

T2-OPOINT-IN

Remote Keypad Option Module

User Guide

Installation and Operating Instructions



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 Bardac Drives 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 Authorized Distributor.

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Part No. T2-OPOINT-IN

V 2.00 April 2023

SAFETY

The T2-OPOINT-IN is designed to be used in conjunction with the Bardac Drives variable speed drive ranges listed. It is intended for professional incorporation into complete equipment or systems. The T2-OPOINT-IN can be used to control the operation of the Bardac Drives ranges E2, E3 P2, V2, V3 (hereafter referred to as Bardac Drives). The drive must be installed correctly to prevent a safety hazard. Bardac Drives 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 Bardac Drives User Guides 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 within this document.

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.

IMPORTANT SAFETY INFORMATION

Safety of machinery, and safety-critical applications

The level of integrity offered by the T2-OPOINT-IN / Bardac 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 BARDAC DRIVES

- 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

Compatible Drives: Bardac Drives: P2, E2, E3, V2, V3
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

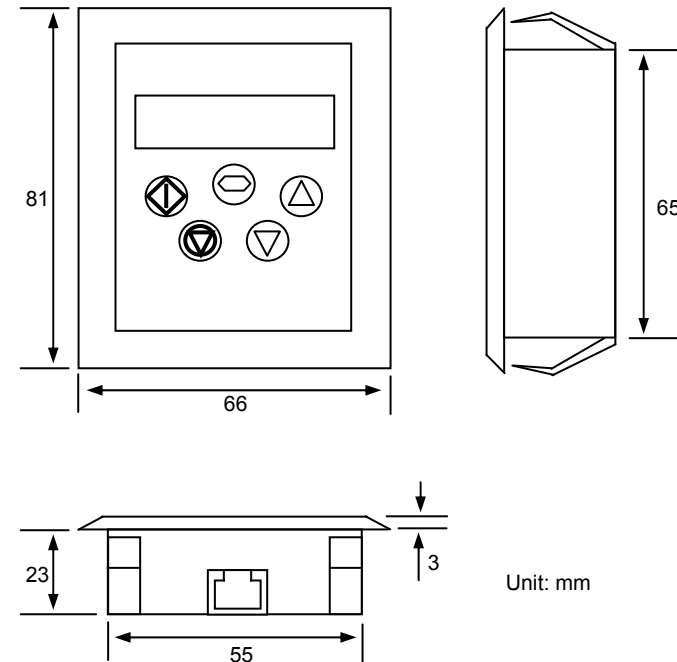
WARNING

- When installing the T2-OPOINT-IN, all Bardac Drives 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 drives should be installed by qualified electrical persons and in accordance with local and national regulations and codes of practice.
- Refer to the relevant Bardac Drive user manual for further details.

CAUTION

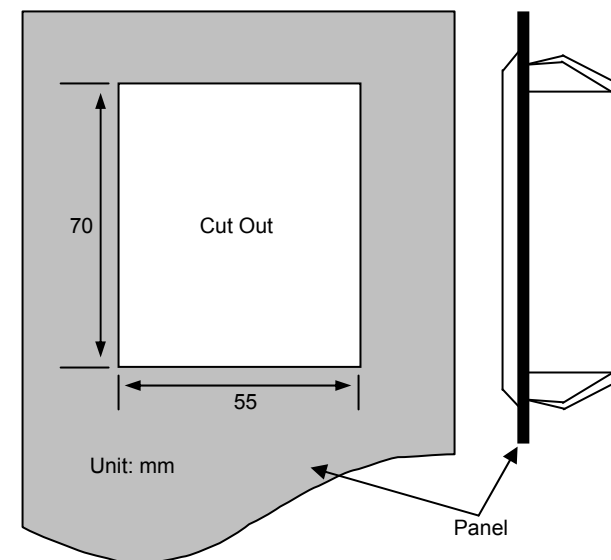
- Carefully inspect the T2-OPOINT-IN before installation to ensure it is undamaged.
- Store the T2-OPOINT-IN in its box until required. Storage should be clean and dry. Temperature range -40°C to +60°C.
- Install the T2-OPOINT-IN on a flat, flame-resistant vibration-free surface.
- Flammable material should not be placed close to the T2-OPOINT-IN.

DIMENSIONS



THROUGH PANEL MOUNT

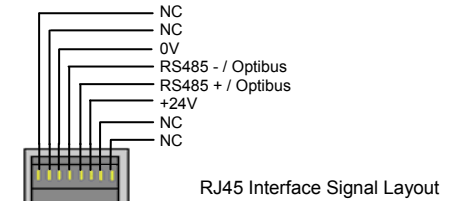
The panel on to which the T2-OPOINT-IN is to be mounted should be cut out in accordance with the diagram below.



ELECTRICAL INSTALLATION

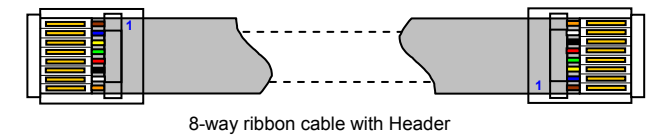
Electrical Interface

The T2-OPOINT-IN 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:



Cable Requirements

Standard 8-way data cables with plugs are available from your local Bardac Drives stockist on request. If the data cable is made up on site, ensure that the connection pin out is correct: Pin 1 to Pin 1, through Pin 8 to Pin 8.

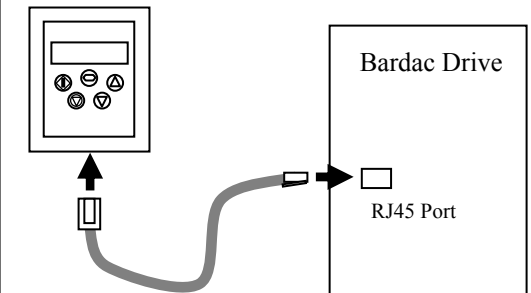


CAUTION

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

System Setup

The T2-OPOINT-IN provides the +24V power supply to the T2-OPOINT-IN 2 via the RJ45 connection. Once the physical connection has been setup, the system is ready to operate. See picture below:
Note: The location of the RJ45 connector on the Bardac Drive will vary depending on the Bardac Drive range and model.

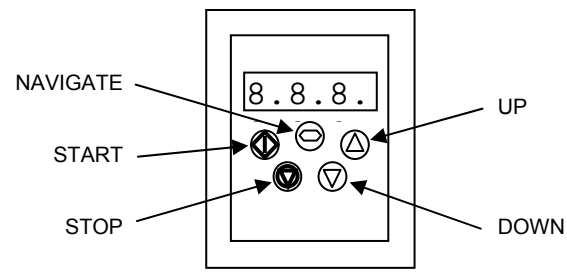


Electromagnetic Compatibility (EMC)

Bardac Drives are 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 the User Guide, the radiated emissions levels of all Bardac Drives 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 the drive when enabled and running.

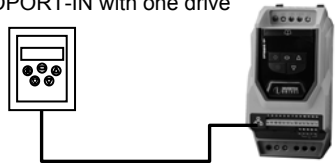
START:

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).

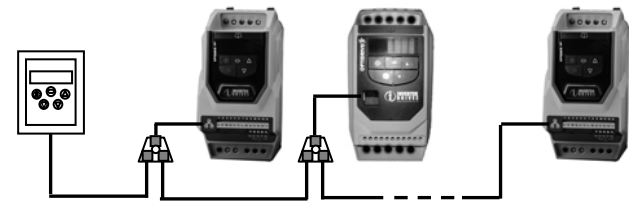
SYSTEM SETUP

Depending on the requirement of the application, T2-OPOINT-IN can be used in the following different ways:

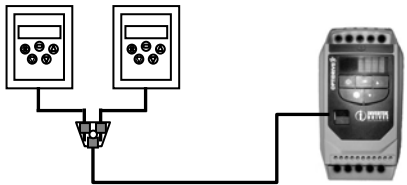
- One T2-OPOINT-IN with one drive



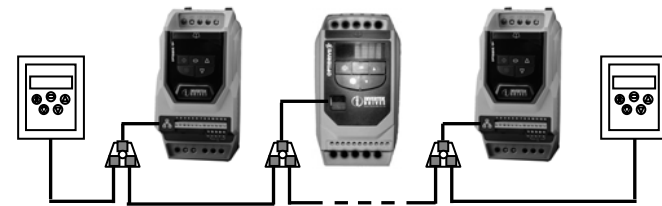
- One T2-OPOINT-IN with multiple drives (up to 63 max)



- Two T2-OPOINT-IN with one drive



- Two T2-OPOINT-IN with multiple drives (up to 63 max)



Different drive models can be used on the same T2-OPOINT-IN network provided a unique communications address is assigned to each.

Note: Cable splitter available from Bardac Drives on request.

EASY STARTUP

To setup the communication address

By default, the T2-OPOINT-IN will try to communicate with the drive that has address 1 in the network after powering up for the first time. The T2-OPOINT-IN will display "SCAN.." after power up, which indicates that the T2-OPOINT-IN is searching for the drive with the correct drive address in the network. Once the drive has been found, the message "Load.." will be displayed on the T2-OPOINT-IN display window, which indicates that the T2-OPOINT-IN is reading the configuration information from the drive. Usually it will take 1~2 seconds for the T2-OPOINT-IN to read this information. After the data has been loaded, T2-OPOINT-IN will display the drive real time status. If the T2-OPOINT-IN doesn't find the drive in the network, i.e. there is no drive in the network with address equal to 1, the T2-OPOINT-IN 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 T2-OPOINT-IN. Once the address has been changed to a value to match that of the drive, the **STOP** button must be pressed to enable the T2-OPOINT-IN to search for the drive again. Once the communication between T2-OPOINT-IN and drive has been set up, The user can change the T2-OPOINT-IN 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 T2-OPOINT-IN establishing communications with the drive that has this address.

NOTE

For detailed parameter listing and functional setup, please refer to the corresponding Bardac Drives user guide

To setup T2-OPOINT-IN device number

The user can use a maximum of 2 T2-OPOINT-IN units within the same drive network to communicate with the same drive or different drives.

When using two T2-OPOINT-IN units with the same drive, the user needs to change the T2-OPOINT-IN Device Number on the second T2-OPOINT-IN to ensure correct operation. All T2-OPOINT-IN units are set to Device Number 1 by default.

To change the Device Number, press the **NAVIGATE**, **STOP** and **DOWN** buttons together. The message "Port-X" (x = 1 or 2) will be displayed. The User can then use the **UP** or **DOWN** buttons to change the Optiport 2 Device Number to 1 or 2 as required. Press **NAVIGATE**, **STOP** and **DOWN** button together again to return to normal operation.

Note:

- The T2-OPOINT-IN Device Address should only be changed to 2 if 2 T2-OPOINT-IN units are connected on a network. An T2-OPOINT-IN with Device Number 1 must always be present for the network to function correctly.

REAL TIME OPERATION

Once the communication has been setup between the drive and T2-OPOINT-IN, the user can control the Bardac Drive by using the control buttons on the front panel of the T2-OPOINT-IN.

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 the first parameter in the Bardac Drives parameter menu.
- Press and release the **NAVIGATE** key to display the value of the parameter to be edited.
- 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.

To change parameter group (P2 & V3 drives only) Ensure that extended parameter group access is enabled. The default extended parameter access code is 101 and this should be entered in P1-14 to enable the extended parameter group access. Enter parameter edit mode with parameter number PX-XX displayed. Press **NAVIGATE** button and then simultaneously press and release the **UP** or **DOWN** key to change the parameter group number until the required parameter group is displayed.

Locking access to the parameters

- To prevent unauthorised access to the parameters via the T2-OPOINT-IN, set the following parameter values based on the Bardac Drive product range in use:
P2 or V3 Range: P2-39 = 1
E3 Range: P-38 = 1
Once this parameter has been set, access to parameters via the T2-OPOINT-IN will be prevented.

- The operational information (e.g. 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 parameter listed above back to 0 via the drive keypad directly.

Presetting target speed in keypad mode

Set the following parameter values based on the Bardac Drive product range in use:

P2 or V3 Range: P1-12 = 1 or 2
E3 Range: P-12 = 1 or 2

Setting a value of 1 enables keypad mode with forward direction only, whilst a value of 2 enables keypad mode with forward and reverse rotation.

Ensure the following parameters are also set based on the Bardac product range in use to enable the drive to start from the preset speed:

P2 or V3 Range: P2-37 = 1 or 5
E3 Range: P-31 = 1 or 3

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 P2-37 / 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:

P2 or V3 Range: P1-01
E3 Range: 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:

P2 or V3 Range: P1-02
E3 Range: P-02

Press the **STOP** key to stop the drive.

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 (assuming P2-37 / P-31 = 1).

To reverse direction of rotation with P1-12 = 2

Set the following parameter values based on the Bardac Drive product range in use to select keypad mode with reverse direction enabled:

P2 or V3 Range: P1-12 = 2
E3 Range: P-12 = 2

Press the **START** key. The drive ramps up to the preset speed as set in the digital potentiometer (assuming P2-37 / 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.

BASIC DRIVE TRIP CODES

For a full list of codes and detailed troubleshooting information please refer to the corresponding Bardac Drives user manual

Fault Code	Fault Code	What has happened
E3	P2 & V3	
P-dEF	P-dEF	Default parameters loaded
0-1	E-01 E-h01	Over current on drive output to motor
1.t-erP	E-1.tF	Drive overload trip.
01-b	E-br01	Brake channel over current
0L-br	E-br0L	Brake resistor overload
P5-erP	E-P5	Internal power stage fault
0-UoL	E-0U	Over voltage on DC bus
U-UoL	E-UU	Under voltage on DC bus
0-t	E-0t	Heatsink over temperature
U-t	E-Ut	Under temperature
th-F	E-thF	Faulty thermistor on heatsink.
E-er iP	E-Et	External trip on digital Input
5C-erP	E-5C 10	Comms loss trip
P-L055	E-PL05	Input phase loss trip
SPi n-F	SP in-F	Spin start failed
dREr-F	E-dRErF	Internal memory fault. Parameters not saved, defaults reloaded.
4-20 F	E-4.20F	Current analog input out of range
N/A	Ph-1 b	Three phase input voltage imbalance
N/A	E-RE..	Auto-tune failed error with error code

UNDERSTANDING THE DISPLAY MESSAGES

T2-OPOINT-IN uses various display messages to indicate different working status. See the following table for more information.

Message	Explanation
SCAN..	The T2-OPOINT-IN is searching for the drive in the network.
LOAD..	The T2-OPOINT-IN has found the drive in the network and is loading the initialisation information from the drive.
Err-SC	The T2-OPOINT-IN has lost the communication link to the drive.
Adr-XX	Indicates the T2-OPOINT-IN address, where XX= 1...63
Port-X	This message shows the T2-OPOINT-IN device number X = 1 or 2

TROUBLE SHOOTING

Symptom	Explanation
'Adr-XX' displayed after 'SCAN..' message	T2-OPOINT-IN 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 network.
Display 'Err-id' on power up	This normally occurs when there are two T2-OPOINT-IN units in the same drive network and both of them have the same device number. Check and change the device number of one T2-OPOINT-IN.
Display 'Err-id' during normal operation	This normally occurs when the user plugs a second T2-OPOINT-IN into the drive network. Change the device number of one of the T2-OPOINT-IN units.
Display 'Err-SC'	Check the electrical connection, and make sure the cable is connected correctly between the T2-OPOINT-IN and the drive. Press 'STOP' button to enable the T2-OPOINT-IN to search for the drive again.