8 Isolated Universal AI PO1112

DISCONTINUED: Consult sales department

Doc. Code: CE109312 Revision : K

Product Description

The PO1112 module is part of the Ponto Series and has 8 isolated analog inputs for measuring voltage, current, RTD, thermocouples, mV and resistance. When measuring temperature the module automatically compensates for cold joint temperature, conversion and linearization of the values.

The module is designed to control or supervise machineries and processes.

The picture shows the product installed in an analog IO base with spring terminal blocks.

The module main features are:

- Universal isolated module, with independently configurable inputs for any transducer and range
- Local and remote diagnostic
- Measurement of voltage and current
- Measurement of thermocouples type J, K, B, E, T, R, S, N with linearization
- Measurement of RTDs type Pt100 and Pt100 accordingly to American and European standards
- Cold joint compensation for thermocouples measurement
- Verification of open thermocouple
- Hot swap with no interference on panel cabling
- Remote parameterization via software
- Galvanic isolation between analog inputs and logic circuits
- Field cabling connected to the base, thus eliminating intermediary terminal blocks for field signals
- Optional protection with fuse on IOs power supply and on 4-20 mA signal
- Filters parameters configurable by software
- Automatic addressing
- Automatic verification of module type based on the bus head

Ordering Information

Included Items

The product packaging comes with:

- PO1112 Module
- Installation Guide

Product Code

Please use following product code when ordering the product:

Code	Description
PO1112	8 Isolated Universal AI

Related Products

Depending on your system requirements, the following products might be ordered along with the PO1112. Please check with your sales representative if you have any questions.

Code	Description
PO6004	Analog I/O Spring-clamp Terminal Base
PO6104	Analog I/O Spring-clamp Terminal Base with Fuse
PO6001	Analog IO Base - Spring
PO6101	Analog IO Base – Spring with Fuse
PO8520	16 Fuses 3 A 250 Vac (1)
PO8521	16 Fuses 32 mA 250 Vac (1)
PO8510	10 Sheets with 14 labels of 16 tags for printer (2)
PO8523	Spring Terminal Block Tool (3)
AL3492	Current Analog I/O Suppressor
AL3493	Analog I/O Suppressor

Notes

PO6004, PO6104, PO6001 and PO6101: The section Electrical Installation describes how to select the best analog base for each application.

PO8520 and PO8521: The products PO8520 and PO8521 may work as 16 spare fuses for bases PO6101, PO6104 and PO6151.

PO8510: The product PO8510 is A4 sheets with labels where the tags may be printed using the MasterTool ProPonto Software - MT6000.

PO8523: The product PO8523 is an isolated tool to connect the cables into the spring bases PO6001, PO6004, PO6101 and PO6104.

AL3492: The product AL3492 is a suppressor module for analog points of current that adds a high level of protection against surges.

AL3493: The product AL3493 is a suppressor module for analog points that adds a high level of protection against surges.

Features

General Features

	PO1112
Module type	8 isolated analog inputs
Input type	Voltage, current, thermocouple, RTD, resistance
Data format	16 bits in 2 complement, justified to the left
Converter resolution	16 bits monotonicity guaranteed, no missing codes
Terminal block configuration	1 terminal block, power supply 24 Vdc for 4-20 mA sensors (P) 1 terminal block voltage input (+) (V) 1 terminal block voltage input (-) (L) 1 terminal block current input (I) 1 terminal block for each IO return (0 Vdc), interconnected (N) 1 terminal block for shield cable (G)
Diagnostic indication	Two multifunctional LEDs with indication of module Ok, missing external power supply, burned fuse, out of range signal and missing parameterization.
Configurable parameters	Signal type per input Measurement range per input Thermocouple and RTD per input Filters per input Temperature unit (^{o}F or ^{o}C) per module
Auto-test	A/D converter and all the control logic
Hot swap	Yes
Protections	3 A fuse in the sensor power cable and 32mA fuse in line with current signal when used with fused bases Polarity inversion for power supplies Surge voltage suppressors in all analog inputs Modules with revision CS or greater have a PTC thermistor in all current inputs to over current/ voltage protection
External power supply	19.2 to 30 Vdc including ripple Consumption 100 mA @ 24 Vdc.
Scanning time	25 or 100 ms
Initialing time	1.8 s
Isolation	
Inputs to logic circuits	1500 Vac for 1 minute
Inputs to ground	1500 Vac for 1 minute
Power supply to logic circuits	1500 Vac for 1 minute
Among inputs	No isolation
Bus power consumption	66 mA
Power consumption	2.5 W
Maximum operating temperature	60 ^{o}C
Dimensions	100 x 52 x 84 mm
Norms	- IEC 61131-2:2003, clauses 8 and 11 Please see Series' general features
Compatible bases	PO6001: Spring-clamp Analog I/O Terminal Base PO6004: Spring-clamp Analog I/O Terminal Base PO6051: Screw-clamp Analog I/O Terminal Base PO6101: Fuse and Spring-clamp Analog I/O Terminal Base PO6104: Fuse and Spring-clamp Analog I/O Terminal Base PO6151: Fuse and Screw-clamp Analog I/O Terminal Base

Notes

Scanning time: The scanning time is the time the module takes to provide a new canal value to the GBL bus. This time may be configured for 25 ms or 100 ms for the module (all I/O points). All the 8 canals are updated at the same time.

The scanning time is a function of the conversion time and the filter algorithm, where the cutting frequency is programmable by the user. The scanning time may be set to 25 or 100 ms when measuring voltage and current. When measuring temperature via thermistors, thermocouples and resistance the scanning time must is set to 100 ms.

> ATTENTION:
> If the scanning time is set to 25 ms: it is not possible to configure measurement for thermocouples, RTDs and resistance; also filtering times of 100 ms, 1 s and 10 s are not available.
> If scanning time is set to 25 ms and the modes and filtering times set to values described above, then the module will get into a canal configuration error status.

Initialing time: The initialing time is the time required for the module to make its internal initialization, during which the data are not available to the CP. After this time, are initiated all channel scans, and the subsequent data updating. This also occurs during system reconfiguration.

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.

Voltage Mode Features

	PO1112 – Voltage Mode		
Precision	± 0.1% full range@ 25 °C ± 0.005% / °C full range		
Resolution	16 bits Monotonicity guaranteed with no missing codes		
Input impedance	1,1 MΩ		
Maximum voltage without damage	± 15 Vdc		
Filtering	Time constant configurable: 0.2 ms, 1.3 ms, 100 ms, 1 s or 10 s		
Crosstalk DC to 100 Hz	- 30 dB mim		
Scanning time	25 or 100 ms		
Ranges	Range	Counting	Resolution
	-100 to +100 mVdc	-30,000 to 30,000	3,33 μVdc
	0 to 1 Vdc	0 to 30,000	33,3 μVdc
	0 to 5 Vdc	0 to 30,000	166,6 μVdc
	0 to 10 Vdc	0 to 30,000	333 μVdc
	-1 to +1 Vdc	-30,000 to 30,000	33,3 μVdc
	-5 to +5 Vdc	-30,000 to 30,000	166,6 μVdc
	-10 to +10 Vdc	-30,000 to 30,000	333 μVdc
Range slack	± 5%		
Over-range indication	When 5% over or under measurement range		

Current Mode Features

	PO1112 – Current Mode		
Precision	± 0.1% full range @ 25 °C ± 0.005% / °C full range		
Resolution	16 bits Monotonicity guaranteed with no missing codes		
Input impedance	Less than 75 Ω - no fuse (PO6001, PO6004 or PO6051 base) Less than 365 Ω - with fuse 32 mA (PO6101, PO6104 or PO6151 base)		
Maximum current without damage	40 mA		
Maximum voltage without damage	± 30 Vdc		
Filtering	Time constant configurable: 0.2 ms, 1.3 ms, 100 ms, 1 s or 10 s		
Crosstalk @ 100hz	- 30 dB mim		
Scanning time	25 or 100 ms		
Ranges	Range	Counting	Resolution
	-1 to +1 mA	-30,000 to 30,000	0.033 μA
	0 to 20 mA	0 to 30,000	0.666 μA
	4 to 20 mA	0 to 30,000	0.533 μA
	-20 to +20 mA	-30,000 to 30,000	0.667 μA
Range slack	± 5%		
Over-range indication	When 5% over or under measurement range		
Open wire detection	Indicates that field cable was broken (only 4-20 mA)		

Notes

Ranges - Counting: When an analog input is configured to 4-20 mA current mode and there is no input current, the PO1112 module will read the value -7500.

Thermocouple Mode Features

	PO1112 – Thermocouple Mode			
Precision	± 0.1% full range @ 25 °C ± 0.001% /°C full range			
Resolution	16 bits Monotonicity guaranteed with no missing codes			
Measurement unit	Configurable: °C or °F			
Input impedance	10 MΩ			
Maximum continuous voltage without damage	± 15 Vdc			
Filtering	Time constant configurable: 1.3 ms, 100 ms, 1 s or 10 s			
Maximum common mode voltage	± 1500 mVdc			
Common mode rejection	120 dB @ 60hz			
Crosstalk among canals @ 100hz	- 30 dB mim			
Open thermocouple detection	Indicated at the diagnostic			
Cold joint compensation	Usage of two temperature sensors integrated into the base Compensation range from 0 to 80 °C Precision ± 1 °C from 0 to 80 °C			
Scanning time	100 ms			
Thermocouple Mode °C **Curve ITS-90**	Model	Temperature	Counting	Resolution
	J	0 to 1140 °C	0 to 11400	0.1°C
	K	-200 to 1250 °C	-2000 to 12500	0.1°C
	B	485 to 1700 °C	4850 to 17000	0.1°C
	E	-200 to 900 °C	-2000 to 9000	0.1°C
	T	-200 to 350 °C	-2000 to 3500	0.1°C
	R	0 to 1450 °C	0 to 14500	0.1°C
	S	0 to 1450 °C	0 to 14500	0.1°C
	N	-200 to 1300 °C	-2000 to 13000	0.1°C
Thermocouple Mode °F **Curve ITS-90**	Model	Temperature	Counting	Resolution
	J	32 to 2084 °F	320 to 20840	0.2 °F
	K	-328 to 2282 °F	-3280 to 22820	0.2 °F
	B	905 to 3092 °F	9050 to 30920	0.2 °F
	E	-328 to 1652 °F	-3280 to 16520	0.2 °F
	T	-328 to 662 °F	-3280 to 6620	0.2 °F
	R	32 to 2642 °F	320 to 26420	0.2 °F
	S	-32 to 2642 °F	-320 to 26420	0.2 °F
	N	-328 to 2372 °F	-3280 to 23720	0.2 °F
Range slack	± 5%			
Over-range indication	When 5% over or under measurement range			

Notes

Precision: The determination of the maximum scales thermocouple should be done by adding the error of the cold junction. The error of the cold junction is computed in milivolts from the table of the thermocouple used.

RTD Mode Features

	PO1112 –RTD Mode			
Precision	± 0.1% full range @ 25 °C ± 0.006% / °C full range			
Resolution	16 bits Monotonicity guaranteed with no missing codes			
Measurement unit	Configurable: °C or °F			
Input impedance	1.1 MΩ			
Excitation current	452 μA			
Measurement technique	3 wires			
Maximum continuous voltage with no damage	± 15 Vdc			
Filtering	Time constant configurable: 1.3 ms, 100 ms, 1 s or 10 s			
Crosstalk among canals @ 100 Hz	- 30 dB mim			
Detection of open RTD	Indication at the diagnoses if the temperature measurement is 8% higher than the measuring range.			
Scanning time	100 ms			
RTD Mode Measurement °C	Model	Temperature	Counting	Resolution
European Curve (DIN 43760)	Pt100	-200 to +850 °C	-2000 to 8500	0.1 °C
α= 0,00385	Pt1000	-200 to +850 °C	-2000 to 8500	0.1 °C
RTD Mode Measurement °C	Model	Temperature	Counting	Resolution
American Curve	Pt100	-100 to +457 °C	-1000 to 4570	0.1 °C
α=0,00392	Pt1000	-100 to +457 °C	-1000 to 4570	0.1 °C
RTD Mode Measurement °F	Model	Temperature	Counting	Resolution
European Curve (DIN 43760)	Pt100	-328 to 1562 °F	-3280 to 15620	0.2 °F
α= 0,00385	Pt1000	-328 to 1562 °F	-3280 to 15620	0.2 °F
RTD Mode Measurement °F	Model	Temperature	Counting	Resolution
American Curve	Pt100	-148 to 854.6 °F	-1480 to 8546	0.2 °F
α=0,00392	Pt1000	-148 to 854.6 °F	-1480 to 8546	0.2 °F
Range slack	± 5%			
Sensor cable	3-wires, maximum resistance per wire = 20 Ω			
Over-range indication	When 5% over or under measurement range			

Notes

European curve and American curve: For a correct measurement of temperature the module must to be configured with the same curve of the RTD sensors.

Resistance Mode Features

	PO1112 – Resistance Mode		
Precision	± 0.1% full range @ 25 °C ± 0.006% / °C full range		
Resolution	16 bits Monotonicity guaranteed with no missing codes		
Input impedance	1.1 MΩ		
Excitation current	452 μA		
Measurement technique	2 or 3 wires		
Filtering	Time constant configurable: 1.3 ms, 100 ms, 1 s or 10 s		
Crosstalk among canals @ 100hz	- 30 dB mim		
Detection of open resistance	Indicated at the diagnoses		
Ranges	Range	Counting	Resolution
	0 to 400 Ω	0 to 30,000	13,3 mΩ
	0 to 4000 Ω	0 to 30,000	133 mΩ
Scanning time	100 ms		
Range slack	± 5%		
Sensor cable	3-wires, maximum resistance per wire = 20 Ω		
Over-range indication	When 5% over or under measurement range		

Installation

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

Electrical Installation

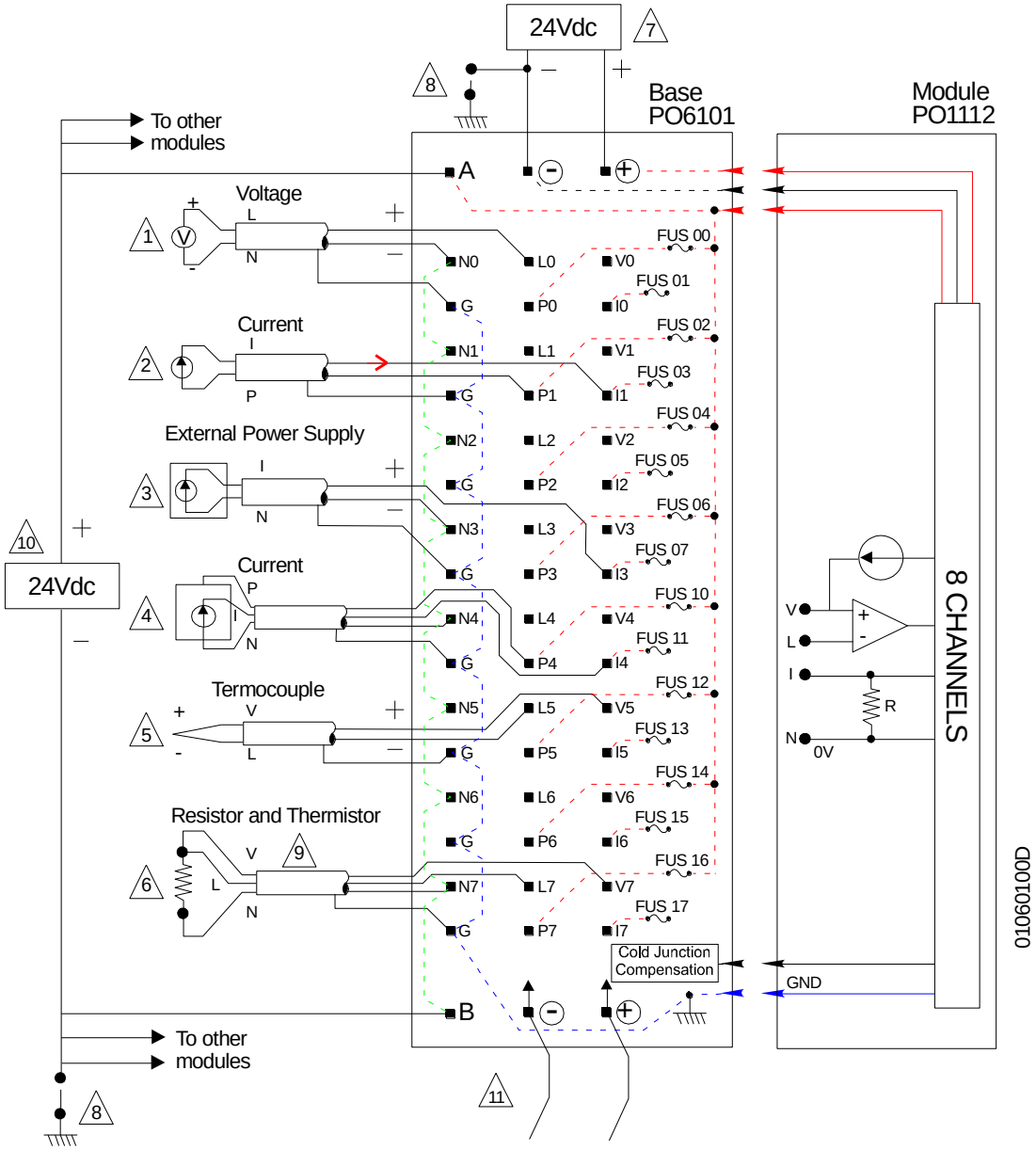
The module PO1112 should be used together with one of the following Ponto Series analog bases: P6001, P6004, PO6051, PO6101, PO6104 and PO6151. The table below can be used to help the choice of the best analog base to be used on a given application.

	Signals Px and Ix with fuse	Without fuse
Only current measurements or any others analog measurements	PO6101/PO6151	PO6001/PO6051
Current measurement and other analog measurement on the same module	PO6104	PO6004

The analog bases PO6xx1 and PO6x04 are different according the following characteristics:

- The bases PO6xx1 (PO6001, PO6051, PO6101 and PO6151) are ideal for applications where it's used the signals Px to supply field sensors because they allow a more simplified electrical installation for these cases.
- The bases PO6x04 (P6004 and PO6104) allow the usage of current measurement together with any other analog measurement on the same module. The usage of PO6xx1 bases in this case may result in analog signals measurement variation.
- The bases PO6001 and PO6051 only differ in the way of how the field sensor wiring is fixed.
- The bases PO6101 and PO6151 only differ in the way of how the field sensor wiring is fixed.

The diagram below shows the PO1112 electrical connection with the analog bases PO6101, PO6151, PO6001 or PO6051. For the bases PO6001 and PO6051 the fuses, indicated in the diagram as FUS 0x, must be ignored.



The diagram below shows the PO1112 electrical connection with the analog bases PO6104 or PO6004. For the base PO6005 the fuses, indicated in the diagram as FUS 0x, must be ignored.

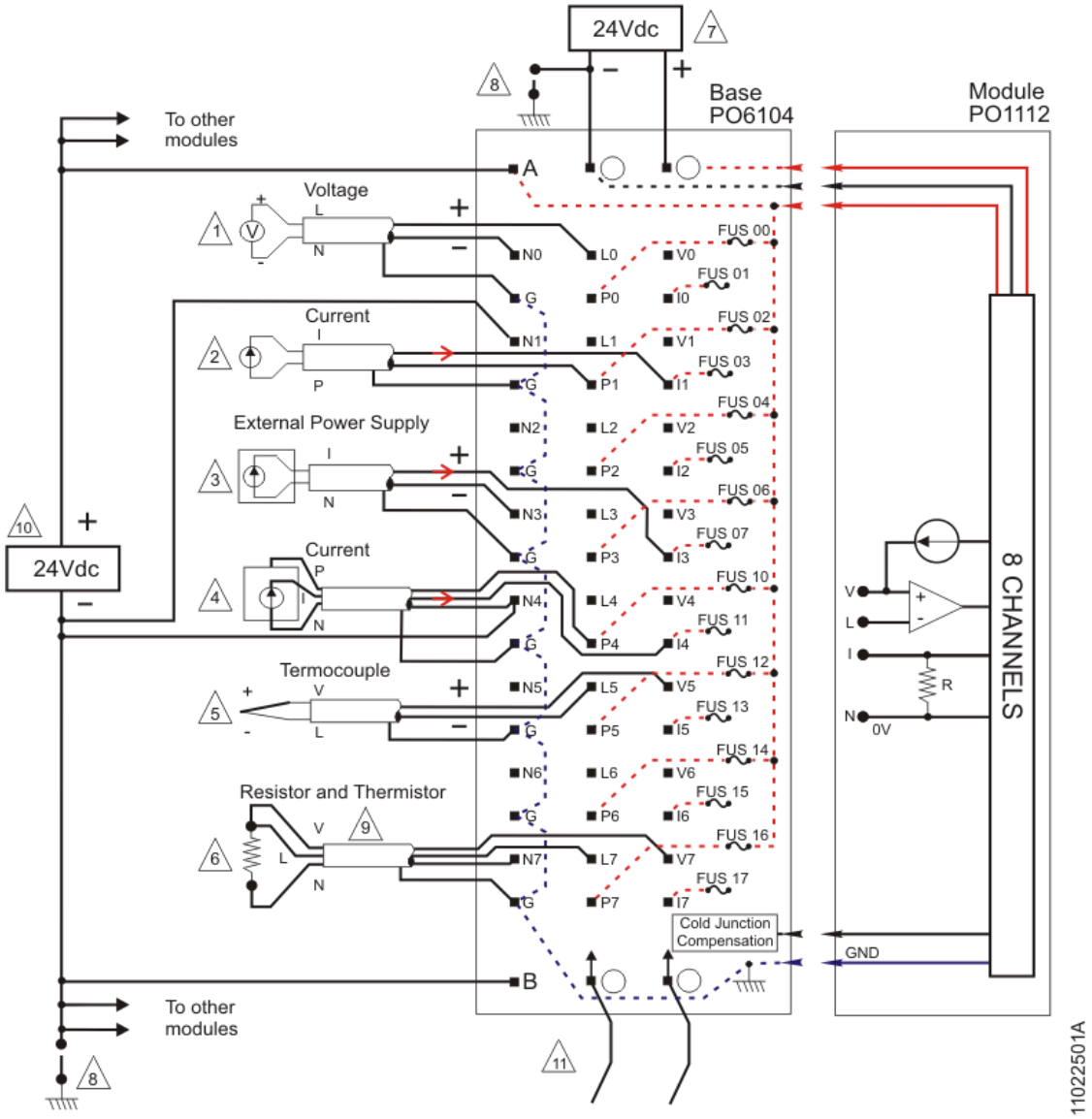


Diagram notes:

1 – Please connect the positive terminal to the L block and the negative terminal to the N common when measuring voltage.
2 – This is the required connection for 2 wires current sensors – the sensor is powered by the current signal. The 24 Vdc power supply is gotten from the terminal P and the input signal is connected to the terminal I. For this kind of application we recommend the use of terminal bases with fuses (PO6101, PO6104 or PO6151). Using this terminal bases the current input is protected by a 32 mA fuse per channel, identified by the odd numbering in the fuse case.
3 – Current Sensors that require external power, type four wire sensors: the input signal enter by the borne I and return to sensor by the borne N.
4 – Sensors that need 24 Vdc power supply can use the terminals P. These terminals are internally connected to the Power Supplier (10) and they are protected by a 3 A fuse with even numbering in the terminal base.
5 – The thermocouples measurement should be made by the positive terminal connected to V block and the negative to the L block. The environment temperature compensation (cold joint) is automatically done through integrated sensors in the base – bellow the terminal blocks.
6 – For measuring Resistors or Thermistors you should use shielded cable with 3 wires of the same size and shield as the one connected to G block. The V and L cables must connect directly on the component to be measured, without intermediary connectors.
7 – The electric installation is done by feeding the base with a 24 Vdc power supply on the terminal block extremities – blocks marked by + and -. This connection is mandatory.

8 – The common point for the power supply (6) and the sensors (9) may be connected to the panel ground. This connection is not mandatory, but it is recommended in order to reduce electric noise in automation systems.
9 – All the signals must be connected by shielded cables with the shield grounded preferably at the G block or by the sensor. It should not be grounded at both shield ends.
10 – Points A and B need only to be connected to a external power supply (24 Vdc) when some of the points P (P0 to P7) are used to supply a field sensor that requires external power. In addition, when using the points A and B in the analog base PO6101, fuses peers of 3 A must be in good condition so that the module does not indicate a diagnosis of burned fuse. It is recommended the use of a separate power supply of indicated on the item (7), as in the case of a short circuit failure in the field, the system does not lose the integrity and still be able to help maintenance services through the diagnostics.
11 – The next module may be fed through the points (+) and (-) on this base. The maximum number of bases that may be connected in this way is 10. No other device can be connected to this terminal blocks.

Module power supply:
The PO1112 module utilizes a 24 Vdc regulated power supply (terminal blocks + and -). This power supply may be used also to feed the field sensors. We recommend to use separate power supplies for larger systems.

Field cabling:
When installing the module please follow procedures described below in order to avoid electromagnetic interference:

- Avoid sharing the same conduit for high voltage or current cables (for instance motors power supply) and sensor cables.
- Identify and eliminate other noise sources, such as faulty or unprotected contactors and sparks produced by wear down motors' brushes.
- Utilize shielded cables for carrying input signals and having one of the shield ends grounded.

> ATTENTION: Should be use the recommendations from standard IEEE 518-1977 Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Input to Controllers from External Sources.

Fuses:
The PO6101, PO6104 and PO6151 bases have protection fuses for the sensors power supply or against current surges on the current inputs.
The fuses identification follows direct relation to the IOs as shows below:

Module IO	00	01	02	03	04	05	06	07
3 A Power Supply Fuse	F00	F02	F04	F06	F10	F12	F14	F16
32 mA Current Input Fuse	F01	F03	F05	F07	F11	F13	F15	F17

The fuse casing is of the bayonet type. When replacing the fuse, please shut down the power supply and use a plastic screw driver with 5mm width. Please consult the Ponto Series Utilization Manual for complete fuse replacement procedures.

> ATTENTION: because the special characteristics, when necessary to replace the Fuses, it's necessary the use only original spare part PO8521.

Measurement of Environment Temperature:
In order to measure the environment temperature please short circuit the terminal blocks V and L for any analog input available. Then such input should be configured for any thermocouple that includes the environment temperature range (any thermocouple except type B). The temperature value measured by such point will be the environment temperature.

> 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.

ATTENTION:

This is an analog module and it's installation near radio-frequency emitter devices may interfere in the precision of the inputs. Avoid installing it near radio equipment, antennas and similar devices.

Field wiring should be shielded because radio-frequency coupling may happen in field signals.

Module has been tested with electromagnetic fields of intensities up to 10 V/m. In those conditions, observed precision was at least 0,5%. This field intensity corresponds to the maximum values considered by international standards to industrial environment. Stronger fields can cause greater performance depreciation.

Tests with portable radio transmitters (walkie-talkies) near the module (1 meter) caused no alteration in nominal precision.

Mechanical Assembly

The mechanical assembly is described in the Ponto Series Utilization Manual.

Please adjust the mechanical code on the assembly base to 12 (1 on switch A and 2 on switch B).

Parameterization

The CPU or field network head defines via software the PO1112 module parameterization. The parameterization sets the measurement modes as well as the filtering. Such parameterization may be set by the MasterTool when using Altus CPUs or by the software that configures the field bus 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 ten bytes. The first two bytes set the generic module aspects and the remaining eight set the parameterization of each analog input.

The bytes should be defined as follow.

Byte	Parameters
0	Module generics
1	Module generics
2	Canal 0
3	Canal 1
4	Canal 2
5	Canal 3
6	Canal 4
7	Canal 5
8	Canal 6
9	Canal 7

Bits

Description of the parameterization bits for each byte:

Byte 0 - Module generics								Description
7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	
				1	**0**	**1**	**0**	Number of parameters bytes
0	**0**	**0**	**0**					Not used

This byte carries always the OAH value, with no options.

Byte 1 - Generics								Description
7	6	5	4	3	2	1	0	
							0	Temperature unit in ^{o}C
							1	Temperature unit in ^{o}F
						0		Not used (always zero)
					0			RTD Curve American standard
					1			RTD Curve European standard
				0				Scanning time = 100 ms
				1				Scanning time = 25 ms
0	**0**	**0**	**0**					Not used (always zero)

Scanning time: if Scanning time is set to 25 ms then it is not possible to configure any canal for measurement of thermocouples, RTDs and resistance. It will get into a parameterization error.

The bytes 2 to 9 define individually each analog input. The 3 most significant ones define the filter and the 5 least significant define the type of the analog variable.

Bytes 2 to 9								Description
7	6	5	4	3	2	1	0	
	0	**0**						Filter 0.2 ms – cut frequency of 780 Hz when configured in Byte 1 with scanning time of 25 ms.
								Filter 1.3 ms - cut frequency of 122 Hz when configured in Byte 1 with scanning time of 100 ms.
	0	**1**						Filter 100 ms - cut frequency of 1.6 Hz
	1	**0**						Filter 1 s - cut frequency of 0.16 Hz
	1	**1**						Filter 10 s - cut frequency of 0.016 Hz
			0	**0**	**0**	**0**	**0**	Deactivated canal
			0	**0**	**0**	**0**	**1**	Voltage -100 to 100 mVdc
			0	**0**	**0**	**1**	**0**	Voltage 0 to 1 Vdc
			0	**0**	**0**	**1**	**1**	Voltage 0 to 5 Vdc
			0	**0**	**1**	**0**	**0**	Voltage 0 to 10 Vdc
			0	**0**	**1**	**0**	**1**	Voltage -1 to +1 Vdc
			0	**0**	**1**	**1**	**0**	Voltage -5 to + 5 Vdc
			0	**0**	**1**	**1**	**1**	Voltage -10 to +10 Vdc
			0	**1**	**0**	**0**	**0**	Current -1 to +1 mA
			0	**1**	**0**	**0**	**1**	Current: 0 to 20 mA
			0	**1**	**0**	**1**	**0**	Current 4 to 20 mA
			0	**1**	**0**	**1**	**1**	Current -20 to +20 mA
			1	**0**	**0**	**0**	**0**	Thermocouple type J
			1	**0**	**0**	**0**	**1**	Thermocouple type K
			1	**0**	**0**	**1**	**0**	Thermocouple type B
			1	**0**	**0**	**1**	**1**	Thermocouple type E
			1	**0**	**1**	**0**	**0**	Thermocouple type T
			1	**0**	**1**	**0**	**1**	Thermocouple type R
			1	**0**	**1**	**1**	**0**	Thermocouple type S
			1	**0**	**1**	**1**	**1**	Thermocouple type N
			1	**1**	**0**	**0**	**0**	RTD PT100
			1	**1**	**0**	**0**	**1**	RTD PT1000
			1	**1**	**0**	**1**	**1**	Resistance of 0 to 400 Ω
			1	**1**	**1**	**0**	**0**	Resistance of 0 to 4000 Ω
0								Not used (always zero)

Deactivated canal: module will always provide zero for such input.
Filters: the 100 ms, 1 s and 10 s are available just for scanning time set to 100 ms in the Byte 1.

Example

Byte	Parameters	7	6	5	4	3	2	1	0	Hex Value	Description
0	Module generics	0	0	0	0	1	0	1	0	0A	Fixed value
1	Module generics	0	0	0	0	0	1	0	1	05	^{o}F /European Curve/ scanning in 100 ms
2	Canal 0	0	1	0	1	0	0	0	0	50	Filter 1s / Thermocouple type J
3	Canal 1	0	0	1	0	0	1	1	1	27	Filter 100 ms / Voltage –10 to 10 Vdc
4	Canal 2	0	0	0	0	1	0	1	0	0A	Filter 25 ms / Current 4 to 20 mA
5	Canal 3	0	1	1	1	1	0	0	0	78	Filter 10 s / RTD PT100
6	Canal 4	0	0	1	1	1	0	1	1	3B	Filter 100 ms / Resistance 0 to 400 Ω
7	Canal 5	0	1	1	1	1	0	1	1	7B	Filter 10 s / Resistance 0 to 400 Ω
8	Canal 6	0	1	0	0	0	0	1	0	42	Filter 1 s / Voltage 0 to 1 Vdc
9	Canal 7	0	0	0	0	0	0	0	0	00	Deactivated canal

Diagnosis

The PO1112 module provides ten bytes for operating diagnosis including information about the connected sensors. The first two bytes indicate the generic aspects related to the module operation.

Byte	Diagnosis
0	Module generics
1	Module generics
2	Canal 0
3	Canal 1
4	Canal 2
5	Canal 3
6	Canal 4
7	Canal 5
8	Canal 6
9	Canal 7

The diagnosis of PO1112, when mounted on a local bus, is available to the CPU as the tables below.

In the case of module compose a Remote PROFIBUS, diagnostic information is made available to the CPU that holds the Network Interface PROFIBUS Master, only the existence of fault conditions. In this case, they are sent their message codes in decimal form.

Byte 0 - General of Module								PROFIBUS Message Code	Description
7	6	5	4	3	2	1	0		
					0	**0**	**0**	-	Always zero
				0				-	Normal operation
				1				31	Non parameterized module
			0					-	Normal temperature
			1					05	Out of range temperature (1)
	0	**0**						-	Always zero
0								-	Normal fuses
1								30	One or more burned 3A fuses

(1) The module uses the cold joint temperature sensor in order to monitor the environment temperature. This indication will occur when the temperature is out of the operating range of module, beyond the limits 0 to 65ºC.

Byte 1								
7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Description**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	Always zero

Bytes 2 to 10								**Description**
7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	
							0	Normal operation
							1	Canal wrongly configured
						0		Normal RTD sensor
						1		Short circuited RTD sensor
					0			Normal sensor (thermocouples, RTDs) or cable (Current)
					1			Open sensor (thermocouples, RTDs) or cable (Current) (1)
				0				Measurement within range
				1				Over-range
0	**0**	**0**	**0**					Always zero

(1) When the diagnosis of "Open sensor (thermocouples, RTDs") or "Cable (current) "is indicated, the status of the diagnosis of "Sensor RTD short circuit" and "over range" on the scale of measurement, should be disregarded.

The diagnosis LED indicates the following situations:

LED DG	**Meaning**	**Causes**
On	Normal operation	
Blinking 1X	Head is not accessing module or logic fault at module	- Wrong module type for the position - Non declared module - Damaged module
Blinking 2X	Burned fuse	- one or more 3 A fuses are burnt
Blinking 4X (the fault identification is dome through CPU diagnosis word)	Missing continuity for signal of thermocouple, RTD and resistance Missing continuity for signal	- Field cable open
	Missing continuity for signal current 4 – 20 mA	- Field cable open

LED 17	**Meaning**	**Cause**
On	Normal operation	
Blinking 1X	Parameterization error	Parameterization is not valid.
Off	Non parameterization	Parameterization missing

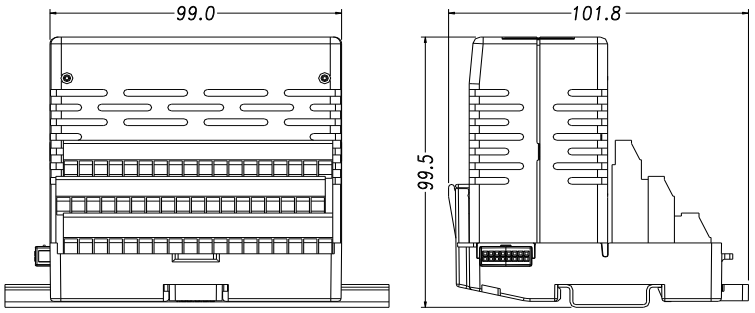
If you get any signalization different from described above please ship module to Altus Support.

Physical Dimensions

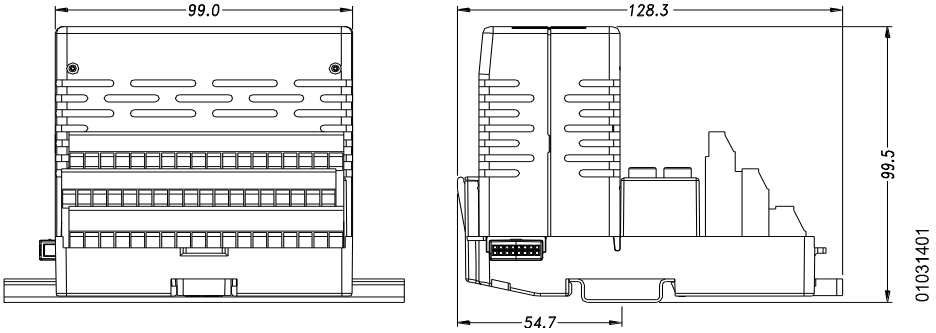
Dimensions in mm.

The electrical panel dimensions should take into consideration the module base sizes. Please consult the Ponto Series Utilization Manual IP20 - MU209000.

Here is the PO1112 module assembled in a PO6001, PO6004 or PO6051 base in DIN TS35 rails.



Here is the PO1112 module assembled in a fused base PO6101, PO6104 or PO6151 base in DIN TS35 rails.



Maintenance

The hot swap procedure is described in the Ponto Series Utilization Manual.

When calibrating the module please use instrumentation like Beta Calibrator or similar for voltage, current and thermocouples; and use precision resistors for RTDs and resistance.

All the module adjusts are set through software by Altus.

Manuals

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

Document Code	Description
CT109000	Ponto Series General Characteristics
CT102660	Analog I/O Suppressor Characteristics
MU209000	Ponto Series Utilization Manual - IP20
MU203600	Utilization Manual , MT6000- MasterTool ProPonto
MU209100	Utilization Manual PO3045- UPC
MAN/MT4100	Utilization Manual MasterTool MT4100

Also please consult the utilization manuals for the field network heads and compatible CPUs.