Product Description

The Ponto Series CPUs present an extended integration of functions, on-line programming, high memory capacity and integrated serial ports.

The PO3142 model has three serial interfaces to programming, local supervision and MODBUS network.

The CPUs communicate through the GBL bus, creating a compact control and supervision system. With the use of network interfaces the CPUs can control up to 4.096 I/O points.

Main features *:

- Direct access to 30 I/O modules through Ponto Series bus
- Capacity up to 4.096 I/O points
- High speed processing, adequacy to complex and extensive systems
- Communication to PROFIBUS networks
- 2 RS-232 serial ports, with configurable and programmable protocols, including MODBUS master or slave
- 1 Isolated RS-485 serial port, with configurable and programmable protocols, including MODBUS master or slave
- Great Flash memory capacity: up to 512 Kbytes for application program
- It allows PROFIBUS DP Master Interface
- Connectivity to Ethernet network.
- WebServer characteristics
- Diagnostic and status operation via LEDs indicators on front panel
- Diagnostic information via operands
- Floating point operand (%F)
- +24 Vdc internal power supply with capacity of 12 modules along two segments.
- Floating Point operand (%F)
- Unsigned integer 32 bits operand (%I)**
- Identification label

*These characteristics are referred to the most completed model, the PO3342.

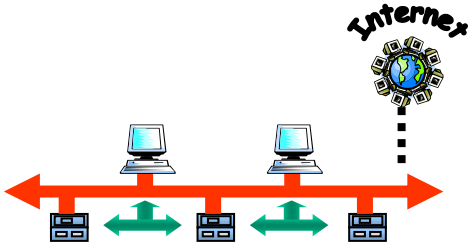
**Available on firmware version 2.00 or greater, or product revision “AS” or greater.

Ordering Information

Included Items

The product packing comes with:

- CPU PO3042 or PO3142 or PO3242 or PO3342.
- Installation Guide



Product Code

Use the following codes when ordering the product:

Code	Description
PO3042	CPU 128K Flash, 16 I/O Modules, 2 Serial, MODBUS
PO3142	CPU 256K Flash, 30 I/O Modules, 3 Serial, MODBUS
PO3242	CPU 256K Flash, 30 I/O Modules, 2 Serial, MODBUS, PROFIBUS, Ethernet
PO3342	CPU 256K Flash, 30 I/O Modules, 2 Serial, MODBUS,PROFIBUS, WebServer

Related Products

Depending on your system requirements, the following products might be ordered along with the CPU:

Code	Description
PO6302	UCP PO3x42 Base
MT4100	MasterTool Programming MT4100
MT6000	MasterTool ProPonto w/ Manuals
AL-2700	Mathematical Functions
AL-2702	ALNET I (master) functions
AL-2703	Communication Functions (F Module)
AL-1715	RJ45-CFDB9 Cable
AL-1718	RJ45-CMDB9 RS-232C Cable
AL-1719	RJ45-CMDB9 RS-232 Cable
AL-1720	RJ45-CMDB9 RS-232 / RS-485 Cable
AL-1731	RJ45-CMDB9 RS-485 Cable
AL-2301	RS-485 Network Cable (up to 1000 meters)
AL-2305	(CMDB9 - RS-485) Branch Cable
AL-2306	RS-485 Network Cable (up to 500 meters)
AL-2600	Branch and termination for Network
AL-2601	DB9 Connector to RS-485 Network
PO4053	PROFIBUS DP Interface
PO7091	Industrial Ethernet Interface
PO8510	10 Sheets with 14 labels each, 16 tags by label, for printer
PO8530	Battery (spare part)
PO8524	Bus Terminator (spare part)
PO8525	Branch and Terminator to RS-485 Network

PO6302: Base to CPUs PO3042, PO3142, PO3242 and PO3342.

AL-1715: Cable assembled with one RJ45 connector and one RS-232 9-pin male sub-D connector IBM/PC standard. It is used on COM1 and COM3 to connect the following equipment:

- MMI, which uses IBM/PC standard connector, for local supervision
- IBM/PC standard microcomputer with supervision software.
- IBM/PC standard microcomputer to UCP programming through MasterTool Software

AL-1718: Cable assembled with one RJ45 connector and one RS-232 9-pin male sub-D connector Altus standard. It is used on COM1 and COM3 to connect the following equipment:

- AL-1413 module, RS-232 / RS-485 Converter

AL-1719: Cable assembled with one RJ45 connector and one RS-232 9-pin male sub-D connector Altus standard. It is used on COM1 and COM3 to connect the following equipment:

- Foton 5 or Foton 10 (MMI)

AL-1720: Cable assembled with one RJ45 connector and one RS-232/RS-485 9-pin male sub-D connector Altus standard. It is used on COM1 and COM3 to connect the following equipment:

- Foton 1 or Foton 3 (MMI)

AL-1731: Cable assembled with one RJ45 connector and one RS-485 9-pin male sub-D connector Altus standard. It is used on COM2 to connect the PO8525 module.

AL-2301: Shielded cable with two pairs, no connectors. It is used on RS-485 network:

- Connecting an RS-485 network between two or more AL-2600 or PO8525, maximum length of 1000 meters.

AL-2306: Shielded cable with two pairs, no connectors. It is used on RS-485 network:

- Connecting an RS-485 network between two or more AL-2600 or PO8525, maximum length of 500 meters.

AL-2600: This module helps to connect a RS-485 network (AL-2301 cable) to the AL-2305 cable.

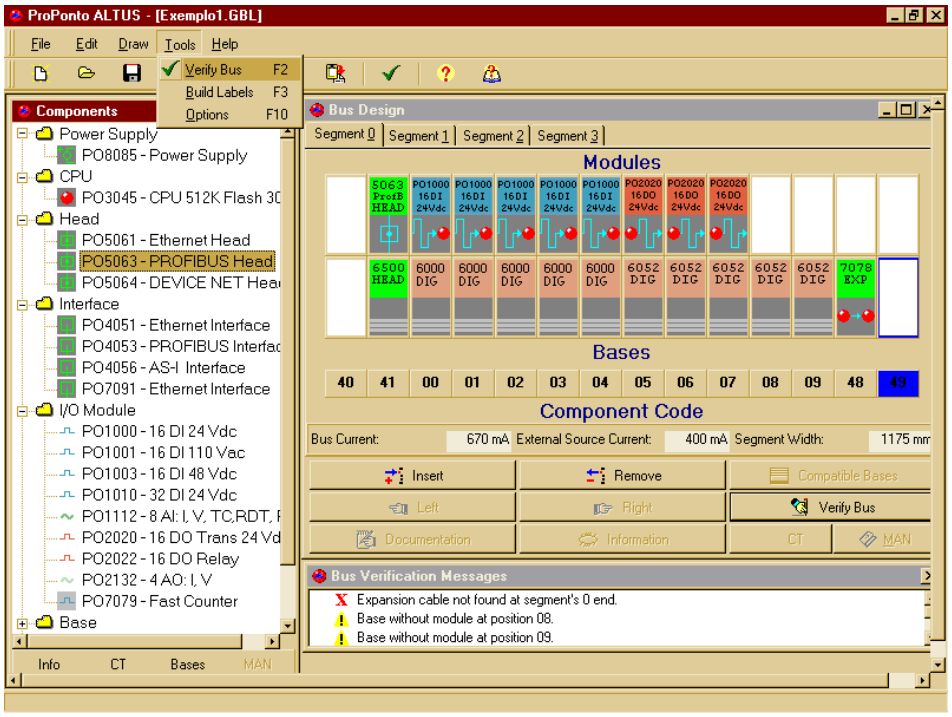
PO8525: This module can be use to connect the CPU to a RS-485 network. It has two terminals to network derivation, termination resistors, and one RJ45 connector. The serial port COM2 is connected to this module through the AL-1731 cable.

MT6000 –MasterTool ProPonto

The ProPonto allows the definition of modules to be installed in every bus, thus facilitating the system design. Main functions are:

- Graphical design of buses.
- Bus validation. It checks items like power consumption, compatible bases and design limits.
- Tags definition. It generates labels for module identification.
- List of materials.
- Label impression with identification tags

The software runs in Windows 32 bits.



Characteristics

	PO3042	PO3142	PO3242	PO3342
Description	CPU 128K Flash, 16 I/O Modules, 2 Serial Interfaces	CPU 256K Flash, 30 I/O Modules, 3 Serial Interfaces	CPU 256K Flash, 30 I/O Modules, PROFIBUS, Ethernet	CPU 256K Flash, 30 I/O Modules, PROFIBUS, WebServer
Application program memory – Flash type	128K	256K	256K	256K
Application program memory – RAM type	256K	256K	256K	256K
Maximum Modules	16	30	30	30
Maximum number of Segments	4	4	4	4
Maximum local I/O points	256 using modules with 16 points 512 using modules with 32 points	480 using modules with 16 points 960 using modules with 32 points	480 using modules with 16 points 960 using modules with 32 points	480 using modules with 16 points 960 using modules with 32 points
Maximum local analog I/O points	128 using modules with 8 points	240 using modules with 8 points	240 using modules with 8 points	240 using modules with 8 points
Maximum I/O points through networks	No	No	4096	4096
Network interface support (PO4053 module)	No	No	Yes	Yes
Ethernet TCP/IP interface support (PO7091 module)	No	No	Yes	Yes
Ethernet TCP/IP interface support with WebServer (PO7091 module)	No	No	No	Yes
Serial interfaces (see Serial Ports item)	1 x RS-232 1 x RS-485 COM1 e COM2	2 x RS-232 1 x RS-485 COM 1, COM2 e COM3	1 x RS-232 1 x RS-485 COM 1, COM2	1 x RS-232 1 x RS-485 COM 1, COM2
Serial port RS-232 (COM1)	RTS, CTS	-	RTS, CTS	RTS, CTS
Serial port RS-485 (COM2)	Isolated	Isolated	Isolated	Isolated
Serial port RS-232 (COM3)	Not used	RTS, CTS, DTR, DSR.	Not used	Not used
Floating point operand (%F)	Yes	Yes	Yes	Yes
MODBUS Protocol (master / slave)	Yes*	Yes	Yes	Yes
Power supply	Embedded	Embedded	Embedded	Embedded
MasterTool Programming Software – MT4100 or MT4000	3.40 or greater version*		3.62 or greater version*	
ProPonto Configuration Software – MT6000	1.35 or greater version		1.40 or greater version	

Serial Interfaces: The RS-232 ports use RJ45 connector with grounded shielding. The RS-485 port uses DB 9 connector.

Power supply: The CPUs PO3x42 includes an internal power supply, which is feed with +24 Vdc. The power supply supports up to 12 I/O modules, distributed on two segments. If it is necessary the use of more I/O modules the PO8085 power supply must be installed in the beginning of the segment.

***MODBUS Protocol:** The MODBUS protocol is available on PO3042 CPU from firmware version 2.00 or greater.

***MasterTool Programming:** to use MODBUS protocol in PO3042 CPU, or %I operand, it is necessary MasterTool Programming version 3.90 or greater.

General Characteristics

	PO3042, PO3142, PO3242, PO3342
Module type	CPU
Hot Swap	Yes, for all I/O modules
Maximum analog I/O points	The limit is provided by the network bus. A system with 1000 analog points, demands 11 PROFIBUS analog remotes
Typical bus scan time	0,5 ms with 480 digital I/O points
Local bus rate	12 Mbaud
Network connecting support	Yes, through network interfaces
Retentive memory	48 Kbytes
On-line programming	Yes
Typical program scan time	1,6 ms / Kwords
Real Time Clock	Yes
Watchdog	Yes
Battery for retentive operands	Inside the base, hot swap
Connector configuration **PO6302 Base**	1 RJ45 connector RJ45, COM 1 1 DB9 connector DB9, COM 2 1 RJ45 connector RJ45, COM 3
Status indication	LEDs EX, PG, ER, WD, TX, RX
Diagnostic indication	LED DG multifunctional
Isolation **RS-485 Serial port RS-485**	1500 Vac / 1 minute
External power supply	19 a 30 Vdc including ripple maximum consumption: 620 mA @ 24 Vdc (fifteen I/O modules)
Power dissipation	4,5 W
Operating temperature	0 to 60 ^{o}C
Dimensions (W x H x D) mm	99 x 49 x 81 mm
Bases	PO6302

Serial Ports

The Ponto Series CPUs have an optimal communication capability, which provides a wide range of communication features. They have up to 3 serial ports with the following communication rates:

	Communication Rate (bps)
COM1	9600, 4800, 2400, 1200, 600, 300
COM2	38400, 19200, 9600, 4800, 2400, 1200, 600, 300
COM3	38400, 19200, 9600, 4800, 2400, 1200, 600, 300

The next table shows the protocols allowed by each port. It is important to note that some protocols can be used simultaneity.

	COM 1 RS-232	COM 2 RS-485	COM 3 RS-232
Alnet I slave **Included on all CPUs** complete	Yes	Yes	Yes
ALNET I (master) functions **Product: AL-2702** only M tables, writing and reading	--	Yes	Yes
Communication Functions (F Module) **Product: AL-2703** It allows the programming of any serial protocol (asynchronous)	--	Yes	Yes
MODBUS master Included on PO3142, PO3242 and PO3342 Not available on PO3042 model	--	Yes	Yes
MODBUS slave Included on PO3142, PO3242 and PO3342 Not available on UCP PO3042	--	Yes	Yes
Line communication function **Product:** It allows the communication via modem, line. Only with Digitel DT22B modems	--	--	Yes

For further details see User's Manual and Technical Characteristics (CEs) of the listed protocols.

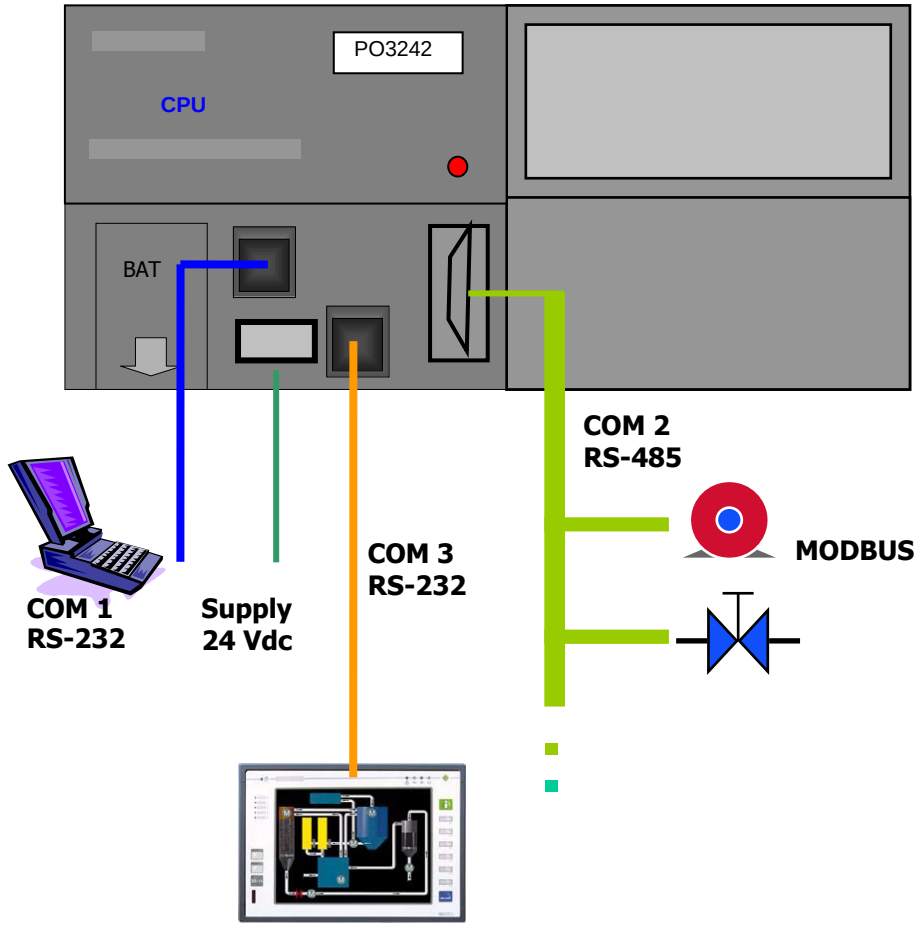
The following table presents some examples of combination:

	COM1	COM 2	COM 3
Example 01	Alnet I slave	MODBUS master	MODBUS master
Example 02	Alnet I slave	MODBUS master	MODBUS slave
Example 03	Alnet I slave	MODBUS slave	AL-2703
Example 04	Alnet I slave	MODBUS slave	Alnet I slave
Example 05	Alnet I slave	Alnet I slave	AL-2703
Example 06	Alnet I slave	AL-2703	Alnet I Master

The 3 serial ports can be used like the following way:

- Serial Port RS-232 (COM 1) :
  Connection to computer with the programming software MasterTool, or local MMI, via RJ45 connector.
- Serial Port RS-485 isolated (COM 2):
  Connection with equipment that use MODBUS protocol. The port is isolated, adequate to network implementation.
- Serial Port RS-232 (COM 3) :
  Connection to local MMI, via RJ45 connector.

The COM 1 and COM 3 ports can use modems or radio modems. Some options of connection with these ports are:
- FOTON 1, FOTON 3, FOTON 5 and FOTON 10
- Supervision software: any that understand ALNET I v2.0 protocol



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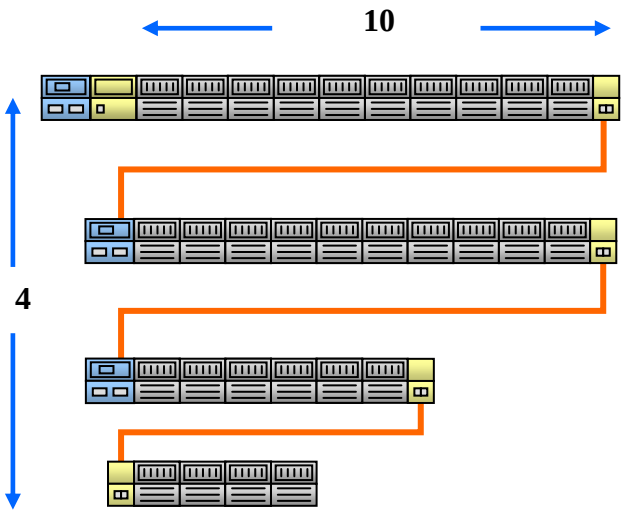
Local Bus I/O Capacity

The CPU has the following limits for local I/O (PO3142):

- Maximum number of modules: 30
- Maximum number of segments: 4
- Maximum number of module by segment: 10
- The maximum number of points depends of the each type. The limit for digital points is 960. The limit for analog points is 240.

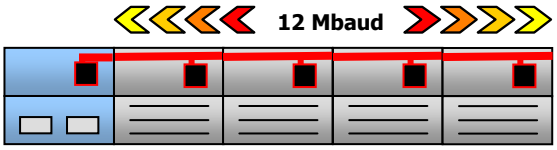
For further details see User's Manual – Ponto Series.



Local bus scan time

The communication between the CPU or head is based on a high speed bus, which is implemented with a unique chip, achieving in this way unsurpassed acquisition and parameterization speed. The main features of this bus are:

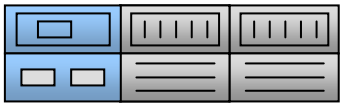
- 12Mbaud serial bus, 0,5 ms scan time for 480 digital points
- Automatic addressing and module identification
- Hot swap for any I/O module



Power Supply

The CPUs have an internal power supply that can supply energy for up to 12 I/O modules. This power supply is fed by +24 Vdc power supply connected on the base terminals.

CPU PO3x42 **I/O Modules**



Base PO6302

Using the software MasterTool ProPonto is possible to configure a greater number of modules, because it is considered the individual current of each module.

Otherwise it is possible to have interface modules, with greater consumption, so the number of modules will decrease.

Software Characteristics

	PO3042 , PO3142, PO3242, PO3342
Programming language	Relay diagram and logic blocks, structured in modules with functions and sub-routines
On line programming	COM 1, COM 2, COM 3
Input (E) and output (S) operands	4096
Auxiliary operands (bits)	4096
Memory operands (M) (word 16bits)	Up to 9984
Decimal operands (D) (32 bits, BCD form + signal)	Up to 9984
Floating point operand (F) (32 bits, IEEE 754)	Up to 9984
Memory table operand (TM) (word 16bits)	Up to 255 tables with 255 positions each
Floating point table operand (TF) (32 bits, IEEE 754)	Up to 255 tables with 255 positions each
Decimal table operand (TD) (32 bits, BCD format + signal)	Up to 255 tables with 255 positions each
Memory constant (KM) (16 bits)	Stored in the application program
Decimal constant (KD) (32 bits, BCD form + signal)	Stored in the application program
Floating point constant (32 bits, IEEE 754)	Stored in the application program
Typical memory occupation by contact instruction	7 bytes
Memory retention	Configurable for operands S, A, M, D, F Always active for TM, TD e TF
File instruction	Permits the storage of great amounts of data in blocks with up to 32 Kbytes
Programmable time for module E018	2,5ms 3,125ms 5ms 10ms 25ms 50ms

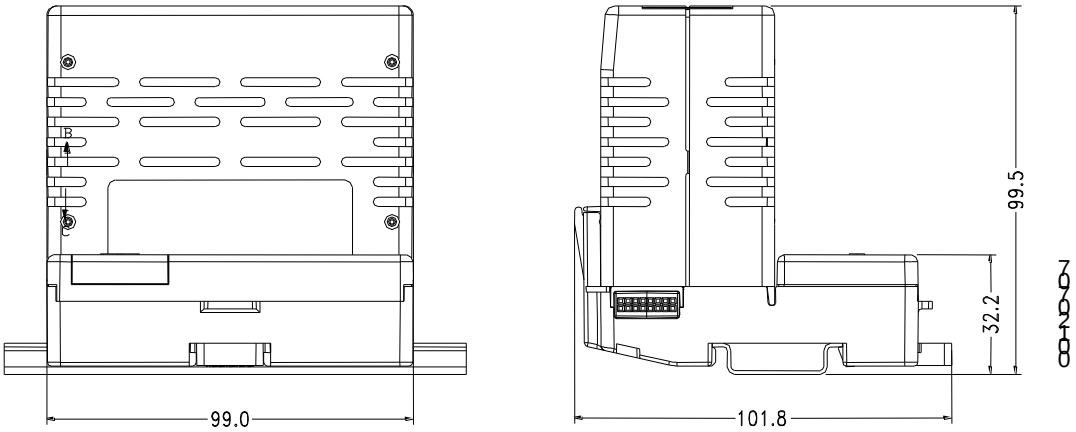
- The total number of 4096 digital I/O points include inputs and outputs from local and remote buses. The sum of E with S operands must be less or equal than the limit.
- All numeric operands (KM, KD, KF, KI, M, D, F, I, TM, TD, TF and TI) allow arithmetic signal in the representation values. The number of simple operands and tables (M, D, F, TM, TD, TF) is configured by each program, and is limited by the available memory capacity of operands (48 Kbytes).
- The feature of memory retention can be attributed to the operands S, A, M, D, F e I through the programmer. The retentive operands have their values preserved during power outage, whereas the non-retentive operands have their values zeroed. The table operands are always retentive.
- %I operand is available from firmware version 2.00 or greater, or product revision “AS” or greater. It is necessary MasterTool version 3.90 or greater to use it.

Installation

The CPUs installation is described on the User's Manual – Ponto Series CPUs

Physical Dimensions

mm dimensions



Manuals

For correct application and utilization the **User's Manual – CPU Ponto Series** must be consulted.

For further technical details, configuration, installation and programming of products from Ponto Series ® please consult following documents

Document Code	Description
CT109000	Characteristics and Configuration from Ponto Series
MU209000	User's Manual – Ponto Series IP20
MU209104	User's Manual – Ponto Series CPUs
MU299025	User's Manual – MasterTool MT4100
MU299040	User's Manual – MT6000, MasterTool ProPonto
	Technical Characteristics (CEs) from Ponto Series Modules