

# Bardac drives

## PI OPTION MODULE

### User Guide

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The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation. The contents of this User Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous improvement, the manufacturer reserves the right to change the specification of the product or its performance or the contents of the User Guide without notice.

#### SAFETY

This option module is specifically designed to be used with the Optidrive variable speed drive product and is intended for professional incorporation into complete equipment or systems. If installed incorrectly it may present a safety hazard. The Optidrive uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction.

System design, installation, commissioning and maintenance must be carried out only by personnel who have the necessary training and experience. They must read carefully this safety information and the instructions in this Guide and follow all information regarding transport, storage, installation and use of the Option module, including the specified environmental limitations.

Please read the IMPORTANT SAFETY INFORMATION below, and all Warning and Caution boxes elsewhere.

#### SAFETY NOTICES

**WARNING** is given where there is a hazard that could lead to injury or death of personnel.

**CAUTION** is given where there is a hazard that could lead to damage to equipment.

It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with the EMC legislation of the country of use. Within the European Union, equipment into which this product is incorporated must comply with 89/336/EEC, Electromagnetic Compatibility.

#### WARNING

Within the European Union, all machinery in which this product is used must comply with the Directive 89/392/EEC, Safety of Machinery. In particular, the equipment should comply with EN60204-1.

#### WARRANTY

All Bardac Drives OD products carry a 2-year warranty, valid from the date of manufacture.

Complete Warranty Terms and Conditions are available upon request from your IDL Authorised Distributor.

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#### MECHANICAL AND ELECTRICAL INSTALLATION

##### CAUTION

- Store the Optidrive Option Module in its box until required. It should be stored in a clean and dry environment. Temperature range -40°C to +60°C.
- Install the Option Module onto the Optidrive by inserting the row of 11 pins into the terminal connector of the Optidrive, ensuring that the terminals are tightened.
- If the Option Module is being used with Size#1 Optidrive, care should be taken to support the Option Module when the terminal screws of the Option Module are being tightened or loosened.

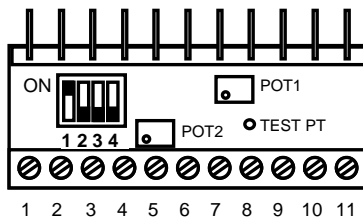
##### WARNING

- Optidrives and the Option Modules should be installed only by qualified electrical persons and in accordance with local and national regulations and codes of practice.
- **Electric shock hazard!** Disconnect and **ISOLATE** the Optidrive before attempting any work on it. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply.
- Where the electrical supply to the drive is through a plug and socket connector, do not disconnect until 10 minutes have elapsed after turning off the supply.

##### SPECIFICATIONS

Rated reference input :	+/- 10V DC or 4...20mA	Proportional gain range :	0.2 .... 30
Rated feedback input :	+/- 10V DC or 4...20mA	Integral gain settings :	0.1s, 1s, 10s
Max input voltage :	+/- 50V DC	Conformity :	IP00, UL94V-0
Environmental :	-10°C ... +50°C		

##### SWITCH SETTINGS FOR OPERATIONAL MODE SELECTION



	Switch Open (OFF)	Switch Closed (ON)
S1 *	Integral gain 0.1s	Integral gain 1s
S2 *	Integral gain 0.1s	Integral gain 10s
S3	Feedback format 0...10V	Feedback format 4...20mA
S4	Reference format 0...10V	Reference format 4...20mA

\* The greater integral time will take precedence should S1 and S2 be closed at the same time.

##### Note :

P-16 must be set to voltage mode (0-10V) to support this option module.

##### POTENTIOMETER SETTINGS

###### POTENTIOMETER 1 : REFERENCE VOLTAGE PRESET

For those applications that require a fixed preset operating point, an on-board preset potentiometer is available to avoid having to use an external potentiometer for this type of application. To use this feature, S4 must be open (Off). The preset voltage ranges from 0V (fully anticlockwise) to 10V (fully clockwise). Note that the preset voltage can be measured on the PI Option Module test point (see diagram above).

**Important Note :** If an external reference is used (either voltage or current format), this potentiometer must be turned to zero (fully anti-clockwise). If this is not done, an offset will be introduced by POT1.

###### POTENTIOMETER 2 : PROPORTIONAL GAIN ADJUST

The proportional gain of the PI controller is adjusted using POT2 (see above diagram). Minimum gain is achieved by turning the Potentiometer fully anti-clockwise. In general, it is best use this setting as the starting point during commissioning of this Option Module with the Optidrive in any application.

##### General Notes :

- When the 4...20mA setting is used for either the feedback (pin 7) or reference (pin 6) input and the 0.10V setting is used for the other input (eg 0...10V ref, 4...20mA feedback), the voltages measured on pins 6 and 7 will be different under stable operating conditions. This is due to an offset of 2.5V that is introduced internally to support 4...20mA operation. Control settles with the 0...10V input nominally 2.5V lower than the 4...20mA input.
- Both Potentiometers 1 and 2 are 5-turn types, ie they require 5 full turns to cover the full range. In the event of the maximum or minimum point being reached, the adjustment disengages to avoid mechanical damage.

Both POT1 and 2 are turned to their minimum values (fully anti-clockwise) when delivered from Invertek Drives Ltd.

##### OPTION MODULE CONTROL TERMINALS



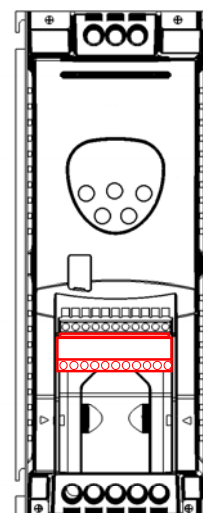
\* The analog PI inputs must be connected to terminals 6 and 7.

##### STANDARDS CONFORMITY

An Optidrive fitted with this Option Module complies with the following standards:

- CE-marked for Low Voltage Directive.
- IEC 664-1 Insulation Coordination within Low Voltage Systems.
- UL 840 Insulation coordination for electrical equipment.
- EN50081-2 EMC Generic Emissions Standard, Industrial Level.
- EN50082-2 EMC Generic Immunity Standard, Industrial Level.
- Enclosure ingress protection, EN60529 IP00, NEMA 250.
- Flammability rating according to UL 94.

*G O Jones*  
**G O Jones, Technical Director**



Option PCB inserted into Optidrive control terminal strip.

All 11 terminal screws on the Optidrive must be tightened to ensure good electrical contact and correct functionality.

Optidrive size 2