TECO Frequency Inverter

7300PA PROFIBUS-DP Slave

Communication Interface

APPLICATION MANUAL

VERSION : 01

Content

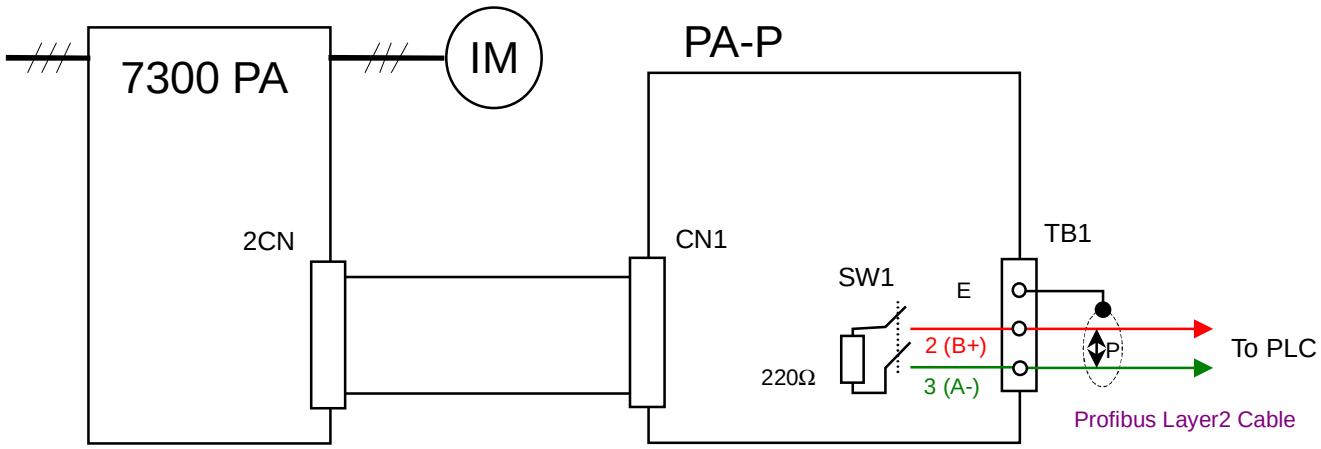
1. INTRODUCTION

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 Vcm=50V,dV/dt=5000V/uSec								
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 odder 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.

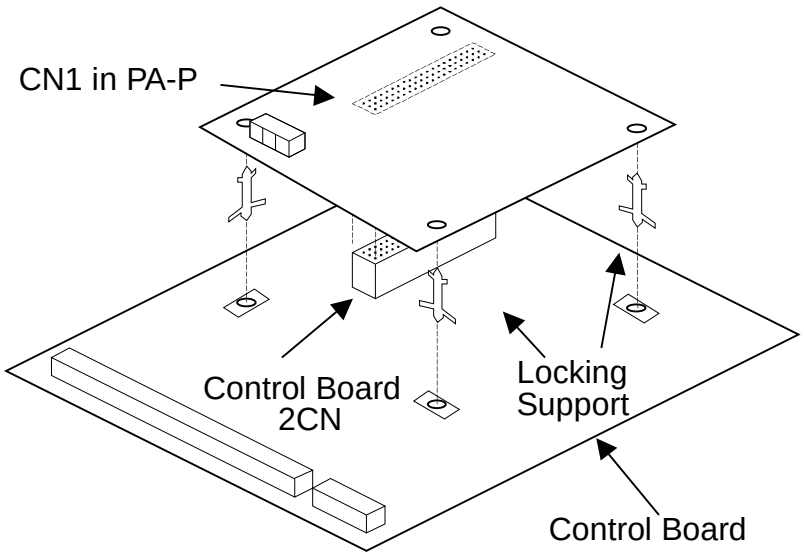
(3) Insert attached 4 locking supports into the 7300PA control board.

(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.

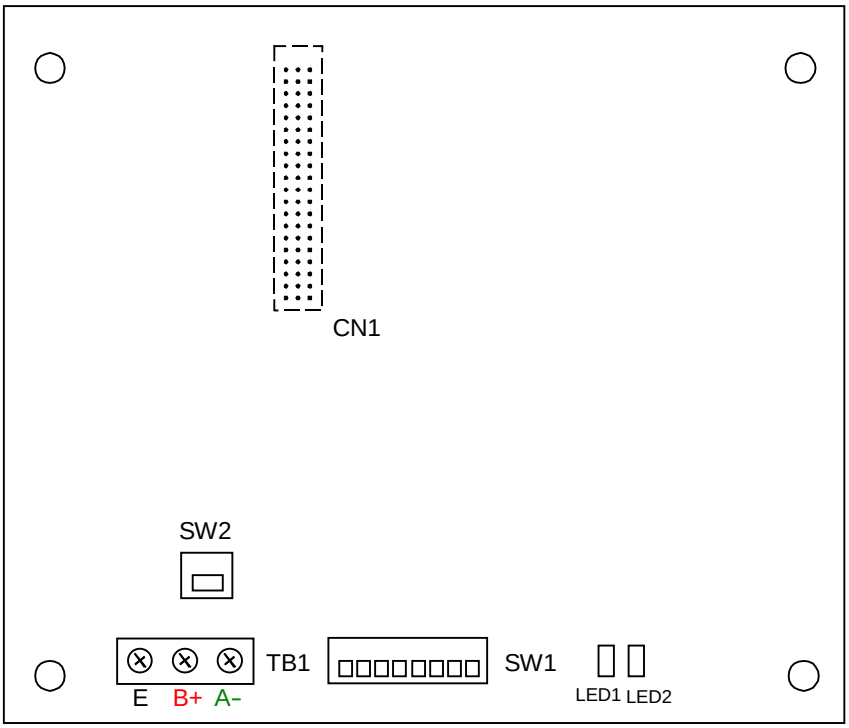
(5) Connect the Profibus Cable to the TB1 terminal of PA-P communication interface (the red line is for terminal B+, and the green one is for A-)

(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
```