

NEXTO SERIES: SALES GUIDE

PROGRAMMABLE CONTROLLERS

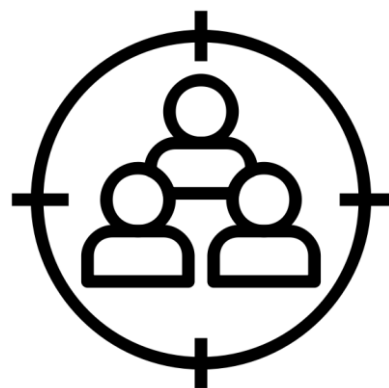


altus

A close-up photograph of two people in business attire shaking hands. The person on the left is wearing a blue suit jacket, and the person on the right is wearing a dark brown suit jacket. The background is blurred, showing an office setting with a wooden desk and a laptop. A blue rectangular box with white text is overlaid on the center of the image.

KEY SELLING POINTS

WHY ALTUS?



Customer Focus

Differentiated service



Reliable

We master the technology



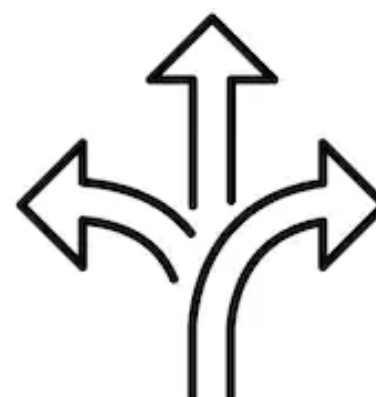
Global

Installed bases in Latin America,
Europe, Asia and Africa



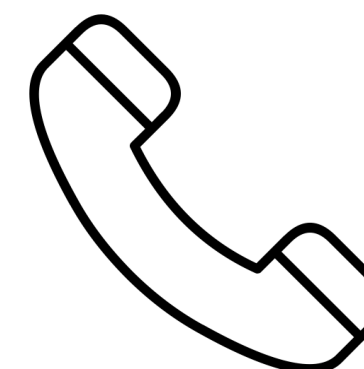
Brazilian

Local content superior to 90%



Flexible

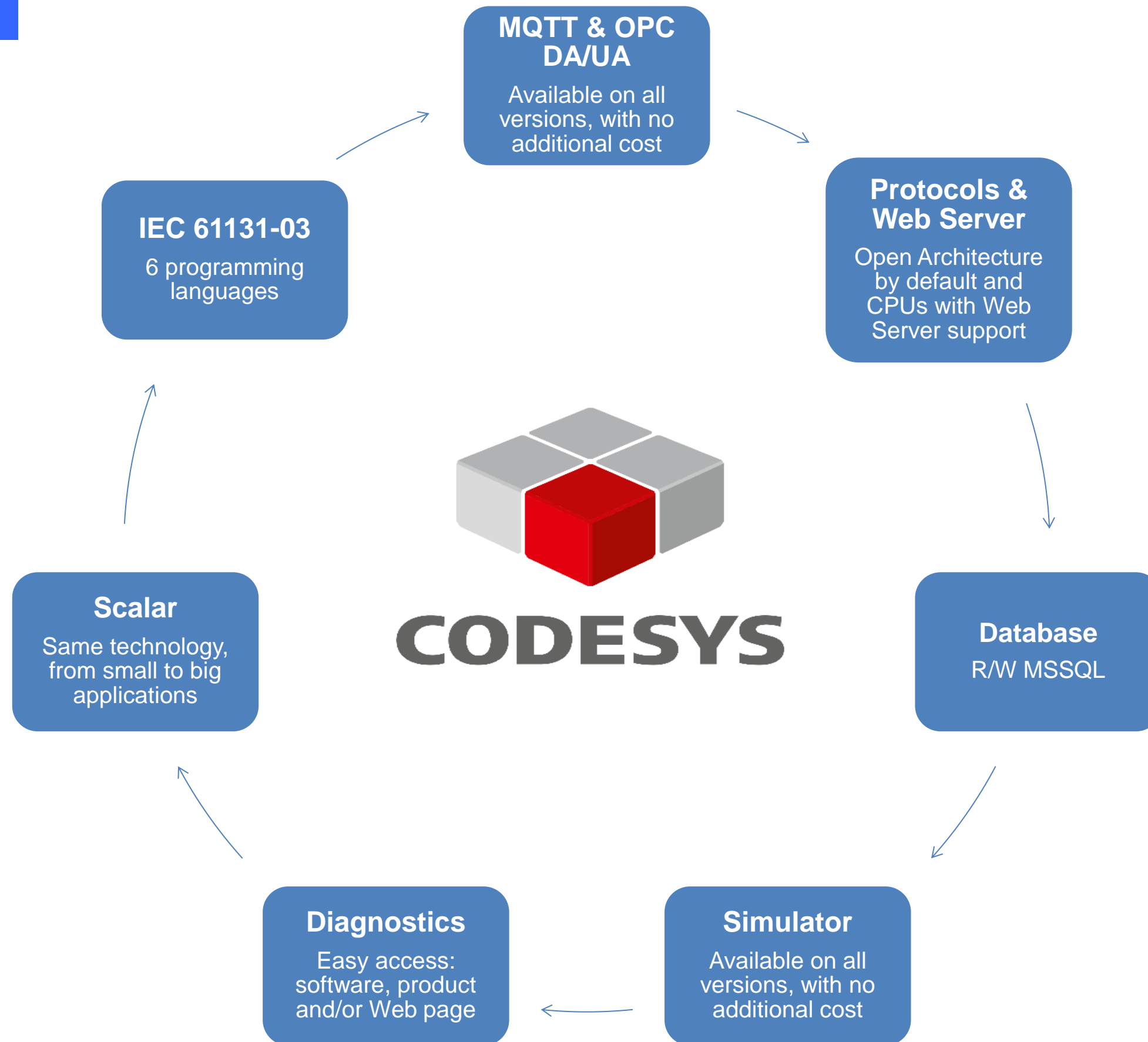
Applications in various segments



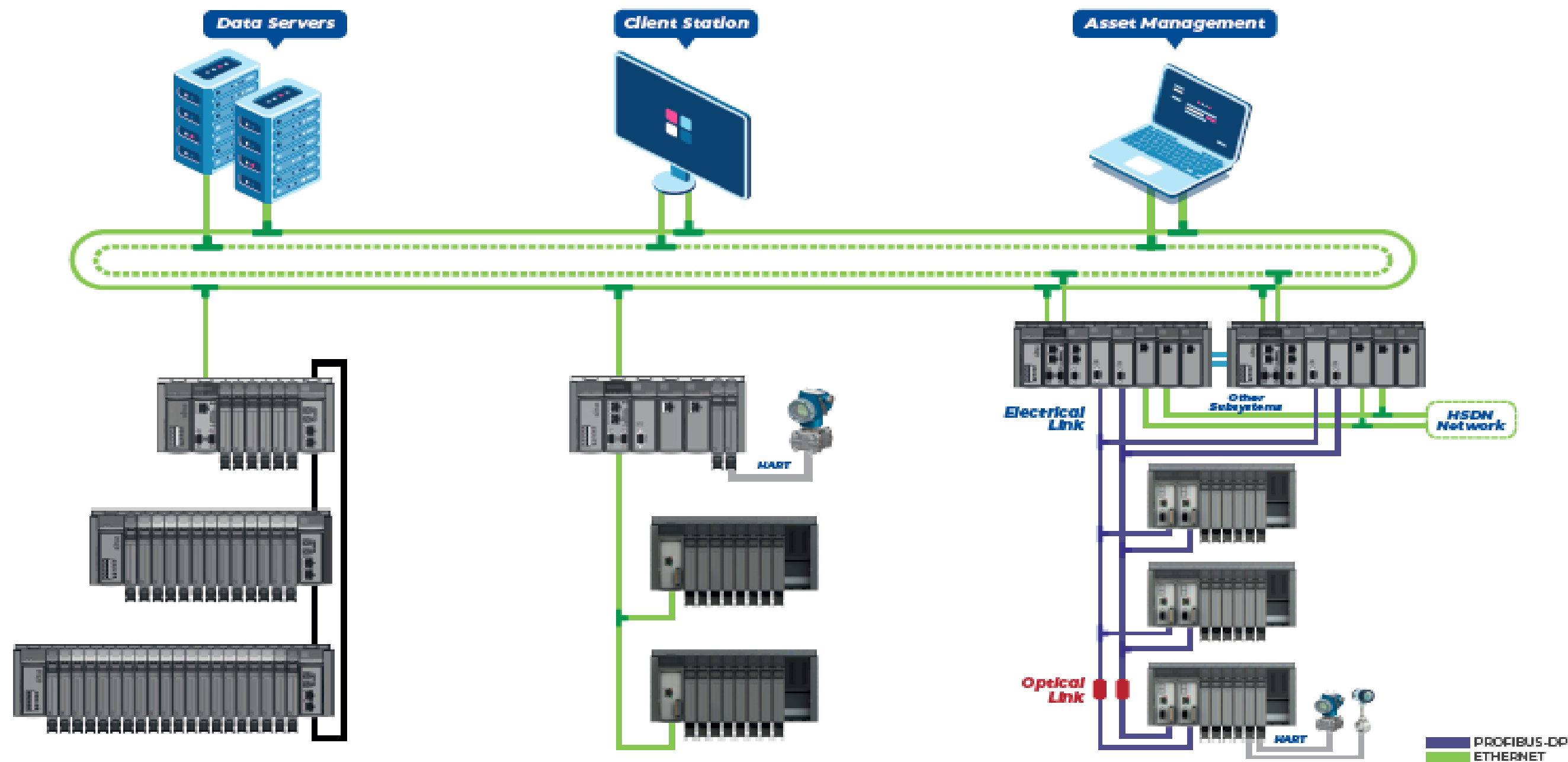
Accessible

Free tech support
Mon. to Fri. from 8AM to 10PM
Sat. from 8AM to 5PM

WHY NEXTO?



ARCHITECTURES



Bus expansion rack

High performance and advanced features for large I/O point systems.

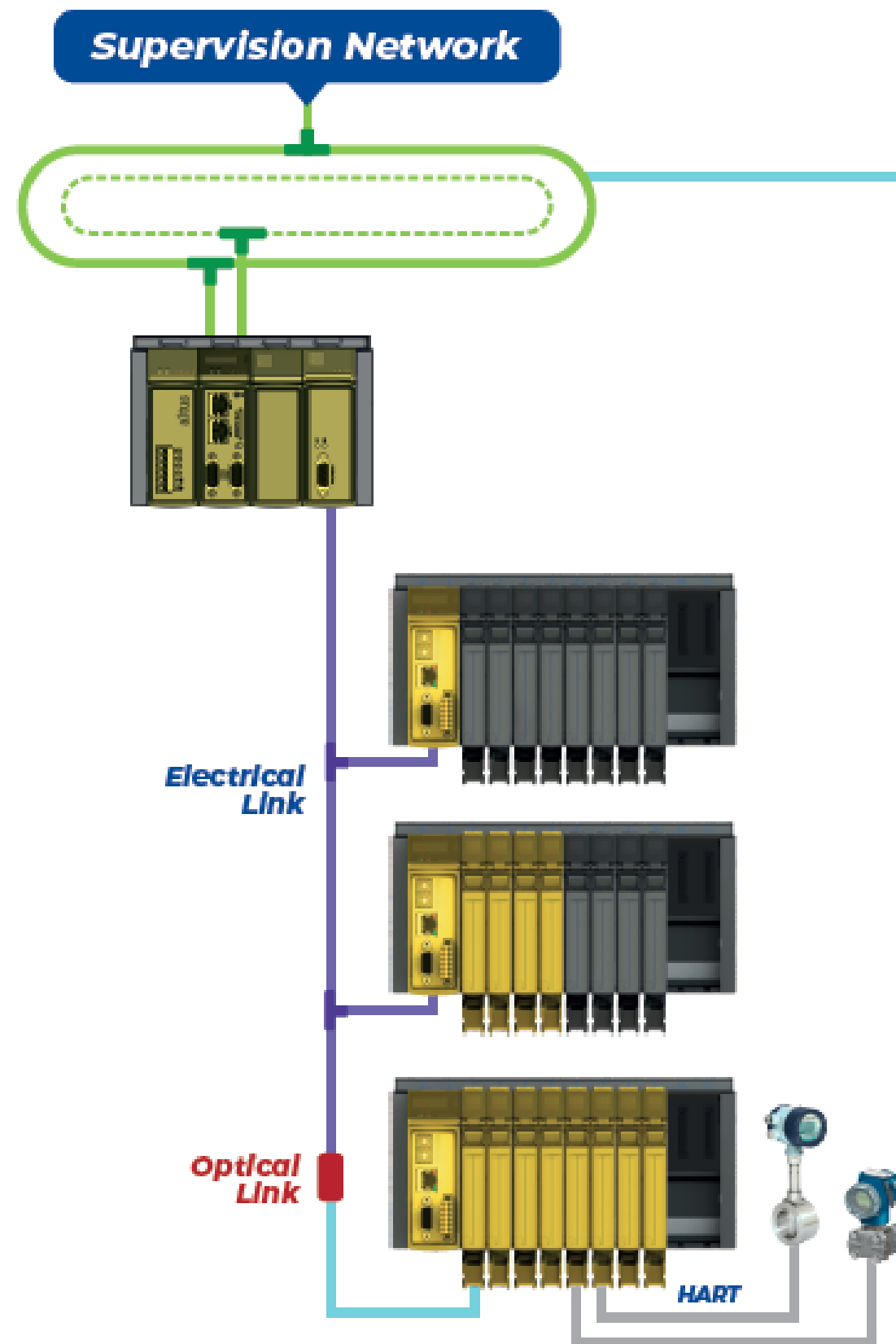
Distributed systems

More reach to your control network, ideal for building automation, refrigeration and sanitation

Total availability

CPU redundancy and hot swap modules, perfect for non-stop applications

FUNCTIONAL SAFETY

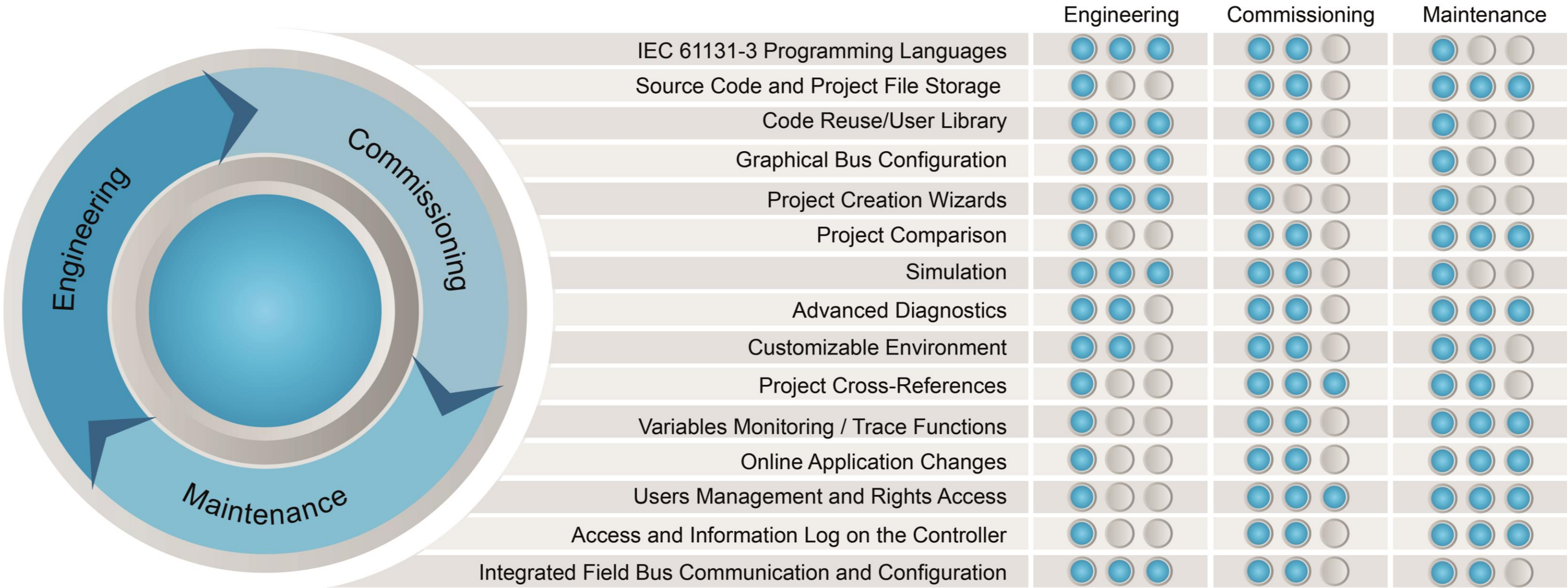


Security architecture

Automation system for functional safety with PLC Safety and PROFSafe control.

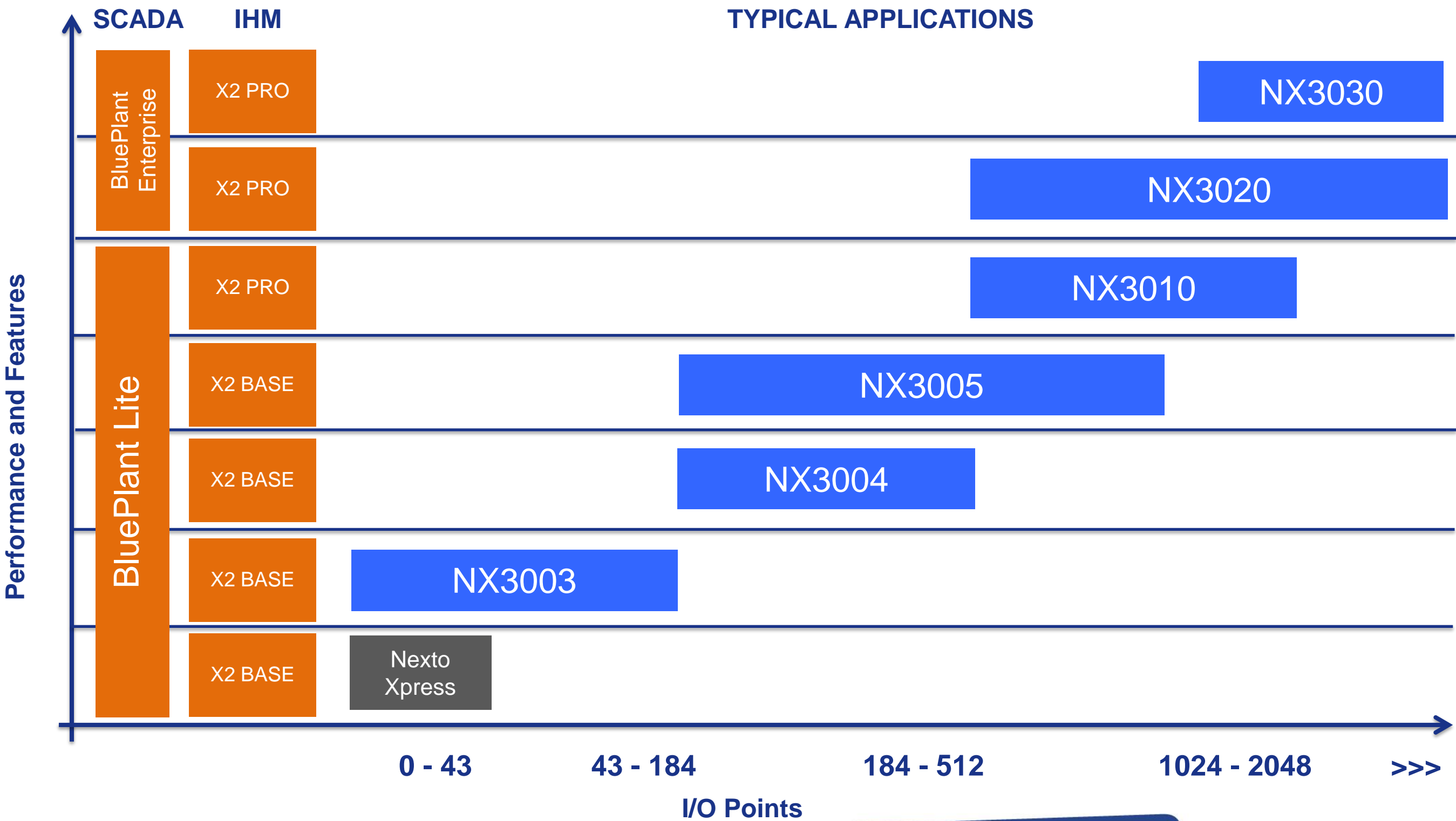
Note: the current solution uses PROFIBUS. The upgrade project to PROFINET is ongoing

BENEFITS TO THE CUSTOMER



- Import and export structures to spreadsheets, such as Microsoft Excel®
- Direct read and write on MSSQL databases
- Programming with several symbolic variables, library creation and reuse of code for MHRS reduction

NEXTO SERIES



PROMOTIONAL MATERIAL

Marketing

- Presentation, Catalog (Portuguese and English) - access www.altus.com.br/nexto
- Success cases in several segments (Portuguese and English)

Technical Characteristics

- All modules have their own documentation with technical characteristics (Portuguese, English and Spanish)

User Manuals

- Vast technical literature (Portuguese and English)
- Knowledge base
- Over 1,000 pages, covering:
 - Nexto Series' User Manual
 - MasterTool IEC XE's User Manual
 - IEC 61131-3 Programming Manual
 - Nexto CPUs' User Manual
 - PROFIBUS-DP Master Module's User Manual

A close-up photograph of a dartboard with a red dart hitting the bullseye. The dartboard has concentric rings with numbers 3 through 9 visible. A blue rectangular box with the text "SUCCESS CASES" is overlaid on the center of the image.

SUCCESS CASES

NEXTO SERIES

Vale

- Ore processing plant in Corumbá/MS
- PROFIBUS-DP field communication
- Supervisory communication using MODBUS TCP
- Nexto NX3030 with redundancy
- 500 I/O points
- Application: from the extraction of raw ore to loading the trucks with processed ore



Nexto Series

Mining

Challenge

Since Iron Age, period of the history where this metal started to be used to replace brass on appliances, tools and weapons, iron ore has been one of the most popular elements used on products manufacturing of all industry segments. According to U.S. Geological Survey and UNCTAD (United Nations Conference on Trade and Development), Brazil is the second biggest iron producer – with a 28 billion ton reserve, the fifth biggest in the world, equivalent to 8.3% of total reserves.

To ensure production stability and keep its brand competitive in the domestic market, one of the biggest mining companies of the planet found in Altus, the solution to modernize their iron ore processing plant automation in Corumbá, municipality located 425 km away from Campo Grande, Mato Grosso do Sul State.

Solution

The ideal solution for the mining company automation site modernization was based on Altus main line of products: Nexto Series Programmable Controllers. The project for this worldwide well known company was developed with Altus participation, notorious for its projects and applications quality, together with an integration company located in the vicinity of the mining site. By holding a continuous production process, which does not allow hypothetical stops due to failures on the automation system, a redundant system was applied to make sure that, in case something unpredictable happens with any equipment, the plant would still run normally. Thus, by featuring redundancy and hot swapping capabilities, essential for applications with continuous processing demands, Nexto Series played an important role to keep the high production demand rhythm of the mining company. The expansion capability of the I/O modules without stopping the system, with automatic addressing of modules on the backplane, completed the essential features of the Series.

Result

The solution, responsible for controlling since the raw ore extraction in the mines to the load of the trucks with the processed iron, used the NX3030 Nexto Series CPU. Redundant, it was responsible for controlling 500 I/O points with PROFIBUS-DP field bus communication protocol. Besides, communication with the supervisory software was architected using MODBUS TCP protocol.



NEXTO SERIES

Bunge

- Brasilia unit
- Integrator: CV Soluções, Valberto
- MODBUS TCP Communication
- SoftStarter
- Application: wheat milling, system by gravity, blowers, fine feeder, sieves/vibrators, wheat separator, sieve for refining and final bran
- 320 I/O points
- 900 points with supervisory system

RASIP®



BUNGE



Nexto Series Food Industry

Challenge

Grain production, that serves the production of food and other purposes as raw material, is one of the main Brazilian economic activities.

As it is one of the biggest industries of the country, having a lot of influence on the results of the annual Brazilian trade balance, many companies invest to maintain continuous production and improved quality. For that to be achieved, one of the largest players of the market looked for Altus to automate systems like milling, vibration, refinement and wheat bran. This kind of application provides outputs for the food industry and commercial establishments.

Solution

As an automation system able to control complex industrial processes in a distributed and redundant way, Nexto Series was chosen for this application. With a high-speed processor and low power consumption, the Series dispenses moving parts, contributing to a high mean time between failures (MTBF). Furthermore, features like the high density of points per module and hot swapping, complete project data storage in the controller and capacity to allow changes in the programming logic without stopping the process, played a key role for the success of this application.

Other two important differences of Nexto Series programmable controllers are its compact design, which allows easy adaptation to small spaces, and its easy handling during commissioning and maintenance in the field. The MasterTool IEC XE programming software offers six graphical and textual programming languages which are compatible with IEC 61131-3 standards with the possibility of code creation that can be reused by means of stored libraries in the system. These features contribute to reduce engineering time in the application development and maintenance.

Results

The ideal solution for smaller applications is based on the N03010 CPU, which has been chosen for this challenge. The project's role is to monitor the performance and trigger the conveyors, vibrators and fan engines used in the wheat preparation. Altus used 320 points of digital I/Os, plus 900 communication points with SCADA software, all applied in a single backplane rack. That has been made possible through the use of a soft starter device responsible for the motors driving.



NEXTO SERIES

Sabesp – CCO Santos

- Baixada Santista – São Paulo's coast
- Integrator: Sabesp team
- MODBUS TCP communication
- QK Remotes, Ponto, FBs
- Application: communications concentrator, operator commands verification ("Sabesp Santos protocol over MODBUS")
- 1,500 remote I/Os
- 1,500 points with supervisory system
- 2,000 backup points – already exchanging information



Nexto Series Water and Wastewater Plants

Challenge

The city of Santos, in Brazil, is proud to be considered one of the cities with the highest sanitation levels in the country. It provides fresh water and collects sewage to and from all its inhabitants. This service is provided by a company responsible for the water treatment plants of 969 cities in the state of São Paulo. Its goals are to provide by 2019, 100% of treated water, 90% of collected sewage and 85% of treated sewage. To ease the management of this process, the COC (Control and Operations Center) which is located right in the central region of Santos, was created. At this site, there is a complete access to the production and water supply of the entire coast. It is possible to make strategic decisions and set operations on the entire logistics supply chain from the COC.

Solution

Altus Nexto Series Programmable Controllers, were used to maintain the levels of sanitation that Santos actually presents. With great technological potential, the Series is able to control large numbers of I/Os and communication data. It also controls applications such as sewage treatment and pumping in every location of the coast of São Paulo in a distributed way. Nexto Series adds features present in typical DCS and offers high multiprocessing capability, complying with IEC 61131-3. Among the six programming languages, there is the ST language (Structured Text), which allows interaction with Excel and uses it to ease the creation of tags, communication spreadsheets with remote devices and supervisory, apart from keeping up-to-date the project documentation, saving hours of development with the use of macros to create programs dynamically. The controllers meet the needs of communication with many types of devices and supervision software. The use of open protocols is essential to maintain compatibility and integration with different tools. The MODBUS TCP that works as both client and server in CPUs, is one of the examples that could be given.

Result

For this application, Altus used two NX3020 units, with approximately 200 connected CPUs, totaling over 6,000 points of communication. In this project, special filtering logic was developed, in order to control the commands sent between the CPUs connected to Nexto's CPUs and from the supervisory system that controls the process. Furthermore, the chosen CPUs disengage the supervision network from the corporate network by having two independent Ethernet interfaces, avoiding chances of damaging the acquisition data due to viruses that could affect the system in the supervision layer. Another difference in this project was the compact design of the product, which allowed quick adjustments on the previously installed panels at the COC without taking extra space.






NEXTO SERIES

Lanxess

- Porto Feliz – São Paulo's inland
- Integrator: Wectrus
- MODBUS TCP communication
- 40 frequency drives with PROFIBUS-DP I/Os
- Application: automation of the recirculation pumps in the reaction area
- 1000 Points with supervisory system

LANXESS
Energizing Chemistry



Nexto Series Chemical Industry

Challenge

The chemical process industry has a wide range of applications and segments. They range from the production of basic raw material for production lines, such as plastics used in engineering, to elements for advanced technology applications, such as chemicals for cars and resins for water treatment. In Brazil, one of the world leaders in this segment has units across four states in the country and makes regular investments to maintain its dominance over competitors. To differentiate their products with sustainable features, one of the actions of this company was to invest funds to improve water reuse in the activities of one of its units. Responsible for the production of inorganic pigments used in the automotive industry and in the purification of drinking water, the unit needed upgrades in its supervisory and automation system.

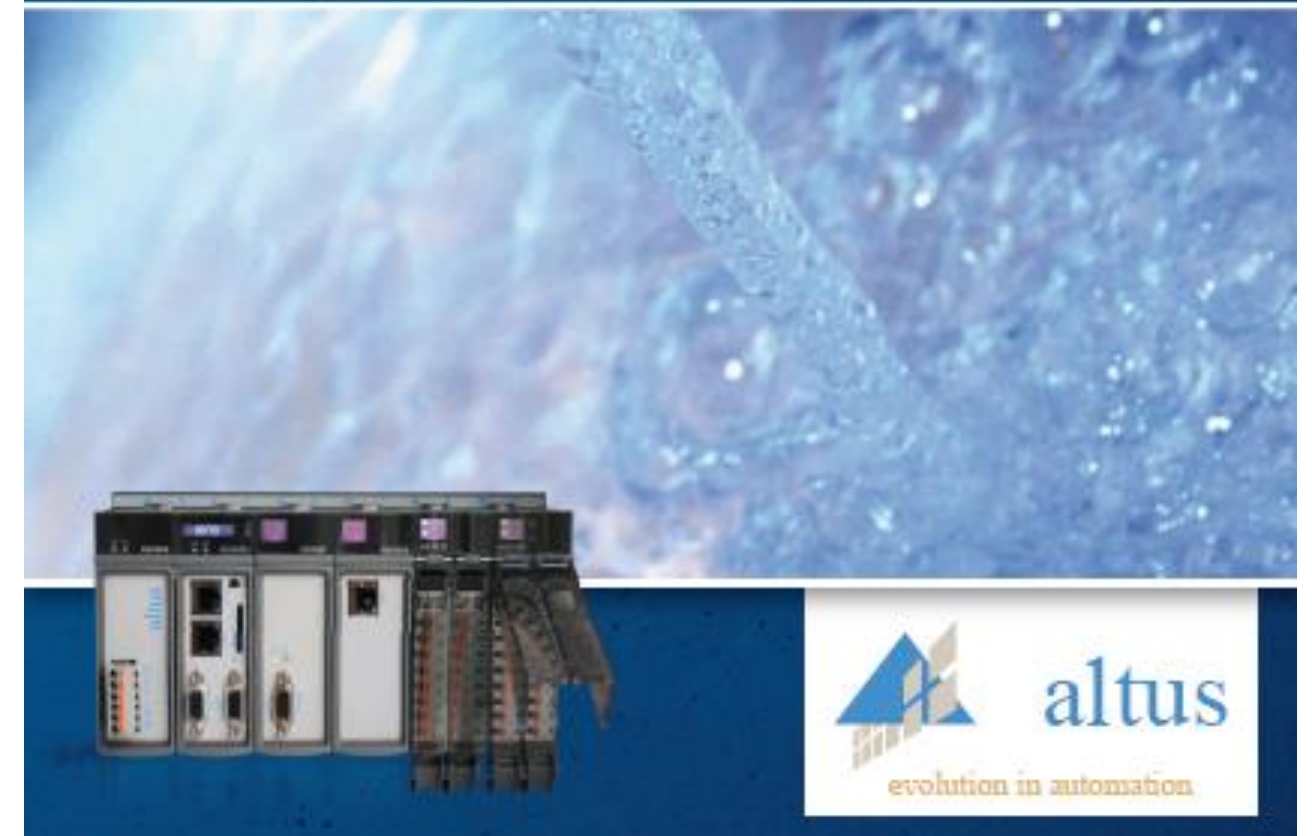
Solution

The solution demanded an automation system to control the water recirculation pumps of the plant. The Nexto Series programmable controllers have been indicated to this challenge. With a high-speed processor, the product dispenses moving parts, contributing to a higher average time between failures. Its multiprocessing capability adds features found typically in DCSs. The Nexto Series CPUs use graphical and textual programming languages compatible with IEC 61131-3 standard. Among them, there is the graphical FBD (Function Block Diagram) language, which allows segmentation into blocks to facilitate system maintenance and use of different languages within these blocks, allowing versatility in programming the tasks of the controller. The Series also enables the creation of user libraries that can be reused in different applications, which helps to reduce investments in the development of the current solution and in the future.

Result

For this project, a complete solution made with Altus products was developed. Beyond the use of N03030 CPUs for maintenance and supervision, dozens of frequency inverters were also included. The Nexto Series CPUs are responsible for managing more than 1,000 points of communication with the supervision software and also the control of more than 300 I/O points linked to the inverters. The high-speed data processing and communication of the controllers allowed a quick update of variables in real time in the supervisory

system, minimizing the reaction time for commands, providing greater plant safety to the operators. Another distinguishing highlight is the libraries that were created inside the MasterTool IEC-XE software, which allowed the reduction of hours of development. Being a common feature in these types of applications, communication via PROFIBUS-DP made it also possible to integrate with different manufacturers.



altus
evolution in automation

NEXTO SERIES

Petrobras

- Automation of the FPSO (Floating Production Storage and Offloading) platforms
- Nexto NX3030
- Redundancy of the controllers, Ethernet communication modules and PROFIBUS-DP field networks
- Over 9,200 I/O points, including digital and analog with support to asset management by HART protocol



Nexto Series Oil & Gas

Challenge

After the discovery of the pre-salt layer in the Brazilian coast, the extraction of oil has turned to be one of the obstacles to be overcome by Brazil to become the sixth largest supplier of this raw material. The platforms to be used in the process are the Floating Production Storage and Offloading type (FPSO's). These are ships responsible for the exploration, production and temporary storage of oil. The production's flow is done by tankers, avoiding the need for connection pipelines. All these individual features require sophisticated and secure automation controls, which integrate processes of oil production, gas and fire detection, emergency shutdown and others.

Solution

The needs of the customer required a reliable solution with high availability and advanced technology to this challenge. Therefore, Altus relied on the Nexto Series technological potential. Awarded for its design, the new generation of programmable controllers presents as one of its highlights, its high performance and its ability to control large amounts of point numbers and remote backplane racks. It is capable to control complex applications such as exploration and production of oil in a distributed and redundant way. Its advanced diagnosis capabilities, available in user applications, allow the acquisition of accurate information on the system. The Nexto Series CPU, has been designed for several types of applications. It has features that fully meet the requirements of this project. The CPU is redundant and it is located in different backplane racks. If one active unit fails, the standby one kicks in automatically, avoiding impacts in the process. Moreover, its parametrization is simple, with no need of special programming, making the user experience much easier.

Result

The NX3030 CPU, used in the project, has proved to be the ideal option for this challenge by being specialized in the use of large redundant applications with distributed I/O points. Redundancy is present at all levels, in controllers, Ethernet communication modules and in the PROFIBUS-DP fieldbus modules. Summing more than 9,200 points, analog and digital with asset management support via HART protocol, the system is divided into several redundant systems operating in critical applications of this enormous challenge. In programming, Altus used the IEC 61131-3, CFC (Continuous Function Chart) programming language, which allows the quick understanding of logic diagrams, previously designed in a CAD system, reducing the margin for error, rework and system debugging.



NEXTO SERIES

CESP

- São Paulo's inland
- Integrator: Altus FCAMP
- Exter Series' HMIs
- MODBUS TCP communication
- NX3010 communicating in PROFIBUS-DP with Ponto Series Remote with 32 AIs and output module
- Application: Control of grid clogging according to input pressure vs output pressure



Nexto Series Power

Challenge

In a country with immense and abundant rivers flowing over plains and depressions, it is natural that most of its energy source is based on hydroelectric power plants. In Brazil, they supply approximately 90% of the produced power within the national territory. However, this is an extremely high investment due to the infrastructure that is needed for these large sites, especially in the southeastern region of Brazil. Hosting a wide number of industries, the region is the one with the highest power consumption in the country. Having that said, one of the largest power generation companies of the country, highlighted for its enterprises in all national power production areas, invested in Altus products for the automation of one of the three biggest hydroelectric power plants of Brazil.

Solution

The use of internal and external pressure sensors was not possible on the water load loss monitoring system. With that information given, a reliable solution was necessary to reduce generation as soon as a loss was detected. When there is too much dirt and trash in the water intake system, the water pressure increases that can result in the grid overflow, which could damage the generating unit turbines and consequently cause a bigger accident that might stop power supply to big cities.

Nexto Series Programmable controllers have been used in this solution. By featuring IEC 61131-3 standard programming languages, it has been considered the ideal product for this application. Split between textual and graphical, the languages are made available by MasterTool IEC XE software. They can be used in the same project, giving the user the possibility of reusing the codes that were developed in other solutions. Besides, the application can be converted between the graphical languages and the user can reuse them in other versions of the software.

Result

Through the use of a NX3010 CPU, communicating with a Ponto Series remote in PROFIBUS-DP, it was possible to control the load losses on the grid. Using the high level Structured Text (ST), Nexto Series is capable of writing equations from measurements of the generator behavior, anticipating the grid obstruction and acting quickly on power reduction of the generating unit. This avoids larger damage on the turbine parts and contributes to the energetic availability of the plant.



NEXTO SERIES

SKF Group

- São Paulo's inland
- Integrator: Integrador Setup
- MODBUS TCP communication
- Nexto Series' Digital and Analog I/O
- Application: 6 temperature control loops in an auto parts oven
- PID loops
- Use of Thermocouple/Current converters



Nexto Series Metal Industry

Challenge

In São Paulo, Brazil, a company, supplier of forged and machined parts market, has seen the Altus Nexto Series as an important tool for the automation of their parts ovens. Producing machined rings for the manufacturing of various made in Brazil bearings, they required a compact programmable controller to maintain their production of 20 tons of steel per year.

Solution

Advanced automation system, the Nexto Series Programmable Controllers adds typical DCS functions through its multiprocessing capability and software. The Series has a high speed processor, hot-swap, high resolution analog modules and a single and integrated platform for programming, providing flexibility in the development and reducing the costs of engineering and commissioning.

Qualified for complex industrial automation tasks, it allows easy integration with the most traditional monitoring systems. Its high technology provides reliability and connectivity which contribute to achieve an increased productivity in this industry.

The MasterTool IEC XE programming software provides textual and graphical languages compatible with IEC 61131-3, making the understanding and development of applications easier for any professional, even without prior knowledge and training for the Nexto Series. Besides, it allows changes in the programming logic without interruptions in the application.

Its high performance results in lower power consumption and reduced heat generation. The Series easy program maintenance and web diagnostics displays save time and labor work.

Result

The N03010 CPU was chosen to be used in this project. Ideal for small processes, the application has 284 points of communication, with 80 inputs and 104 outputs (analog and digital), plus six PID loops available in MasterTool, which provided greater robustness and temperature control of the ovens. In this architecture, Altus used a complete bus of Nexto Series with digital and analog inputs and outputs. Moreover, the Nexto Series programmable controllers, differentiated by compact design, allows easy adaptation to small environments without taking much space. Another feature was its high resolution in the analog modules, which also contributed to the success of the application, adding more precision to the ovens control.



NEXTO SERIES

Scania

- Productive unit in Europe
- Application: automation of a long duration tests platform in the production line of heavy vehicules
- Nexto NX3010
- Communication of the main controller with the safety controllers and HMI via MODBUS TCP protocol
- Analog and Digital I/O modules in the Nexto Series rack

SCANIA

Nexto Series

Automotive

Challenge

One of the most significant vectors of the Industries in the world, the automotive market is an economy driver, which is noticed by its levels of production and sales. Some countries are highly dependent on this market as their transport network is basically composed by roads and the economy is centralized on this type of industrial activity. Within this context, a worldwide manufacturer specialized in the production of buses and trucks can be highlighted. Holding several factories around the world and acting with international coverage, the company needed an efficient automation system for its testing line in one of their production units in Europe.

Solution

For a long automation testing platform in the heavy vehicles production line, a control panel which counted on Nexto Series Programmable Controllers has been developed. Together with other high functional security controllers and also IX Series HMIs, Nexto was in charge of monitoring the testing station responsible for the wheel axis verification. The main feature that qualified Nexto Series for this challenge was its easy-to-use features and wizards to create new projects, especially because of the languages based on IEC 61131-3 standard and its MODBUS TCP communication channel: high performance, which ensured low updating time for all system data. The project creation wizard and the graphical programming and configuration environment allowed the responsible application integrator to learn quickly how to set the system. Hence, the application development could then be made in a short period of time.

Result

The NX3010 CPU has been chosen for this application, where MODBUS TCP protocol was responsible for the communication of the master controller with the security controllers and the IX Series TXA model HMI. The application also counted on analog and digital I/O modules attached to Nexto Series' backplane. The superior communication with the supervisory system and on field data acquisition were fundamental to the application's success. The programming languages availability, in accordance with IEC 61131-3 standard, turned MasterTool IEC XE learning curve and the application development into a quick and easy experience for the integrator, taking only a few hours to be done, reducing significantly expenses with the system's maintenance.



NEXTO SERIES

Itaú

- Application: Control of BMS (A/C and lighting) and EPMS (energy consumption) systems in data centers, making energy available for the servers efficiently
- 40 units of NX3020, 2 units of NX3030
- 10,000 communication points



Nexto Series Building Automation

Challenge

When one of the five largest banks in the world, with 4,000 branches located in Brazil, decided to build the two largest data centers in Latin America, they realized that the automation system definition was a major challenge. These data sites keep information related to customers and the bank itself, which are vital for any transaction or financial operation. Therefore, they need to be available and active all the time. In order to achieve these requirements, a controlled environment is necessary, where air conditioning and temperature control is perfect. A possible fault on these data centers could result in consequences and interruptions on the services provided by large corporations like this.

Altus was challenged to supply the automation for the servers and computers room. This application is responsible for the BMS (air conditioning and lighting) and EPMS (power consumption) system. The goal was to distribute as much power as possible to these servers with the lower consumption possible, ensuring optimal operating conditions to the installed equipment.

Solution

Nexto Series Programmable Controllers have been chosen for the execution of the project's tasks. Its CPU counts on a RISC 32 bits PowerPC type processor, that features high performance and low power consumption. It is capable of doing more than 145 thousand Boolean instructions or up to 300 RD bops per millisecond, not to mention complex arithmetic calculations and advanced control functions. Presenting features such as integrated communication ports on the CPU and redundancy support, the Series is also capable of running traditional networks and fieldbuses protocols, such as MODBUS RTU, MODBUS TCP and PROFIBUS-DP. In cases where there is the need to make equipments from different manufactures communicate, the user is free to create their own protocol. This flexibility is essential in applications of this segment.

In this application, with a higher number of remotes, control and supervision points, Nexto Series shows all its versatility as it concentrates, in the same family, a redundant with fast performance system for data communication in ETHERNET, with compact low power consumption remotes that can be distributed.

Result

To ensure power supply and good air system performance, two Nexto Series CPUs have been chosen. In total, 40 units are NX3020, two NX3030 and 10 thousand communication points. This architecture allowed higher data storage capacity and information exchange. Besides, data reading was vital to be done with high speed. This application's purpose was to make sure that no financial collapse would happen because of machines overheating.

A photograph of two men in business attire sitting at a table, looking at a tablet. The man on the left is holding the tablet, and the man on the right is pointing at the screen. They are in a modern office setting with large windows in the background showing a city street. A blue banner with white text is overlaid on the image.

COMPETITORS OVERVIEW



- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



VS



- **ROCKWELL (MICRO SERIES)**

Micro850 Micro870



FEATURES COMPARISON

Features	Micro850 24XXX	Micro850 48XXX	Micro870 24XXX	NX300X	NX30X0
Price Analysis	Similar to NX300X Inferior to NX30X0	Similar to NX300X Inferior to NX30X0	Similar to NX300X Inferior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	14 DI, 10 DO	28 DI, 20 DO	14 DI, 10 DO	0 – 14 DI, 0 – 10 DO	No
Embedded Analog I/Os	No	No	No	No	No
Fast Inputs	4	6	4	0 - 4	No
Fast Outputs	2	3	2	0 - 4	No
Memory	120kb (prog.)	120kb (prog.)	240kb (prog.) 128kb (data)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	?	?	?	Yes, no battery	Yes, no battery
Retentive Data	?	?	?	7,5kB	64kB – 112kB
USB	Yes	Yes	Yes	No	No
Data Logging	?	?	?	Yes	Yes
I/O Expansion	Yes (max. 132 points)	Yes (max. 192 points)	Yes (max. 304 points)	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	Micro850 24XXX	Micro850 48XXX	Micro870 24XXX	NX300X	NX30X0
Diagnostics Display	No	No	No	Yes	Yes
Integrated Power Supply	Yes	Yes	Yes	Yes	No
Ethernet	Yes	Yes	Yes	Yes	Yes
Web Server	?	?	?	Yes (NX3005)	No
Serial	RS-232 and RS-485	RS-232 and RS-485	RS-232 and RS-485	RS-485	RS-232 and RS-485
Memory Card Slot	?	?	?	No	Yes
Performance	300ns / instruction	300ns / instruction	300ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	?	?	?	Yes	Yes
Redundancy	?	?	?	No	Yes (NX3030)
Operating Temperature	-20°C to 65°C	-20°C to 65°C	-20°C to 65°C	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	Yes	Yes	No	No

FEATURES COMPARISON

Features	Connected Components Workbench		MT8500 – Mastertool IEC XE
Hardware	Micro850	Micro870	NX3XXX
Programming	LD, FBD and ST		ST, SFC, FBD, LD, IL, CFC
Simulation	?		Yes
License	Free for project visualization Paid for development		Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	Yes (via expansion)		No
Modbus TCP/RTU	Yes		Yes
ASCII	Yes		No
OPC DA/UA	?		Yes



FEATURES COMPARISON

Features	Connected Components Workbench		MT8500 – Mastertool IEC XE
Hardware	Micro850	Micro870	NX3XXX
Ethernet/IP	Yes		Yes
EtherCAT	No		Yes
CANopen	?		No
PROFIBUS	No		Yes
PROFINET	No		No (under development)
MQTT	?		Yes
Database	?		Yes



HIGHLIGHTS



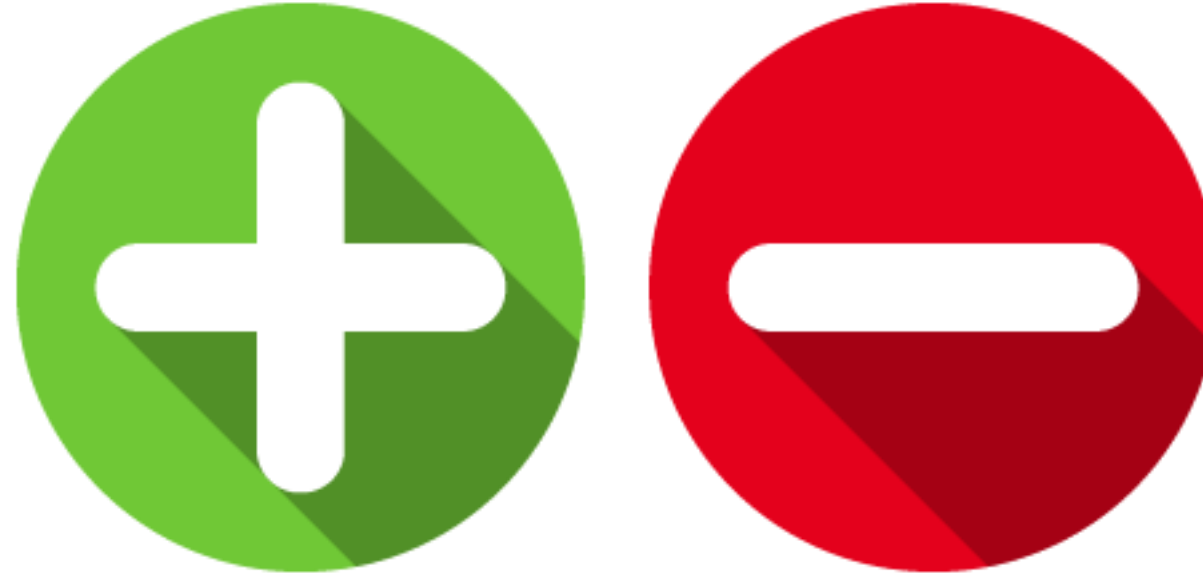
Advantages:

- Performance
 - 33x to 50x superior
- Software
 - More programming languages available
- Memory
 - 25 to 70x more memory
- Superior I/O expansion capacity, depending on the model
- Diagnostics Display
- EtherCAT
- PROFIBUS

Disadvantages:

- Less integrated I/Os, depending on the configuration
- Less fast I/Os, depending on the configuration
- USB Port
- Operating Temperature
- DIN Rail support
- DeviceNet
- ASCII
- Price
 - Micro850 and Micro870 inferior to NX30X0
- Integrated Power Supply
 - NX30X0 does not include

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Datalogging
- Web Server (NX3005 includes)
- Memory Card Slot (NX30X0 includes)
- Functional Safety
- Redundancy (NX3030 includes)
- Software Simulation
- Free Software License
- OPC DA/UA
- MQTT
- Database

*advantages not verified due to the lack of information available on the competitor's technical documentation



- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



VS



- **ROCKWELL (COMPACTLOGIX SERIES)**

5380 5480



FEATURES COMPARISON

Features	CompactLogix 5380	CompactLogix 5480	NX300X	NX30X0
Price Analysis	Superior to NX300X Superior to NX30X0	Superior to NX300X Superior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	No	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No	No
Fast Inputs	No	No	0-4	No
Fast Outputs	No	No	0-4	No
Memory	0,6MB - 10MB (user)	3MB – 20MB (user)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	?	?	Yes, no battery	Yes, no battery
Retentive Data	?	?	7,5kB	64kB – 112kB
USB	Yes	Yes	No	No
Data Logging	?	?	Yes	Yes
I/O Expansion	Yes (max. 8 to 31 modules)	Yes (max. 8 to 31 modules)	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	CompactLogix 5380	CompactLogix 5480	NX300X	NX30X0
Diagnostics Display	Yes	Yes	Yes	Yes
Integrated Power Supply	Yes	Yes	Yes	No
Ethernet	Yes	Yes	Yes	Yes
Web Server	?	?	Yes (NX3005)	No
Serial	No	No	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	Yes	No	Yes
Performance	?	?	6ns to 9ns / instruction	6ns / instruction
Functional Safety	Yes	Yes	Yes	Yes
Redundancy	?	?	No	Yes (NX3030)
Operating Temperature	0°C to 60°C	0°C to 60°C	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	Yes	No	No

FEATURES COMPARISON

Features	Studio 5000		MT8500 – Mastertool IEC XE
Hardware	CompactLogix 5380	CompactLogix 5480	NX3XXX
Programming	LD, ST, FBD and SFC		ST, SFC, FBD, LD, IL, CFC
Simulation	Yes		Yes
License	Paid		Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	Yes		No
Modbus TCP/RTU	Yes		Yes
ASCII	?		No
OPC DA/UA	?		Yes

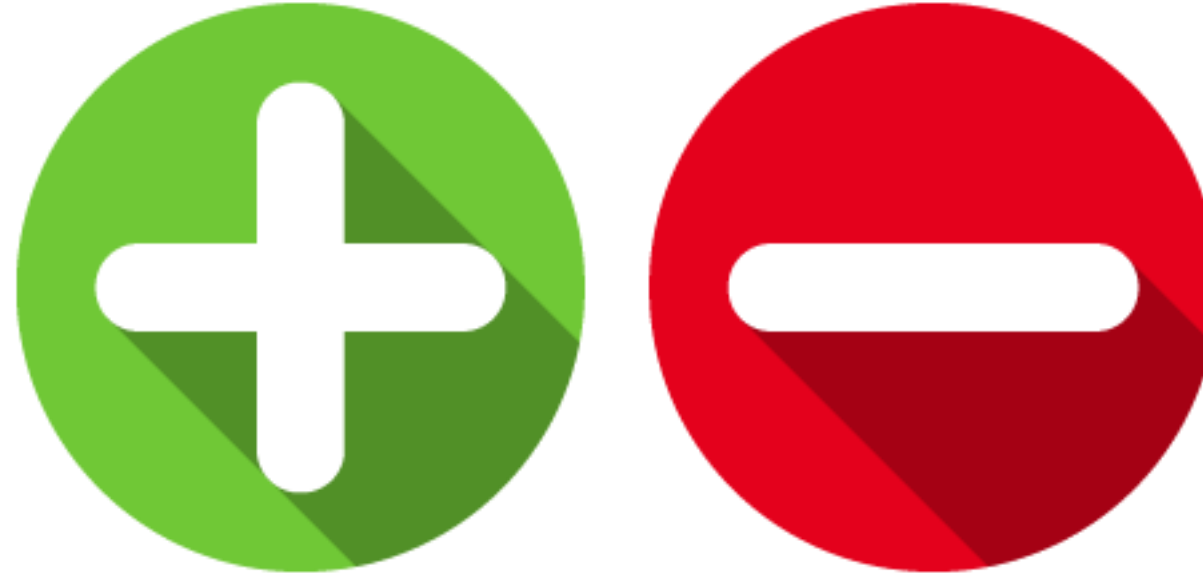


FEATURES COMPARISON

Features	Studio 5000		MT8500 – Mastertool IEC XE
Hardware	CompactLogix 5380	CompactLogix 5480	NX3XXX
Ethernet/IP	Yes		Yes
EtherCAT	?		No
CANopen	No		Yes
PROFIBUS	?		Yes
PROFINET	?		No (under development)
MQTT	?		Yes
Database	?		Yes



HIGHLIGHTS



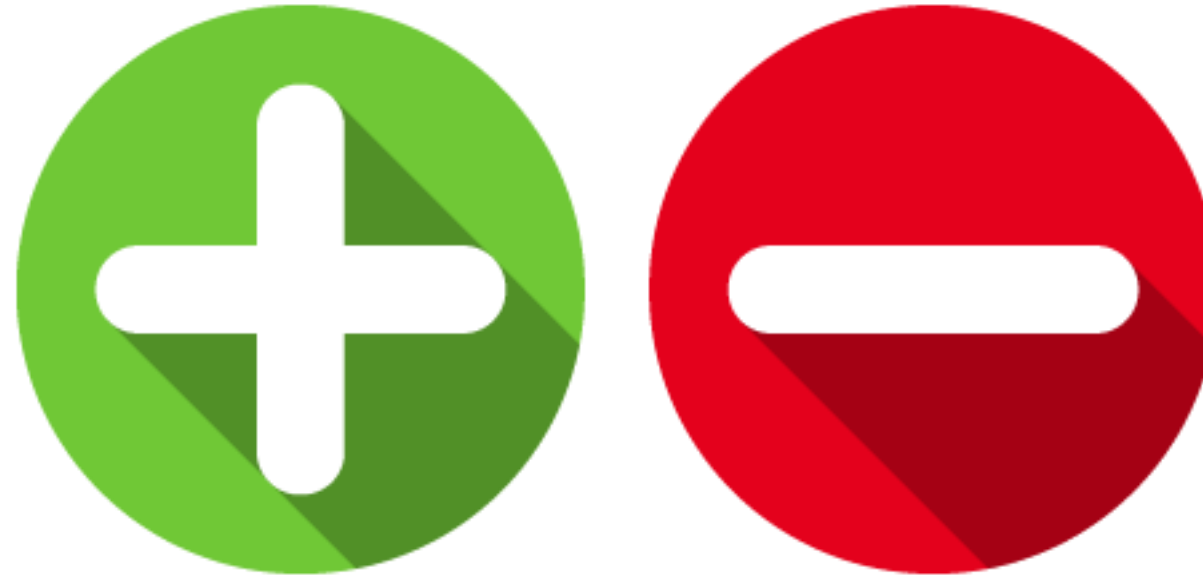
Advantages:

- Integrated Digital I/Os
- Integrated Fast I/Os
- Serial Port
- Software
 - More programming languages available
- Price
 - CompactLogix 5380 and 5480 superior to NX300X and NX30X0
- Free Software License
- EtherCAT

Disadvantages:

- USB Port
- DIN Rail support
- Integrated Power Supply
 - NX30X0 does not include
- Memory Card Slot
 - NX300X does not include
- DeviceNet Scanner

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Datalogging
- Web Server (NX3005 includes)
- Performance
- Redundancy (NX3030 includes)
- OPC DA/UA
- PROFIBUS
- MQTT
- Database

*advantages not verified due to the lack of information available on the competitor's technical documentation



- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



- **ROCKWELL (CONTROLLOGIX SERIES)**

5570 5580



VS

FEATURES COMPARISON

Features	ControlLogix 5570	ControlLogix 5580	NX300X	NX30X0
Price Analysis	Superior to NX300X Superior to NX30X0	Superior to NX300X Superior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	No	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No	No
Fast Inputs	No	No	0-4	No
Fast Outputs	No	No	0-4	No
Memory	2-32MB (user)	3-40MB (user)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	?	?	Yes, no battery	Yes, no battery
Retentive Data	?	?	7,5kB	64kb – 112kB
USB	Yes	Yes	No	No
Data Logging	?	?	Yes	Yes
I/O Expansion	Yes (max. 128.000 I/O)	Yes (max. 128.000 I/O)	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	ControlLogix 5570	ControlLogix 5580	NX300X	NX30X0
Diagnostics Display	Yes	Yes	Yes	Yes
Integrated Power Supply	No	No	Yes	No
Ethernet	No	Yes	Yes	Yes
Web Server	?	?	Yes (NX3005)	No
Serial	No	No	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	Yes	No	Yes
Performance	?	?	6ns to 9ns / instruction	6ns / instruction
Functional Safety	Yes	Yes	Yes	Yes
Redundancy	Yes	No	No	Yes (NX3030)
Operating Temperature	0°C to 60°C	0°C to 60°C	0°C to 60°C	0°C to 60°C
DIN Rail Support	?	?	No	No

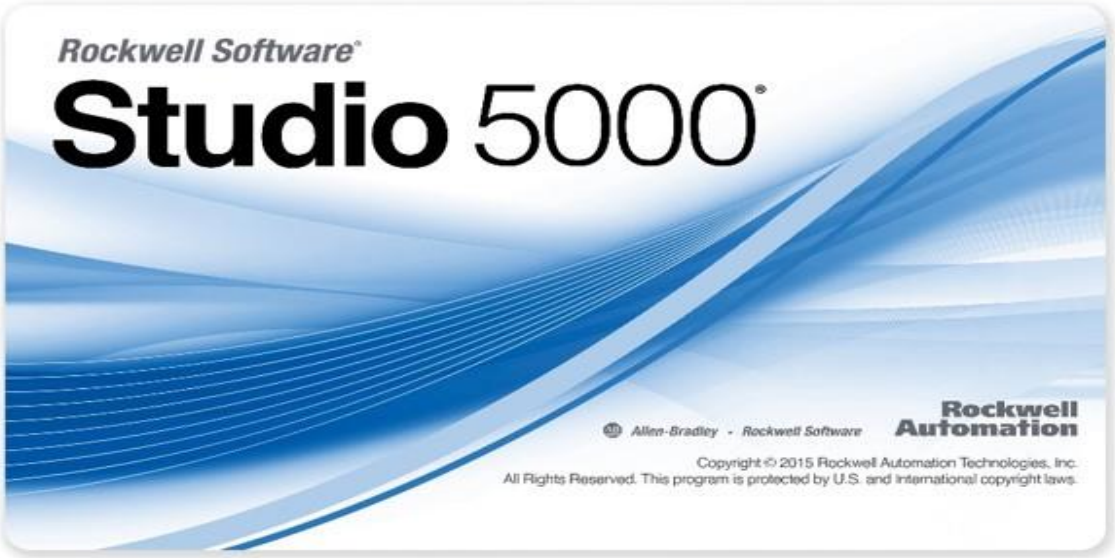
FEATURES COMPARISON

Features	Studio 5000		MT8500 – Mastertool IEC XE
Hardware	ControlLogix 5570	ControlLogix 5580	NX3XXX
Programming	LD, ST, FBD and SFC		ST, SFC, FBD, LD, IL, CFC
Simulation	?		Yes
License	Paid		Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	Yes		No
Modbus TCP/RTU	Yes		Yes
ASCII	?		No
OPC DA/UA	?		Yes

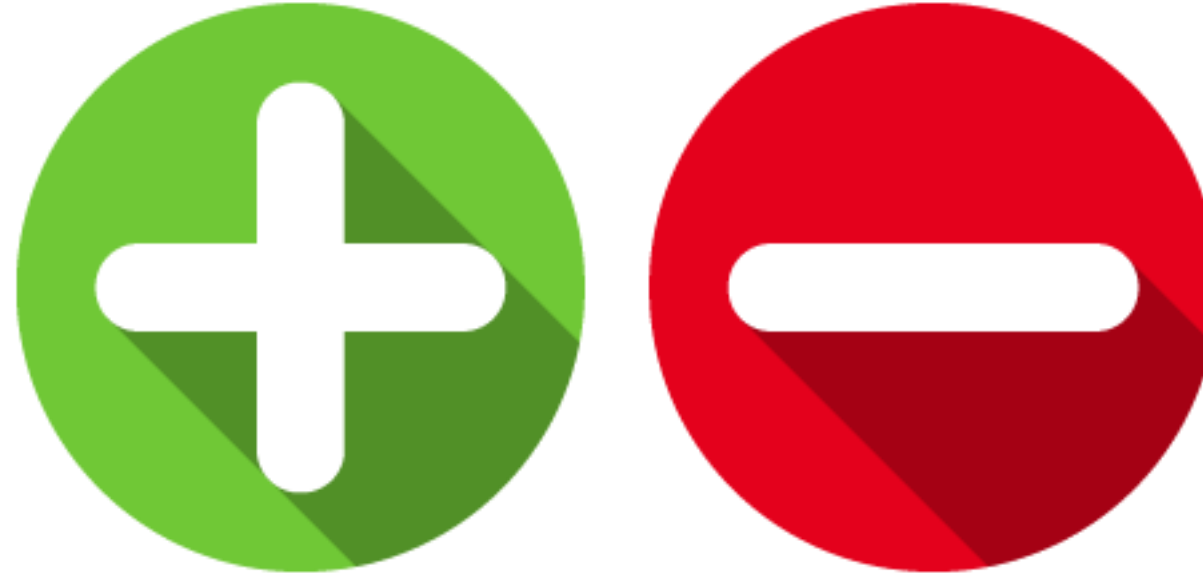


FEATURES COMPARISON

Features	Studio 5000		MT8500 – Mastertool IEC XE
Hardware	ControlLogix 5570	ControlLogix 5580	NX3XXX
Ethernet/IP	Yes		Yes
EtherCAT	?		No
CANopen	No		Yes
PROFIBUS	?		Yes
PROFINET	?		No (under development)
MQTT	?		Yes
Database	?		Yes



HIGHLIGHTS



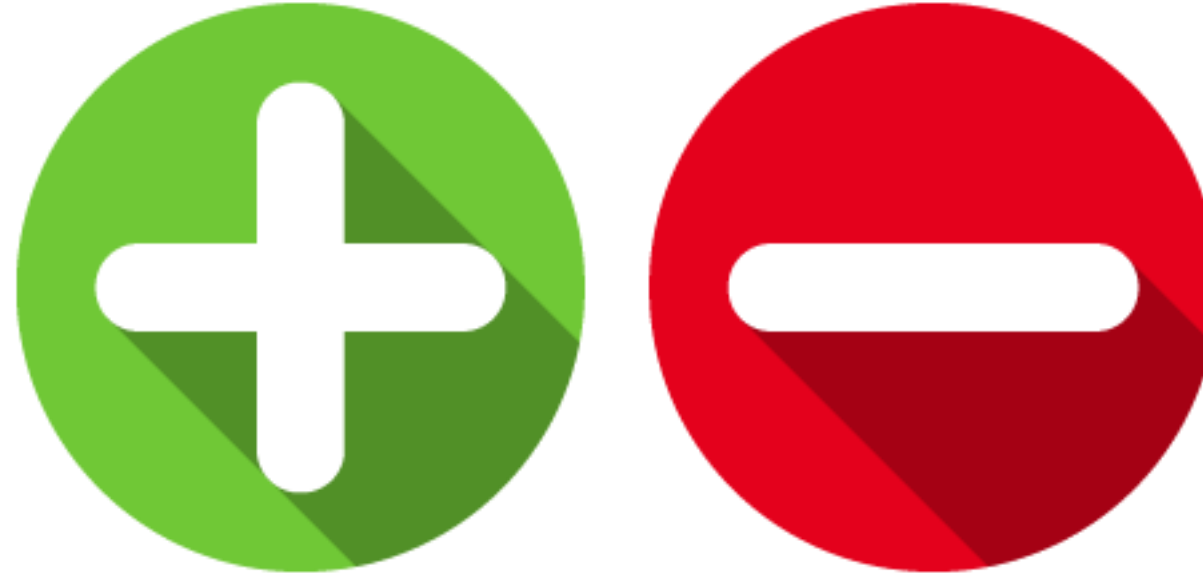
Advantages*:

- Integrated Digital I/Os
- Integrated Fast I/Os
- Integrated Power Supply
 - NX300X includes
- Serial Port
- Price
 - ControlLogix 5570 and 5580 superior to NX300X and NX30X0
- EtherCAT
- Free Software License
- Integrated Power Supply
 - NX300X includes
- Redundancy
 - ControlLogix 5580 does not include
- Software
 - More programming languages available

Disadvantages:

- USB Port
- Inferior I/O expansion capacity
- DeviceNet
- Memory Card Slot
 - NX300X does not include
- Redundancy
 - Only NX3030 includes, other NXs do not

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Datalogging
- Web Server (NX3005 includes)
- Performance
- Software Simulation
- OPC DA/UA
- PROFIBUS
- MQTT
- Database

*advantages not verified due to the lack of information available on the competitor's technical documentation

altus

- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



SIEMENS

- **SIEMENS (SIMATIC SERIES)**

S7-1200 S7-1500



FEATURES COMPARISON

Features	S7-1200	S7-1500	NX300X	NX30X0
Price Analysis	Similar to NX300X Inferior to NX30X0	Inferior to NX300X and NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	6-14 DI, 4-10 DO	16-32 DI, 16-32 DO	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	2 AI, 0-2 AO	5 AI, 2 AO	No	No
Fast Inputs	3-6	6	0-4	No
Fast Outputs	0-4	4	0-4	No
Memory	30kB-125kB (prog.) 1MB-4MB (data)	150kB-4MB (prog.) 1MB-20MB (data)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	Yes (with or without battery?)	?	Yes, no battery	Yes, no battery
Retentive Data	2kB – 10kB	?	7,5kB	64kB – 112kB
USB	No	No	No	No
Data Logging	Yes	?	Yes	Yes
I/O Expansion	Yes (max. 14-284 Digital I/Os, max. 3-67 Analog I/Os)	Yes	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	S7-1200	S7-1500	NX300X	NX30X0
Diagnostics Display	No	Yes	Yes	Yes
Integrated Power Supply	Yes	No	Yes	No
Ethernet	Yes	?	Yes	Yes
Web Server	Yes	Yes	Yes (NX3005)	No
Serial	No	No	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	Yes	No	Yes
Performance	85ns / instruction	1ns to 60ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	Yes	Yes	Yes	Yes
Redundancy	?	Yes	No	Yes (NX3030)
Operating Temperature	-20°C to 60°C	0°C to 60°C	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	Yes, with adapter (purchased separately)	No	No

FEATURES COMPARISON

Features	TIA PORTAL		MT8500 – Mastertool IEC XE
Hardware	S7-1200	S7-1500	NX3XXX
Programming	LD, FBD, STL, SFC, ST		ST, SFC, FBD, LD, IL, CFC
Simulation	Yes		Yes
License	Paid		Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	No		No
Modbus TCP/RTU	Yes		Yes
ASCII	Yes		No
OPC DA/UA	Yes		Yes

SIEMENS



FEATURES COMPARISON

Features	TIA PORTAL		MT8500 – Mastertool IEC XE
Hardware	S7-1200	S7-1500	NX3XXX
Ethernet/IP	Yes		Yes
EtherCAT	?		No
CANopen	No		Yes
PROFIBUS	Yes		Yes
PROFINET	Yes		No (under development)
MQTT	Yes		Yes
Database	Yes		Yes

SIEMENS



HIGHLIGHTS



Advantages:

- Retentive Memory
 - NX3030 has 6x to 56x more than S7-1200
- Performance
 - 9x to 14x superior to S7-1200, depending on the model
 - Up to 10x superior to S7-1500, depending on the model
- Integrated Power Supply
 - S7-1500 does not include
- Free Software License
- Superior I/O expansion capacity, depending on the model
- Software
 - More programming languages available
- Price
 - S7-1500 superior to NX300x and NX30X0
- Diagnostics Display
- EtherCAT



Disadvantages:

- Less Integrated I/Os, depending on the configuration
- No Integrated Analog I/Os
- Less Fast I/Os
- Performance
 - 6x to 9x inferior to S7-1500, depending on the model
- Integrated Power Supply
 - NX30X0 does not include
- Operating Temperature
- DIN Rail Support
- ASCII
- PROFINET
- Price
 - S7-1200 inferior to NX30X0
- Memory Card Slot
 - NX300X does not include
- Web Server
 - Only NX3005 includes, other NXs do not
- Redundancy
 - NX300X does not include

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Datalogging
- Ethernet

*advantages not verified due to the lack of information available on the competitor's technical documentation

altus

- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



SIEMENS

- **SIEMENS (SIMATIC ET 200SP SERIES)**

1510SP-1 PN 1512SP-1 PN



FEATURES COMPARISON

Features	1510SP-1	1512SP-1	NX300X	NX30X0
Price Analysis	Superior to NX300X Superior to NX30X0	Superior to NX300X Superior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	No	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No	No
Fast Inputs	No	No	0-4	No
Fast Outputs	No	No	0-4	No
Memory	100kB (prog.) 750kB (data)	200kB (prog.) 1MB (data)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	Yes (with or without battery?)	Yes (with or without battery?)	Yes, no battery	Yes, no battery
Retentive Data	128kB (88kB usable)	128kB (88kB usable)	7,5kB	64kB – 112kB
USB	No	No	No	No
Data Logging	?	?	Yes	Yes
I/O Expansion	Yes	Yes	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	1510SP-1	1512SP-1	NX300X	NX30X0
Diagnostics Display	No	No	Yes	Yes
Integrated Power Supply	Yes	Yes	Yes	No
Ethernet	Yes	Yes	Yes	Yes
Web Server	Yes	Yes	Yes (NX3005)	No
Serial	No	No	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	Yes	No	Yes
Performance	72ns / instruction	48ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	Yes	Yes	Yes	Yes
Redundancy	Yes	Yes	No	Yes (NX3030)
Operating Temperature	0°C to 60°C (ambient)	0°C to 60°C (ambient)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	Yes	No	No

FEATURES COMPARISON

Features	SIMATIC STEP 7		MT8500 – Mastertool IEC XE
Hardware	1510SP-1 PN	1512SP-1 PN	NX3XXX
Programming	LD, FBD, STL, SFC, ST		ST, SFC, FBD, LD, IL, CFC
Simulation	Yes		Yes
License	Paid		Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	No		No
Modbus TCP/RTU	Yes		Yes
ASCII	?		No
OPC DA/UA	Yes		Yes

SIEMENS



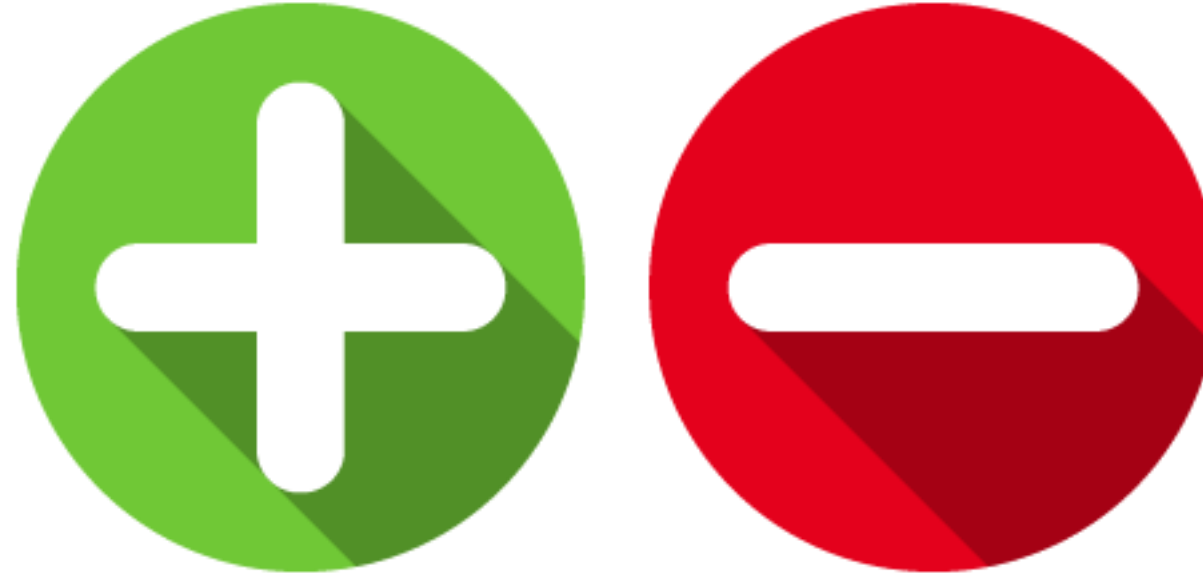
FEATURES COMPARISON

Features	SIMATIC STEP 7		MT8500 – Mastertool IEC XE
Hardware	1510SP-1 PN	1512SP-1 PN	NX3XXX
Ethernet/IP	Yes		Yes
EtherCAT	?		No
CANopen	No		Yes
PROFIBUS	Yes		Yes
PROFINET	Yes		No (under development)
MQTT	Yes		Yes
Database	Yes		Yes

SIEMENS



HIGHLIGHTS



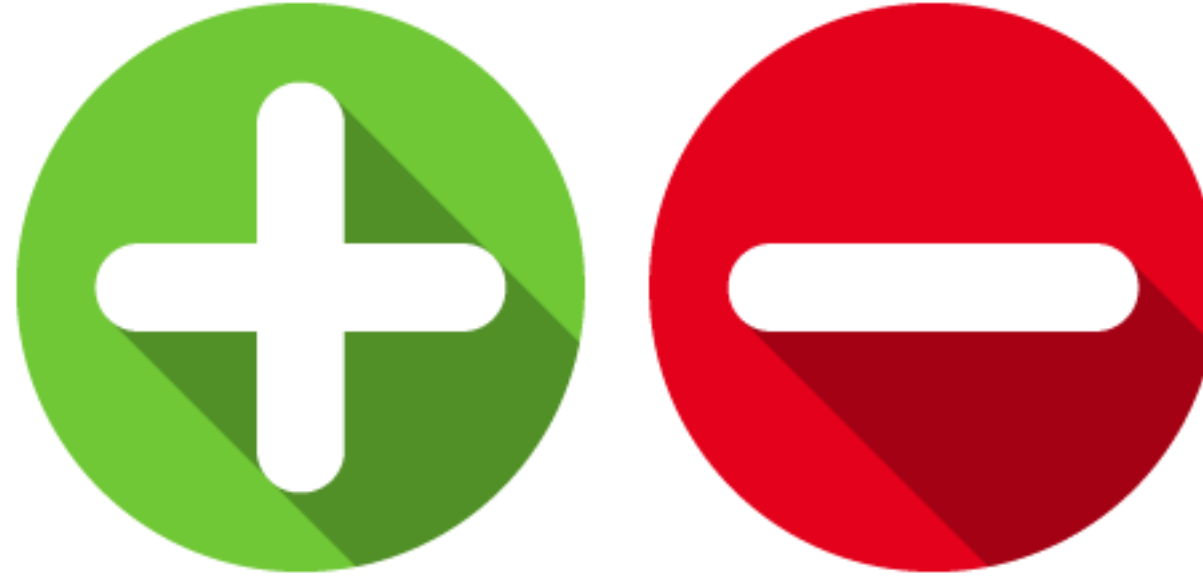
Advantages:

- Integrated Digital I/Os
- Integrated Fast I/Os
- Memory (program)
 - 30x to 80x more
- Serial Port
- Performance
 - 5x to 12x superior
- Software
 - More programming languages
- Price
 - 1510SP-1 PN and 1512SP-1 PN superior to NX300X and NX30X0
- Diagnostics Display
- EtherCAT
- Free Software License

Disadvantages:

- DIN Rail Support
- PROFINET
- Integrated Power Supply
 - NX30X0 does not include
- Memory Card Slot
 - NX300X does not include
- Retentive Data
 - NX300X has less memory

HIGHLIGHTS



Possible Advantages*:

- Datalogging

*advantages not verified due to the lack of information available on the competitor's technical documentation

altus

- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



Schneider Electric

- **SCHNEIDER ELECTRIC
(MODICON SERIES)**

M221 M241 M251



FEATURES COMPARISON

Features	M221	M241	M251	NX300X	NX30X0
Price Analysis	Inferior to NX300X Inferior to NX30X0	Similar to NX300X Inferior to NX30X0	Similar to NX300X Inferior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	9-24 DI, 7-16 DO	14-24 DI, 10-16 DO	20-40 DI, 16 DO	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	2 AI, 0 AO	No	0-2 AI, 0-2 AO	No	No
Fast Inputs	4	8	0-4	0-4	No
Fast Outputs	0-2	4	0-4	0-4	No
Memory	256kB (user)	8MB (prog.)	8MB (prog.)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	?	?	?	Yes, no battery	Yes, no battery
Retentive Data	?	?	?	7,5kB	64kB – 112kB
USB	Yes	Yes	Yes	No	No
Data Logging	Yes	Yes	Yes	Yes	Yes
I/O Expansion	Yes (max. 14 modules with rack expansion)	Yes (max. 14 modules with rack expansion)	Yes (max. 14 modules with rack expansion)	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	M221	M241	M251	NX300X	NX30X0
Diagnostics Display	No	No	No	Yes	Yes
Integrated Power Supply	Yes	Yes	Yes	Yes	No
Ethernet	Yes	Yes	Yes	Yes	Yes
Web Server	Yes	Yes	Yes	Yes (NX3005)	No
Serial	Yes	Yes	Yes	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	Yes	Yes	No	Yes
Performance	200ns / instruction	22ns / instruction	22ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	?	Yes	Yes	Yes	Yes
Redundancy	?	?	?	No	Yes (NX3030)
Operating Temperature	-10°C to 55°C (ambient)	-10°C to 55°C (ambient)	-10°C to 55°C (ambient)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	Yes	Yes	No	No

FEATURES COMPARISON

Features	EcoStruxure Machine Expert Basic	SoMachine		MT8500 – Mastertool IEC XE
Hardware	M221	M241	M251	NX3XXX
Programming	IL, LD, Grafcet, ST	IL, LD, SFC, ST, FBD, CFC	IL, LD, SFC, ST, FBD, CFC	ST, SFC, FBD, LD, IL, CFC
Simulation	Yes	Yes	Yes	Yes
License	Free	Paid	Paid	Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	No	No	No	No
Modbus TCP/RTU	Yes	Yes	Yes	Yes
ASCII	Yes	Yes	Yes	No
OPC DA/UA	Yes	Yes	Yes	Yes



FEATURES COMPARISON

Features	EcoStruxure Machine Expert Basic	SoMachine		MT8500 – Mastertool IEC XE
Hardware	M221	M241	M251	NX3XXX
Ethernet/IP	Yes	Yes	Yes	Yes
EtherCAT	Yes	Yes	Yes	No
CANopen	No	No	Yes	Yes
PROFIBUS	No	Yes	Yes	Yes
PROFINET	No	?	?	No (under development)
MQTT	?	?	?	Yes
Database	?	Yes	Yes	Yes



HIGHLIGHTS



Advantages:

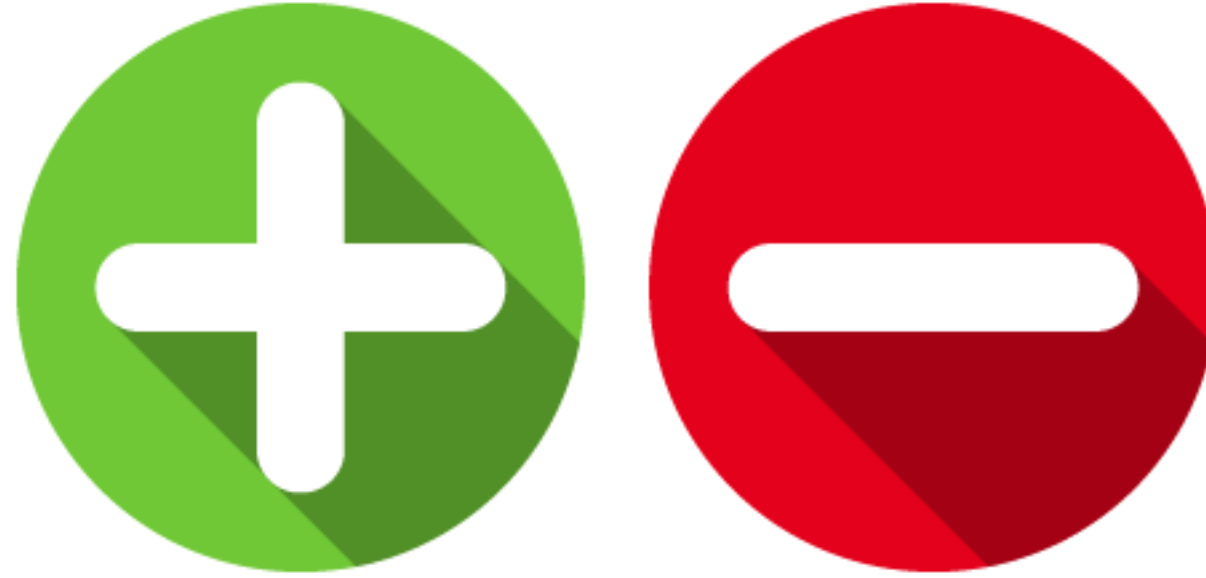
- Performance
 - 22x to 33x superior to model M221
 - 2,4x to 3,6x superior to models M241 and M251
- Software
 - More programming languages available than EcoStruxure Machine Expert Basic for M221
- Diagnostics Display
- PROFIBUS
 - M221 does not include
- EtherCAT
 - M221 and M241 do not include
- Free Software License
 - M241 and M251 are paid



Disadvantages:

- Less Integrated Digital I/Os, depending on the configuration
- No Analog I/Os
- Less Fast Inputs than model M241
- USB Port
- DIN Rail Support
- CANopen
- Integrated Power Supply
 - NX30X0 does not include
- Price
 - M221 inferior to NX300X and NX30X0
 - M241 inferior to NX30X0
 - M251 inferior to NX30X0
- Memory Card Slot
 - NX300X does not include
- Web Server
 - Only NX3005 includes
- ASCII

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Functional Safety (M221)
- Redundancy
- MQTT
- Database

*advantages not verified due to the lack of information available on the competitor's technical documentation

altus

- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



Schneider Electric

- **SCHNEIDER ELECTRIC
(MODICON SERIES)**

M262



FEATURES COMPARISON

Features	M262	NX300X	NX30X0
Price Analysis	Superior to NX300X Similar to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	4 DI, 4 DO	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No
Fast Inputs	4	0-4	No
Fast Outputs	4	0-4	No
Memory	32MB RAM (prog.)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	Yes (with or without battery?)	Yes, no battery	Yes, no battery
Retentive Data	512kB	7,5kB	64kB – 112kB
USB	Yes	No	No
Data Logging	Yes	Yes	Yes
I/O Expansion	Yes	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	M262	NX300X	NX30X0
Diagnostics Display	No	Yes	Yes
Integrated Power Supply	Yes	Yes	No
Ethernet	Yes	Yes	Yes
Web Server	Yes	Yes (NX3005)	No
Serial	RS-232 and RS-485	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	No	Yes
Performance	3ns to 5ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	Yes	Yes	Yes
Redundancy	?	No	Yes (NX3030)
Operating Temperature	-20°C to 60°C (ambient)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	No	No

FEATURES COMPARISON

Features	EcoStruxure Machine Expert	MT8500 – Mastertool IEC XE
Hardware	M262	NX3XXX
Programming	IL, LD, SFC, ST, FBD	ST, SFC, FBD, LD, IL, CFC
Simulation	Yes	Yes
License	Paid	Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	No	No
Modbus TCP/RTU	Yes	Yes
ASCII	Yes	No
OPC DA/UA	Yes	Yes

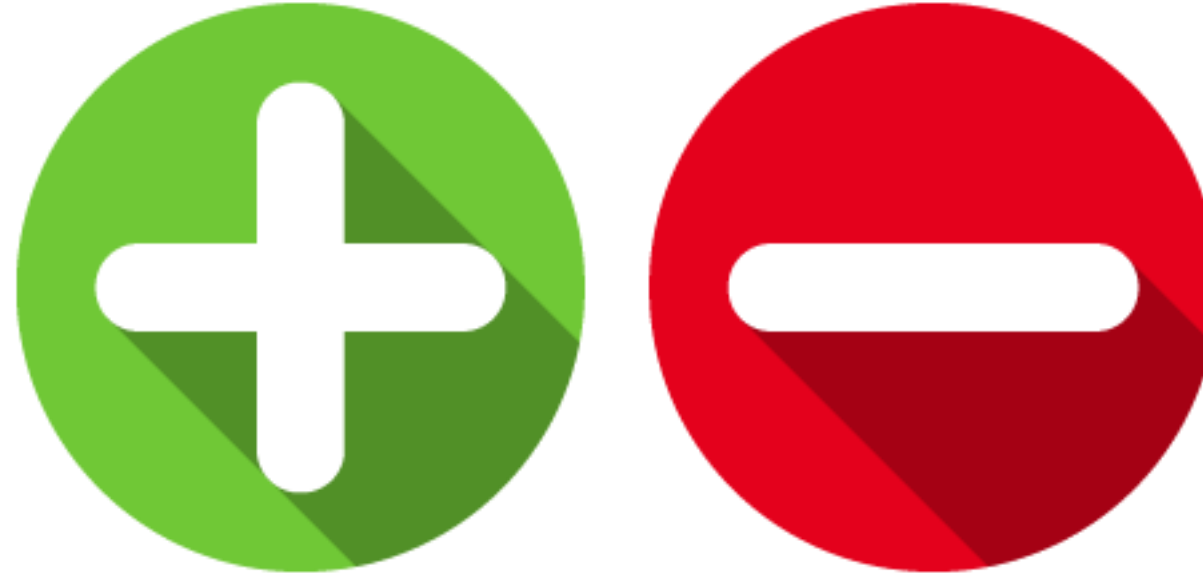


FEATURES COMPARISON

Features	EcoStruxure Machine Expert	MT8500 – Mastertool IEC XE
Hardware	M262	NX3XXX
Ethernet/IP	Yes	Yes
EtherCAT	Yes	No
CANopen	No	Yes
PROFIBUS	No	Yes
PROFINET	No	No (under development)
MQTT	Yes	Yes
Database	Yes	Yes



HIGHLIGHTS



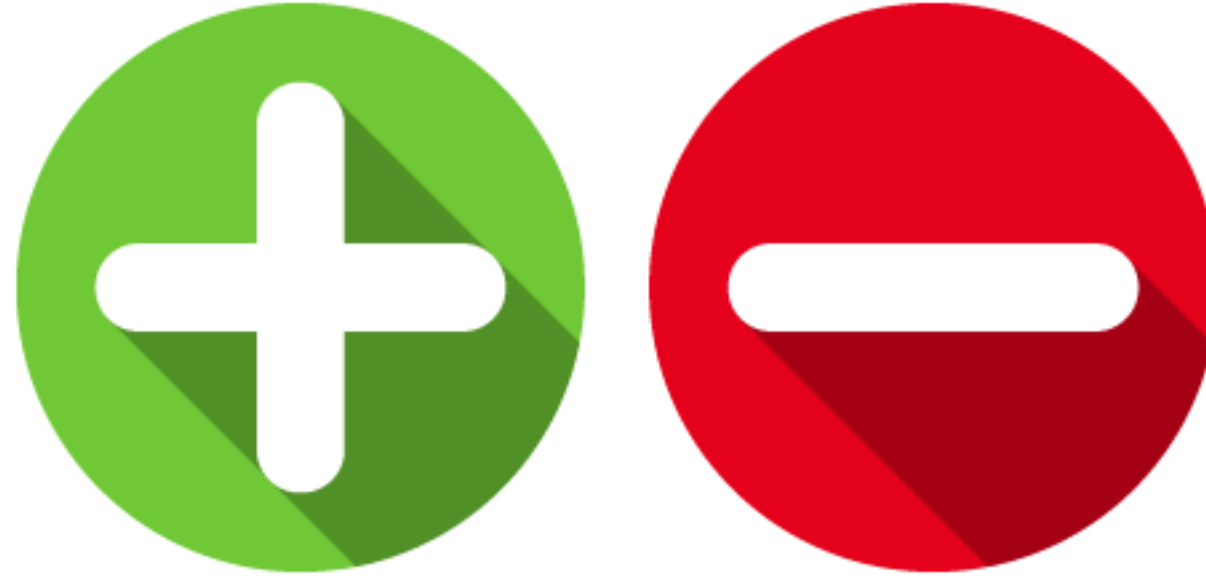
Advantages:

- More Integrated I/Os, depending on the configuration
- Software
 - More programming languages available
- Price
 - M262 superior to NX300X
- Diagnostics Display
- EtherCAT
- PROFIBUS
- Free Software License

Disadvantages:

- Retentive Data
 - 4x to 68x less memory
- USB Port
- Performance
 - 1,2x to 3x inferior
- DIN Rail Support
- ASCII
- CANopen
- Integrated Power Supply
 - NX30X0 does not include
- Memory Card Slot
 - NX300X does not include
- NX30X0 does not include Integrated Digital I/Os

HIGHLIGHTS



Possible Advantages*:

- Redundancy

*advantages not verified due to the lack of information available on the competitor's technical documentation

altus

- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



Schneider Electric

- **SCHNEIDER ELECTRIC
(MODICON SERIES)**

M340 M580



FEATURES COMPARISON

Features	M340	M580	NX300X	NX30X0
Price Analysis	Similar to NX300X Inferior to NX30X0	Superior to NX300X Superior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	8-64	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No	No
Fast Inputs	No	No	0-4	No
Fast Outputs	No	No	0-4	No
Memory	4MB (prog.) 256kB (data)	4MB-64MB (prog.) 384kB-64MB (data)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	?	Yes (with or without battery?)	Yes, no battery	Yes, no battery
Retentive Data	?	Yes	7,5kB	64kB – 112kB
USB	Yes	Yes	No	No
Data Logging	Yes	Yes	Yes	Yes
I/O Expansion	Yes	Yes (max. 94 modules with rack expansion)	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	M340	M580	NX300X	NX30X0
Diagnostics Display	No	No	Yes	Yes
Integrated Power Supply	No	No	Yes	No
Ethernet	Yes	Yes	Yes	Yes
Web Server	Yes	Yes	Yes (NX3005)	No
Serial	Yes	No	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	Yes	No	Yes
Performance	123ns to 185ns / instruction	20ns to 100ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	?	Yes	Yes	Yes
Redundancy	?	Yes	No	Yes (NX3030)
Operating Temperature	0°C to 60°C (standard version) -25°C to 70°C (ruggedized version)	0°C to 60°C (standard version) -25°C to 70°C (extended temperature version)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes (rack connection to the DIN rail)	Yes (rack connection to the DIN rail)	No	No

FEATURES COMPARISON

Features	EcoStruxure Control Expert		MT8500 – Mastertool IEC XE
Hardware	M340	M580	NX3XXX
Programming	IL, LD, SFC, ST, FBD	IL, LD, SFC, ST, FBD	ST, SFC, FBD, LD, IL, CFC
Simulation	Yes	Yes	Yes
License	Paid	Paid	Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	?	?	No
Modbus TCP/RTU	Yes	Yes	Yes
ASCII	?	?	No
OPC DA/UA	Yes	Yes	Yes



FEATURES COMPARISON

Features	EcoStruxure Control Expert		MT8500 – Mastertool IEC XE
Hardware	M340	M580	NX3XXX
Ethernet/IP	Yes	Yes	Yes
EtherCAT	Yes	Yes	No
CANopen	No	No	Yes
PROFIBUS	Yes	Yes	Yes
PROFINET	No	No	No (under development)
MQTT	?	?	Yes
Database	Yes	Yes	Yes



HIGHLIGHTS



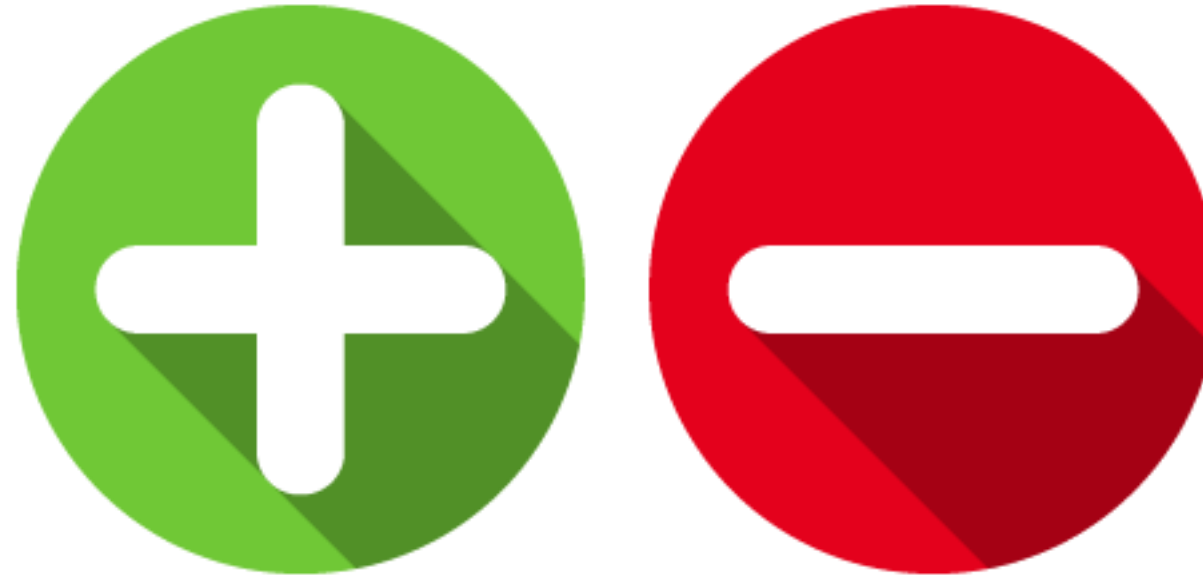
Advantages:

- Integrated Digital I/Os
 - M580 does not include
- Integrated Fast I/Os
- Memory
 - More than model M340, depending on the configuration
- Integrated Power Supply
- Serial Port
 - M580 does not include
- Price
 - M580 superior to NX300X and NX30X0
- Performance
 - 13x to 30x superior to model M340
 - 1,7x to 16x superior to model M580
- EtherCAT
- Free Software License
- Software
 - More programming languages available
- Integrated Power Supply
 - M340 and M580 do not include

Disadvantages:

- Memory
 - Less than model M580, depending on the configuration
- Memory Card Slot
 - NX300X does not include
- USB Port
- Operating Temperature
- DIN Rail Support
- CANopen
- Price
 - M340 inferior to NX30X0
- Integrated Digital I/Os
 - NX30X0 does not include
- Web Server
 - Only NX3005 includes
- Redundancy
 - Only NX3030 includes

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Functional Safety
 - M340 possibly does not include
- Redundancy
 - M340 possibly does not include
- MQTT

*advantages not verified due to the lack of information available on the competitor's technical documentation

altus

- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



OMRON

- **OMRON (NX SERIES)**

NX1



FEATURES COMPARISON

Features	NX1	NX300X	NX30X0
Price Analysis	Similar to NX300X Inferior to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No
Fast Inputs	No	0-4	No
Fast Outputs	No	0-4	No
Memory	5MB (prog.)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	Yes (with or without battery?)	Yes, no battery	Yes, no battery
Retentive Data	1,5MB	7,5kB	64kB – 112kB
USB	No	No	No
Data Logging	?	Yes	Yes
I/O Expansion	Yes (max. 32 modules)	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Sim (max. 2048 points)

FEATURES COMPARISON

Features	NX1	NX300X	NX30X0
Diagnostics Display	No	Yes	Yes
Integrated Power Supply	Yes	Yes	No
Ethernet	Yes	Yes	Yes
Web Server	?	Yes (NX3005)	No
Serial	No	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	No	Yes
Performance	3,3ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	Yes	Yes	Yes
Redundancy	?	No	Yes (NX3030)
Operating Temperature	0°C to 55°C (ambient)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	No	No

FEATURES COMPARISON

Features	Sysmac Studio	MT8500 – Mastertool IEC XE
Hardware	NX1	NX3XXX
Programming	LD, ST	ST, SFC, FBD, LD, IL, CFC
Simulation	Yes	Yes
License	?	Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	?	No
Modbus TCP/RTU	Yes	Yes
ASCII	?	No
OPC DA/UA	Yes	Yes



FEATURES COMPARISON

Features	Sysmac Studio	MT8500 – Mastertool IEC XE
Hardware	NX1	NX3XXX
Ethernet/IP	Yes	Yes
EtherCAT	?	No
CANopen	Yes	Yes
PROFIBUS	?	Yes
PROFINET	?	No (under development)
MQTT	?	Yes
Database	Yes	Yes



HIGHLIGHTS



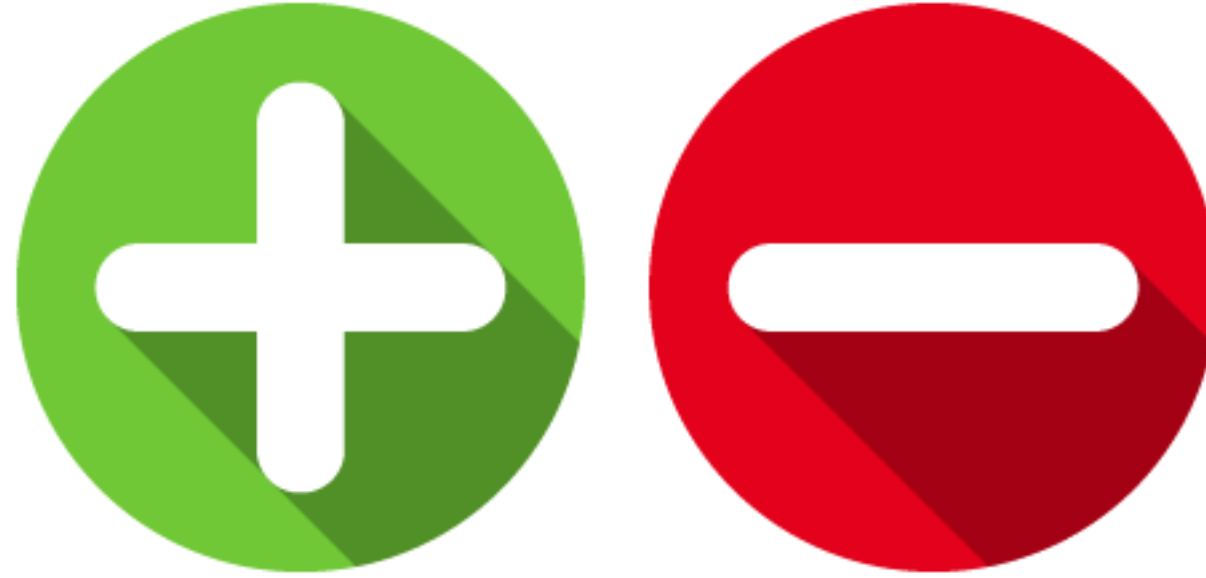
Advantages:

- Integrated Digital I/Os
- Integrated Fast I/Os
- Serial Port
- Software
 - More programming languages available
- Diagnostics Display

Disadvantages:

- Retentive Data
 - 13x to 204x less memory
- Performance
 - 1,8x to 2,72x inferior
- DIN Rail Support
- Price
 - NX1 inferior to NX30X0
- Integrated Power Supply
 - NX30X0 does not include
- Memory Card Slot
 - NX300X does not include

HIGHLIGHTS



Possible Advantages*:

- Datalogging
- Web Server
- Redundancy
- Free Software License
- PROFIBUS
- MQTT

*advantages not verified due to the lack of information available on the competitor's technical documentation



- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



VS



- **MITSUBISHI (MELSEC SERIES)**

MELSEC-Q



FEATURES COMPARISON

Features	MELSEC-Q	NX300X	NX30X0
Price Analysis	Superior to NX300X Similar to NX30X0	LPM Price (CRM)	LPM Price(CRM)
Embedded Digital I/Os	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No
Fast Inputs	No	0-4	No
Fast Outputs	No	0-4	No
Memory	16MB (data)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	?	Yes, no battery	Yes, no battery
Retentive Data	?	7,5kB	64kB – 112kB
USB	Yes	No	No
Data Logging	Yes	Yes	Yes
I/O Expansion	Yes	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	MELSEC-Q	NX300X	NX30X0
Diagnostics Display	No	Yes	Yes
Integrated Power Supply	No	Yes	No
Ethernet	Yes	Yes	Yes
Web Server	?	Yes (NX3005)	No
Serial	Yes	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	No	Yes
Performance	1,9ns / instruction	6ns to 9ns / instruction	6ns / instruction
Functional Safety	?	Yes	Yes
Redundancy	Yes	No	Yes (NX3030)
Operating Temperature	0°C to 55°C (ambient)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes (rack connected to the DIN rail, with adaptor)	No	No

FEATURES COMPARISON

Features	GX Works2	MT8500 – Mastertool IEC XE
Hardware	MELSEC-Q	NX3XXX
Programming	LD, ST, IL, SFC, MELSAP-L, FBD, FB, C/C++	ST, SFC, FBD, LD, IL, CFC
Simulation	?	Yes
License	Paid	Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	?	No
Modbus TCP/RTU	Yes	Yes
ASCII	?	No
OPC DA/UA	?	Yes

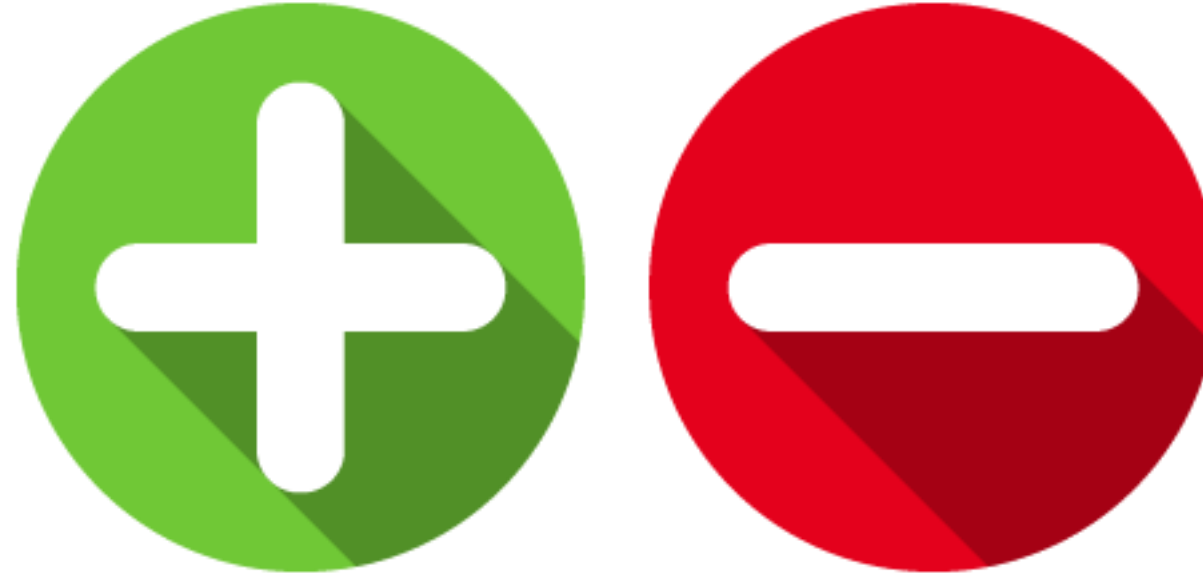


FEATURES COMPARISON

Features	GX Works2	MT8500 – Mastertool IEC XE
Hardware	MELSEC-Q	NX3XXX
Ethernet/IP	Yes	Yes
EtherCAT	?	No
CANopen	?	Yes
PROFIBUS	?	Yes
PROFINET	?	No (under development)
MQTT	?	Yes
Database	?	Yes



HIGHLIGHTS



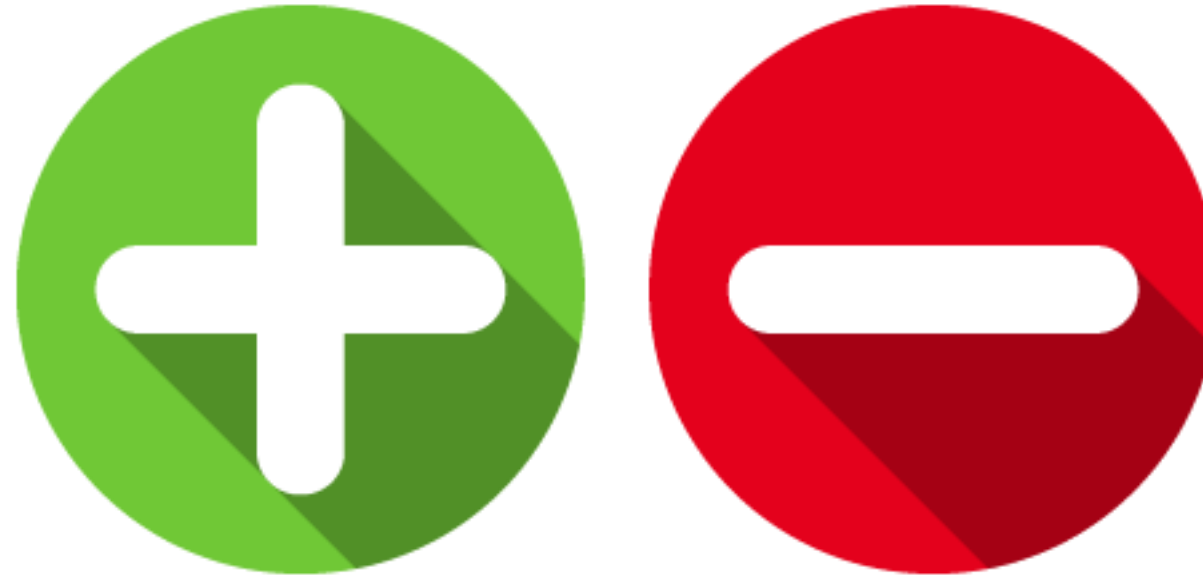
Advantages:

- Integrated Digital I/Os
- Integrated Fast I/Os
- Software
 - MasterTool based in CoDeSys; GX Works2 is not CoDeSys
 - Better integration with field protocols, such as PROFIBUS-DP and EtherCAT
- Redundancy
 - Nexto solution has a 50% inferior cost
- Price
 - MELSEC-Q superior to NX300X
- Diagnostics Display
- Integrated Power Supply
- Free Software License

Disadvantages:

- USB Port
- Software
 - Less programming languages available
 - Less intuitive
 - Less libraries available
- Inferior expansion modules diversity
- Performance
 - 3,1x to 4,7x inferior
- DIN Rail Support
- Memory Card Slot
 - NX300X does not include
- Redundancy
 - Only NX3030 includes

HIGHLIGHTS



Possible Advantages*:

- Retentiveness
- Web Server
- Functional Safety
- Redundancy
- Software Simulation
- OPC DA/UA
- EtherCAT
- PROFIBUS
- MQTT
- Database

*advantages not verified due to the lack of information available on the competitor's technical documentation



- **ALTUS (NEXTO SERIES)**

NX3003 NX3004 NX3005
NX3010 NX3020 NX3030



- **WAGO (PFC200 SERIES)**

750-8215



FEATURES COMPARISON

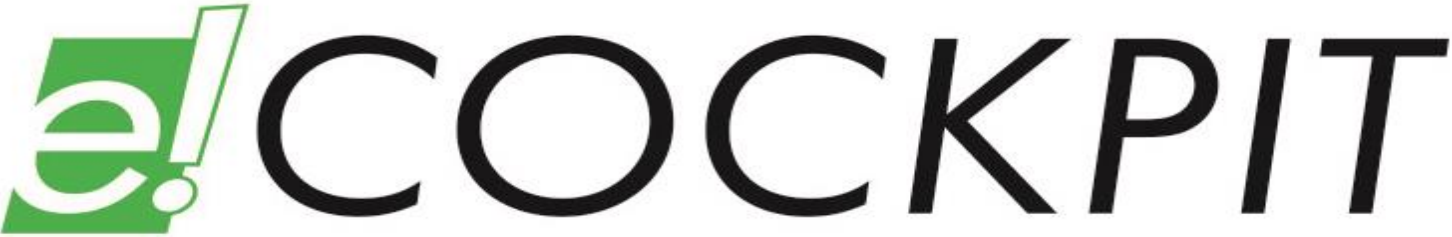
Características	750-8215	NX300X	NX30X0
Price Analysis	Superior to NX300X Similar to NX30X0	LPM Price (CRM)	LPM Price (CRM)
Embedded Digital I/Os	No	0-14 DI, 0-10 DO	No
Embedded Analog I/Os	No	No	No
Fast Inputs	No	0-4	No
Fast Outputs	No	0-4	No
Memory	16MB (prog.) 64MB (data)	3MB-6MB (prog.) 16MB (data)	4MB-8MB (prog.) 32MB (data)
Retentiveness	Yes (with or without battery?)	Yes, no battery	Yes, no battery
Retentive Data	128kB	7,5kB	64kB – 112kB
USB	Yes	No	No
Data Logging	Yes	Yes	Yes
I/O Expansion	Yes	Yes NX3003 = max. 184 points NX3004 = max. 512 points NX3005 = max. 1024 points	Yes (max. 2048 points)

FEATURES COMPARISON

Features	750-8215	NX300X	NX30X0
Diagnostics Display	No	Yes	Yes
Integrated Power Supply	Yes	Yes	No
Ethernet	Yes	Yes	Yes
Web Server	Yes	Yes (NX3005)	No
Serial	RS-232 and RS-485	RS-485	RS-232 and RS-485
Memory Card Slot	Yes	No	Yes
Performance	?	6ns to 9ns / instruction	6ns / instruction
Functional Safety	?	Yes	Yes
Redundancy	?	No	Yes (NX3030)
Operating Temperature	0°C to 55°C– standard version -20°C to 60°C – extended temp. version (ambient)	0°C to 60°C	0°C to 60°C
DIN Rail Support	Yes	No	No

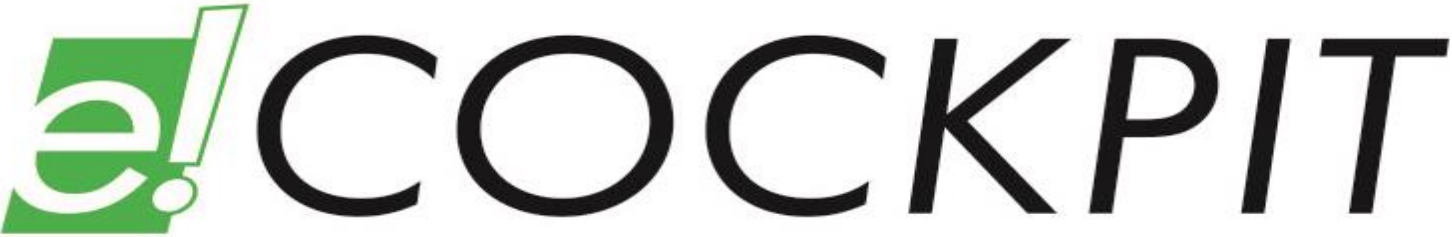
FEATURES COMPARISON

Features	e!Cockpit	MT8500 – Mastertool IEC XE
Hardware	750-8215	NX3XXX
Programming	ST, SFC, FBD, LD, IL, CFC	ST, SFC, FBD, LD, IL, CFC
Simulation	Yes	Yes
License	Free (with limitations)	Free for up to 320 points for NX300X and NX3010 CPUs
DeviceNet Scanner	No	No
Modbus TCP/RTU	Yes	Yes
ASCII	Yes	No
OPC DA/UA	Yes	Yes

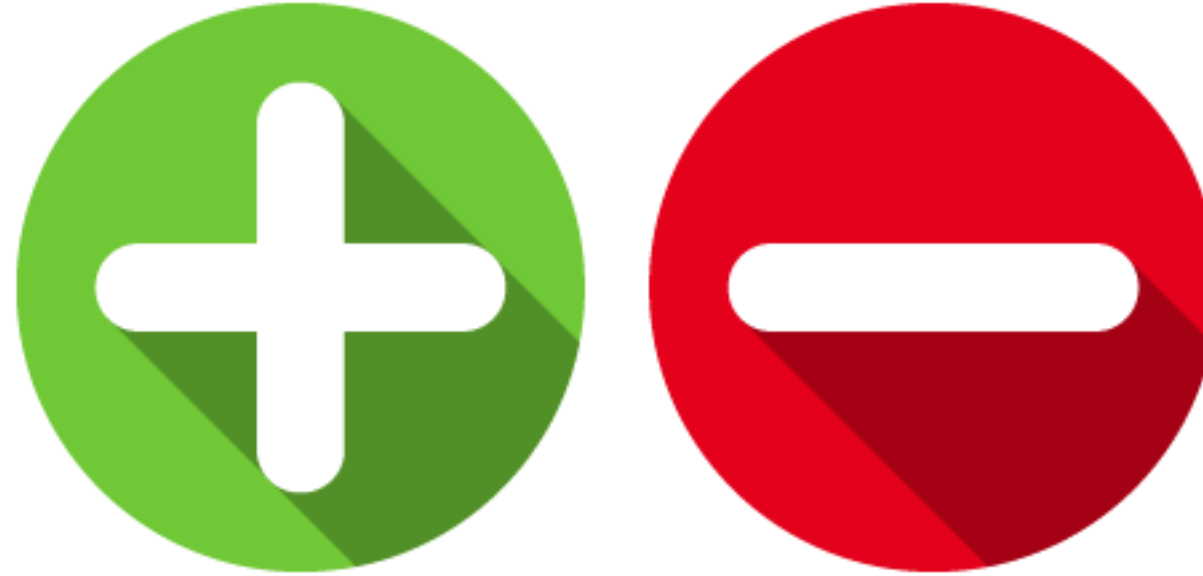


FEATURES COMPARISON

Features	e!Cockpit	MT8500 – Mastertool IEC XE
Hardware	750-8215	NX3XXX
Ethernet/IP	Yes	Yes
EtherCAT	Yes	No
CANopen	Yes	Yes
PROFIBUS	Yes	Yes
PROFINET	Yes	No (under development)
MQTT	Yes	Yes
Database	Yes	Yes



HIGHLIGHTS



Advantages:

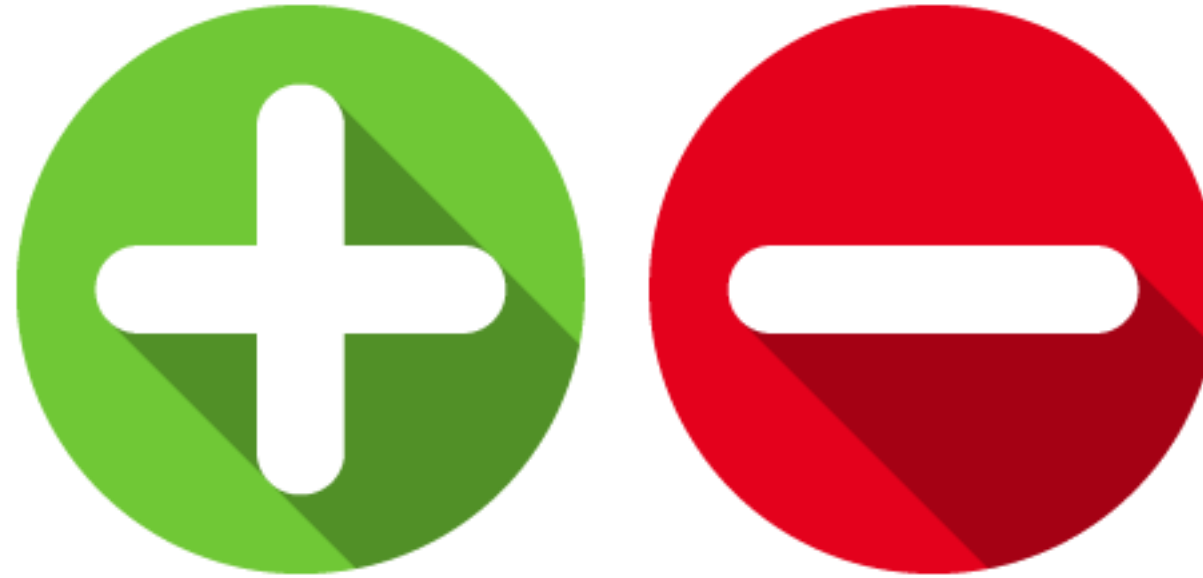
- Integrated Digital I/Os
- Integrated Fast I/Os
- Price
 - 750-8215 superior to NX300X
- Diagnostics Display

Disadvantages:

- Memory
 - 7,5x to 20x less memory
- Retentive Data
 - 1,15x to 17x less memory
- USB Port
- Integrated Power Supply
 - NX30X0 does not include
- Web Server
 - Only NX3005 includes
- Memory Card Slot
 - NX300X does not include
- DIN Rail Support
- ASCII
- CANopen
- PROFINET

Note: this comparison was made specifically with model 750-8215 from Wago's PFC200 Series. This Series has approximately 30 models, of which are not being considered here.

HIGHLIGHTS



Possible Advantages*:

- Integrated Power Supply (NX300X)
- Performance
- Functional Safety
- Redundancy

*advantages not verified due to the lack of information available on the competitor's technical documentation



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