JN5-CM-PDP
Profibus-DP for E510
User Manual

2012.04

Apply to: JN5-CM-PDP

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1 Summary

JN5-CM-PDP module was developed for automation tasks using the PROFIBUS-DP field bus system. JN5-CM-PDP module is a “gateway” and can only be operated in combination with other base units.

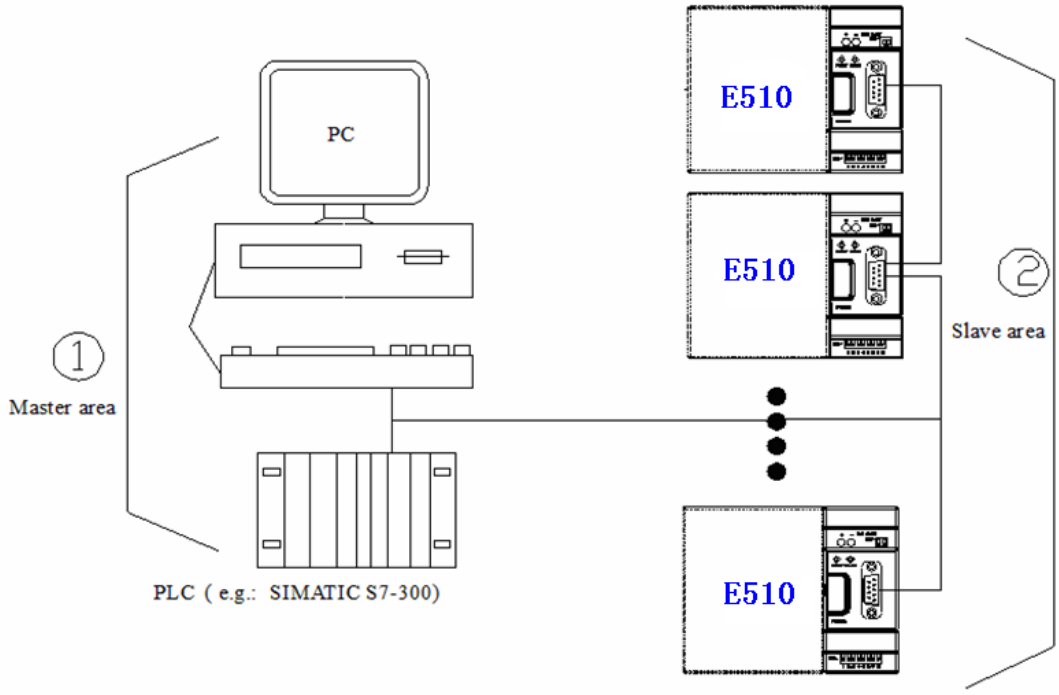
JN5-CM-PDP module can be connected with different type base units when selecting different GSD file.

JN5-CM-PDP for E510 module: selecting **TECO_E51.GSD** file, connected with E510 series drive.

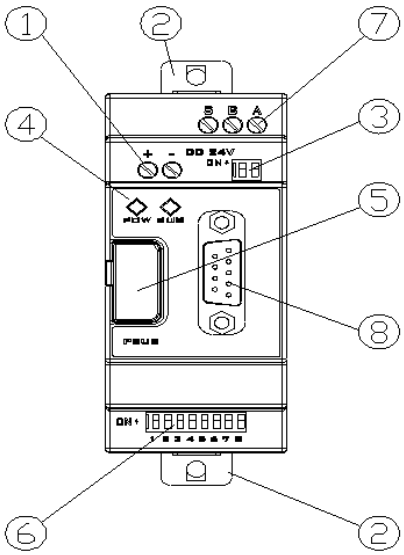
E510 drive with PROFIBUS-DP gateway PBUS module always operates as network slaver.

1.1 System Overview

JN5-CM-PDP modules connect with E510 via RS485 as network slavers.



1.2 Structure of the Unit



① 24vDC power supply
② Retractable mounting feet
③ 2bits DIP switch (terminal resistor)
④ POW & BUS LED
⑤ PRESS
⑥ 8bits DIP switch (setting address)
⑦ RS485 port
(Interface to connect with E510)
⑧ PROFIBUS-DP connection (9pin D-SUB socket)

1.3 PROFIBUS-DP Function Description

JN5-CM-PDP communication module PROFIBUS-DP function is decided by GSD file.

You can select the following 4 functions described in the 'TECO_E51.GSD' file via network configuration tools. More function describe refer to 'chapter-3 Communication'.

1. Cyclical process data exchange (PZD).
2. Parameter accessing: cyclical accessing of parameters (PKW).
3. PROFIBUS supports the control commands SYNC and FREEZE for data synchronization between master and slaves.
4. Support the configuration of data structure for data exchange with E510 series.

2 Installation

2.1 Installation and Dimension

- Installation

The JN5-CM-PDP module should always be mounted vertically. Press the slots on the back of the module onto the rail until the plastic clamps hold the rails in place.

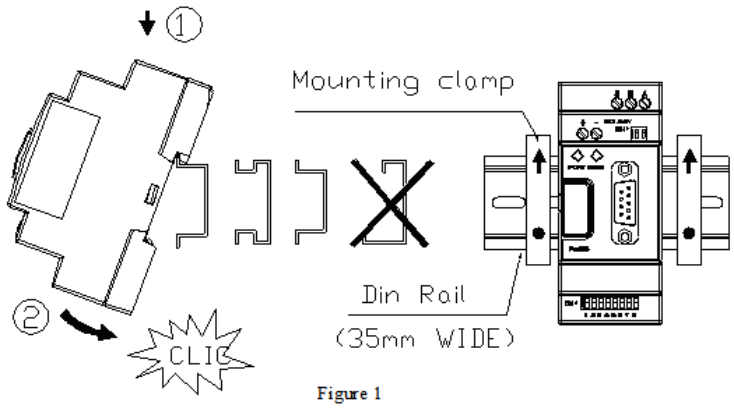


Figure 1

Use M4 screws to direct mount the PBUS module as shown Figure 2.

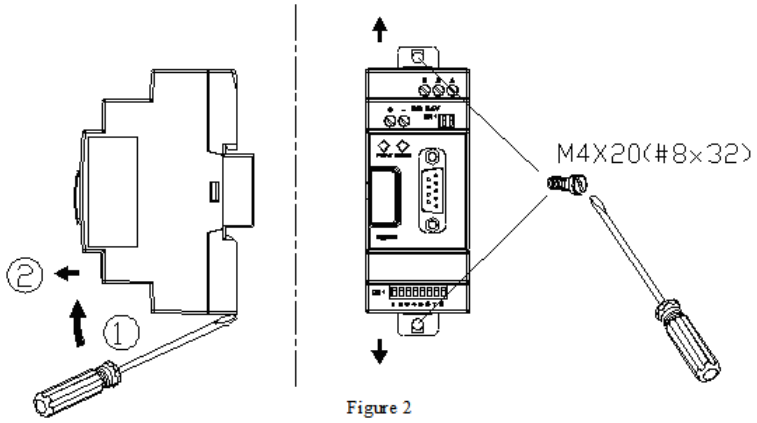
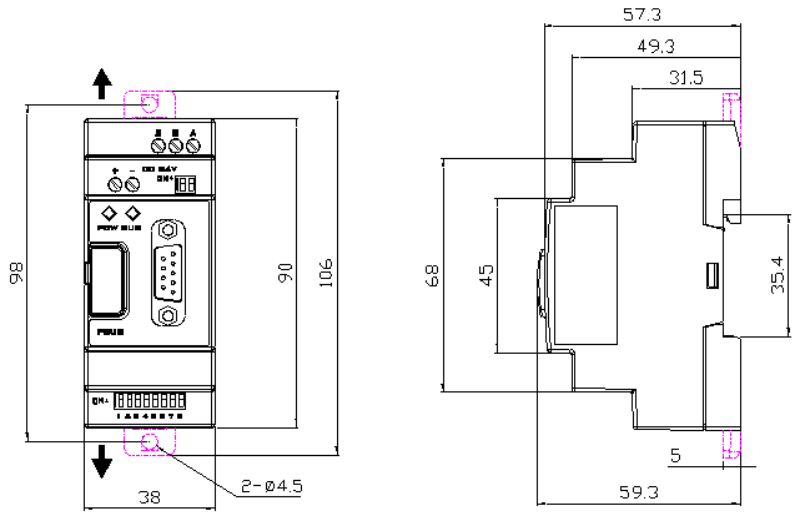
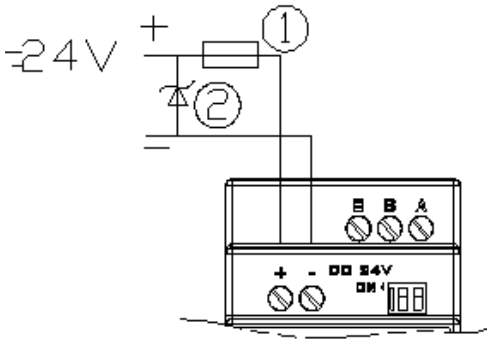


Figure 2

- Dimension:
  Unit: mm (1 inch = 25.4mm)



2.2 Connecting Power Supply



JN5-CM-PDP module operates with a 24vDC supply voltage.
User can use an external 24vDC power.
①: 1A quick-blowing fuse, circuit-breaker or circuit protector
②: Surge absorber

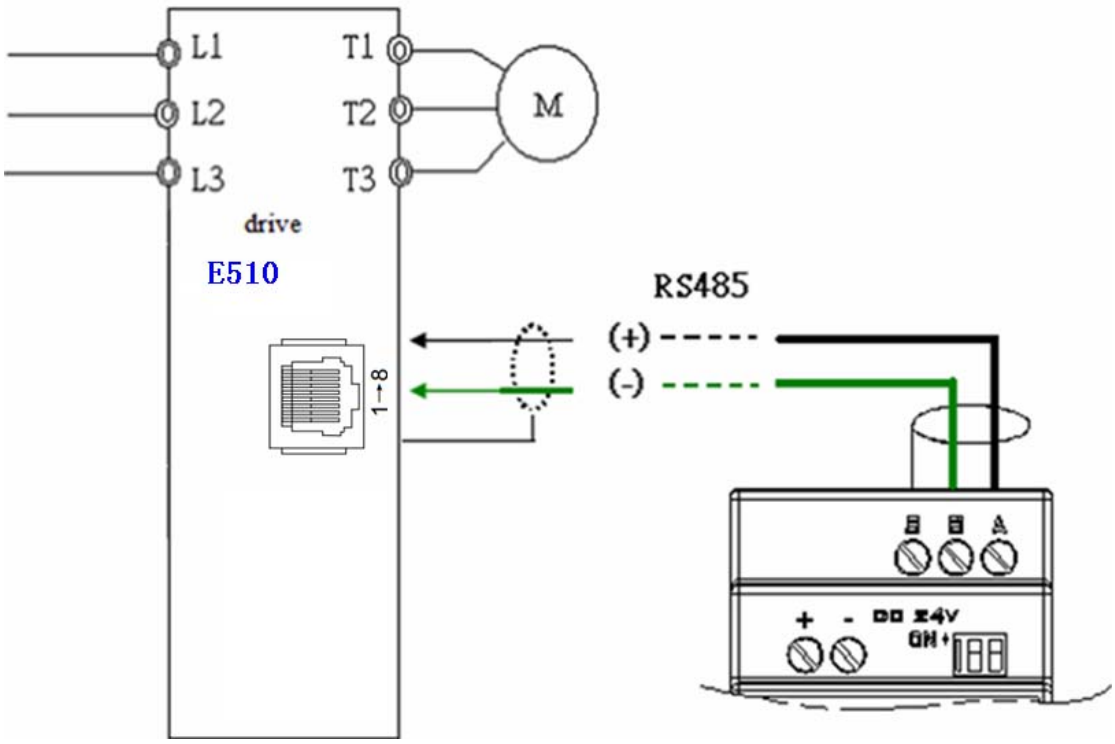
2.3 Connect with Base Unit and Setting Parameters

JN5-CM-PDP module connected with base unit via a RS485 port with MODBUS RTU protocol. Setting for RS485 port: Baud Rate 19200kbps, 8 bit data length, 1bit for stop bit, and no parity bit.

Users have to set parameters as shown in the table below.

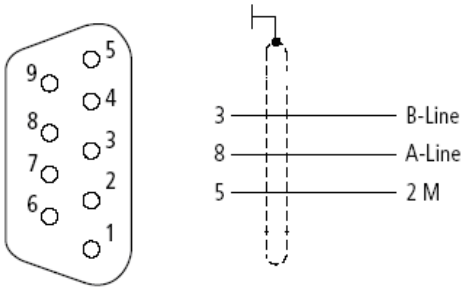
Function	Description	Setting value	Default value
00-02	Run source	2: communication control	0
00-05	Frequency source	5: communication setting	0
09-00	Communication address	1: address=1	1
09-01	RTU/ASCII mode	0: RTU mode	0
09-02	Serial Baud Rate	2: 19200bps	2
09-03	Stop Bit	0: 1stop bit	0
09-04	Parity Bit	0: no parity bit	0
09-05	Data Length	0: 8bit data length	0

More information for setting and wiring refer to see: E510 User Manual.



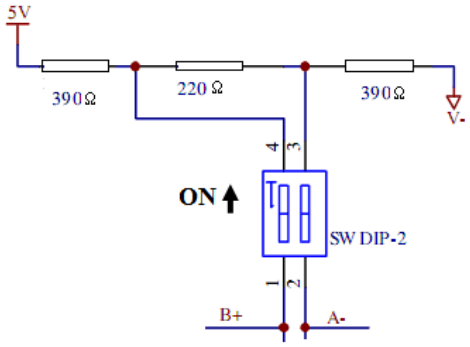
2.4 Connect with PROFIBUS-DP Bus

Please use a 9-pole D-SUB to connect the JN5-CM-PDP module to the PROFIBUS-DP field bus. For this use the special PROFIBUS-DP plug and the special PROFIBUS-DP cable.
The type of cable used determines the permissible maximum bus length and the transfer rate.



Pin	Signal name	Designation
1	Not assigned	-
2	Not assigned	-
3	RXD/TXD-P (B- Line)	Receive/Send data -P
4	Not assigned	-
5	DGND（2M）	Data reference potential
6	Not assigned	-
7	Not assigned	-
8	RXD/TXD-N (A-Line)	Receive/Send data -N
9	Not assigned	-

2.5 Bus Terminating Resistors

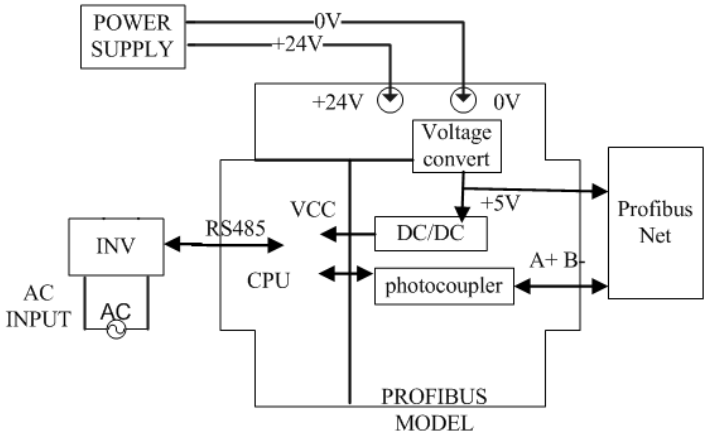


Bus Terminating Resistors

The first and last station in a bus segment must be connected to the bus with the bus terminating resistor switched on.
JN5-CM-PDP modules have integrated bus termination. The 2bit DIP switch of module enables the bus terminating resistors to be switched on.

2.6 Electronic Isolation

The following electrical isolation should be provided for the JN5-CM-PDP module:



Note: Can't use E510 user 24V to connect JN5-CM-PDP input, otherwise JN5-CM-PDP is no islanded with E510.

2.7 Data Transfer Rate and Distance

JN5-CM-PDP module automatically detects the baud rate in the PROFIBUS-DP network after it is power on. However, this requires that at least one master station sends valid telegrams in the network.

The following transfer rates are supported: 9.6Kbit/s to 6000Kbit/s.

Two types of bus cable are specified in IEC 61158. Cable type B should no longer be used with new applications because it has bee discontinued. Cable type A allows all transfer rates up to 12000Kbit/s to be used. Cables for burial in the ground, festoon suspension and drum cables are also available.

The cable parameters are as follows:

Parameter	Cable type A
Surge impedance in Ω	135~165 Ω (at 3~20MHz)
Effective capacitance	<30 (pF/m)
Loop resistance	<110 (Ω /Km)
Core diameter	>0.64 (mm)
Core cross section	>0.34 (mm^2)

Distance between stations when using type A cable to IEC 61158:

Baud rate (Kbit/s)	Max. cable length type A cable (m)
9.6	1200
19.2	1200
93.75	1200
187.5	1000
500	400
1500	200
3000	100
6000	100

3 Communication

3.1 Initial Power Up

Before you power on the JN5-CM-PDP module, verify that it is properly connected to the power supply, to the bus connector and to the base unit. If the JN5-CM-PDP unit is factory set, the station address of the PROFIBUS-DP station must be set.

3.2 PROFIBUS-DP Address

Every PROFIBUS-DP station requires a unique address in the PROFIBUS-DP structure. User can use the integrated 8bits DIP switch on the JN5-CM-PDP to set address. The SW1-1 is the lowest bit, and the SW1-7 is highest bit, the SW1-8 is not used.

Valid PROFIBUS Address range is 1~125.

SW_7	SW-6	SW-5	SW-4	SW-3	SW-2	SW-1	Address
OFF	OFF	OFF	OFF	OFF	OFF	OFF	0
OFF	OFF	OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	OFF	OFF	ON	OFF	2
OFF	OFF	OFF	OFF	OFF	ON	ON	3
OFF	OFF	OFF	OFF	ON	OFF	OFF	4
□	□	□	□	□	□	□	□
ON	ON	ON	ON	ON	OFF	ON	125

NOTE: Setting address changes via DIP switch will not be effective immediately. This will be effective after JN5-CM-PDP module power re-boot.

3.3 JN5-CM-PDP Cyclical Data Exchange

JN5-CM-PDP is controlled via cyclical PROFIBUS-DP channel. This channel can be used to access the parameters of E510 series diver.

3.3.1 PPO configuration

The structure of useful data for the cyclical channel is defined in the PROFIDrive Profile version2.0. Please refer to the Parameter Process data Object (PPO).

PKW				**PZD**									
PKE	IND	PWE		PZD1 STW ZSW	PZD2 HSW HIW	PZD3	PZD4	PZD5	PZD6	PZD7	PZD8	PZD9	PZD10
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
PPO1													
PPO2													
				PPO3									
				PPO4									
PPO5													

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

NOTE: JN5-CM-PDP supports PPO1 and PPO3 structure only.

3.3.2 Extended configuration

In addition to the PPO types, cyclical data can also be configured to EXT CONF1 or EXT CONF2 (shown as the table below). These two extended configuration both have four process data words.

PKW				**PZD**									
PKE	IND	PWE		PZD1 STW ZSW	PZD2 HSW HIW	PZD3	PZD4	PZD5	PZD6	PZD7	PZD8	PZD9	PZD10
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									

3.3.3 Default settings of PZD structure

JN5-CM-PDP 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 0x2501 of A510 series drive.
HSW: Main set point, mapping to MODBUS address 0x2502 of A510 series drive.
ZSW1: Drives status, mapping to MODBUS address 0x2520 of A510 series drive.
HIW: Main actual value, mapping to MODBUS address 0x2524 of A510 series diver.

PROFIBUS-DP master → E510 series drive
PZD3: Not used.
PZD4: Not used.

E510 series drive → PROFIBUS-DP master
E510 output status, mapping to MODBUS address 0x2520~0x252E of E510 series drive. The default settings of PZD3/PZD4 as follows:
PZD3: Default Multi-function terminal on/off status, mapping to MODBUS address 0x2522 of E510 series drive.
PZD4: Default output current, mapping to MODBUS address 0x2527 of E510 series drive.

3.3.4 Control and Status words

JN5-CM-PDP supports the PPO1 and PPO3 data structure. However, it does not support the bit assignments of control and status words in PROFIDrive profile. It only supports the E510 series drive control and status words.

Control word (data from PROFIBUS-DP to E510 series drive)

Bit	Meaning	1	0
0	**Operation Command**	**Run**	**Stop**
1	**Reverse Command**	**Reverse**	**Forward**
2	**External Fault**	**Fault**	
3	**Fault Reset**	**Reset**	
4	**Jog Command**		
5	**Jog Reverse Command**		
6	**Multi function Command S1**	**ON**	**OFF**
7	**Multi function Command S2**	**ON**	**OFF**
8	**Multi function Command S3**	**ON**	**OFF**
9	**Multi function Command S4**	**ON**	**OFF**
A	**Multi function Command S5**	**ON**	**OFF**
B	**Multi function Command S6**	**ON**	**OFF**
C	**Relay R1**	**ON**	**OFF**
D	**Triode R2**	**ON**	**OFF**
E-F	**Reserved**		

Status word (data from E510 series drive to PROFIBUS-DP)

Bit	Meaning	1	0
0	**Operation State**	**Run**	**Stop**
1	**Direction State**	**Reverse**	**Forward**
2	**Inverter operation prepare state**	**ready**	**unready**
3	**Abnormal**	**Abnormal**	**normal**
4	**Data setting error**	**Error**	**No error**
5-F	**(unused)**		

3.3.5 Accessing parameter via PKW area

In cyclical data, JN5-CM-PDP can provide request and response message to access the E510 series 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)														
bit	**15**			**12**	**11**										**0**
	AK				**Parameter number(PNU)**										
Word 2	IND Reserved														
Word 3	PWE1														
bit	**15**								**8**	**7**					**0**
	Reserved									**Fault number**					
Word 4	PWE2 Read/Write parameters														

- **PKE**

Bit 0 to 11 (PNU) contain the MODBUS address of the relevant parameter.
Please refer to Appendix B: E510 series drive MODBUS address allocation.
Bits 12 to 15(AK) contain the request or the response identifier.

Request identifier (Master → JN5-CM-PDP)

Request Identifier	Description
0	No request
1	Read parameter value
2	Modify parameter value

Response identifier (JN5-CM-PDP → Master)

Request Identifier	Description
0	No response
1	Request parameter value processed
7	Request parameter value cannot process

If request parameter value cannot be processed, and the fault numbers following will be stored in the low byte of PWE1.

NO.	Description
0	Parameter does not exist
1	Parameter can not change in current state
2	Parameter value minimum/maximum not reached/exceeded
101	Other SP communication error occur, e.g. response time over

- **PWE**

All parameters for the E510 series drive 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.

- **Example for PKW mechanism**

Read data of parameter 00-05 (frequency source command).

To read value of 00-05, first set the request ID to 1. Then refer to the appendix to find out the corresponding MODBUS address 0x0005. Thus, the data sequence is as follows:

Master → JN5-CM-PDP: 1005 0000 0000 0000

JN5-CM-PDP → Master: 1005 0000 0000 0004

Request	
Word 1(PKE)	1005
Word 2(IND)	0000
Word 3(PWE1)	0000
Word 4(PWE2)	0000

Response	
Word 1(PKE)	1005
Word 2(IND)	0000
Word 3(PWE1)	0000
Word 4(PWE2)	0004

4 GSD File and Parameters

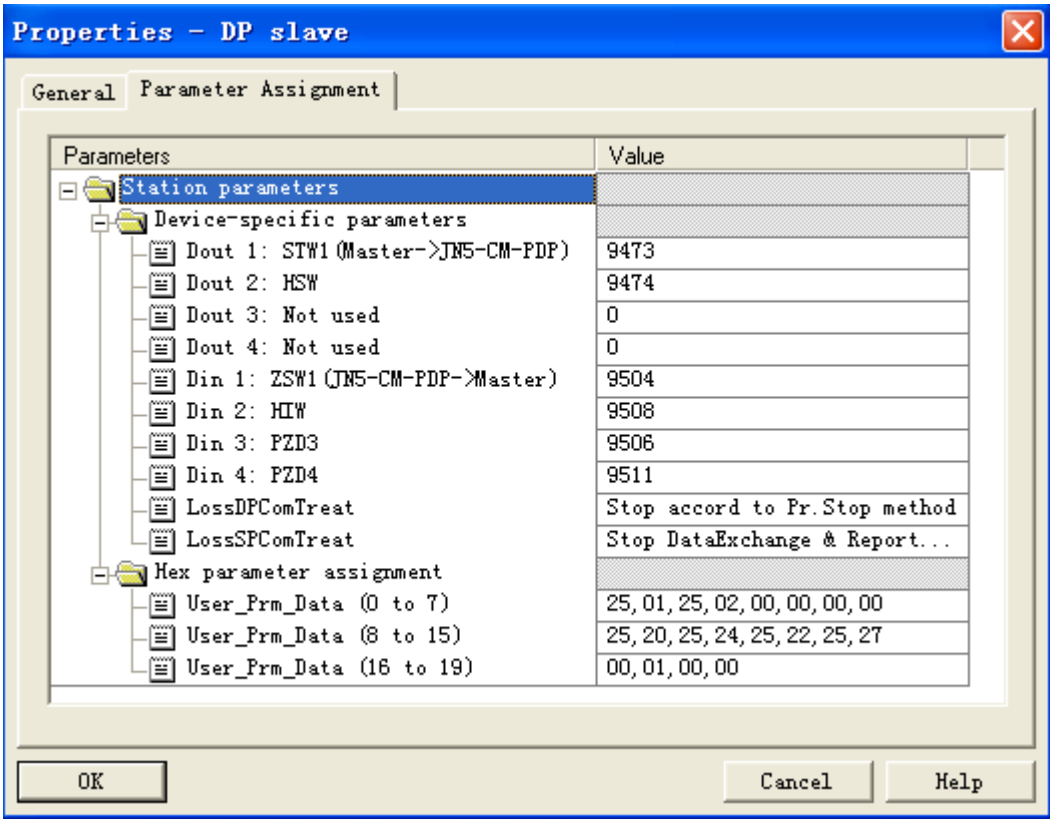
A GSD file is a text file used to identify PROFIBUS-DP device (master or slave), which contains the necessary data for the configuration of DP slaves within a standard DP master. Typical information in a GSD file are Vendor information, supported Baud rates, Timing information, supported Options/features and Available I/O signals. The parameters in GSD file are used for the configuration of the PROFIBUS network. The parameters descriptions are shown as below.

- GSD File for E510 series drive Appendix A: TECO_E51.GSD
- Parameters for E510 series drive

The parameters description is shown as in the table below:

Item	Name	Type	Description	Default
1	Dout1	U16	This is the MODBUS address of STW1. Other addresses are not allowed.	0x2501
2	Dout2	U16	This is the MODBUS address of HSW. Other addresses are not allowed.	0x2502
3	Dout3	U16	Not used	0x0000
4	Dout4	U16	Not used	0x0000
5	Din1	U16	This is the MODBUS address of ZSW1. Other addresses are not allowed.	0x2520
6	Din2	U16	This is the MODBUS address of HIW. Other addresses are not allowed.	0x2524
7	Din3	U16	This is a MODBUS address and should in range of 0x2520 to 0x252E. JN5-CM-PDP 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".	0x2522
8	Din4	U16	This is a MODBUS address and should in range of 0x2520 to 0x252E. JN5-CM-PDP 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".	0x2527
9	LossDPComTreat	U16	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 07-09 stop method.	0x0001
10	LossSPComTreat	U16	It is used to decide the method when the SP communication is lost. The settings can be: 00 - Stop data exchange and alarm; 01 - Continue data exchange and alarm; 02 - Ignore and continue data exchange.	0x0000

The default parameter setting is shown as in the following:



5 Troubleshooting

5.1 LED Display

POW LED and BUS LED are used to monitor the JN5-CM-PDP communication status.

LED state	Description	Corrective Actions
POWER LED		
OFF	No power	Verify the power supply of JN5-CM-PDP unit.
Orange	SPComm not establish	1, Check the connection between the JN5-CM-PDP unit and base unit 2, Check the communication setting in base unit is (19200, 8, N, 1)
Flashing Red LED	SPComm error occur	Check the PLC program, and ensure the communication address in JN5-CM-PDP unit is correct.
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.
Green ON	Power supply present	
Green flash	Communication with the base unit correct.	
BUS LED		
OFF	DPComm not establish	1, Verify network installation is OK 2, Check the user parameter assignment of JN5-CM-PDP unit is correct
Green on	DPComm is established	

5.2 Bus Diagnostic Data

JN5-CM-PDP provides 8 bytes diagnostic data when the abnormal communication occurs or parameter “LossSPComTreat” is set to report alarm.

It includes 6 bytes standard diagnostic data and 2 bytes device related diagnostic data. The following table shows the meanings of the 8 bytes:

Bytes 1~6	Byte 7	Byte 8
Standard diagnostic data	Length in bytes 2	SPComm status 00 - normal 01 - SPComm return error code 02 - SPComm time out

Byte 7 indicates the length of device related diagnostic data, including itself, so byte 7 is always 2.

Byte 8 indicates the SP communication status when the error occurs.

If there is a communication error detected between JN5-CM-PDP unit and drive base unit (E510), the error code will be displayed on the digital keypad of drive.

Appendix

Appendix A: TECO_E51.GSD

```
;=============================================================
; GSD-File for E510 series drives Profibus DP
;
; Auto_Baud_supp, 6MBaud
;
; File       : TECO_E51.GSD
;=============================================================

#Profibus_DP

; Unit-Definition-List:

GSD_Revision            = 1
Vendor_Name             = "TECO Electric&Machinery Co.,Ltd"
Model_Name              = "E510 ProfiBus-DP"
Revision                = "Rev1.0"
Ident_Number            = 0x0AC2
Protocol_Ident          = 0                 ; PROFIBUS DP
Station_Type            = 0                 ; DP-slave
FMS_supp                = 0
Hardware_Release        = "V1.0"
Software_Release        = "V1.0"
Redundancy              = 0
Repeater_Ctrl_Sig       = 0
24V_Pins                = 0
Implementation_Type = "SPC3"
;Bitmap_Device          = "E510 DRV"
;Bitmap_Diag            = "E510 DRV"
;Bitmap_SF              = "E510 DRV"
Slave_Family            = 1@TECO@E510  ; Drives family

; Supported Communication Speeds:
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                = 0

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

; DP_Slave Information:
Freeze_Mode_supp        = 1
Sync_Mode_supp          = 1
Auto_Baud_supp          = 1
Set_Slave_Add_supp      = 0
Min_Slave_Intervall = 1             ; 100 micro-second

; Module-Definitions:
Modular_Station         = 1             ; 0-compact; 1-modular
Max_Module              = 1
Max_Input_Len           = 16
Max_Output_Len          = 16
Max_Data_Len            = 32

Modul_Offset            = 0
Fail_Safe               = 0
Max_Diag_Data_Len       = 8

; Meaning of "device diagnostic" field
Unit_Diag_Bit( 0 ) = "SPComm return error code"
Unit_Diag_Bit( 1 ) = "SPComm time out"

OrderNumber="JN5-CM-PDP"

; Specify the user parameters:

Max_User_Prm_Data_Len       = 20
User_Prm_Data_Len           = 20
User_Prm_Data               = 0x25,0x01,\
                              0x25,0x02,\
                              0x00,0x00,\
                              0x00,0x00,\
```

```
                                0x25,0x20,\
                                0x25,0x24,\
                                0x25,0x22,\
                                0x25,0x27,\
                                0x00,0x01,\
                                0x00,0x00

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

; Extended Description of User-Parameters

PrmText = 1
Text(0) = "Ignore and Continue"
Text(1) = "Stop accord to Pr.Stop method"
EndPrmText

PrmText = 2
Text(0) = "Stop DataExchange & Report Fault"
Text(1) = "Continue & Report Alarm"
Text(2) = "Ignore & Continue DataExchange"
EndPrmText

ExtUserPrmData = 1 "Dout 1: STW1(Master->JN5-CM-PDP)"
Unsigned16 0x2501 9473-9473
EndExtUserPrmData

ExtUserPrmData = 2 "Dout 2: HSW"
Unsigned16 0x2502 9474-9474
EndExtUserPrmData

ExtUserPrmData = 3 "Dout 3: Not used"
Unsigned16 0x0000 0-0
EndExtUserPrmData

ExtUserPrmData = 4 "Dout 4: Not used"
Unsigned16 0x0000 0-0
EndExtUserPrmData
```

```
ExtUserPrmData = 5 "Din 1: ZSW1(JN5-CM-PDP->Master)"
Unsigned16 0x2520 9504-9504
EndExtUserPrmData

ExtUserPrmData = 6 "Din 2: HIW"
Unsigned16 0x2524 9508-9508
EndExtUserPrmData

ExtUserPrmData = 7 "Din 3: PZD3"
Unsigned16 0x2522 9504-9518
EndExtUserPrmData

ExtUserPrmData = 8 "Din 4: PZD4"
Unsigned16 0x2527 9504-9518
EndExtUserPrmData

ExtUserPrmData = 9 "LossDPComTreat"
Unsigned16 1 0-1
Prm_Text_Ref = 1
EndExtUserPrmData

ExtUserPrmData = 10 "LossSPComTreat"
Unsigned16 0 0-2
Prm_Text_Ref = 2
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

;========== END of GSD file for E510 Drives ====================
```

Appendix B: E510 MODBUS address allocation

Register Code	Function Block	Register Code	Function Block	Register Code	Function Block	Register Code	Function Block	Register Code	Function Block
Group00		Group01		Group02		Group03		Group03	
0000H	00-00	0100H	01-00	0200H	02-00	0300H	03-00	0315H	03-21
0001H	00-01	0101H	01-01	0201H	02-01	0301H	03-01	0316H	03-22
0002H	00-02	0102H	01-02	0202H	02-02	0302H	03-02	0317H	03-23
0003H	00-03	0103H	01-03	0203H	02-03	0303H	03-03	0318H	03-24
0004H	00-04	0104H	01-04	0204H	02-04	0304H	03-04	0319H	03-25
0005H	00-05	0105H	01-05	0205H	02-05	0305H	03-05	031AH	03-26
0006H	00-06	0106H	01-06	0206H	02-06	0306H	03-06	Group04	
0007H	00-07	0107H	01-07	0207H	02-07	0307H	03-07	0400H	04-00
0008H	00-08	0108H	01-08	预留	02-08	0308H	03-08	0401H	04-01
0009H	00-09	0109H	01-09	预留	02-09	0309H	03-09	0402H	04-02
000AH	00-10	010AH	01-10	预留	02-10	030AH	03-10	0403H	04-03
000BH	00-11	010BH	01-11	预留	02-11	030BH	03-11	0404H	04-04
000CH	00-12	010CH	01-12	预留	02-12	030CH	03-12	0405H	04-05
000DH	00-13			预留	02-13	030DH	03-13	0406H	04-06
000EH	00-14			020DH	02-14	030EH	03-14	0407H	04-07
000FH	00-15			020EH	02-15	030FH	03-15	0408H	04-08
0010H	00-16			0210H	02-16	0310H	03-16	0409H	04-09
0011H	00-17					0311H	03-17	040AH	04-10
0012H	00-18					0312H	03-18	040BH	04-11
0013H	00-19					0313H	03-19	040CH	04-12
0014H	00-20					0314H	03-20	040DH	04-13
								040EH	04-14
								040FH	04-15
Group05		Group06		Group07		Group10		Group12	
0500H	05-00	0600H	06-00	0700H	07-00	0A00H	10-00	0C00H	12-00
0501H	05-01	0601H	06-01	0701H	07-01	0A01H	10-01	0C01H	12-01
0502H	05-02	0602H	06-02	0702H	07-02	0A02H	10-02	0C02H	12-02
0503H	05-03	0603H	06-03	0703H	07-03	0A03H	10-03	0C03H	12-03
0504H	05-04	0604H	06-04	0704H	07-04	0A04H	10-04	0C04H	12-04
0505H	05-05	0605H	06-05	0705H	07-05	0A05H	10-05	0C05H	12-05
0506H	05-06	0606H	06-06	0706H	07-06	0A06H	10-06	0C06H	12-06
0507H	05-07	0607H	06-07	0707H	07-07	0A07H	10-07	0C07H	12-07
0508H	05-08	0608H	06-08	0708H	07-08	0A08H	10-08	0C08H	12-08
0509H	05-09	0609H	06-09	0709H	07-09	0A09H	10-09	0C09H	12-09
050AH	05-10	060AH	06-10	070AH	07-10	0A0AH	10-10	0C0AH	12-10
050BH	05-11	060BH	06-11	070BH	07-11	0A0BH	10-11	0C0BH	12-11

Register Code	Function Block	Register Code	Function Block	Register Code	Function Block	Register Code	Function Block	Register Code	Function Block
050CH	05-12	060CH	06-12	070CH	07-12	0A0CH	10-12	0C0CH	12-12
050DH	05-13	060DH	06-13	070DH	07-13	0A0DH	10-13	0C0DH	12-13
050EH	05-14	060EH	06-14	070EH	07-14	0A0EH	10-14	0C0EH	12-14
050FH	05-15	060FH	06-15	Group08		0A0FH	10-15	0C0FH	12-15
0510H	05-16	0610H	06-16	0800H	08-00	0A10H	10-16	Group13	
0511H	05-17	0611H	06-17	0801H	08-01	0A11H	10-17	0D00H	13-00
0512H	05-18	0612H	06-18	0802H	08-02	0A12H	10-18	0D01H	13-01
0513H	05-19	0613H	06-19	0803H	08-03	0A13H	10-19	0D02H	13-02
0514H	05-20	0614H	06-20	0804H	08-04	0A14H	10-20	0D03H	13-03
0515H	05-21	0615H	06-21	0805H	08-05	0A15H	10-21	0D04H	13-04
0516H	05-22	0616H	06-22	0806H	08-06	0A16H	10-22	0D05H	13-05
0517H	05-23	0617H	06-23	0807H	08-07	Group11		0D06H	13-06
0518H	05-24	0618H	06-24	0808H	08-08	0B00H	11-00	0D07H	13-07
0519H	05-25	0619H	06-25	0809H	08-09	0B01H	11-01	0D08H	13-08
051AH	05-26	061AH	06-26	080AH	08-10	0B02H	11-02	Group15	
051BH	05-27	061BH	06-27	080BH	08-11	0B03H	11-03	0E20H	15-32
051CH	05-28	061CH	06-28	080CH	08-12	0B04H	11-04		
051DH	05-29	061DH	06-29	080DH	08-13	0B05H	11-05		
051EH	05-30	061EH	06-30	080EH	08-14	0B06H	11-06		
051FH	05-31	061FH	06-31	080FH	08-15	0B07H	11-07		
0520H	05-32	0620H	06-32	0810H	08-16	0B08H	11-08		
0521H	05-33	0621H	06-33	0811H	08-17	0B09H	11-09		
0522H	05-34	0622H	06-34	Group09		0B0AH	11-10		
0523H	05-35	0623H	06-35	0900H	09-00	0B0BH	11-11		
0524H	05-36	0624H	06-36	0901H	09-01	0B0CH	11-12		
0525H	05-37	0625H	06-37	0902H	09-02	0B0DH	11-13		
0526H	05-38	0626H	06-38	0903H	09-03	0B0EH	11-14		
0527H	05-39	0627H	06-39	0904H	09-04	0B0FH	11-15		
0528H	05-40	0628H	06-40	0905H	09-05	0B10H	11-16		
0529H	05-41	0629H	06-41	0906H	09-06	0B11H	11-17		
052AH	05-42	062AH	06-42	0907H	09-07				
052BH	05-43	062BH	06-43	0908H	09-08				
052CH	05-44	062CH	06-44						
052DH	05-45	062DH	06-45						
052EH	05-46	062EH	06-46						
052FH	05-47	062FH	06-47						
0530H	05-48								

Register code of function block of drive (as for the parameter description, please refer to drive user manual)

Command DATA (Readable and Writable)

<table>
<tr><th>Register</th><th>Content</th></tr>
<tr><td>2501H</td><td>Operation signal
<table>
<tr><th>Bit</th><th>Meaning</th><th>1</th><th>0</th></tr>
<tr><td>0</td><td>Operation Command</td><td>Run</td><td>Stop</td></tr>
<tr><td>1</td><td>Reverse Command</td><td>Reverse</td><td>Forward</td></tr>
<tr><td>2</td><td>External Fault</td><td>Fault (EFO)</td><td></td></tr>
<tr><td>3</td><td>Fault Reset</td><td>Reset</td><td></td></tr>
<tr><td>4</td><td>Jog Command</td><td>Jog</td><td></td></tr>
<tr><td>5</td><td>Jog Reverse Command</td><td>Jog reverse</td><td></td></tr>
<tr><td>6</td><td>Multi function Command S1</td><td>ON</td><td>OFF</td></tr>
<tr><td>7</td><td>Multi function Command S2</td><td>ON</td><td>OFF</td></tr>
<tr><td>8</td><td>Multi function Command S3</td><td>ON</td><td>OFF</td></tr>
<tr><td>9</td><td>Multi function Command S4</td><td>ON</td><td>OFF</td></tr>
<tr><td>A</td><td>Multi function Command S5</td><td>ON</td><td>OFF</td></tr>
<tr><td>B</td><td>Multi function Command S6</td><td>ON</td><td>OFF</td></tr>
<tr><td>C</td><td>Relay R1</td><td>ON</td><td>OFF</td></tr>
<tr><td>D</td><td>Triode R2</td><td>ON</td><td>OFF</td></tr>
<tr><td>E~F</td><td>(unused)</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>2502H</td><td>Frequency Command</td></tr>
<tr><td>2503H
~
251FH</td><td>(unused)</td></tr>
</table>

Note: The unused Bit is defined as 0, the spare register is not available for writing Data.

Supervision Data (Only for reading)

<table>
<tr><th>Register</th><th>Content</th></tr>
<tr><td>2520H</td><td>
<table>
<tr><th>Bit</th><th>Meaning</th><th>1</th><th>0</th></tr>
<tr><td>0</td><td>Operation State</td><td>Run</td><td>Stop</td></tr>
<tr><td>1</td><td>Direction State</td><td>Reverse</td><td>Forward</td></tr>
<tr><td>2</td><td>Inverter operation prepare state</td><td>ready</td><td>unready</td></tr>
<tr><td>3</td><td>Abnormal</td><td>Abnormal</td><td>normal</td></tr>
<tr><td>4</td><td>Data setting error</td><td>Error</td><td>No error</td></tr>
<tr><td>5~F</td><td>(unused)</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>2521H</td><td>Error content
<table>
<tr><th>Code</th><th>Meaning</th><th>Code</th><th>Meaning</th></tr>
<tr><td>00</td><td>The inverter is normal</td><td>20</td><td>Over current during decelerating (OC-D)</td></tr>
<tr><td>01</td><td>Inverter over heat (OH)</td><td>21</td><td>Over current at start (OC_S)</td></tr>
<tr><td>02</td><td>Over current at stop (OC)</td><td>22</td><td>(unused)</td></tr>
<tr><td>03</td><td>Under voltage (LV)</td><td>23</td><td>Under voltage during running (LV-C)</td></tr>
<tr><td>04</td><td>Over voltage (OV)</td><td>24</td><td>Over voltage at constant speed / decelerating (OV-C)</td></tr>
<tr><td>05</td><td>(unused)</td><td>25</td><td>Inverter over heat at constant speed (OH-C)</td></tr>
<tr><td>06</td><td>External BB(bb)</td><td>26</td><td>Run at 0 Hz (STP0)</td></tr>
<tr><td>07</td><td>CPU interrupted (CTER)</td><td>27</td><td>Direct start disable (STP1)</td></tr>
<tr><td>08</td><td>PID feedback signal loss (PDER)</td><td>28</td><td>Control panel emergency stop (STP2)</td></tr>
<tr><td>09</td><td>EEPROM abnormal (EPR)</td><td>29</td><td>Keypad operation error (Err1)</td></tr>
<tr><td>10</td><td>Auto testing error(ATER)</td><td>30</td><td>Parameter setting error (Err2)</td></tr>
<tr><td>11</td><td>Over torque detected (OL3)</td><td>31</td><td>Analog converting error (Err4)</td></tr>
<tr><td>12</td><td>Inverter over load (OL2)</td><td>32</td><td>Modifying the parameter in communication (Err5)</td></tr>
<tr><td>13</td><td>Motor over load (OL1)</td><td>33</td><td>Communication failure (Err6)</td></tr>
<tr><td>14</td><td>Communication error(EFO)</td><td>34</td><td>Parameter setting error (Err7)</td></tr>
<tr><td>15</td><td>Emergency stop (E.S)</td><td>35</td><td>Default setting error (Err8)</td></tr>
<tr><td>16</td><td>Parameter locked(LOC)</td><td>36</td><td>(unused)</td></tr>
<tr><td>17</td><td>(Unused)</td><td>37</td><td>(unused)</td></tr>
<tr><td>18</td><td>Over current at constant speed (OC-C)</td><td>38</td><td>(EPR1)</td></tr>
<tr><td>19</td><td>Over current during accelerating (OC-A)</td><td>39</td><td>(EPR2)</td></tr>
<tr><td>40</td><td colspan="3">Inverter over speed (OVSP)</td></tr>
</table>
</td></tr>
</table>

Note: The unused Bit is defined as 0.

Supervision Data (Only for reading)

<table>
<tr><th>Register</th><th>Content</th></tr>
<tr><td>2522H</td><td>MFIT state
<table>
<tr><th colspan="2">Bit</th><th>Meaning</th><th>1</th><th>0</th></tr>
<tr><td rowspan="8">Sequent input value</td><td>0</td><td>MFIT S1</td><td>ON</td><td>OFF</td></tr>
<tr><td>1</td><td>MFIT S2</td><td>ON</td><td>OFF</td></tr>
<tr><td>2</td><td>MFIT S3</td><td>ON</td><td>OFF</td></tr>
<tr><td>3</td><td>MFIT S4</td><td>ON</td><td>OFF</td></tr>
<tr><td>4</td><td>MFIT S5</td><td>ON</td><td>OFF</td></tr>
<tr><td>5</td><td>MFIT S6</td><td>ON</td><td>OFF</td></tr>
<tr><td>6</td><td>Relay R1</td><td>ON</td><td>OFF</td></tr>
<tr><td rowspan="2">Terminal output</td><td>7</td><td>Triode R2</td><td>ON</td><td>OFF</td></tr>
<tr><td>9~F</td><td>(unused)</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>2523H</td><td>Frequency command (100/1Hz)</td></tr>
<tr><td>2524H</td><td>Frequency output (100/1Hz)</td></tr>
<tr><td>2525H</td><td>Voltage command (10/1V)</td></tr>
<tr><td>2526H</td><td>DC voltage command (1/1V)</td></tr>
<tr><td>2527H</td><td>Current output (10/1A)</td></tr>
<tr><td>2528H</td><td>Reserved</td></tr>
<tr><td>2529H</td><td>Output torque</td></tr>
<tr><td>252AH</td><td>PID Feedback value (100% / Max output frequency, 10/1%)</td></tr>
<tr><td>252BH</td><td>PID input value (100% / Max output frequency, 10/1% , sign attached)</td></tr>
<tr><td>252CH</td><td>TM2 AIN input value (1001 / 10V)</td></tr>
<tr><td>252DH</td><td>TM2 AV2 input value (1001 / 10V)</td></tr>
<tr><td>252EH</td><td>Keypad’s analog input value (1000 / 10V)</td></tr>
<tr><td>252FH</td><td>Ready-to-use</td></tr>
</table>