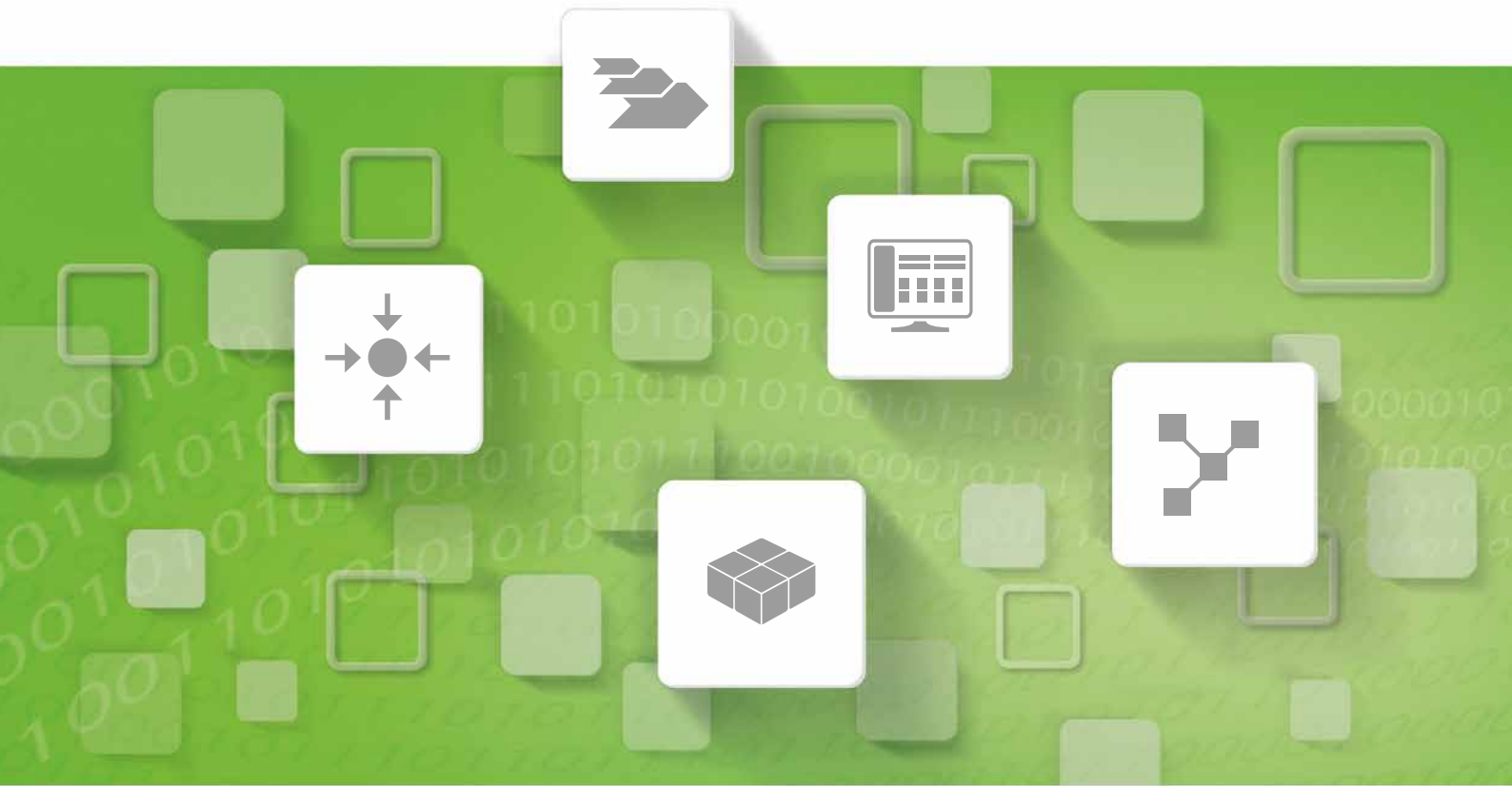# MODERN ENGINEERING — FAMILIAR ENVIRONMENT

A Trusted Approach Advances Automation!

e!COCKPIT

INVITATION TO DISCOVER

WE INNOVATE!

WAGO®
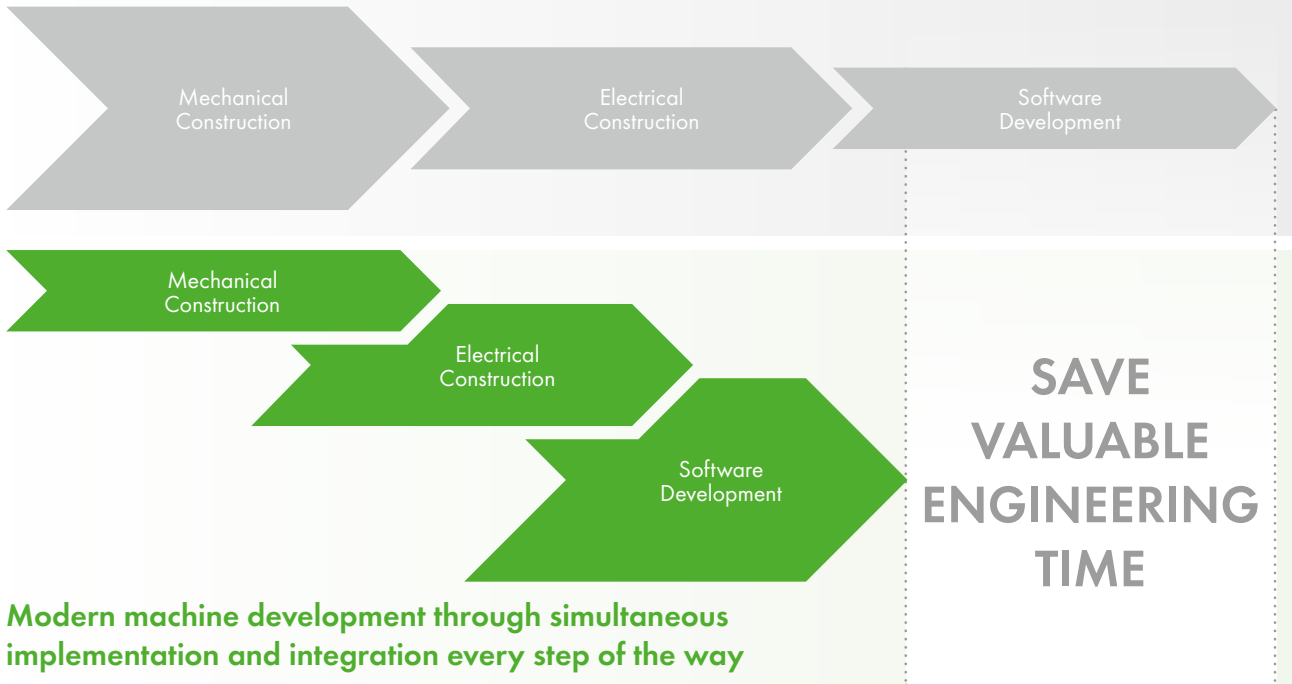
MECHATRONICS TODAY

Engineering is a Key Factor for Success

Traditional Machine Development

| Mechanical Construction | Electrical Construction | Software Development |

| Mechanical Construction |
| Electrical Construction |
| Software Development |

SAVE VALUABLE ENGINEERING TIME

Modern machine development through simultaneous implementation and integration every step of the way

The Challenge of Mechatronics

The merging of mechanical, electrical and software components has enabled today's machinery, plant engineering and related industries to achieve what was once seemingly impossible — shortening development cycles while increasing both product diversity and sophistication.

Integrated Development is a Crucial Factor

Developing high-performance mechatronic units relies on integrated development. However, success only occurs when mechanical and electrical engineering are tightly integrated into software development. Every task and function must be seamlessly synchronized in order to meet critical time-to-market deadlines.

Software is a Distinguishing Feature

The amount of software embedded into a mechatronic unit is steadily rising, and this software is being tasked with increasing levels of machine functionality. In fact, this change has led to software becoming more and more important as a key differentiator between automation systems.

Leverage Your Engineering Tools

Modern engineering tools and software support every step of the development cycle — from construction up to machine operation — making them crucial to the development of sophisticated solutions and end products.

e!COCKPIT MODERN DEVELOPMENT

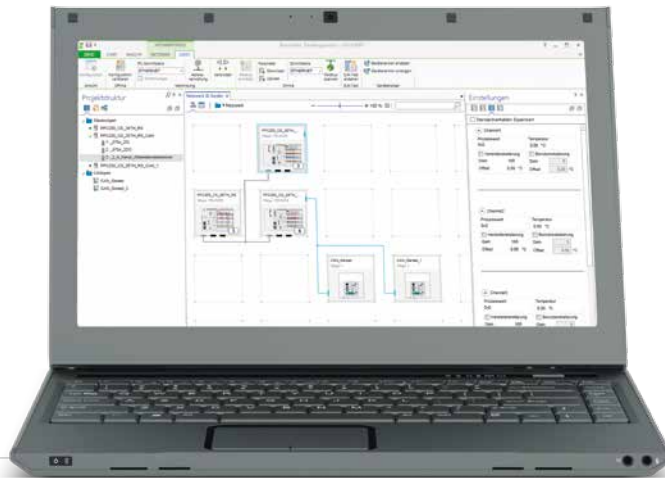## Software for Seamless Engineering

Programming

Visualizing

Configuring

Diagnosing

Automation Software

Quickly implementing complex machine functions is critical in modern mechanical engineering applications. Both in the office and on the shop floor, development engineers and technicians must manage challenging tasks.

*e!*COCKPIT is an integrated development environment that supports every automation task from hardware configuration, programming, simulation and visualization up to commissioning — all in one software package. Completely reimagined, this development environment enables users to easily master complex automation networks, saving both time and money.

Embedded in Development Process

It has never been more important for users today to artfully align each task and function to master the onslaught of increasingly complex — and demanding — parallel development of multiple product lines. To keep projects on time, *e!*COCKPIT provides end-to-end data storage for every automation task — all in one software.

In addition, *e!*COCKPIT offers interfaces for master data exchange with external electrical and mechanical engineering software. This simplifies complex data transmission, while largely eliminating error-prone double inputs.

- **One software for every task**
- **Consistent look & feel**
- **Perfectly integrated into the machine's life cycle**

GETTING STARTED — AUTOMATION

Easy Start

Using new software often requires that valuable engineering time be taken to learn it. Recognizing this shortcoming in other software, WAGO developed **e!**COCKPIT for rapid deployment with a concise and clearly structured user interface that invites you to discover how project development and commissioning has evolved.

The engineering software is based on well-known and established user interface features, such as context-sensitive menu prompts, that only display the functions and commands related to the current task. Even starting **e!**COCKPIT is incredibly easy.

Clear Project Structure

Separation of device and program items

Tabular and graphical views

Simple logging of responsibilities and dependencies

Trusted User Guidance

Context-sensitive menus:
Focus on the task at hand

Simple symbols:
Identify rather than search

Quick access to frequently used functions
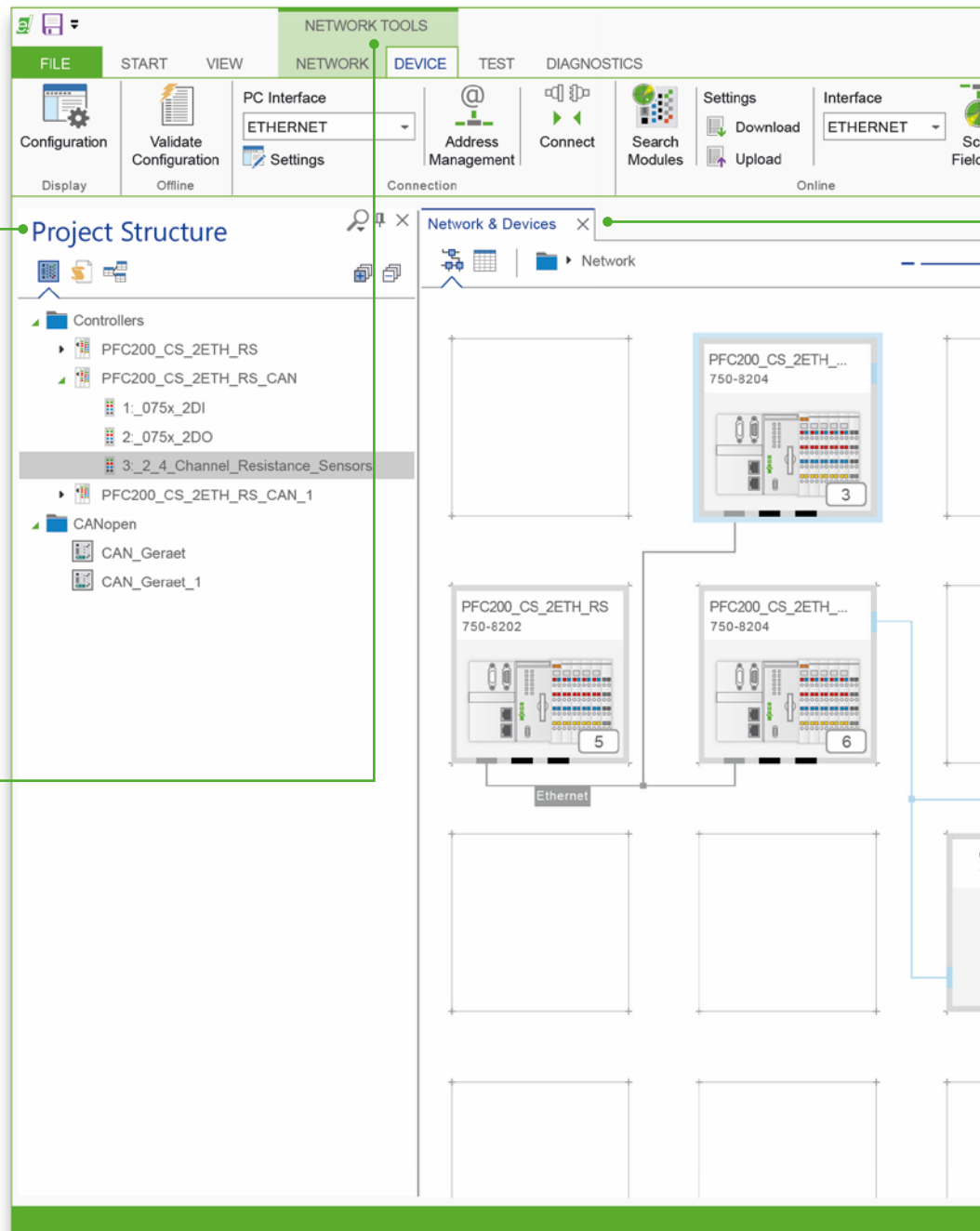
Always in Control

Working effectively means always seeing the entire picture, even when dealing with complex automation topologies.

e!COCKPIT features user-defined workspaces that are tailored to the task at hand. Graphical configurators show relationships clearly and intuitively, while clear status indicators enable quick diagnostics and troubleshooting.
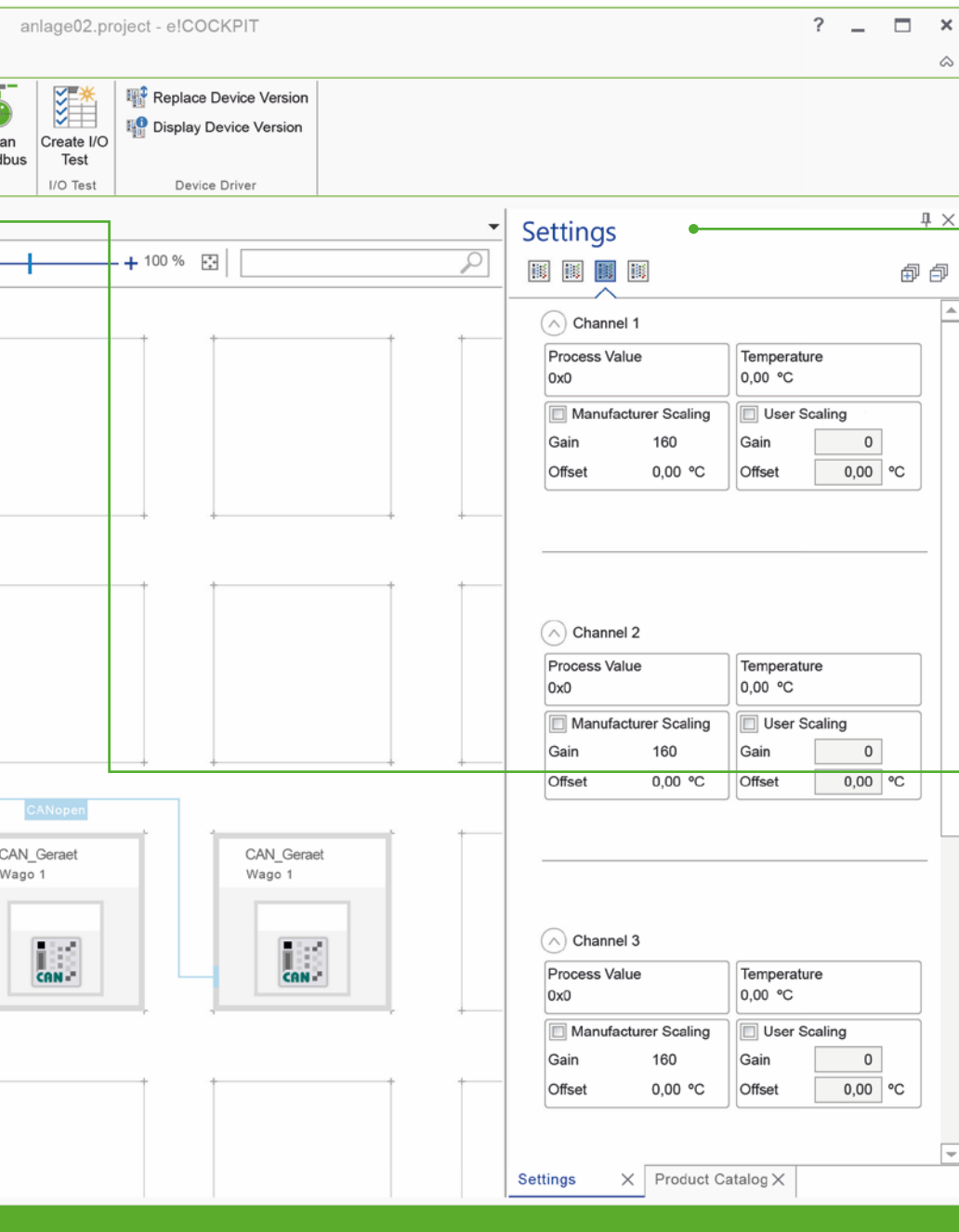
Target-Oriented Configuration Dialogs

Clearly structured controller, fieldbus coupler and I/O module settings

Batch processing: Simultaneously set parameter values for several modules

Optimum Workspaces

Predefined workspaces for networks and devices, as well as programming

User-defined workspaces can be customized and saved

CONFIGURING

Simple Hardware Parameterization

- Integrated configurators:
  Optimally tune hardware

- Ease of use:
  Save time using Drag & Drop

- Graphical network topology:
  Easily identify relationships

Configuration:
The Foundation for Automation

Configuring hardware and related components is essential in automation — every device must be precisely calibrated to support high-performance control software. As such, controllers, fieldbus couplers, input/output modules and their communication relationships should be adjustable.

The integrated *e!COCKPIT* configurators provide modern operating tools: Devices can be arranged via Drag & Drop within a project, individual devices or complete network branches can be duplicated via Copy & Paste. Simultaneously setting parameter values for several modules also highlights the simplicity of configuration with *e!COCKPIT*.

Clear Graphical Topology View

Network devices are typically arranged in a tree structure. In addition to this type of presentation, *e!COCKPIT* also provides a graphical network topology. This allows the complex relationships between network devices and their current statuses to be identified easily and intuitively.

This graphical topology view is also used to configure different communication protocols. This way, connecting controllers to fieldbus systems using *e!COCKPIT* is incredibly simple. And automation engineers can seamlessly incorporate available field devices using fieldbus-specific device description files, such as EDS.

PROGRAMMING

Ready for the Future Thanks to CODESYS 3

- Based on CODESYS 3 technology
- IEC 61131-3:
  No need to learn new programming
- Object-oriented programming:
  Benefit from modern paradigms

CODESYS 3:
Integrated Environment

*e!*COCKPIT is based on the high-performing and well-established CODESYS 3 industry standard. This supports software development in IEC 61131-3 PLC programming languages: Structured Text (ST), Ladder Diagram (LD), Function Block Diagram (FBD), Instruction List (IL), Sequential Function Chart (SFC) and Continuous Function Chart (CFC). For flexibility, all programming languages can be combined with one another. Created programs can be easily debugged on the engineering PC via simulation.

This standardized and highly simplified programming environment guides software developers, allowing them to reuse and further develop existing programs without relearning software. These developers also benefit from the continuous development of the software's platform. Compatibility with the IEC standard ultimately ensures the continued profitability of all investments — including those you have already made.

In addition, *e!*COCKPIT also supports modern paradigms, such as Object-Oriented Programming (OOP).

VISUALIZING

Industry-Leading Operating and Monitoring

- Modern operating and monitoring user interfaces
- Integrated visualization editor: Direct access to program variables
- Not bound to any one language or target system: Unicode, HTML 5 or CSS

Modern Visualization — Modern Machines

Advanced user interfaces for machine operation and monitoring are standard. Today, HMI-based design is a critical factor that influences the purchase of an entire automation line. *e!COCKPIT* employs Drag & Drop to streamline the design of modern user interfaces.

The integrated visualization editor offers direct access to program variables; the HMI and PLC programs can be simulated on the engineering PC without being opened, dramatically expediting project development. Using Unicode and modern standards, such as HTML or CSS, also provides freedom from the traditional barriers of language and target systems.

DIAGNOSING

Fast Development, Commissioning and Maintenance

- **Systematic status views: Always have a complete system overview**

- **Extensive diagnostics options: Fast error localization and elimination**

Simple Diagnostics Are Critical Every Step of the Way

Being acutely aware of the automation network's current status is an absolute must for the rapid detection and elimination of errors — be it during development in the office or directly on the machine during commissioning.

*e!*COCKPIT offers comprehensive diagnostics options for this, with individual views always displaying the control systems' current status data — both in tables and diagrams. To keep projects on time, error messages are transmitted directly and clearly. Employing the structured wiring test function, erroneous wiring can be systematically identified.

Even with complex automation solutions, you always have a clear overview of the overall situation.

e!COCKPIT **ADVANTAGES**

Engineering Software for Automation Technology

## Integrated engineering: One software for every task

e!COCKPIT offers end-to-end functions, which optimally support all automation tasks: from data import for upstream software tools, through programming and on up to commissioning. Accelerate project development.

A smart design that invites you to discover

The modern user interface will stand up to ever-evolving demands. Well-structured, clearly laid out, customizable and focused — only the functions and commands relevant to task at hand are available. This makes adapting to new software straightforward.
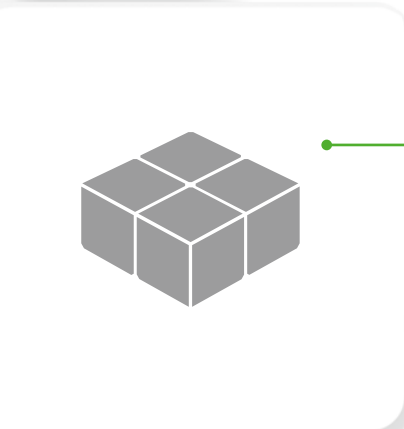
WE! INNOVATE!
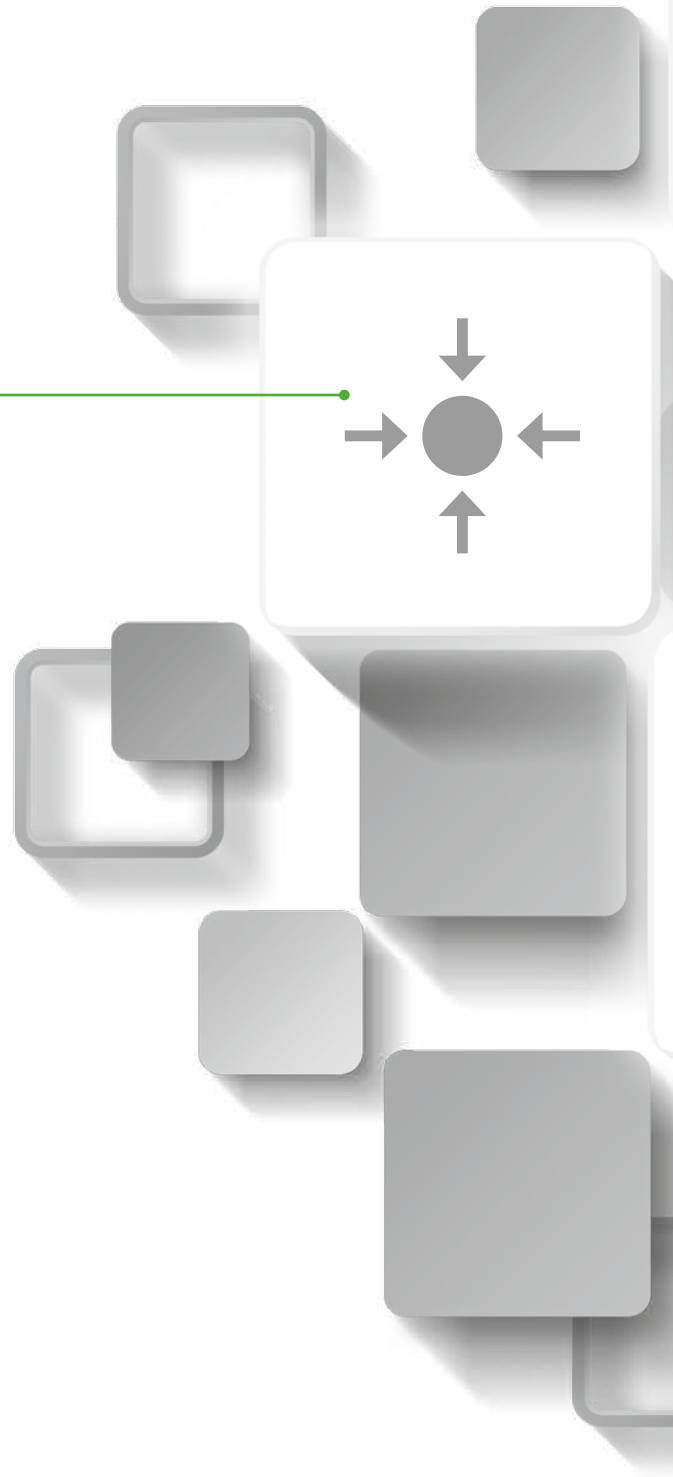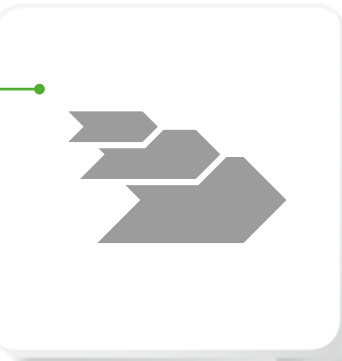
Modern software

From the onset, *e!COCKPIT* was developed to be, and remain, state of the art. In addition to the integration of established standards, the software is equipped with end-to-end data storage and automatic online upgrades to pace fast-moving industry trends. Always stay up to date.

CODESYS 3 – The Technological Platform

e!COCKPIT is based on the CODESYS 3 software platform. Implementing this recognized industrial standard allows you to reuse previously created software and secure your future investments.
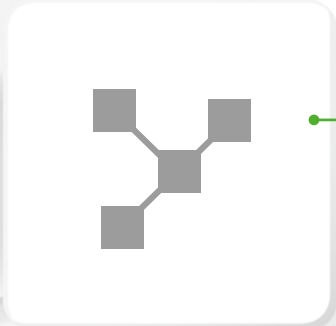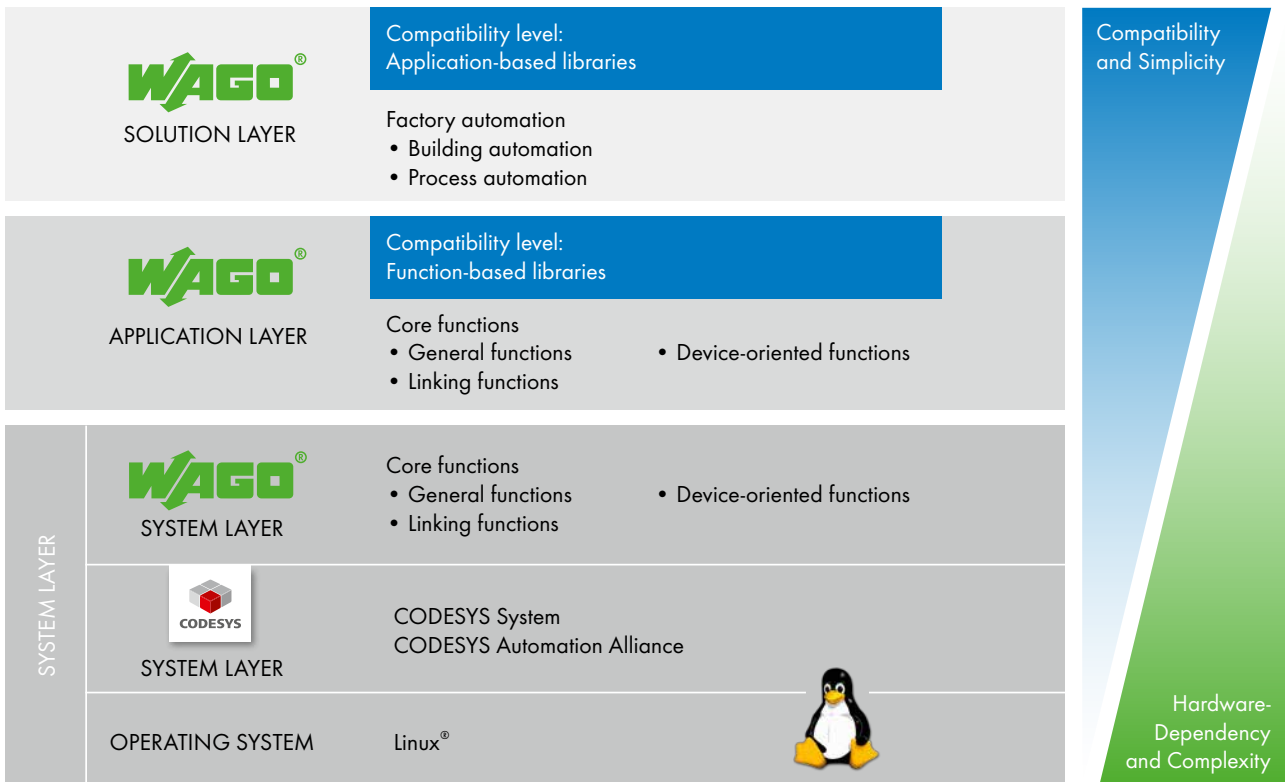
Graphical Network Configuration

e!COCKPIT provides graphical network configuration. Put yourself in complete control of even the most complex automation networks.

LIBRARIES

Technologies, Applications and Solutions

Runtime Software Controls the Machine

Machines and systems are controlled by runtime software that determines behavior, while enabling both operation and current status monitoring for the user. It also transmits operating data to higher-level systems. Unlike engineering software, runtime software operates continuously — it is a part of the machine and ensures correct operation.

Ready-to-Use Function Blocks Save Development Time

Comprehensive, tried-and-tested software function blocks (IEC libraries) help achieve development goals faster. Thus, e!COCKPIT is supplemented with comprehensive IEC libraries.

Essentially, the libraries are divided into three abstraction layers:

- The **solution layer** primarily contains complete, easy-to-use software solutions for production, building and process automation.
- The **application layer** contains functions, e.g., communication, that are ideal for convenient, easy application.
- The **system layer** provides experts with complete system access.

The upper layers are separated by compatibility levels. Essentially, this enables software to be developed independently of the hardware it will be used on. This provides the greatest degree of flexibility in selecting the right device for the right application, while retaining a uniform software base. It also provides investment security.

e!COCKPIT AT A GLANCE

Systems, Integrated Functions and Interfaces

Configuring	
Device configuration	Controllers based on CODESYS 3, I/O-SYSTEMS (750/753)
Fieldbus configuration	CanOPEN, Modbus TCP/UDP, Modbus RTU, PROFIBUS
Field device integration	Manufacturer-independent support of EDS and GSD device description files
Connectivity	TCP, USB, OPC, network variables, CODESYS data server
Programming	
Programming languages: IEC 61131-3	Structured Text (ST), Ladder Diagram (LD), Function Block Diagram (FBD), Instruction List (IL), Sequential Function Chart (SFC), Continuous Function Chart (CFC)
Methods and tools	Object-oriented programming, source level debugging, project-wide cross reference monitoring
Simulation	PC-based control, operation and monitoring simulation
Technologies	Comprehensive base technologies that feature IEC libraries (e.g., control technology, communication)
Visualizing	
Display	Supports modern Web browsers via HTML 5 and CSS
Language selection	Almost an unlimited number of languages supported by UNICODE
Diagnosing	
Diagnostic views	Integrated wiring test feature, targeted network and device diagnostics using context-related views
Software properties	
Import and export interfaces	CODESYS 3 project files (*.project)
Convenience features	Automatic online updates, flexible, savable workspaces, automatic download of project changes
Supported operating systems	Windows 7 (32- and 64-bit) Windows 8, Windows 8.1 (32- and 64-bit)
System requirements	**Minimum:** Core2Duo, 2 GB RAM, 1 GB of free hard drive space 1,366 x 768 px display resolution **Recommended:** Core i5, 6 GB memory 5 GB free hard disk storage 1,920 x 1,080 px screen resolution
Licensing	30-day trial, workstation, multi-user, site, buy-out license

Additional information:

Please contact us — we would be happy to provide an in-person presentation of e!COCKPIT.

Additional information is available on our website:

http://www.wago.com/ecockpit

e!COCKPIT **IN ACTION**

Ideal for PFC Controllers and the WAGO-I/O-SYSTEM 750

- **PLC and IT functions all in one device**
- **Linux® 3.18 real-time operating system**
- **Visualization and configuration via Webserver**
- **High level security with SSH and SSL/TLS, VPN and a firewall**

PFC Controller

As successful members of the WAGO controller family, the PFC Controllers shine thanks to high processing speeds and application diversity.

The PFC100 blends an extremely compact design with high performance.

The PFC200 excels with its wide range of interfaces and generous memory.

Both are generously equipped with two ETHERNET ports and additional communication interfaces, such as RS-232/-485, CANopen, Profibus DP or MODBUS (depending on model).

To provide users with a high level of security, SSL/TLS, SSH, VPN and a firewall are standard. With the integrated Web-based Management, as well as state-of-the-art HTML5 visualization, the PFC Controllers offer a convenient programming environment. This is perfectly complemented by *e!COCKPIT* and the real-time capable Linux® operating system.

With these features, the PFC Controllers optimally support the migration to *e!COCKPIT*.

- **Open, fieldbus-independent design maximizes return on investment**
- **500+ individual function modules are available in 1-, 2-, 4-, 8- and 16-channel configurations**
- **Tested and approved worldwide**

The WAGO-I/O-SYSTEM 750:
One System for Every Application

Optimized for process-oriented communication, the WAGO-I/O-SYSTEM offers scalable performance and high integration density with an unbeatable price/performance ratio.

With a fieldbus-independent design that features finely granular and modular components, the WAGO-I/O-SYSTEM readily meets all the requirements placed on distributed fieldbus systems. The system also carries certifications from prominent worldwide agencies for use in extremely diverse applications. It reduces hardware and system costs while providing virtually unlimited application possibilities.

The WAGO-I/O-SYSTEM provides simple operation and maximum efficiency!

WE!
INNOVATE!

WAGO ®