

## Product Description

PO1010 module, part of Ponto series, has 32 digital voltage input points for 24 Vdc. This module is of positive logic type (sink type) to be used in 2 wire (switches) applications.

The module is used on process or machine control or supervision.

The picture shows the product assembled on a digital module base with spring-style terminals.



Its main characteristics are:

- High density of points with one return point for each two sensors.
- Hot-swapping, without changing any panel wiring
- Field wiring is connected to base, allowing direct connection of all field signals without intermediate terminals
- Local and Remote diagnostics
- Automatic addressing
- Module type automatically detected by bus head

## Ordering Information

### Included Items

Product packing contains the following items:

- PO1010 module
- Installation Guide

## Product Coding

The following code must be used on product order:

Code	Description
PO1010	24 Vdc 32 DI Opto Module

## Related Products

The following products must be ordered separately when necessary:

Code	Description
PO6000	Digital E/S Spring-style Base
PO6050	Digital E/S Barrier-style Base
PO8511	10 sheets with 16 strips with 32 tags for printer

## Characteristics

	PO1010
<b>Module type</b>	Sink type 32 isolated digital inputs
<b>Input voltage</b>	24 Vdc nominal 15 to 30 Vdc for 1 state 0 to 5 Vdc for 0 state
<b>Input current</b>	3 mA at nominal voltage
<b>Input type</b>	Type 1, for switches
<b>Input Impedance</b>	5 K $\Omega$
<b>Terminal strip configuration</b>	1 terminal for each point 1 terminal for power supply of each two points
<b>Filtering time</b>	Configurable from 0 to 100 ms
<b>State indication</b>	One LED for each input point
<b>Diagnostic indication</b>	One multifunctional LED indicates module OK, module not accessed or missing external supply
<b>Configurable parameters</b>	Filtering time
<b>Interruption</b>	Input 00 can interrupt UCP
<b>Hot swapping</b>	Yes
<b>Protections</b>	External supply power polarity inversion
<b>External power supply</b>	19 to 30 Vdc, ripple included 150 mA maximum current consumption with all points on
<b>Isolation</b>	
<b>Inputs to logic</b>	1500 Vac for 1 minute, 250Vac continuous
<b>Inputs to grounding</b>	1500 Vac for 1 minute, 250Vac continuous
<b>Between inputs</b>	Non isolated
<b>Bus current consumption</b>	97 mA
<b>Power dissipated</b>	4.5 W maximum with all points On
<b>Maximum operation temperature</b>	60 °C
<b>Dimension</b>	100 x 52 x 84 mm
<b>Standards Compliance</b>	- IEC 61131-2:2003, clauses 8 and 11
<b>Compatible Base</b>	PO6000: Digital E/S Spring-style Base PO6050: Digital E/S Barrier-style Base

### Notes:

**Filtering time:** Analog to RC filter. The configurable time set by the user is the minimum time the input must stay in one state to be recognized as valid.

**Power supply interruptions:** Interruptions in power port are supported if not longer than 10 ms and if the module is powered with its nominal 24 Vdc voltage or greater. Longer interruptions or in voltages lower than the nominal may cause modules reset.

## Installation

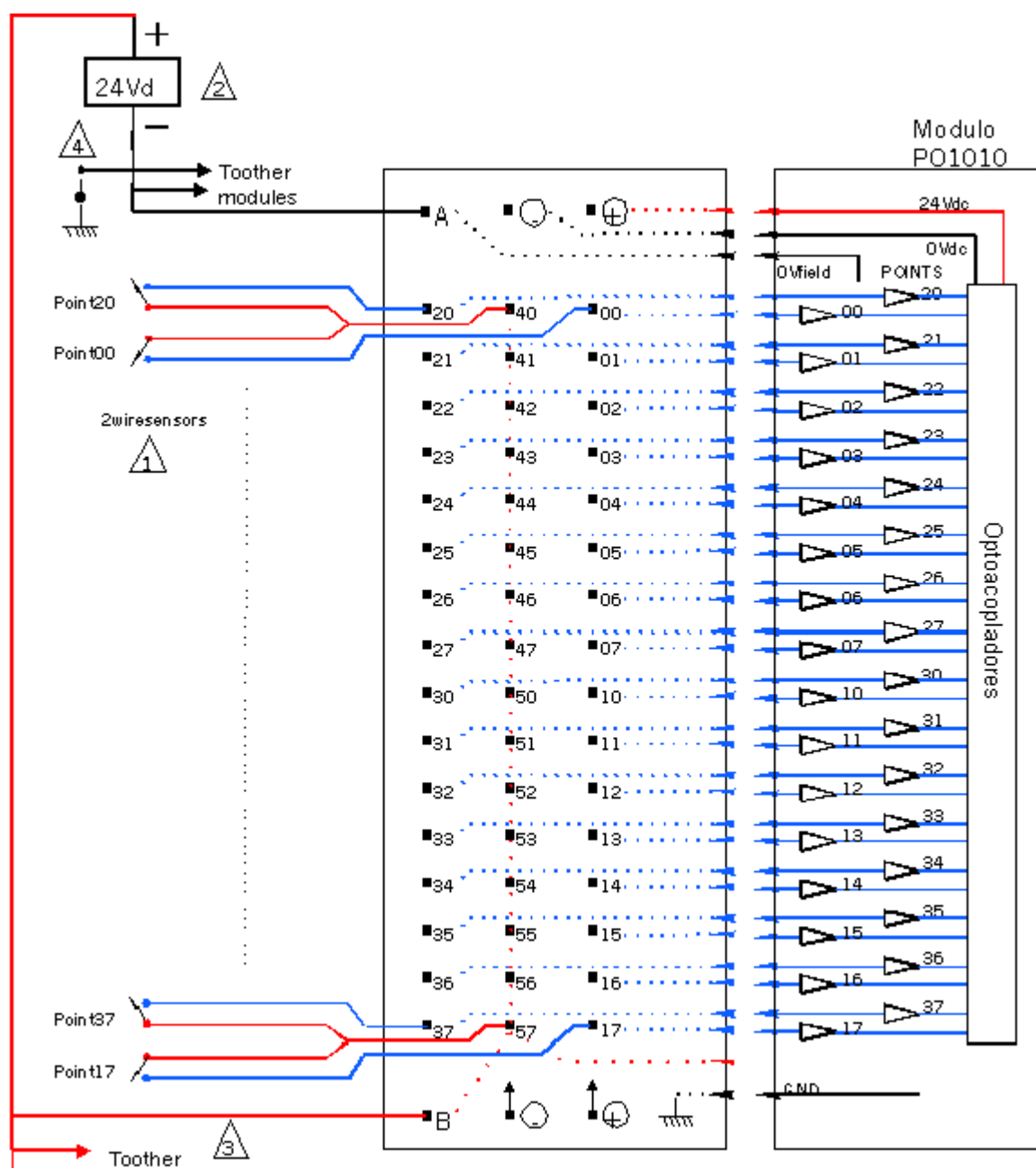


### ATTENTION:

ESD (Electro Static Discharge) sensitive device. Always touch a grounded metallic object before handling the device.

## Electrical Installation

The following diagram shows the wiring for 2 wire sensors with PO1010 module installed on a PO6000 base.



## Diagram Notes:

- 1 – Two wire sensors use central base line (+24 Vdc voltage) for supply. This connection is recommended with double tubular terminals as it allows two cables been connected to same point.
- 2 – Field sensors power supply. This supply must be connected to points A and B on each base, according diagram. The supply must guarantee that sensors signal levels are complying to module specifications. The power supply must furnish a continuous voltage and, preferably, regulated.
- 3 – The positive +24 Vdc pole must be connected to B point to power module and common (40 to 57) of the input points. This power line is susceptible to short-circuits in the field installation. Use appropriate fuse for protection.
- 4 – The common point of power supply to field sensors ( 0V ) can be connected to electric panel grounding. This connection is not mandatory but is recommended to minimize electric noise in automation system.
- 5 – The next module can be fed through bridge wiring from ( + ) and ( - ) points of this base. PO1010 does not use the (+) and (-) points.

## ATTENTION:

Each Ponto series module may need a particular connection type for A and B terminals. In this case B terminal is connected to + 24 Vdc and A is connected to 0 Vdc of the same supply.

The terminal identification have a direct relationship with points and LEDs in the module, according to the following table:

Module Point	00	01	02	03	04	05	06	07	10	11	12	13	14	15	16	17
Point Terminal	00	01	02	03	04	05	06	07	10	11	12	13	14	15	16	17
Supply Terminal	40	41	42	43	44	45	46	47	50	51	52	53	54	55	56	57
Module Point	20	21	22	23	24	25	26	27	30	31	32	33	34	35	36	37
Point Terminal	20	21	22	23	24	25	26	27	30	31	32	33	34	35	36	37
Supply Terminal	40	41	42	43	44	45	46	47	50	51	52	53	54	55	56	57

## ATTENTION:

LEDs of points 20 to 37 depends on power supply from the bus master (CPU or fieldbus head). LEDs of points 00 to 17 are powered directly by the input voltage.

## ATTENTION:

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

## Mechanical Assembly

The mechanical assembly of this module is described in Ponto Series Installation manual and no specific instructions are needed in this case.

The mechanical switch must be set to 10 position (switch A in 1 and switch B in 0)

## Parameterization

The CPU or field network head defines PO1010 module parameterization by software. The parameterization sets the filtering time. Such parameterization may be set by the MasterTool when using Altus CPUs or by the software that configures the fieldbus master. For further information please consult Ponto Series Utilization Manual, MasterTool Utilization Manual and Manuals for the Interfaces and Field Network Heads. The parameterization is set through user friendly menus. For reference purposes, following are the binary codes.

## Parameters Bytes

The module parameterization is defined by two bytes. The first byte set the generic module aspects and the second sets the parameterization for filtering time.

The bytes should be defined as follow.

Byte	Parameters
0	General
1	General

Byte 0 - General								Description
7	6	5	4	3	2	1	0	
				0	0	1	0	Number of parameters bytes ( always 2 )
0	0	0	0					always zeros

Byte 1								Description
7	6	5	4	3	2	1	0	Filtering time
					0	0	0	0,5 ms
					0	0	1	2 ms
					0	1	0	10 ms
					0	1	1	50 ms
					1	0	0	100 ms
0	0	0	0	0				always zeros

## Example

Byte	Parameters	7	6	5	4	3	2	1	0	HEX Value	Description
0	General	0	0	0	0	0	0	1	0	02	Constant value
1	General	0	0	0	0	0	1	0	0	04	100 ms filter

## Diagnosis

### Diagnosis Byte

PO1010 module provides two bytes for operating diagnosis. The first byte indicates the generic aspects related to the module operation and the second parameters problems.

Byte	Diagnosis
0	General
1	Parameterization

Diagnosis bytes have the following meaning:.

Byte 0 - General								Description
7	6	5	4	3	2	1	0	
					0	0	0	Always zero
				0				Normal operation
				1				Module without parameters
			0					Always zero
		0						Hardware normal operation
		1						Hardware error
	0							External power supply OK
	1							External power supply under 19 Vdc
0								Always zero

Byte 1 - Parameterization								Description
7	6	5	4	3	2	1	0	
							0	Normal operation with correct parameters
							1	Wrong parameters to module
0	0	0	0	0	0	0	0	Always zero

### Diagnosis LED

The module diagnostic LED indications are as following:

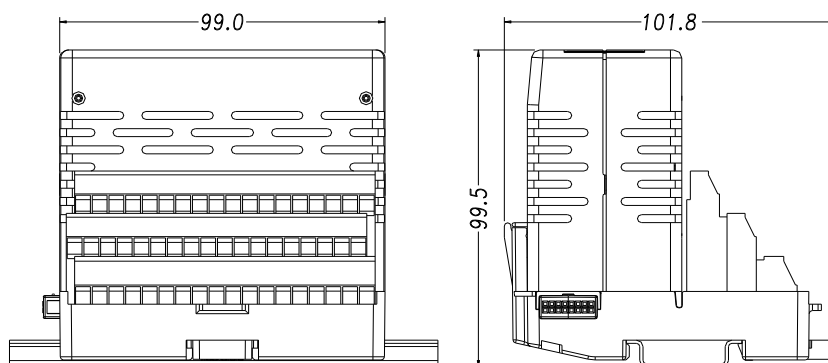
LED DG	Meaning	Causes
ON	Normal operation	
Blinking 1X	Head is not accessing module or logic fault at module	<ul style="list-style-type: none"> <li>- Wrong module type for the position</li> <li>- Non declared module</li> <li>- Damaged module</li> </ul>
Blinking 3X	Under voltage on external power supply	<ul style="list-style-type: none"> <li>- The external power supply is under 19 VDC</li> </ul>
Blinking 4X	Hardware error or module without parameters	<ul style="list-style-type: none"> <li>- Damaged module</li> <li>- Greater noise than specification</li> <li>- Wrong module type for the position</li> <li>- Wrong parameters table in CPU or fieldbus head.</li> </ul>

## Physical Dimensions

Dimensions are in mm.

Dimensions to electric panel design must consider module base.

Ponto Series Installation manual must be consulted for general panel dimensioning.



## Maintenance

Hot swap proceeding is described on Ponto Series Installation manual.

## Manuals

For more technical details and configuration on Ponto series products the following documents may be consulted:

Document Code	Description
CT109000	Ponto series characteristics and configuration
MU209000	Ponto Series users manual
MU209100	Ponto Series PROFIBUS Remote I/O Configuration Manual
MU203600	MT6000 users manual - MasterTool ProPonto,
MU109100	PO3045 users manual - UCP
MU203028	MT4100 users manual - MasterTool

Additionally compatible CPUs and net heads user manuals may be consulted.