http://www.delta.com.tw/industrialautomation/

Profibus (CME-PD01)
User Manual

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Chapter 1 Preface

1.1 Receiving and Inspection

All Delta CME-PD01 have gone through rigorous quality control tests at the factory prior to the shipment. Upon the receive of CME-PD01, please check that the package includes:

- 1pcs CME-PD01,
- 1pcs communication cable (for RJ-45, 8 pins),
- 1 instruction sheet

1.2 Using this Manual

- Chapter 2 describes the overview of CME-PD01
- Chapter 3 briefly describes the introduction to PROFIBUS and PROFIBUS-DP
- Chapter 4 introduces how to install and remove the CME-PD01
- Chapter 5 describes the communication with PROFIBUS-DP system
- Chapter 6 introduces GSD file and parameter settings in GSD file of CME-PD01
- Chapter 7 provides LEDs information, and corrective actions for problem solving
- Chapter 8 provides the dimensions of the CME-PD01
- Firmware version should conform with VFD-E Drives as table below:

Delta AC Drive	Firmware Version
VFD-E	Version 2.02 and above

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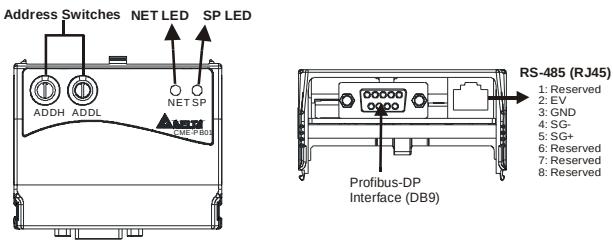
Chapter 2 Overview

CME-PD01, defined as a communication module for PROFIBUS-DP, is used to link VFD-E series and PROFIBUS-DP system.

2.1 Layout



- **SP LED:** Indicating the connection status between Drives and CME-PD01
- **NET LED:** Indicating the connection status between CME-PD01 and PROFIBUS-DP
- **Address Switches:** Setting the address of CME-PD01 on PROFIBUS-DP network
- **RS-485 Interface (RJ-45):** Connecting to VFD-E Drives, and supply power to CME-PD01
- **PROFIBUS-DP Interface (DB9):** 9-PIN connector that connects CME-PD01 to PROFIBUS-DP network

2.2 Technical Information

- Two LEDs on CME-PD01 used to display the connection status of CME-PD01:
  SP LED: indicating the connection status between CME-PD01 and VFD-E series
  NET LED: indicating the connection status between CME-PD01 and PROFIBUS-DP

NOTE

For more information of LEDs display, refer to *Chapter 7 Troubleshooting*.

- The address in PROFIBUS-DP can be set via two rotary address switches, ADDH and ADDL, on CME-PD01:
  ADDH used as a high 4 bits of address, ADDL used as a low 4 bits of address.

For more information of address switches, refer to Chapter 5 Communication.

- A specific 8-PIN communication cable for RJ-45, is used to connect the CME-PD01 to VFD-E series via RS-485 interface. VFD-E series supply the 15V DC power to CME-PD01 through this cable.
- PROFIBUS-DP interface (DB9) uses a standard PROFIBUS-DP system interface. We recommend users use the standard connector to connect CME-PD01 to PROFIBUS-DP system. Besides, the CME-PD01 also provides a 4-PIN extended socket for users to connect it to PROFIBUS-DP system based upon the requirements. However, please pay attention to the assignment of A1, B1, and A2, B2 on the 4-PIN extended socket.
- CME-PD01 supports baud rates of 9.6kbaud to 12Mbaud.

2.3 Functionality

- Cyclical process data exchange (PZD).
- Parameter accessing: cyclical accessing of parameters (PKW).
- PROFIBUS supports the control commands SYNC and FREEZE for data synchronization between master and slaves.
- Support the configuration of data structure for data exchange with VFD-E series.

Chapter 3 Profibus Introduction

3.1 PROFIBUS

PROFIBUS is an international, vendor- independent, opening filed bus standard for a wide range of applications in the fields of manufacturing, production, process and building automation, and other automation control field.
The PROFIBUS family comprises three types of protocol, PROFIBUS-DP, PROFIBUS-PA and PROFIBUS-FMS, each of them is used for different tasks:

- PROFIBUS-DP (Decentralized Periphery): PROFIBUS-DP is a rapid and low cost communication connection designed for high-speed data transmission at field level. PROFIBUS-DP has widespread usage for such items as remote I/O systems, motor control centers, and variable speed drives. It is designed and optimized especially for communication between automation systems and decentralized peripheral devices.
- PROFIBUS-PA (Process Automation): PROFIBUS-PA is the PROFIBUS solution for process automation, typically with MBP-IS transmission technology. Based upon PROFIBUS-DP, PROFIBUS-PA is an extension of the PROFIBUS-DP protocol for data transmission. It is designed to support intrinsically safe applications and can be used within hazardous areas, with high explosion risk using intrinsic safe MBP-IS interface. PROFIBUS-PA is used to connect sensor and controller to the bus.
- PROFIBUS-FMS (Fieldbus Message Specification): PROFIBUS-FMS is multiple master communications designed for communication at the cell level. It is designed for acyclic or cyclic data transfers at medium speed between control equipment and cell-level controllers. FMS services open up a wide range of applications and offer a wide range of functionality and flexibility.

The Maximum cable length in a segment depends on the transmission speed. PROFIBUS-DP communicates at speeds from 9.6 Kbps to 12 Mbps over distances from 100 to 1,200 meters.

Baud Rate (bps)	9.6K	19.2K	93.75K	187.5K	500K	1.5M	12M
Length (m)	1200	1200	1200	1000	400	200	100

3.2 PROFIBUS-DP

PROFIBUS-DP is a PROFIBUS communication profile optimized for high-speed, time-critical data transmission at field level using low-cost connections. PROFIBUS-DP is a suitable substitute for conventional, costly parallel wiring of 24 V measurement signals in production and manufacturing automation, as well as for analog 4(0) to 20mA measurement signals in process automation.

Chapter 4 Installation Information

Please make sure that the power of VFD-E series is OFF before installation or remove the CME-PD01 from network.

4.1 Installation

Improper installation of the CME-PD01 will cost its life usage. Please follow the instructions to install your CME-PD01 carefully.

STEP 1	STEP 2
	
STEP 3	**STEP 4**
	

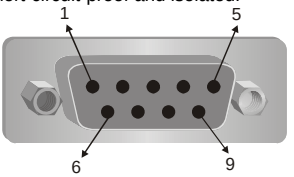
- Power Supply

  The power of CME-PD01 is supplied from VFD-E series Drive. **The VFD-E firmware version should be V2.02 and above**. No external power needed. The +15VDC power is applied to CME-PD01 directly via a specific 6-PIN communication cable (This 6-PIN cable is packed together with CME-PD01).

- CME-PD01 is energized while the power is applied to the VFD-E series, then the SP LED will be steady green.

4.2 Pin Assignment of PROFIBUS-DP Interface (DB9)

Use PROFIBUS-DP interface (DB9) of CME-PD01 connecting CME-PD01 to PROFIBUS DP system. The terminals are short-circuit-proof and isolated.



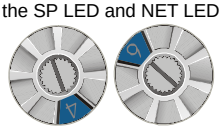
Pin	Designation	Description
1	-	Not assigned
2	-	Not assigned
3	Rxd/TxD-P	Receive/send data P (B)
4	-	Not assigned
5	DGND	Data reference potential (C)
6	VP	Supply voltage positive
7	-	Not assigned
8	RxD/TxD-N	Receive/send data N (A)
9	-	Not assigned

Chapter 5 Communication

Please make sure that you have read chapter 4 and fully understood the CME-PD01 installation.

5.1 PROFIBUS Address

CME-PD01 has two rotary switches to set the PROFIBUS address, the only way for user to set the address. The address switches, ADDH and ADDL, allow user to set the address in a HEX format. ADDH is used to set high 4 bits of address, and ADDL is used to set low 4 bits of address. If both ADDH and ADDL are set to F, and CME-PD01 is power ON or re-power ON, then CME-PD01 will enter the TEST mode, the SP LED and NET LED will be in steady orange.



Address	Description
1..0x7D	Valid PROFIBUS address
0 or 0x7E..0xFE	Invalid PROFIBUS address
0xFF	Enter TEST mode

NOTE

Setting changes via address switches will not effective when CME-PD01 is operating. This means the setting changes will effective after CME-PD01 power re-boot. Please understand this cold restart must be initiated by toggling the power to OFF and then ON.

5.2 VFD-E Parameters Settings

CME-PD01 is designed to communicate with VFD-E series via MODBUS communication port. Prior to the connection, users have to set parameters below in the VFD-E series:

- Set the communication protocol of VFD-E series to RTU 8, N, 2.
- Set the baud rate of VFD-E series to 9600bps.
- Set the frequency source for VFD-E series to operate via RS485.
- Set the operation source of VFD-E series via MODBUS communication.
- Refer to the following table for the above settings when connecting to VFD-E series:

	VFD-E type
Baud Rate 9600	P09.01=1
RTU 8, N, 2	P09.04=3
Freq. Source	P02.00=3
Command Source	P02.01=3

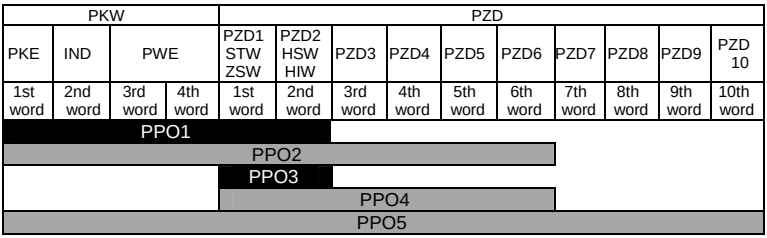
After these settings completed, connecting CME-PD01 and VFD-E series via communication cable mentioned earlier, CME-PD01 is then energized. Two LEDs will be firstly in orange because CME-PD01 is initialized and test itself. SP LED will be then in steady green since that the connection is established between CME-PD01 and VFD-E series.

5.3 Cyclical Data of CME-PD01 via PROFIBUS-DP

CME-PD01 is controlled via cyclical PROFIBUS-DP channel. This channel can be used to access the parameters of VFD-E series.

5.3.1 Useful Data Structure as Defined in PROFIDrive Profile 2.0

The structure of useful data for the cyclical channel is defined in the PROFIDrive Profile, version 2.0. Please refer to the Parameter Process data Object (PPO).



PKW: Parameter ID/value	**STW**: Control word
PZD: Process data	**ZSW**: Status word
PKE: Parameter ID	**HSW**: Main setpoint
IND: Sub-index	**HIW**: Main actual value
PWE: Parameter value	

NOTE

CME-PD01 supports PPO1 and PPO3 structure only.

5.3.2 Extended Configuration

In addition to the PPO types, cyclical data can also be configured to EXT CONF 1 or EXT CONF 2 (see table below). These two extended configuration both have four process data words. The areas of consistency can be set flexibly.

PKW				PZD									
PKE	IND	PWE		PZD1 STW ZSW	PZD2 HSW HIW	PZD3	PZD4	PZD5	PZD6	PZD7	PZD8	PZD9	PZD 10
1st word	2nd word	3rd word	4th word	1st word	2nd word	3rd word	4th word	5th word	6th word	7th word	8th word	9th word	10th word
EXT CONF 1													
				EXT CONF 2									

5.3.3 Default Settings of PZD Structure

CME-PD01 must receive the user parameters from master that configured via GSD file. The default settings of PZD structure are as follows:
STW1: Control Word, mapping to MODBUS address 0x2000 of VFD-E series.
HSW: Main set point, mapping to MODBUS address 0x2001 of VFD-E series.
ZSW: Drives status, mapping to MODBUS address 0x2101 of VFD-E series.
HIW: Main command frequency, mapping to MODBUS address 0x2102 of VFD-E series.
DP master -> VFD-E series:
PZD3: No default assignment
PZD4: No default assignment
VFD-E series-> DP master:
PZD3: Output frequency, mapping to MODBUS address 0x2103 of VFD-E series.
PZD4: Output current, mapping to MODBUS address 0x2104 of VFD-E series.

5.3.4 Control and Status Words

CME-PD01 supports the PPO1 and PPO3 data structure. However, it does not support the bit assignments of control and status words in PROFIDRV. It only supports the DELTA VFD-E series control and status words.

Control word (data from DP to VFD-E series)

Bit 0~1	00B: No function
	01B: Stop
	10B：Run
	11B：JOG + Run
Bit 2~3	Reserved
Bit 4~5	00B：No function
	01B：FWD
	10B：REV

	11B：Change direction
Bit 6~7	00B：1st Accel / Decel time
	01B：2nd Accel / Decel time
Bit 8~15	Reserved
Frequency Command	
Bit 0	1：E.F. ON
Bit 1	1：Reset command
Bit 2~15	Reserved

Table above is for reference only, please check VFD-E series user manual for details. The control word that is mapping to the address of VFD-E series can be carried out by CME-PD01, so the bit assignments in the user manual of VFD-E series is valid.

Status word (data from VFD-E series to DP)

Bit 0~1	LED status 00B: RUN LED light on, STOP LED light off (Drive Stop) 01B: RUN LED blink, STOP LED light up (Drive decelerate to stop) 10B: RUN LED light up, STOP LED blink (Drive standby) 11B: RUN LED light on, STOP LED light off (Drive Run)
Bit 2	1: JOG is active
Bit 3~4	00B: REV LED light off, FWD LED light up (Forward) 01B: REV LED blink, FWD LED light up (Reverse to Forward) 10B: REV LED light up, FWD LED blink (Forward to Reverse) 11B: REV LED light up, FWD LED light off (Reverse)
Bit 5~7	Reserved
Bit 8	1: Master frequency controlled by communication
Bit 9	1: Master frequency controlled by external terminal (EXT)
Bit 10	1: Operation command controlled by communication interface
Bit 11~15	Reserved

NOTE

Table above is for reference only, please check VFD-E series user manual for details. CME-PD01 will get the status word from VFD-E series, so the bit assignments in the user manual of VFD-E series is valid.

5.3.5 Accessing Parameters via PKW Area

In cyclical data, CME-PD01 can provide request and response (read / write) message to access the VFD-E parameters. Due to the request and response mechanism, the master must send the request until receives a corresponding response.

Following 4 words are for PKW area:

Word 1	Parameter ID (PKE)														
	15			12	11	10									
	AK				SPM	Parameter number (PNU)									
Word 2	Parameter sub-index (IND)														
	15												8	7	
Word 3	PWE1 Reserved														
Word 4	PWE2 Read/Write parameters														

5.3.5.1 PKE

Bits 0 to 10 (PNU) contain the number of the relevant parameter.

Bit 11 is reserved.

Bits 12 to 15 (AK) contain the request or the response identifier.

Request identifier (master → CME-PD01)

Request Identifier	Description
0	No request
1	Request parameter value
2	Modify parameter value (word)

Response identifier (CME-PD01 → master)

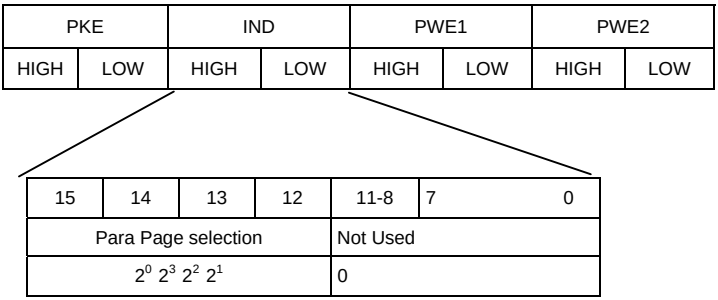
Request Identifier	Description
0	No response
1	Send parameter value (word)
7	Cannot process request (with error number)

Fault numbers for "Cannot process request" response

NO.	Description	
0	Illegal Parameter number	Parameter does not exist
1	Parameter value cannot be modified	Parameter is a read-only parameter or can not change in current state
2	Minimum/maximum not reached / exceeded	
18	Other error	

5.3.5.2 IND

Structure of IND for cyclical communication via PPOs



Function of Parameter Page Selection

Basic PNU (B.PNU bit 10-0 of PKE)	Page selection (P.PNU)	Total PNU (B.PNU+P.PNU*2000)
0…1999	0	0…1999
0…1999	1	2000…3999
0…1999	2	4000…4999
…	…	…
0…1999	15	30000…31999

NOTE

In IND, Bit 15 uses a multiplier of 20, so the value of Bit 15 for the access P2000- P3999 must be set to 1.

5.3.5.3 Parameter Value (PWE) 3rd and 4th Word

All parameters for the VFD-E series are 16-bit. A 16-bit parameter value is transferred by PWE2 (4th word). PWE1 (3rd word) must be set to 0 on the PROFIBUS-DP master in this case.

5.3.5.4 Examples for PKW Mechanism

Example 1: Read data of parameter P0003

To read value of P0003, set the request ID to 1 (request parameter value - word). Because P0003 is less than 2000, the Para Page Select is 0, thus, the data sequence are as follows:

Master → CME-PD01 : 1003 0000 0000 0000 request value of P0003

CME-PD01 → Master : 1003 0000 0000 1770

Request	
Word 1 (PKE)	1003
Word 2 (IND)	0000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0000

Response	
Word 1 (PKE)	1003
Word 2 (IND)	0000
Word 3 (PWE1)	0000
Word 4 (PWE2)	1770

CME-PD01 responds the value of P0003. All parameters in VFD-E series are 16-bit value, so the value is transferred to PWE2 (4th word). The value of P0003 is 0x1770 (6000 decimal). In the VFD-E series, it is “Maximum Output Frequency”.

Example 2: Read command frequency in VFD-E series (0x2102)

To read value of command frequency, set the request ID to1, we should set the Para Page Select because the parameter address is greater than 2000. The address 0x2102 is 8450 in decimal, if set Page Select to 4, then the Basic PNU is 8450 – 4*2000 = 450 (0x1c2), thus, the data sequence are as follows:

Master → CME-PD01 : 11C2 2000 0000 0000 request value of address 0x2102

CME-PD01 → Master : 11C2 2000 0000 0868

Request	
Word 1 (PKE)	11C2
Word 2 (IND)	2000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0000

Response	
Word 1 (PKE)	11C2
Word 2 (IND)	2000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0868

Example 3: Write data 2 to parameter P0804

To write data to P0804, request ID is set to 2 (Modify parameter value - word), Para Page Select should be set because the parameter address is greater than 2000. The address of P0804 is 0x0804, which is 2052 in decimal, if set Page Select to 1 (bit 15 of IND is 1), then the Basic PNU is 2052 – 1*2000 = 052 (0x34), thus, the data sequence are as follows:

Master → CME-PD01: 2034800000000002 write data to P0804

CME-PD01 → Master: 1034800000000002

Request	
Word 1 (PKE)	2034
Word 2 (IND)	8000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0002

Response	
Word 1 (PKE)	1034
Word 2 (IND)	8000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0002

All parameters values in VFD-E series are 16-bit, so the data may be transferred to PWE2 (4th word).

NOTE

VFD-E series will write the data to EEPROM. When using PKW to change the value of parameter, the data will be written to EEPROM directly. **However, the frequent writing action may result in EEPROM damage and the EEPROM will have no capability of directly saving data.** So please pay close attention on it.

Example 4: Read diagnostic data

User can use the special address to read the current diagnostic data. Please refer to Section 6.2 for details. The diagnostic address starts from 0x7500 to 0x7504 (5 words). To read diagnostic data in these addresses, request ID is set to 1, Para Page Select should be set because the parameter address is greater than 2000. The address 0x7500, which is 29952

in decimal, if set Page Select to 14, then the Basic PNU is 29952-14*2000=1952(0x7A0), thus, the data sequence are as follows:

Master - > CME-PD01 : 17A0700000000000 read data from 0x7500

CME-PD01 - > Master : 17A0700000000300

Request	
Word 1 (PKE)	17A0
Word 2 (IND)	7000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0000

Response	
Word 1 (PKE)	17A0
Word 2 (IND)	7000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0300

If the data that CME-PD01 returns is 0x0300, it indicates that Scan port is disconnected. Please refer to Section 7.2 for details.

Example 5: Access error

When failing to read/write parameters by using PKW, an error message will be shown from the CME-PD01. Suppose that the data sequence master sent is 202D 8000 0000 0002. If this address (0x07FD) cannot be found by the VFD-E, it will respond the data sequence 702D 8000 0000 0000, request ID is 7 which means cannot process request (with error number), and error number is 0 (Illegal Parameter Number).

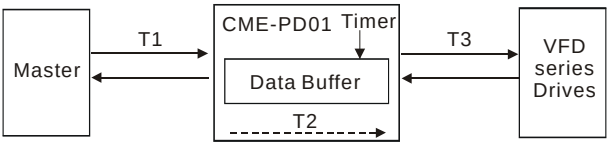
Request	
Word 1 (PKE)	202D
Word 2 (IND)	8000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0002

Response	
Word 1 (PKE)	702D
Word 2 (IND)	8000
Word 3 (PWE1)	0000
Word 4 (PWE2)	0000

5.4 CME-PD01 Response Time

The response (refresh) time via PROFIBUS connection can be divided in 3 parts:

- T1: transmission time between Master and CME-PD01
- T2: waiting time for CME-PD01 buffer
- T3: transmission time between CME-PD01 and VFD-E



T1 depends on the actual transmission speed and the type of master in use.
T2 depends on the internal timer of CME-PD01. Data is transmitted to VFD-E series per 70ms triggered by a timer. User cannot change the time-out interval.
T3 depends on the Modbus communication between CME-PD01 and VFD-E series.
So the response (refresh) time is,

Max. response (refresh) **time = T1 + T2 (70ms) + T3**

In fact, the actual response (refresh) time is less than the Max. response (refresh) time. When the data is send to CME-PD01, CME-PD01 will save the data to data buffer. If the timer is in time-out, the data will be transmitted to VFD-E immediately.

Chapter 6 Parameters Setting in GSD file

6.1 GSD File

A GSD file is a text file used to identify PROFIBUS-DP device (Master or Slave), which contains the necessary data for the configuration of DP slaves within a standard DP master. Typical information in a GSD file are Vendor information, supported Baud rates, Timing information, supported Options/features and Available I/O signals. The GSD file is the fundamental building block for the master parameter record. Please download the GSD file at Delta website http://www.delta.com.tw/product/em/drive/ac_motor/download/optional/PD_2p00.GSD

GSD-File for Delta VFD series Drives
File: DELT08DB.GSD
File start: ==

#Profibus_DP

; Unit-Definition-List:

GSD_Revision = 1
Vendor_Name = "Delta Electronics"
Model_Name = "VFD DRIVES"
Revision = "Rev. 1"
Ident_Number = 0x08DB
Protocol_Ident = 0
Station_Type = 0
FMS_supp = 0
Hardware_Release = "V1.0"
Software_Release = "V1.0"
Redundancy = 0
Repeater_Ctrl_Sig = 2
24V_Pins = 0
Implementation_Type = "SPC3"
Bitmap_Device = "VFDDRV"
Bitmap_Diag = "VFDDRV"
Bitmap_SF = "VFDDRV"
Slave_Family = 1@TdF@Delta VFD Drives

```
Auto_Baud_supp      = 1
9.6_supp            = 1
19.2_supp           = 1
93.75_supp          = 1
187.5_supp          = 1
500_supp            = 1
1.5M_supp           = 1
3M_supp             = 1
6M_supp             = 1
12M_supp            = 1
MaxTsdr_9.6         = 60
MaxTsdr_19.2        = 60
MaxTsdr_93.75       = 60
MaxTsdr_187.5       = 60
MaxTsdr_500         = 100
MaxTsdr_1.5M        = 150
MaxTsdr_3M          = 250
MaxTsdr_6M          = 450
MaxTsdr_12M         = 800

Freeze_Mode_supp    = 1
Sync_Mode_supp      = 1
Set_Slave_Add_supp  = 0
Min_Slave_Intervall             = 1

Modular_Station                 = 1
Max_Module          = 1
Max_Input_Len       = 32
Max_Output_Len      = 32
Max_Data_Len        = 64
Modul_Offset                    = 0
Fail_Safe                       = 0
Max_Diag_Data_Len   = 16
ORDERNUMBER                             = "PD-01"

Max_User_Prm_Data_Len           = 26
User_Prm_Data_Len               = 26
User_Prm_Data                           = 0x20,0x00,\
                                  0x20,0x01,\
            0x00,0x00,\
```

```
                0x00,0x00,\
                0x21,0x01,\
                0x21,0x02,\
                0x21,0x03,\
                0x21,0x04,\
                0x00,0x01,\
                0x00,0x02,\
                0x00,0x02,\
                0x00,0x01,\
                0x00,0x00

Module = "4 PKW,  2 PZD  (PPO 1)       " 0xF3, 0xF1
EndModule
Module = "0 PKW,  2 PZD  (PPO 3)       " 0x00, 0xF1
EndModule
Module = "4 PKW,  4 PZD                " 0xF3, 0xF3
EndModule
Module = "0 PKW,  4 PZD                " 0x00, 0xF3
EndModule

PrmText = 1
Text(0) = "Address discontinuous"
Text(1) = "Address continue"
EndPrmText
PrmText = 2
Text(0) = "Ignore and Continue"
Text(1) = "Stop accord to Pr.STOP METHOD"
EndPrmText
PrmText = 3
Text(0) = "Stop DataExchange & Report Fault"
Text(1) = "Continue & Report Alarm"
Text(2) = "Ignore & Continue DataExchange"
EndPrmText

ExtUserPrmData = 1 "Data Input 1(PD-01 -> VFD)"
Unsigned16 0x2000 0-65535
EndExtUserPrmData
ExtUserPrmData = 2 "Data Input 2"
Unsigned16 0x2001 0-65535
EndExtUserPrmData
ExtUserPrmData = 3 "Data Input 3"
```

Unsigned16 0x0000 0-65535
EndExtUserPrmData
ExtUserPrmData = 4 "Data Input 4"
Unsigned16 0x0000 0-65535
EndExtUserPrmData
ExtUserPrmData = 5 "Data Output 1(VFD -> PD-01)"
Unsigned16 0x2101 0-65535
EndExtUserPrmData
ExtUserPrmData = 6 "Data Output 2"
Unsigned16 0x2102 0-65535
EndExtUserPrmData
ExtUserPrmData = 7 "Data Output 3"
Unsigned16 0x2103 0-65535
EndExtUserPrmData
ExtUserPrmData = 8 "Data Output 4"
Unsigned16 0x2104 0-65535
EndExtUserPrmData
ExtUserPrmData = 9 "d_state"
Unsigned16 1 0-1
Prm_Text_Ref = 1
EndExtUserPrmData
ExtUserPrmData = 10 "din_len"
Unsigned16 2 0-4
EndExtUserPrmData
ExtUserPrmData = 11 "dout_len"
Unsigned16 2 0-4
EndExtUserPrmData
ExtUserPrmData = 12 "LossDPComTreat"
Unsigned16 1 0-1
Prm_Text_Ref = 2
EndExtUserPrmData
ExtUserPrmData = 13 "LossSPComTreat"
Unsigned16 0 0-2
Prm_Text_Ref = 3
EndExtUserPrmData

Ext_User_Prm_Data_Ref(0) = 1
Ext_User_Prm_Data_Ref(2) = 2
Ext_User_Prm_Data_Ref(4) = 3
Ext_User_Prm_Data_Ref(6) = 4
Ext_User_Prm_Data_Ref(8) = 5

Ext_User_Prm_Data_Ref(10) = 6
Ext_User_Prm_Data_Ref(12) = 7
Ext_User_Prm_Data_Ref(14) = 8
Ext_User_Prm_Data_Ref(16) = 9
Ext_User_Prm_Data_Ref(18) = 10
Ext_User_Prm_Data_Ref(20) = 11
Ext_User_Prm_Data_Ref(22) = 12
Ext_User_Prm_Data_Ref(24) = 13

File END: ==========

NOTE

The required GSD file is available and can be downloaded from the DELTA web site http://www.delta.com.tw, or you can copy this text to a text editor such as NOTEPAD, and save it as a GSD file named “DELT08DB.GSD”. Please make sure the extension file name is ".GSD", **NOT** ".GSD.TXT".

6.2 Parameters Settings

The parameters in GSD file are used for the configuration of the PROFIBUS network. The parameters description are shown in the following table:

Item	Name	Type	Description	Default
1	Data Input 1	UINT	This is a MODBUS address. The 1st word of cyclic output data PZD will be sent to this address.	0x2000
2	Data Input 2	UINT	This is a MODBUS address. The 2nd word of cyclic output data PZD will be sent to this address.	0x2001
3	Data Input 3	UINT	This is a MODBUS address. The 3rd word of cyclic output data PZD will be sent to this address if selecting module "4 PKW, 4 PZD".	0x0000
4	Data Input 4	UINT	This is a MODBUS address. The 4th word of cyclic output data PZD will be sent to this address if selecting module "4 PKW, 4 PZD".	0x0000
5	Data Output 1	UINT	This is a MODBUS address. CME-PD01 will monitor this address, and copy the return data to the 1st word of cyclic input data PZD.	0x2101
6	Data Output 2	UINT	This is a MODBUS address. CME-PD01 will monitor this address, and copy the return data to the 2nd word of cyclic input data PZD.	0x2102
7	Data Output 3	UINT	This is a MODBUS address. CME-PD01 will monitor this address, and copy the return data to the 3rd word of cyclic input data PZD if selecting module "4 PKW, 4 PZD".	0x2103

Item	Name	Type	Description	Default
8	Data Output 4	UINT	This is a MODBUS address. CME-PD01 will monitor this address, and copy the return data to the 4th word of cyclic input data PZD if selecting module "4 PKW, 4 PZD".	0x2104
9	d_state	UINT	This is a flag. If address in Data Output 1 ~ Data Output 4 is continuous, set it to 1 or set it to 0.	0x0001
10	din_len	UINT	This is a length, and unit is word. It specifies the length of CME-PD01 to process data in PZD. If user selects module "4 PKW, 4 PZD", but din_len is 3, CME-PD01 will process 3 word and ignore the 4th word.	0x0002
11	dout_len	UINT	This is a length, and unit is word. It specifies the length of CME-PD01 to monitor data from the AC Drive. If user selects module "4 PKW, 4 PZD", but dout_len is 3, CME-PD01 will monitor 3 word and ignore the 4th word.	0x0002
12	LossDPComTreat	UINT	It is used to decide the method when communication with Profibus network is lost. The settings can be: 00 – Ignore event and continue; 01 – Stop according to Pr “Stop Method” in VFD-E.	0x0001
13	LossSPComTreat	UINT	It is used to decide the method when the SP communication (SCANport communication) is lost. The settings can be: 00 – Stop data exchange and have fault; 01 – Continue data exchange and alarm; 02 – Ignore and continue data exchange.	0x0000

If the address in Data Output 1 ~ Data Output 4 is continuous, then set d_state to 1, CME-PD01 will get starting address from Data Output 1. The next data will be got from the address next to the starting address, and the reading length is determined by dout_len. If the MODBUS address for reading is discontinuous, please set d_state to 0, CME-PD01 will also get starting address from Data Output 1, but the difference is other data will be got from the address saved in Data Output 2, Data Output 3 and Data Output 4 in order.

Example, if

Data Output 1 = 0x2100;

Data Output 2 = 0x2101;

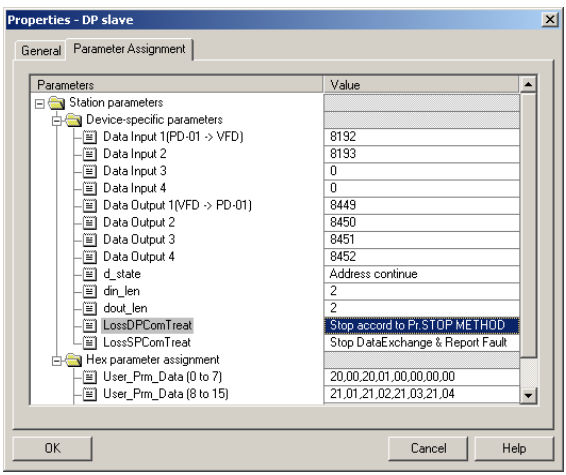
Data Output 3 = 0x2102;

Data Output 4 = 0x2103;

dout_len = 0x0003;

The MODBUS address in Data Output 1~Data Output 4 is continuous, so you can set the d_state to 1, then CME-PD01 will monitor the address starting from Data Output 1, and monitor 3 words from VFD-E series Drives one time. When the dout_len is 3, CME-PD01 will ignore the address in Data Output 4. If d_state is set to 0, CME-PD01 will read data from the address in Data Output 1, and read data from the address in Data Output 2, and so forth.

The parameters settings are shown in the following:



NOTE

Please do not set d_state to 1 when the address in Data Output 1 ~ Data Output 4 is discontinuous to avoid parameter process error and IO disconnect. The CME-PD01 just checks the address starting from Data Output 1 to Data Output [dout_len-1], in other words, if the address in Data Output 1 ~ Data Output 3 is continuous, but the address in Data Output 4 is not, and dout_len is 0x0003, then the check still can pass.

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Chapter 7 Troubleshooting

7.1 LED Displays

Two LEDs, SP and NET LED, are used to monitor the CME-PD01 communication status.

■ **NET LED**

State	Indication	Corrective Actions
LED is off	No power	1. Verify that the power supply of CME-PD01. 2. Check whether the power supply is connected and that power is applied to the CME-PD01 through the connector.
Rapid Flashing Red LED	Invalid PROFIBUS address set via switch	Check whether the switch value is valid, valid value of slave is within 1-125. Set the valid value and re-power
Flashing Red LED	1. Communication link to PROFIBUS, but No cyclical data exchanged 2. Extended user parameter error	Parameters are sent by master (from GSD file). For example, if d_state is set to 1, ensure the data in Data Output 1 ~ Data Output [dout_len-1] are continuous addresses. Otherwise, CME-PD01 will not be able to pass the Parameterization check.
Red LED	No connection to PROFIBUS	1. Verify that network installation is OK. 2. Verify that PLC is working. 3. Verify that switch address setting is correct.
Flashing Green LED	“Master” is in “Stop” mode, cyclical process data exchange is in progress, but setting is invalid (control word = 0)	Set PLC to RUN mode, and send the control command to CME-PD01.
Green LED	Cyclic data is exchanging and working	

■ **SP LED**

State	Indication	Corrective Actions
LED is off	No power	1. Verify that the power supply of CME-PD01 2. Check whether the power supply is connected and that power is applied to the CME-PD01 through the connector
Flashing Red LED	CRC check error	Check if the communication setting in VFD-E is (9600, <8,N,2>, RTU)
Red LED	Connection failure, or no connection	1. Check whether the connection between the VFD-E and RS485 of CME-PD01 is correct 2. Re-connect and ensure that the wire specification is correct
Flashing Green LED	AC Drive returns error code	1. Check the AC Drive type and version. 2. Check the PLC program, and ensure the communication address in CME-PD01 is correct.
Green LED	Operating normally	

NOTE

If both SP LED and NET LED are in steady orange, it indicates that CME-PD01 is in “test mode”. Please do not set the communication address of CME-PD01 to 0XFF at this time. Be sure to set it to other value and re-power on the CME-PD01.

7.2 Diagnostic Data

CME-PD01 provides 16 bytes diagnostic data when the abnormal communication occurs or parameter “LossSPComTreat” is set to “Continue data exchange and report alarm”. It includes 6 bytes standard diagnostic data and 10 bytes device related diagnostic data. The following table shows the meanings of the 16 bytes:

Bytes 1-6	Byte 7	Byte 8	Byte 9	Bytes 10-16
Standard diagnostic data	Length in bytes	SP communication status	Error code	Reserved

Byte 7 indicates the length of device related diagnostic data, including itself. So if byte 7 is 10 (0Ahex), it indicates it has 10 bytes (including byte 7) for the device related diagnostic data.
Byte 8 indicates the SP communication status when the error occurs, and the valid value should be shown as follows:

00 – Normal

01 – CRC check error

02 – VFD-E returns error code

03 – Communication is time-out

Byte 9 indicates the error code when byte 8 is 02 (VFD-E will return error code). Refer to the Section 7.3 for the meanings of invalid code.

User can get the diagnostic data via PZD area any time. Following table is some special MODBUS addresses that CME-PD01 provides to indicate the diagnostic status.

Comm. address	**0x7500**		**0x7501**		**0x7502**		**0x7503**		**0x7504**	
	High byte	Low byte	High byte	Low byte	High byte	Low byte	High byte	Low byte	High byte	Low byte
Description	SP Comm. status	Error code	Reserved (factory setting is 0)							

User can get these data through “Data Output 1”, or “Data Output 2”, or “Data Output 3”, or “Data Output 4” in parameters. For example, if “Data Output 1” is set to 0x7500, that means the diagnostic data can be got from address 0x7500, and the return data from the 1st word of address 0x7500 in PZD area is the dialogic data.

NOTE

These special addresses are read-only, it will fail if user tries to write data.

7.3 Error Codes

If there is a communication error detected between CME-PD01 and VFD-E series Drives, the error code will be displayed on the digital keypad of VFD-E.

VFD-E can process the message from CME-PD01 if the communication setting is valid. But if the command of message is invalid, the VFD-E will respond a report message that has error codes listed in table below, to CME-PD01.

Error Code	Description	Corrective Actions
01	Illegal command code The command code received in the command message is not available for the drives.	1. Check the Request Identifier in PKW area. CME-PD01 just supports ID 0, 1, 2. 2. Re-power on the CME-PD01.
02	Illegal command code The command code received in the command message is not available for the drives.	1. Check the Parameter number in PKW area, and refer the VFD-E user manual. 2. Check the settings of parameters “Data Input 1” to “Data Input 4”, “Data Output 1” to “Data Output 4”, and refer to the VFD-E user manual. 3. Re-power on the CME-PD01.
03	Illegal command code The command code received in the command message is not available for the drives.	1. Check the parameter data (PWE2) in PKW area, and refer the VFD-E user manual. 2. Check the PLC program to confirm the data transmitted to CME-PD01 from master is valid. 3. Re-power on the CME-PD01.
04	Slave device failure The drive cannot perform the requested action.	1. Check all data in PKW. 2. Re-power on the CME-PD01.
05	Reserved	1. Please refer to section 4.2 in this manual and check the setting of VFD-E. 2. Return to factory.
06	VFD-E is busy	
07	Reserved	
08	Reserved	
09	Check sum error	
10	Time-out	
11	Invalid baud rate/protocol	
12	Message is too long	
13	Message is too short	
14	Invalid character is in the message	

Chapter 8 Dimensions