

# NEXTO



**TAKE CONTROL OVER YOUR BUSINESS**

# NEXTO SERIES

## STATE-OF-THE-ART PROGRAMMABLE CONTROLLER

- Wide variety of CPUs and I/O modules
- Redundancy of CPUs, power suppliers and communication modules
- Power supply, monitoring, control and field networks



The background of the slide is a silhouette of an industrial facility, likely a refinery or chemical plant, set against a dramatic sunset sky. The sun is a bright white circle partially obscured by the dark structures of the plant. The sky transitions from a deep orange near the horizon to a darker red at the top. The industrial structures include tall chimneys, complex piping, and large cylindrical tanks.

ADVANCED AUTOMATION SYSTEM

## **NEXTO SERIES**

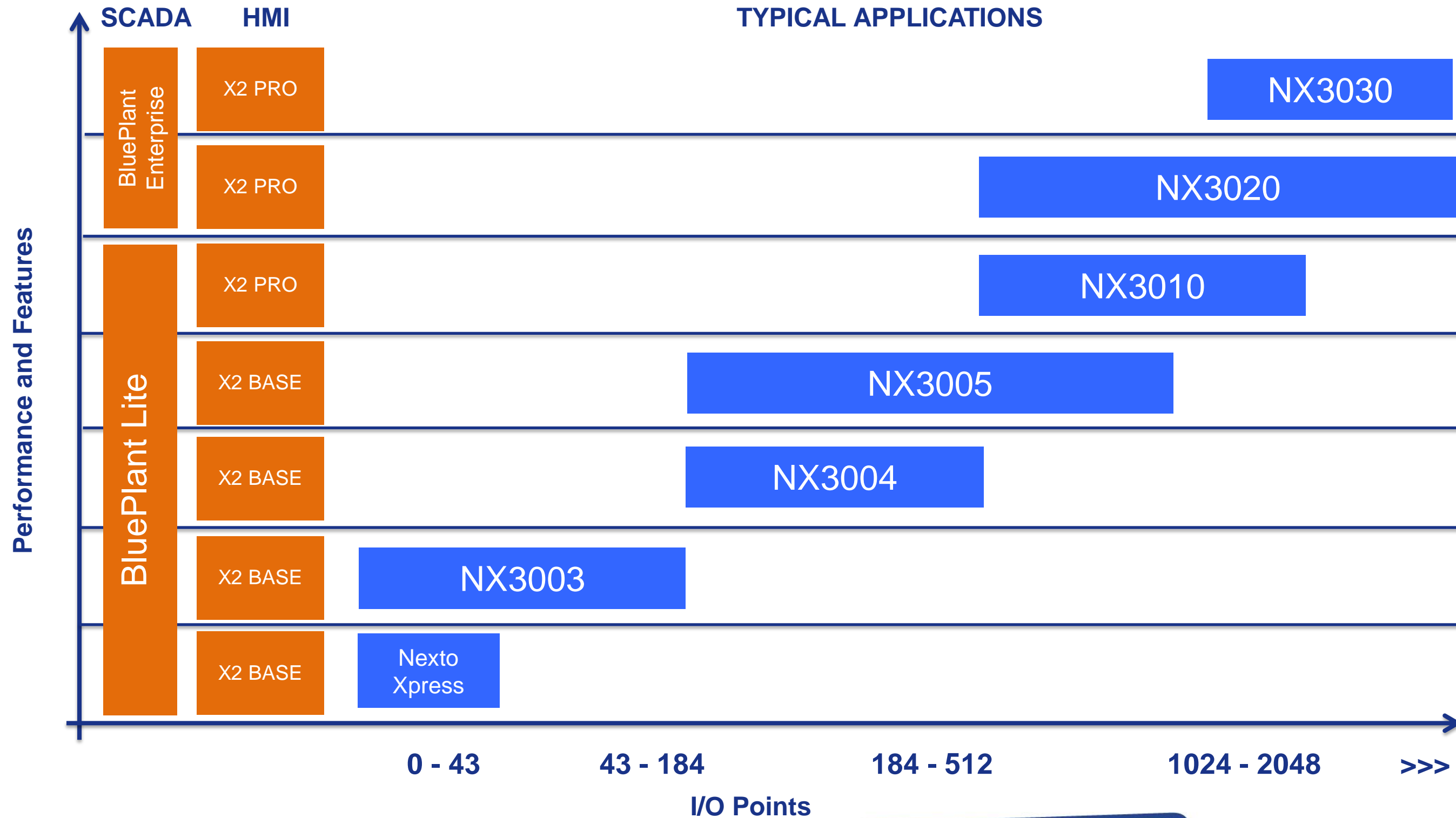
- Aggregates DCS' typical elements
- Integration with most traditional SCADA systems
- Used for control systems in small, medium and high-end applications



## MARKETS

**FLEXIBLE AND POWERFUL, NEXTO PLC IS SUITABLE FOR SEVERAL DIFFERENT MARKETS, SUCH AS**  
**OIL & GAS | MACHINERY | AGROINDUSTRY | POWER | WATER & WASTEWATER**  
**FOOD & BEVERAGE | TRANSPORTATION | BUILDING AUTOMATION | DISTRIBUTED PROCESS**

# NEXTO SERIES



## NEXTO SERIES

- Modular architecture
- Innovative design features and superior finishing, using materials such as aluminum, plastics and LCDs

**AWARDED WITH “IF PRODUCT DESIGN AWARD” STAMP IN 2012, “INDUSTRY + SKILLED TRADES” CATEGORY**



## NEXTO SERIES

### ROHS DIRECTIVE - RESTRICTION OF CERTAIN HAZARDOUS SUBSTANCES

- Nexto Series was developed according to European eco-design requirements

### IT IS AN EUROPEAN DIRECTIVE WHICH PROHIBITS THAT CERTAIN HAZARDOUS SUBSTANCES ARE USED IN MANUFACTURING PROCESSES

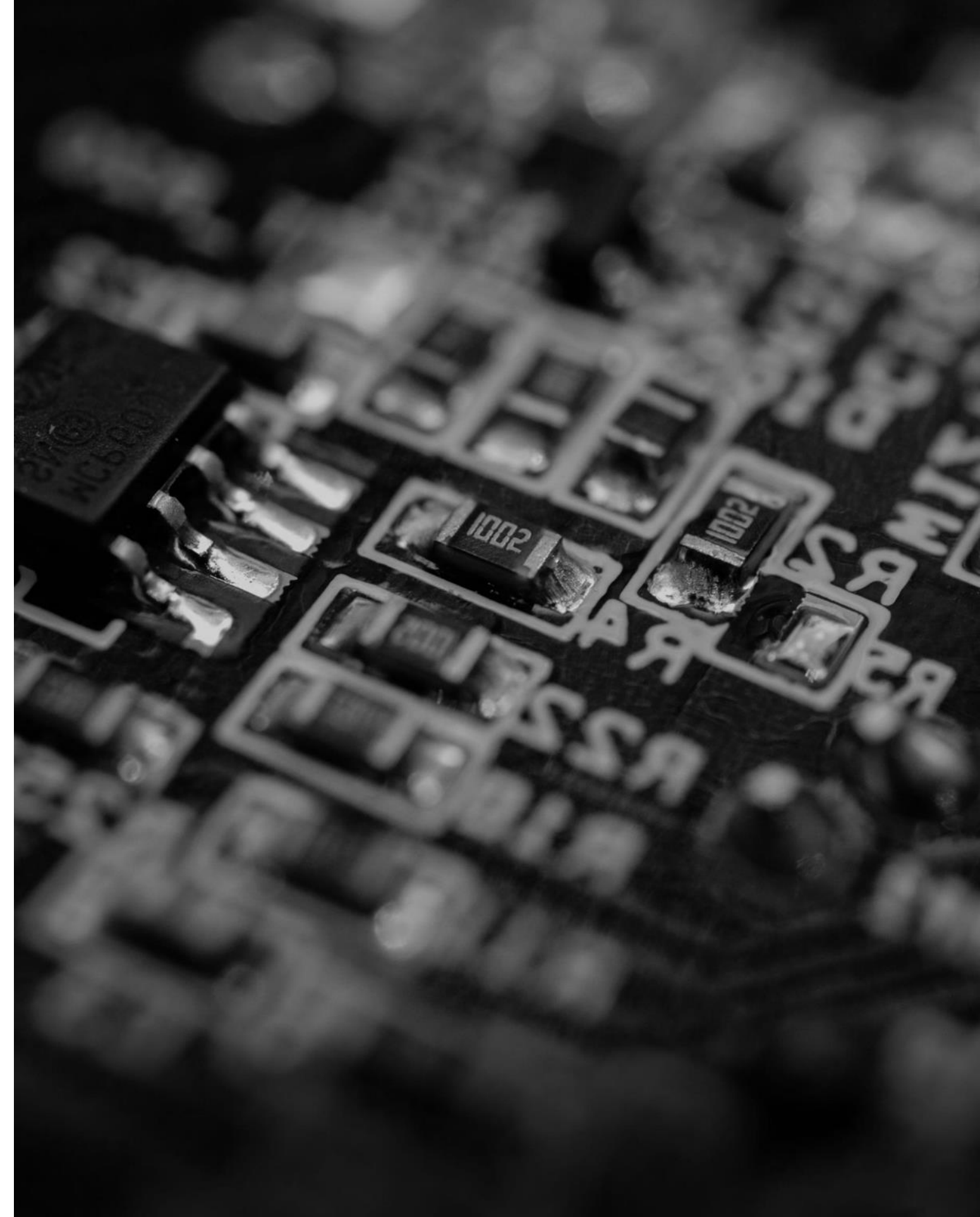
- Cadmium (Cd)
- Mercury (Hg)
- Hexavalent Chromium (Cr6+)
- Polybrominated Biphenyls (PBBs)
- Polybrominated Diphenyl Ethers (PBDEs)
- Lead (Pb)



## NEXTO SERIES

### PROTECTION AGAINST HAZARDOUS SUBSTANCES IN INDUSTRIAL ENVIRONMENTS

- Many industrial environments have hazardous substances on the air for printed circuit boards such as chemical components, air and moisture.
- In the conformal coating process a thin layer of nonconductive material is applied to protect against corrosion, extreme temperatures, sea air, humidity, among others.





## NEXTO SERIES

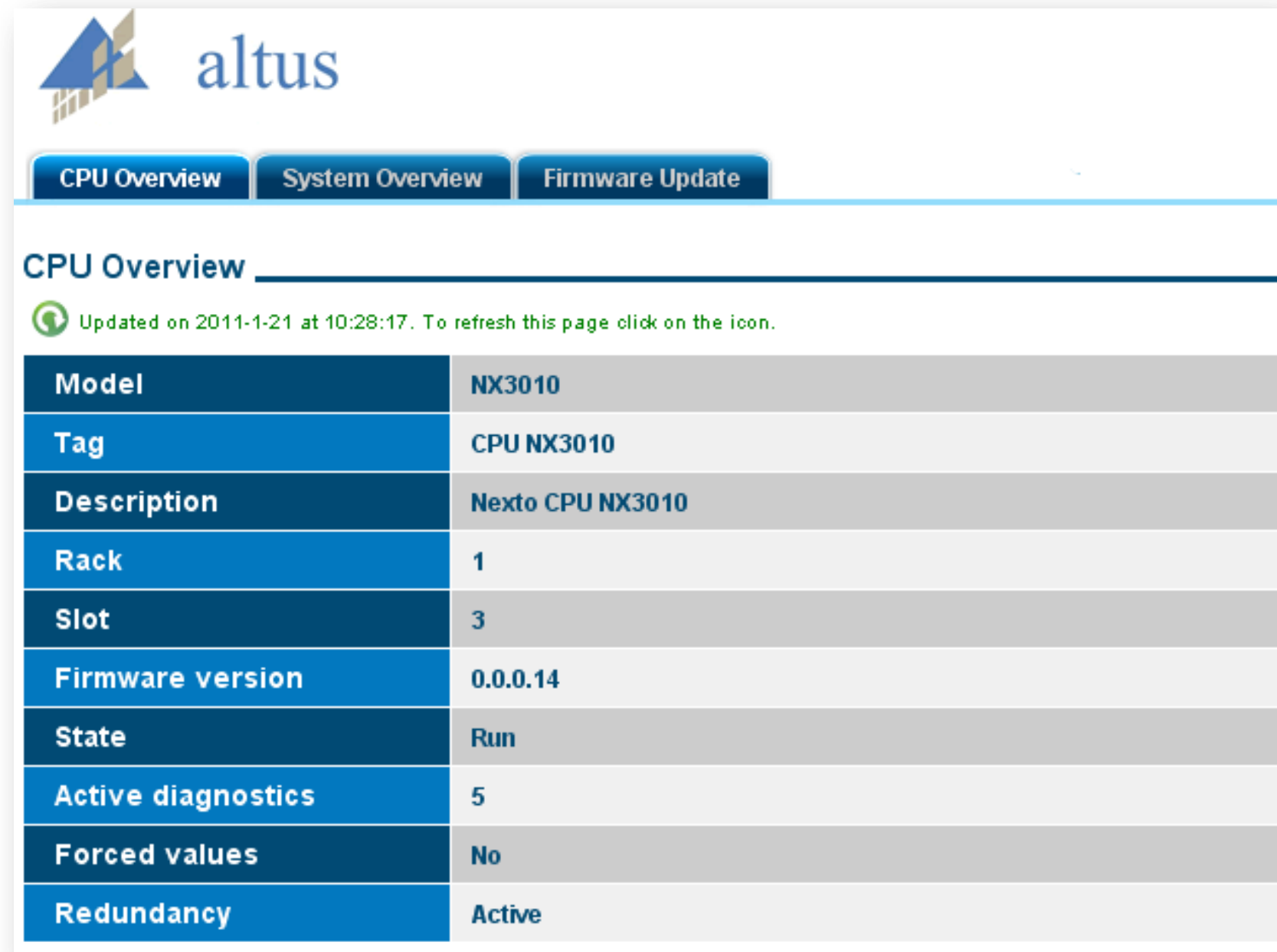
### HIGH QUALITY

- The high quality of Nexto controllers is accredited by renowned world-class technological institutes
  - **CE** – European directives
  - **UL** – NRAQ category (UL61010-1 and UL61010-2-201)
  - **DNV-GL** – Type Approval Category for Marine applications
  - **EAC** – TR004/TR020 Russian directives



# NEXTO SERIES

- All diagnostics available for user application
- Remote access through the Web
- Firmware update via Web
- Password protection



The screenshot displays the Altus web interface. At the top left is the Altus logo. Below it are three navigation buttons: "CPU Overview" (selected), "System Overview", and "Firmware Update". The main content area is titled "CPU Overview" and includes a refresh icon and text: "Updated on 2011-1-21 at 10:28:17. To refresh this page click on the icon." Below this is a table with the following data:

Model	NX3010
Tag	CPU NX3010
Description	Nexto CPU NX3010
Rack	1
Slot	3
Firmware version	0.0.0.14
State	Run
Active diagnostics	5
Forced values	No
Redundancy	Active

**NEXTO SERIES**

- Built-in compact graphical LCD displays in each module
- Allows direct and easy access to critical information:
  - System state (RUN, STOP, ...), redundancy state (ACT, SBY, ...), serial activities, forcing of variables, active diagnostics and more



## NEXTO SERIES

### ONE TOUCH DIAG – OTD

- Clear and accurate diagnostics accessible directly from the module, in real time



### ELECTRONIC TAG ON DISPLAY

- Tags and description of all I/O points accessible directly from the PLC, in real time



## NEXTO SERIES

### DUAL HARDWARE WIDTH

- High flexibility delivering several different sets of I/Os
- Compact and robust
- Absence of screw and tools for installation and maintenance
- Spring-type connector

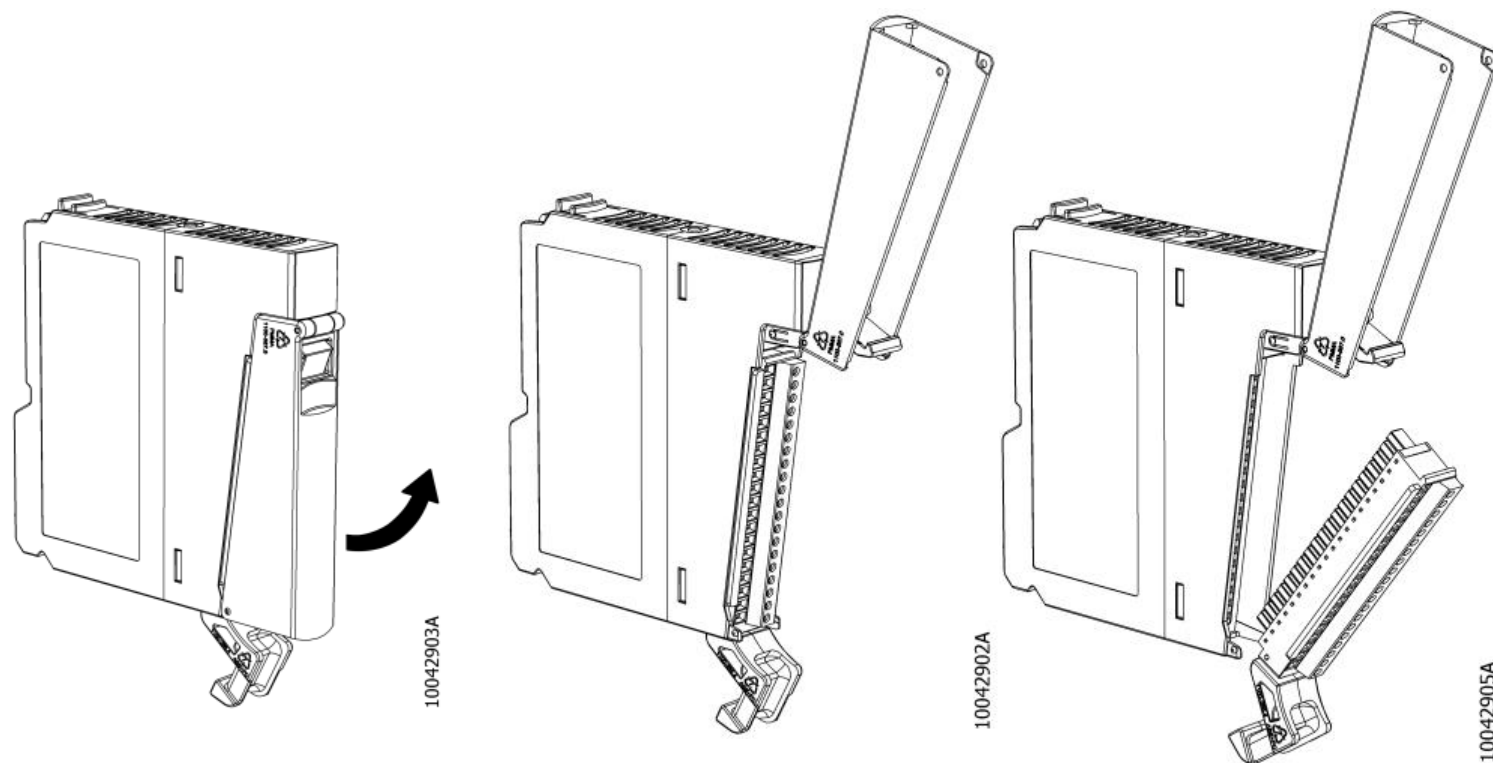


INNOVATIVE FEATURES

# NEXTO SERIES

## EASY PLUG SYSTEM - EPS

- Practical insertion & extraction mechanism for I/O terminal blocks using a lever on the front of the modules



## NEXTO SERIES

### BATTERY FREE OPERATION

- No battery
- Eco-friendly
- Data retention of 20 years
- RTC time backup (up to 15 days)

### ON-BOARD FULL DOCUMENTATION

- Project files can be easily stored and accessed during engineering, commissioning and maintenance tasks

### IP PROTECTION AND LOGIN PASSWORD

- Password management to protect access to the project or controller

### HIGH RELIABILITY

- Low consumption and no moving parts (cooling fans)



## NEXTO SERIES

### MULTIPLE BLOCK STORAGE

- High memory capacity for applications
- Many variable types:
  - %I, %Q, %M, symbolic variable, persistent variable, retain variable
- User memory for project files:
  - .PDF, .DOC, .JPG, others
- System and user events registry memory (log)
- miniSD memory card (up to 8GB)

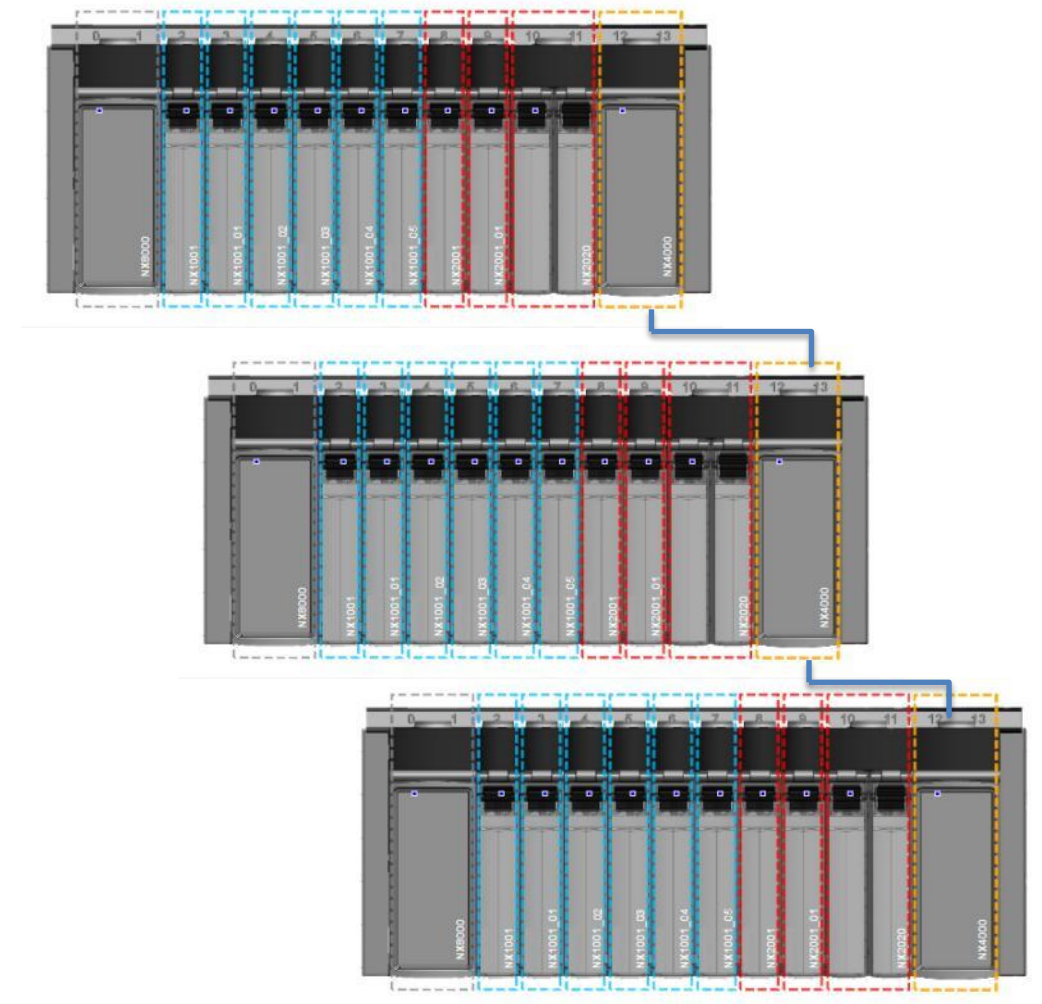




# NEXTO SERIES

## MAIN FEATURES – I/O SYSTEM

- Hot-swapping of any module
- Up to 320 I/Os in one rack
- Supports bus interruptions triggered by digital inputs events
- Expansion of up to 24 remote racks using bus coupler modules and power supply modules
- Optional redundancy if using two bus coupler modules
- Special functions: counters, period measurement and pulse capture



## NEXTO SERIES

### FEATURES

- Based on deterministic Ethernet technology (100 Mbps)
- Up to 25 racks (1 local + 24 remote racks)
- 100 m of distance between racks (cable) or longer using fiber optic converters

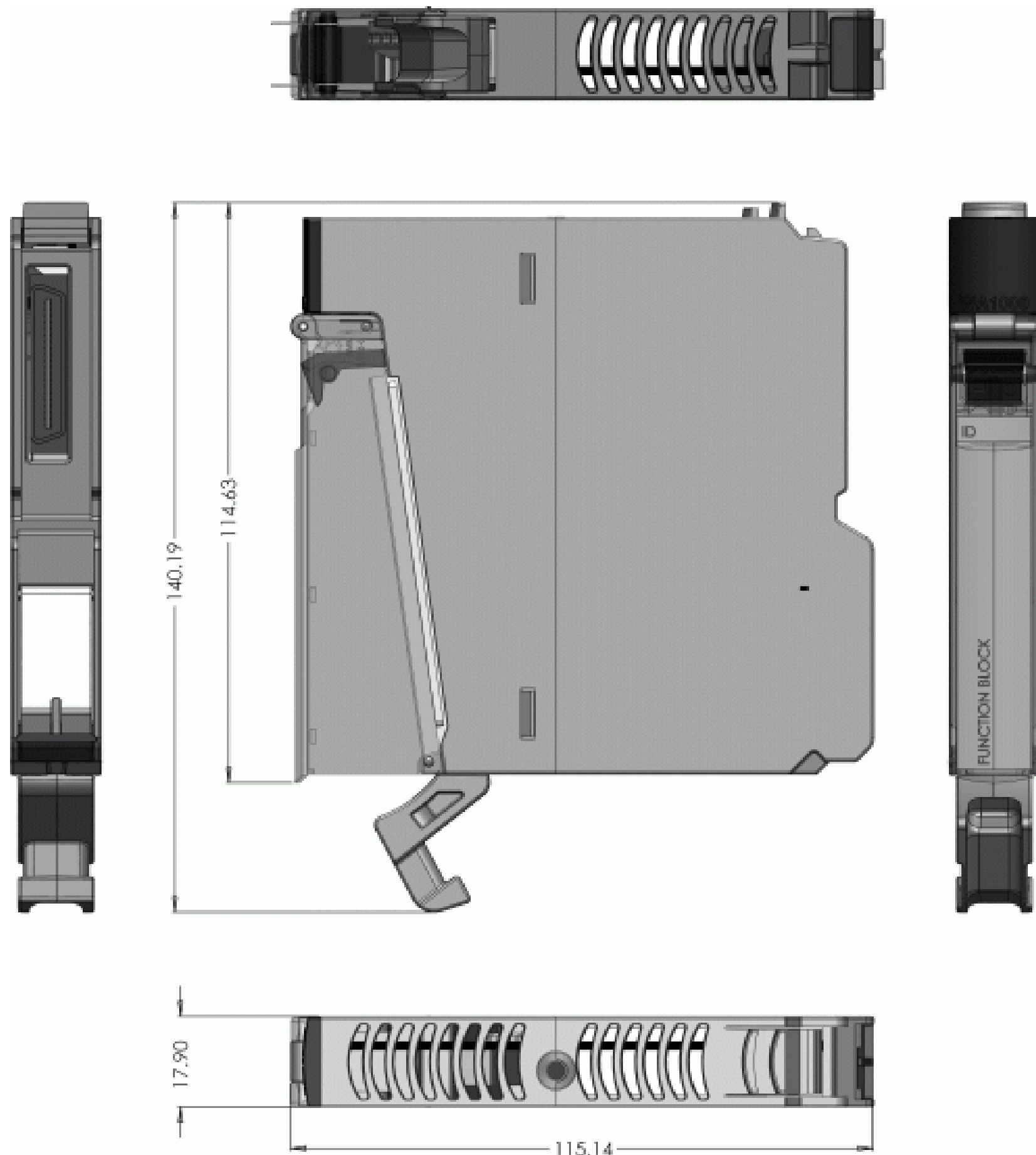
### PERFORMANCE

- High performance with low latencies for interruptions
- High I/O update rate (2,048 I/Os @ 10 ms)

INNOVATIVE FEATURES

# NEXTO SERIES

**DIMENSIONS – 18 MM MODULE**

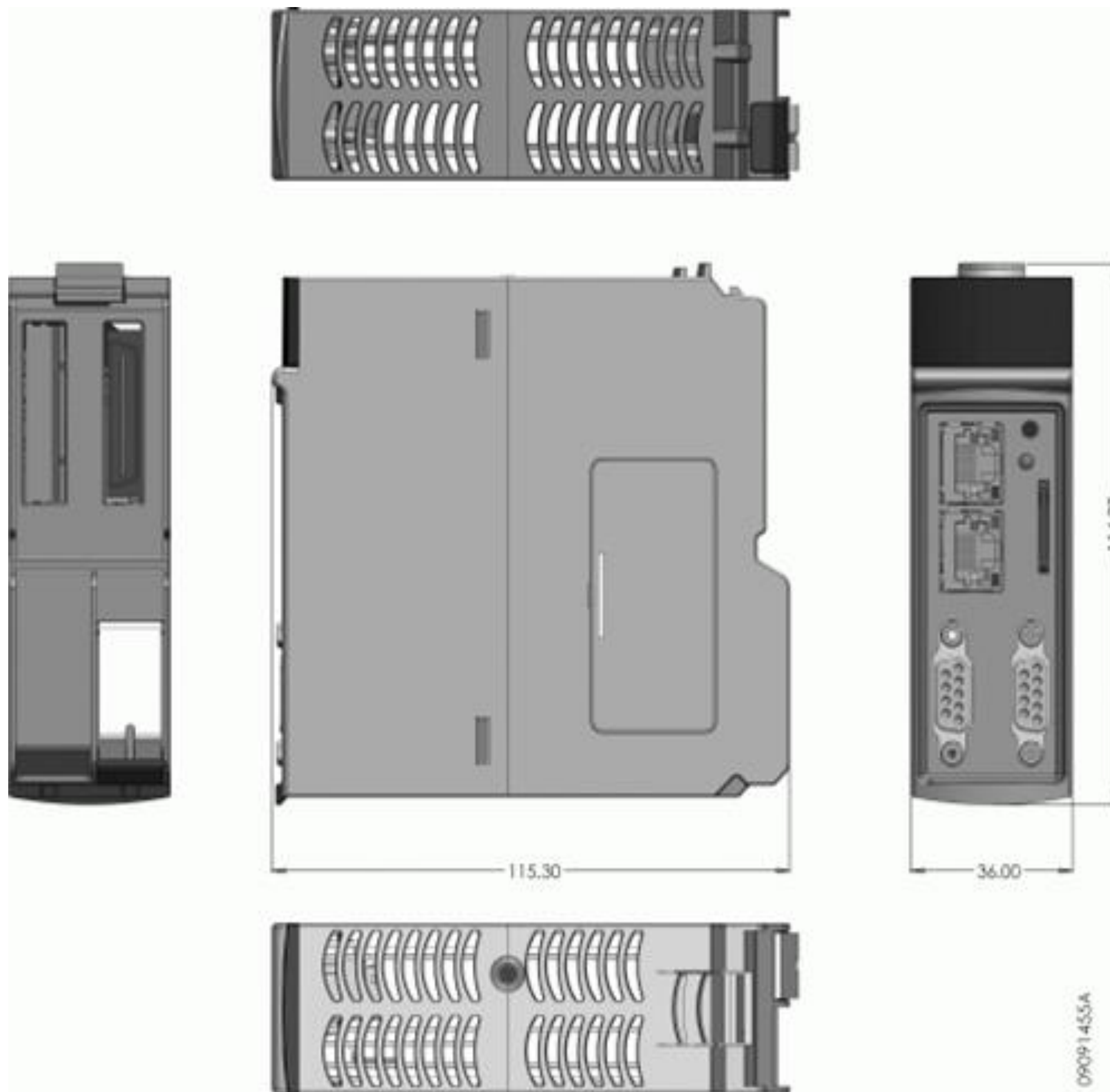


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INNOVATIVE FEATURES

# NEXTO SERIES

**DIMENSIONS – 36 MM MODULE**

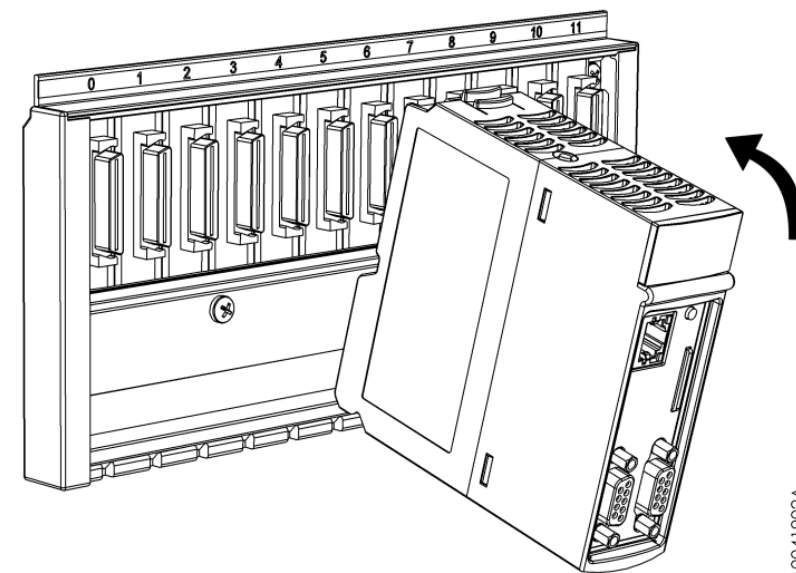
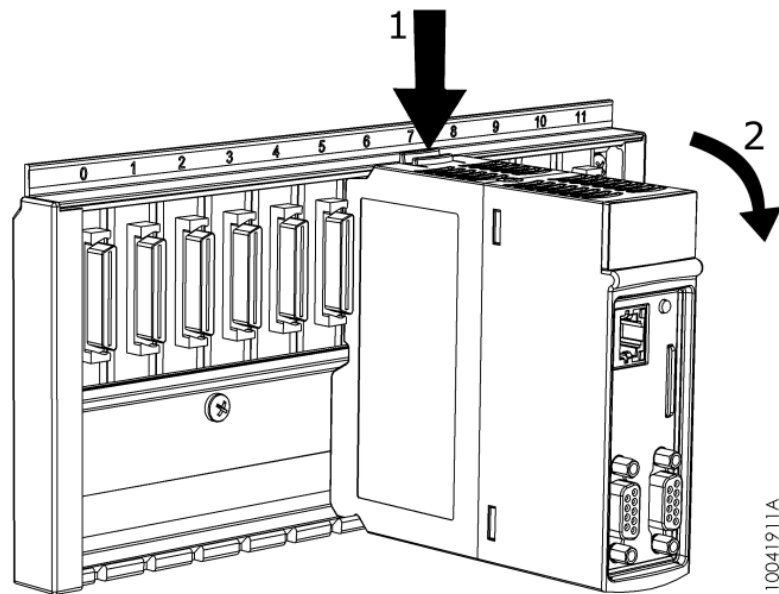


HOT-SWAPPING

## NEXTO SERIES

### FULL HOT-SWAP SUPPORT

- Easy insertion and extraction system without stopping the application (no need for screws or tools)



**NEXTO SERIES**



**NEXTO SERIES**

Backplane Rack

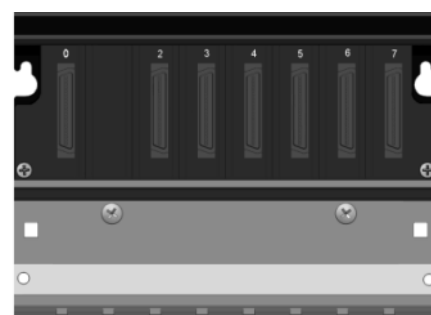
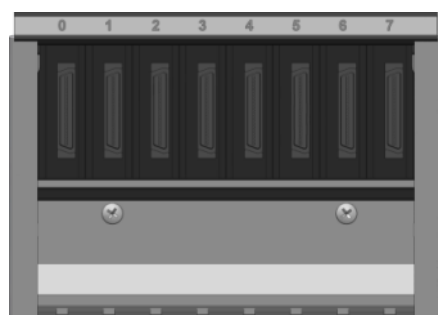


**NEXTO SERIES**



**NX9020 - 2-slot backplane rack (for stand-alone CPUs)**

\*applications with NX3003, NX3004 and NX3005 CPUs



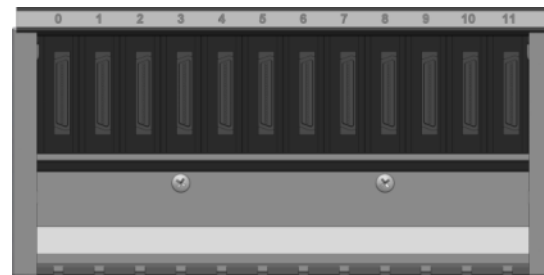
**8-slot backplane racks:**

**NX9000** – with hot-swapping

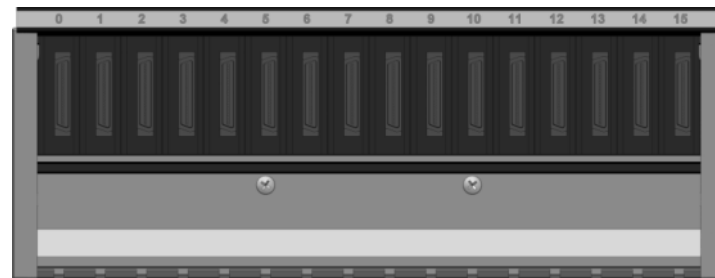
**NX9010** – without hot-swapping



**NEXTO SERIES**



**NX9001** – 12-slot hot-swap backplane rack



**NX9002** – 16-slot hot-swap backplane rack



**NX9003** – 24-slot hot swap backplane rack

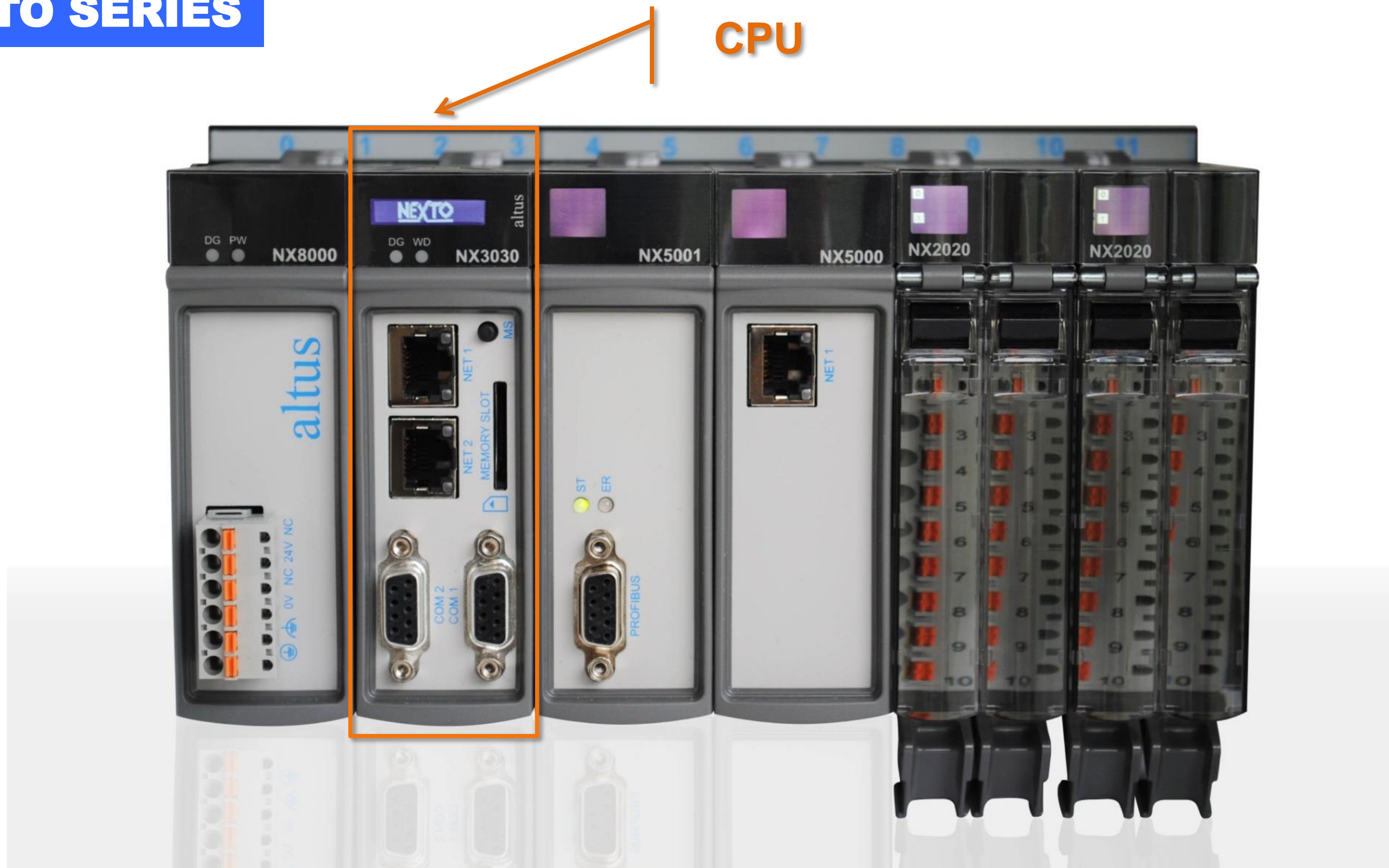
**NEXTO SERIES**

**Power Supply Module**



**NEXTO SERIES**

**CPU**



## NEXTO SERIES

### MAIN FEATURES – CPUs

- 333 MHz 32 bits PowerPC processor
- 2 serial interfaces (RS-232 e RS-485/RS-422)
- Up to 2 10/100 Mbps Ethernet interfaces
- Communication protocols:
  - MODBUS RTU (master/slave)
  - MODBUS TCP (client/server)
  - EtherCAT (master for NX3020 and NX3030)
  - EtherNet/IP (scanner/adapter)
  - IEC 60870-5-104 (server for NX3005, NX3020 and NX3030)
  - OPC UA and OPC DA (with encryption)
  - MQTT
- Embedded web server (HTTP) for diagnostics
- Customized embedded web pages (NX3005)



## NEXTO SERIES

### MAIN FEATURES – CPUs

- SNTP: real-time clock synchronization
- SOE: sequence of events of binary inputs with time stamping
- SNMP: Ethernet network management (MIB2)
- Redundancy (NX3030)
- Memory card – miniSD (NX3010, NX3020 and NX3030)



NX3003 CPU

## NEXTO SERIES

### IDEAL FOR SMALL APPLICATIONS

- CPU with embedded power supply
- Support to up to 10 I/O modules
- 14 digital inputs (4 high-speed inputs)
- 10 digital outputs (4 high-speed outputs)
- One Ethernet port
- One serial port (MODBUS RTU/User)
- Protocols and services: MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, EtherNet/IP, SNTP, SNMP, MQTT, OPC DA and OPC UA



NX3004 CPU

## NEXTO SERIES

### IDEAL FOR HIGH-PERFORMANCE MACHINERY CONTROL AND SMALL APPLICATIONS

- CPU with embedded power supply
- Support to up to 32 I/O modules
- One Ethernet port
- Allows one bus expansion rack (with NX4000)
- Allows PROFIBUS-DP fieldbus expansion (with NX5001)
- Protocols and services: MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, EtherNet/IP, SNTP, SNMP, MQTT, OPC DA and OPC UA



NX3005 CPU

## NEXTO SERIES

### SOLUTION FOR APPLICATIONS WITH EMBEDDED WEB SUPERVISION

- CPU with embedded power supply
- Support to up to 64 I/O modules
- One Ethernet port
- Allows four bus expansion racks (with NX4000)
- Allows PROFIBUS-DP fieldbus expansion (with NX5001)
- One serial port (MODBUS RTU / User)
- Development of web pages embedded in the CPU
- Protocols and services: IEC 60870-5-104 Server, EtherNet/IP, WebServer, MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, SNTP, SNMP, MQTT, OPC DA and OPC UA





NX3005 CPU

# NEXTO SERIES

- REMOTE ACCESS (WEB)
- SUPERVISION AND MONITORING
- TELEMETRY

HTTP (Web Server)



NX3010 CPU

## NEXTO SERIES

### SOLUTION FOR HIGH-SPEED MACHINERY AND MID-SIZED APPLICATIONS

- CPU without integrated power supply
- One Ethernet port
- Two Serial ports
- MiniSD memory card slot
- Support to up to 128 I/O modules
- Allows bus expansion racks (with NX4000)
- Protocols and services: EtherNet/IP, MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, SNTP, SNMP, MQTT, OPC DA and OPC DA



## NEXTO SERIES

### IDEAL FOR MEDIUM-TO-LARGE APPLICATIONS WITH DISTRIBUTED I/O POINTS

- CPU without integrated power supply
- Two Ethernet ports
- Two Serial ports (MODBUS RTU / User)
- MiniSD memory card slot
- Support to up to 128 I/O modules
- Expansion of up to 25 expansion racks (each one with capacity for up to 20 I/O modules)
- Architecture based on multiple racks with optional redundancy
- Protocols and services: IEC 60870-5-104 Server, EtherNet/IP, EtherCAT Master, MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, SNTP, SNMP, MQTT, OPC DA and OPC UA



## NEXTO SERIES

### SOLUTION FOR CRITICAL AND HIGH AVAILABILITY APPLICATIONS

- CPU without integrated power supply
- Two Ethernet ports
- Two Serial ports
- MiniSD memory card slot
- Support to up to 128 I/O modules
- Expansion of up to 25 expansion racks (each one with capacity for up to 20 I/O modules)
- Architecture based on multiple racks with optional redundancy
- Protocols and services: IEC 60870-5-104 Server, EtherNet/IP, EtherCAT Master, MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, SNTP, SNMP, MQTT, OPC DA and OPC UA



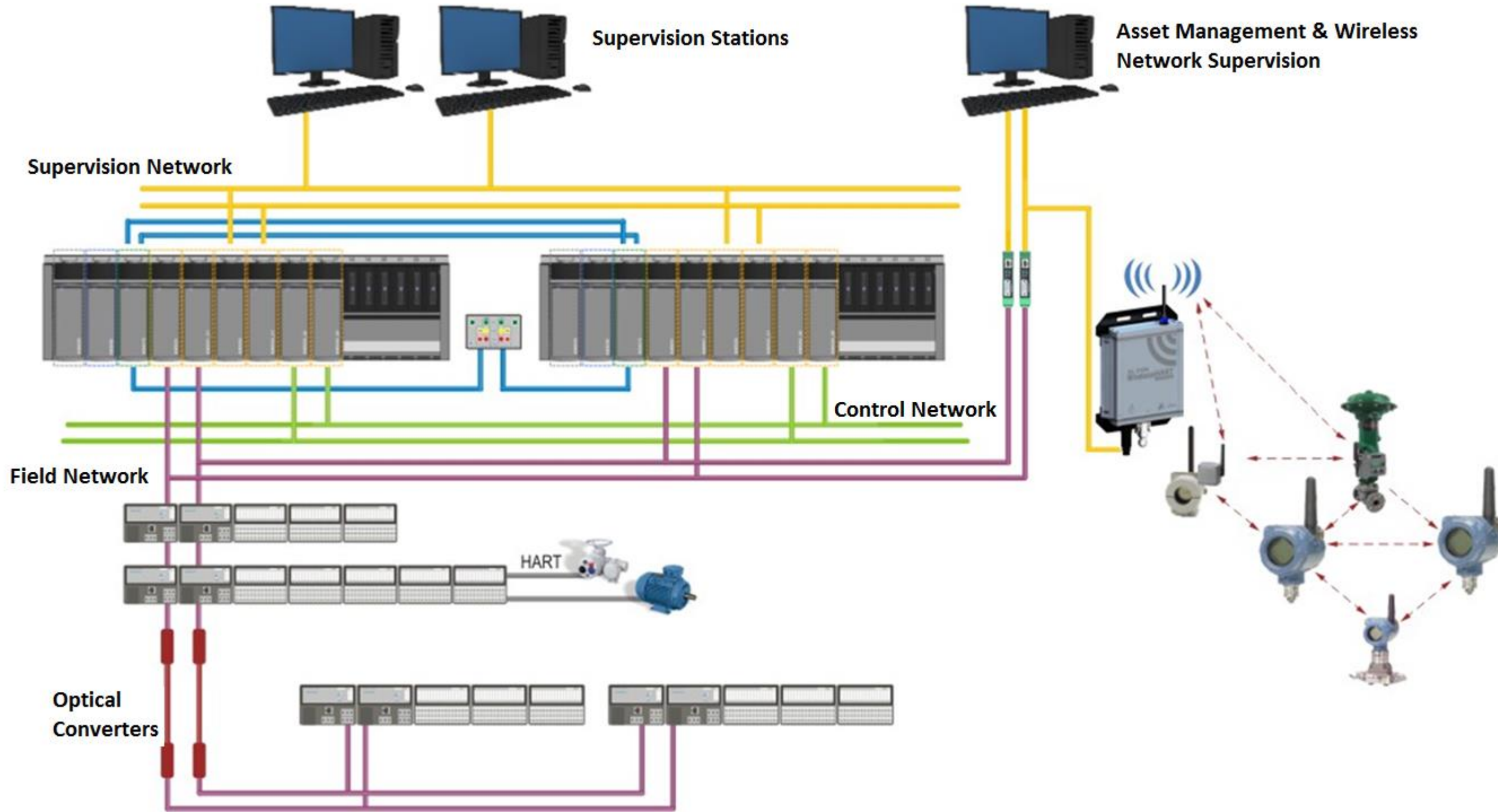
## NEXTO SERIES

### SOLUTION FOR CRITICAL AND HIGH AVAILABILITY APPLICATIONS

- Redundant CPUs are located in different racks (half clusters)
- In case of failure on the active CPU, the standby CPU switches over automatically (with an up-to-date data context)
- Easy to set up – no special programming is needed
- Automatic program synchronization and transfer between half-clusters
- Support to online changes and I/O expansion without stopping the process
- Critical processes are not affected by simple failure events
- Designed to deliver:
  - Increased productivity
  - Minimized process down times
  - Low maintenance and repair times (MTTR)



**NEXTO SERIES**



**NEXTO SERIES**

	<b>NX3003</b>	<b>NX3004</b>	<b>NX3005</b>	<b>NX3010</b>	<b>NX3020</b>	<b>NX3030</b>
Program Memory	3 MB	3 MB	6 MB	4 MB	6 MB	8 MB
Source-Code Memory	32 MB	32 MB	40 MB	40 MB	80 MB	120 MB
Master PROFIBUS-DP Fieldbus	-	1	1	1	4	4
Ethernet Interfaces	1	1	2	1	4	8
Redundancy (Fieldbus/Ethernet)	-	-	-	-	Yes	Yes
Sequence of Events (SOE)	-	-	-	-	Yes	Yes
Memory Card Support	-	-	-	Yes	Yes	Yes
Supported Rack Expansions	-	1	4	8	24	24
Maximum Number of I/O Modules	10	32	64	128	128	128
Embedded Digital Inputs	14	-	-	-	-	-
Embedded Digital Outputs	10	-	-	-	-	-

**NEXTO SERIES**

Communication Modules





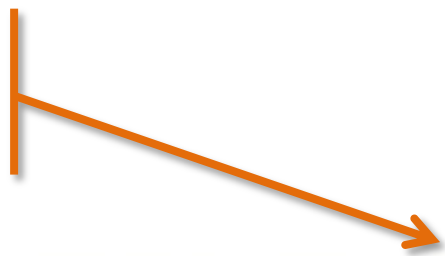
## NEXTO SERIES

- PROFIBUS DP Master (Redundancy)
- 10/100 Mbps Ethernet Interface (Redundancy)



**NEXTO SERIES**

**Digital & Analog I/O**



## NEXTO SERIES

### **NX1001**

- 16 Digital Inputs 24 Vdc Module
- opto-isolated Input (sink/source)

### **NX1005**

- Mix of 8 Digital Inputs and 8 Digital Outputs Transistor Module
- Mixed features of NX1001 and NX2001

### **SPECIAL FEATURES**

- **COUNTERS**
  - Input for signal of 20 kHz and 2 kHz
- **PERIOD MEASUREMENT**
  - Input for signal of 200 us to 1 second
- **PULSE CATCH**
  - Detection of pulses shorter than the application cycle



## NEXTO SERIES

### NX2001

- 16 Transistor Digital Output Module
- Grouped outputs in 2 isolated groups between them and logic

### NX2020

- 16 Relay Digital Outputs Module
- Grouped outputs in 2 groups

### LOAD SPECIFICATIONS

	NX2001	NX2020
Output type	Transistor isolated source type	Relay isolated dry contact
Maximum current per output	1 A @ 30 Vdc	2 A @ 30 Vdc 2 A @ 250 Vac



## NEXTO SERIES

### NX6000

- 8 Analog Inputs Voltage/Current Module 16-bit
- Isolated inputs from logic
- 24 Vdc internal protection
- Selectable scales by software (0 to 10 V, -10 V to +10 V, 0 to 20 mA, 4 to 20 mA and -20 to 20 mA)

### NX6100

- 4 Analog Voltage/Current Outputs Module 16-bit
- Isolated outputs from logic
- Selectable scales by software (0 to 10 V, -10 V to +10 V, 0 to 20 mA, 4 to 20 mA and -20 to 20 mA)



## NEXTO SERIES

### NX6010

- 8 Thermocouple Analog Inputs Module
- Isolated inputs from logic
- 24 Vdc internal protection
- Supported thermocouples: J, K, B, E, T, R, S and N
- Individual configuration per input
- 24 bits converter resolution and 16 bits data format in two's complement



## NEXTO SERIES

### NX6020

- 8 RTD Analog Inputs Module
- Isolated inputs from logic
- Supported RTD sensors types: Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000 and Cu10
- Supported resistance ranges: 0  $\Omega$  to 400  $\Omega$  and 0  $\Omega$  to 4000  $\Omega$
- Individual configuration per input
- 24 bits converter resolution and 16 bits data format in two's complement



## NEXTO SERIES

### **NX5100 – MODBUS TCP HEAD**

### **NX5101 – MODBUS TCP HEAD (NO HOT-SWAP)**

- Integrated power supply
- Support for up to 22 I/O modules
- Easy software configuration (through MasterTool IEC XE)





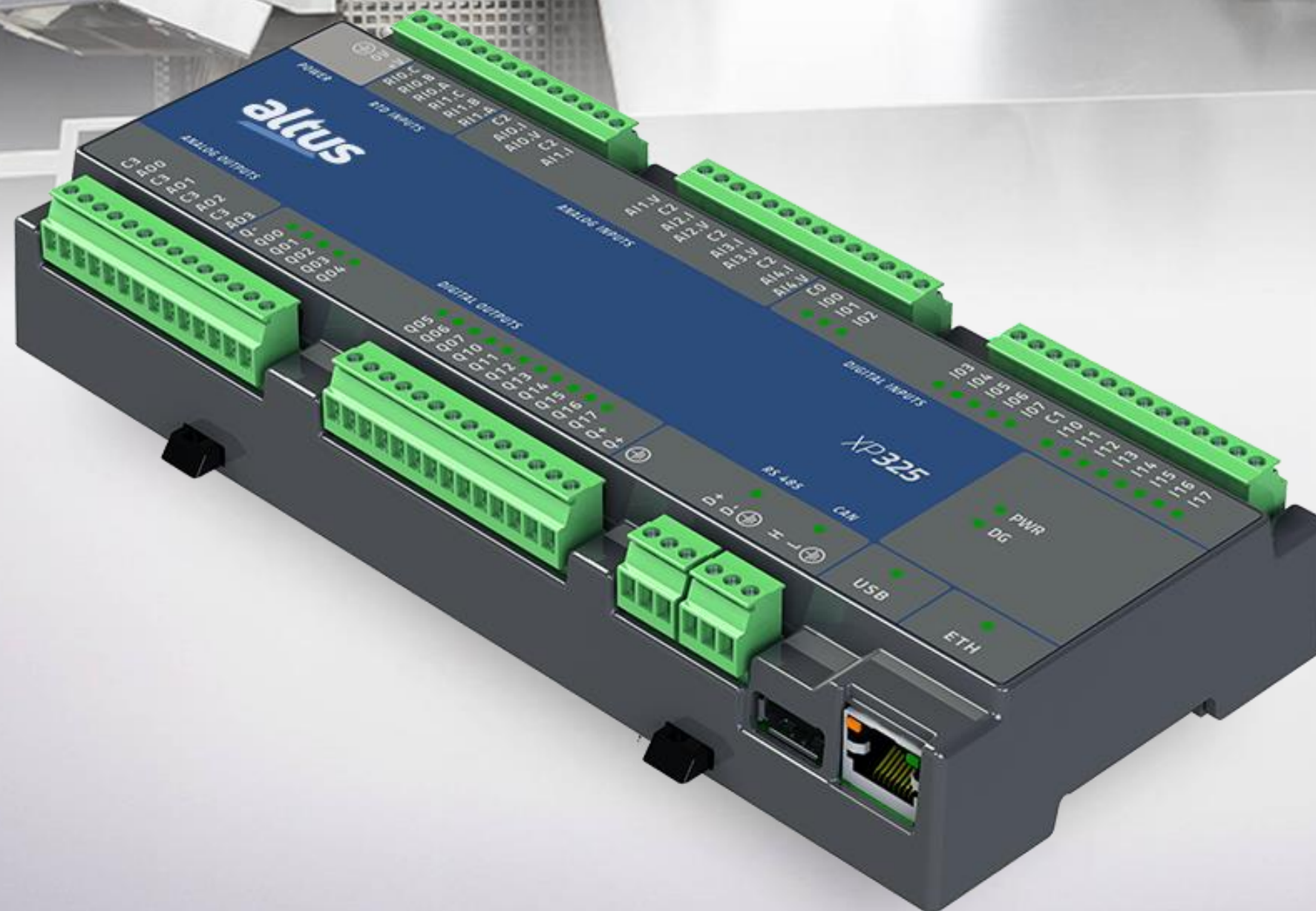
## NEXTO SERIES

### **NX5110 – PROFIBUS-DP HEAD**

### **NX5210 – PROFIBUS-DP REDUNDANT HEAD**

- Compatible with any PROFIBUS-DP master (EN 50170)
- Integrated power supply
- Up to 22 I/O modules support
- Auto-parameterization and configuration of I/O modules via PROFIBUS-DP master (class 1)





NEXTO XPRESS

## NEXTO SERIES

- Compact Programmable Controller with embedded I/Os, ideal for machines and small applications
- High density of I/Os (up to 43 points in only one product) and Real Time Clock (RTC)
- Ethernet interface, Serial port, CANopen and USB. Supports MODBUS RTU and TCP client/server, EtherNet/IP Scanner, MQTT, OPC DA and OPC UA protocols



NEXTO JET

## NEXTO SERIES

- High speed I/O modules
- Ideal for small and medium applications
- Cost effective for either machines or distributed systems



NEXTO SAFETY

## NEXTO SERIES

- Altus solution for Functional Safety
- Fail-safe CPU and I/O modules
- Products with ISO 13849-1 (Cat. 4 PLe.) and certified by IEC 61508 and IEC 62061 (up to SIL 3 level)
- Support to PROFISafe safety protocol

PROGRAMMING ENVIRONMENT

## MASTERTOOL IEC XE

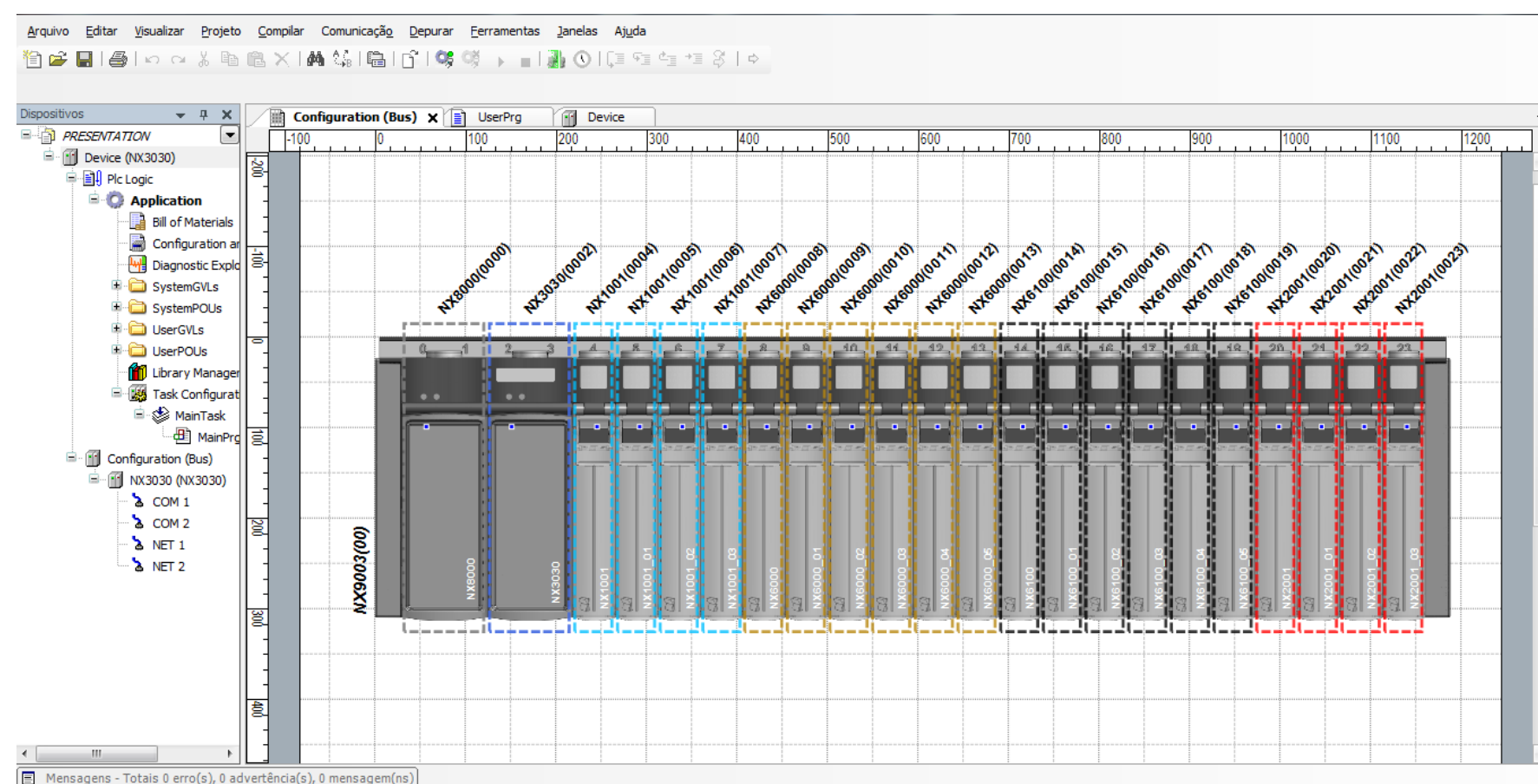


- An easy-to-use software for all your automation needs
- 6 programming languages
- Friendly user interface and easy to use
- Single control platform with modern programming environment
- Online programming
- Offline simulation

# MASTERTOOL IEC XE

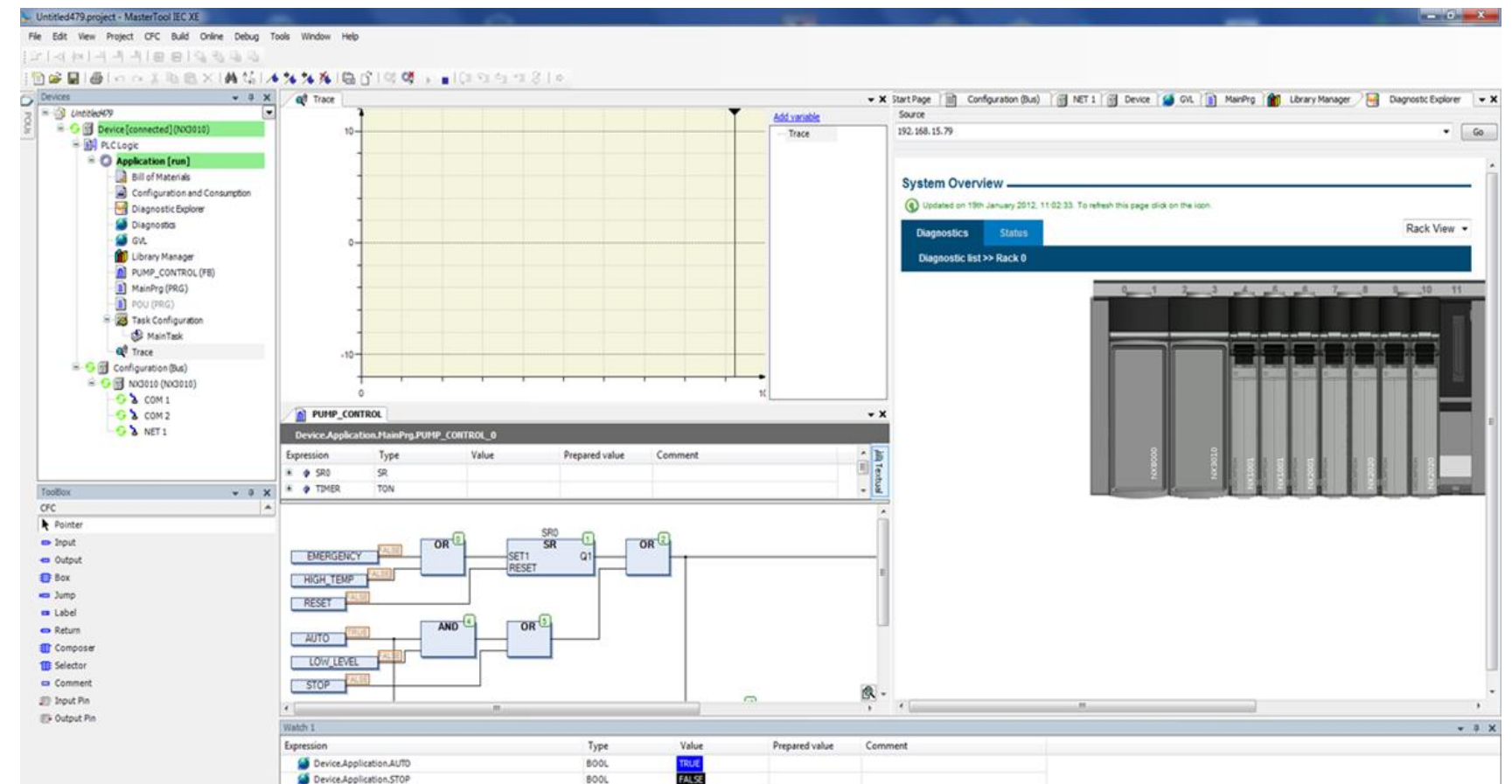
## ALLOWS A FAST AND COMPREHENSIVE WAY TO CONFIGURE THE SYSTEM

- Advanced edition resources integrating standard communication protocols and fieldbus networks in the same programming tool
- Graphical bus configuration
- Auto-complete features and integrated help files for easy programming



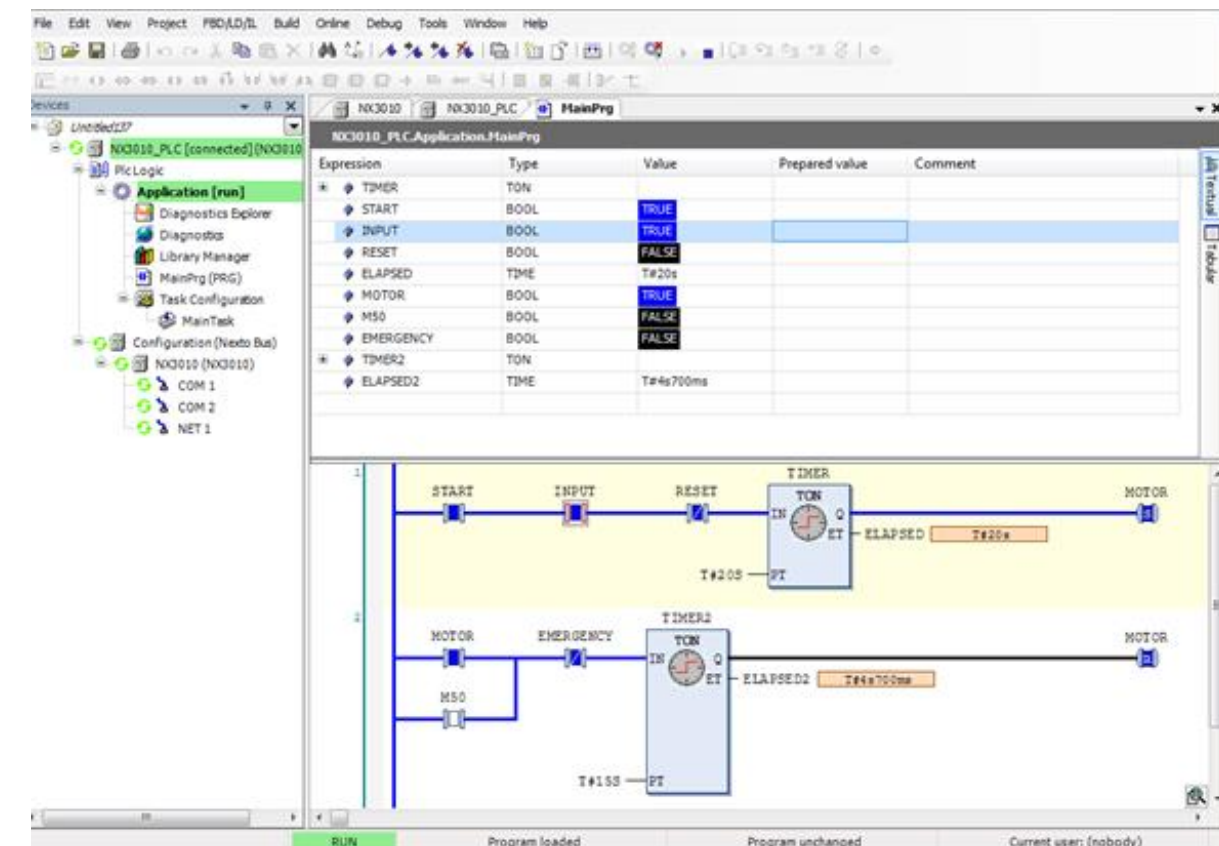
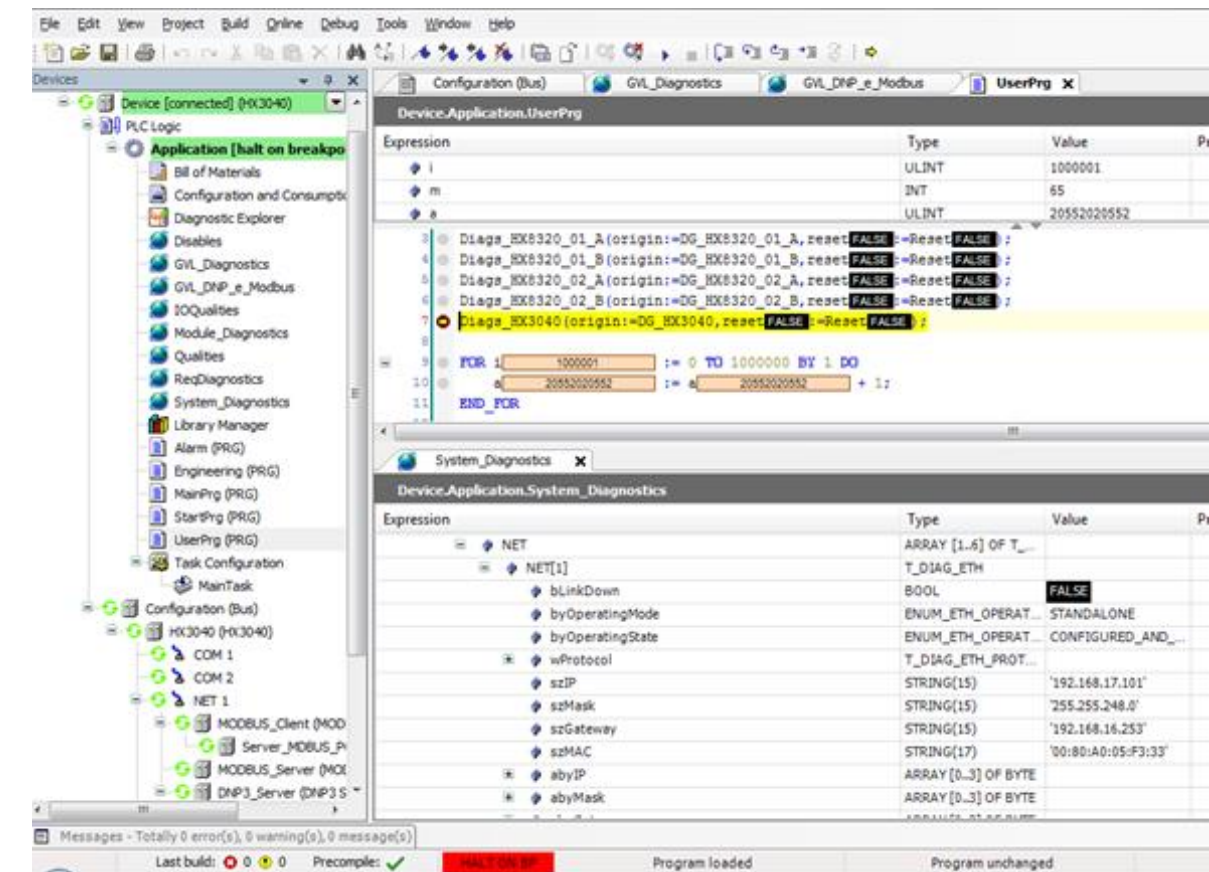
# MASTERTOOL IEC XE

- Object-oriented programming
- Simulation tool
- Print outs of user application documents
  - Bill of materials (BOM)
  - POU's
  - Configuration parameters, tags and description lists
- Docking view (friendly user interface allows to customize MasterTool IEC XE environment)



# MASTERTOOL IEC XE

- Offline application simulation
- Online application debbuging
- Monitoring
  - I/O variables
  - Symbolic variables
  - System diagnostics
  - Modules diagnostics
- Use of breakpoint and step by step execution
- Communication with SCADA and HMI simulation using OPC DA

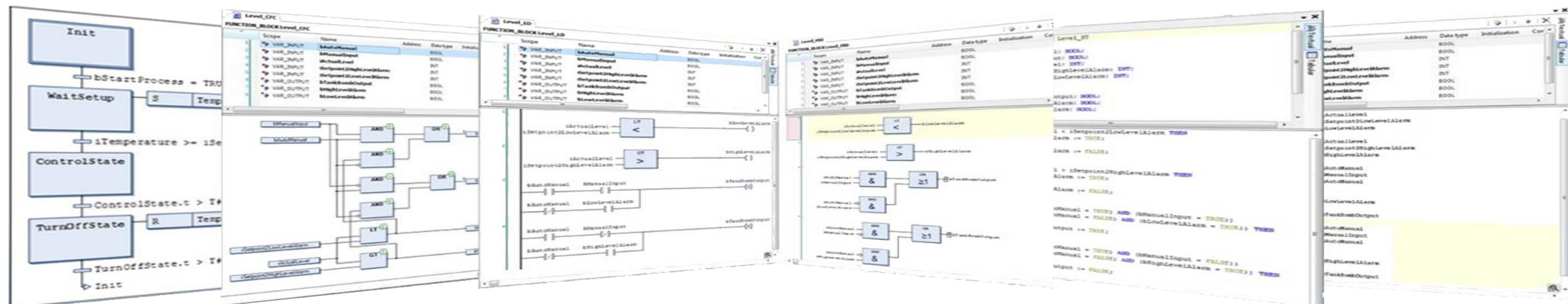




# MASTERTOOL IEC XE

## IEC 61131-3 – PROGRAMMING LANGUAGES

- Structured Text (ST)
- Sequential Function Chart (SFC)
- Function Block Diagram (FBD)
- Ladder Diagram (LD)
- Instruction List (IL)
- Continuous Function Chart (CFC)
- Support for different languages on the same application



**MASTERTOOL IEC XE**

Features	Lite	Basic	Pro	Adv
Free Version	YES	NO	NO	NO
CPU's	XPRESS NX3003 NX3004 NX3005 NX3010	XPRESS NX3003 NX3004 NX3005 NX3010 NX3020	ALL	ALL
Bus Expansion Support	NO	YES	YES	YES
Redundancy of Bus Expansion	NO	NO	YES	YES
Additional Ethernet Modules	NO	YES	YES	YES
Redundancy of Aditonal Ethernet Modules	NO	NO	YES	YES

**MASTERTOOL IEC XE**

Features	Lite	Basic	Pro	Adv
PROFIBUS-DP Fieldbus Interfaces	NO	NX3004 NX3005 NX3010 NX3020	NX3004 NX3005 NX3010 NX3020 NX3030	NX3004 NX3005 NX3010 NX3020 NX3030
Redundancy of PROFIBUS-DP Fieldbus Interfaces	NO	NO	NX3020 NX3030	NX3020 NX3030
Half-Clusters Redundancy	NO	NO	NO	YES
Maximum Number of I/O Points	320	2048	UNLIMITED	UNLIMITED

## NEXTO SERIES

### TECHNICAL FEATURES

- Every Nexto module has a set of documents available in Portuguese, English and Spanish

### USER MANUALS

- Large technical documentation available in Portuguese and English
- More than 1,000 pages, covering:
  - Nexto Series User Manual
  - MasterTool IEC XE User Manual
  - IEC 61131-3 Programming Manual
  - Nexto CPUs User Manual
  - PROFIBUS-DP Master User Manual

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