



Programmable Controllers



altus

evolution in automation

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PX Series



High availability and trustworthiness

The PX Series was developed associating quality and high technology, providing solutions for control systems of major industrial processes.

It offers a great flexibility in the system automation, using the PONTO series I/O modules, through open communication protocol, as PROFIBUS-DP. PX Series integrates all ALTUS PROFIBUS-DP solution.

For applications that high availability and trustworthiness of the system are very important, PX Series is the perfect solution, because includes redundant architecture for its main components: sources, CPUs, Ethernet interfaces, field bus interfaces and field bus heads.



Main Characteristics:

- Redundancy of CPU "Hot stand-by";
- Redundancy of networks: PROFIBUS-DP and MODBUS TCP;
- Ethernet Interface 100Mbps/s redundant with different IPs;
- Possibility of use up to 4 coprocessors that you can add to the CPU;
- High communication capacity;
- Ample and sophisticated line of I/O modules from PONTO Series;
- Hot-swap I/O modules;
- High capacity of diagnosis;
- Operation with floating-point.

Type	Code	Description
CPUs	PX2004	CPU with 1M Flash memory and 142 I/O modules, with up to 2048 points, floating point operations
Processors	PX2005	Real-time Multitask processor
	PX2017	Redundant coprocessor
	PX3406	PROFIBUS-DP interface
	PX3412	Ethernet interface 10/100 Mbps/s
	PX3414	Ethernet communication for MODBUS-TPC redundancy
Special Modules	PX1413	RS232C / Rs485 converter
	PX1422	Timing generator with GPS
	PX2405/232	Rs232 serial card
	PX2405/485	RS485 isolated serial card
	PX2605	PROFIBUS-DP active terminator
	PX2612	PROFIBUS-DP network active terminator
	PX3511	24 - 48 Vdc power supply
	PX3512	AC/DC power supply
Racks	PX3631	Rack for 4 modules, CPU and power supply
	PX3635	Rack for 8 modules, CPU and power supply
	PX3640	Rack for 6 modules, CPU and redundant power supply

Ponto Series

Innovation in distributed automation systems

The Ponto Series has CPUs of high capacity and offers the best solution for distributed control systems with remote I/O. It includes flexible architecture that allows the access of remote modules through field bus.



Main Characteristics:

- Open communication networks: PROFIBUS-DP, MODBUS-RTU;
- Ethernet interface;
- Diversity of diagnostics;
- Automatic module addressing;
- Hot-swap I/O modules;
- Universal analog modules;
- Cost reduction due to size of the panel and resources of project and assembly;
- CE marking.

Type	Code	Modules I/O	Memory	Ports	Drivers	WebServer	Redundancy	Display
CPUs Family PO3X42	PO3142	Up to 30	256K	2 x RS232 1 x RS485	MODBUS RTU	No	No	No
	PO3342	Up to 30	256K	1 x RS232 1 x RS485 Ethernet*	MODBUS – RTU PROFIBUS – DP*	Optional	No	No
CPUs Family PO3X47	PO3047	Up to 16	256K	1 x RS232 1 x RS485 1 x USB Ethernet*	MODBUS – RTU	No	No	Yes
	PO3147	Up to 30	512K	1 x RS232 1 x RS485 1 x USB Ethernet*	MODBUS – RTU PROFIBUS – DP*	Optional	No	Yes
	PO3247	Up to 30	1MB	1 x RS232 1 x RS485 1 x USB Ethernet*	MODBUS – RTU PROFIBUS – DP*	Optional	Yes	Yes
Digital Inputs Modules	PO1000	16 Digital inputs 24 Vdc Module						
	PO1001	16 Digital inputs 110 Vac Module						
	PO1002	16 Digital inputs 220 Vac Module						
	PO1003	16 Digital inputs 48 Vdc Module						
	PO1004	16 Digital inputs 125 Vdc Module						
	PO1006	8 Digital inputs monitored 24 Vdc module						
	PO1010	32 Digital inputs 24 Vdc module						
Digital Outputs Modules	PO2020	16 Digital outputs 24 Vdc / 2 A transistor module						
	PO2022	16 Relay digital outputs, dry contact, 2A module						
	PO2025	8 Isolated digital outputs 24 Vdc						
Analog Inputs Modules	PO1212	8 Isolated universal analog input						
	PO1213	Up to 8 isolated voltage / current analog inputs module						
Analog Outputs Modules	PO2132	4 Universal analog outputs module						
Communication Interfaces	PO4053	PROFIBUS-DP net interface						
	PO5063V1	PROFIBUS-DP fieldbus head						
	PO5036V5	Redundant PROFIBUS-DP fieldbus head						
	PO7092	Industrial interface ethernet 100Mbps						
	PO9901	Ethernet interface with Webserver, Webgate Plus						
Bases	PO6000	Base for digital module						
	PO6001	Base for analog module						
	PO6002	Base with common line for digital module						
	PO6003	Base for VAC						
	PO6100	Base for fuse for digital module						
	PO6101	Base for fuse for analog module						
	PO6102	Base with Fuse and Common Line for D mode						
	PO6302	Base for CPU						
	PO6312	Base to Wi-Fi communication						
	PO6400	Base for PROFIBUS-DP interface						
	PO6401	Base for Ethernet interface						
	PO6500	Base for PROFIBUS-DP fieldbus head						
	Special Modules	PO7079	4 Fast Counter Inputs 24 VDC Module					
PO8085		Power Supply						

* Disponible with optional module

FBs Series

Best cost-benefit for automations of small applications

The FBs Series of Programmable Controllers is the best solution for automations of small applications that require high speed processing, modularity and low cost. With models and a great diversity of I/O modules, the serie has the necessary configuration for the automation of your system.

The CPUs of the FBs Series are available in three families: MA (Economic), MC (Standard) and MN (Motion Control). This series presents the best cost-benefit, with monitoring capacity up to 512 digital I/O points and 128 analog I/O points, MODBUS RTU and MODBUS TCP communication protocols, possibility of connection up to five serial interfaces, among others functionalities, with a highly competitive price.



Main Characteristics:

- High speed and performance;
- Modular architecture, with several options of I/O modules;
- Connection up to 5 communication interfaces (RS232/RS485 and Ethernet);
- High-speed input up to 920 KHz;
- Special functions for Motion Control;
- MODBUS RTU Master/Slave and MODBUS TCP protocols;
- I/O points integrated in the CPU;
- WinProLadder: free, intuitive and friendly programming software.

Type	Code	Inputs Points	Outputs Points	I/O Expansion	Serial Expansion	Detachable Terminal block	Memory	Power Supply	
UCPs - MA	FBs-14MA* FBs-14MATJ**	8 (4 c/ 10KHz)	6 (4 c/ 10KHz)	No	Up to 3	No	40Kb	100-240 Vac	
	FBs-24MA* FBs-24MATJ**	14 (4 c/ 10KHz)	10 (4 c/ 10KHz)	Yes	Up to 3	No	40Kb	100-240 Vac	
	UCPs - MC	FBs-14MC* FBs-14MCTJ**	8 (2 c/ 100KHz) (6 c/ 20KHz)	6 (2 c/ 100KHz) (4 c/ 20KHz)	No	Up to 5	No	40Kb	100-240 Vac
		FBs-24MC* FBs-24MCTJ**	14 (2 c/ 100KHz) (12 c/ 20KHz)	10 (2 c/ 100KHz) (6 c/ 20KHz)	Yes	Up to 5	Yes	40Kb	100-240 Vac
FBs-32MC* FBs-32MCTJ**		20 (2 c/ 100KHz) (14 c/ 20KHz)	12 (2 c/ 100KHz) (6 c/ 20KHz)	Yes	Up to 5	Yes	40Kb	100-240 Vac	
FBs-40MC* FBs-40MCTJ**		24 (2 c/ 100KHz) (14 c/ 20KHz)	16 (2 c/ 100KHz) (6 c/ 20KHz)	Yes	Up to 5	Yes	40Kb	100-240 Vac	
FBs-60MC* FBs-60MCTJ**		36 (2 c/ 100KHz) (14 c/ 20KHz)	24 (2 c/ 100KHz) (14 c/ 20KHz)	Yes	Up to 5	Yes	40Kb	100-240 Vac	
UCPs - MN		FBs-32MN	20 (4 c/ 920KHz) (12 c/ 20KHz)	12 (4 c/ 920KHz) (4 c/ 20KHz)	Yes	Up to 5	Yes	40Kb	100-240 Vac
Digital I/O Modules	FBs-8EA	4 points 24 VDC digital input, 4 points (R/T/S) digital output							
	FBs-8EATJ	4 points 24 VDC digital transistor input, 4 points (R/T/S) digital transistor output							
	FBs-8EX	8 points 24 VDC digital input							
	FBs-8EY	8 points (R/T/S) digital output							
	FBs-8EYTJ	8 points (R/T/S) digital transistor output							
	FBs-16EA	8 points 24 VDC digital input, 8 points (R/T/S) digital output							
	FBs-16EATJ	8 points 24 VDC digital transistor input, 8 points (R/T/S) digital transistor output							
	FBs-16EY	8 points (R/T/S) digital output							
	FBs-16EYTJ	8 points (R/T/S) digital transistor output							
	FBs-24EA	14 points 24 VDC digital input, 10 points (R/T/S) digital input							
	FBs-24EATJ	14 points 24 VDC digital transistor input, 10 points (R/T/S) digital transistor input							
	FBs-40EA	24 points 24 VDC digital input, 16 points (R/T/S) digital output							
	FBs-40EATJ	24 points 24 VDC digital transistor input, 16 points (R/T/S) digital transistor output							
	FBs-60EA	36 points 24 VDC digital input, 24 points (R/T/S) digital output							
FBs-60EATJ	36 points 24 VDC digital transistor input, 24 points (R/T/S) digital transistor output								
Analog I/O Modules	FBs-2DA	2 analog output points							
	FBs-4DA	4 analog output points							
	FBs-6AD	6 analog input points							
	FBs-4A2D	4 analog input points and 2 analog output points							
Analog I/O Boards	FBs-B2DA	2 analog output points expansion							
	FBs-B2A1D	2 analog output points expansion and 1 analog output							
	FBs-B4AD	4 analog input points expansion							
Communication Interface	FBs-CM25	Serial communication module 1 x RS232 e 1 x RS485							
Communication Boards	FBs-CB2	Serial expansion 1 x RS232							
	FBs-CB5	Serial expansion 1 x RS485							
	FBs-CB25	Serial expansion 1 x RS232 e 1 x RS485							
	FBs-CBE	Ethernet Expansion							
Temperature Modules	FBs-TC2	2 channel thermocouple temperature input module with 0.1°C resolution							
	FBs-TC6	6 channel thermocouple temperature input module with 0.1°C resolution							
	FBs-RTD6	6 channel RTD temperature input module with 0.1°C resolution							
Special Modules	FBs-PACK	40kW of Flash memory							
	FBs-DAP-B	IHM LCD 1,5" display, 6 function keys							
	FBs-BDAP	HMI 16 x 2 LCD display, 20 function keys							
Programming Cable	FBs-232PO-9F-150	Programming cable Mini-Din 5 pins / Db9 Female - 1,0m							

* Relay output ** Transistor PNP output

Mastertool Series

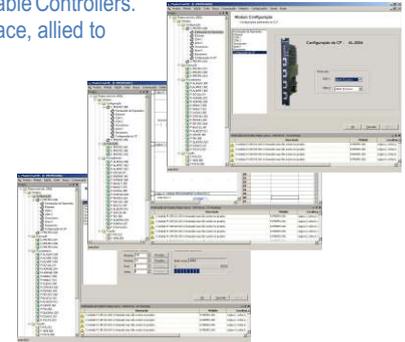
Programming and supervision software



MasterTool Programming software allows the configuration and programming of ALTUS Programmable Controllers. It uses the resources supplied for the Windows environment to offer a powerful man-machine interface, allied to multiple resources of data handling.

MasterTool XE

The MasterTool Extended Edition (MTOOL XE) is the software for configuration and programming of PX Series, AL-2004, PONTO and GRANO. This tool has a friendly environment, making possible an intuitive programming, beyond offering many functionalities that assist you in the reduction of project time.



Functionalities of MTOOL XE:

Based in international standard IEC 61131-3: Ladder Diagram (LD) and Structure Text (ST);

ST language editor: Structuralized literal language, with similar resources to C language, making possible the creation, by the user, of more complex algorithms and specific functions.

Tools:

- Operand replacement in the module or project;
- Movement of operands group;
- Window of modules hierarchy;
- Implementation of project verifier;
- Password protection of modules;
- Creation of functions by the user.

Graphical interface: Modern system of windows, with project visualization, status and tool bars;

Improvements in the global operands cross reference: Locates operand of bit type, analyzes main F modules and indicates if the access was of writing or reading in all the project modules.

Improvements in the LADDER language editor:

- Minimization of logics;
- Monitoring of more than one logic;
- Monitoring and edition of logics simultaneously;
- New instructions layout;
- Skin for main F modules.

Type	Code	Description
MASTERTOOL Extended Edition (MTOOL XE)	MT8000 Lite	Programming software for Grano Series PLCs - Windows 2000 and XP
	MT8000 Professional	Programming software for Grano, Ponto, AL-2004 and PX Series PLCs - Windows 2000 and XP
	MT8000 Advanced	Programming software for Grano, Ponto, AL-2004 and PX Series PLCs with ST language and redundancy wizard - Windows 2000 and XP
MASTERTOOL®	MT6000	Configuration tool for Ponto Series
	MT7000	Web supervision and control
Another Softwares	AL-2785	OPC Server - Communication driver for Ethernet ALNET II
	AL-3850	Auxiliary programming software for AL-2005 for PID applications in Altus PLCs
	AL-3860	Programming software for AL-2008 coprocessor
	AL-3865	Programming software PROFITool

Grano Series



The small giant of automation

The GRANO Series is an excellent solution for small applications, having great flexibility in the configuration of inputs and outputs, including analog points and digital high-speed that satisfies a large range of control applications and positioning.



Main Characteristics:

- CPU of high performance with large memory capacity;
- RS232 serial interface with integrated MODBUS-RTU slave protocol;
- Diagnostic available for applicatory program and software of supervision;
- Special functions: high-speed counter, signal frequency measurement (VFI) frequency output (VFO), pulse width modulation output (PWM) and pulse train (PTO);
- Operations with PID algorithm and floating-point;
- Keyboard for set-points adjustment on-line;
- Architecture extremely flexible HardFlex;
- Expansion with the Clone architecture.

Hardflex architecture:

With this functionality, the hardware is reconfigured to deal with the inputs and outputs signals faster, for each application, optimizing the control performance. In such a way, are available functions as high-speed counting, signal frequency measurement (VFI), frequency output (VFO), pulse train (PTO) and pulse width modulation output (PWM), among others.

Clone architecture:

Connection of two GRANO CPUs, thus the two process independent LADDERS, changing data bytes between itself, configured by the user. So, it is possible to use simultaneous processing, for applications that demand a fast processing and efficient controlling. This clone characteristic can be used in various applications, for example, high speed parallel control or axes positioning control. Each CPU executes its application one individually, having directly access to its input and output points, beyond changing data with the other CPU.

Type	Code	Input Points	Output Points	Analog Inputs	Analog Outputs	High Speed Outputs	Termocouple (J,K)	High Speed Counter	Expansion	Flash Memory	MODBUS	HardFlex
CPUs with Hardflex	GR351	14	10	0	0	2	0	1 (20 KHz)	Yes	32K	Yes	Yes
	GR371	14	10	4 (16 bits)	2 (16 bits)	2	2	1 (20 KHz)	Yes	32K	Yes	Yes
HardFlex	GR900	24 bits counter and High speed outputs										
	GR901	24 bits counter and PTO outputs										
	GR902	24 bits counter and PWM outputs										
Special Modules	GR380	Real time clock module										
	GR801	Expansion cable										
	PO9901	Webgate Plus - ethernet interface with Web Server										
Accessories	AL-1715	RJ45- Db9 cable										
	AL-1531	Full range power supply Vac / Vdc - 24 Vdc / 1 A										