

WAGO Automation

750/753 IP20 WAGO-I/O-SYSTEM



WAGO[®]
INNOVATIVE CONNECTIONS

All In One

The most compact, modular fieldbus-independent I/O system for decentralized automation.

Fine modularity and fieldbus-independence are hallmarks of the WAGO-I/O-SYSTEM, which boasts worldwide approvals for a diverse range of applications. During development, great care was taken to ensure the system could account for all the requirements placed on decentralized fieldbus systems.

Optimized for industrial and building automation, the WAGO-I/O-SYSTEM offers high integration density with an unbeatable price/performance ratio.

- Modular construction: Digital, analog and specialty modules can be combined in virtually any manner within a node
- Freely programmable: Comprehensive programming possibilities in compliance with IEC 61131-3

- Supports all common fieldbus systems
- Safety approvals
- Easy integration of specialty functions, such as safety modules, Exi, vibration analysis and motor controls
- Multiple radio technology modules

Company Profile

WAGO was founded in 1951 with the development of Spring Pressure Connection Technology – the alternative to traditional screw-type connections. Incorrect assembly and poor maintenance can have catastrophic consequences for screw-type connections: loose contacts, short-circuits and shocks. These are unacceptable risks that WAGO has countered for more than 50 years with quality-assured and cost-reducing components. We have not wavered from this course, and have grown Spring Pressure Connection Technology into an international standard.

WAGO USA has been in business since 1979 providing customers with quality automation products. The award-winning WAGO-I/O-SYSTEM has earned loyalty for its innovative design, which is the most compact modular I/O system available. The WAGO-I/O-SYSTEM has grown to include

400+ analog, digital and specialty I/O modules, as well as a successful line of programmable controller products.

With more than 4,800 dedicated professionals in 32 locations worldwide, WAGO can provide superior product availability and support.

The WAGO logo is displayed in a light blue, sans-serif font. It is positioned in the upper right area of the page, overlaid on a dark blue diagonal band that runs from the bottom left towards the top right. Below this band is a green diagonal band, also running from the bottom left towards the top right. The overall design is modern and professional.

When selecting a fieldbus system, consider the following four attributes the WAGO-I/O-SYSTEM offers that can help achieve your automation goals and give you a competitive advantage:

Flexible I/O Structure

The WAGO-I/O-SYSTEM is engineered to be a very flexible platform that delivers exactly what the applications require in one of the smallest packages available, providing extraordinary value.

Network Independent

The WAGO-I/O-SYSTEM supports over 16 of the world's most prevalent industrial fieldbus protocols enabling engineers to use the most effective solution for their application or region while making integration with existing systems trouble-free.

Versatile

With a fieldbus-independent design that features fine granularity and modular components, the WAGO-I/O-SYSTEM can be used in extremely diverse applications. The system is optimized for discrete and process-oriented systems and offers scalable performance for an unbeatable price/performance ratio.

Compact

The WAGO-I/O-SYSTEM is one of the industry's most compact automation platforms. In competitive markets where costly floor space is a concern, having an automation system with a small footprint can help reduce the cost of the system, giving you an edge.



-I/O-SYSTEM 750

Quality and Reliability

Superior reliability combined with minimal life cycle costs make the WAGO-I/O-SYSTEM the world's leading fieldbus system.

- 100% functional test of all modules
- 100% burn-in test of all modules
- Worldwide approvals
- ISO 9001 certification



Universal, Compact and Economical –

Fieldbus Independent

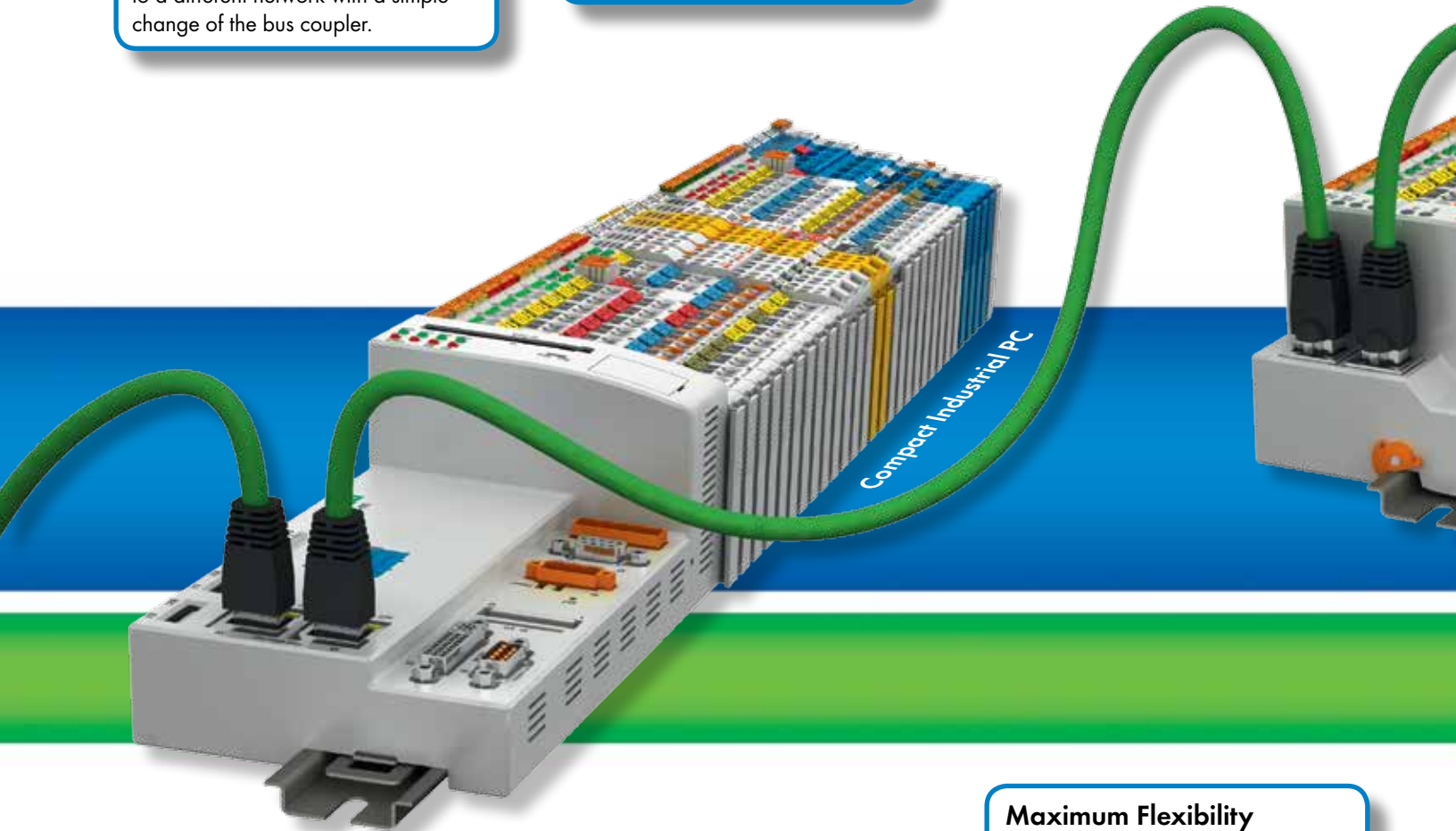
One of the founding principles behind the WAGO-I/O-SYSTEM is fieldbus independence. As one of the first to bring this concept to industry, we now support 16+ networks. The modularity of the system allows existing WAGO-I/O-SYSTEM nodes to be converted to a different network with a simple change of the bus coupler.

Secure and Reliable Connections

CAGE CLAMP® spring pressure wiring technology offers fast, vibration-proof, and corrosion/ thermal cycling resistant wiring that is maintenance-free. No torque specs required!

Mechanical Connection

I/O modules employ built-in contacts for efficient field power distribution. They also provide data contacts for maintenance-free, internal data transmission – no chassis or jumpers required.



Compact Size

Our patented mechanical design allows for extremely compact I/O nodes. I/O modules can accommodate up to 16 channels in a 1/2" wide housing, while most bus couplers are only 2" wide by 4" deep.

Scalable Performance

Interfaces are available for any size and type of automation task – from distributed I/O nodes or stand-alone control to global networks.

- Controllers – 16 bit, 32 bit, and DIN rail mount IPCs for stand-alone distributed, or master control
- Bus couplers – standard for high I/O counts and economy for highly distributed applications

Maximum Flexibility

With so many options, a WAGO-I/O-SYSTEM node can be configured to meet the most difficult application requirements.

- Freely mix analog, digital and special function modules in the same node
- Supply modules allow different voltages (e.g. 24 V, 120 V, 230 V) in the same I/O node
- Fine granularity allows optimal use of space
- Gateways to other networks – Modbus, AS-Interface, I/O Link, etc.

The Ideal Fieldbus System

Pluggable Connections

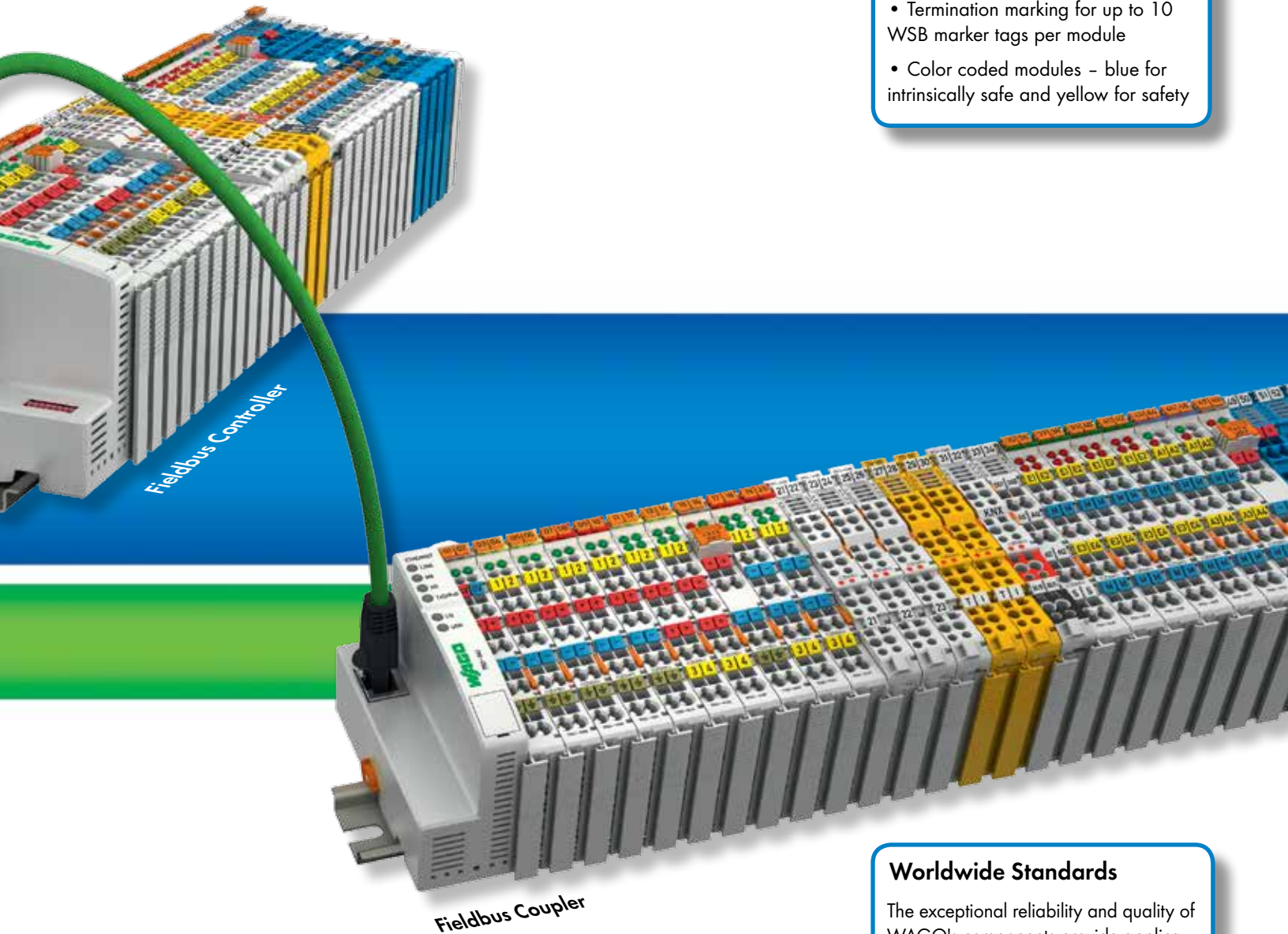
Harness the flexibility of the WAGO-I/O-SYSTEM with 753 Series pluggable connectors.

- Pre-harness I/O connections for plug-and-play wiring
- Built-in test points, tool-less removal, coding/keying, and wire-tie strain relief

Clear Identification

Ample marking and identification.

- Pullout group marker for color identification of module type (DI = yellow, DO = red, AI = green, AO = blue, special functions = clear)
- Termination marking for up to 10 WSB marker tags per module
- Color coded modules - blue for intrinsically safe and yellow for safety



Worldwide Standards

The exceptional reliability and quality of WAGO's components provide applications with the highest levels of technical accuracy and safety. The WAGO-I/O-SYSTEM has achieved multiple international certifications.

- Marine certifications (GL, DNV, BV, ABS)
- UL and ATEX hazardous locations
- Intrinsically safe

Extended Temperatures

Some applications are located in harsh environmental conditions. Therefore select modules from the WAGO-I/O-SYSTEM are engineered to be used in temperatures ranging from -20°C to +60°C.

Simple Handling

The chassis free, DIN rail mount design allows for easy installation, expansion, and modification of the I/O node.

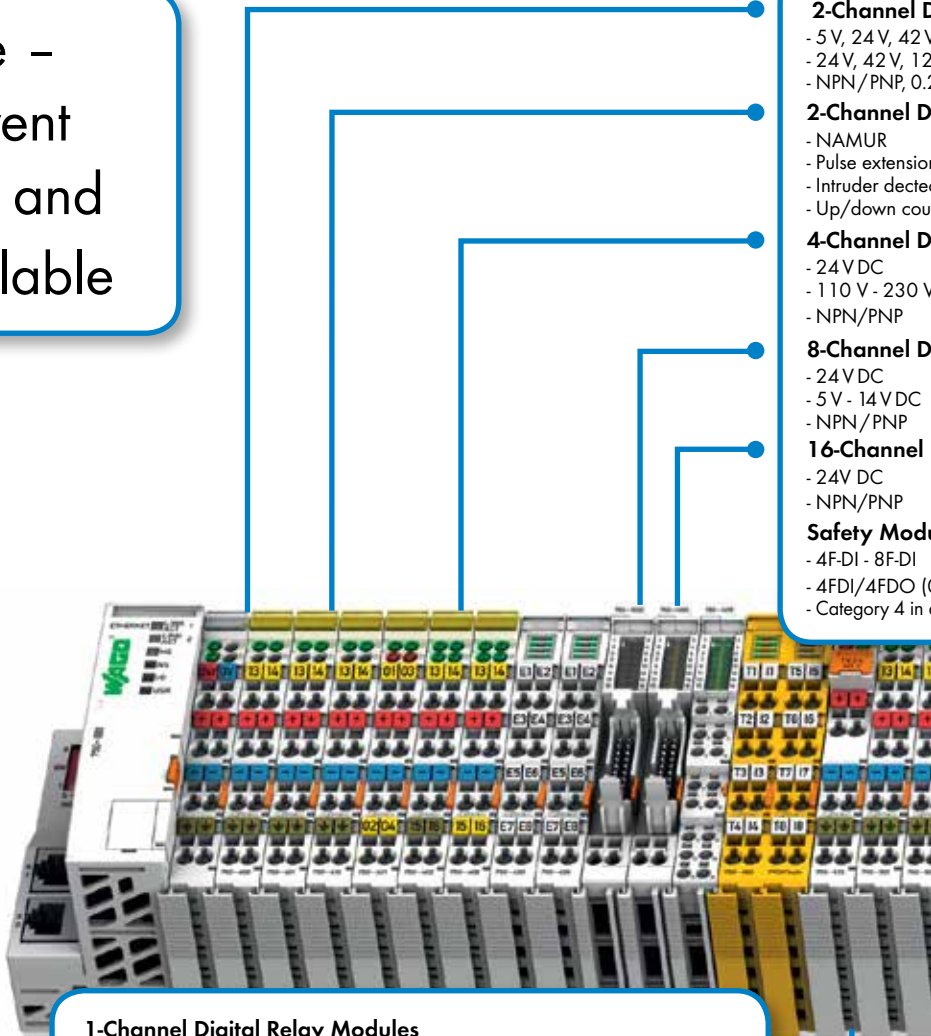
The WAGO-I/O-SYSTEM

Digital

Versatile and flexible – more than 400 different 1, 2, 4, 8, 16-channel and specialty modules available

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Supported Fieldbus Systems
 - Fieldbus couplers
 - Programmable fieldbus controllers



- 2-Channel D**
 - 5 V, 24 V, 42 V
 - 24 V, 42 V, 12
 - NPN/PNP, 0.2
- 2-Channel D**
 - NAMUR
 - Pulse extension
 - Intruder detect
 - Up/down cou
- 4-Channel D**
 - 24 V DC
 - 110 V - 230 V
 - NPN/PNP
- 8-Channel D**
 - 24 V DC
 - 5 V - 14 V DC
 - NPN/PNP
- 16-Channel**
 - 24 V DC
 - NPN/PNP
- Safety Mod**
 - 4F-DI - 8F-DI
 - 4FDI/4FDO (0
 - Category 4 in

- 1-Channel Digital Relay Modules**
 - 440 VAC, 16 A
 - Manual operation, bistable, isolated output
- 2-Channel Digital Output Modules**
 - 24 V DC
 - 0.5 A/2 A, diagnostics (broken wire/ short circuit)
 - 230 VAC/DC, SSR, 3,0 A, diagnostics
- 2-Channel Digital Special Modules**
 - Pulse widths (PWM) output module
- 4-Channel Digital Output Modules**
 - 5 V DC
 - 24 VDC, 0.5 A
 - 120 V/230 VAC, 0.25 A
 - NPN/PNP, diagnostics
- 8-Channel Digital Output Modules**
 - 5V - 14 V DC
 - 24 VDC, 0.5 A
 - NPN/PNP, diagnostics
- 16-Channel Digital Output Modules**
 - 24 V DC, 0.5 A
 - NPN/PNP
- Safety Modules (PROFIsafe)**
 - 4FDI/4FDO (0.5 A, 2.0 A)
 - Category 4 in accordance with EN 954-1 and SIL 3 IEC 61508
- 2-Channel Digital Relay Modules**
 - 0 - 230 V AC/DC
 - 2 make contacts/2 changeover contacts, isolated outputs/non-floating

Digital Output Modules

Input Modules

Digital Input Modules

- 24 V, 48 V, 60 V, 110 VDC
 - 230 V, 230 VAC
 - 2 ms/3.0 ms filter, diagnostics

Digital Special Modules

- 100 kHz
 - 100 kHz

Digital Input Modules

- 230 V AC

Digital Input Modules

Digital Input Modules

Modules (PROFIsafe)

- 0.5 A/20 A
 - accordance with EN 954-1 and SIL 3 IEC 61508

Analog Input Modules

1-Channel Analog Input Modules

- Resistor bridges (strain gauge)

2-Channel Analog Input Modules

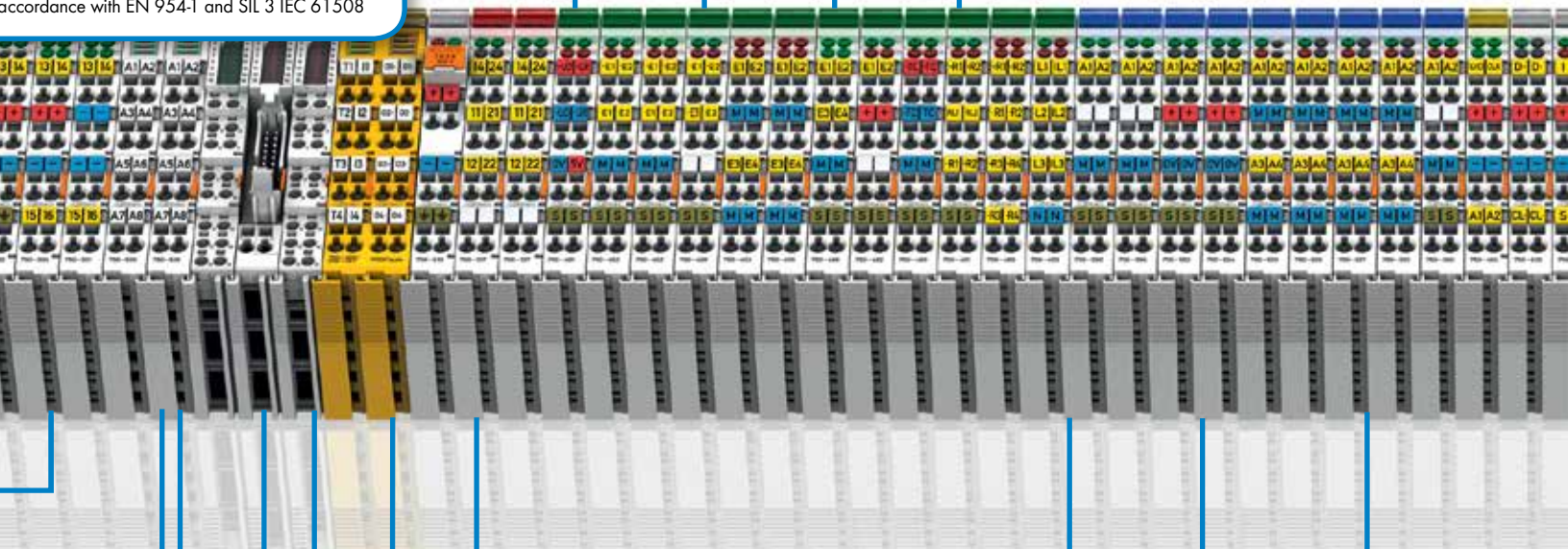
- Differential/single-ended input
 - Measurement input (electrical isolation)
 - 12/14/16 bits resolution
 - 0(4) - 20 mA, 0 - 1(5) A AC/DC
 - 0 - 10 V, ± 10 V, 0 - 30 V DC
 - Diagnostics

4-Channel Analog Input Modules

- Single-ended input
 - 0(4) - 20 mA
 - 0 - 10 V, ± 10 V

Analog Special Functions

- HART protocol
 - RTD module (adjustable)
 - Thermocouple module, diagnostics
 - Power measurement



2-Channel Analog Output Modules

- 0 - 10 V/ ± 10 V
 - 0(4) - 20 mA
 - 10, 12, 16 bits resolution

4-Channel Analog Output Modules

- 0 - 10 V/ ± 10 V
 - 0(4) - 20 mA

Analog Special Functions

- 6 - 18 V
 - 0 - 10 V, 10 mA, diagnostics

Analog Output Modules

Communication and Gateway

Building Automation

AS-Interface Master
 - according to specification (M3) V 3.0
 - for up to 62 slaves

Radio Interface
 - Bluetooth/RF-transceiver

Serial Interface
 - RS 232 C Interface (configurable)
 - RS 485 / 422 Interface (configurable)
 - TTY interface 20 mA current loop
 - Data exchange module

I/O Link
 - 4-channel 3-pole connection
 - Up to 24 bytes process data



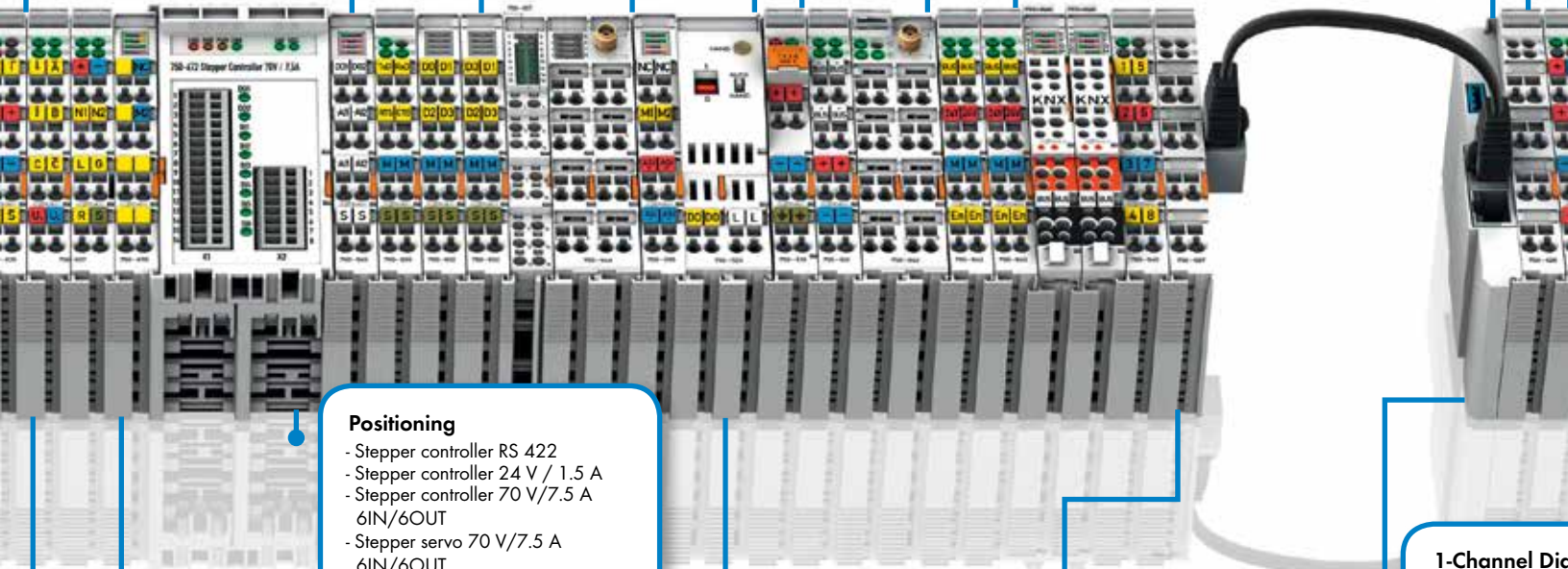
DALI / DSI Master

EnOcean Radio Receiver

MP-Bus (Multi Point Bus)

KNX/EIB/TP1 Module

RTC Module
 - DCF 77 radio receiver



Positioning
 - Stepper controller RS 422
 - Stepper controller 24 V / 1.5 A
 - Stepper controller 70 V/7.5 A 6IN/6OUT
 - Stepper servo 70 V/7.5 A 6IN/6OUT
 - DC drive controller 24V / 5A

Vibration Monitoring
 - Vibration velocity/bearing condition monitoring

Counter
 - Up/down counter
 - Frequency meter
 - Peak-time counter

Distance and Angle Measurement Modules
 - SSI transmitter interface
 - Incremental encoder interface
 - Digital impulse interface

1-Channel Digital Output Module
 - 440 V AC, 16 A
 - Manual operation, bistable, isolated output

Internal Data Bus Extension
 - End module

Internal Data Bus Extension
 - Coupler module

1-Channel Digital Output Module
 - Proximity switch
 - Diagnostics
 - Zone 0+1

2-Channel Digital Output Module
 - Proximity switch
 - Zone 0+1

2-Channel Digital Output Module
 - DC 24 V, short circuit protected
 - Zone 1

2-Channel Analog Input Module
 - 4 - 20 mA (Zone 1)
 - Resistance sensor
 - Diagnostics

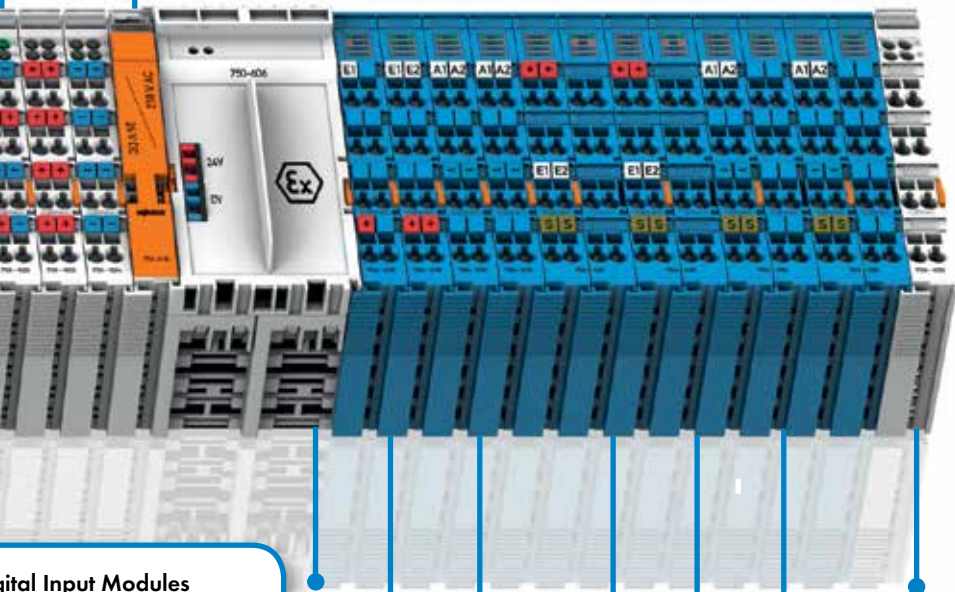
2-Channel Analog Input Module
 - 0 - 20 mA
 - Zone 1

2-Channel Analog Input Module
 - 4-20 mA, HART

Rotating Asset Technology

System Modules

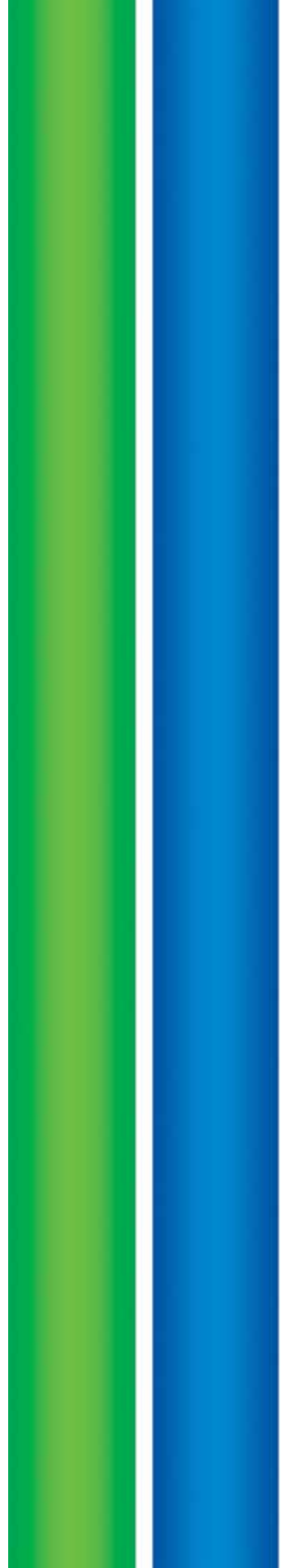
- Filter Modules**
 - System and field-side power supply
 - 24 V DC power supply filter (Surge)
- Field-Side Connection Modules**
 - DC 24 V
 - DC 0 V
- Supply Modules**
 - 0 - 230 V AC/DC
 - Fuse / diagnostics (optional)
 - 24 DC / 5 - 15 V DC (adjustable)
 - 24 V DC EXi
- Separation Modules**
 - 24 V DC / 230 V AC



- Digital Input Modules**
according to DIN EN 50227
- Digital Input Modules**
according to DIN EN 50227
- Digital Output Modules**
circuit protected
- Analog Input Modules**
1), HART
trans (PT100/RTD) (Zone 0+1)
- Analog Output Modules**
- Analog Output Modules**

End Module

Intrinsically Safe Modules EEx [i]



753 Removable Wiring Connectors

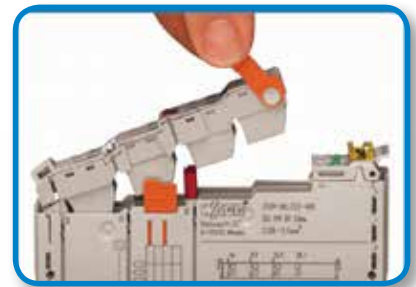
The pluggable connector and the I/O module can be installed and removed without the use of tools



Locate the orange pull-tab on the connector...



Pull toward the front of the connector...

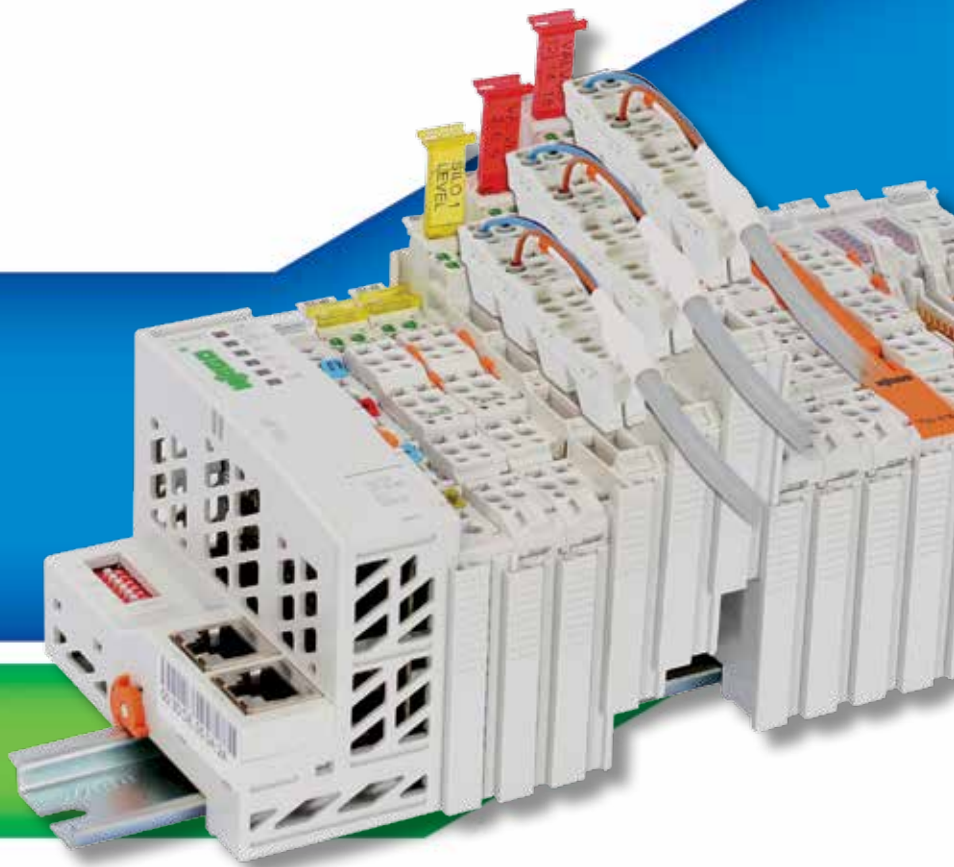


The connector is automatically disengaged

Engineers may find in certain applications that it's advantageous to use removable wiring connectors on I/O modules. The benefits include flexible and time-saving final assembly of the control system. Additionally, module exchange can be performed without disturbing the existing wiring.

WAGO's 753 Series of I/O modules with pluggable connectors is built on the same platform as the 750 Series. 750 and 753 Series modules can be used in the same node for maximum flexibility.

Reliability is of the utmost importance in any control system. That is why the 753 Series offers the benefits of CAGE CLAMP® connections that are vibration-proof and impervious to temperature cycling.



Coding

16 coding possibilities offer additional safety when installing, removing and re-installing connectors



Connect coding pieces together...



Place the coding piece into the I/O module...

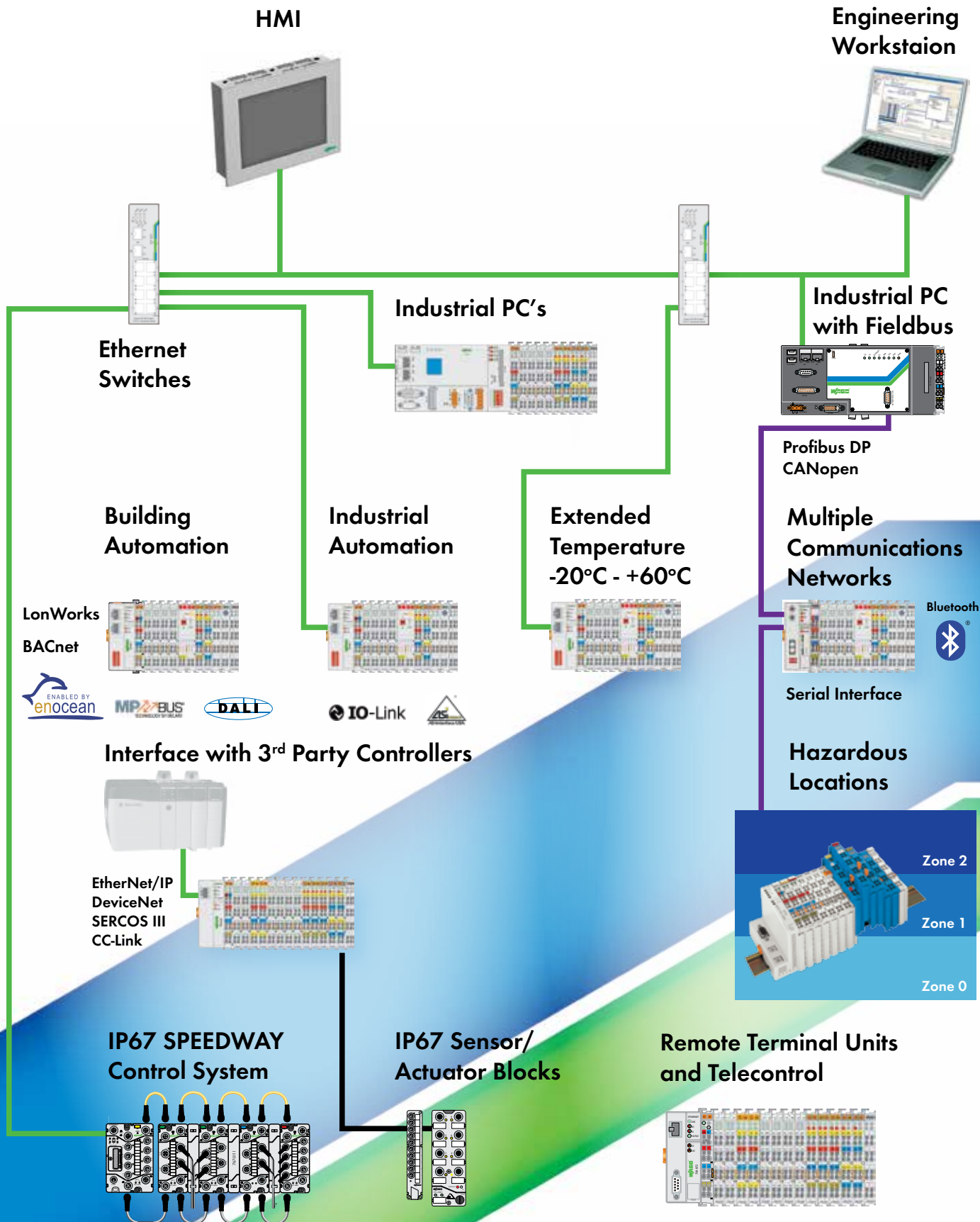


Place the connector into the I/O module



Coded connectors can only fit in the corresponding coded I/O module

WAGO Automation



WAGO-I/O-SYSTEM

for an Extended Temperature Range from -20°C to $+60^{\circ}\text{C}$



WAGO supports harsh environment applications with a line of WAGO-I/O-SYSTEM products for extended temperatures ranging from -20°C to $+60^{\circ}\text{C}$. The extended temperature models are based on 750 Series products and offer the same advantages, i.e., compact, fieldbus-independent, CAGE CLAMP® reliability and economical. Key to these extended-temperature products are the selection of board-level components designed for harsh environments and conformal coating of the PCBs.

WAGO's extended temperature system includes: bus couplers, programmable controllers with built-in

fieldbus and SD cards, digital and analog I/O, as well as select specialty modules. These all employ the same housings and programming software as the standard 750 Series platform. Utilizing the same platform for your control and I/O in harsh environments simplifies engineering, minimizes the system's footprint and reduces costs.

With WAGO's fieldbus-independent strategy, you can design automation systems in harsh environments with the fieldbus of your choice. This includes: EtherNet /IP, MODBUS TCP, PROFIBUS, and CANopen,

WAGO-I/O-SYSTEM 750 and 753 for Marine Applications



Approvals:

ABS (American Bureau of Shipping)

BV (Bureau Veritas)

DNV (Det Norske Veritas)

GL (Germanischer Lloyd)

KR (Korean Register of Shipping)

LR (Lloyd's Register)

NKK (Nippon Kaiji Kyokai)

RINA (Registro Italiano Navale)

BSH (Compass proved)



Designing systems for shipboard or offshore automation challenges engineers to find the most efficient, reliable and compact systems for their critical applications. The WAGO-I/O-SYSTEM can help them meet their requirements.

Select bus couplers, programmable controllers and I/O modules are approved for use in marine applications. In fact, WAGO's 750 Series products carry approvals from nine of the leading marine certification agencies. Refer to the WAGO-I/O-SYSTEM Catalog, Volume 3 for a complete listing of marine-certified products.

Real estate on ships and offshore platforms is at a premium, causing designers to continually search for the smallest solutions. The WAGO-I/O-SYSTEM is ideal for these applications, as it is one of the most compact control systems on the market. In fact, it features 16-point digital I/O modules in 12mm-wide housings. Reducing the footprint of control cabinets can be a tremendous cost-saving tactic for marine applications.

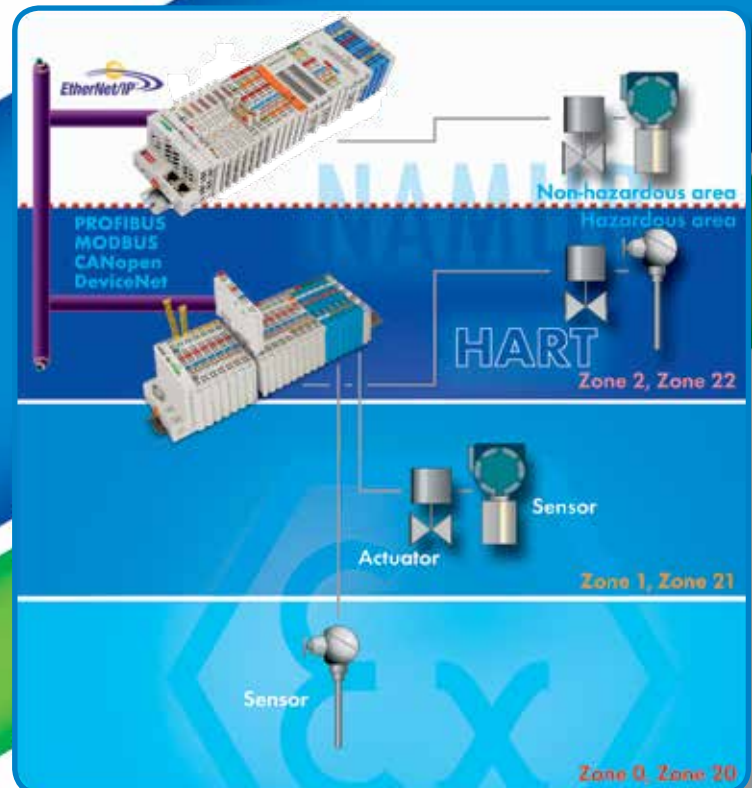
WAGO-I/O-SYSTEM for Hazardous Environments



Many industries such as oil and gas, petrochemical, mining and wastewater have applications located in hazardous locations. The WAGO-I/O-SYSTEM is ideal for these applications. A large majority of couplers, controller and I/O modules are approved for use in UL Class 1, Division 2 and IEC Zone 2/Zone 22 locations.

Intrinsic Safety is a method of ignition protection that can help reduce the time and cost of wiring systems in hazardous locations. The WAGO-I/O-SYSTEM offers Ex i I/O modules specifically designed for this type of protection with intrinsically safe barriers built into the I/O modules. The Ex i modules can be wired to devices located in IEC classified Zone 0 and Zone 1 locations.

Ex i modules can be built up in an intrinsically safe section of a standard 750 Series fieldbus node utilizing an Ex i power supply module. This economical solution enables you to take advantage of all the other benefits of the 750 Series WAGO-I/O-SYSTEM. With this powerful configuration, you can easily connect sensors and actuators located in hazardous areas to your system using the fieldbus you prefer.



WAGO Software

Applications to optimize your solutions

WAGO-I/O-PRO CAA

Programming Tool

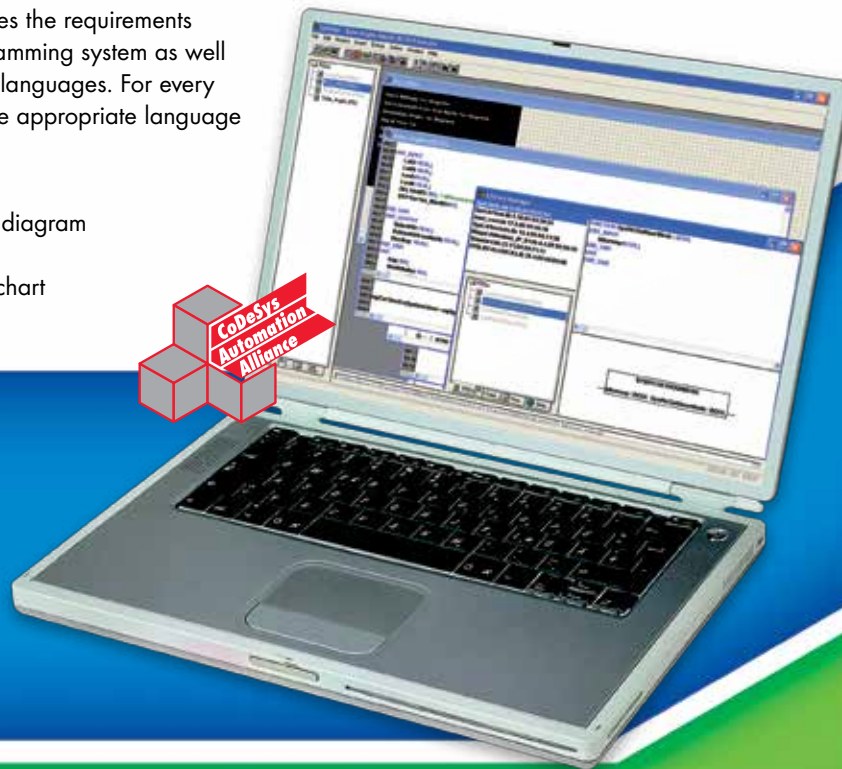
WAGO-I/O-PRO is a programming and visualization tool, allowing users to develop PLC applications for the Programmable Fieldbus Controller of the WAGO-I/O-SYSTEM 750 and 753 Series.

WAGO-I/O-PRO conforms to IEC 61131-3. This standard defines the requirements fulfilled by a programming system as well as 6 programming languages. For every automation task, the appropriate language can be chosen.

- Ladder diagram
- Functional block diagram
- Structured text
- Sequel function chart
- Instruction list

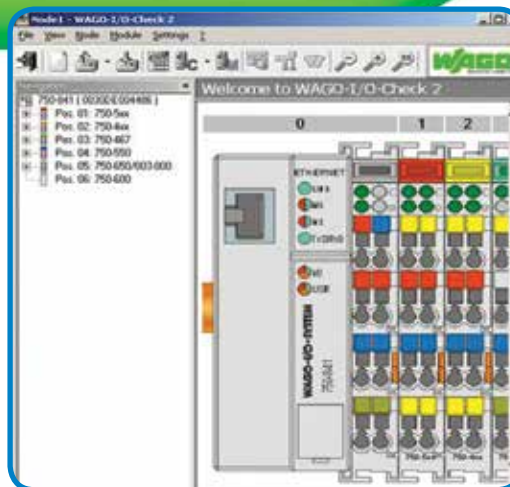
Visualization

No additional tools are needed to visualize the data within a controller. WAGO-I/O-PRO includes an integrated control and monitoring solution that can directly access variables in the controller.



WAGO-I/O-CHECK

WAGO-I/O-CHECK is an application for verifying proper operation of digital and analog I/O. The software is easy to use and can be connected directly to a controller or networked through a Fieldbus. With WAGO-I/O-CHECK it is possible to display and determine the process data of the bus modules. The field wiring, including all sensors and actuators, can thus be checked before start-up.



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