Invertek Drives PT100 Internal Option Module User Guide

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Invertek Drives PT100 Internal Option Module

Product Information

The OPT-2-PTXIN-IN is an internal option module designed for use with Optidrive P2 & Eco firmware version 2.50 or later. It provides two additional inputs for compatible drives to monitorexternal temperatures using PT100 or PT1000 sensors. The module is compatible with all ODP-2 and ODV-3 models, regardless of the IP rating of the drive.

The module is automatically detected as PT100 or PT1000 based on the resistance measurement, and a combination of PT100 and PT1000 sensors can be used on the same card. The temperature measurement can be read back via the scope channels 84 and 85 or as a data input in the built-in PLC program.

The electrical specifications of the module are as follows:

- Number of temperature sensor inputs: 2
- Signal Type: PT100/1000 (auto-select)
- Connection: 2 wire and 3-wire support
- Update frequency: 1Hz (for each channel)
- Resolution: Temperature range
- Insulation level: 2kV
- Maximum signal cable length: 500m

The module has two status LEDs to aid diagnostics. LED A is illuminated if Sensor 1 is connected and the measured resistance is within range. LED B is illuminated if Sensor 2 is connected and the measured resistance is within range.

Product Usage Instructions

1. Before installing the option module, ensure that the drive power is removed.
2. Remove the blanking cover from the option module slot.
3. Carefully slide the option module into the slot, ensuring that the locating tabs are correctly aligned. Do not use excessive force.
4. Tighten the 2 clamping screws to secure the module in place.
5. Connect the PT100/PT1000 sensors to the option module connection terminals as follows:
    - T1: Positive Connection for Sensor 1
    - RL1: Wire Resistance Compensation Sensor 1
    - R1: Negative Connection for Sensor 1
    - T2: Positive Connection for Sensor 2
    - RL2: Wire Resistance Compensation Sensor 2
    - R2: Negative Connection for Sensor 2

Note: To minimize noise injection into the drive control circuit, ensure that the PT100/PT1000 sensors connected are isolated from power earth (ground).

Overview

The OPT-2-PTXIN-IN is an internal option module which provides two additional inputs for compatible drives, to monitor external temperatures via PT100 or PT1000 sensors.

Note
This User Guide is intended to be used with Optidrive P2 & Eco firmware version 2.50 or later. The firmware version of the drive can be displayed in parameter P0-28. Previous versions of firmware can be upgraded using Optitools Studio PC software. Contact your local Invertek Sales Partner for further Information.

OPT-2-PTXIN-IN

General Information
It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with all relevant legislation and codes of practice which apply in the country of use.

CE Marking
All Invertek Drives products intended for use within the European Union carry the CE mark to indicate compliance with European Directives.
A declaration of conformity is available from the website, www.invertekdrives.com
For compliance with the European EMC Directive, the necessary guidance is provided within this document and it is the responsibility of the installer to ensure this guidance is followed to ensure compliance.

UKCA Marking
All Invertek Drives products intended for use within the United Kingdom carry the UKCA mark to indicate compliance with the relevant UK regulations (Including: Electromagnetic Compatibility Regulations). A declaration of conformity is available from the website, www.invertekdrives.com. For compliance with the relevant sections of the above regulations, the necessary guidance is provided within this document and it is the responsibility of the installer to ensure this guidance is followed to ensure compliance.

Overview
The OPT-2-PTXIN-IN is an internally installed terminal option card which provides an additional two PT100 or PT1000 input
for compatible drives, to monitor external temperatures. The inputs are automatically detected as PT100 or PT1000 based on
the resistance measurement and a combination of PT100 and PT1000 sensors can be used on the same card.
The temperature measurement can be read back via the scope channels 84 and 85 or as a data input in the built-in plc program.

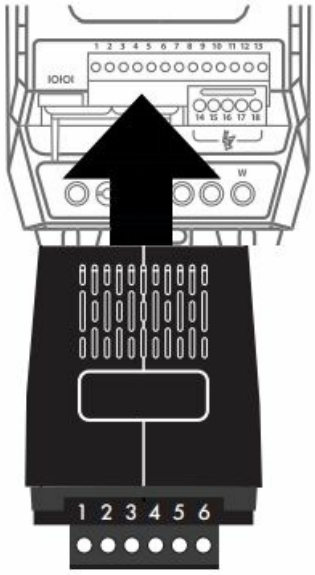
Compatibility with Current Products
OPT-2-PTXIN-IN is compatible with all ODP-2 and ODV-3 models (regardless of the IP rating of the drive).

Electrical Specification
Number of temperature

- sensor inputs: 2
- Signal Type: PT100/1000 (auto-select)
- Connection: 2 wire and 3-wire support
- Update frequency: 1Hz (for each channel)
- Resolution: 10bit (1°C)
- Temperature range: -50 to 204°C (PT100) /
- -58 to 399°C (PT1000)
- Insulation level: 2kV
- Maximum signal cable length: 500m

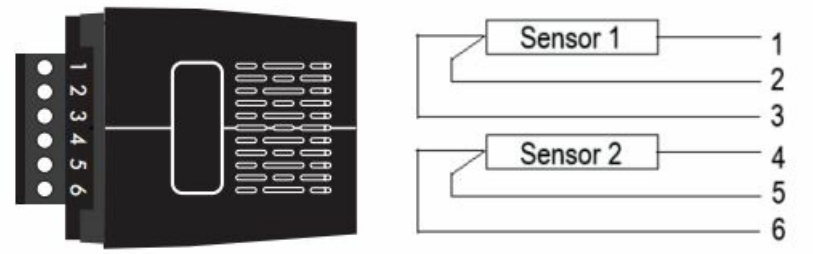
Mechanical Installation

- Ensure the drive power is removed prior to installing the option module
- Remove the blanking cover from the option module slot
- Carefully slide the option module into the slot, ensuring that the locating tabs are correctly aligned. Do not use excessive force
- Tighten the 2 clamping screws to secure the module in place



Option Module Connection Terminals

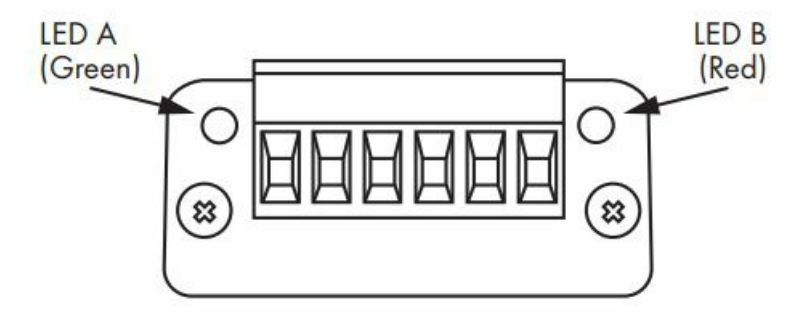
T	Function	Description	
1	+R1	Positive Connection	
2	-RL1	Wire Resistance Compensation	Sensor 1
3	-R1	Negative Connection	
4	+R2	Positive Connection	
5	-RL2	Wire Resistance Compensation	Sensor 2
6	-R2	Negative Connection	



NOTE To minimise on any noise injection into the drive control circuit, ensure that the PT100/PT1000 sensors connected are isolated from power earth (ground).

Status LEDs

The PT100/PT1000 module has two status LED's to aid diagnostics, the LED operation is described below: LED A Illuminated if Sensor 1 is connected and measured resistance is within range.
LED B Illuminated if Sensor 2 is connected and measured resistance is within range.



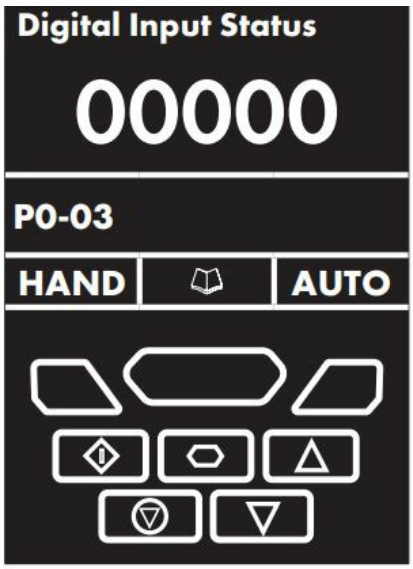
If either LED is not illuminated, the corresponding sensor is not connected correctly or damaged. Check that the connections are made correctly as shown above or replace the sensor.

Reading back the Sensor Temperature and Status
The temperature measured by the sensor can be read back in units of °C using the plc program in OptiTools Studio or reading the P0-80 Index parameter.

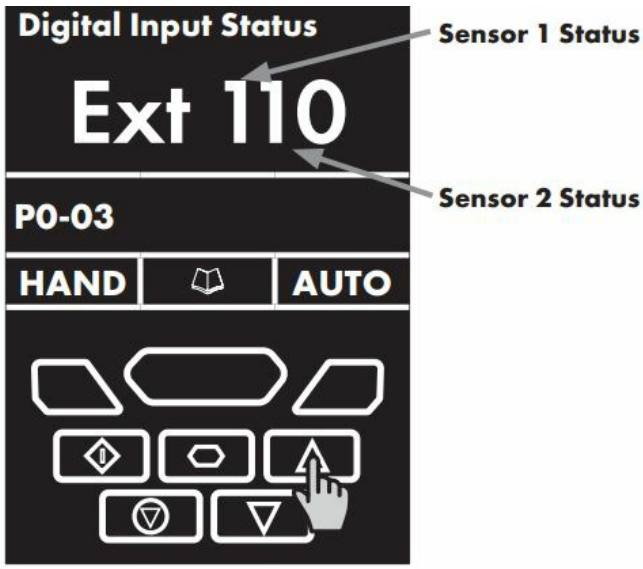
Reading back the Sensor Temperature and Status on the Drive Keypad
The P0-80 index can be read by setting P6-28 to the index value and then reading back the displayed value in P0-80 as follows:

P6-28 Setting	P0-80 Display Value
94	Sensor 1 Temperature in Deg C
95	Sensor 2 Temperature in Deg C

Please note that the P0-80 displayed value is unsigned so only temperatures of zero degrees C or above will display correctly here without any further interpretation of the value.
In addition to this, the sensor status can be read back using P0-03 by looking at DI6 (sensor 1) and DI7 (sensor 2) status. A value of 1 would indicate sensor connected and measurement within range, a value of 0 would indicate either sensor not connected or measurement out of range. DI6 and DI7 status can be read on the drive display by reading P0-03 as follows:



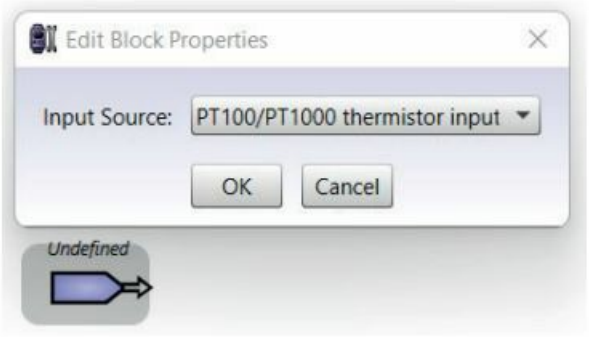
Select P0-03 and view the value to see the Digital Input Status as shown above.



Pressing the arrow up to reach the extended I/O status.

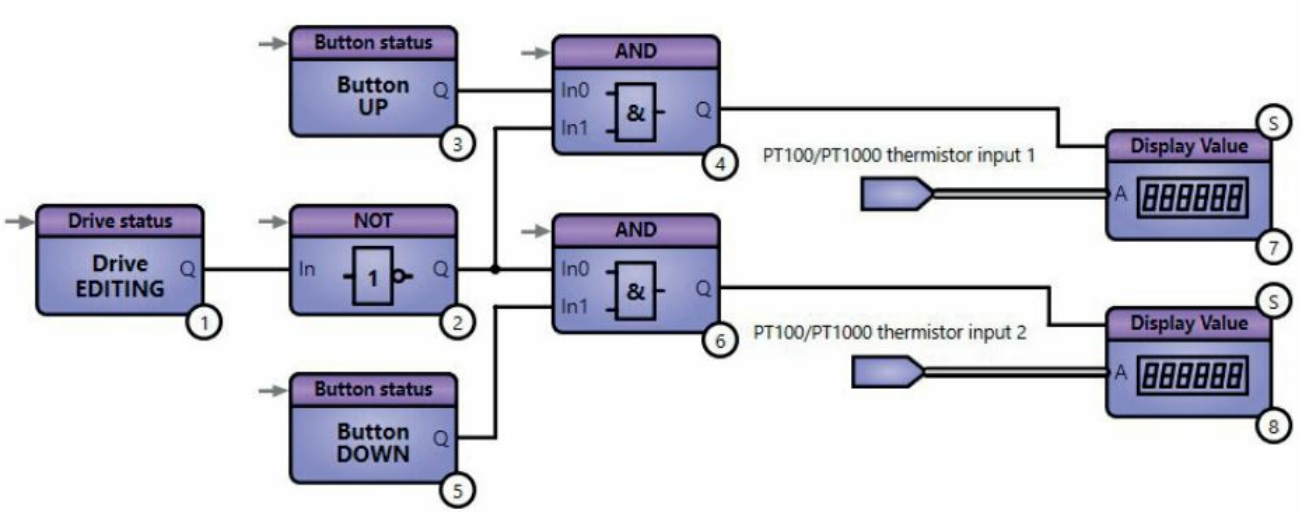
The drive will now display the extended inputs (DI6, DI7 & DI8). The first digit to the left would indicate the status of Sensor 1 and the next digit would indicate the status of Sensor 2.

Reading back the Sensor Temperature and Status using the on-board PLC
In the Function Block Editor, the temperature measured by each sensor can be read and processed from a Data Input as shown below:

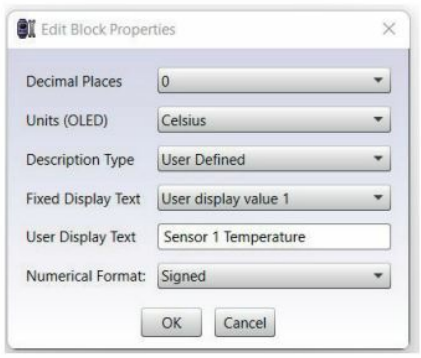


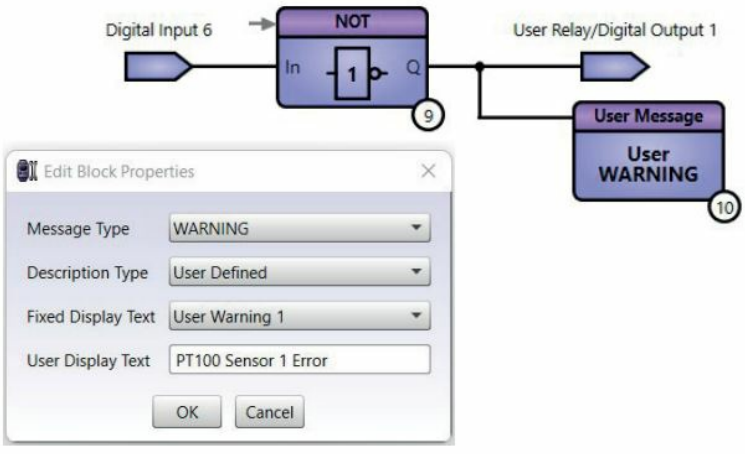
Double clicking on the data input can allow you to select the source as the PT100/PT1000 thermistor input. NOTE There are two PT100/PT1000 inputs to select from, ensure that you select the correct one for your installation/application.

An example program is shown below where if the drive is NOT in Editing Mode, AND the UP Button is pressed, the temperature measured by Sensor 1 will be displayed in Degrees C. When the UP Button is released, the display will return to the standard mode. In a similar way, if the drive is NOT in Editing Mode, AND the DOWN Button is pressed, the temperature measured by Sensor 2 will be displayed in Degrees C. When the DOWN Button is released, the display will return to the standard mode.



- The display Value block should be set to signed and the units applied as Celsius as shown below:
- The Sensor Input Status could also be monitored for signal loss or error by monitoring DI6 (Sensor 1) or DI7 (Sensor 2) as illustrated below:





In the above example, the drive relay would change state if the sensor is disconnected and a warning displayed on the drive.

NOTE The relay source must be changed to User Defined using P9-35 (P9-36 for relay 2) for this feature to work.

82-PTXIN-IN_V1.00

Invertek Drives Ltd

- Offa’s Dyke Business Park, Welshpool, Powys SY21 8JF United Kingdom
- Tel: +44 (0)1938 556868
- Fax: +44 (0)1938 556869
- www.invertekdrives.com

Documents / Resources

	Invertek Drives PT100 Internal Option Module [pdf] User Guide PT100, PT1000, Module, OPT-2-PTXIN-IN, PT100 Internal Option Module, Internal Option Module, Option Module, Module

References

- Variable Frequency Drive Manufacturer | Variable Speed Drives | AC Drives | Invertek Drives