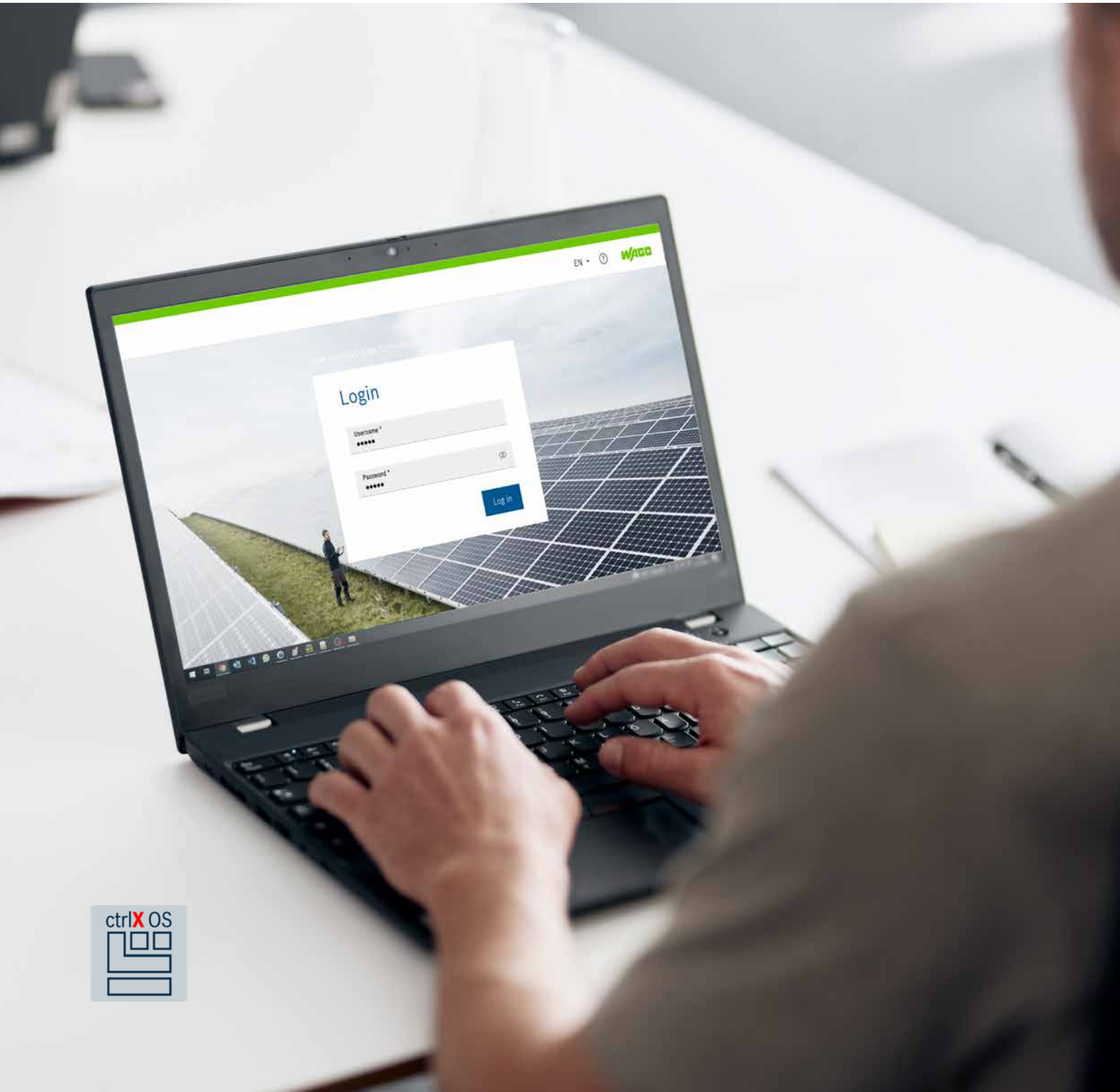
Future-Proof Positioning – with an Integrated Ecosystem

Experience modern engineering with ctrlX OS.



Mastering the Future of Automation with Strong Partnerships

In industry, systems are becoming increasingly complex and demanding, meaning that in the future, challenges can only be solved together. Therefore, WAGO relies on openness and strong partnerships. The motto: Achieving more together!

The demands placed on automation processes are steadily increasing: development and production times are becoming shorter, resources are becoming more scarce, and the shortage of skilled labor is also creating challenges. To take advantage of the opportunities offered by the digital transformation, WAGO relies on openness and strong partnerships because: co-creation and communication are the only way to jointly develop long-term solutions!

Since Bosch Rexroth shares this open mindset, both companies have combined their strengths as system and technology partners. The foundation for this collaboration is Bosch Rexroth's Linux®-based ctrlX OS operating system, which is being further developed with WAGO. It enables the use of various state-of-the-art programming languages and is completely standards-based on every interface. Here ctrlX OS stands next to the classic Linux® operating system in the WAGO environment.

» BUNDLING STRENGTHS TOGETHER«

At the end of 2022, Bosch Rexroth released the ctrlX OS operating system for other devices and third-party vendors. Since it was a perfect complement to the previous product strategy, WAGO integrated it into its devices and wanted to actively participate in the design. Bosch Rexroth showed interest, and this led to the idea of a system and technology partnership:

»The nice thing is that WAGO and Bosch Rexroth have different focal points. This creates a complementary situation that benefits both sides.«

Johannes Pfeffer
Vice President of the AUTOMATION Business Unit at WAGO

As part of their collaboration, Bosch Rexroth and WAGO are pursuing the goal of creating a world-leading and open automation system on the market by integrating additional partners, breaking all previous boundaries. Whether in power engineering or mechanical engineering: Through partnerships, technologies and solutions from different vendors can be seamlessly connected – at every level along a complete value-added chain. This maximizes flexibility and creates a "marketplace of possibilities" that opens up new degrees of freedom in automation.

Common Goals at a Glance

- Integration of the ctrlX OS operating system into future WAGO controllers
- Increase freedom for automation users by jointly developing the platform based on ctrlX AUTOMATION
- Development of industry-specific apps
- Creating a world-leading platform by integrating other partners

Unlimited Possibilities with ctrlX OS

From the field level to edge devices up to the cloud: By merging OT and IT, the real-time-capable Linux®-based operating system removes all previous limitations to give users more freedom.

Marco Henkel
Vice President of Technology Management at WAGO

»It depends not only on speed but also on determinism and equidistance. The symbiosis of processor, communication and memory connections, as well as the support of the operating system, are essential for success in the application.«

This is precisely where the strength of the ctrlX AUTOMATION ecosystem lies: It is designed for real-time use in industrial environments, can be used at all automation levels and thus simplifies the fusion of OT and IT applications. ctrlX OS has the potential to make lasting change within the automation industry.

In addition, ctrlX OS' flexibility reduces integration costs in all directions and ensures faster time-to-market. Similar to today's WAGO solutions, the operating system allows easy connection of all standard bus and network protocols. What is special about the open world at WAGO: There are many different ways to reach the goal. Depending on the user group, the standard Linux®-based or higher-integrated ctrlX OS-based operating system may be the right approach. Both platforms offer real-time-capable and event-based components, allowing them to be used on the control and middleware levels.

Efficient and Secure Networking: ctrlX OS Integrates Cybersecurity Standards per IEC 62443-4-1.

In automation, control technology and IT are growing together with the IoT: efficient and secure data exchange creates new possibilities – simultaneously, the industrial Internet of Things (IIoT) sets new security requirements. In order to optimally fulfill these requirements, WAGO has certified the development processes according to IEC 62443-4-1 and integrated the cybersecurity standards into ctrlX OS as well. The automation platform supports seamless integration, ensuring that industrial systems can be protected across all boundaries – freedom and cybersecurity go hand in hand. The WAGO Edge Controller 400 is the first software product to be certified according to this standard. It offers numerous security features to optimally meet all security requirements throughout the entire product lifecycle.

Free Choice of Programming Environment

The system and technology partnership between WAGO and Bosch Rexroth makes it easier to meet the challenges of our time with future-proof solutions – for example, by freely selecting the programming environment. This allows users to more freely and flexibly adjust their control tasks to meet evolving needs. In addition to WAGO applications, they may leverage the immense range of apps and support from the growing community of ctrlX partners. Along with CODESYS, developers have the right tools for every need: logi.CAD, NodeRED, Blockly, high-level languages like Python and other engineering tools are compatible with the ctrlX OS operating system.

Your Benefits at a Glance:

- Certified data security per IEC 62443
- Community: solutions and assistance in forums
- Maximum openness with minimum restrictions

Variety of Apps: ctrlX World Opens up New Degrees of Freedom

The advantage of ctrlX OS is its open programming environment. Anyone who uses ctrlX OS has access to the entire solution area of ctrlX World. Regardless of the industrial sector in which the end user is active, they can suddenly expect – regardless of the vendor and device – uniform cybersecurity, remote manageability and the use of apps.

WAGO and Bosch Rexroth have developed a cross-industry "marketplace of possibilities" that encompasses each firm's expertise and provides users with the opportunity to set up individual software systems for a wide range of apps.

The possibility of “use for all” creates completely new opportunities for everyone involved. Users can even become co-creators: Depending on their choice, they can use the apps to conquer challenges or develop their own apps. The self-sufficiency of each app on shared platforms allows each entity to contribute its knowledge without becoming dependent on the platform or any other software. The installation of ctrlX OS opens up a big world: Users can expect an immense range of apps available for download in the WAGO Download Center. The customer also receives software licenses directly from WAGO. This makes it even easier and more flexible to develop, install, update and operate software-based functions. The ctrlX Store offers just under 20 main solution categories with more than 150 partner use cases. The advantage: Users can buy these solutions directly in the ctrlX Store because it is a “one-stop shop,” eliminating the need to search for third-party vendors.

Go to the Download Center

Seamless Connection via Data Layer

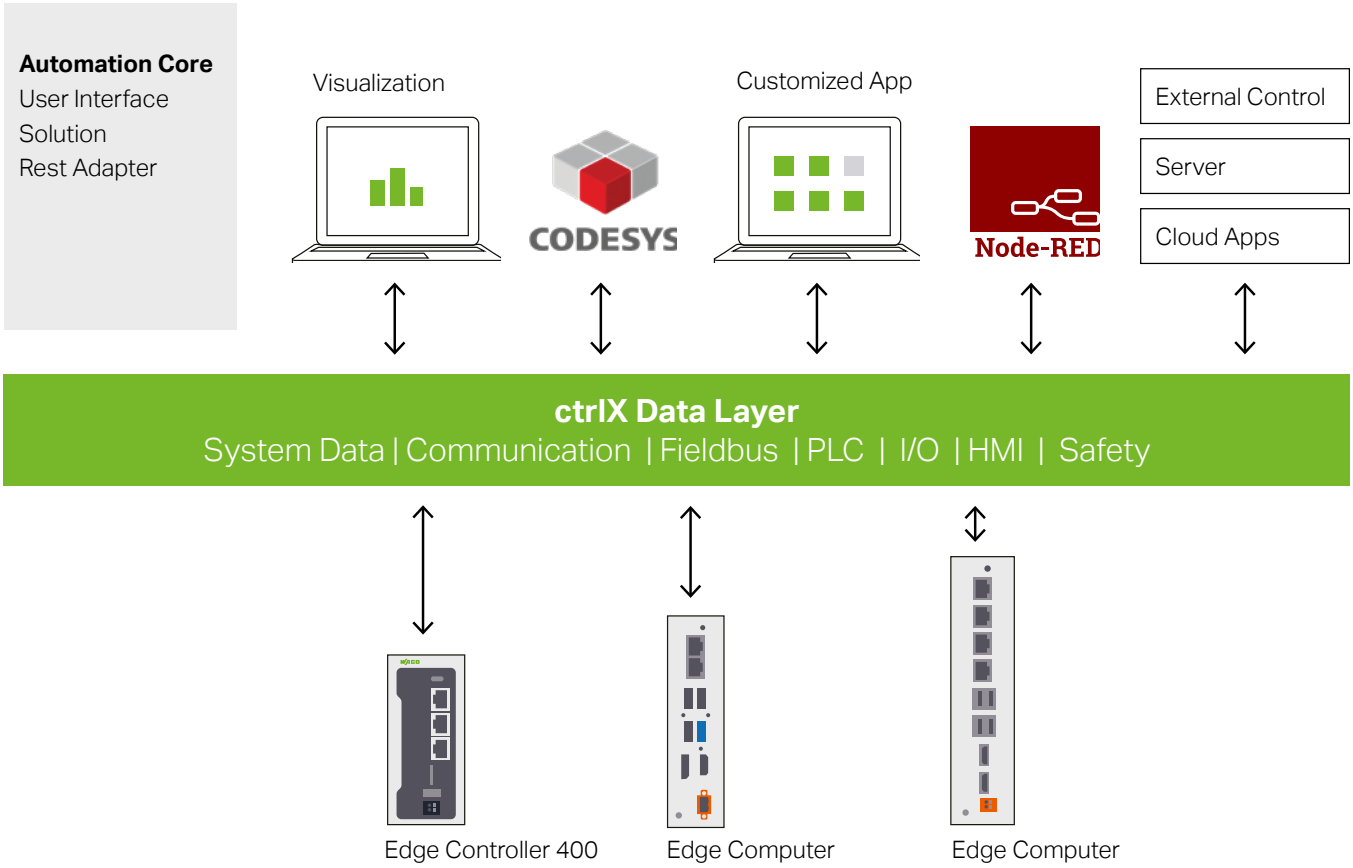
The so-called data layer forms the core of ctrlX OS: It is the common data exchange layer and enables secure communication between different applications. The special feature: ctrlX OS is characterized by a microservices-based architecture, i.e., it consists of different modules to offer users flexible expansion options.

For example, several people can work on one project simultaneously: While one person develops the visualization of the control program in App 1, someone else can work on the cloud connection in App 2 in parallel.

Another important advantage is the ease of adaptation: individual applications or microservices can be removed or replaced depending on customer requirements. What is special about this is that the rest of the architecture remains unchanged so that processes can be adapted with just a few clicks. As a standardized interface, the data layer creates a seamless connection between microservices and the connected hardware.

For Optimal Data Exchange

As the accompanying system graphic illustrates, ctrlX OS also makes it possible to use real-time and non-real-time capable apps on one device. Customers can optionally combine different programming languages, such as CODESYS and Node-RED, on a ctrlX OS-based device. Each application transmits data to the data layer, which functions as a connection point and ensures optimal data exchange.



Another advantage is the data layer-to-data layer communication, which is illustrated in the lower part of the graphic: The data layer of the Edge Controller 400 can easily communicate with the data layer of the Edge Computer – without a communication protocol. Since the data layer establishes a connection to other devices, it is also possible, among other things, to aggregate the data from the Edge Computer and send it to the cloud; only a rights release is required.

The data abstraction in the data layer thus ensures a seamless connection of heterogeneous systems. This means that systems where completely different bus systems are used in individual modules can communicate with each other via the data layer, or an app based on the data layer can make corresponding links to the data.

Product Portfolio for Your Application

WAGO Edge Controller 400

Engineering complex automation tasks made easy: Use data from machines and systems directly in the field instead of the resource-intensive transfer to a cloud solution. The WAGO Edge Controller 400 is tailored to ctrlX OS, guarantees optimal data use in the field and can be easily integrated into existing systems due to the various interfaces.

The devices require little space, can be easily integrated into existing systems and process applications directly on the machine. Using ctrlX app technology, the WAGO Edge Controller 400 can be flexibly adapted to the specific task.

The special feature: Developers and programmers can freely decide whether to use the WAGO Edge Controller 400, which is tailored to ctrlX OS, or the powerful WAGO Edge Computer, which will offer a choice between ctrlX OS and classic CODESYS in the future.

Your Benefits:

- Ideal for ctrlX OS
- IoT-ready thanks to MQTT and OPC UA
- Comprehensive app offer for ctrlX
- Certified per IEC 62443-4-1

WAGO Edge Computer

Industrial processes increasingly require more computing power in the field to ensure optimal data use. WAGO offers solutions with the Edge Computer, on which the Linux®-based, real-time-capable ctrlX OS technology is used step by step. Expanding to 16 GB of RAM and 32 GB of RAM, it is ideal for complex applications because large data volumes can be processed and optimized directly on the machine.

With edge computing, users can put cloud functionality right on the machine and benefit from a seamless connection between IT and OT. The WAGO Edge Computers fit perfectly into the automation environment and offer a further option for flexible system design in complex applications.

Your Benefits:

- Equipped with high computing power and scalable memory
- Compact, low-maintenance
- Allows use of standard software
- The standard Linux® or Linux®-based ctrlX OS is available as the operating system.

Looking for the Right Solution?

ctrlX OS in Use
Edge Gateway for Smart Factories

It not only offers maximum openness and freedom, but also opens up a holistic ecosystem based on a universal modular system for IoT solutions. For each use case, the right apps are available as needed, and the user can choose from an immense variety of options. This creates precisely tailored solutions. The apps can be configured and managed via a Web interface – significantly reducing the engineering effort required for data connection. Configuration is performed quickly and intuitively via guided configuration dialogs and a mouse click – no programming needed.

CtrlX OS functions not only as a machine controller but also as a secure and intelligent gateway solution. This is especially useful in smart factories, where data floods, latencies and, ultimately, bottlenecks are the greatest challenges. The Linux®-based ctrlX OS operating system can demonstrate its strengths here: Depending on the requirements, applications can access a uniform data layer and build scalable solutions.

Corresponding to the core tasks – data acquisition, processing and real-time data analysis – established software options are available as apps that enable the right level of interplay. By capturing and analyzing real-time data, the Smart Factory can monitor the system status, reduce downtime, accurately predict maintenance needs and improve overall product quality. This, in turn, leads to fewer bottlenecks, higher returns and lower overall costs. In addition, automated machine cycles can be tracked to improve latency and enable faster analysis and correction.

Another advantage is the significant increase in connectivity: Due to the large number of direct connection options and communication standards, the apps maximize flexibility for connecting different devices. They integrate seamlessly into existing and future systems and promote flexibility and integration in industrial environments.

In addition, controllers based on ctrlX OS are independent of specific hardware on which the operating system runs. This makes ctrlX OS compatible with various types of hardware and versatile to use. Depending on the computing power required, integrators can choose between the WAGO Edge Controller 400 or the different WAGO Edge Computers. As an integral component of the automation solution, ctrlX OS can increase transparency and efficiency in Smart Factories.

Interested?

Feel free to contact us and arrange an appointment with our experts.

Phone: +49 571 887 – 0
Email: info.de@wago.com

WAGO GmbH & Co. KG
Postfach 2880 · 32385 Minden
Hansastraße 27 · 32423 Minden
info@wago.com
www.wago.com

Headquarters +49 (0)571/ 887 - 0
Sales +49 (0)571/ 887 - 44 222
Orders +49 (0)571/ 887 - 44 333

MM-430835 - BROCHURE CTRLX-OS - EN - 04/2024 - Printed in Germany - Änderungen vorbehalten