

WAGO-I/O-SYSTEM 750

One System for Every Application



As the leader in screwless interconnect and electronic interface technologies, WAGO developed the first finely modular, fieldbus-independent system in 1995. To this day, our steadfast commitment to innovation and versatility enables us to continue setting new standards in usability, performance and reliability. A compact design combined with the highest quality standards has made the WAGO-I/O-SYSTEM one of the world's most successful decentralized I/O systems.



Decentralized Automation

With WAGO

One System for Every Application

The WAGO-I/O-SYSTEM 750/753 is characterized by its universal application scope and extensive product portfolio. With more than 500 different modules, the versatility and flexibility is so great that virtually every requirement in a wide range of industries is covered.

Industrial Automation

A wide selection of I/O modules for various potential and signal types, as well as specialty functions, makes it possible to economically wire sensors/actuators – even in safety-related applications.

Building Automation

The broad portfolio allows for flexible, cellar-to-ceiling solutions with conventional I/O modules, standardized industry-specific fieldbus protocols and subsystems for typical applications in lighting, shading, heating, ventilating and air conditioning (HVAC) and more.

Marine and Onshore/Offshore Automation

International approvals coupled with industry-specific features permit use in shipbuilding and other harsh sectors. Addressing industry- and operating environment-specific requirements has enabled use on marine diesels and in the EMC-sensitive area of a vessel's bridge. Because the requirements are significantly greater for immunity to interference or emission of interference and mechanical performance in these sensitive areas, the system can readily meet the needs of other industries.

Process Automation

Even under the harshest environmental conditions, use is possible with special approvals. Potential hazardous location applications include oil and gas production, the chemical industry and power generation. The WAGO-I/O-SYSTEM can be installed in Zone 2/22 with its intrinsically safe I/O modules making it possible to connect sensors/actuators in Zones 1/21 and 0/20.

WAGO-I/O-SYSTEM 750

The Perfect I/O-System

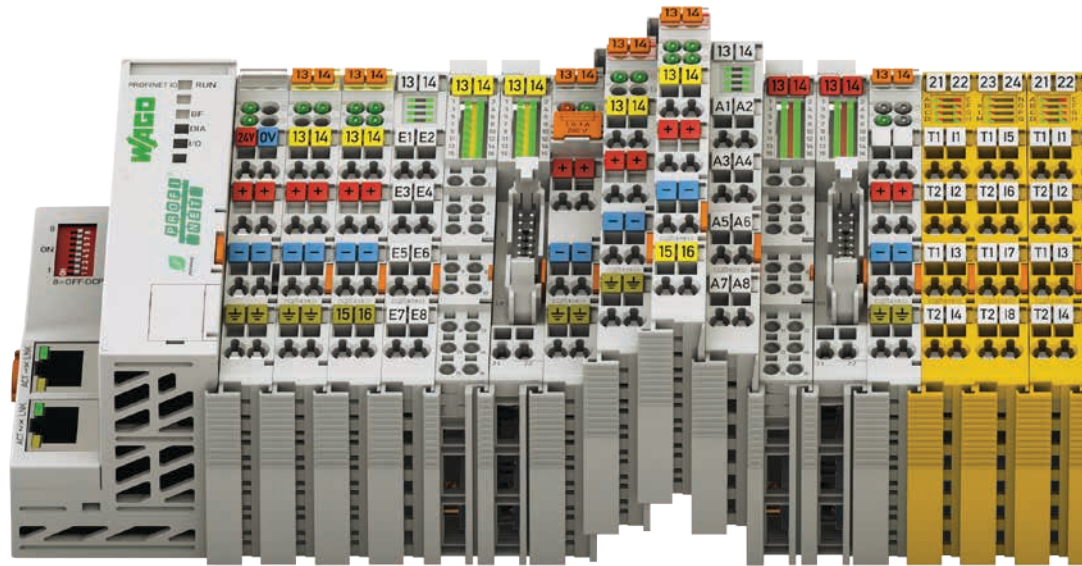


Advantages

- Fieldbus-independent – compatible with all prominent fieldbus protocols & ETHERNET standards
- Flexible platform adapts to diverse applications and environments
- Tested and approved worldwide
- Wide range of accessories for marking and connection technology
- CAGE CLAMP® connection technology for vibration-proof, fast and maintenance-free connections

Universal, Compact and Economical

The Ideal Fieldbus Node



Maximum Fieldbus Independence

The system's modularity is also reflected in its support for numerous fieldbus systems and ETHERNET standards. Depending on the application, it is possible to choose between fieldbus couplers and communication modules for different protocols.

Worldwide Approvals

International approvals for building and industrial automation, as well as the process and shipbuilding sectors, guarantee worldwide use – even under harsh operating conditions, e.g., ATEX, BR-Ex, IECEx, UL, UL ANSI/ISA and shipbuilding.

Clear Identification

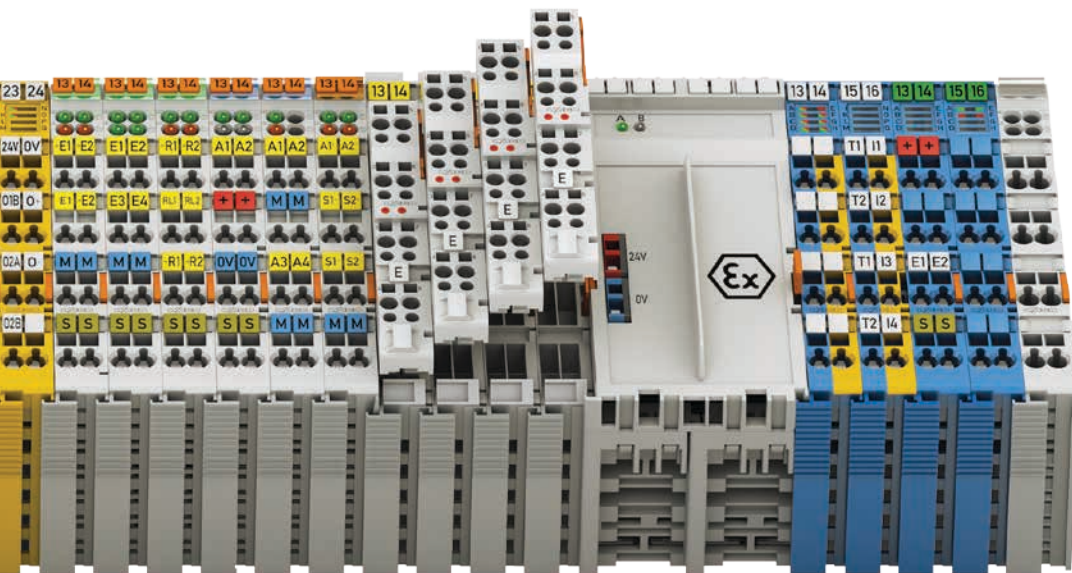
Pullout group markers identify module functionality (integrated or as an option). Connector assignment and technical data are located on the side of the I/O module. The WAGO WSB marker system also allows for module- and channel-related identification.

Extremely Compact

Our patented mechanical design leads to extremely compact I/O nodes. I/O modules can accommodate up to 16 channels in a 12 mm (1/2") wide housing.

- Finely granular I/O modules enable node customization
- Space-saving design permits high integration density





Pluggable Connections

The 753 Series Modules are 100 % compatible with the 750 Series and feature pluggable connectors. A detachable wiring interface allows an operator to easily replace a module without removing and then rewiring all pre-existing wiring. This convenience virtually eliminates installation errors and saves time – if needed, this can be executed via placeholder modules.

Maximum Reliability and Ruggedness

The WAGO I/O-SYSTEM is also designed for applications operating under the most demanding environmental conditions in accordance with the highest standards, e.g., those required in ship-building. The system is distinguished from other products that are solely intended for industrial use because of:

- Greatly increased vibration rating
- Significantly greater immunity to interference (ESD)
- Lower emission of interference
- Larger voltage fluctuation range
- Improved ruggedness for continuous operation in upper temperature ranges

In addition, CAGE CLAMP® spring pressure connections ensure superior reliability. Integrated QA measures in the production process and 100 % function testing ensure consistent quality.

Maximum Flexibility

Each node in the WAGO I/O-SYSTEM can be configured to meet each channel's requirements, and various potentials and signal types are available (granularity of 1–16 channels). Digital and analog I/O modules, as well as specialty modules, can be freely mixed in the same node. Supply modules permit different voltages (e.g., 24 V, 120 V, 230 V) within the same I/O node.

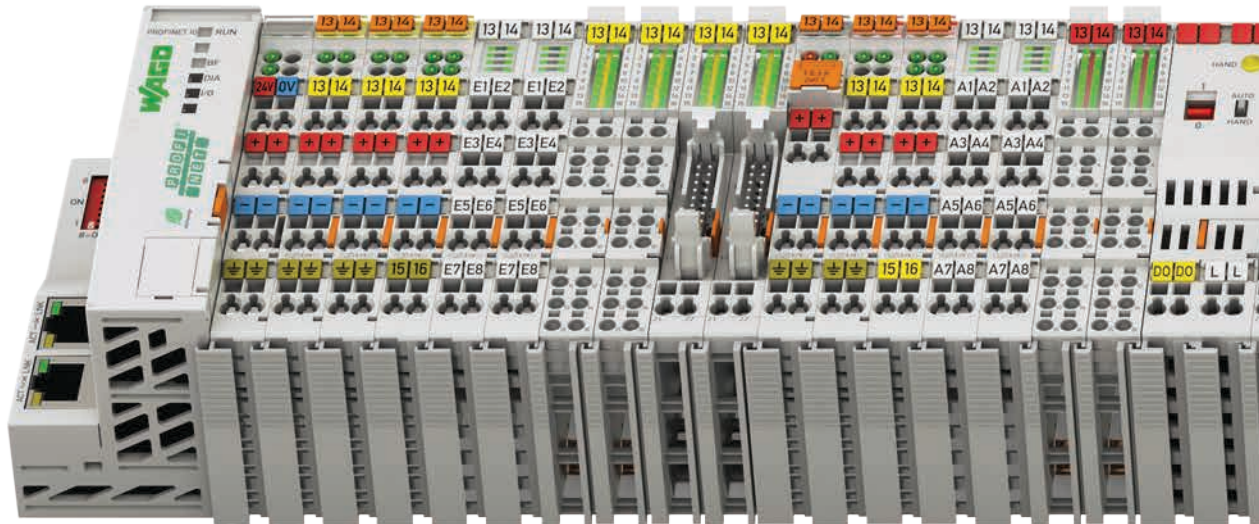
Easy to Use

The modular, DIN-rail-mount design allows for easy installation, expansion and modification of the I/O node. The straightforward design prevents installation errors.

In addition, proven CAGE CLAMP® technology offers fast, vibration-proof and maintenance-free connections that are independent of operator skill. Depending on the I/O module's granularity, field peripherals can be directly wired using 1-, 2-, 3- or 4-wire technology.

500+ Individual Function Modules

1-, 2-, 4-, 8- and 16-Channel



Digital Input Modules

2-Channel Digital Input Modules

- 24, 48, 60, 110, 220 VDC
- 120, 230 VAC
- NPN/PNP, 0.2 ms/3.0 ms filter, diagnostics

2-Channel Digital Specialty Modules

- NAMUR
- Pulse extension
- Intruder detection
- Up/down counter, 500 Hz, 100 kHz

4-Channel Digital Input Modules

- 5, 24, 42 VDC
- AC 24 V, 42 V, 110–230 V

8-Channel Digital Input Modules

- 24 VDC, 5–14 VDC
- NPN/PNP, 0.2/3.0 ms filter
- PTC

16-Channel Digital Input Modules

- Push-in CAGE CLAMP®, 24 VDC, NPN/PNP
- Ribbon cable, 24 VDC, NPN/PNP



Digital Output Modules

1-Channel Digital Output Module

- 440 VAC, 16 A
- Manual operation, bistable, isolated output

2-Channel Digital Output Modules

- 24 VDC, 0.5 A/2 A, diagnostics (broken wire/short circuit)
- 230 VAC, SSR, 3.0 A, diagnostics

4-Channel Digital Output Modules

- 5 VDC, 24 V, 0.5 A
- 120–230 VAC, 0.25 A
- NPN/PNP, diagnostics

8-Channel Digital Output Modules

- 5–14 VDC, 1 A
- 24 VDC, 0.5 A
- NPN/PNP, diagnostics

16-Channel Digital Output Modules

- Push-in CAGE CLAMP®, 24 VDC, 0.5 A, NPN/PNP
- Ribbon cable, 24 VDC, 0.5 A, NPN/PNP

2-Channel Relay Output Modules

- 0–230 V AC/DC
- 2 make contacts/2 changeover contacts, isolated outputs/non-floating



Analog Input Modules

1-Channel Analog Input Modules

- Resistor bridge (strain gauge)

2-Channel Analog Input Modules

- 0(4)–20 mA, 0–1(5) A AC/DC
- 0–10 V, ± 10 V, 0–30 V DC
- Thermocouple measurement module
- RTD measurement module (adjustable)
- Differential/single-ended input
- Measurement input (electrical isolation)
- HART modules

4-Channel Analog Input Modules

- 0(4)–20 mA
- 0–10 V, ± 10 V
- RTD measurement module (adjustable)
- Single-ended input

8-Channel Analog Input Modules

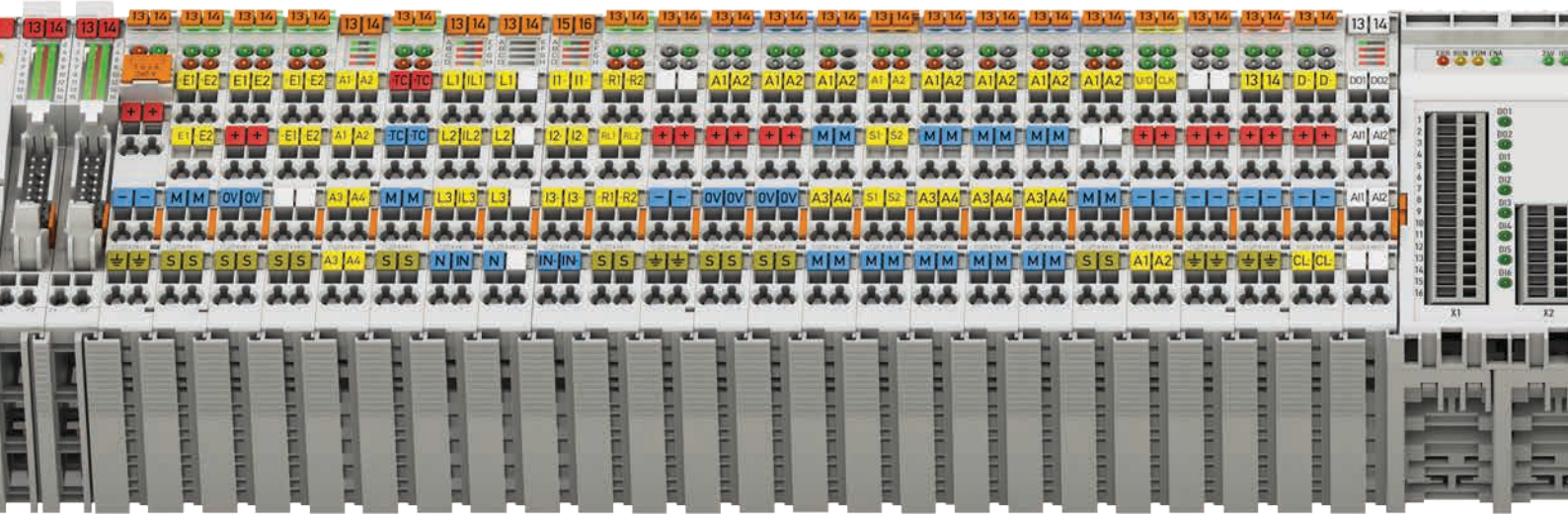
- 0–10 V / ± 10 V
- 0(4)–20 mA
- Thermocouple measurement module
- RTD measurement module
- Single-ended input
- Push-in CAGE CLAMP® connection technology

3-Phase Power Measurement Modules

- 480/690 V, 1 A/5 A/Rogowski coil



IEC 60870-5-101/-103/-104
IEC 61850
IEC 61400-25
DNP3



Analog Output Modules

2-Channel Analog Output Modules

- 0–10 V, ± 10 V
- 0/4–20 mA

4-Channel Analog Output Modules

- 0–10 V, ± 10 V
- 0/4–20 mA

8-Channel Analog Output Modules

- 0–10 V, ± 10 V

Analog Specialty Functions

- 6–18 V
- 0–10 V, 10 mA, diagnostics



Function and Technology Modules

Counters

- Up/down counters
- Frequency counter
- Peak-time counter

Distance and Angle Measurement

- SSI transmitter interface
- Incremental encoder interface
- Digital impulse interface

Positioning

- Stepper controller, RS-422
- Stepper controller, 24 V/1.5 A
- Stepper controller, 70 V/7.5 A, 6IN/2OUT
- Servo stepper controller, 70 V/7.5 A, 6IN/2OUT
- DC drive controller, 24 V/5 A

Pulse Width

Output Module

Proportional Valve Module

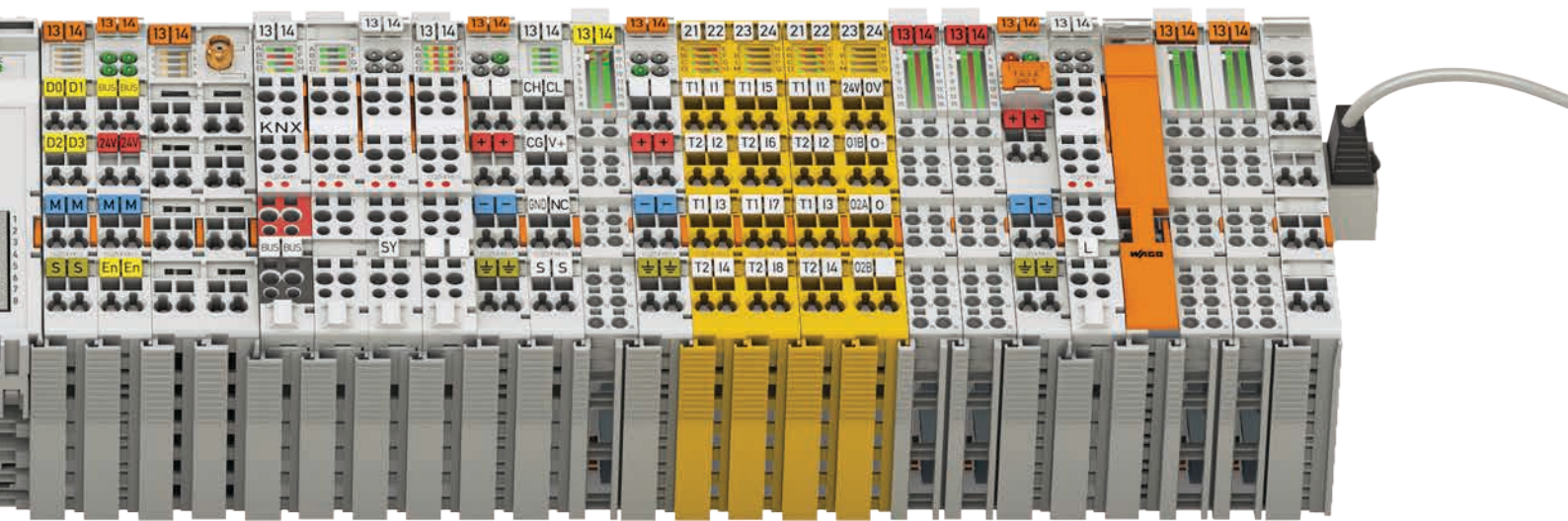
- Control of hydraulic or pneumatic valves

Vibration Monitoring

- Vibration velocity/bearing condition monitoring

RTC Module

- DCF77 radio receiver



■ Communication Modules

Building Automation

- DALI Multi-Master
- EnOcean radio receiver
- MP-Bus
- KNX/EIB/TP1 module
- LON®
- SMI
- M-Bus

Serial Interfaces

- RS-232/RS-485 interfaces (configurable)
- TTY interface, 20 mA, current loop
- Data exchange module

4-Channel I/O-Link Master

AS Interface Master

- Per (M4) V 3.0 specification
- Up to 62 slaves

CAN Gateway

Radio Interface

- *Bluetooth*®/RF transceiver

■ Functional Safety

Digital Input/Output Modules (PROFIsafe)

- 4FDI, 24 VDC
- 4FDI/2FDO, 24 VDC, 10 A
- 4FDI/4FDO, 24 VDC, 2 A
- 4FDI/4FRO, 48 VAC, 60 VDC, 6 A
- 8FDI, 24 VDC
- Ple/Cat. 4 to EN ISO 13849 or SIL 3 EN IEC 62061

Intrinsically Safe Module

- 4 F Ex i DI, 24 VDC, Zones 0+1

■ Supply and Segment Modules

Internal Data Bus Extension

- End module
- Coupler module

Supply Module

- 0–230 V AC/DC
- Fuse/diagnostics (optional)
- 24 VDC / 5–15 VDC (adjustable)

Filter Modules

- System and field supply
- 24 VDC power supply filter with overvoltage (surge) protection

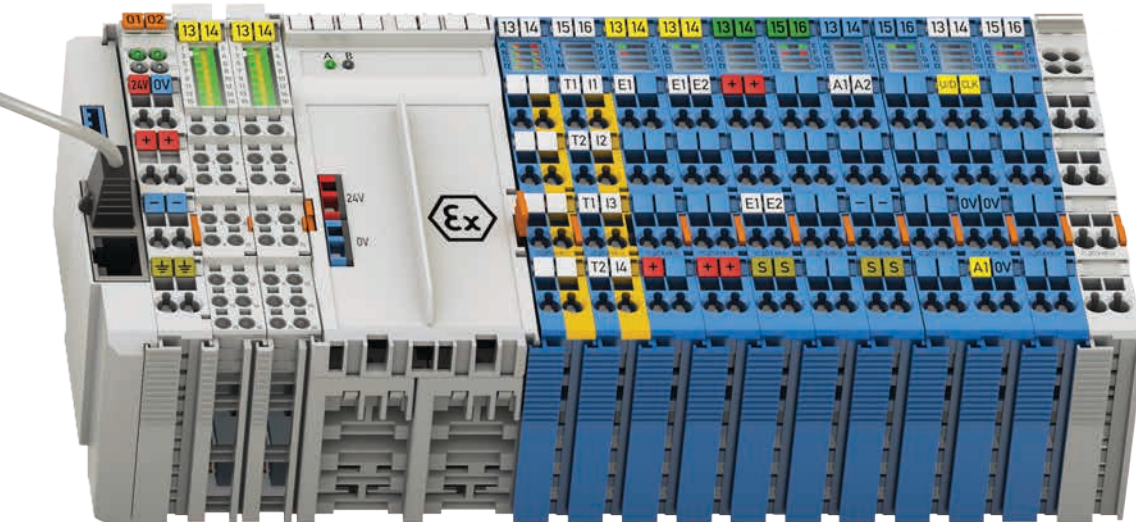
Field-Side Connection Modules

- 24 VDC
- 0 VDC

Separation Modules

- 24 VDC / 230 VAC

End module



■ Ex i Intrinsically Safe Modules

1-Channel Digital Input Module

- NAMUR

2-Channel Digital Input Module

- NAMUR

4-Channel Digital Input Module

- PROFIsafe

8-Channel Digital Input Module

- NAMUR

2-Channel Digital Output Module

- 20 mA

2-Channel Relay Output Module

- Changeover contact

2-Channel Analog Input Module

- 4–20 mA
- 4–20 mA, HART
- RTD
- Thermocouple

2-Channel Analog Output Module

- 0–20 mA
- 4–20 mA

Up/Down Counters

- NAMUR

Supply Module

- 24 VDC, 1 A, Ex i

FIELDBUS-INDEPENDENT

The Right Fieldbus Coupler and Controller for Every Application



Fieldbus Couplers

- Fieldbus couplers connect the WAGO-I/O-SYSTEM 750 to a higher-level control system
- Fieldbus-independent – compatible with all prominent fieldbus protocols & ETHERNET standards
- Space-saving design

750 Series Controllers

- Controllers for all prominent fieldbus systems and ETHERNET standards
- Quick start-up
- Programmable with CODESYS per IEC 61131-3
- Direct connection to a wide range of I/O modules from the WAGO-I/O-SYSTEM 750
- Flexible platform adapts to diverse applications and environments

PFC Controllers

- Controllers for all prominent fieldbus systems and ETHERNET standards
- High processing speed
- Multiple communication interfaces can be used in parallel
- Scalable performance
- Programmable with CODESYS per IEC 61131-3
- Can be combined with high-level languages
- Linux® real-time operating system
- Robust and maintenance-free
- SSH and SSL/TLS provide high levels of security



IEC 60870-5-101/-103/-104
IEC 61850
IEC 61400-25
DNP3



ENGINEERING SOFTWARE

Programmable in Compliance with IEC 61131-3

Software Factors into Success

Today's mechanical engineering and related industries are characterized by ever-shortening development times, exponentially more complex projects and the increasing role of software as part of the overall solution. In fact, software is becoming an essential factor that influences the success of a project.

Linux® and WAGO – Automation for the Future

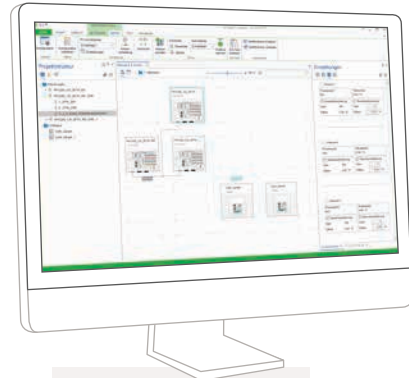


WAGO's Microsoft Windows-based engineering software perfectly dovetails with into our controller portfolio that features the Linux® operating system. In addition to their scalability through the open source community, the Linux®-based controllers are impressive with a future-proof code base. To create complex tasks, you have a choice between programming in IEC 61131 with CODESYS or in Linux® directly with the controllers from WAGO.

CODESYS as an Integrated Environment

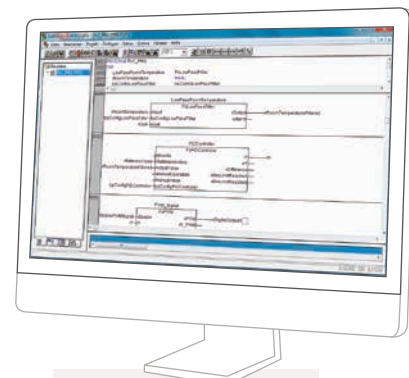


All WAGO controllers are equipped with the high-performance CODESYS industry standard. This allows software development in IEC 61131-3 PLC programming languages (ST, FBD, LD, IL, SFC and CFC). WAGO's proven programming environment guides developers, allowing them to reuse and further develop existing programs without relearning software. This means that modern paradigms, such as Object-Oriented Programming (OOP), or modern visualization technologies are available.



based on CODESYS 3

- Integrated engineering:
One software for every task
- A smart design that invites you to discover
- Modern software: end-to-end data storage and automatic online upgrades
- Based on CODESYS 3 technology
- Graphical network configuration



based on CODESYS 2.3

- Highly efficient translation between programming languages
- Automatic declaration of variables
- Library management
- Online status indication in the program code
- Offline simulation and integrated process visualization
- Recording and graphical display of project variables

WAGO-I/O-SYSTEM 750 XTR

For eXTReMe Environmental Conditions



Instantly recognizable by its dark gray modules, the WAGO-I/O-SYSTEM 750 XTR's unique features make it ideal for extreme environments or applications thanks to:

XTR

Based on 750 Series

DIN EN 60068-2-6



- Fine modularity with a large variety of components
- Compact design (up to 16 channels in a 12 mm/0.5" wide housing)
- Field-side connection via Spring Pressure Termination Technology

eXTReMe temperature range

from -40 °C to +70 °C



- No air conditioning required
- Reduced space requirements
- Lower energy and maintenance costs

eXTReMe isolation

up to 5 kV of impulse voltage

DIN EN 60870-2-1



- Can be used in unshielded areas
- Ideal for standard telecontrol equipment
- Increased system uptime

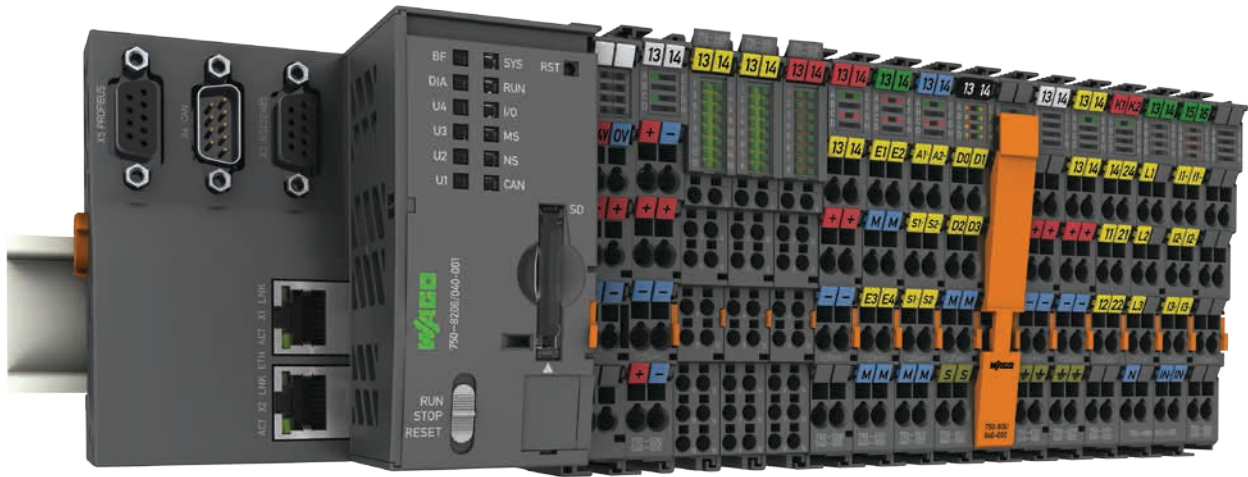
eXTReMe vibration resistance

up to 5g acceleration

DIN EN 60068-2-6



- Install in vibration-prone and shock-generating system components
- Increased system uptime
- Investment security



PFC200, Controllers and Fieldbus Couplers



Digital Input Modules

2-Channel Digital Input Modules

- 220 VDC, 3.0 ms
- 110 VDC, 3.0 ms
- 60 VDC, 3.0 ms

8-Channel Digital Input Modules

- 24 VDC, 3.0 ms
- 24 VDC, 0.2 ms

16-Channel Digital Input Modules

- 24 VDC, 3.0 ms



Digital Output Modules

2-Channel Digital Output Modules

- 24 VDC, 2 A, diagnostics
- 230 VAC, 1 A, relay with 2 make contacts

8-Channel Digital Output Modules

- 24 VDC, 0.5 A



Analog Input Modules

2-Channel Analog Input Modules

- 4–20 mA Differential Input NE43
- RTD measurement module (adjustable)
- Thermocouple measurement module

4-Channel Analog Input Modules

- 0–20 mA / 4–20 mA
- 0–10 V / ±10 V
- Single-ended input
- RTD measurement module (adjustable)

3-Phase Power Measurement Modules

- 690 V, 1 A / 5 A / Rogowski coil



Analog Output Modules

2-Channel Analog Output Modules

- 0/4–20 mA

4-Channel Analog Output Modules

- 0–10 V / ±10 V



Communication, Supply and Segment Modules

Supply Module

- 24 VDC / AC/DC 0–230 V

Filter Modules

- 24 VDC power supply filter/ field-side power supply filter
- System and field supply

Field-Side Connection Modules

- 24 VDC, 0 VDC

Serial Interface

- RS-232/RS-485

Separation Module

End Module

WAGO-I/O-SYSTEM 750

One System for Every Application



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Industry and Engineering

- Fieldbus-independent solutions with scalable performance for major fieldbus systems and industrial Ethernet standards
- Cost- and space-saving design with 1-, 2-, 4-, 8- and 16-channels per I/O module
- Functional safety according to Ple/ Cat. 4 per EN ISO 13849 or SIL 3 EN IEC 62061
- Application-specific specialty functions: positioning, condition monitoring, etc.
- Wide range of interfaces: CAN, IO-Link, AS-Interface and more
- Current and energy measurement technology for energy consumption calculation

Building Automation

- Fully integrated building automation with BACnet/IP, BACnet MS/TP, KNX IP and MODBUS/TCP
- Fast and efficient solutions for all building systems due to freely programmable controllers and application-specific function blocks
- Continuous networking and remote access, e.g., using Web-based technologies
- Wide range of building automation interfaces (e.g., KNX, LON®, DALI, EnOcean, SMI, MP-Bus)

Energy

- Scalable controllers and telecontrol technology
- Communication per IEC 60870-5-101/-103/-104, 61850, 61400-25, DNP3
- PFC hardening is possible in compliance with the German Energy and Water Industry (BDEW) Whitepaper
- 750 XTR benefits:
 - Temperature range: -40 °C to +70 °C
 - Isolation up to 5 kV of impulse voltage (DIN EN 60870-2-1)
 - Vibration resistance up to 5g of acceleration (DIN EN 60068-2-6)
- Current and energy measurement technology for extensive network analyses
- Gateway functionality with interfaces to all common fieldbus systems



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Process

- Application in Zone 2/22 hazardous areas
- Intrinsically safe analog and digital I/O modules for connection to Zones 0+1 (20+21)
- All in one module: functional safety and explosion protection
- Numerous specialty and analog functions (RTD, TC, AC/DC), NAMUR, as well as extensive diagnostics (e.g., short circuits, wire breakage and out-of-measurement range)
- Different potentials can be supplied within one node
- HART protocol support
- Certified to ATEX, IECEx, UL ANSI/ISA 12.12.01, UL, GOST-R and more

Shipbuilding and On/Offshore

- Media redundancy controller
 - Media redundancy provides high operational reliability
 - Operation in two separate networks
- 750 XTR benefits:
 - Temperature range: -40 °C to +70 °C
 - Isolation up to 5 kV of impulse voltage (DIN EN 60870-2-1)
 - Vibration resistance up to 5g of acceleration (DIN EN 60068-2-6)
- International approvals: GL, LR, DNV, BV, RINA, KR, NK, ABS and PRS
- Environmental category (DNV GL) D and EMC1, operation on the bridge or direct operation on combustion engines and compressors
- Certified operation on the bridge, "Compass" certificate (BSH)
- Gateway functions: RS-232/RS-485, NMEA2000, SAE J1939, Modbus RTU and more

Transportation

- 750 XTR was developed using the strict IRIS railway standard as guidance and complies with EN 50155 requirements:
 - EMC resistance per DIN EN 50121-3-2
 - Temperaturklasse: T2 (-40 °C ... +70 °C)
 - Shock & vibration per EN 61373 for 1A and 1B locations
 - Voltage fluctuations 0.725 x Un up to 1.25 x Un (0.7 x Un via external power supply)
 - Isolation up to 5 kV of impulse voltage per DIN EN 60870-2-1
 - Conformal coating protects all PCBs from moisture, condensation and atmospheric pollutants.

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