![WAGO]

Edge Computing

WAGO Edge Controller and Edge Computer
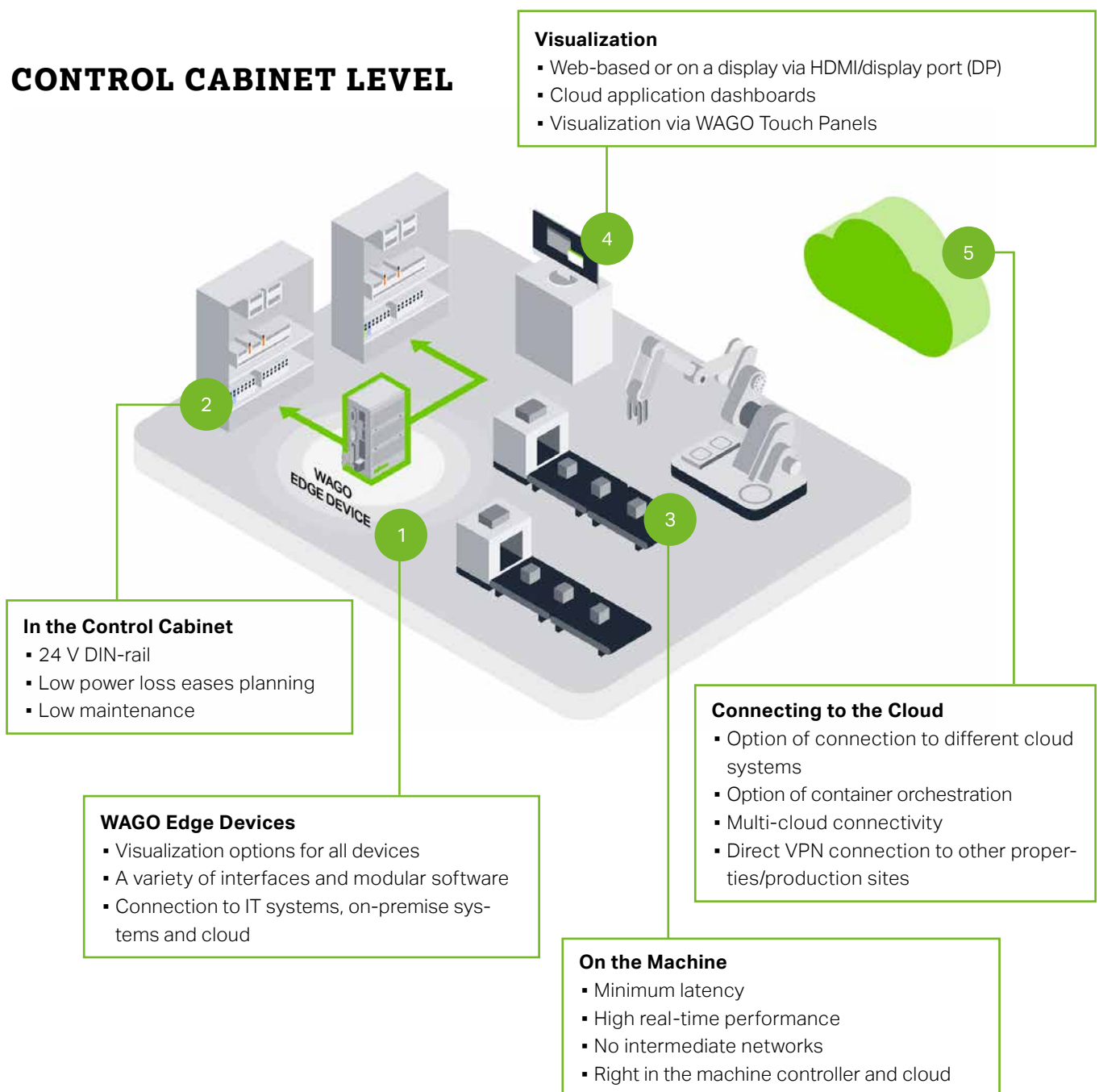
Edge Computing for the Control Cabinet and Factory Levels

Easy Cloud Connection

Transferring data from machines and systems directly to a cloud solution is often too resource-intensive and cannot be implemented without sacrificing performance because industrial environments require low latency. Edge computing combines the advantages of decentralized cloud architectures with those of a local network architecture and has become an established approach. This approach allows digitization right in the control cabinet, helping optimize factories and increase their efficiency.
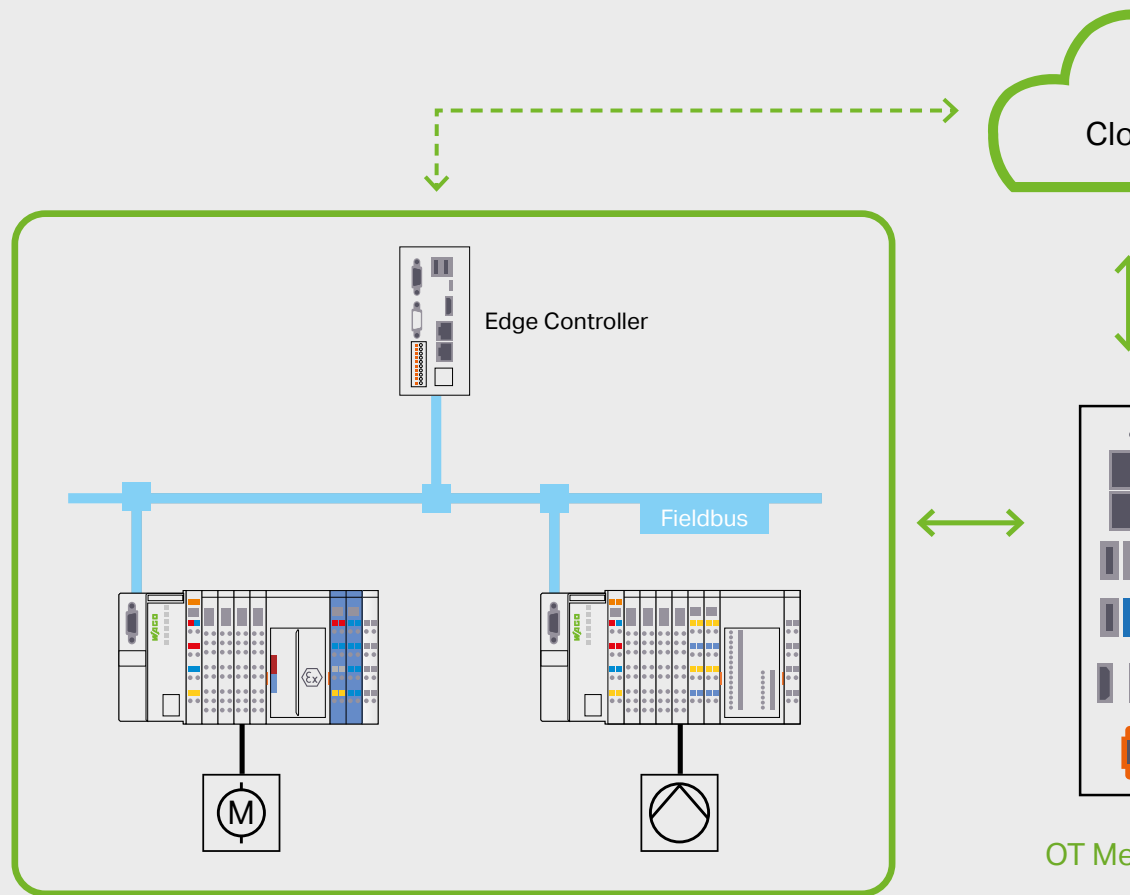
CONTROL CABINET LEVEL

Visualization
- Web-based or on a display via HDMI/display port (DP)
- Cloud application dashboards
- Visualization via WAGO Touch Panels

In the Control Cabinet
- 24 V DIN-rail
- Low power loss eases planning
- Low maintenance

WAGO Edge Devices
- Visualization options for all devices
- A variety of interfaces and modular software
- Connection to IT systems, on-premise systems and cloud

Connecting to the Cloud
- Option of connection to different cloud systems
- Option of container orchestration
- Multi-cloud connectivity
- Direct VPN connection to other properties/production sites

On the Machine
- Minimum latency
- High real-time performance
- No intermediate networks
- Right in the machine controller and cloud

FACTORY LEVEL

Factory Level
- Powerful centralized factory edge
- Container management tools
- Data channelization before data is sent to the cloud
- Direct VPN connection to other properties/production sites

Edge Controller

Fieldbus

Clo[ud]

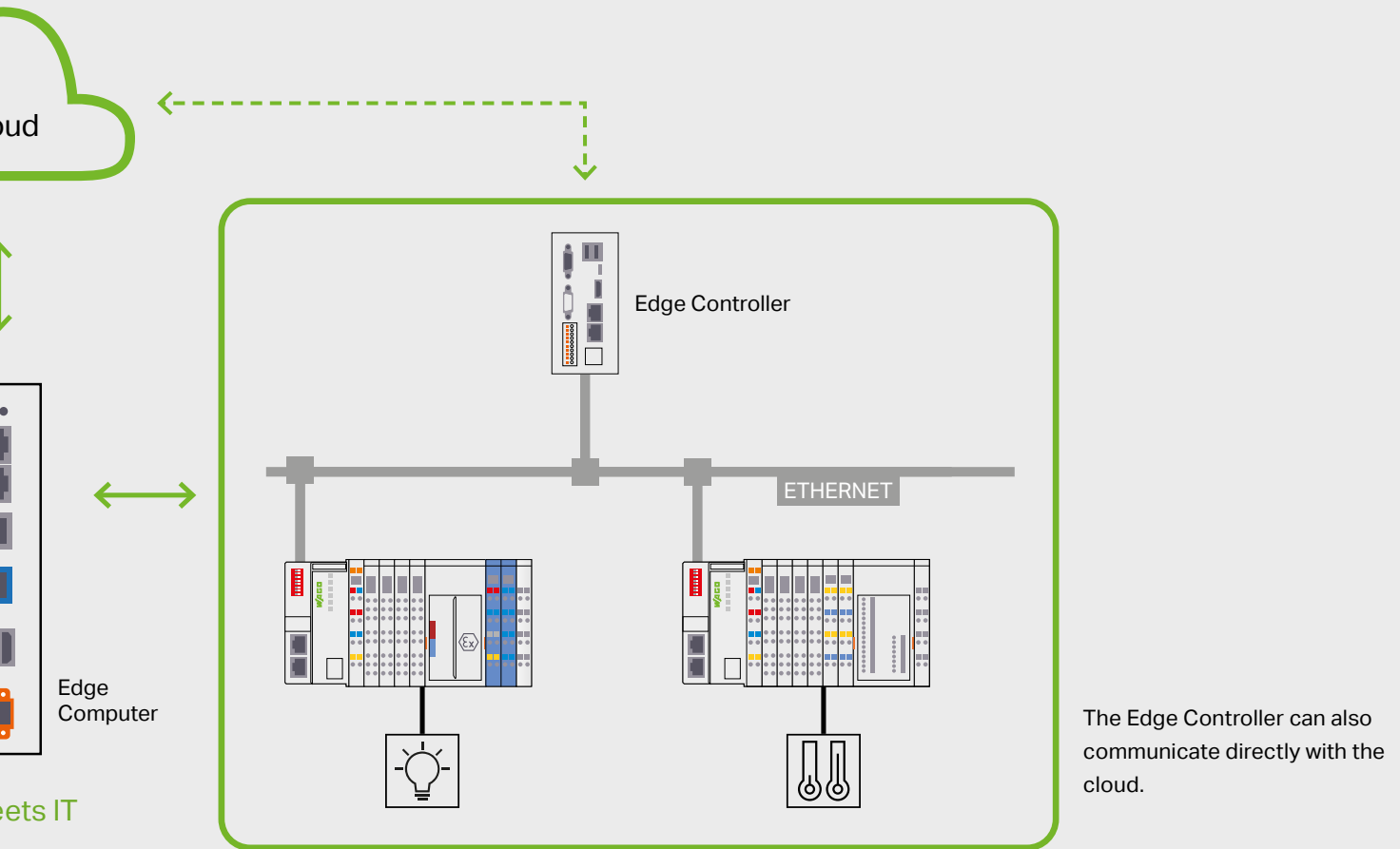OT Me[ets IT]

Fast, Targeted
Processing of Machine Data

OT Meets IT

Processes in control cabinets are becoming more and more intelligent, resulting in more and more data that can be analyzed and transferred to a cloud for additional processing. However, this extra processing is often resource- and cost-intensive; due to the time pressures of industrial environments involved, it cannot be implemented without sacrificing performance.

Conventional PLCs cannot handle huge data volumes, but powerful servers are too big for control cabinet applications and cannot be integrated. What is needed instead is in-the-field computing power that meets the specific requirements. In IIoT integration, OT (Operational Technology) and IT (Informational Technology) are becoming increasingly interconnected.

This is where the **Edge Device** comes into play: It functions as the interface between the local and central networks right on the machine, combining control and data processing and serving as the interface to the cloud level on a device. It processes data in real-time, compresses it according to locally defined criteria and shifts it to the cloud or a local data repository as needed. This allows initial analysis results to be fed back directly to terminal devices or processed further.

With the Edge Devices and PFC family, WAGO establishes a connection between the IT and OT worlds, which focus on data processing close to processes.

ud

Edge Controller

ETHERNET

Edge
Computer

eets IT

The Edge Controller can also communicate directly with the cloud.

The IT and OT Environments Merge

- Where demands on computing power and memory are high, the powerful but compact WAGO Edge Computer provides cloud functionality right on the machine – saving space and money, conserving resources and ensuring security.

- The Edge Controllers collect data from sensors via integrated interfaces or fieldbus couplers and send it – via OPC UA, for example – to the cloud or the Edge Computer in the control cabinet for preprocessing. Thanks to its large variety of interfaces, the Edge Controller can also be used as a standalone controller and standalone edge device.

- The data is then forwarded from it to the cloud or a local data repository. The visualization can be displayed with the open-source Grafana tool, for example.

- High energy efficiency: Edge Controller with max. 2.9 W / 9.4 W (with USB load)

Added Value at a Glance

High Performance
High operating speeds thanks to parallel execution of computing operations with powerful processors. The working memory can be scaled from 2 GB to 16 GB.

Quick Commissioning
Pre-installed Linux® and Docker®

Openness
High-performance WAGO hardware combined with the open Linux® operating system for complex tasks

Docker® Containers
The Edge Devices support Docker® containers. With the Edge Controller, the applications can also run parallel to PLC operation.

Energy Efficiency
The Edge Controller is highly efficient, with a maximum power consumption of 2.9 W (without USB load).

IEC Programming
Familiar engineering with the Edge Controller per IEC 61131 based on CODESYS V3

Fast Installation
DIN-35-rail mounting for significant time savings

A Flexible Selection of Interfaces and Performance Classes
Different variants of the Edge Devices are available that provide the specific interfaces and performance required for each application.

IoT-Ready
WAGO's Cloud and Multi-Cloud Connectivity allow data to be sent from the field level to WAGO Cloud or other cloud services.

Cybersecurity
Integrated SSH and SSL/TLS encryption methods come standard for establishing secure HTTPS and FTPS connections. A firewall provides additional protection against unwanted access. The TPM 2.0 chip and UEFI Boot Secure option further increase the security of the Edge Computer.

Low Maintenance
Because they use flash memory and passive cooling, WAGO's Edge Devices are low-maintenance.

High Protection Class
The Edge Computer's protection class is IP40.

Extended Temperature Range
Wide temperature range with passive cooling: −20 ... +60 °C
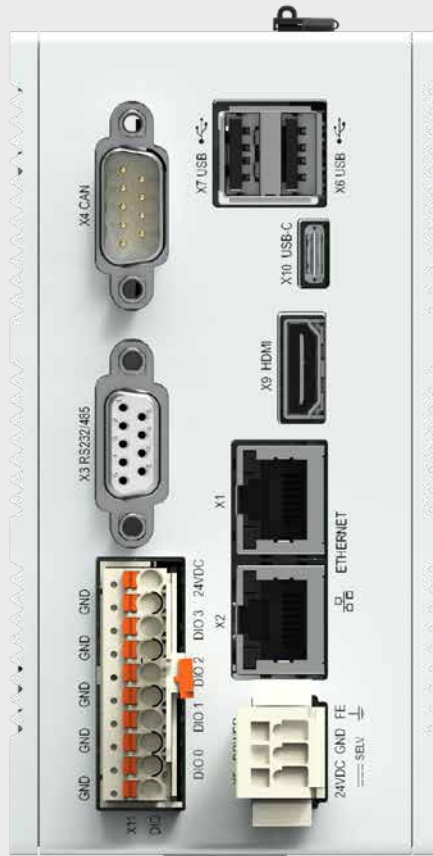
Wide Input Voltage Range
Wide input voltage range: 10 ... 36 VDC

Optimal Data Utilization in the Field

WAGO's Edge Controllers and Edge Computers

If you want fast, targeted processing of your machine data, which requires more computing power right in the field, WAGO Edge Devices are ideal. We offer the right hardware for every edge application.

The Edge Controller

A Comprehensive Selection of Interfaces

The Edge Controllers support Docker® technology, combining PLC functionality and data processing into a single device. The devices also need very little space in your automation system. Optimize system development by developing both the control logic and the visualizations (Web and Target Visu), for instance, with WAGO's *e!COCKPIT* software. The Edge Controller's ARM quad-core processing power lets you implement both powerful control and high-performance data preprocessing. Easily extend HTML5 Web visualizations to other devices via the built-in Webserver. Use Docker® containers on the controller to run applications in parallel with your PLC code.

With support for the MQTT and OPC UA protocols, the Edge Controller meets your IIoT needs. Easily connect your shop floor data to your preferred cloud service. TLS encryption, augmented by an onboard firewall and VPN, ensures security.

Multiple onboard fieldbus ports support the Modbus TCP, CANopen® and EtherNet/IP™ (adapter) protocols. A configurable serial port (RS-232/-485) can connect additional field devices. Use the Edge Controller between the field and cloud layers. In addition, the device's four configurable digital inputs and outputs directly connect the sensor and controller.

Additional functions like special fieldbuses (Multi-Cloud, Sparkplug, OPC UA Server Extended, BACnet®, EtherCAT®, EtherNet/IP™ Scanner and Telecontrol) can be added as needed through licenses.

Cloud

Engineering

MQTT

ETHERNET

Edge Controller
Target- and
Web-Visu
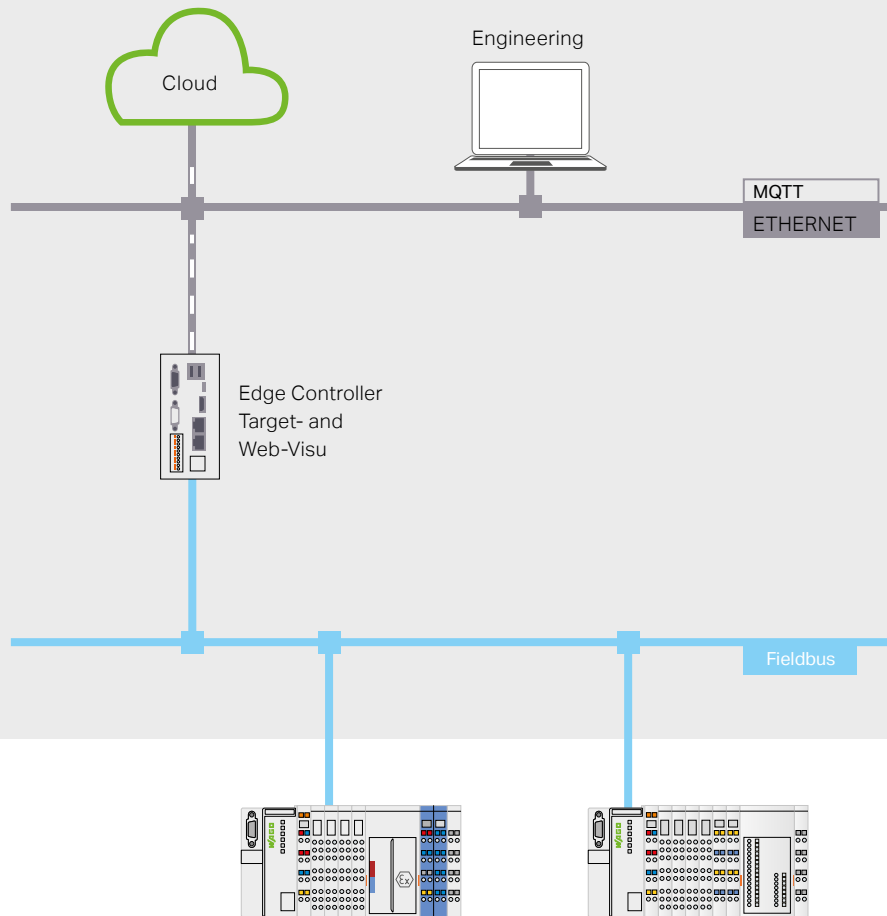
Fieldbus

Your Benefits:

- Control and data processing in one device
- Low latency with real-time patch
- Docker® technology support
- Option of using Web and Target Visu
- Supported fieldbus protocols: Modbus TCP, CANopen®, EtherNet/IP™ Adapter
- Optional Multi-Cloud, Sparkplug, OPC UA Server Extended, BACnet®,
  EtherCAT® Master, EtherNet/IP™ Scanner and Telecontrol
- IoT-ready thanks to MQTT and OPC UA
- High energy efficiency: max. 2.9 W / 9.4 W (with USB load)

**Scan QR code for data
sheet and downloads.**

The Edge Computers

High-Performance Data Processing

Where demands on computing power and memory are high, the WAGO Edge Computer offers the perfect solution. Two variants feature a 1.91 GHz Intel quad-core Atom processor (item numbers 752-9400 and -9401), and the third variant has a 2.8 GHz Intel i7 processor (item number 752-9800). All have standard Debian Linux. Users can draw on abundant resources and model entire automation processes on them. Display devices can be connected directly via HDMI or DisplayPort. Several USB ports and two gigabit ETHERNET ports are available for communication. Phone cards can also be used via an expansion slot if a cable connection is not possible, for example.

The two 1.91 GHz variants feature 4 GB or, optionally, 8 GB of RAM and a 64 GB flash memory and typically achieve a 30 W of power. The 2.8 GHz variant for more complex projects is equipped with 16 GB of RAM and a 256 GB flash memory.

The typical power of this higher-powered Edge Computer is 55 W. At 45 × 200 × 140 mm, so it requires a bit more control cabinet space in the depth dimension than the two 1.91 GHz variants (40 × 150 × 105). If substantial data volumes must be processed, the Edge Computer can be expanded with an SSD. For this purpose, the housing provides a convenient mounting space for a 2.5-inch SSD. Despite its extended temperature range from −20°C to 60°C, the Edge Computer needs no fan and features a compact design, making it easy to mount on a DIN-rail in a control cabinet without taking up much space.

Standard software and containerized applications like Node-RED can be used on the Edge Computer. For example, the open-source Grafana application is an excellent choice for graphical data display. Security also plays an important role in the Edge Computer. A TPM 2.0 chip allows

Cloud

Fieldbus

Ethernet

OT meets IT
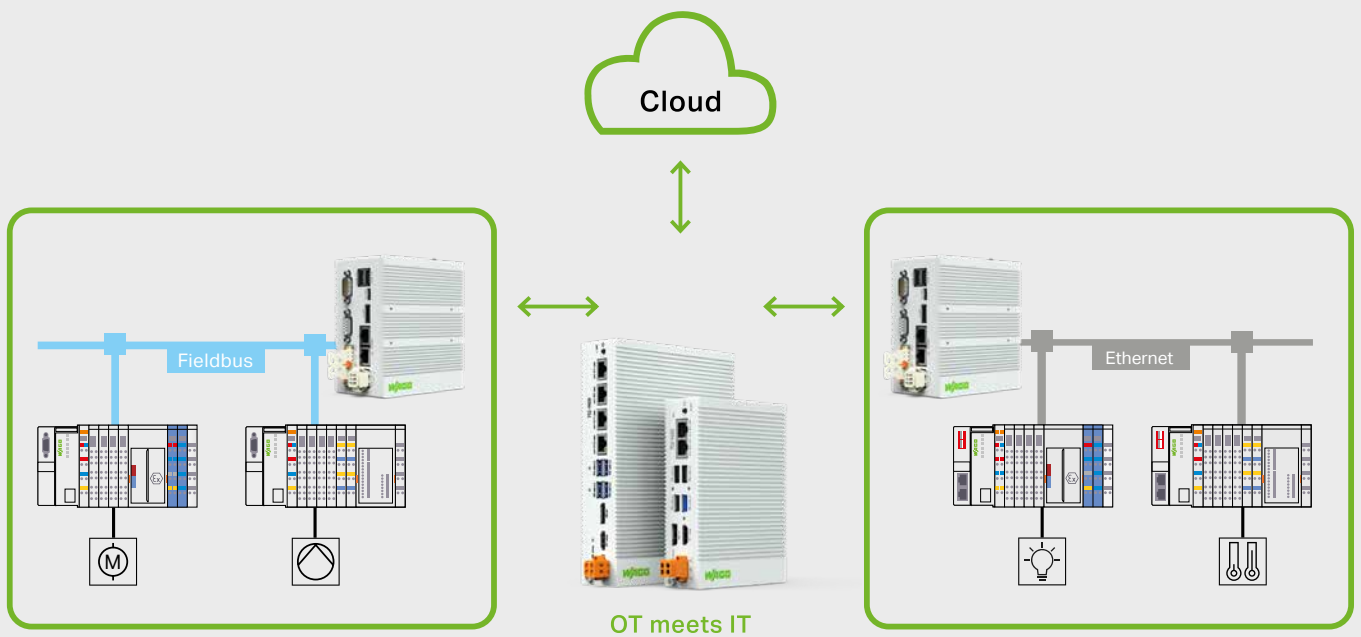
an encryption mechanism to be used to ensure data security. These devices also have the best software technology for high security. A significant portion of the software on the devices is open-source, so security and stability are always guaranteed because the large open-source community continually reviews the source code and provides bug fixes. Besides the standard VPN applications, the devices are open for special security solutions. In accordance with open-source principles, users gain high-security access to other remote maintenance services in addition to WAGO's own VPN solution.

Your Benefits:

- High computing power, scalable storage
- Compact, low-maintenance
- Allows use of standard software