MEGMEET

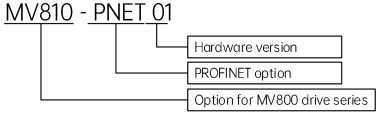
MV800 PROFINET Communication Option

User Manual

Version: V02

1 Product Information

1.1 Designation rule



1.2 Functions and specifications

MV810-PNET01 option provides communication expansion for the MV800 drive series. Its functions and specifications are explained below:

1.2.1 Function features

(1) Supports process data transmission through PZD
(2) Supports access of drive parameters through PKW
(3) Supports 100 Mbps full duplex
(4) Supports bus network topology and star network topology

1.2.2 Basic specifications

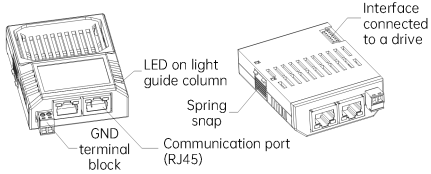
PROFINET connector	Interface	Two RJ45 ports
	Transmission mode	High-speed bus
	Transmission media	CAT6 Ethernet cable
	Galvanic isolation	500 V DC
Communication	Information type	Cyclic data exchange
	Module name	MV810-PNET01
	GSDML file	GSDML-V2.32-megmeet-mv800.xml
	Bus transmission speed	100 Mbps
Electrical specifications	Power voltage	3.3 V DC (provided by the drive)
	Insulation voltage	500 V DC
	Power consumption	1 W
	Weight	25 g

Environment	Noise immunity	ESD(IEC 61800-5-1, IEC 61000-4-2) EFT (IEC 61800-5-1, IEC 61000-4-4) Surge Test (IEC 61800-5-1, IEC 61000-4-5) Conducted Susceptibility Test (IEC 61800-5-1, IEC 61000-4-6)
	Operating/Storage environment	Operating: -10 to 50℃ (temperature), 95% (humidity) Storage: -25 to 70℃ (temperature), 95% (humidity)
	Vibration/Shock resistance	International standards IEC 61131-2, IEC 68-2-6 (TEST FC)/ IEC 61131-2&IEC 68-2-27 (TEST Ea)

1.3 Terminal description

1.3.1 Layout

The following figure shows the front and back views of MV810-PNET01.

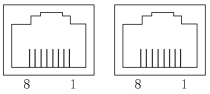


The option has GND, two RJ45 ports and the interface connected to a drive.

1.3.2 Pin definitions

The pin definitions of MV810-PNET01 are listed below:

Pin	Name	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	N/C	NOT CONNECTED
5	N/C	NOT CONNECTED
6	RX-	Receive Data-
7	N/C	NOT CONNECTED
8	N/C	NOT CONNECTED



1.3.3 LED indicator description and fault diagnosis

MV810-PNET01 has two LED indicators: the LED on the light guide column of the expansion box and the LED on the communication port. The LED on the light guide column indicates whether MV810-PNET01 has established communication with host device; and the LED on the communication port indicates whether the communication status of MV810-PNET01 is normal.

Description of LED on the light guide column:

LED status	Description	Action
On	No communication between the PN card and the host device	Check whether the PN card is properly connected to the host device
Off	Communication established between the PN card and the host device	No need for actions

Description of LED on the communication port:

LED status	Description	Action
Green light on	Normal connection	No need for actions
Green light off	No connection	Connect MV810-PNET01 to the PROFINET bus properly
Orange light flashing	Normal data communication	No need for actions
Orange light solid on or off	No data communication	Cut off the power supply and check whether MV810-PNET01 is properly installed and connected to the drive

2 Installation

2.1 Accessory list

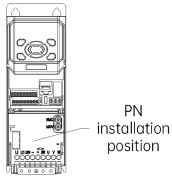
Accessory list	Specifications	Quantity
MV810-PNET01 option	75 × 60 × 24 mm	1
User manual	A4 × 1	1

2.2 Installation method

The installation position, interface and steps of MV810-PNET01 are described below:

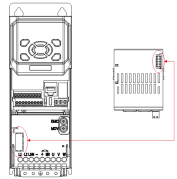
2.2.1 Installation position

The installation position of the MV810 PN option is shown in the right figure (taking enclosure B as the example, similar for other enclosures).



2.2.2 Installation interface

The electrical interface of the MV810 PN option is connected to the drive as shown in the right figure.



2.2.3 Installation steps

Installation method: front side mounting of PN

(1) When the drive is powered off, press the granulated part on the middle-upper of the lower cover, slide it down firmly to take down the cover, as shown in Fig. 1-1 a.

(2) Use a straight screwdriver to pry open the dustproof cap or rubber plug, as shown in Fig. 1-1 b.

(3) Install the PN option: hold the expansion box (a bus card inside) upwards (indicators up), then align the expansion box with the electrical bus interface of the installation position, and press down horizontally to buckle the spring snap of the expansion box into the groove at the lower part of the drive, as shown in Fig. 1-1 c and d.

(4) The bus card is successfully installed, as shown in Fig. 1-1 e.

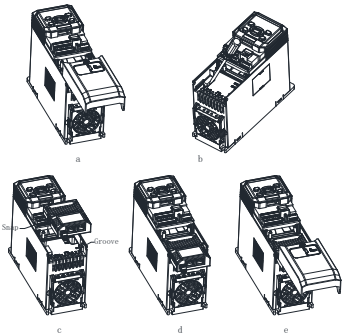
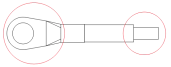


Fig. 1-1 PN card installation steps

(5) Grounding: MV810-PNET01 must be grounded during wiring as shown in Fig. 1-2. You need to prepare and crimp the cable by yourself.



A end B end

Fig. 1-2 Grounding terminal connection

Grounding method:
connect the B end of the grounding cable to the option's grounding terminal block, and you can check the grounding cable diameter and torque by referring to Table 1-1;
then connect the A end of the grounding cable to the grounding rack PE (the mark for grounding, circled in Fig. 1-3 of the drive (taking enclosure B as an example, similar for others), and you can check the grounding screw specifications and torque by referring to Table 1-2.

Fig. 1-3

Table 1-1 Recommended diameter and torque for the grounding cable

Option	Screw	Diameter	Stripped part	Torque (±10%)
MV810-PNET01	M2.0	0.5 to 1.5 mm²/ (28 to 16 AWG)	5 to 6 mm	2 kg-cm/(1.7 lb.in)/ (0.2 N·m)

Table 1-2 Recommended grounding screw and torque

Enclosure	Screw	Torque (±10%)
B	M3	7 kg-cm/(6.08 lb-in)/(0.68 N·m)
C	M4	15 kg-cm/(13.0 lb-in)/(1.47 N·m)
D		

3 PN Customized Protocol

The customized protocol for MV810-PNET01 is described as below.

Parameter	Byte	Description
	Byte0	The local device is the PN slave station (PN card installed) and also the 485 master station, which transmits messages of the PN master station to other 485 slave stations. Byte0: Target station number (485 slave station) Byte1: Source station number (the local station, with PN option, set by P15.02) Slave station response: Byte0: Target station number (485 master station) Byte1: Source station number (the local station)
	Byte1	
PKW1	Byte2	Read/Write of the function code parameter (one for each time) 0x03: Read one 0x06: Write one, saved to EEPROM 0x07: Write one, not saved to EEPROM Byte2: High byte of the command word Byte3: Low byte of the command word Slave station response: Byte2: 0 Byte3: 0x03, response to read 0x06 and 0x07, response to write 0x08+command code, error response
	Byte3	
PKW2	Byte4	Function code address to be read and written Byte4: High byte of the address Byte5: Low byte of the address Slave station response: Byte4: High byte of the address
	Byte5	

Parameter	Byte	Description
		Byte5: Low byte of the address
PKW3	Byte6	For write operation, PKW3 is the specific written value; For read operation, PKW3 is the number of read (fixed to 1)
	Byte7	Byte6: High byte of the parameter value Byte7: Low byte of the parameter value Slave station response: Byte6: High byte of function code value (response to read), 0 (response to write), high byte of error code (error response) Byte7: Low byte of function code value (response to read), 0 (response to write), low byte of error code (error response)
PZD1	Byte8	Control word sent by the master station: Bit0: Forward running 0: Disabled 1: Enabled Bit1: Reverse running 0: Disabled 1: Enabled Bit2: Forward jogging 0: Disabled 1: Enabled Bit3: Reverse jogging 0: Disabled 1: Enabled Bit4: Decelerate to stop 0: Disabled 1: Enabled Bit5: Coast to stop 0: Disabled 1: Enabled Bit6: Fault reset 0: Disabled 1: Enabled Bit7: Emergency stop 0: Disabled 1: Enabled Byte8: High byte of the control word Byte9: Low byte of the control word Status word responded by the slave station: Bit0: Forward running 0: Invalid 1: Valid Bit1: Reverse running 0: Invalid 1: Valid Bit2: Stop 0: Invalid 1: Valid Bit3: Fault 0: Invalid 1: Valid Bit4: Power-down 0: Invalid 1: Valid Bit5: Ready state 0: Invalid 1: Valid Bit6: Motor number 0: Motor 1 1: Motor 2 Bit7: Motor type 0: Asynchronous 1: Synchronous Bit8: Overload pre-warning 0: Invalid 1: Valid
	Byte9	

<table>
<tr><th>Parameter</th><th>Byte</th><th>Description</th></tr>
<tr><td></td><td></td><td>Bit9–Bit10: Command channel
0: Keypad 1: Terminal 2: Communication
Byte8: High byte of the status word
Byte9: Low byte of the status word</td></tr>
<tr><td rowspan="2">PZD2</td><td>Byte10</td><td rowspan="13">The eleven words from PZD2 to PZD12 are used to read and write internal parameters of the drive. P43.02 to P43.12 are used to set parameters to be written, and P43.13 to P43.23 are used to set parameters to be read.
<table><tr><td>P43.02</td><td>PZD2 receive</td><td rowspan="12">0: Disabled
1: Frequency reference (0.00 to P02.10)
2: Drive torque upper limit reference (0.0 to 300% of the motor rated current)
3: Braking torque upper limit reference (0.0 to 300% of the motor rated current)
4: Torque reference (-300.0 to 300.0% of the motor rated current)
5: FWD frequency upper limit reference (0.00 to P02.10)
6: REV frequency upper limit reference (0.0 to P02.10)
7: Voltage reference (VF separation) (0 to 1000)
8: Virtual input terminal command (0 to 0xFF corresponding to DI8 to DI1)
9: Output terminal bus command</td></tr><tr><td>P43.03</td><td>PZD3 receive</td></tr><tr><td>P43.04</td><td>PZD4 receive</td></tr><tr><td>P43.05</td><td>PZD5 receive</td></tr><tr><td>P43.06</td><td>PZD6 receive</td></tr><tr><td>P43.07</td><td>PZD7 receive</td></tr><tr><td>P43.08</td><td>PZD8 receive</td></tr><tr><td>P43.09</td><td>PZD9 receive</td></tr><tr><td>P43.10</td><td>PZD10 receive</td></tr><tr><td>P43.11</td><td>PZD11 receive</td></tr><tr><td>P43.12</td><td>PZD12 receive</td></tr></table></td></tr>
<tr><td>Byte11</td></tr>
<tr><td rowspan="2">PZD3</td><td>Byte12</td></tr>
<tr><td>Byte13</td></tr>
<tr><td rowspan="2">PZD4</td><td>Byte14</td></tr>
<tr><td>Byte15</td></tr>
<tr><td rowspan="2">PZD5</td><td>Byte16</td></tr>
<tr><td>Byte17</td></tr>
<tr><td rowspan="2">PZD6</td><td>Byte18</td></tr>
<tr><td>Byte19</td></tr>
<tr><td rowspan="2">PZD7</td><td>Byte20</td></tr>
<tr><td>Byte21</td></tr>
<tr><td rowspan="2">PZD8</td><td>Byte22</td></tr>
<tr><td>Byte23</td></tr>
<tr><td rowspan="2">PZD9</td><td>Byte24</td></tr>
<tr><td>Byte25</td></tr>
<tr><td rowspan="2">PZD10</td><td>Byte26</td></tr>
<tr><td>Byte27</td></tr>
<tr><td rowspan="2">PZD11</td><td>Byte28</td></tr>
<tr><td>Byte29</td></tr>
<tr><td>PZD12</td><td>Byte30</td></tr>
</table>

Parameter	Byte			Description
				(set the output terminal function to No.39, 0 to 0xF corresponding to RO, DO3, DO2 and DO1) 10: AO1 output reference (0 to 100.0%) 11: HDO1 output reference (0 to 100.0%) 12: HDO2 output reference (0 to 100.0%) 13: PID reference (0.0 to 100.0%) 14: PID feedback (0.0 to 100.0%) 15 to 30: Reserved
	Byte31	P43.13	PZD2 feedback	0: Disabled 1: Frequency reference (0.01 Hz) 2: Ramp reference (0.01 Hz) 3: Output frequency (0.01 Hz) 4: Output voltage (1 V) 5: Output current (0.1 A) 6: Bus voltage (0.1 V) 7: Motor power (0.1%) 8: Output torque (0.1%) 9: Exciting current (0.1 A) 10: Torque current (0.1 A) 11: Status word (0 to 0xFFFF) 12: Fault code (0 to 46) 13: DI1 to DI4 status (0 to 0xFFFF) 14: DI5 to DI8 status 15: Digital output status (0 to 0xF) 16: AI1 input voltage (0 to 10.00 V) 17: AI2 input voltage (-10.00 V to 10.00 V) 18: HDI input frequency (0 to 50.000 kHz)
		P43.14	PZD3 feedback	
		P43.15	PZD4 feedback	
		P43.16	PZD5 feedback	
		P43.17	PZD6 feedback	
		P43.18	PZD7 feedback	
		P43.19	PZD8 feedback	
		P43.20	PZD9 feedback	
		P43.21	PZD10 feedback	
		P43.22	PZD11 feedback	

<table>
<tr><th>Parameter</th><th>Byte</th><th colspan="3">Description</th></tr>
<tr><td></td><td></td><td>P43.23</td><td>PZD12 feedback</td><td>19: AO output value (0 to 100.0%)
20: HDO1 output value (0 to 50.000 kHz)
21: HDO2 output value (0 to 50.000 kHz)
22: PID reference value (-100.0% to 100.0%)
23: PID feedback value (-100.0% to 100.0%)
24: PID deviation (-100.0% to 100.0%)
25: PID output (-100.0% to 100.0%)
26 to 30: Reserved</td></tr>
<tr><td></td><td></td><td colspan="3">Byte10: High byte of the parameter
Byte11: Low byte of the parameter
(similar for other Bytes)</td></tr>
</table>

4 Example of PN parameter settings

The PN customized messages can be used in two modes:

Mode 1: Common PN communication

This mode is the traditional communication between the controller and the PN device, with each drive installed with a PN option. It is not necessary to write the first two bytes (address) of the customized protocol. The function codes are set as below:

P02.02=2 (communication control)
P02.03=3 (PN communication)
P02.05=8 (frequency reference channel set to PN)
Ones place of P15.00=0 (non PN to 485)
P40.00=1 (PN function enabled)
P40.01=3.0 s (detection for expansion card identification timeout, can be modified to other values)
P43.00=3.0 s (detection for PN communication timeout, can be modified to other values)

P43.01=1 (0 is the standard message 1, and 1 is the customized message)
P43.02 to P43.12 are used to set the parameters for the controller to write
P43.13 to P43.23 are used to set the parameters for the controller to read

Mode 2: PN to 485 (one PN option can control up to 5 drives)

In this mode, only one drive is installed with the PN option which transmits the controller's messages to other drives through 485, with the frame header and tail deleted, the length being 33 bytes. Only the customized message is allowed. The controller uses the first two bytes (485 station number) to visit the corresponding drive. The function code setting can be divided into two types:

(1) 485 master station
P02.02=2 (communication control)
P02.03=3 (PN communication)
P02.05=8 (frequency reference channel set to PN)
Ones place of P15.00=1 (PN to 485)
Set the local 485 station number through P15.02
P40.00=1 (PN to 485 function of the master station enabled)
P40.01=3.0 s (detection for expansion card identification timeout, can be modified to other values)
P43.00=3.0 s (detection for PN communication timeout, can be modified to other values)
P43.01=1 (only the customized message allowed)
P43.02 to P43.12 are used to set the parameters for the controller to write
P43.13 to P43.23 are used to set the parameters for the controller to read

(2) 485 slave station
P02.02=2 (communication control)
P02.03=3 (PN communication)
P02.05=8 (frequency reference channel set to PN)
Ones place of P15.00=1 (PN to 485)
Set the local 485 station number through P15.02
P40.00=0 (PN to 485 function of the slave station enabled)
P40.01=3.0 s (detection for expansion card identification timeout, can be modified to other values)
P43.00=3.0 s (detection for PN communication timeout, can be modified to other values)
P43.01=1 (only the customized message allowed)

P43.02 to P43.12 are used to set the parameters for the controller to write
P43.13 to P43.23 are used to set the parameters for the controller to read

Note: Currently, the baud rate of PN-485 is set to 200 k, and it takes less than 5 ms for the master to receive response from the slave after sending the message. The master forwards a PN message every 50 ms (this period must be greater than the total time of one sending and response), while the controller forwards at a higher frequency. Therefore, there may be kind of delay for the controller to receive the corresponding data and response status. The mode can only be used in scenarios not requiring high real-time performance.

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Warranty bill of communication option

Customer company:	
Detailed address:	
Contact:	Tel:
Option model:	
Option No:	
Purchase date:	
Service unit:	
Contact:	Tel:
Maintenance date:	

MEGMEET

SHENZHEN MEGMEET ELECTRICAL CO., LTD.

Certificate

Checker:_____
Manufacturing date:
_____

The product has been tested in line with design standards and approved for leaving the factory.