

PROFINET IO Interface

OPT-2-PFNET-IN

OPT-3-PFNET-IN



Overview

This option module is specifically designed to be used with the Optidrive P2 and Optidrive Eco range of variable speed drive products and is intended for professional incorporation into complete equipment or systems. If installed incorrectly it may present a safety hazard. Before commencing installation and commissioning, the user should ensure they are fully familiar with the Optidrive P2, and in particular have read the important safety information and warnings contained in the Optidrive P2 / Optidrive Eco User Guide.

Note

This User Guide is intended to be used with Optidrive P2 & Eco firmware version 2.00 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 Inverter Sales Partner for further Information.

Module Selection and Setup

Both modules fit the Optidrive option slot and support Optidrive P2 (ODP-2-...) and Eco (ODV-...) drives.
Cyclic process data: **4 x 16-bit words (8 bytes)** in each direction.

Product (module label)	P2 / Eco	MRP
OPT-2-PFNET-IN (54-PFNET-P2)	RT / RT	Not supported
OPT-3-PFNET-IN (54-M40PF-00)	RT / RT	Client

GSDML File Selection

A GSDML file for each interface can be obtained from invertekdrives.com.

OPT-2-PFNET-IN: GSDML-V2.3-HMS-OPT2PFNETIN-20260924.xml

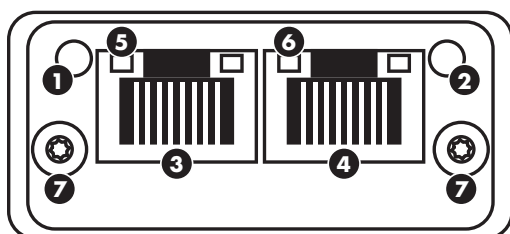
OPT-3-PFNET-IN: GSDML-V2.46-HMS-OPT3PFNETIN-20260924.xml

NOTE: The two GSDML files are not interchangeable.

IP Address Configuration

By default, DHCP is enabled. To change the module's IP settings, use the built-in network configuration tools in your PLC engineering software, where available. Alternatively, download and use the IP Address Configuration tool from invertekdrives.com.

Layout



- 1 Network Status LED
- 2 Module Status LED
- 3 Ethernet Port 1
- 4 Ethernet Port 2
- 5 Port 1 Activity LED
- 6 Port 2 Activity LED
- 7 Clamping screws: Torx 8, 0.25 Nm

Network Status LED

State	Indication
Off	Offline / No Power / Not inserted
Green	Online, Connection with IO Controller established, IO Controller in RUN state
Flashing Green	Online, Connection with IO Controller established, IO Controller in STOP state

Module Status LED

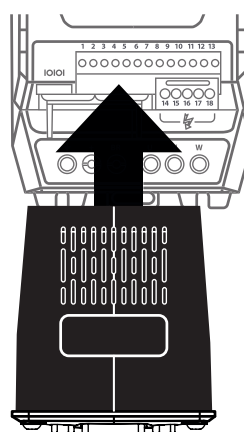
State	Indication
Off	No Power / Initialising
Green	Normal Operation
Green 1 Flash	Diagnostic Event Present
Green 2 Flashes	Network Node Identification
Red	Exception Error, Module in Exception State
Red 1 Flash	Configuration Error
Red 2 Flashes	IP Address Not Set
Red 3 Flashes	Station Name Not Set
Red 4 Flashes	Internal Module Error

Link / Port Activity LEDs

State	Indication
Off	No Link
Green	Link Established, No Communication
Green Flickering	Link Established & Communicating

Installation

- Remove drive power before fitting the option.
- Remove the option-slot blanking cover.
- Slide the module in carefully, with the locating tabs aligned; do not use excessive force.
- Secure it with the two clamping screws. Follow the drive safety instructions.



Optidrive Setup and Data Mapping

Set **P1-14 = 101** for advanced parameter access. Set the PROFINET device name and IP settings in the PLC engineering software.

Configure start-up parameters in the PLC project - both modules

Select the drive device in the PLC project's hardware configuration and open its Module parameters (in TIA Portal: Properties > General > Module parameters). Configure P1-12, P5-05, P5-06, P5-07, P5-08, P5-12, P5-13 and P5-14, then download the updated hardware configuration to the PLC.

At each PROFINET start-up parameterisation, the PLC writes the configured values to the drive, overwriting the corresponding local drive settings. P1-12 defaults to 4 (Fieldbus Control), unless changed in the PLC project. Do not rely on changes made only at the drive.

Before operation, verify the configured start-up values and test **P5-05 / P5-06** communication-loss timeout / action.

Data Mapping

PDI = PLC outputs (PLC to drive). **PDO = PLC inputs** (drive to PLC). Each direction contains four 16-bit words. The GSDML fixes Output 4W in slot 1 and Input 4W in slot 2. Standard word mapping is automatic.

Input Data (PDI) - PLC to Drive

PDI 1 and PDI 2 have fixed functions. Select PDI 3 and PDI 4 using P5-14 and P5-13 in the PLC Module parameters, as described above.

PDI Word 1: Fixed Function - Drive Control Word

This 16-bit word controls the drive when **P1-12 = 4**.

Bit	Name	Function	Control conditions
0	Drive Run	0: Drive stop 1: Drive run	For normal operation, bit 3 has the highest priority and bit 0 has the lowest priority (bit 3 > bit 1 > bit 0). For normal run/stop control, bit 0 only should be used.
1	Fast Stop Select	0: No function 1: Stop with deceleration ramp 2	
2	Fault Reset	0: No function 1: Rising-edge fault reset request	Start/stop (bit 0), fast stop (bit 1) and coast stop (bit 3) can only be used to control the drive when P2-37 = 0 to 3. If P2-37 > 3, start/stop is controlled directly by the drive control terminals.
3	Coast Stop	0: No function 1: Coast to stop; overrides bit 0	
4-15	Not used		Fault reset (bit 2) operates when the drive is set for Fieldbus control (P1-12 = 4).

PDI Word 2: Fixed Function - Frequency Setpoint

A signed 16-bit integer with one decimal place sets the frequency. Examples: 500 = 50.0 Hz; 123 = 12.3 Hz; -1 (0xFFFF) = -0.1 Hz; -234 (0xFF16) = -23.4 Hz. A negative reference requests reverse direction; the most significant bit is 1. Allowed input: -5000 to +5000. Drive speed remains limited by P1-01.

PDI Word 3: User Defined Function - P5-14

0: Torque limit/reference (Optidrive P2 only). Select this option in PLC Module parameters to control the torque limit/setpoint from the fieldbus; set drive parameter P4-06 = 3. Data is an unsigned 16-bit integer with one decimal place: 500 = 50.0%; 123 = 12.3%. Allowed input: 0 to 2000; torque remains limited by P4-07.

1: User PID reference register. Receives the PID controller setpoint from the fieldbus. Set drive parameter P9-38 = 1 and do not use the PID User setpoint within the drive PLC function.

2: User Register 3. Transfers PDI 3 to User Register 3. Define its function in Parameter Group 9. Do not write to User Register 3 within drive PLC code; its value may be read.

PDI Word 4: User Defined Function - P5-13

0: Fieldbus Ramp Control. Select this option in PLC Module parameters to control acceleration and deceleration ramps from the fieldbus. Set P5-07 = 1 in the PLC project to enable the function.

1: User Register 4. Transfers PDI 4 to User Register 4. Define its function in Parameter Group 9. Do not write to User Register 4 within any function/code used in the internal Function Block Program in the drive; its value may be read.

Replacing OPT-2-PFNET-IN with OPT-3-PFNET-IN

Install the OPT-3-PFNET-IN GSDML and replace the device in the PLC hardware configuration. Check the PROFINET device name, IP settings, I/O addresses, tags and start-up parameters, then download the updated configuration. The word format is unchanged, but the PROFINET identification differs: **the old hardware configuration cannot be used unchanged**. Before returning the machine to service, test control, speed reference, feedback and communication-loss behaviour.

Output Data (PDO) - Drive to PLC

This part of the process data contains real-time drive data returned to the PLC. PDO 1 and PDO 2 have fixed functions; PDO 3 and PDO 4 are user-configurable. The mapping is common to both modules; drive-specific restrictions still apply.

Set PDO selections in the PLC project

Select the drive device in the PLC project's hardware configuration and configure P5-12 and P5-08 under its Module parameters (see page 3). Download the updated hardware configuration to the PLC. At each PROFINET start-up parameterisation, the PLC writes the configured values to the drive, overwriting the corresponding local drive settings.

PDO Word 1: Fixed Function - Drive Status and Error Code

High byte: drive fault code, valid when the drive is tripped.

Low byte: drive status information, with the following bit functions.

Bit	Logic 0	Logic 1	Notes
0	Drive stopped	Drive running	Indicates when the output to the motor is enabled.
1	Drive healthy	Drive fault (tripped)	Indicates a drive trip. The fault code is in the high byte.
2	Auto control mode	Hand control mode	Optidrive Eco only: Hand control is selected.
3	OK	Inhibit	Status of the STO / Hardware Inhibit circuit.
4	OK	Maintenance time reached	The programmable System Maintenance Time Interval has expired.
5	Not in standby	Standby	No function assigned.
6	Not ready	Drive ready	Mains power applied; no inhibit; no trip; Enable Input present.
7	Normal load	Low/high mode detected	Optidrive Eco only: low or high load condition detected.
8-15	Last / current fault code		For fault-code information, refer to the Optidrive User Guide.

PDO Word 2: Fixed Function - Output Frequency

Signed 16-bit output frequency with one decimal place: 123 = 12.3 Hz; -234 (0xFF16) = -23.4 Hz.

PDO Word 3: User Defined Function - P5-12

Select the data using **P5-12** in PLC **Module parameters**:

0: Motor current - one decimal place; 100 = 10.0 A.

1: Output power - kW to two decimal places; 400 = 4.00 kW.

2: Digital input status - bit 0 = digital input 1, bit 1 = digital input 2, etc.

3: Analog Input 2 signal level - 0 to 1000 = 0 to 100.0%.

4: Drive heatsink temperature - 0 to 100 = 0 to 100 °C.

5: User Register 1 - User Defined Register 1 value.

6: User Register 2 - User Defined Register 2 value.

7: P0-80 value - user-selected data value.

PDO Word 4: User Defined Function - P5-08

Select the data using **P5-08** in PLC **Module parameters**:

0: Output torque - Motor torque feedback in %, with one decimal place; e.g. 500 = 50.0%.

1: Output power - kW to two decimal places; 400 = 4.00 kW.

2: Digital input status - bit 0 = digital input 1, bit 1 = digital input 2, etc.

3: Analog Input 2 signal level - 0 to 1000 = 0 to 100.0%.

4: Drive heatsink temperature - 0 to 100 = 0 to 100 °C.

5: User Register 1 - User Defined Register 1 value.

6: User Register 2 - User Defined Register 2 value.

7: P0-80 value - user-selected data value.



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