IO Field

I/O Modules as a Gateway for Machine-Level Automation

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I/O Modules as a Gateway for Global Machine-Level Automation

Unique communication capabilities in IP67 automation; designed for more than just monitoring and control of machines/systems


IBN and
Parameterization
Connection of
Intelligent Sensors/
Actuators

An Impressively Innovative Portfolio

Efficient Power Supply

- 2 power supply cables (up to 16 A)
- Actuators can be switched off separately

Bluetooth® Interface

- For communication
- For maintenance and diagnostics

High-Performance Fieldbus Modules

- For PROFINET®, EtherCAT®, EtherNet/IP®
- Includes OPC UA, MQTT, Webserver
- Integrated BT interface (Android/iOS app)

Standard Marking

- WMB Inline marking
- Marking strips

Flexible Installation

- Side or front-mount options
- Mounts without adapters

Integrated IO-Link Master

- Up to 8 IO-Link ports
- Up to 4 A per port
- Up to 16 digital I/Os
- Class A and Class B

IO-Link Hubs

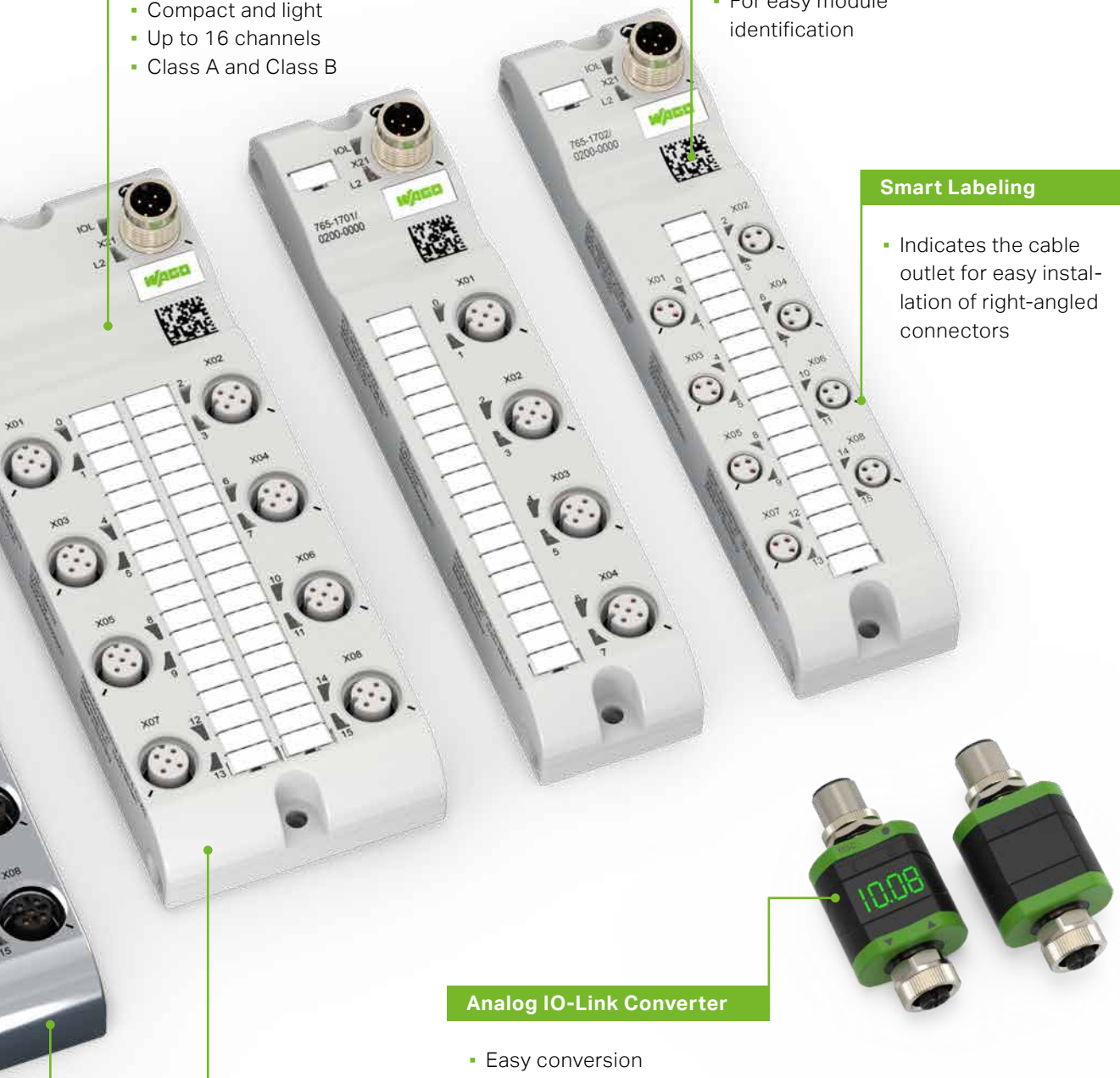
- Compact and light
- Up to 16 channels
- Class A and Class B

Data Matrix Code

- For easy module identification

Smart Labeling

- Indicates the cable outlet for easy installation of right-angled connectors



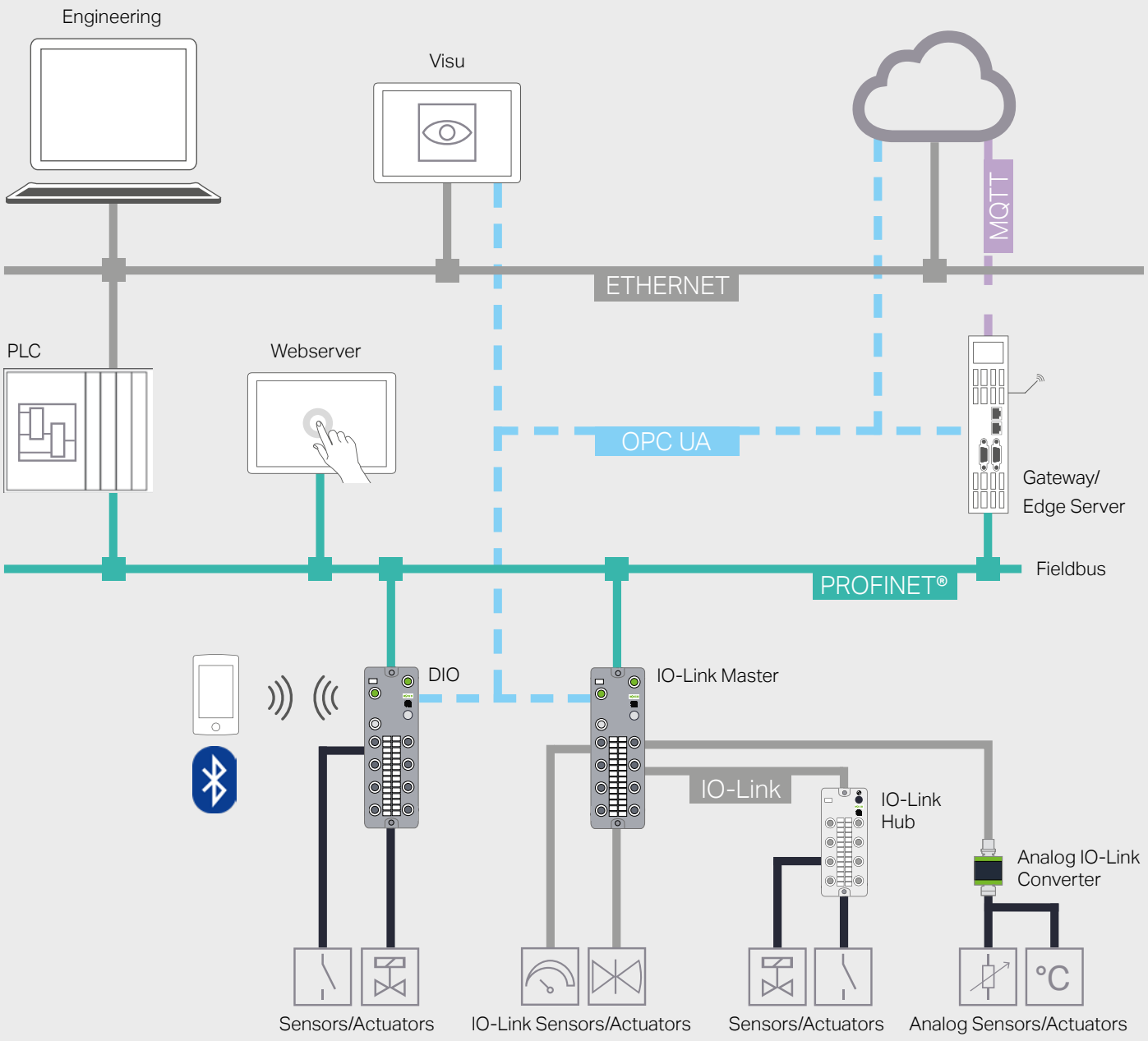
Analog IO-Link Converter

- Easy conversion of analog signals, e.g., for digitizing old systems (retrofitting)
- Interference-free signal transmission

IP67 Housings

- Metal and plastic
- Strength for the toughest tasks
- Low weight for mobile applications

IO Field
www.wago.com/field



PROFINET® EtherNet/IP EtherCAT® Webserver

MQTT OPC UA IO-Link Bluetooth®

Extended Network Connectivity

Modern decentralized production systems require automation solutions that ensure the highest level of connectivity and provide maximum performance outside the control cabinet.

WAGO developed its upgradable I/O System Field with IP67 protection type to meet these needs today and tomorrow. It combines fast ETHERNET-based fieldbuses like PROFINET® and technologies like OPC UA, Bluetooth® and Webserver, as well as MQTT as the protocol for cloud connectivity.

Device Description
A device description file describes the functionality of a fieldbus I/O module. The file contains all the relevant data important for both engineering and data exchange. Different files are available for different fieldbuses (e.g., GSDML).

IO-Link
Fieldbus modules equipped with IO-Link masters and IO-Link hubs as devices facilitate effective, versatile connection of intelligent sensors/actuators to the automation system. Configuration of IO-Link devices and WAGO I/O-Link hubs via the device description (GSDML) is also supported.

OPC UA
The system is equipped with an OPC UA server, allowing OPC UA clients (e.g., UaExpert) to access a huge range of device data, such as parameter data, status information, identification/diagnostics data and containers.

MQTT
The WAGO I/O System Field supports MQTT as an open message protocol for data transmission.

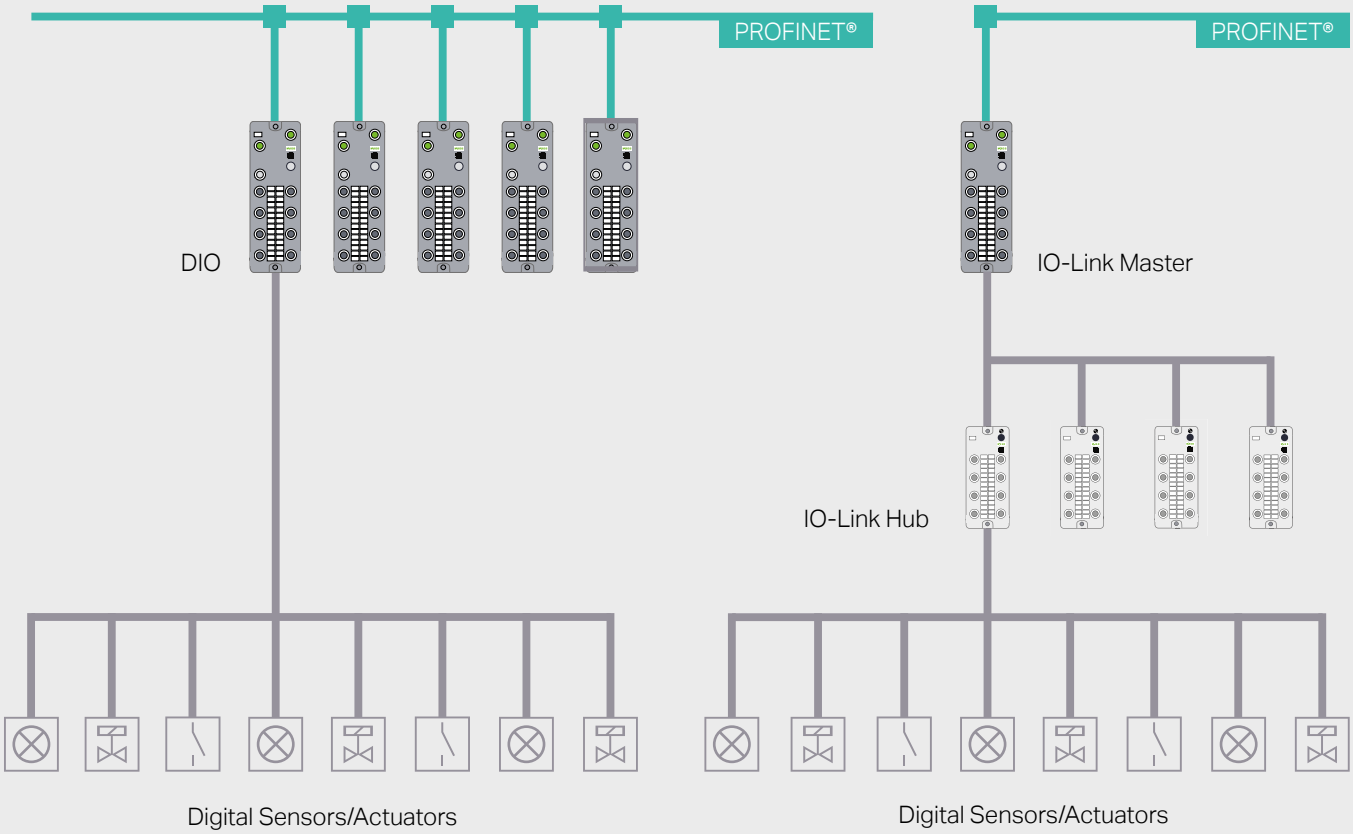
Bluetooth®
For wireless access via mobile device, an app is available that provides direct access to a fieldbus module by identifying a data matrix code and communicating via BLE (Bluetooth® low energy).

Webserver
A wide range of system information can be accessed via a website using standard browsers.

The Benefits for You:

- Platform-independent data exchange via OPC UA
- System information provided via MQTT
- Fast, distributed access to module information via Bluetooth®
- Access to system information via integrated Webserver

Fieldbus Examples: without IO-Link and with IO-Link



All-in-One Solution with IO-Link

In combination with IO-Link, the WAGO I/O System Field fully demonstrates its strengths as a flexible "IO distributor" for both data collection and data distribution. The communication standard allows a seamless data flow from the control level to the sensor and actuator level. This considerably simplifies configuration and cabling. It also creates completely new possibilities for diagnostics, parameterization and device identification.

The Benefits for You:

- End-to-end cloud and fieldbus communication with IO-Link
- Simplified wiring for project planning and device replacement
- Up to 8 IO-Link hubs per module
- Up to 4 A per port
- Up to 128 digital IOs on one master
- Star topology for short line paths
- Fewer IP addresses

Integrated Load Management

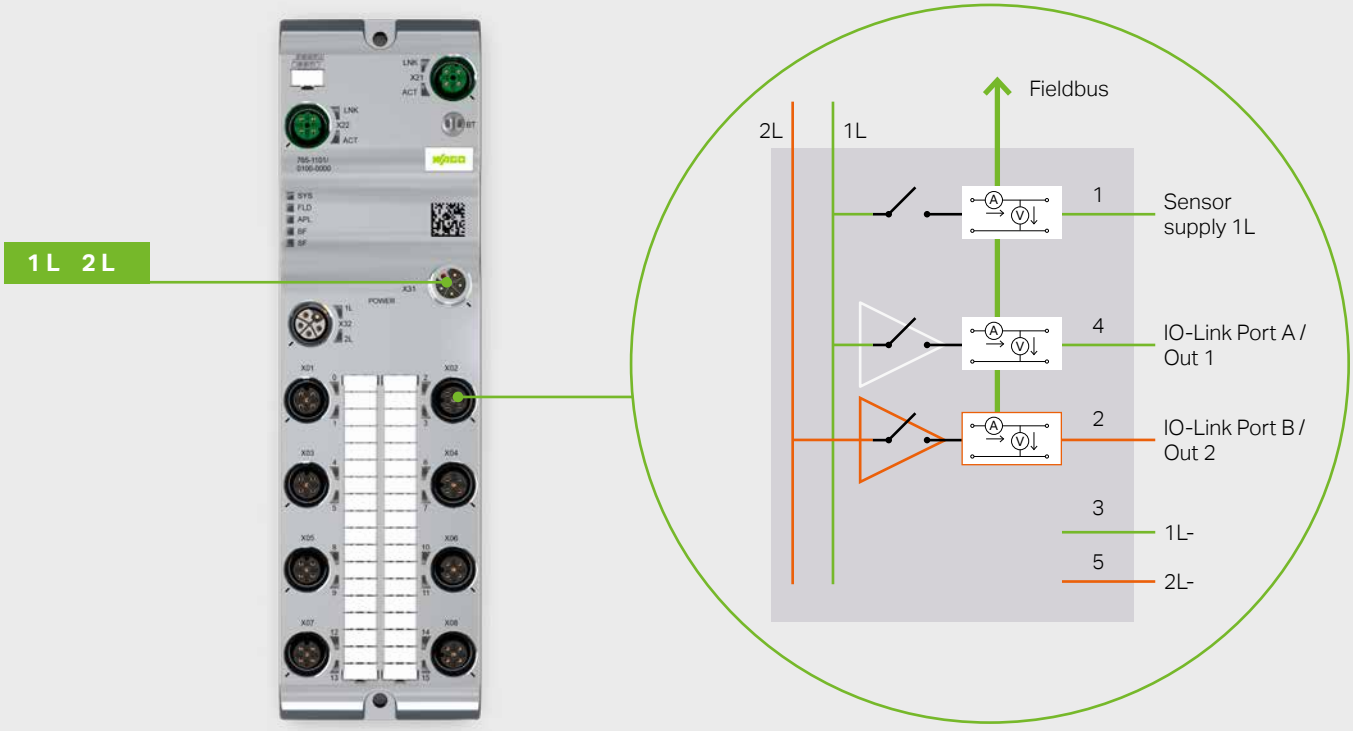
Innovative load management ensures full utilization of a system's power via supply and output current load management. Current and voltage can be recorded and evaluated for each channel. Overload limits can be set for individual channels. As a result, errors can be detected faster and more clearly differentiated in the event of faults. It is also easier to predict errors, which is essential for future-oriented trends such as predictive maintenance.

The Benefits for You:

- High-capacity power supply with up to 2 × 16 A and up to 4 A per IO-Link port
- Adjustable output current limitation
- Definition of pre-alarms and main alarms
- Voltage and current monitoring (by channel and module)
- Channel-based temperature monitoring

Diagnostics Options

- **Monitoring power consumption:** When and why does overload occur?
- **Monitoring all electricity flows:** Who is to blame?
- **Optimizing current load:** Actual measurement versus data sheet
- **Current limitation through parameters:** No dramatic increase in current consumption
- **Parallel access via TCP/IP:** Monitoring and diagnostics simultaneous with actual operation
- **Separate warning and overcurrent limits:** Warning before shutdown
- **Adjustable warning and overload limits:** Safe optimization of your own power resources; predictive maintenance of the connected devices
- **Logging:** Saving to log file



PROFINET EtherNet/IP EtherCAT

WAGO I/O System Field Tooling

App

The WAGO I/O Field app is an app for mobile maintenance, diagnostics, operation and monitoring of installed WAGO I/O System Field modules and IO-Link devices. Android and iOS versions of the app are available for free for download from the corresponding app stores.

Features:

- Log users on/off
- *Connect/disconnect Bluetooth®*
- View, read and adjust fieldbus modules
- Download and import IODDS*
- Read/write access to IO-Link devices*
- Simulate inputs, force outputs
- Access to data sheets, manuals etc.

* Only for IO-Link Masters

Webserver

All fieldbus modules of the WAGO I/O System Field have an integrated Webserver. Distributed systems/machines can be accessed conveniently from a workstation via a standard Web browser with access to a corresponding network.

Features:

- Set up/manage users and access rights
- Module update/reset
- View/change module settings and display port information
- Read and write access to IO-Link devices
- Simulate inputs, force outputs

WAGO IO-Link Configurator

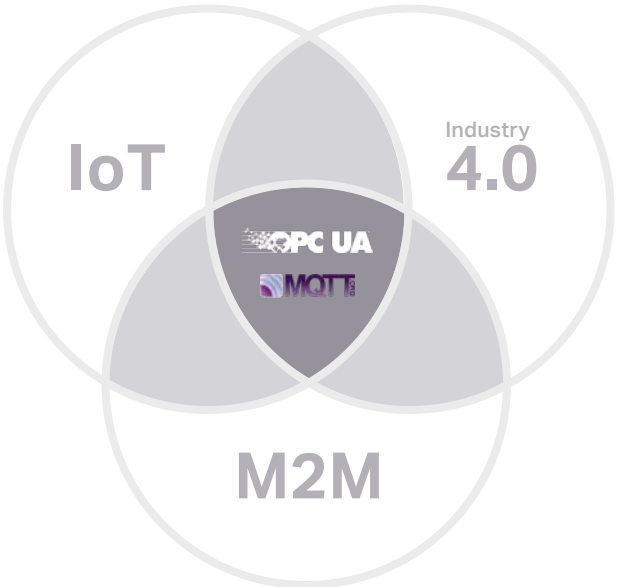
WAGO IO-Link Configurator is an independent commissioning, configuration and management software solution. It allows parameterization, operation and monitoring of WAGO IO-Link masters of the WAGO I/O System Field and, in particular, of the WAGO IO-Link devices connected to it. It can also be used for full configuration and operation of IO-Link devices from all third-party manufacturers. WAGO IO-Link Configurator can be used either as a standalone program or integrated into engineering systems with a TCI (Tool Calling Interface).

Features:

- IOLM and IODD import
- IODD viewer function
- IODDfinder access
- Integrated TCI

OPC UA and MQTT

The fieldbus modules of the WAGO I/O System Field are equipped with an OPC UA server. It enables the same type of manufacturer-independent information exchange among sensors, controllers and MES or ERP systems. OPC UA provides machine-interpretable data and information on this data. Thanks to OPC, time-critical, machine-level data can be transferred in parallel in real time via the fieldbus using the MQTT protocol, which works according to the publisher/subscriber principle.



Features:

- Identify devices
- Read device/port parameters
- Read process/measured values
- Provide diagnostic information/statistics

Functionality and Aesthetics in One System

The IP67-rated WAGO I/O System Field is optimized for robust, cabinet-free automation. The modules mount exactly where you need them – at the heart of the action, on the machine, close to sensors and actuators. This not only reduces the cabling required, but also simplifies commissioning, maintenance and diagnostics.

The system offers uncompromising protection with pressure cast zinc housings for extremely harsh environments, or robust yet lightweight plastic housings for mobile applications. The modules operate reliably at temperatures from −25 to +70°C (−13 ... +158°F) and, thanks to internal shielding, are immune to electromagnetic interference. Slim housing variants and lateral mounting options open up more space.

Rugged resistance to the harshest environmental conditions (like those found in metal-working centers prone to impact, vibration, oil, grease, water or dust) thanks to the encapsulated electronics in the metal housing

Highly dynamic for robotic and handling machines due to low weight of non-encapsulated plastic housings

Flexible mounting on the machine thanks to variable mounting options and compact design (no adapter, lateral mounting holes); easy mounting of the modules on T-groove profiles with machine screws and T-groove nuts – no drilling required.

Space-saving ergonomic design
User-specific marking with product name from the WAGO marking program; ergonomic LED positioning for high visibility despite the presence of cables and pluggable connectors; on-device factory markings are easy to understand. Sensors and actuators are connected via standard M8 and M12 A connectors. The M12 L-coded power supply offers up to 16 A, providing more power in less space.

The Benefits for You:

- Fully encapsulated IP67 metal housings for extreme environments
- Non-encapsulated, lightweight IP67 plastic housings for mobile applications
- Detailed labeling, convenient marking options and clearly visible LEDs

Automation of Sawing Equipment with the WAGO I/O System Field in IP67

Burkhardt-Löffler, located in the Franconia region of Germany, relies on end-to-end automation from WAGO for the stone working equipment it manufactures. The WAGO I/O System Field provides the necessary connectivity in their newly developed saw. The solution boasts many advantages, including easy cabling, free parameterization of the inputs and outputs, protection class IP67 – and fast implementation.

Securely Networked Components

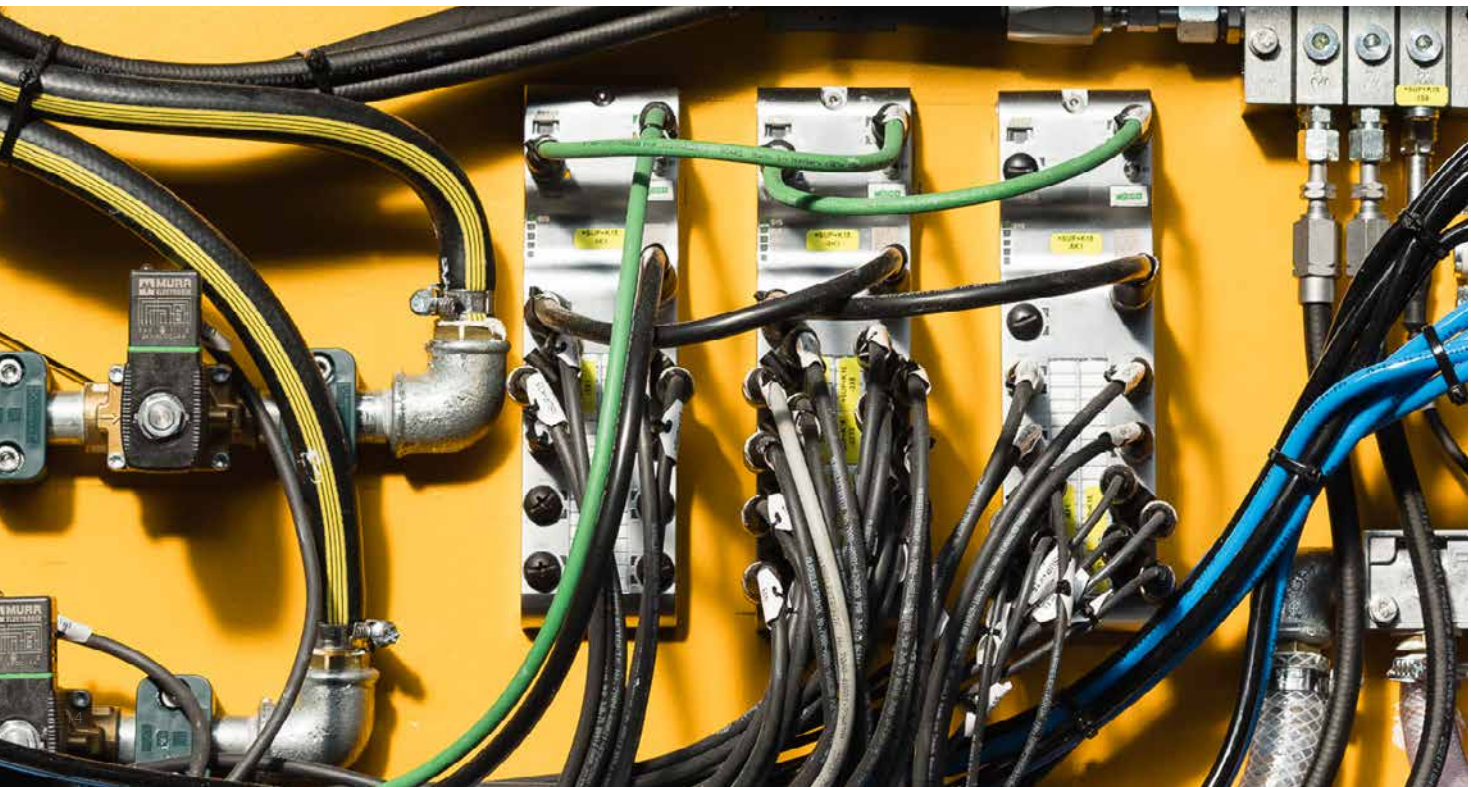
The systems and machines from Burkhardt-Löffler enable end-to-end automation of manufacturing processes: from delivery of raw plates, to cataloging, to cutting and finishing. "Few if any other manufacturers in the world can offer what we do in this form," emphasizes sales expert Dieter Löffler.

Automating the processes requires comprehensive networking and digitization of the machinery. In their newest development, a garage-size multi-blade bridge saw with a rotary head, Burkhardt-Löffler uses an I/O solution from WAGO to achieve a high degree of connectivity: The WAGO I/O System Field provides the basis for the reliable interplay of the individual components.

Harnessing Flexibility through Free Parameterization

Gempel especially values the flexibility provided by the WAGO solution's inputs and outputs, which support variable individual parameterization. "In products from other manufacturers, the interfaces are either inputs or outputs by default. In contrast, the WAGO I/O System Field gives us the ability to freely determine which ones are inputs and which are outputs – and the option of modifying the setup again and again," he explains. This also benefits the customers. "If they need another output later, they can simply convert an input to an output."

Gempel explains that, while this is also possible with other I/O solutions or a terminal box in theory, it involves significant time and effort for rewiring and reprogramming. Most customers lack the relevant in-house expertise, so they would have to rely on external experts – and that takes time and costs money. "With WAGO, however, we can access the I/O product via remote maintenance and reparameterize it with a few mouse clicks. That's much more efficient," he explains.



Processing large solid stone blocks and plates demands a lot from systems and machines. They work in harsh environments – the water used for cooling combines with the stone dust produced during sawing to create so-called stone sludge. “That can become as hard as cement when it dries,” says Gempel. He explains that, although many component manufacturers tout how well their product handles these harsh conditions, the reality is often very different. “In contrast, the environment causes no difficulties for the WAGO I/O solution, because it satisfies the requirements for protection class IP67,” he explains.

Following all these positive experiences, Burkhardt-Löffler plans to use the WAGO I/O System Field in other systems in the future, like in the five-axis CNC bridge saw – one of the machines that make up the company’s “bread and butter,” as sales expert Löffler likes to say. Meanwhile, the first multi-blade rotary head bridge saw will soon be on its way “across the pond” to fulfill an order from a US customer. Other such machines are already under discussion, according to Löffler, and WAGO I/O System Field will be there with them.

»When searching for an I/O product, we had the same requirements as our customers: We wanted a solution that would guarantee the highest level of quality and safety – while also giving us maximum flexibility. WAGO’s Field product meets these requirements perfectly.«

Patrick Gempel, Electrical Design Manager at Burkhardt-Löffler

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