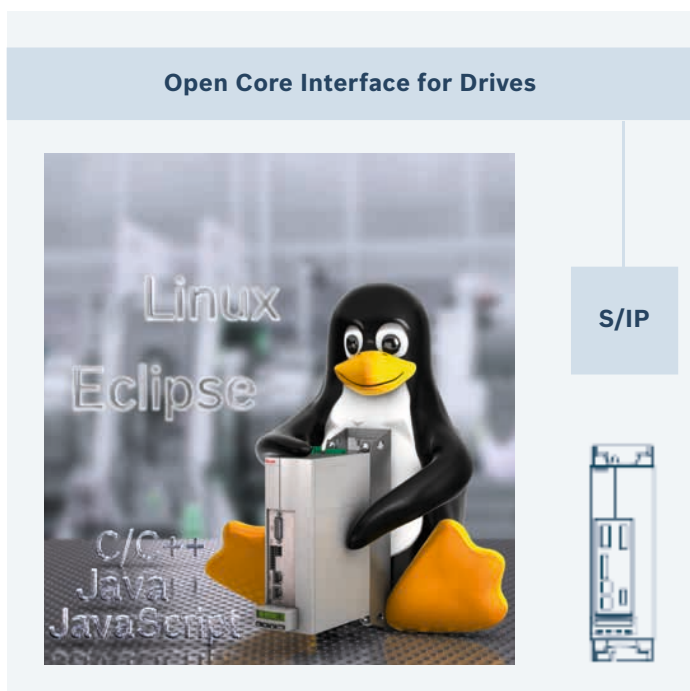
Open Core Interface for Drives gives IT automation applications direct access to all drive parameters – for all IndraDrive drives from 100 W to 4 MW, whether centralized or decentralized. The Sercos Internet protocol (S/IP) used facilitates standardized network communication at the production level. Simple, quick, flexible.

A consistent PLC and IT portfolio

It is possible to perfectly connect drive-based machine controls and subsystems with IT automation devices, data and services via the Open Core Interface for Drives interface technology. This opens up completely new degrees of freedom for you in relation to automation. High-level language-based applications on external devices are provided with flexible access to all the control and drive functions of IndraDrive.

Benefits

- ▶ High-level language programming with C/C++ and C#
- ▶ Programming smart devices in C# with Microsoft Visual Studio with Xamarin and Java with Android Studio
- ▶ Expansion of operation and service concepts
- ▶ Direct Java programming for use in databases and MES systems
- ▶ Direct access to all drive functions, parameters and PLC variables
- ▶ Drive-controlled positioning and drive-internal interpolation using high-level language functions
- ▶ Use of WebConnector for Industry 4.0 protocols (MQTT, CoAP, LwM2M, etc.)
- ▶ Support for Node-RED and Node.js in IoT applications
- ▶ Implementation of web-based or company-wide M2M applications based on Java
- ▶ Can be used with IndraDrive Cs, C, M, Mi and ML with economy, basic and advanced control units
- ▶ Connecting the drives to Windows, Linux and iOS-based development environments
- ▶ Accelerated time-to-market thanks to wide support of environments such as LabView, MATLAB and Simulink



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