

Product Description

Nexto Series programmable controllers are the ultimate solution for industrial automation and system control. With high embedded technology, the products of the family are able to control, in a distributed and redundant way, complex industrial systems, machines, high performance production lines and the most advanced processes of Industry 4.0. Modern and high-speed, the Nexto series uses cutting-edge technology to provide reliability and connectivity, helping to increase the productivity of different businesses.

Compact, robust and with high availability, the series products have excellent processing performance and rack expansion possibilities. Its architecture allows easy integration with supervision, control and field networks, in addition to CPU and power supply redundancy. The family's equipment also offers advanced diagnostics and hot swapping, minimizing or eliminating maintenance downtime and ensuring a continuous production process.



Its main features are:

- 32 Kbytes of dots %I and 32 Kbytes of dots %Q
- Large memory capacity for user application and user data
- 64 Kbytes of retentive or persistent memory
- 32-bit high-speed processing
- Floating point unit
- 1 serial port
- 1 front panel Ethernet interface
- miniSD Card Interface
- Advanced Diagnostic Services
- System Message Log
- OPC DA/UA, PROFINET, SNMP and EtherNet/IP protocols
- Clock Synchronism via SNTP
- Web Server Resources
- One Touch Diag
- Compliance with international standard IEC 61131-3
- Real Time Clock (RTC)
- Compact and modern design
- Free of moving parts (fans, active coolers, etc.)

Purchase Data

Included Items

The product package contains the following items:

- NX3010 module
- Installation guide

Product Code

The following code should be used to purchase the product:

Code	Description
NX3010	High-speed CPU, 1 Ethernet port, 2 serial channels, memory card interface and remote rack expansion support

Table 1: Product Code

Related products

The following products must be purchased separately when necessary:

Code	Description
MT8500	MasterTool IEC XE
AL-2600	RS-485 network branch and terminator
AL-2306	RS-485 cable for MODBUS or CAN network
AL-2319	RJ45-RJ45 Cable
AL-1729	RJ45-CMDB9 Cable
AL-1748	CMDB9-CFDB9 Cable
AL-1752	CMDB9-CMDB9 Cable
AL-1753	CMDB9-CMDB25 Cable
AL-1754	CMDB9-CFDB9 Cable
AL-1761	CMDB9-CMDB9 Cable
AL-1762	CMDB9-CMDB9 Cable
AL-1763	CMDB9-Terminal Block Cable
AL-1766	CFDB9-Terminal Block Cable
NX9101	32 GB microSD memory card with miniSD and SD adapters
NX9202	RJ45-RJ45 2 m Cable
NX9205	RJ45-RJ45 5 m Cable
NX9210	RJ45-RJ45 10 m Cable
NX9000	8-Slot Backplane Rack
NX9001	12-Slot Backplane Rack
NX9002	16-Slot Backplane Rack
NX9003	24-Slot Backplane Rack
NX8000	30 W 24 Vdc Power Supply Module

Table 2: Related Products

Notes:

MT8500: MasterTool IEC XE is available in four different versions: LITE, BASIC, PROFESSIONAL and ADVANCED. For more details, please check MasterTool IEC XE User Manual - MU299609.

AL-2600: This module is used for branch and termination of RS-422/485 networks. For each network node, an AL-2600 is required. The AL-2600 that is at the ends of network must be configured with termination, except when there is a device with active internal termination, the rest must be configured without termination.

AL-2306: Two shielded twisted pairs cable without connectors, used for networks based on RS-485 or CAN.

AL-2319: Two RJ45 connectors for programming the CPUs of the Nexto Series and Ethernet point-to-point with another device with Ethernet interface communication.

AL-1729: RS-232C standard cable with one RJ45 connector and one DB9 male connector for communication between CPUs of the Nexto Series and other Altus products of the DUO Series, Piccolo Series and Ponto Series.

AL-1748: RS-232C standard cable with one DB9 male connector and one DB9 female connector for communication between CPUs of the Nexto Series and Altus products of the Cimrex Series.

AL-1752: RS-232C standard cable with two DB9 male connectors for communication between CPUs of the Nexto Series and Altus products of the H Series and iX series.

AL-1753: RS-232C standard cable with one DB9 male connector and one DB25 male connector for communication between CPUs of the Nexto Series and Altus products of the H Series.

AL-1754: RS-232C standard cable with one DB9 male connector and one DB9 female connector for communication between CPUs of the Nexto Series and Altus products of the Exter Series or Serial port, RS-232C standard, of a microcomputer.

AL-1761: RS-232C standard cable with two DB9 male connectors for communication between Nexto Series CPUs and Altus products of the AL Series.

AL-1762: RS-232C standard cable with two DB9 male connectors for communication between Nexto Series CPUs.

AL-1763: Cable with one DB9 male connector and terminal block for communication between CPUs of the Nexto Series and products with RS-485/RS-422 standard terminal block.

AL-1766: Cable with a female DB9 connector and terminals for communication between HMI P2 and Nexto Xpress/NX3003 controllers.

NX9202/NX9205/NX9210: Cables used for Ethernet communication and to interconnect the bus expansion modules.

Innovative Features

Nexto Series brings to the user many innovations regarding utilization, supervision and system maintenance. These features were developed focusing a new concept in industrial automation.



Battery Free Operation: Nexto Series does not require any kind of battery for memory maintenance and real time clock operation. This feature is extremely important because it reduces the system maintenance needs and allows the use in remote locations where maintenance can be difficult to be performed. Besides, this feature is environmentally friendly.



Easy Plug System: Nexto Series has an exclusive method to plug and unplug I/O terminal blocks. The terminal blocks can be easily removed with a single movement and with no special tools. In order to plug the terminal block back to the module, the frontal cover assists the installation procedure, fitting the terminal block to the module.



Multiple Block Storage: Several kinds of memories are available to the user in Nexto Series CPUs, offering the best option for any user needs. These memories are divided in volatile memories and non-volatile memories. For volatile memories, Nexto Series CPUs offer addressable input (%I), addressable output (%Q), addressable memory (%M), data memory and redundant data memory. For applications that require non-volatile functionality, Nexto Series CPUs bring retain addressable memory (%Q), retain data memory, persistent addressable memory (%Q), persistent data memory, program memory, source code memory, CPU file system (doc, PDF, data) and memory card interface.



One Touch Diag: One Touch Diag is an exclusive feature that Nexto Series brings to PLCs. With this new concept, the user can check diagnostic information of any module present in the system directly on CPU's graphic display with one single press in the diagnostic switch of the respective module. OTD is a powerful diagnostic tool that can be used offline (without supervisor or programmer), reducing maintenance and commissioning times.

OFD – On Board Full Documentation: Nexto Series CPUs are capable of storing the complete project documentation in its own memory. This feature can be very convenient for backup purposes and maintenance, since the complete information is stored in a single and reliable place.

ETD – Electronic Tag on Display: Another exclusive feature that Nexto Series brings to PLCs is the Electronic Tag on Display. This new functionality brings the process of checking the tag names of any I/O pin or module used in the system directly to the CPU's graphic display. Along with this information, the user can check the description, as well. This feature is extremely useful during maintenance and troubleshooting procedures.

DHW – Double Hardware Width: Nexto Series modules were designed to save space in user cabinets or machines. For this reason, Nexto Series delivers two different module widths: Double Width (two backplane rack slots are required) and Single Width (only one backplane rack slot is required). This concept allows the use of compact I/O modules with a high-density of I/O points along with complex modules, like CPUs, fieldbus masters and power supply modules.

High-speed CPU: All Nexto Series CPUs were designed to provide an outstanding performance to the user, allowing the coverage of a large range of applications requirements.



iF Product Design Award 2012: Nexto Series was the winner of iF Product Design Award 2012 in industry + skilled trades group. This award is recognized internationally as a seal of quality and excellence, considered the Oscars of the design in Europe.

Product characteristics

General features

	NX3010
Backplane rack occupation	2 posições sequenciais
Power supply integrated	No
Ethernet TCP/IP local interface	1
Serial Interface	2
CAN Interface	No
USB Port Host	No
Memory Card Interface	Yes
Real time clock (RTC)	Yes 1 ms resolution, max. variation of 2 seconds per day.
Watchdog	Yes
Status and diagnostic Indication	Graphic display LEDs Web pages CPU internal memory
Programming languages	Structured Text (ST) Ladder Diagram (LD) Function Chart Sequencing (SFC) Function Block Diagram (FBD) Function Continuous Chart (CFC)
Tasks	Cyclic (periodic) Event-triggered (software interrupt) External event-triggered (hardware interrupt) Continuous (free running) State-triggered (software interrupt)
Online changes	Yes
Maximum number of tasks	16
Maximum number of expansion bus	8
Bus expansion redundancy support	Yes
Maximum number of I/O modules on the bus	128
Maximum number of additional Ethernet TCP/IP interface modules	0
Ethernet TCP/IP interface redundancy support	No
Maximum number of PROFIBUS-DP network (using master modules PROFIBUS-DP)	1
PROFIBUS-DP network redundancy support	No
Redundancy support (half-clusters)	No
Hot Swap support	Yes
Event oriented data reporting (SOE)	No
Protocol	-
Maximum Event Queue Size	-
Web pages development (available through the HTTP protocol)	No
One Touch Diag (OTD)	Yes





	NX3010
Electronic Tag on Display (ETD)	Yes
Standards	
IEC 61131-3	Yes
DNV-GL Type Approval – DNVGL-CG-0339 (TAA000013D)	Yes
IEC 61131-2	Yes
 CE – 2014/35/EU (LVD) and 2014/30/EU (EMC)	Yes
 RoHS – 2011/65/EU	Yes
 UL Listed – UL61010-1 (file E473496)	Yes
 EAC – CU TR 004/2011 (LVD) and CU TR 020/2011 (EMC)	Yes

Table 3: Common Features

Notes:

Real Time Clock (RTC): The retention time, time that the real time clock will continue to update the date and time after a CPU power down, is 15 days for operation at 25 °C. At the maximum product temperature, the retention time is reduced to 10 days.

Maximum number of I/O modules on bus: The maximum number of I/O modules refers to the sum of all modules on the local bus and expansions.

Memory

	NX3010
Addressable input variables memory (%I)	32 Kbytes
Addressable output variables memory (%Q)	32 Kbytes
Direct representation variable memory (%M)	16 Kbytes
Symbolic variable memory	4 Mbytes
Maximum amount of memory configurable as retentive or persistent	64 Kbytes
Full Redundant Data Memory	-
Direct representation input variable memory (%I)	-
Direct representation output variable memory (%Q)	-
Direct representation variable memory (%M)	-
Symbolic variable memory	-
Program memory	4 Mbytes

	NX3010
Source code memory (backup)	40 Mbytes
User files memory	16 Mbytes

Table 4: Memory

Protocols

	NX3010	Interface
Open Protocol	Yes	COM1/COM2
MODBUS RTU Master	Yes	COM1/COM2
MODBUS RTU Slave	Yes	COM1/COM2
MODBUS TCP Client	Yes	NET1
MODBUS TCP Server	Yes	NET1
MODBUS RTU via TCP Client	Yes	NET1
MODBUS RTU via TCP Server	Yes	NET1
CANopen Master	No	-
CANopen Slave	No	-
CAN low level	No	-
SAE J-1939	No	-
OPC DA Server	Yes	NET1
OPC UA Server	Yes	NET1
EtherCAT Master	No	-
SNMP Agent	Yes	NET1
DNP3 Server (Event-oriented data)	No	-
IEC 60870-5-104 Server	No	-
EtherNet/IP Scanner	Yes	NET1
EtherNet/IP Adapter	Yes	NET1
MQTT Client	Yes	NET1
SNTP Client (for clock synchronism)	Yes	NET1
PROFINET Controller	Yes	NET1
PROFINET Device	No	-

Table 5: Protocols

Note:

PROFINET Controller: Enabled for use on a simple (not ring) network with up to 8 devices. For larger applications, consult technical support.

Serial Interfaces

COM 1


COM 1	
Connector	Shielded female DB9
Physical interface	RS-232C
Modem signals	RTS, CTS, DCD
Baud rate	200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Isolation Logic to Serial Port Serial Port to protection earth 	Not isolated 1000 Vac / 1 minute

Table 6: COM 1 Serial Interface Features

COM 2


COM 2	
Connector	Shielded female DB9
Physical interface	RS-422 or RS-485 (depending on the selected cable)
Communication direction	RS-422: full duplex RS-485: half duplex
RS-422 maximum transceivers	11 (1 transmitter and 10 receivers)
RS-485 maximum transceivers	32
Termination	Yes (optional via cable selection)
Baud rate	200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Isolation Logic to Serial Port Serial Port to protection earth 	1000 Vac / 1 minute 1000 Vac / 1 minute

Table 7: COM 2 Serial Interface Features

Notes:

Physical interface: Depending on the configuration of the used cable, it's possible to choose the kind of physical interface: RS-422 or RS-485. The list of cables can be found at [Related products](#) section.

RS-422 maximum transceivers: It's the maximum number of RS-422 interfaces that can be used on the same bus.

RS-485 maximum transceivers: It's the maximum number of RS-485 interfaces that can be used on the same bus.

Ethernet interfaces

NET 1

	NET 1
Connector	Shielded female RJ45
Auto crossover	Yes
Maximum cable length	100 m
Cable type	UTP or ScTP, category 5
Baud rate	10/100 Mbps
Physical layer	10/100 BASE-TX (Full Duplex)
Data link layer	LLC (Logical Link Control)
Network layer	IP (Internet Protocol))
Transport layer	TCP (Transmission Control Protocol) UDP (User Datagram Protocol)
Diagnostic	LEDs - green (speed), yellow (link/activity)
Isolation Ethernet interface to Se- rial Port	1500 Vac / 1 minute

Table 8: Ethernet NET 1 Interface Features

Memory Card Interface

	Memory Card
Maximum Capacity	32 Gbytes
Minimum Capacity	2 Gbytes
Type	MiniSD
File System	FAT32
Remove card safely	Yes, by pressing MS switch

Table 9: Memory Card Interface Features

Notes:

Maximum Capacity: The memory card capacity must be less than or equal to this limit for correct operation on Nexto CPU, otherwise the Nexto CPU may not detect the memory card or even present problems during data transfer.

Minimum Capacity: The memory card capacity must be greater than or equal to this limit for correct operation on Nexto CPU, otherwise the Nexto CPU may not detect the memory card or even present problems during data transfer.

File System: It is recommended to format the memory card using the Nexto CPU, otherwise it may result in performance loss in the memory card interface.

Environmental Characteristics

	NX3010
Current consumption on the power supply rail	800 mA
Dissipation	4 W
Operating temperature	0 to 60 °C
Storage temperature	-25 to 75 °C
Relative humidity	5% to 96%, non-condensing
Conformal coating	Yes
IP Level	IP 20
Module dimensions (W x H x D)	36,00 x 114,63 x 115,30 mm
Package dimensions (W x H x D)	44,00 x 122,00 x 147,00 mm
Weight	350 g
Weight with package	400 g

Table 10: Environmental Characteristics

Notes:

Conformal coating of electronic circuits: The covering of electronic circuits protects internal parts of the product against moisture, dust and other harsh elements to electronic circuits.

Performance

Instruction	Language	Variables	Instruction Times (μs)
1000 Contacts	LD	BOOL	6
1000 Divisions	ST	INT	43
		REAL	81
	LD	INT	43
		REAL	81
1000 Multiplications	ST	INT	15
		REAL	23
	LD	INT	15
		REAL	23
1000 Sums	ST	INT	15
		REAL	23
	LD	INT	15
		REAL	23
1000 PID	ST	REAL	< 5000

Table 11: Instruction Times

Compatibility with Other Products

To develop an application for Nexto Series CPUs, it is necessary to check the version of MasterTool IEC XE. The following table shows the minimum version required (where the controllers were introduced) and the respective firmware version at that time:

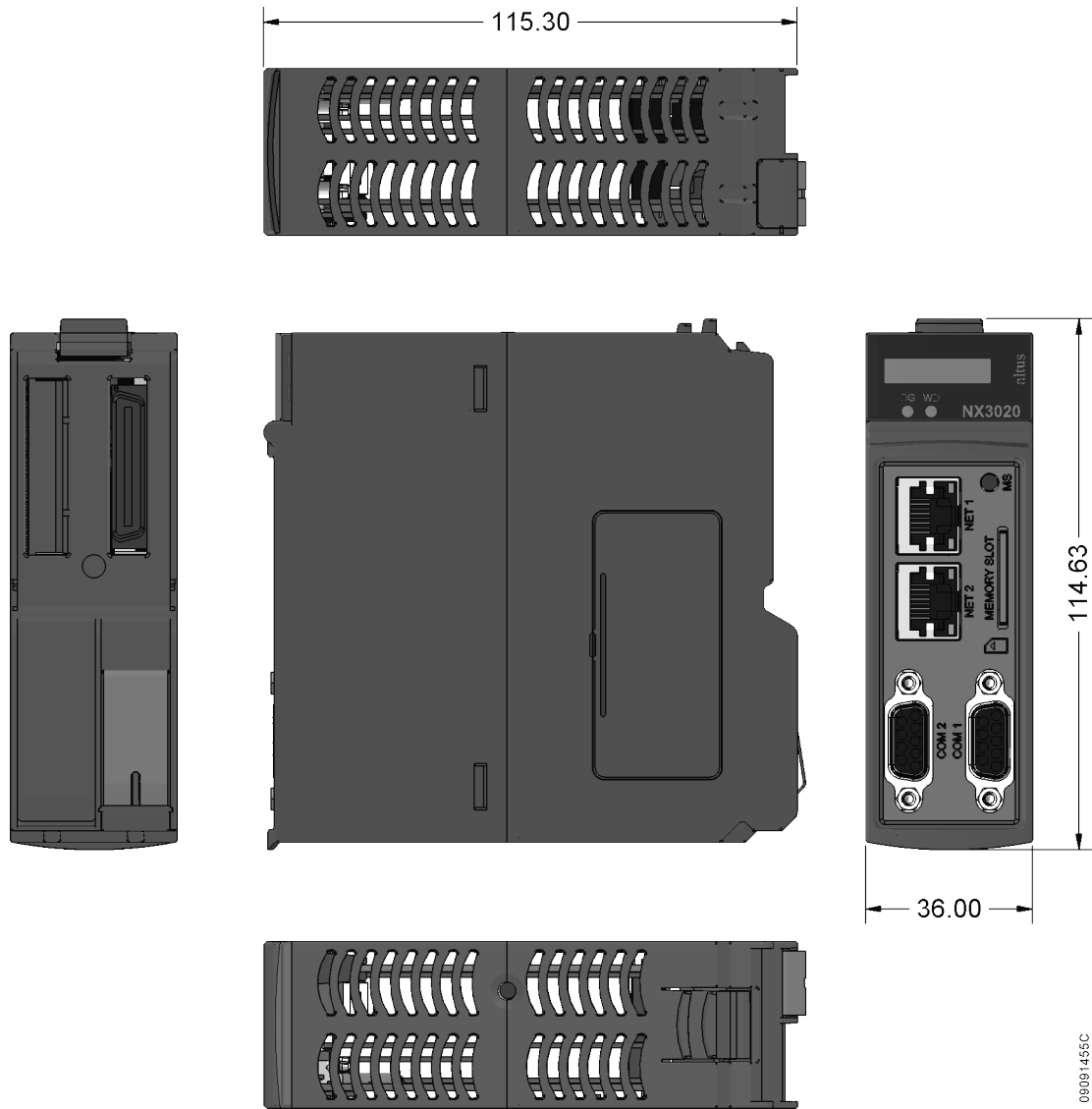
Nexto Series CPUs	MasterTool IEC XE	Firmware version
NX3010, NX3020, NX3030	1.00 to 2.09	1.2.0.9 to 1.7.0.14
NX3010, NX3020, NX3030	3.00 or above	1.8.3.0 or above

Table 12: Compatibility with other products

Additionally, along the development roadmap of MasterTool IEC XE some features may be included (like special Function Blocks, etc...), which can introduce a requirement of minimum firmware version. During the download of the application, MasterTool IEC XE checks the firmware version installed on the controller and, if it does not meets the minimum requirement, will show a message requesting to update. The latest firmware version can be downloaded from Altus website, and it is fully compatible with previous applications.

Physical Dimensions

Dimensions in mm.



06091455C

Figure 1: CPU Physical Dimensions

Manuals

For the correct application and use, the CPU NX3010 Series User Manual – MU214105 must be consulted.

For more technical details, configuration, installation and programming of Nexto Series, see the table below. This table is just a guide to some relevant documents that can be useful during the use, maintenance and programming of Nexto Series controllers. The complete and updated table containing all Nexto Series documents can be found at Nexto Series User Manual – MU214600.

Code	Description	Language
CE114000	Nexto Series – Technical Characteristics	English
CT114000	Série Nexto – Características Técnicas	Portuguese
CS114000	Serie Nexto – Características Técnicas	Spanish
CE114100	NX3010 Technical Characteristics	English
CT114100	Características Técnicas NX3010	Portuguese
CS114100	Especificaciones y Configuraciones NX3010	Spanish
CE114200	NX8000 Power Supply Module Technical Characteristics	English
CT114200	Características Técnicas Fonte de Alimentação NX8000	Portuguese
CS114200	Características Técnicas del Fuente de Alimentación NX8000	Spanish
CE114700	Nexto Series Backplane Racks Technical Characteristic	English
CT114700	Características Técnicas dos Bastidores da Série Nexto	Portuguese
CS114700	Características Técnicas de los Bastidores de la Serie Nexto	Spanish
CE114810	Nexto Series Accessories for Backplane Rack Technical Characteristics	English
CT114810	Características Técnicas Acessórios para Bastidor Série Nexto	Portuguese
CS114810	Características Técnicas del Cierres Laterales para el Bastidor	Spanish
CE114902	Nexto Series PROFIBUS-DP Master Technical Characteristics	English
CT114902	Características Técnicas do Mestre PROFIBUS-DP da Série Nexto	Portuguese
CS114902	Características Técnicas del Módulo Profibus-DP Maestro	Spanish
CE114903	Nexto Series Ethernet Module Technical Characteristics	English
CT114903	Características Técnicas Módulo Ethernet Série Nexto	Portuguese
CS114903	Características Técnicas del Modulo Ethernet Série Nexto	Spanish
CE114908	NX5110 and NX5210 PROFIBUS-DP Heads Technical Characteristics	English
CT114908	Características Técnicas Interfaces Cabeça PROFIBUSDP NX5110 e NX5210	Portuguese
CS114908	Especificaciones y Configuraciones PROFIBUS-DP Interfaz Cabezas NX5110 y NX5210	Spanish
MU214600	Nexto Series User Manual	English
MU214000	Manual de Utilização Série Nexto	Portuguese
MU214613	NX3010 CPU User Manual	English
MU214101	Manual de Utilização UCP NX3010	Portuguese
MU299609	MasterTool IEC XE User Manual	English
MU299048	Manual de Utilização MasterTool IEC XE	Portuguese
MP399609	MasterTool IEC XE Programming Manual	English
MP399048	Manual de Programação MasterTool IEC XE	Portuguese
MU214601	NX5001 PROFIBUS DP Master User Manual	English
MU214001	Manual de Utilização Mestre PROFIBUS-DP NX5001	Portuguese
MU214608	Nexto PROFIBUS-DP Head Utilization Manual	English
MU214108	Manual de Utilização da Cabeça PROFIBUS-DP Nexto	Portuguese
MU214603	Nexto Series HART Manual	English

Code	Description	Language
MU214610	Advanced Control Functions User Manual	English
NAP151	Utilização do Tunneller OPC	Portuguese
NAP165	Comunicação OPC UA com Controladores ALTUS	Portuguese
NAP165_ing	OPC UA Communication with ALTUS Controllers	English

Table 13: Related Documents