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Bardac drives P2 Profibus DP Interface User Guide

**Profibus DP Interface
User Guide**

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P2 Profibus DP Interface

This option module is specifically designed to be used with the P2 and V3 series 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 P2, and in particular have read the important safety information and warnings contained in the P2 / V3 manual.

Note

This User Guide is intended to be used with P2 & V3 firmware version 1.20.
The firmware version of the drive can be displayed in parameter P0-28.
Overview
The Profibus DP Interface is intended to be installed in the drive option slot, and allows the drive to be connected to a Profibus DP network. The interface offers the following functionality:

- Automatic Baud Rate Detection from 9.6kpbs to 12mbps Cyclic Process Data Exchange
- 4 Input Words from the network master to the drive

- 4 Output Words from the drive to the network master
- Parameter Access via DPV-1 Read / Write Services

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

Drive Setup

- Set the drive to Fieldbus control mode by setting parameter P1-12 = 4
- Ensure Advanced Parameter Access is enabled on the drive by setting P1-14 = 101
- Set the required node address for the drive in P5-01
- Further drive parameter setting options are possible, please read the drive P2/V3 User Guide for further information

Compatibility:	
This Option is suitable for use on the following product ranges:	
P2 (P2-… Drives) V3 (V3-… Drives)	
Part No:	82-PROFB-CC
40 Log Canoe Circle Stevensville, MD 21666 USA	

	Item	
1	Operation Mode	
2	Status	
3	Profibus Network Connector	

Operation Mode	
State	Indication
Off	No Power / Not inserted
Green	Online, Data Exchange
Flashing Green	Network OK, No data exchange
Single Red Flash	Parameter Error

Double Red Flash	Network Error

Status	
State	Indication
Off	No Power
Green	Initialised
Flashing Green	Initialised, self testing
Red	Error

Profibus DP Connector Pinnout	
Pin	Function
1	N/C
2	N/C
3	B Line Positive RxD/TxD, RS485 level
4	RTS (Request to send)
5	GND Bus ground (isolated)
6	+5V Bus Output termination power (isolated, short-circuit protected)
7	N/C
8	A Line Negative RxD/TxD, RS485 level
9	N/C

82-PROFB -CC Profibus DP Interface User Guide

Data Mapping

P2 & V3 series drives support a 4 word cyclic data exchange format. The format and data contained in each word is detailed below.

Input Data (PDI) Telegram

This part of the memory contains the real-time drive commands sent from the network master to the drive, allowing the drive to be controlled. The function of the first two data words (PDI 1 and PDI 2) is fixed, to allow basic control over the drive operation and output frequency to be achieved. The configuration of the remaining two words can be adjusted by the user.

A 16 Bit control word is used to control the behaviour of the drive when P1-12 = 4. The bits function as follows :

Bit	Name	Description	
0	Drive Run	0 : Drive Stop 1 : Drive Run	For normal operation, Bit 3 has the highest priority, bit 0 has the lowest priority (bit 3>bit 1>bit 0). For normal run/stop control, Bit 0 only should be used. Note that the start/stop (bit 0), fast stop (bit 1) and coast stop (bit 3) can only be used to control the drive when P2-31= 0 to 3. If P2-37 > 3, the start/stop function is controlled directly by the drive control terminals. The Reset function (bit 2) will operate providing that the drive is set for Fieldbus control P1-12 = 4.
1	Fast Stop Select	0 : No Function 1 : Drive Stop with Deceleration Ramp 2	
2	Fault Reset	0 : No Function 1 : Rising Edge fault reset request	
3	Not Used	0 : No Function 1 : Drive Coasts to stop. Overrides bit 0	
15-Apr	Coast Stop	Not Used	

PDI Word 2: Fixed Function : Frequency Setpoint
This word is used to transfer the frequency setpoint to the Optidrive. The input data is a 16bit signed integer including one decimal place. For example, a value of 500 represents a frequency setpoint to the drive of 50.0Hz, value 123 gives 12.3Hz. For a negative (reverse) speed reference, a negative value can be transferred to the drive, where the MSB of the high byte must be 1. For example, -1(0xFFFF) gives -0.1Hz. -234(0xFF16) gives -23.4Hz. The allowed input value range is from -5000 to +5000; however the drive output speed will be limited by the maximum speed set by P1-01. PDI Word 3 : User Defined Function
The function of this data word can be selected by the user using drive parameter P5-14. The possible setting options are shown below:
0: Torque limit/reference (P2 Only) – This option must be selected if the drive output torque limit / setpoint is to be controlled from the fieldbus. This also requires setting P4-06 = 3. The input data is a 16bit unsigned integer including one decimal place. For example, a value of 500 represents a torque setpoint to the drive of 50.0%, value 123 gives 12.3%.
The allowed input value range is from 0 to +2000; however the drive output torque will be limited by the maximum limit set by P4-07.

1. User PID reference register – This option allows the setpoint to the PID controller to be received from the Fieldbus. In order for this option to be used, P9-38 must be set to 1, and the PID User setpoint must not be utilised within the drive PLC function.

2. User register 3 – The value received by the drive in PDI 3 is transferred to User Register

3. This option allows the function of the process data word to be defined in Parameter Group 9. In this case, User Register 3 should not be written to within any PLC function code, although the value can be read. PDI Word 4: User

Defined Function
The function of this data word can be selected by the user using drive parameter P5-13. The possible setting options are shown below:
0: Fieldbus Ramp Control – This option must be selected if the drive acceleration and deceleration ramps are to be controlled from the fieldbus.

P5-07 must also be set to 1 to enable this function.

1. User register 4 – The value received by the drive in PDI 4 is transferred to User Register 4. This option allows the function of the process data word to be defined in Parameter Group 9. In this case, User Register 3 should not be written to within any PLC function code, although the value can be read.

Output Data

This part of the memory contains the real-time drive data returned from the drive to the network master. The function of the first two data words (PDO 1 and PDO 2) is fixed. The configuration of the remaining two words can be adjusted by the user.

PDO Word 1: Fixed Function : Drive Status & Error Code:

This word contains 2 bytes with information as follows:

High byte : Gives the drive error (fault) code. (Valid when the drive is tripped)

Low byte : Gives the drive status information, 8 bits which function as follows :

Bit	Logic 0	Logic 1	Notes
0	Drive Stopped	Drive Running	
1	Drive Healthy	Drive Fault (Tripped)	
2	Maintenance Indication (V3 Only)	STO Inhibit	Logic 1 indicates that the Safe Torque Off hardware circuit connections required for drive operation are not present. For further information, refer to the P2/V3 drive user guide.
3			
4-7	Not used		

PDO Word 2 : Fixed Function : Output Frequency

This word gives the real time drive output frequency information. The data is a 16bit signed integer with one decimal place. E.g. value 123 means 12.3Hz. Value – 234 (0xFF16) means -23.4Hz.

PDO Word 3 : Output Current

Data to be transferred in this word can be selected by the User in drive parameter P5-12. The possible settings are as follows:

0: Motor current – Output current to 1 decimal place, e.g. 100 = 10.0 Amps

1. Power (x.xx kW) Output power in kW to two decimal places, e.g. 400 = 4.00kW

2. Digital input status – Bit 0 indicates digital input 1 status, bit 1 indicates digital input 2 status 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 1 Value

7. P0-80 value – User Selected data value.

PDO Word 4 : User Defined

Data to be transferred in this word can be selected by the User in drive parameter P5-08. The possible settings are as follows:

0 : Output Torque (Optidrive P2 Only) – 0 to 2000 = 0 to 200.0%

1. Output Power – Output power in kW to two decimal places, e.g. 400 = 4.00kW

2. Digital Input Status – Bit 0 indicates digital input 1 status, bit 1 indicates digital input 2 status 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

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driveweb.com
automationthings.com

Documents / Resources

	Bardac drives P2 Profibus DP Interface [pdf] User Guide P2, V3, P2 Profibus DP Interface, Profibus DP Interface, DP Interface, Interface

References

- **AT Automation Things - AC Drives, DC Drives & Automation Controllers**
- **B AC Drives, DC Drives, Motors & Control Technology | Bardac Drives**
- **Internet-Accessible Distributed Control Technology | drive.web**