



TECO Frequency Inverter
7300PA PROFIBUS-DP Slave
Communication Interface

APPLICATION MANUAL

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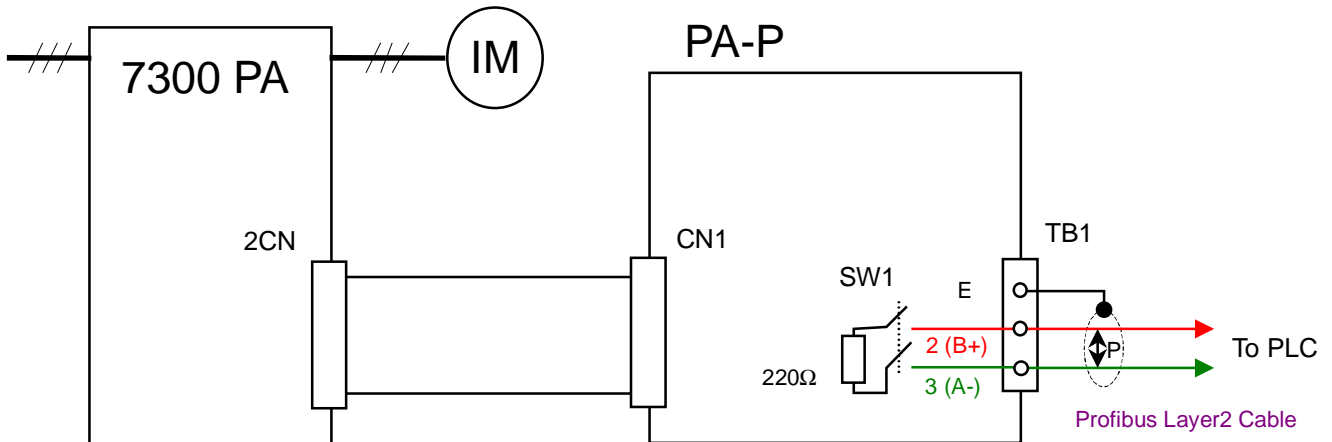
1. INTRODUCTION

This manual describes feature of PA-P communication card and the communication methods between TECO frequency inverter 7300PA and PLC through Profibus-DP network.

2. SPECIFICATION

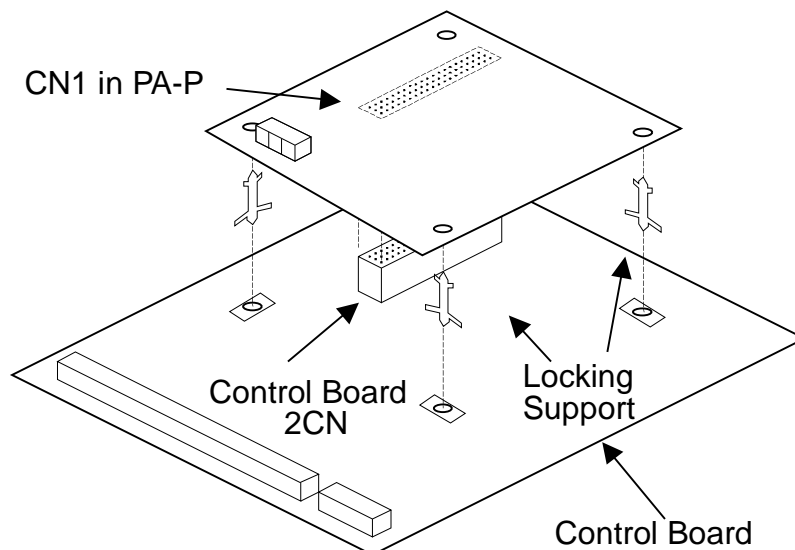
| Specification | Contents | | | | | | | | | |
|----------------------------|---|-------|--------|--------|------|------|-----|-----|-----|--|
| Main Function | Connect 7300PA inverter with Profibus-DP Network | | | | | | | | | |
| Suitable Inverter | 7300PA with software 0403 or newer version. | | | | | | | | | |
| Mounting Base | 4 Screws Built-in | | | | | | | | | |
| Maximum Connection | 32 DP-slave nodes | | | | | | | | | |
| Auto-Baud Search (bit/Sec) | 9.6K | 19.2K | 93.75K | 187.5K | 500K | 1.5M | 3M | 6M | 12M | |
| Transmission Distance (m) | 1200 | 1200 | 1200 | 1000 | 400 | 200 | 100 | 100 | 100 | |
| Connection Medium | Profibus Layer2 Cable | | | | | | | | | |
| Optic Coupler Isolation | Common Mode Rejection $V_{cm}=50V, dV/dt=5000V/\mu Sec$ | | | | | | | | | |
| Access Parameters | 16 Words in, 16 Words out | | | | | | | | | |
| Terminal Resistors | On Board DIP Switch Setting | | | | | | | | | |
| LED Indication | Operation, Profibus Communication | | | | | | | | | |
| Mechanical Dimension | 112mm x 110mm | | | | | | | | | |

3. WIRING DIAGRAM

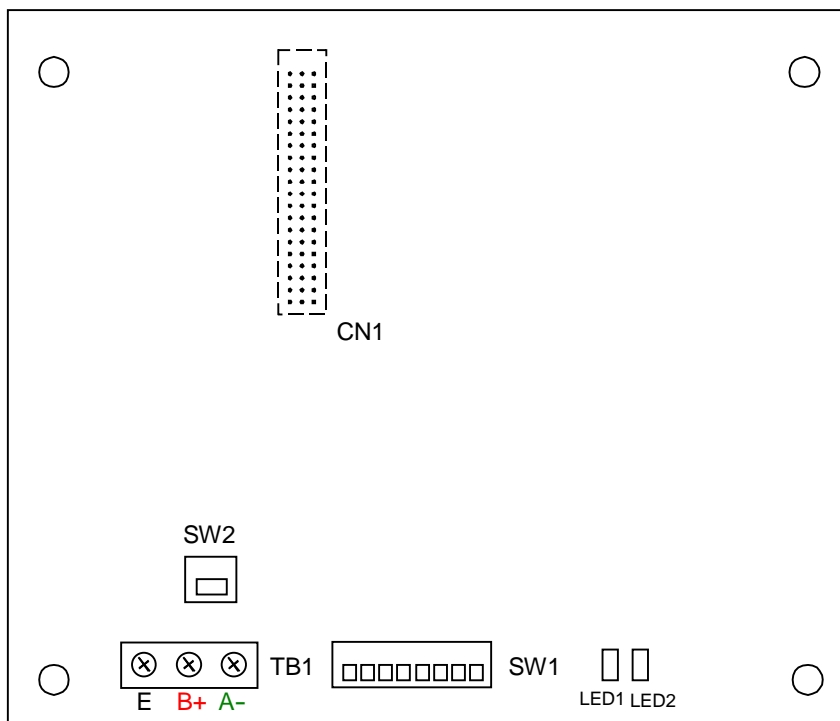


4. INSTALLATION

- (1) Turn on the inverter and check the Software version in parameter Un-10.
In order to support functions of PA-P communication interface, it is necessary to use 7300PA inverter with software version 0403 or newer version. If the software version is older than 0403, please contact the sales to update the inverter.
- (2) Set parameters Sn-08, Cn-31, which is for communication. Then turn off the inverter.
- (3) Insert attached 4 locking supports into the 7300PA control board.
- (4) Mount the PA-C communication interface to the control board, with the holes in the right side aligned to the locking supports, and the connector CN1 aligned to 2CN of control board.
- (5) Connect the Profibus Cable to the TB1 terminal of PA-P communication interface (the red line is for terminal B+, and the green one is for A-)
- (6) Set Profibus Address and terminal resistor through SW1 and SW2.
- (7) Turn the inverter.



5. Descriptions of Terminals, LEDs and DIP switches



(1) Terminals

| Terminal | Description |
|----------|-------------------------------------|
| B+ | Profibus Signal (Positive) |
| A- | Profibus Signal (Negative) |
| E | Connect to shield of Profibus Cable |

(2) LED

| LED | Description |
|--------------|--|
| LED1 (RED) | LED lights while the interface operates without error. |
| LED2 (GREEN) | LED lights during the Profibus-DP communication. |

(3) DIP Switch

A SW1 (Profibus Address. Please set SW1-6, 1-7 and 1-8 to OFF)

| Address | SW1-5 | SW1-4 | SW1-3 | SW1-2 | SW1-1 |
|---------|-------|-------|-------|-------|-------|
| 1 | OFF | OFF | OFF | OFF | OFF |
| 2 | OFF | OFF | OFF | OFF | ON |
| ... | ... | | | | |
| 30 | ON | ON | ON | OFF | ON |
| 31 | ON | ON | ON | ON | OFF |

B SW2 (Terminal Resistor)

| SW2 | Description |
|-----|---|
| ON | Enable terminal resistor between B+ and A- |
| OFF | Disable terminal resistor between B+ and A- |

6. Related Parameters for Communication

(1) Source of Run/Stop command and Frequency reference

| | |
|--------------|---|
| Sn-08 = ---0 | Frequency reference is from Communication. |
| = ---1 | Frequency reference is from Operator or Terminal. |
| = --0- | Run/Stop command is from Communication. |
| = --1- | Run/Stop command is from Operator or Terminal. |
| | (Default = --11) |

(2) Stopping Method while Communication Fault/Alarm.

| | | |
|--------------|---|------------------|
| Sn-08 = 00-- | Decelerating to stop by Bn-02 | (Default = 00--) |
| = 01-- | Coasting to stop | |
| = 10-- | Decelerating to stop by Bn-04 | |
| = 11-- | Continuous operation | |
| | (Can be stopped by STOP Key if Sn-05 = ----0) | |

(3) Time-out Check

| | |
|----------------|----------------------------------|
| Cn-31 = 00.0 s | Don't care |
| = 0.1 - 25.5 | Checked Error (Default = 01.0 s) |

7. Communication status indication of inverter

If the connection between PA-P communication interface and Profibus network is OK and the power is set up, the PA-P will send inverter information to PLC through Profibus network, receive inverter commands from PLC and send them to 7300PA inverter.

While Run/Stop command and/or Frequency reference is from RS-485 (Sn-08 is not equal to --11), the communication time-out function is enabled (Cn-31 is not 0) and the inverter does not receive any message from PLC in period specified by Cn-31, the inverter will display "CPF21" warning.

Bit 2, 3 of parameter Sn-08 will decide the display format and operation of "CPF21".

| | |
|--------------|--|
| Sn-08 = 00-- | Decelerating to stop by Bn-02 (fault "CPF21" light up) |
| = 01-- | Coasting to stop (fault "CPF21" light up) |
| = 10-- | Decelerating to stop by Bn-04 (fault "CPF21" light up) |
| = 11-- | Continuous operation (alarm "CPF21" flash) |

8. Profibus I/O List

(1) In Data (Data is received by PLC)

| No, | Contents | BIT | Description |
|-----|-----------------|------|---|
| 1 | Inverter Status | 0 | 0 = STOP, 1 = Running |
| | | 1 | 1 = ZERO SPEED |
| | | 2 | 0 = FWD Run, 1 = REV Run |
| | | 3 | 1 = FAULT RESET |
| | | 4 | RESERVED |
| | | 5 | 1 = Inverter Ready |
| | | 6 | 1 = Inverter Alarm |
| | | 7 | 1 = Inverter Fault |
| | | 8-15 | RESERVED |
| 2 | Fault Content 1 | 0 | Main Circuit UV (UV1) |
| | | 1 | Control Circuit UV (UV2) |
| | | 2 | MC Defective (UV3) |
| | | 3 | Overcurrent (OC) |
| | | 4 | Overvoltage (OV) |
| | | 5 | RESERVED |
| | | 6 | Overheat (OH) |
| | | 7 | Motor Overload (OL1) |
| | | 8 | Inverter Overload (OL2) |
| | | 9 | Overtorque (OL3) |
| | | 10 | External Fault 3 (EF3) |
| | | 11 | External Fault 5 (EF5) |
| | | 12 | External Fault 6 (EF6) |
| | | 13 | External Fault 7 (EF7) |
| | | 14 | External Fault 8 (EF8) |
| 15 | RESERVED | | |
| 3 | Fault Content 2 | 0 | Control Circuit Fault (CPF02) |
| | | 1 | EEPROM Fault (CPF03) |
| | | 2 | EEPROM BCC Code Error (CPF04) |
| | | 3 | CPU ADC Fault (CPF05) |
| | | 4-12 | RESERVED |
| | | 13 | Communication between 7300PA and PA-P Failed. |
| | | 14 | Dual-Port RAM Checksum Error |
| | | 15 | WDT Error (CPF27) |

| No, | Contents | BIT | Description |
|-----|--------------------------------------|----------------------|---------------------------|
| 4 | Alarm Content | 0 | Undervoltage (UV) |
| | | 1 | Overvoltage (OV) |
| | | 2 | Overheat (OH2) |
| | | 3 | Overtorque (OL2) |
| | | 4 | External Fault (EF) |
| | | 5 | Base Block (BB) |
| | | 6 | External Fault 3 (EF3) |
| | | 7 | External Fault 5 (EF5) |
| | | 8 | External Fault 6 (EF6) |
| | | 9 | External Fault 7 (EF7) |
| | | 10 | External Fault 8 (EF8) |
| | | 11-15 | RESERVED |
| 5 | Frequency Reference | 100/1Hz | |
| 6 | Output Frequency | 100/1Hz | |
| 7 | Output Voltage | 1/1V | |
| 8 | Output Current | 10/1A | |
| 9 | Main Circuit DC Voltage | 1/1V | |
| 10 | Analog Input Vin Signal | 100/10V | |
| 11 | Analog Input Ain Signal | 0 = 4mA, 1000 = 20mA | |
| 12 | Analog Input Aux Signal | 100/10V | |
| 13 | Multifunction Terminal Status | 0 | 1 : Terminal ① is closed |
| | | 1 | 1 : Terminal ② is closed |
| | | 2 | 1 : Terminal ③ is closed |
| | | 3 | 1 : Terminal ④ is closed |
| | | 4 | 1 : Terminal ⑤ is closed |
| | | 5 | 1 : Terminal ⑥ is closed |
| | | 6 | 1 : Terminal ⑦ is closed |
| | | 7 | 1 : Terminal ⑧ is closed |
| | | 8-15 | RESERVED |
| 14 | Analog Output AO1 Signal | 100/10V | |
| 15 | Analog Output AO2 Signal | 100/10V | |
| 16 | Multifunction Output Terminal Status | 0 | R2A-R2C Status 1 : Closed |
| | | 1 | DO1 Status 1 : Closed |
| | | 2 | R1A-R1C Status 1 : Closed |
| | | 3-15 | RESERVED |

(2) Out Data (Data is sent by PLC)

| No, | Contents | BIT | Description |
|-----|---------------------------------|---|---|
| 1 | Operation Signals | 0 | 0 = STOP, 1 = RUN (It is valid while Sn-08 = --0-.) |
| | | 1 | 0 = Forward, 1 = Reverse (It is valid while Sn-08 = --0-.) |
| | | 2 | 1 = External Fault |
| | | 3 | 1 = Fault Reset |
| | | 4-15 | RESERVED |
| 2 | Frequency Reference | 100/1Hz (It is valid while Sn-08 = -0--.) | |
| 3 | RESERVED | — | |
| 4 | RESERVED | — | |
| 5 | RESERVED | — | |
| 6 | Analog Output AO1 Command | 100/10V (It is valid while Sn-26 = 10.) | |
| 7 | Analog Output AO2 Command | 100/10V (It is valid while Sn-27 = 10.) | |
| 8 | Multifunction Output Command | 0 | R2A-R2C Output 1 : Output (It is valid while Sn-20 = 0F.) |
| | | 1 | DO1 Output 1 : Output (It is valid while Sn-21 = 0F.) |
| | | 2 | R1A-R1C Output 1 : Output (It is valid while Sn-22 = 0F.) |
| | | 3-15 | RESERVED |
| 9 | RESERVED | — | |
| 10 | RESERVED | — | |
| 11 | RESERVED | — | |
| 12 | RESERVED | — | |
| 13 | RESERVED | — | |
| 14 | RESERVED | — | |
| 15 | RESERVED | — | |

9 Error Message

If PA-P communication interface is unable to communicate with Profibus network or 7300PA inverter, or the PA-P interface circuit is defective, the 7300PA inverter will display error message in the digital operator. For most of the errors, the LED1 in PA-P communication interface will flash or be off, showing that the interface is unable to work properly.

| Message in Operator | PA-P LED1 | Content | Description |
|---------------------|-----------|------------------------------|---|
| CPF21 | Flash | Communication Time-out | PA-P does not receive any data from Profibus network in specified period. |
| CPF23 | Flash | Dual-port RAM Fault | PA-P Dual-Port RAM Fault |
| CPF24 | OFF | EEPROM Checksum Fault | PA-P EPROM Checksum Fault |
| CPF24 | Light | Dual-port RAM Checksum Error | Dual-port RAM Checksum Error while data is being exchanged in Dual-port RAM |
| CPF25 | Flash | RAM Fault | PA-P RAM Fault |
| CPF26 | Flash | Comm. IC Fault | Profibus Communication IC Fault. |
| CPF27 | Flash | WDT Fault | PA-P program error. Built-in Watch Dog Timer is active. |

10 GSD File

```

; /*****
; /* Filename: TECO7300.GSD
; /* ModelName:   TECO AC DRIVES 7300 PA
; /* CreateDate:  2004.12.13
; /*****
#Profibus_DP
GSD_Revision      = 1
Vendor_Name       = "TECO"
Model_Name        = "7300PA"
Revision          = "Version1.0"
Ident_Number      = 0x7300
Protocol_Ident    = 0                ;Profibus-DP
Station_Type      = 0                ;DP Slaver
FMS_supp         = 0                ;Pure DP Device
Hardware_Release  = "HW_V1.0"
Software_Release  = "SW_V1.0"
;
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
Redundancy        = 0                ;Not Redundancy Supported
Repeater_Ctrl_Sig = 2                ;TTL
24V_Pins          = 0                ;Not Connected
;
Implementation_Type = "SPC3"
Bitmap_Device      = "DP_NORM"
Bitmap_Diag        = "bmpdia"
Bitmap_SF          = "bmpsf"

```

```
;
Freeze_Mode_supp      = 1           ;Supported
Sync_Mode_supp       = 1           ;Supported
Auto_Baud_supp       = 1           ;Supported
Set_Slave_Add_supp   = 0           ;can not change via profibus
;
Fail_Safe             = 0
Slave_Family          = 1           ;Drives Family
Min_Slave_Intervall  = 10          ;PollingCycle:10*100uS=1mS
;
Max_Diag_Data_Len    = 16
Max_User_Prm_Data_Len = 5
Modul_Offset         = 255
Ext_User_Prm_Data_Const(0) = 0x00,0x00,0x00,0x00,0x00
;
Modular_Station      = 1           ;Modular Device
Max_Module           = 1           ;Only 1 Module can be inserted
Max_Input_Len        = 32
Max_Output_Len       = 32
Max_Data_Len         = 64
Module="16 Word In,16 Word Out" 0x7f
EndModule
```