1. Product Description

The Nexto XF is a powerful Programmable Logic Controller (PLC), belonging to the family of controllers and I/O modules of the Nexto Series. The Nexto XF provides high-speed processing power in a compact design with integrated I/O, easily expandable with external I/O modules. There are several options available, allowing you to choose the best solution regardless of the complexity of the application.

This product portfolio targets small, medium and distributed control systems, offering models with a range of options of I/O integrated points that includes digital and analog inputs and outputs concentrated in a single controller, including analog inputs and outputs. For additional I/O needs, the system can be easily expanded through expansion modules coupled to the high-speed bus (refer to Related Products section). Additionally, the number of I/O points can be further increased through remote (distributed) I/O devices communicating via protocols such as CANopen, EtherNet/IP, PROFINET, EtherCAT, and MODBUS.

The Nexto XF is suitable for small to medium applications and remotely distributed I/O. It can be used in applications such as infrastructure, building and factory automation (food, textile, packaging, general machinery), water and wastewater treatment and numerous OEM solutions. Integrated solutions of firewall and VPN adds security to ensure data integrity and reduce risks associated to cybersecurity threats. Additionally, the controller is an ideal solution to complement large applications along with the Nexto Series portfolio, extending the range of applications using the same technology and engineering environment. This is a significant advantage for OEMs and system integrators with different range of applications needs and scales.

Key features include:

- Compact and modern design
- DIN rail mounting
- High-speed bus I/O expansion
- High-performance 64-bit Dual-Core ARM processor
- Two 10/100 Mbps Ethernet interfaces with protocols such as OPC UA, EtherNet/IP, PROFINET, EtherCAT, MODBUS, and MQTT (complete list in this document)
- Web service (Webvisu)
- Docker Engine
- Firewall and VPN
- CAN interface (CANopen and J1939)
- RS-485 interface (ModBus-RTU, Master/Slave)
- High I/O density (up to 44 integrated I/O points in the controller)
- Opto-isolated digital inputs
- Encoder inputs (quadrature)
- Opto-isolated transistor digital outputs
- PTO outputs
- Dedicated analog voltage and current inputs
- Analog voltage or current outputs
- Memory card (microSD)
- USB host port (V2.0)
- LEDs for I/O status indication and diagnostics
- Real-time clock (RTC)
- Retentive memory
- Compliance with international standard (IEC 61131-3)
- Fanless cooling (no moving parts)
- Battery-free
- Conformal coating

2. Ordering Information

2.1. Included Itens

The product packaging includes the following items:

- CLP module with integrated I/O XF3xx
- 40-pin connector
- 20-pin connector
- 3-pin connector
- 2 x 4-pin connectors
- Nexto XF bus terminator
- CPU embedded I/O cable cover

2.2. Product Code

The following code should be used to purchase the product:

Code	Description
XF300-B	High-speed compact PLC with 16 digital inputs, 16 transistor digital outputs, 2 Ethernet ports, 1 RS-485 port, 1 CAN port, USB Host, and microSD card. Support for basic protocols only.
XF300	High-speed compact PLC with 16 digital inputs, 16 transistor digital outputs, 2 Ethernet ports, 1 RS-485 port, 1 CAN port, USB Host, and microSD card.
XF315	High-speed compact CLP with 16 digital inputs, 16 transistor digital outputs, 6 current analog inputs, 4 voltage analog inputs, 2 Ethernet ports, 1 RS-485 port, 1 CAN port, USB Host, and microSD card.
XF325	High-speed compact PLC with 16 digital inputs, 16 transistor digital outputs, 6 current analog inputs, 4 voltage analog inputs, 2 analog outputs (V/I), 2 Ethernet ports, 1 RS-485 port, 1 CAN port, USB Host, and microSD card.
XF325-W	High-speed compact PLC with 16 digital inputs, 16 transistor digital outputs, 6 current analog inputs, 4 voltage analog inputs, 2 analog outputs (V/I), 2 Ethernet ports, 1 RS-485 port, 1 CAN port, USB Host, microSD card and user web page support.

Table 1: Nexto XF Controller Models

3. Related Products

The following products must be purchased separately when necessary:

Code	Description
MT9000	Mastertool X
NX9202	RJ45-RJ45 2 m Cable
NX9205	RJ45-RJ45 5 m Cable
NX9210	RJ45-RJ45 10 m Cable
AL-2600	RS-485 network branch and terminator
AL-2306	RS-485 cable for MODBUS or CAN network
NX9101	32 GB microSD memory card with miniSD and SD adapters
AL-1766	CFDB9-Terminal Block Cable
FBS-USB-232M9	Universal USB-Serial converter cable / 2m
XP900	TP-Link nano Wireless 150 Mbps USB Adapter TL-WN725N (only available in Brazil)
AMJG0808	Simple cable RJ45-RJ45 2 m
TLE3-21100	Gateway IoT Industrial
XF101	24Vdc 16 DI module
XF201	24Vdc 16 DO transistor module
XF600	6 AI voltage/current module 12bit
XF610	8 AI thermocouple module
XF620	8 AI RTD module
XF700	4 AO voltage/current module 12bit
XF900	Nexto XF bus terminator
XF901	CPU embedded I/O cable cover
XF902	I/O module cable cover

Table 2: Related Products

Notas:

NX92xx: Cable for programming the CPUs of the Nexto Series and Ethernet point-to-point with another device with ethernet interface communication.

AL-2600: This module is used for branch and termination of RS-485 networks. For each network node, an AL-2600 is required. The AL-2600 that are at the ends of network must be configured with termination, except when there is a device with active external 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-1766: Cable with a female DB9 connector and terminals for communication between HMI P2 and Nexto XF controller.

FBS-USB-232M9: Cable for use as a USB-Serial converter on the USB interface of XF controllers.

AMJG0808: Cable for programming the CPUs.

4. Product Features

4.1. General Features

	XF300-B XF300	XF315	XF325	XF325-W
Digital inputs	16 (9 fast)			
Digital outputs	16 (8 fast)			
Max. number of high-speed counters	3			
Max. number of external interruptions	9			
Max. number of PTO outputs	3			
Max number of VFO/PWM outputs	8			
Analog voltage inputs	-	4	4	4
Analog current inputs	-	6	6	6
Analog V/I outputs	-	-	2	2
Ethernet TCP / IP interface	2			
RS-485 serial interface	1			
CAN interface	1			
USB Host port	1			
User web pages (Webvisu)	No			Yes
Docker engine	No		Yes	
FTP	Yes			
Firewall	Yes			
VPN	Yes			
Maximum number of tasks	24			
Max number of I/O expansion modules supported	10			
Max number of I/O expansion modules supported with additional power supply expansion	32			
Ethernet interface redundancy support	Yes			
Programming languages	Structured Text (ST) Ladder Diagram (LD) Sequential Function Chart (SFC) Function Block Diagram (FBD) Continuous Function Chart (CFC)			
Online changes	Yes			
Watchdog	Yes			
Status and diagnosis	LEDs, web page and internal CPU memory			
Real-time clock (RTC)	Yes 1 ms resolution, max. variation of 3 seconds per day, retention time of 7 days.			
Isolation				
Protective earth ⏚ to all	1000 Vdc / 1 minute (700 Vac / 1 minute)			
Logic/RS-485/CAN/USB to all	1000 Vdc / 1 minute (700 Vac / 1 minute)			
Ethernet to all	1000 Vdc / 1 minute (700 Vac / 1 minute)			
Power supply to all	1000 Vdc / 1 minute (700 Vac / 1 minute)			
Analog I/O to all	1000 Vdc / 1 minute (700 Vac / 1 minute)			
Digital inputs to all	1000 Vdc / 1 minute (700 Vac / 1 minute)			
Digital inputs group I0x to I1x	1000 Vdc / 1 minute (700 Vac / 1 minute)			

Digital outputs to all	1000 Vdc / 1 minute (700 Vac / 1 minute)
Maximum power dissipation	6 W
Maximum wire size	0.5 mm^2 (20 AWG) with ferrule 1.5 mm^2 (16 AWG) without ferrule
Minimum wire temperature rating	75 °C
Wire material	Copper only
IP level	IP 20
Conformal coating	Yes
Operating temperature	-20 to 60 °C
Storage temperature	-40 to 70 °C
Operating and storage relative humidity	10% to 95%, non-condensing
Vibration resistance (IEC 60068-2-6, sinus)	3.5 mm from 5 to 8.4 Hz 1 G from 8.4 to 500 Hz 10 sweeps each axis, 1 octave per minute
Shock resistance (IEC 60068-2-27, half-sine)	15 G for 11 ms, 6 shocks in each of 3 axis
Product dimensions (W x H x D)	100,0 x 115,5 x 111,0 mm (without cable cover)
Package dimensions (W x H x D)	107,4 x 132,9 x 130,5 mm
Weight	500,0 g
Weight with package	550,0 g

Table 3: General Features

Notes:

Maximum number of tasks: This value represents the maximum number of user and system tasks. Detailed description of possible user tasks can be found in the Project Profiles section of the User Manual.

Isolation: The term *Logic* refers to internal interfaces, such as processors, memories and USB, Serial and CAN communication interfaces.

Conformal coating: Conformal coating protects the electronic components inside the product from moisture, dust and other harsh elements to electronic circuits.

4.2. Standards and Certifications

Standards and Certifications	
IEC	61131-2: Industrial-process measurement and control - Programmable controllers - Part 2: Equipment requirements and tests 61131-3: Programmable controllers - Part 3: Programming languages
	DNV Type Approval – DNV-CG-0339
	2014/30/EU (EMC) 2014/35/EU (LVD) 2011/65/EU and 2015/863/EU (ROHS)
	S.I. 2016 No. 1091 (EMC) S.I. 2016 No. 1101 (Safety) S.I. 2012 No. 3032 (ROHS)
	UL/cUL Listed – UL 61010-1 UL 61010-2-201 UL 121201 (Class 1 Div 2)

Table 4: Standards and Certifications

4.3. Memory

	XF300-B XF300	XF315	XF325	XF325-W
Addressable input variables memory (%I)	64 KB			
Addressable output variables memory (%Q)	64 KB			
Direct representation variable memory (%M)	32 KB			
Symbolic variable memory	10 MB			
Program memory	32 MB			
Total memory **Program memory +** **Source code memory (backup) +** **Webvisu files memory**	256 MB			
Retain/persistent memory	128 KB			
User files memory **Memory of the CPU +** **Docker Memory**	256 MB + 4 GB			

Table 5: Memory

4.4. Performance

Instruction	Language	Variable Type	Time (μs)
1000 Contacts	LD	BOOL	2.1
1000 Divisions	LD, ST	INT	9.2
		REAL	17.0
1000 Multiplications	LD, ST	INT	6.4
		REAL	8.2
1000 Sums	LD, ST	INT	4.4
		REAL	8.2

Table 6: Instruction Times

4.5. Protocols

		Interface
Open protocol	✓	COM 1 / USB
MODBUS RTU master	✓	COM 1
MODBUS RTU slave	✓	COM 1
MODBUS TCP client	✓	NET 1 / NET 2
MODBUS TCP server	✓	NET 1 / NET 2
MODBUS RTU over TCP client	✓	NET 1 / NET 2
MODBUS RTU over TCP server	✓	NET 1 / NET 2
CANopen master	✓	CAN
CANopen slave	×	CAN
CAN low level	✓	CAN
SAE J1939	✓	CAN
OPC DA server	✓	NET 1 / NET 2 / USB
OPC UA server	✓	NET 1 / NET 2 / USB
EtherCAT master	✓	NET 1 / NET 2
SNMP agent	✓	NET 1 / NET 2 / USB
IEC 60870-5-104 server	×	-
EtherNet/IP scanner	✓	NET 1 / NET 2
EtherNet/IP adapter	✓	NET 1 / NET 2
MQTT client	✓	NET 1 / NET 2 / USB
SNTP client (clock synchronism)	✓	NET 1 / NET 2 / USB
PROFINET controller	✓	NET 1 / NET 2
PROFINET device	×	-
OpenVPN client	✓	NET 1 / NET 2 / USB
OpenVPN server	✓	NET 1 / NET 2 / USB
FTP server	✓	NET 1 / NET 2 / USB
RSTP	✓	NET 1 / NET 2
MRP	✓	NET 1 / NET 2

Table 7: Protocols

Notes:

USB: The use of a Serial Converter, WiFi Adapter or 3G/4G Modem is necessary.

PROFINET Controller: Enabled for use in a single-path network (without ring) with up to 8 devices. For larger applications, please consult technical support.

4.6. RS-485 Interface

	RS-485
Conector	4-pin terminal block (D+, D-, GND and shield)
Interface física	RS-485 bus
RS-485 max. transceivers	32
Termination	Yes (through mechanical switch)
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Isolation	
Logic to serial port	1000 Vac / 1 minute
Serial port to protection earth ⏚	1000 Vac / 1 minute

Table 8: RS-485 Serial Interface Features

4.7. CAN Interface

	CAN
Conector	4-pin terminal block (H, L, GND and shield)
Physical interface	CAN bus
Supported standards	CAN 2.0A 2.0B (11-bit and 29-bit identifiers)
Max. number of nodes	64
Termination	Yes (through mechanical switch)
Taxa de transmissão	10, 20, 50, 100, 125, 250, 500, 800, 1000 kbit/s
Isolation	
Logic to CAN	1000 Vac / 1 minute
CAN to protection earth ⏚	1000 Vac / 1 minute

Table 9: CAN Interface Features

4.8. Memory Card Interface

The memory card can be used for different data to be stored such as user logs, project documentation and source files.

	Memory Card
Maximum Capacity	32 GB
Minimum Capacity	2 GB
Type	MicroSD
File System	FAT32
Remove card safely	Yes (via button)

Table 10: 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.

4.9. USB Interface

	USB
Conector	USB A female
Physical interface	USB V2.0
Baud rate	1.5 Mbps (Low-Speed), 12 Mbps (Full-Speed) and 480 Mbps (Hi-Speed)
Maximum current	500 mA
Supported devices	Mass storage USB RS-232 serial converter USB 3G/4G modem USB WiFi adapter
Isolation **Logic to USB** **USB to protection earth** ⏚	 Not isolated 1000 Vac / 1 minute

Table 11: USB Interface Features

Attention:

The CPU supports the use of only one USB device at a time. Devices such as USB hubs are not supported.

4.9.1. List of Supported Devices

4.9.1.1. RS-232 Converter

Controller	Manufacturer
FT232	FTDI
PL2303	Prolific

Table 12: Supported USB to RS-232 converters

4.9.1.2. 3G/4G Modem

Model	Manufacturer	Type	Remarks
E303	Huawei	Bridge	-
E3272	Huawei	Bridge	-
E3276	Huawei	Bridge	-
E8372	Huawei	Router	The redirection of the configuration web page (button *Open Modem Page*) is not compatible with this model. Router configuration must be done externally on a PC.

Table 13: Supported USB modems

4.9.1.3. WiFi Adapter

Chipset	Manufacturer	Example of comercial products
RTL8188EU	Realtek	TP-LINK model TL-WN725N LM Technologies model LM007
RT28xx	Ralink/Mediatek	D-Link model DWA-125
AR9271	Atheros/Qualcomm	TP-LINK model TL-WN721N

Table 14: Supported chipsets for USB WiFi adapters

4.10. Ethernet Interface

	Ethernet
Interfaces	NET1 and NET2
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
Data link layer	LLC
Network layer	IP
Transport layer	TCP (Transmission Control Protocol) UDP (User Datagram Protocol)
Operation mode	Single / NIC Teaming / Switch
Diagnostics	LED (Link/Activity)
Isolation **Ethernet interface to logic** **Ethernet interface to ethernet interface** **Ethernet interface to protection earth** ⏚	 1000 Vac / 1 minute 1000 Vac / 1 minute 1000 Vac / 1 minute

Table 15: Ethernet Interface Features

4.11. Power Supply

	Power supply
Nominal input voltage	24 Vdc
Input voltage	18 to 30 Vdc
Maximum input current	1.35 A at 24 Vdc
Maximum in-rush current	15 A for 1 ms
Maximum interruption time	10 ms at 18 Vdc
Number of I/O modules suported by integrated power supply	10
Input protections	Polarity reversal Overvoltage Short-circuit (fuse) Overload and short-circuit on the I/O module bus
Isolation **Input to logic** **Input to protective earth** ⏚	 1000 Vac / 1 minute 1000 Vac / 1 minute

Table 16: Power Supply Features

4.12. Digital Inputs

	Digital inputs
Number of inputs	7
Type of inputs	Opto-isolated, sink/source
Connector identification	I00 to I06
Input voltage	24 Vdc 15 to 30 Vdc for logic level 1 0 to 5 Vdc for logic level 0
Input impedance	4.95 kΩ
Max. input current	6.2 mA at 30 Vdc
Input status indication	Yes
Response time	0.4 ms
Input filter	Disabled or configurable by software from 2 ms to 255 ms
Isolation **Input to logic** **Input to protective earth** ⏚	 1000 Vac / 1 minute 1000 Vac / 1 minute

Table 17: Digital Inputs Features

Nota:

Input Filter: The filter sampling is performed in the MainTask (or update function), so it is recommended to use values that are multiples of the task interval.

4.13. Fast Digital Inputs

	Fast digital inputs
Number of fast inputs	9
Type of fast inputs	Opto-isolated sink/source
Maximum number of fast counters	3 (Increment/Decrement, A-pulse, B-direction, and Z-zero)
Maximum number of encoders	3 (Quadrature A, B e Z)
Max. number of external interrupts	9 (Rise, Fall or Both)
Connector identification	I07 a I15
Input voltage	24 Vdc 15 to 30 Vdc for logic level 1 0 to 5 Vdc for logic level 0
Input impedance	3.9 kΩ
Max. input current	7.3 mA at 30 Vdc
Configuration mode	**Modes for 1 input:** Standard digital input External interrupt **Modes for 3 inputs:** Quadrature/Counter 0 (I07, I08 e I09) Quadrature/Counter 1 (I10, I11 e I12) Quadrature/Counter 2 (I13, I14 e I15)

	Fast digital inputs
Direction control for counting	Only through hardware
Edge detection for counting input	Rising edge, active at logic level 1 – default (support alternative settings)
Data format	32-bit signed integers
Operation limit	From -2,147,483,648 to 2,147,483,647
Max. input frequency	250 kHz
Min. pulse width **@ 24 Vdc**	 2 μs
Isolation **Input to logic** **Input to protective earth** ⏚	 1000 Vac / 1 minute 1000 Vac / 1 minute

Table 18: Characteristics of Fast Digital Inputs

4.14. Digital Outputs

	Digital outputs
Number of outputs	8
Type of outputs	Transistor switch, opto-isolated, source
Connector identification	Q00 to Q07
Max. current	1.5 A per output (single) 6 A total
Leakage current	35 μA
Output resistance	100 mΩ
External power supply	19.2 to 30 Vdc
Switching time	0.4 μs - off-to-on transition at 24 Vdc 1 μs - on-to-off transition at 24 Vdc
Max. switching frequency	250 Hz
Configurable parameters	Yes
Output status indication	Yes (LED)
Output protections	Yes (against voltage surges)
Isolation **Output to logic** **Output to protective earth** ⏚	 1000 Vac / 1 minute 1000 Vac / 1 minute

Table 19: Characteristics of Digital Outputs

Notes:
Switching time: The time required to turn off an output depends the applied load.

4.15. Fast Digital Outputs

	Fast digital outputs	
Number of outputs	8	
Output type	Transistor switch, opto-isolated, source	
Connector identification	Q08 to Q15	
Max. number of PTO outputs	3	
Max. number of VFO/PWM outputs	8 (if not using PTO) 7 (when using 1 PTO) 6 (when using 2 PTOs) 5 (when using 3 PTOs)	
Maximum current	0 to 500 Hz: 1,5A per output (6.0 A total) 500 to 250 KHz: 0.5 A per output	
Pulse generation maximum frequency	250 kHz from 20 mA	
Minimum pulse width at 24 Vdc	Minimum load	Minimum pulse width
	1,2 k Ω	500 ns
Output status indication	Yes (LED)	
Protections	Voltage surge (TVS)	
Operating voltage	19.2 to 30 Vdc	
Output impedance	200 mΩ	
Output modes	Standard output VFO/PWM PTO (only Q08, Q09 e Q14)	
Software managed functions	PTO	VFO/PWM
	Writing the number of pulses to be generated; Writing the number of acceleration and deceleration pulses; Start/end outputs operation; Fast outputs diagnostics; Fast outputs monitoring state.	Writing the frequency value to be generated (1 Hz to 250 kHz); Writing of outputs duty cycle (1% to 100%); Start/end of outputs operations; Fast outputs diagnostics.
Isolation **Output to logic** **Output to protective earth ⏚**	 1000 Vac / 1 minute 1000 Vac / 1 minute	

Table 20: Characteristics of Fast Digital Outputs

4.16. Analog Inputs

	Analog inputs
Number of inputs	10 (with 6 current and 4 voltage)
Type of input	Dedicated as voltage or current, single-ended, configured individually
Data format	16 bits in two's complement, left-justified
Converter resolution	12 bits monotonicity guaranteed, no missing codes
Conversion time	400 μs (all channels enabled)
Channel status indication	Yes (LED)
Protections	Yes, protection against surge voltage and polarity inversion
Isolation **Channel to logic** **Channel to protective earth** ⏚	 1000 Vac / 1 minute 1000 Vac / 1 minute

Table 21: Characteristics of Analog Inputs

	Voltage input		
Input range	Range	Engineering Scale	Resolution
	0 to 10 Vdc	0 to 30,000	2.52 mV
Precision	±0.3 % of full scale @ 25 °C ± 0.010 % of full scale / °C		
Over scale	3 % of full scale		
Maximum input voltage	14 Vdc		
Input impedance	21 kΩ		
Configurable parameters	Filters		
Low pass filter time constant	100 ms, 1 s, 10 s or disabled		

Table 22: Characteristics of Voltage Analog Inputs

	Current input		
Input ranges	Range	Engineering Scale	Resolution
	0 to 20 mA	0 to 30,000	5.03 μA
	4 to 20 mA	0 to 30,000	5.03 μA
Precision	±0.3 % of full scale at 25 °C ± 0.015 % of full scale / °C		
Over scale	3 % of full scale		
Maximum input current	30 mA		
Input impedance	119 Ω		
Configurable parameters	Filters, open loop value		
Low pass filter time constant	100 ms, 1 s, 10 s or disabled		

Table 23: Current Input Mode Features

4.17. Analog Outputs

	Analog outputs
Number of outputs	2
Output type	Voltage or current output, individually configured
Data format	16 bits in two's complement, justified to the left
Converter resolution	12 bits monotonicity guaranteed, no missing codes
Update time	400 μs (all outputs enabled)
Channel status indication	Yes (LED)
Protections	Yes, protection against surge voltage and polarity inversion
Isolation	
Channel to logic	1000 Vac / 1 minute
Channel to protective earth ⏚	1000 Vac / 1 minute

Table 24: Analog Outputs Features

	Voltage output mode		
Output ranges	Range	Engineering Scale	Resolution
	0 to 10 V	0 to 30,000	2.52 mV
Precision	±0.3 % of full scale at 25 °C ± 0.010 % of full scale / °C		
Stabilization time	4 ms		
Over scale	3% of full scale		
Load impedance	$>$ 1 kΩ		
Configurable parameters	Signal type per output (voltage or current)		

Table 25: Voltage Output Mode Features

	Current output mode		
Output ranges	Range	Engineering Scale	Resolution
	0 to 20 mA	0 to 30,000	5.03 μA
	4 to 20 mA	0 to 30,000	5.03 μA
Precision	±0.3 % of full scale at 25 °C ± 0.015 % of full scale / °C		
Stabilization time	4 ms		
Over scale	3% of full scale		
Load impedance	$<$ 600 Ω		
Configurable parameters	Signal type per output (voltage ou current)		

Table 26: Current Output Mode Features

Notes:

Output ranges: When configured as 4 to 20 mA, the output can be set to values below 4 mA by assigning negative values to the output variable (-7,500 for 0 mA).

5. Installation

5.1. Product Identification

This product has some parts that must be observed before installation and use. The following figure identifies each of these parts.

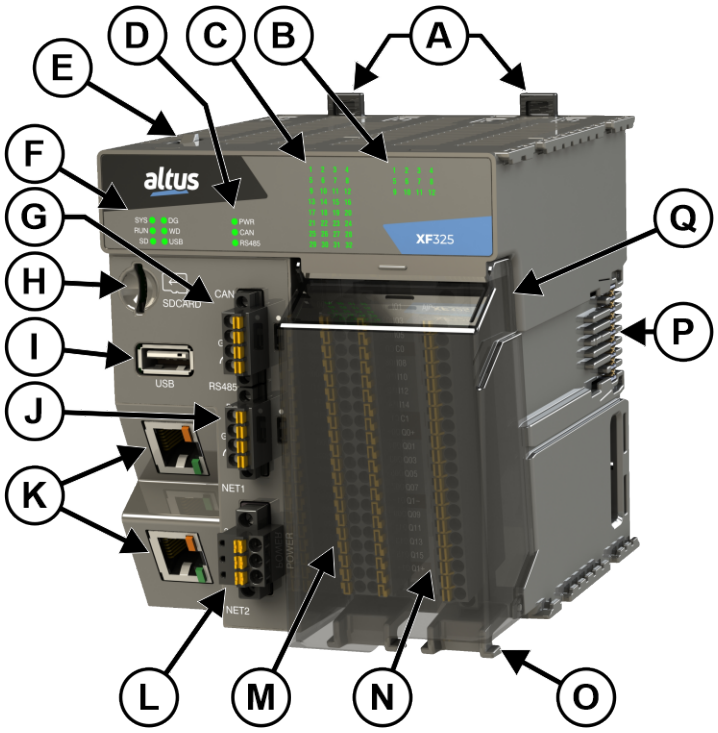

Figure 1: XF325

Ⓐ DIN rail mounting latch.
Ⓑ Status LEDs for embedded analog I/O.
Ⓒ Status LEDs for embedded digital I/O.
Ⓓ Status LEDs for PSU, CAN interfaces, and RS-485.
Ⓔ Button.
Ⓕ CPU status LEDs.
Ⓖ 4-terminal connector for CAN interface and termination switch.
Ⓗ SD card slot.
Ⓘ USB device port.
Ⓙ 4-terminal connector for RS-485 interface and termination switch.
Ⓚ RJ45 ethernet connectors.
Ⓛ 3-terminal connector for power input.
Ⓜ 40-terminal connector for embedded digital I/O.
Ⓝ 20-terminal connector for embedded analog I/O (not available for the XF300).
Ⓞ Support for holding the I/O cable.
Ⓟ Slice connection for expansion modules.
Ⓠ CPU embedded I/O cable cover.

5.2. Electrical Installation

Danger

When performing any installation in an electrical panel, ensure that the power supply is TURNED OFF.

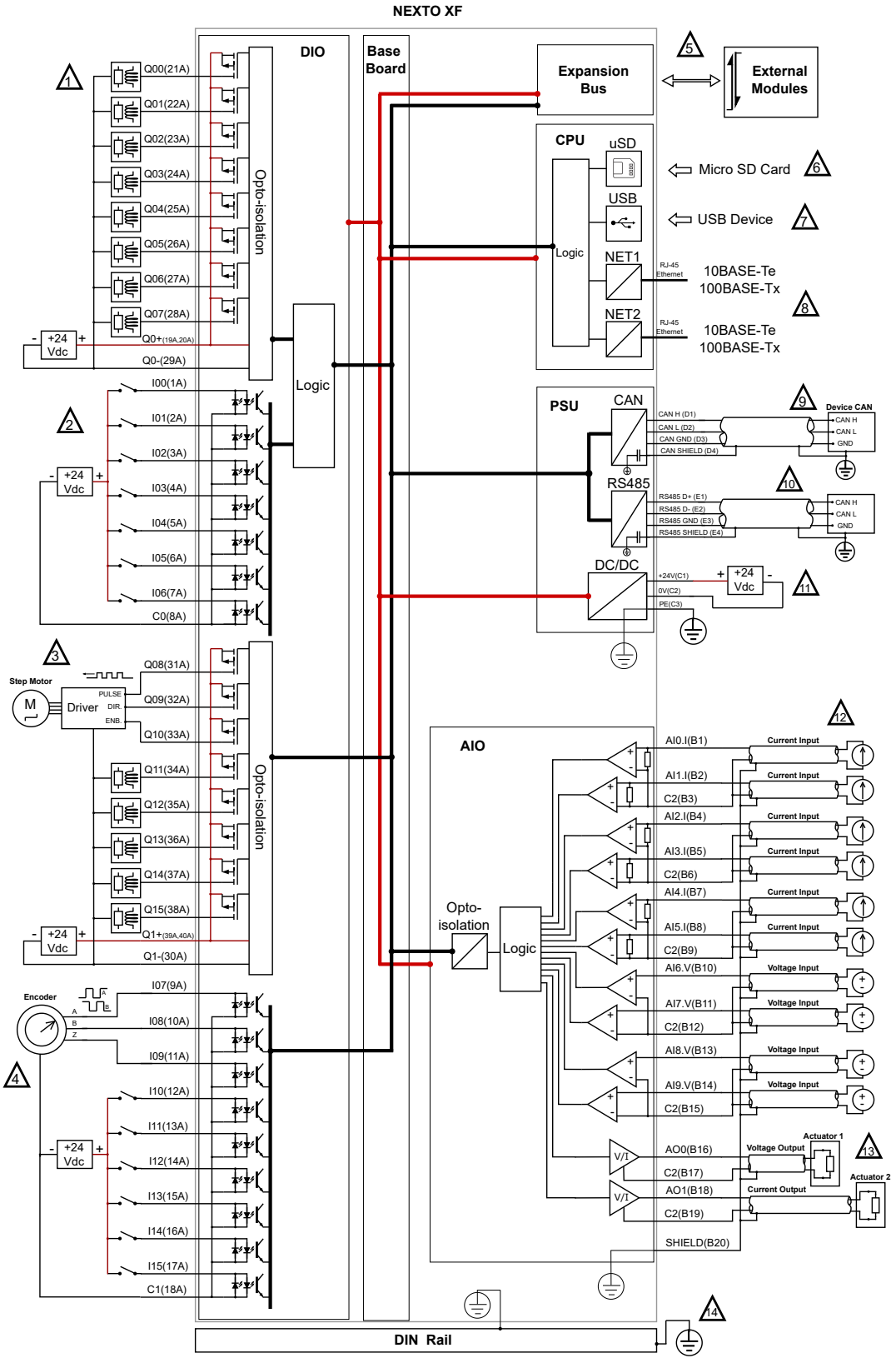

Figure 2: XF3xx electrical wiring diagram

Diagram notes:

1 Typical connection of the isolated digital outputs Q00 to Q07 (source type). Independent external 24Vdc power supply connected to terminals Q0+ and Q0-.

2 Typical connection of the isolated digital inputs I00 to I06 (sink type). Independent external 24Vdc power supply connected to the common terminal C0 and switch contacts.

3 Typical connection of the isolated fast digital outputs Q08 to Q15 for stepper motor control and discrete load activation. Independent external 24Vdc power supply connected to terminals Q1+ and Q1-.

4 Typical connection of the isolated fast digital inputs I07 to I15, with a 3-signal encoder (A, B, and Z) and discrete switches. Independent external 24Vdc power supply connected to the common terminal C1 and switch contacts.

5 I/O Expansion Modules bus connection to external modules or termination cover

6 Micro SD card slot.

7 USB device slot. Refer to the technical specifications table for the USB port to obtain the list of supported devices.

8 Use Ethernet cables specified in the Related Products section.

9 Typical connection of the CAN serial interface.

10 Typical connection of the RS-485 serial interface.

11 Connection of the system's power supply, nominally 24Vdc. Main grounding point of the system.

12 Typical connection for analog voltage and current inputs. Grounding of the cable shield occurs at a single point on the connector (not applicable to the XF300).

13 Typical connection for configurable voltage and current analog outputs. As with the inputs, the cable shield is grounded at a single point on the connector (not applicable to the XF300).

14 The grounding is performed through direct contact of the product with a standard DIN rail, which must be metallic and connected through a proper external grounding.

Protective earth terminal.

The product has in its mechanics a label that identifies it and in it are presented some symbols whose meaning is described below:

Attention! Before using the equipment and installing, read the documentation.

Direct Current.

ATTENTION

Products with broken warranty seal are not covered in warranty.

CAUTION

The device is sensitive to static electricity (ESD). Always touch in a metallic grounded object before handling it.

5.3. Connector Pinouts

The following tables show the descriptions of each terminal on the connectors:

Terminal number	Descrition	Signal
1	24 Vdc power input	+24V
2	0 Vdc power input	0V
3	Protective earth	PE

Table 27: Power Input Connector

Terminal number	Descrition	Signal
1	CAN high differential signal	H
2	CAN low differential signal	L
3	Common of the CAN interface	GND
4	Cable shield connection	Shield

Table 28: CAN Interface Connector

Terminal number	Descrition	Signal
1	RS-485 data+ differential signal	D+
2	RS-485 Data- differential signal	D-
3	Common of the RS-485 interface	GND
4	Cable shield connection	Shield

Table 29: RS-485 Interface Connector

Terminal number	Descrition	Signal
1	Standard digital input 0	I00
2	Standard digital input 1	I01
3	Standard digital input 2	I02
4	Standard digital input 3	I03
5	Standard digital input 4	I04
6	Standard digital input 5	I05
7	Standard digital input 6	I06
8	Common for standard digital inputs	C0
9	Fast digital input 7	I07
10	Fast digital input 8	I08
11	Fast digital input 9	I09
12	Fast digital input 10	I10
13	Fast digital input 11	I11
14	Fast digital input 12	I12
15	Fast digital input 13	I13
16	Fast digital input 14	I14
17	Fast digital input 15	I15
18	Common for fast digital inputs	C1
19 e 20	Power supply for standard digital outputs	Q0+
21	Standard digital output 0	Q00
22	Standard digital output 1	Q01
23	Standard digital output 2	Q02
24	Standard digital output 3	Q03
25	Standard digital output 4	Q04
26	Standard digital output 5	Q05
27	Standard digital output 6	Q06
28	Standard digital output 7	Q07
29	Common for standard digital outputs	Q0-
30	Common for fast digital outputs	Q1-
31	Fast digital output 8	Q08
32	Fast digital output 9	Q09
33	Fast digital output 10	Q010
34	Fast digital output 11	Q011
35	Fast digital output 12	Q012
36	Fast digital output 13	Q013
37	Fast digital output 14	Q014
38	Fast digital output 15	Q015
39 e 40	Power supply for fast digital outputs	Q1+

Table 30: Digital I/O Connector

Terminal number	Descrition	Signal
1	Current analog input 0	AI0.I
2	Current analog input 1	AI1.I
3	Common of the analog interface	C2
4	Current analog input 2	AI2.I
5	Current analog input 3	AI3.I
6	Common of the analog interface	C2
7	Current analog input 4	AI4.I
8	Current analog input 5	AI5.I
9	Common of the analog interface	C2
10	Voltage analog input 6	AI6.V
11	Voltage analog input 7	AI7.V
12	Common of the analog interface	C2
13	Voltage analog input 8	AI8.V
14	Voltage analog input 9	AI9.V
15	Common of the analog interface	C2
16	Analog output 0	AO0
17	Common of the analog interface	C2
18	Analog output 1	AO1
19	Common of the analog interface	C2
20	Cable shield connection	Shield

Table 31: Analog I/O Connector

Note: Pin 1 of the connectors is located in the first position from left to right when viewed from the front of the connector.

5.4. Physical Dimensions

Dimensions in mm.

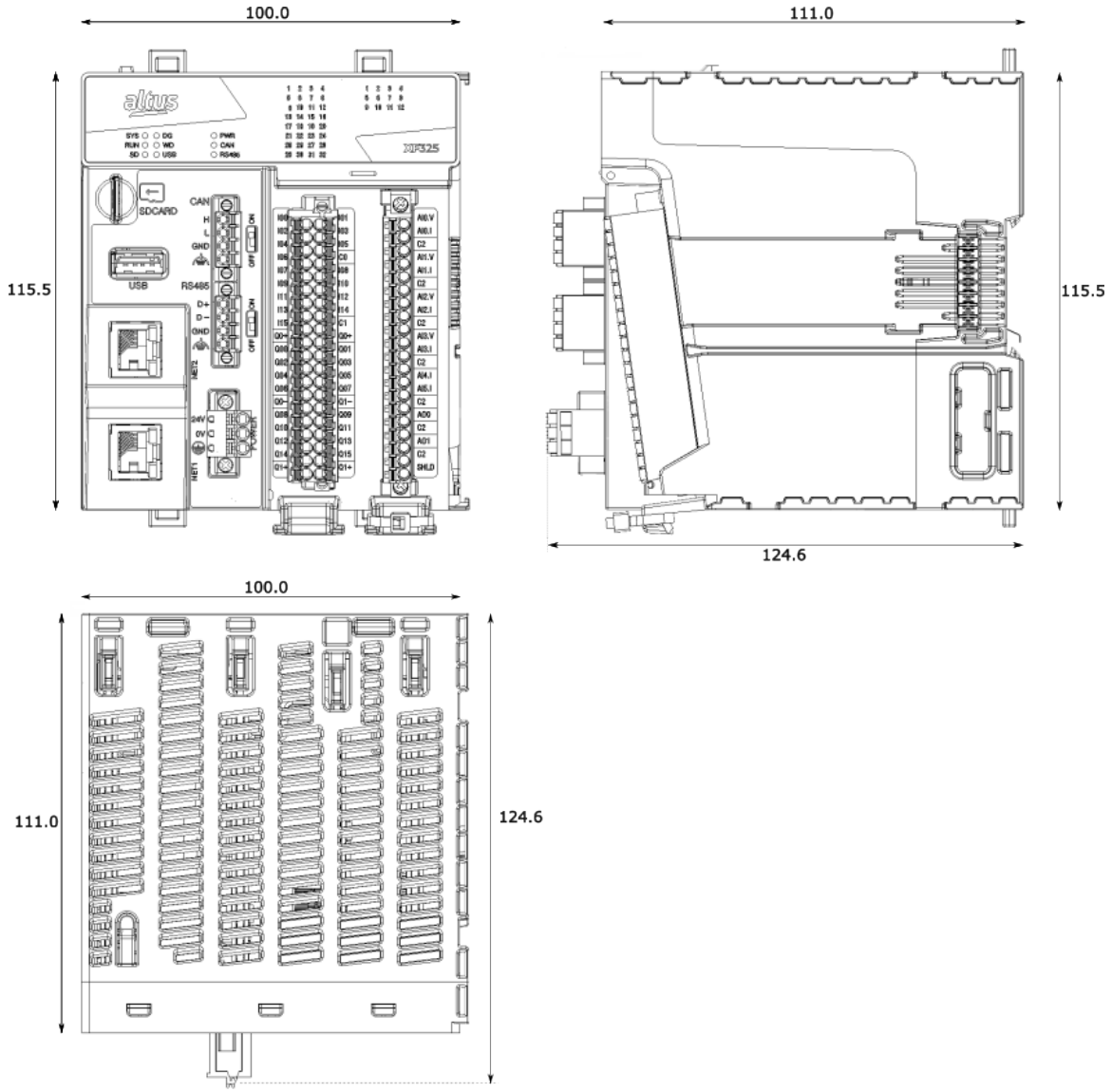

Figure 3: XF3xx Physical Dimensions

5.5. Protection Circuit

For further information, consult the *"Lightining Protection"* section of the Nexto Series User Manual - MU214600.

ATTENTION

Atmospheric discharges (thunders) may cause damages to the product although its protections. Additional protections should be used if the product's power comes from a power supply located outside the panel where it is installed because it could be vulnerable to this kind of discharges. If the field wiring of the output points is susceptible to this kind of discharge, surge suppressors should be used.

6. Manuals

For further technical details, configuration, installation and programming, the table below should be consulted.

The table below is only a guide of some relevant documents that can be useful during the use, maintenance, and programming of this product.

Código	Descrição	Idioma
MU214600	Nexto Series User Manual	Inglês
MU214000	Manual de Utilização Série Nexto	Português
MU214606	MQTT User Manual	Inglês

Table 32: Related documents