

# Empowerful

Scalable modular PLC empowers you with complete control



# Control in your hands

**Flexible:** from medium to large systems, redundant or distributed

**Reliable:** high reliability for safety instrumented systems

**Smart:** accurate diagnostics and a compact design

**Efficient:** superior performance and easy to use



“

High performance with innovative features make Nexto Series the ideal solution for any automation and control system.



## The unique solution for your applications

Nexto Programmable Controllers Series is an advanced automation system able to control in a distributed and redundant way, complex industrial processes, high performance machines and production lines.

Integrating Distributed Control Systems (DCS') features, Nexto Series presents resources for all stages of your application life cycle with its integrated programming and configuration environment based on IEC 61131-3 standard, speeding up development and reducing engineering and commissioning costs.

Its architecture allows easy integration with traditional supervision systems, not to mention its high availability capability with redundancy of CPUs, power supplies, supervision and control networks and field buses. The Series offers advanced diagnostics and hot swapping, minimizing or eliminating downtime for maintenance and ensuring a continuous production process.

Improving even more its existing product line, Nexto Series counts on high reliability modules and specific editors for the development of applications with functional safety requirements in compliance to international standards.



# Flexible



## Superior Performance

The operating system of Nexto Series CPUs is multitasking and preemptive, enabling sophisticated applications and control of the processor's performance. The RISC 32-bit PowerPC processor combines high performance and lower power consumption. Therefore, there is no need for moving parts contributing to a higher MTBF (Mean Time Between Failures).

The processor can perform more than 145,000 Boolean instructions or even 200 PID loops per millisecond, complex arithmetics and advanced control features that are essential for the complete automation of machines and industrial process.

## High Connectivity

Nexto Series supports hardware and software to OPC DA, traditional networks and field bus protocols (MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, PROFIBUS-DP, IEC 60870-5-104 Server, EtherNet/IP and EtherCAT) through its integrated CPU communication interface ports. Yet, in cases of necessity users can develop their own protocols, allowing total integration with any industrial device.

## Availability and Security

For applications that cannot be stopped, Nexto Series has redundant CPUs and hot swapping of its modules, minimizing downtime for maintenance. The I/O module expansion feature without stopping the system enhances the Series.



### Network Variables

Smart and versatile, the Series CPUs have attributes that enable the creation of network variables. This feature enables the user to create, modify and share specific variables among several controllers connected to the network, which reduces the systems engineering time.

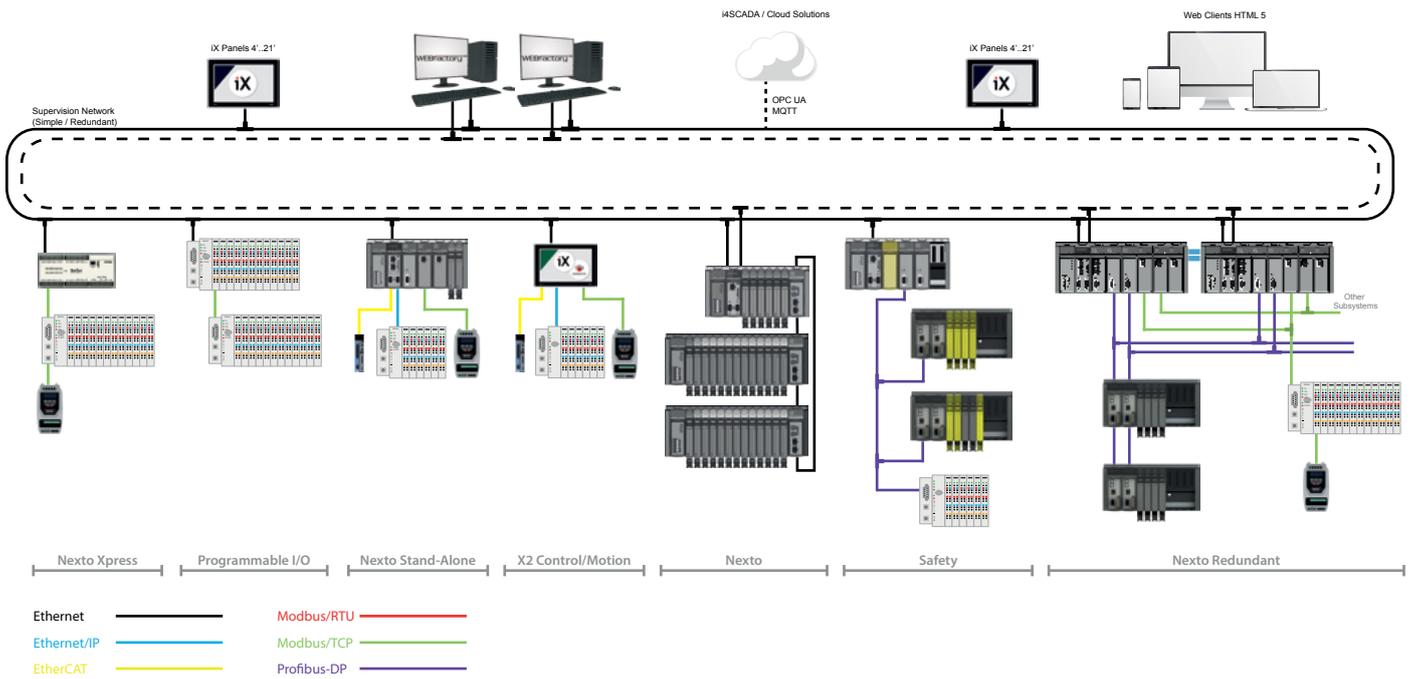
### Scalar Architecture

Based on deterministic Ethernet, the internal bus can be expanded to multiple remote backplane racks without performance loss.

One CPU is able to control up to 320 I/O on a single backplane; local backplane can be connected up to 24 remote backplanes.

Nexto Series is fully compatible with web services, such as:

- Web pages server for diagnostics, supervision and product updates
- User visualization web pages for realtime application data monitoring and control
- SNTP for time synchronization and SNMP for Ethernet network management



“ With its modular architecture, Nexto Series stands out for its flexibility, fitting to the exact size of your applications.



“ Rugged and with high performance, Nexto Jet is ideal for small and medium-sized applications.

### Nexto Jet

In addition of being a rugged equipment designed to meet the requirements of large applications, Nexto Series offers a combination of input and output modules ideal for distributed systems and medium-to-small-sized applications. Maintaining essential features found in other controllers of the series, Nexto Jet equipments stand out as the best cost effective solution for these types of demands. Compact, delivering high performance, the equipments can be also combined with the main products of the series, such as CPUs, backplane racks, communication and fieldbus modules.

### Nexto Series Powerful Features

Designed to use the main features of the popular Nexto Series in a smart way, Nexto Jet turns into a selection of input and output modules where requirements such as hot swapping and advanced functionalities such as OTD (One Touch Diag) and EPS (Easy Plug System) are no longer necessary. The result is a group of compact and economical modules capable of providing highly competitive solutions, with no loss of electrical characteristics such as isolation, performance and accuracy.

Being integrated to MasterTool IEC XE and using all Nexto Series CPUs, fieldbus masters and backplanes, the solution allows any application to be expanded using Nexto Series I/O modules, protecting the investment done on the automation system and offering technology updates and future improvements.

### I/O Modules

The solution is composed by a group of smart input and output modules with features that allow its use in a variety of applications. The digital I/O offering turn Nexto Jet into an extremely versatile solution, reliable and compact. Available on 16 points per module configuration, with 18 mm width each, the source-type digital outputs and sink/source inputs are optically isolated, perfect for operation at 24 Vdc.

On the other hand, the analog modules can be found in different versions, like input and output (I/O) for voltage



and current, temperature reading with RTD sensors (Resistance Temperature Detectors) and thermocouples. All of them offer individual configuration through channels, where MasterTool IEC XE can adjust parameters such as scales, sensors type and filters.

# Reliable



Nexto Series Programmable Controllers feature an exclusive solution of modules to be used in functional safety industrial applications. Designed with high technology and integrity for different types of applications, Nexto Safety solution has been created with the purpose of minimizing the probability of dangerous failures on the development of projects and manufacturing of products. Designed with the highest technology in safety and integrity for different types of applications, the modules have been designed to meet the most severe international failure analysis and standards.

## International Standards

There are different standards related to product development for applications with functional safety requirements. The main one is IEC 61508, that states in a widespread way the requirements and procedures necessary to the development of this type of products. Basically, this standard defines that, for systematic failures rate reduction, well structured procedures must be followed for product's conception, execution, verification and validation. It is understood that, by following this methodology, project failures rate can be considerably reduced.

For random failures the simple reduction process is not possible, therefore the standard covers hardware redundancy methodologies and monitoring techniques that make dangerous failures probability lower. In addition, IEC 61508 standard defines functional safety levels (SIL1, SIL2, SIL3 and SIL4) where each level is related to a maximum value of bearable dangerous failures. What defines the necessary SIL rating for each application is the level of risk to human and physical integrity. All products of Nexto Safety Solution allow up to SIL3 rating.

## Industrial Machines

Another highly used standard is ISO 13849-1, especially in regards to machine functional safety. Just like IEC 61508, ISO 13849-1 states allowed dangerous failures rates as well as the requirements of two consecutive failures. The Series products meet Category 4 performance level, called Cat 4. 4 PLe.



“ Nexto Safety Solution guarantees a new level in Safety.

#### I/O Digital Modules

NX2800 safety digital output module features PN outputs, allowing either the controlling of the output status to be made on the positive or the negative part of the load connection. This process ensures the output shutdown even in the case of failure detection in one of the triggering circuits or failures in the internal logic of the product.

In conventional digital output modules, there is no double activation for the outputs. The digital input module NX1800 offers many different specific diagnostics to avoid erroneous textures in case of mesh failures. The module counts on two output signal groups that feed the input values through safety switches and are responsible for continuous testing of the digital inputs. They can still work with several contact combinations, such as simple antivalent, double equivalent and anti-valent.

#### Interoperability and Protection to your Investment

Nexto Safety Solution products allow the use of conventional and safety equipments on the same backplanes and communication networks. This feature enables the implementation of a simpler project with backplanes, power supply, network interface and integrated programming tools, besides ensuring data exchange between the Safety and the conventional CPU in a safe way. The data integrity is guaranteed by the use of a secure protocol, which in the case of the products in scope, PROFIsafe protocol.

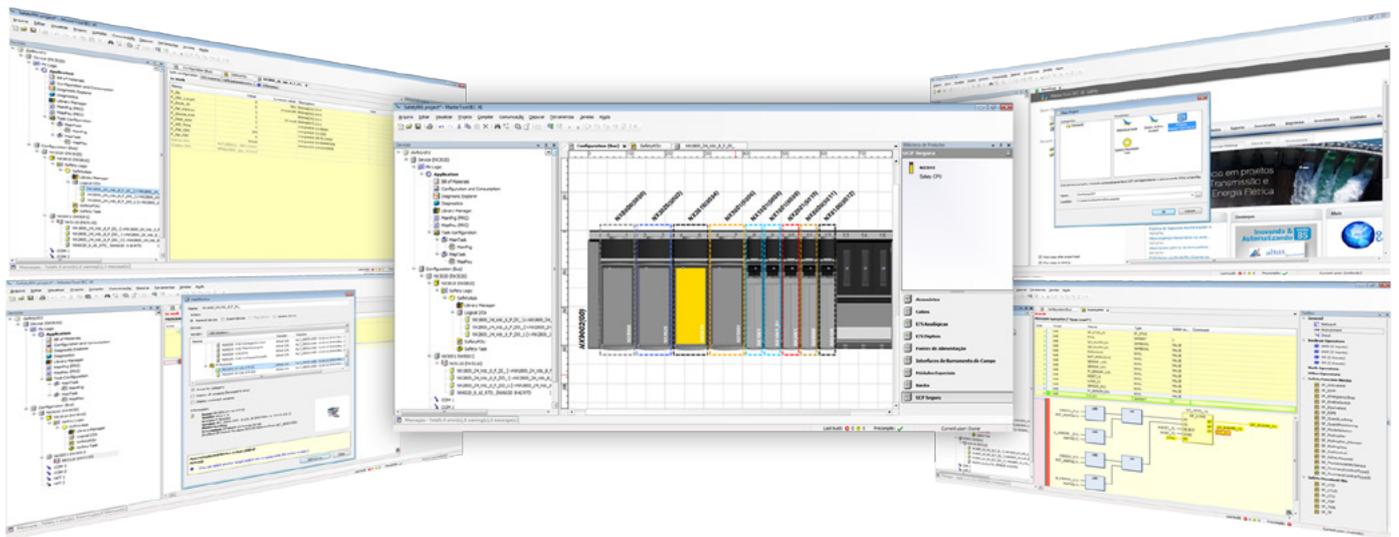




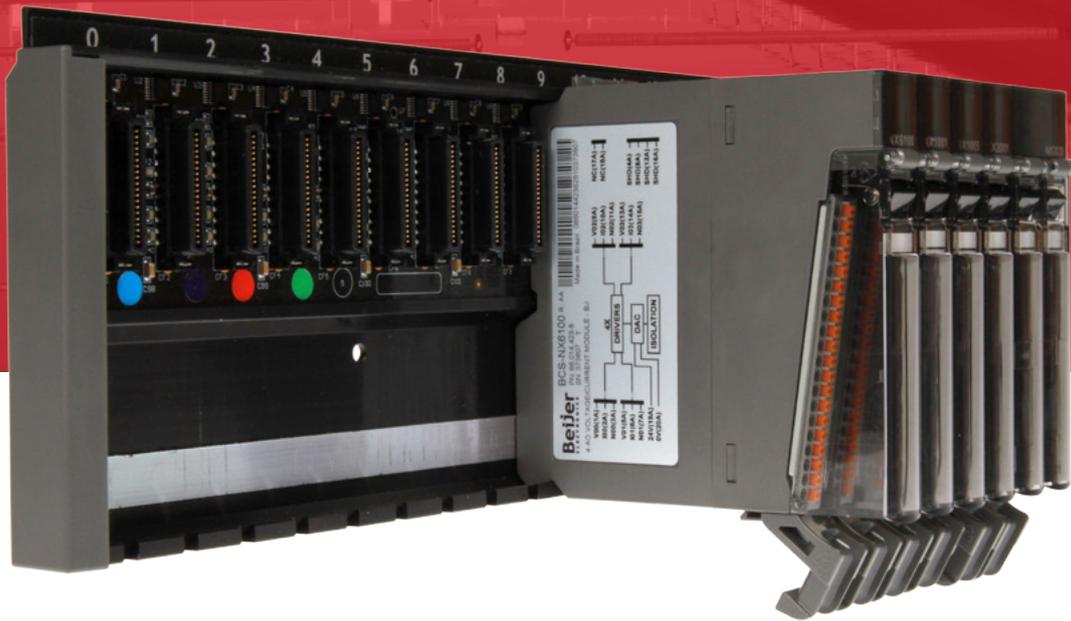
**PROFIsafe Communication**

PROFIsafe is the most used safety communication protocol in industrial automation segment. The protocol reduces the probability of upcoming errors on data transmission between a controller and a SIL I/O module. In safety mixed systems, PROFIsafe is capable of coexisting with other communication protocols, such as PROFIBUS-DP.

Nexto Safety Solution counts on two PROFIsafe slave modules, one with eight digital inputs (NX1800) and the other with four digital outputs (NX2800), in addition to a safety CPU (NX3810).



# Smart



## Practical and Modern

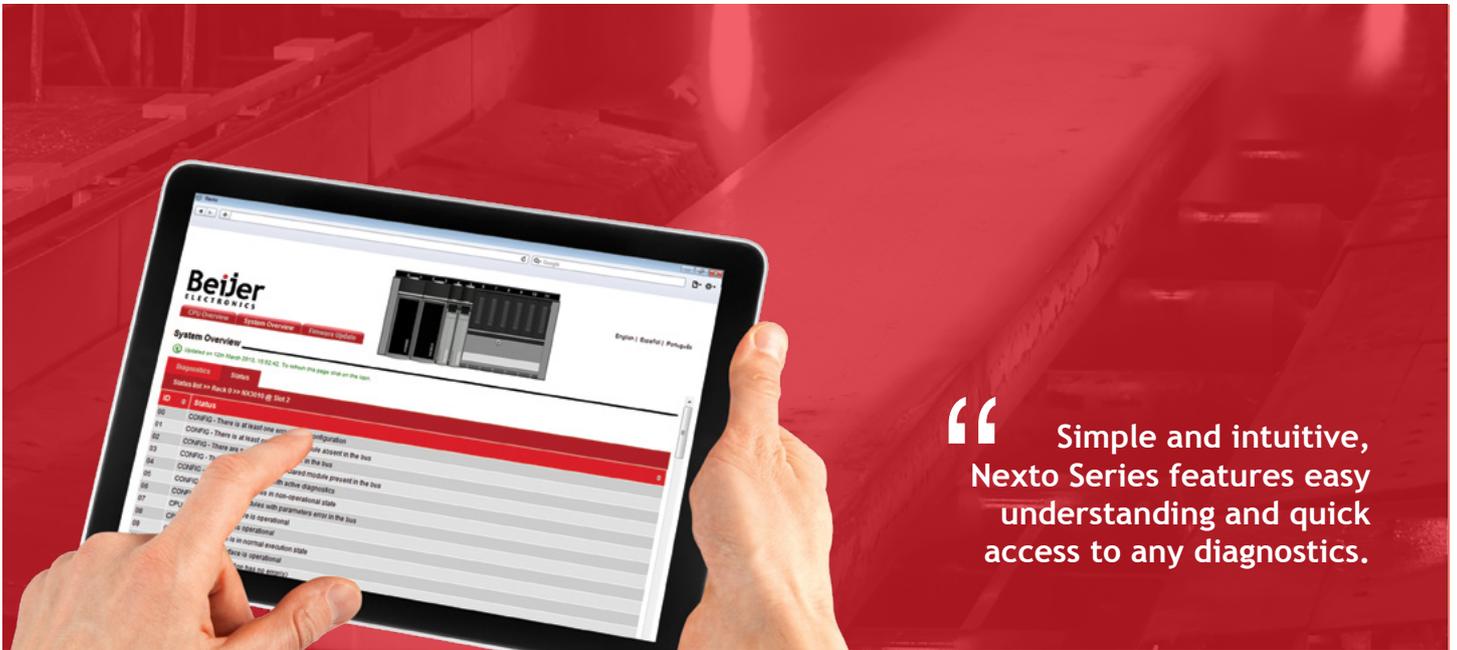
Easy Plug System (EPS) is a practical and safe terminal block insertion and extraction mechanism for input and output modules that exempts the use of auxiliary tools. Nexto Series offers a wide range of I/O, communication interfaces and special modules. Its compact and modular design optimizes the space in control cabinets through the Double Hardware Width (DHW). This feature allows a combination of 18 or 36 mm wide modules.



## Data Storage

The Multiple Block Storage (MBS) is a feature that brings different memories for program storage, commented source code, operands, retain data, log events and mass memory. This last one, made with miniSD card is used for user files, data application storage (data logging) and project documentation through the Onboard Full Documentation (OFD) feature, which speeds up the resolution of problems and ensures safety and reliability of the project information.





“ Simple and intuitive, Nexto Series features easy understanding and quick access to any diagnostics.

### Enhanced Diagnostics

The diagnostic button, located in each module, has the One Touch Diag (OTD) feature, which displays advanced system information, such as a short circuit in the outputs, IP address and alphanumeric tags, among others, assisting in commissioning activities and avoiding technical documents handling at the time of maintenance. In conjunction with the Electronic Tag on Display (ETD) functionality, it allows the I/O module visualization of alphanumeric tags on the CPU graphical display.

### Friendly to the Environment

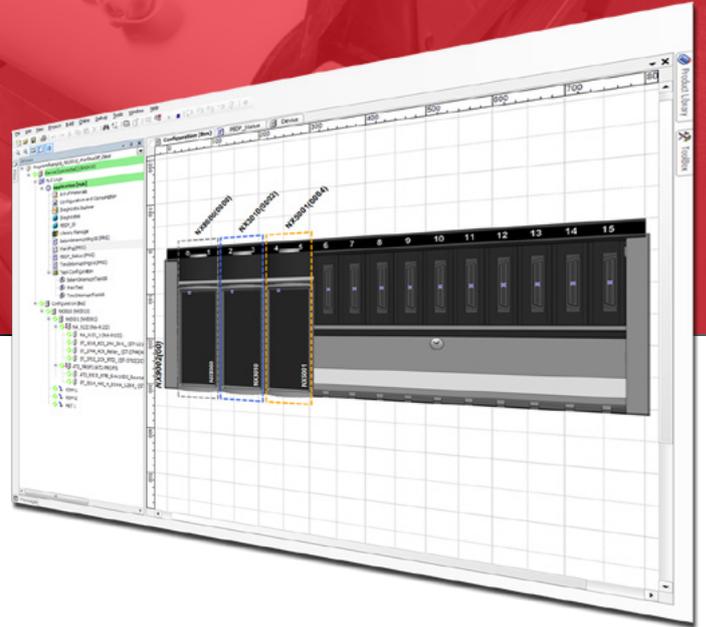
Eco friendly, Nexto has large retain memory, no internal batteries and real-time clock (RTC) with long endurance. All Nexto Series modules come with protection in the components and electronic boards (conformal coating), seeking superior service life even in harsh environments. It also does not use lead in the manufacturing process which makes it compatible with the European ROHS directive. These features were made possible by the BFO (Battery Free Operation) technology which consists in using hardware and software algorithms that eliminate the need for internal information retention by using batteries, thereby reducing the environmental impact in disposing of these elements.

### International Certifications

The high quality of Nexto Series is accredited by renowned technological institutes. In addition to being designed to meet the requirements established by European directives (CE), which allows its trade in the European Economic Area, the Series' products also bear important international certificates. Nexto Series' equipment are classified as NRAQ, granted by Underwriters Laboratories, according to the safety standards UL 61010-1 and UL 61010-2-201. It also holds the Type Approval certification, granted by DNV-GL Group, for marine applications.



# Efficient



### A Complete Tool

Nexto Series has a complete tool for programming, debugging, configuration and simulation of user applications: the BCS Tools. The software has resources for all stages of the life cycle of an automation and process control project, ensuring efficiency throughout the development, commissioning and maintenance.

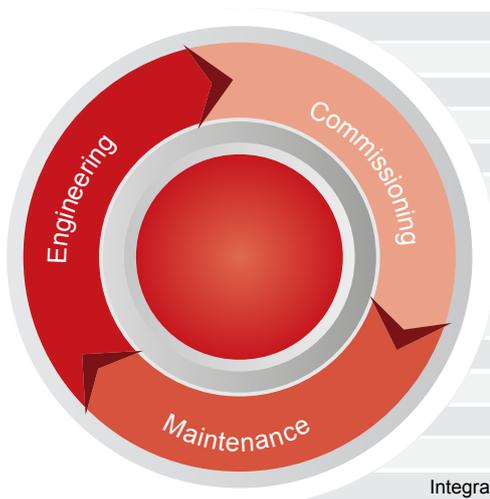
### Customizable Environment

The BCS Tools software comes with a modern and customizable interface due to available docking resources. Those resources allow the user to configure bars, tools and menu structure, providing a different development experience. Object-oriented, the programming is graphical and friendly, with advanced editing capabilities, integrating software application, field buses and other processes into a single interface.

### Advanced Features

Through this software, Nexto Series enables the development of advanced functions, such as variables process handling, mathematical functions, PID control blocks and timers. The Series is also able to reuse these functions in different applications through a sophisticated library function block system, optimizing productivity and minimizing development costs.

## Life Cycle of Automation and Process Control Projects



	Engineering	Commissioning	Maintenance
IEC 61131-3 Programming Languages	● ● ●	● ● ●	● ● ●
Source Code and Project File Storage	● ● ●	● ● ●	● ● ●
Code Reuse / User Library	● ● ●	● ● ●	● ● ●
Graphical Bus Configuration	● ● ●	● ● ●	● ● ●
Project Creation Wizards	● ● ●	● ● ●	● ● ●
Project Comparison	● ● ●	● ● ●	● ● ●
Simulation	● ● ●	● ● ●	● ● ●
Advanced Diagnostics	● ● ●	● ● ●	● ● ●
Customizable Environment	● ● ●	● ● ●	● ● ●
Project Cross-References	● ● ●	● ● ●	● ● ●
Variables Monitoring / Trace Functions	● ● ●	● ● ●	● ● ●
Online Application Changes	● ● ●	● ● ●	● ● ●
Users Management and Rights Access	● ● ●	● ● ●	● ● ●
Access and Information Log	● ● ●	● ● ●	● ● ●
Integrated Field Bus Communication and Configuration	● ● ●	● ● ●	● ● ●

### Easy Commissioning

Another advantage for the commissioning stage, offered by the configuration software, is the vast capacity for monitoring and forcing of digital and analog variables. The tool also features real-time data viewing and applications source code, as well as online editing download application. The trace functions allow the user to monitor internal variables directly into the controller in a graphical and practical way. This feature allows easy data viewing and application debugging without supervisory systems or other external programs.

### Quick Help

The configuration and programming complexity of programmable controllers based on IEC 61131-3 standards can be significantly reduced on Nexto Series, due to the complete group of assistance files with advices and descriptions of BCS Tools main features. This resource aims to guide and be used as a knowledge base to the user, while developing application logic or using some of the tool's functionality. In addition, help files are available in different languages, according to the software installation options.

### Documentation and Security of Applications

In order to achieve full control and maximum security over the system, BCS Tools allows full source-code storage, comments, tags and application project descrip-

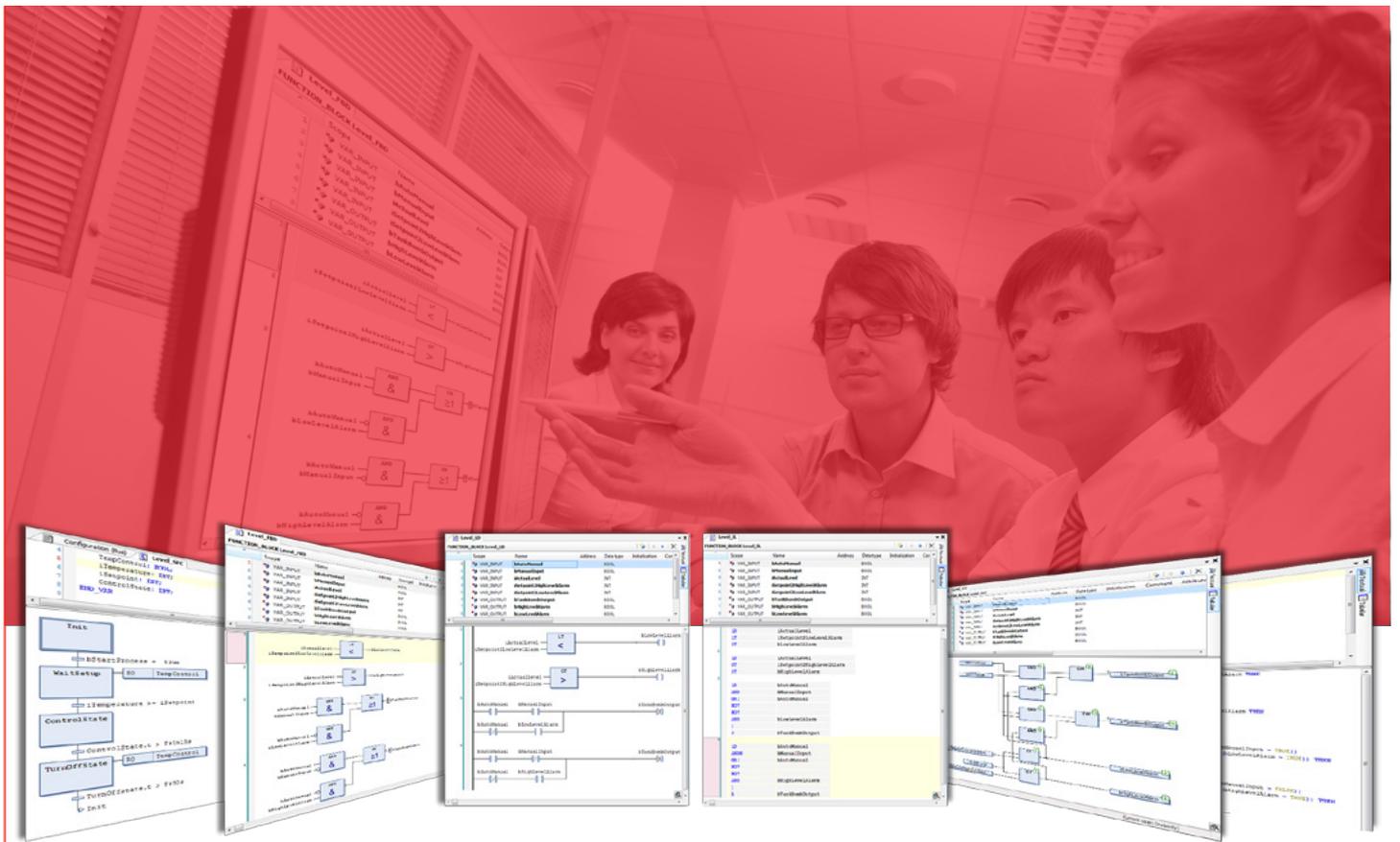
tions, in addition to different access levels to controllers and information through user login, user groups, passwords and specific access rights.

BCS Tools has two different mechanisms for application protection and security features, such as intellectual property protection and secure login on the controller. The first protects the user's intellectual property by allowing the user to save the entire project or specific files within the project by setting an access password. The second provides a way to protect the user's application from any unauthorized access. Thus, Nexto Series CPU will ask for a password before executing any command, such as stopping and programming the application or forcing exit points in a module.

### Integrated Configuration

Nexto Series integrates field bus configuration and standard communication protocols, such as PROFIBUS-DP and MODBUS to the programming tool. This feature allows users to define all configuration parameters in only one place, without using other software tools, speeding up development and reducing engineering costs. Besides, it is also possible to import and export configuration and other application information, enabling its use in other projects.





### Multilingual

Available in Portuguese and English, BCS Tools interface uses, after installation, the standard configured language on the computer's operational system, which can be changed without the need for software reinstallation.

### Simulation

BCS Tools offers a simulation tool which enables users to evaluate and test various project to its operation. It works in online mode (real time) and offline with no need of connection with the controller. In addition, error anticipation during planning and specification steps reduces risks of failures in engineering projects. The tool also enables possible modifications to be tested previously without interfering in the real system, avoiding accidents, damage to properties and the environment, not to mention loss of production or efficiency.

### WebServer Support

In order to give flexibility and agility to the development of medium and small applications, Nexto Series now counts on a WebServer feature that allows its users to create supervision and monitoring screens without the use of any SCADA. Available on NX3005 CPU, the tool is embedded in the controller's memory and can be accessed through a web browser from any device (PC, tablet or smartphone) connected to the network. Besides allowing the user to remotely control the system, this function represents significant cost reductions to the project, once it exempts the use of any equipment or software dedicated specifically to supervision.

### Programming Languages

The software allows the use of these different languages determined in IEC 61131-3 - both graphical and textual - in the same project, providing to the user a powerful way to organize the application, and reuse codes developed in previous solutions. It can convert the application among graphical languages and reuse them in other software versions. Among the graphics languages, the FBD (Function Block Diagram), CFC (Continuous Function Chart), SFC (Sequential Function Chart) and traditional LD (Ladder Diagram) stands out. The available textual languages are ST (Structured Text), a high-level industrial control language with common commands in structured languages, specific logical and mathematical operations, and IL (Instruction List), a low-level language, recommended for applications in which the timing requirement is important.



# Nexto Series

Type	Code	Communication Ports	Protocols	Bus Expansion	Embedded Power Supply	Memory Card	Redundancy
CPUs	BCS-NX3003 •	1x Serial (RS-485) 1x Ethernet TCP/IP	Standard protocols*	No	Yes	No	No
	BCS-NX3004	1x Serial (RS-485/RS-422) 1x Ethernet TCP/IP	Standard protocols*	1	Yes	No	No
	BCS-NX3005	1x Serial (RS-485/RS-422) 1x Ethernet TCP/IP	IEC 60870-5-104 Server, EtherNet/IP, WebServer and standard protocols*	up to 4	Yes	No	No
	BCS-NX3010	2x Serial (RS-232 e RS-485/RS-422) 1x Ethernet TCP/IP	EtherNet/IP and Standard protocols*	up to 8	No	Yes	No
	BCS-NX3020	2x Serial (RS-232 e RS-485/RS-422) 2x Ethernet TCP/IP	IEC 60870-5-104 Server, EtherNet/IP, EtherCAT and standard protocols*	up to 24	No	Yes	No
	BCS-NX3030	2x Serial (RS-232 e RS-485/RS-422) 2x Ethernet TCP/IP	IEC 60870-5-104 Server, EtherNet/IP, EtherCAT and standard protocols*	up to 24	No	Yes	Yes
Communication Modules	BCS-NX5000	10/100 Mbps Ethernet TCP/IP Module					
	BCS-NX5001	PROFIBUS-DP Master					
	BCS-NX5100	MODBUS TCP Head					
	BCS-NX5101	MODBUS TCP Head					
	BCS-NX5110 •	PROFIBUS-DP Head					
	BCS-NX5210	Redundant PROFIBUS-DP Head					
Input Modules	BCS-NX1001	24 Vdc 16 DI Module					
	BCS-NX6000	8 AI Voltage/Current Module					
	BCS-NX6010	8 AI Thermocouple Module					
	BCS-NX6020	4 AI RTD Module					
Output Modules	BCS-NX2001	24 Vdc 16 DO Transistor Module					
	BCS-NX2020	16 DO Relay Module					
Mixed I/O Modules	BCS-NX6100	4 AO Voltage/Current Module - 16 bits					
	BCS-NX1005	24 Vdc 8 DO Transistor / 8 DI Mixed Module					
Power Supply Modules	BCS-NX8000	30 W 24 Vdc Power Supply Module					
Racks	BCS-NX9010	8-Slot Backplane Rack (no hot swap)					
	BCS-NX9000	8-Slot Backplane Rack					
	BCS-NX9001	12-Slot Backplane Rack					
	BCS-NX9002	16-Slot Backplane Rack					
	BCS-NX9003	24-Slot Backplane Rack					
Nexto Jet Modules	BCS-NJ1001	24 Vdc 16 DI Module					
	BCS-NJ1005 •	8 DO 24 Vdc Transistor and 8 DI 24 Vdc Mixed Module					
	BCS-NJ6000	8 AI Voltage/Current Module - 16 bits					
	BCS-NJ6001 •	6 AI Voltage/Current Module - 12 bits					
	BCS-NJ6010	8 AI Thermocouple Module					
	BCS-NJ6011 •	4 AI Thermocouple Module					
	BCS-NJ6020	8 AI RTD Module					
	BCS-NJ2001	24 Vdc 16 DO Transistor Module					
	BCS-NJ6100	4 AO Voltage/Current Module - 16 bits					
	BCS-NJ6101 •	4 AO Voltage/Current Module - 12 bits					
Safety Modules (SIL3)	BCS-NJ6005 •	4 AO / 6 AI Mixed Module - 12 bits					
	BCS-NX3810 •	Functional Safety Module CPU					
	BCS-NX1800 •	24 Vdc 8 DI Functional Safety					
Special Modules	BCS-NX2800 •	24 Vdc 4 DO Functional Safety Transistor					
	BCS-NX4000	Bus Expansion Module					
Software	BCS-NX4010	Redundancy Link Module					
	BCS-Tools LITE	Programming software - Lite					
Accessories	BCS-Tools BASIC	Programming software - Basic					
	BCS-Tools PRO	Programming software - Professional					
	BCS-Tools ADV	Programming software - Advanced					
	BCS-NX9100	Left/Right Side Rack Ends					
	BCS-NX9101	8 Gb Memory Card, MicroSD with MiniSD Adapter					
	BCS-NX9102	Rack Connector Cover					
	BCS-NX9202	RJ45-RJ45 (2 m) Cable					
	BCS-NX9205	RJ45-RJ45 (5 m) Cable					
	BCS-NX9210	RJ45-RJ45 (10 m) Cable					
	BCS-NX9401	6 Position Connector					
BCS-NX9402	10 Position Connector						
BCS-NX9403	20 Position Connector						
BCS-NX9404	6 Position Connector with mounting						

• Available from 2018 Q3.

• Available from 2018 Q2.

\*Standard protocols: MODBUS RTU, MODBUS TCP, MODBUS TCP, MODBUS RTU/TCP, SNTP, SNMP and OPC DA.

## About Beijer Electronics

Beijer Electronics is a fast growing technology company with extensive experience of industrial automation and data communication. The company develops and markets competitive products and solutions that focus on the user. Since its start-up in 1981, Beijer Electronics has evolved into a multinational group present in 16 countries and sales of 1,200 MSEK 2010. The company is listed on the Nasdaq OMX Nordic Exchange Stockholm's Small Cap list under the ticker BELE.

[www.beijerelectronics.com](http://www.beijerelectronics.com)



Head office  
Beijer Electronics AB  
Box 426  
201 24 Malmö, Sweden

[www.beijerelectronics.com](http://www.beijerelectronics.com) | +46 40 358600

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