

OPTIPOINT E-2

Remote Keypad Option Module

User Guide

Installation and Operating Instructions



SAFETY

Optipoint E-2 is designed to be used in conjunction with the Optidrive E-2 variable speed drive and is intended for professional incorporation into complete equipment or systems. The Optipoint E-2 can be used to control the operation of the Optidrive E-2 range. The drive must be installed correctly to prevent a safety hazard. The Optidrive E-2 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 and the Optidrive E-2 User Guide and follow all information regarding transport, storage, installation and use, 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.



Dr David Jones, R&D Director

DECLARATION

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The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation, or adjustment of the optional operating parameters of the drive or from mismatching of the drive to the motor.

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.

WARRANTY

All Invertek Drives Ltd (IDL) products carry a 2-year warranty, valid from the date of manufacture. This date is clearly visible on the rating label.

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

IMPORTANT SAFETY INFORMATION

Safety of machinery, and safety-critical applications

The level of integrity offered by the Optipoint E-2 / Optidrive E-2 control functions – for example stop/start, forward/reverse and maximum speed, is not sufficient for use in safety-critical applications without independent means of protection. All applications where malfunction could cause injury or loss of life must be subject to a risk assessment and further protection provided where needed.

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

CONFORMITY WITH STANDARDS FOR OPTIDRIVE

- CE-marked for Low Voltage Directive.
- EN61000-4 EMC Generic Emissions Standard, Industrial Level.
- EN61000-2 EMC Generic Immunity Standard, Industrial Level.
- Enclosure ingress protection, EN60529, NEMA 250.
- Flammability rating according to UL 94.



GENERAL SPECIFICATION

Signal Interface:	Standard 6-way RJ45 connector
Supply Input:	10V ... 36V DC, 30mA
RS485 signal:	industry standard 2-wire +5V differential
Environmental:	Operational 0 ... 50 °C
	Storage -40 °C ... 60 °C
	Relative Humidity < 95% (non condensing)
Protection rating:	IP54
Max cable length:	20m (unscreened, total length)
	100m (screened, twisted pair, total length)

MECHANICAL INSTALLATION

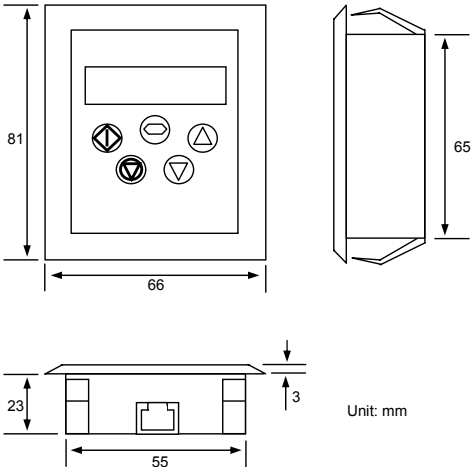
WARNING

- When installing the Optoport E-2, all Optidrives should be disconnected and **ISOLATED** before attempting any work. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply. The Optidrives should be installed by qualified electrical persons and in accordance with local and national regulations and codes of practice.
- Refer to the Optidrive E-2 manual for further details.

CAUTION

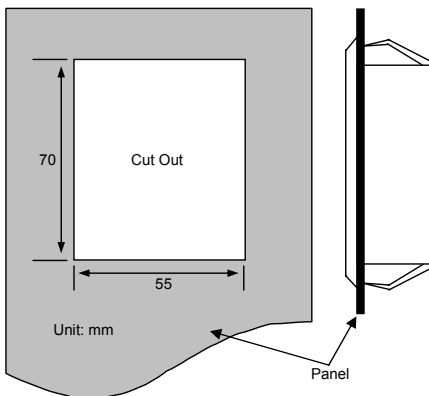
- Carefully inspect the Optoport before installation to ensure it is undamaged.
- Store the Optoport in its box until required. Storage should be clean and dry. Temperature range -40°C to $+60^{\circ}\text{C}$.
- Install the Optoport on a flat, flame-resistant vibration-free surface.
- Flammable material should not be placed close to the Optoport.

DIMENSIONS



THROUGH PANEL MOUNT

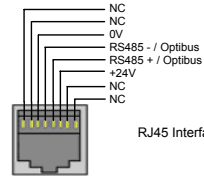
The panel on which the Optoport E-2 is to be mounted should be cut out in accordance with the diagram below.



ELECTRICAL INSTALLATION

Electrical Interface

The Optoport E-2 is uses a standard RJ45 8-Way connector as its electrical interface, which provides a simple solution for the user to setup their system using a standard RJ45 8-Way data cable. The signal layout of the connector is as follows :

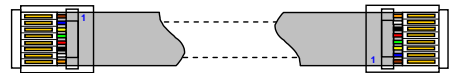


RJ45 Interface Signal Layout

Cable Requirements

Standard 8-way data cables with plugs are available from Invertek Drives Ltd on request.

If the data cable is made up on site, ensure that the connection pin out is correct : Pin 1 to Pin 1, Pin 8 to Pin 8 etc.



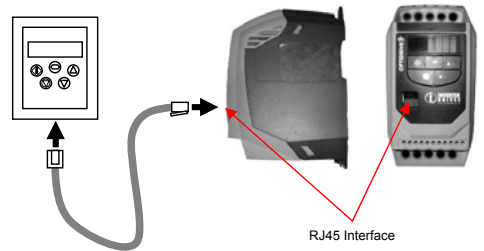
8-way ribbon cable with leader

CAUTION

Incorrect cable connection may damage the drive. Extra care should be taken when using third party cable.

System Setup

The Optidrive E-2 provides the +24V power supply to the Optoport E-2 via RJ45 connection. Once the physical connection has been setup, the system is ready to operate. See picture blow:



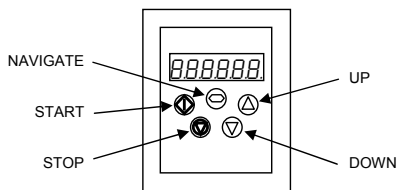
RJ45 Interface

Electromagnetic Compatibility (EMC)

Optidrive is designed to high standards of EMC. EMC data is provided in a separate EMC Data Sheet, available on request. Under extreme conditions, the product might cause or suffer disturbance due to electromagnetic interaction with other 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.

When installed as recommended in this User Guide, the radiated emissions levels of all Optidrives are less than those defined in the Generic radiated emissions standard EN61000-6-4. The conducted emission levels are less than those defined in the Generic radiated emissions standard EN61000-6-4 (class A) for the specified motor cable lengths.

USER INTERFACE



NAVIGATE:

Used to display real-time information, to access and exit parameter edit mode and to store parameter changes

UP:

Used to increase speed in real-time mode or to increase parameter values in parameter edit mode

DOWN:

Used to decrease speed in real-time mode or to decrease parameter values in parameter edit mode

RESET / STOP:

When drive is in trip mode, this button is used to reset a tripped drive. In normal application, when in Keypad mode, this button is used to stop a running drive.

START:

When in keypad mode, the button is used to start a stopped drive or to reverse the direction of rotation if bi-directional keypad mode is enabled (See drive user guide for more information).

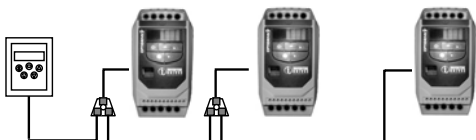
SYSTEM SETUP

Depending on the requirement of the application, Optiport E-2 can be used in the following different ways:

- One Optiport E-2 with one drive



- One Optiport E-2 with multiple drives



Note: The splitter is available from Invertek Drives Ltd on request.

REAL TIME OPERATION

Once the communication has been setup between the drive and Optiport E-2, the user can control the Optidrive E-2 by using the control buttons on the front panel of the Optiport.

To monitor or change a parameter value

- Press and hold the **NAVIGATE** key for more than 1s when the drive is displaying "StoP". The display changes to **P-01**, indicating parameter 01 in parameter group 1.
- Press and release the **NAVIGATE** key to display the value of this parameter.
- Change to the required value using the **UP** and **DOWN** keys.
- Press and release the **NAVIGATE** key once more to store the change.
- Press and hold the **NAVIGATE** key for more than 1s to return to real-time mode. The display shows "StoP" if the drive is stopped or the real-time information (e.g. speed, current or power) if the drive is running.

EASY STARTUP

To setup the communication address

By default, the Optiport E-2 will try to communicate with the drive that has address 1 in the network after powering up for the first time.

The Optiport E-2 will display "SCAN.." after power up, which indicates that the Optiport E-2 is searching the drive with the correct drive address in the network. Once the drive has been found, the message "Load.." will be displayed on the Optiport display window, which indicates that the Optiport is reading the configuration information from the drive. Usually it will take 1-2 seconds for the Optiport to read this information. After the data has been loaded, Optiport E-2 will display the drive real time status.

If the Optiport E-2 doesn't find the drive in the network, i.e. there is only one drive in the network and its address is not equal to 1, the Optiport E-2 communication address will be displayed on the monitor window as "Adr-01". The user can then adjust the address from 1 to 63 by using the **UP** or **DOWN** buttons on the Optiport E-2.

Once the address has been changed to a value to match that of the drive, the **STOP** button must be pressed to enable the Optiport E-2 to search for the drive again.

Once the communication between Optiport and drive has been set up, user can change the Optiport address to set up communication with another drive in the same drive network at anytime.

Pressing the **STOP** and **DOWN** buttons together results in the message "Adr-XX", where "XX" represents the present address. Using the **UP** or **DOWN** button to select the desired drive address. After selecting the new address, pressing **STOP** and **DOWN** button together again will result in Optiport E-2 establishing communications with the drive that has this address.

NOTE

For detailed parameter listing and functional setup, please refer to the corresponding Optidrive E-2 user guide

Locking access to the parameters

- To prevent unauthorised access to the parameters via the Optiport, set P-38 = 1. Once this parameter has been set, access to parameters via the Optiport E-2 will be prevented.
- The Operational information (speed, current, power etc) can be still accessed as normal and the drive can still be controlled from the keypad.
- To unlock parameter access, change P2-38 back to 0 via the drive keypad directly.

Presetting target speed in keypad mode

Set P-12 = 1 or 2 to enable the keypad control, ensuring that P-31 = 1 or 3 to enable the drive to start from the preset speed.

Whilst the drive is stopped, press the **STOP** key. The value of the digital potentiometer will be displayed, indicating target speed. Use the **UP** and **DOWN** keys to select the required target speed.

Press the **STOP** key to return to the real time display showing "StoP", or the **START** key to start the drive ramping up to the target speed.

To vary the speed in real time in keypad control mode

Press the **START** key. The drive will ramp up to the preset speed set in the digital potentiometer (assuming P-31 = 1).

Press **UP** to increase speed.

The drive will run forward, increasing speed until the **UP** button is released. The maximum speed is the speed set in P-01.

Press **DOWN** to decrease speed.

The drive will decrease speed until the **STOP** button is released. The minimum speed is the speed set in P-02.

Pressing the **STOP** key to stop the drive (suppose P-31 = 1).

The drive will decelerate to stop at the selected deceleration ramp.

The display will finally show "StoP" at which point the drive is disabled.

Pressing the **START** key once more results in the drive running back up to the speed at which it was previously running (digital potentiometer value). (assuming P-31 = 1)

NOTE

The hardware enable on the drive must be present when using keypad control mode.

To reverse direction of rotation with P1-12 = 2

Press the **START** key. The drive ramps up to the preset speed as set in the digital potentiometer (assuming P-31 = 1).

Press **UP** or **DOWN** to increase or decrease the speed.

Press the **START** key again. The motor will reverse its direction of rotation.

Press the **STOP** key to decelerate the motor to standstill.

Whenever the drive is started, it will start with a positive speed unless the direction is negated by the digital inputs on the user terminals

DRIVE TRIP CODE

Fault Code	What has happened
P-deF	Default parameters loaded
O-I	Over current on drive output. Excess load on the motor. Over temperature on the heatsink
I.t-trP	Drive has tripped on overload after delivering >100% of value in P-08 for a period of time.
OI-b	Brake channel over current
OL-br	Brake resistor overload
PS-Trp	Internal power stage fault
O-Uolt	Over voltage on DC bus
U-Uolt	Under voltage on DC bus
O-t	Heatsink over temperature
U-t	Under temperature
th-Flt	Faulty thermistor on heatsink.
E-triP	External trip (on dig. Input 2 or 3)
SC-trP	Comms loss trip
P-LOSS	Input phase loss trip
SPIN-F	Spin start failed
data-F	Internal memory fault. Parameters not saved, defaults reloaded.
4-20F	Current analog input out of range

For detail trouble shooting information, please refer to the corresponding drive user guide.

UNDERSTANDING THE DISPLAY MESSAGES

Optiport E-2 uses various display messages to indicate different working status. See the following table for more information.

Message	Explanation
SCAN..	The Optiport E-2 is searching for the drive in the network.
LOAD..	The Optiport E-2 has found the drive in the network and is loading the initialisation information from the drive.
Err-SC	The Optiport E-2 has lost the communication link to the drive.
Adr-XX	Indicates the Optiport E-2 address, where XX= 1...63

TROUBLE SHOOTING

Symptom	Explanation
'Adr-XX' displayed after 'SCAN..' message	Optiport E-2 failed to find the drive with the specified address in the network. Check that the RJ45 data cable connection is correct. Check that the drive with address XX is available in the whole network. If XX > 1 and only one Optiport E-2 is connected, then check the Optiport E-2 device number, make sure the number is 1.
Display 'Err-SC'	Check the electrical connection, and make sure the cable is connected correctly between the Optiport E-2 and drive. Press STOP button to enable the Optiport E-2 to search the drive again.

NOTES



Invertek Drives Ltd adopts a policy of continuous improvement and whilst every effort has been made to provide accurate and up to date information, the information contained in this brochure should be used for guidance purposes only and does not form the part of any contract.