HAPN-*HPVFV frequency inverter*
Profibus DP communication protocol
User manual

V3.0302

SOLCOM & HAPN (SHANGHAI) ELECTRIC CO., LTD

PROFILE

The manual is special for Profibus DP communication protocol of HPVFV low voltage frequency inverter.

Wiring and setting

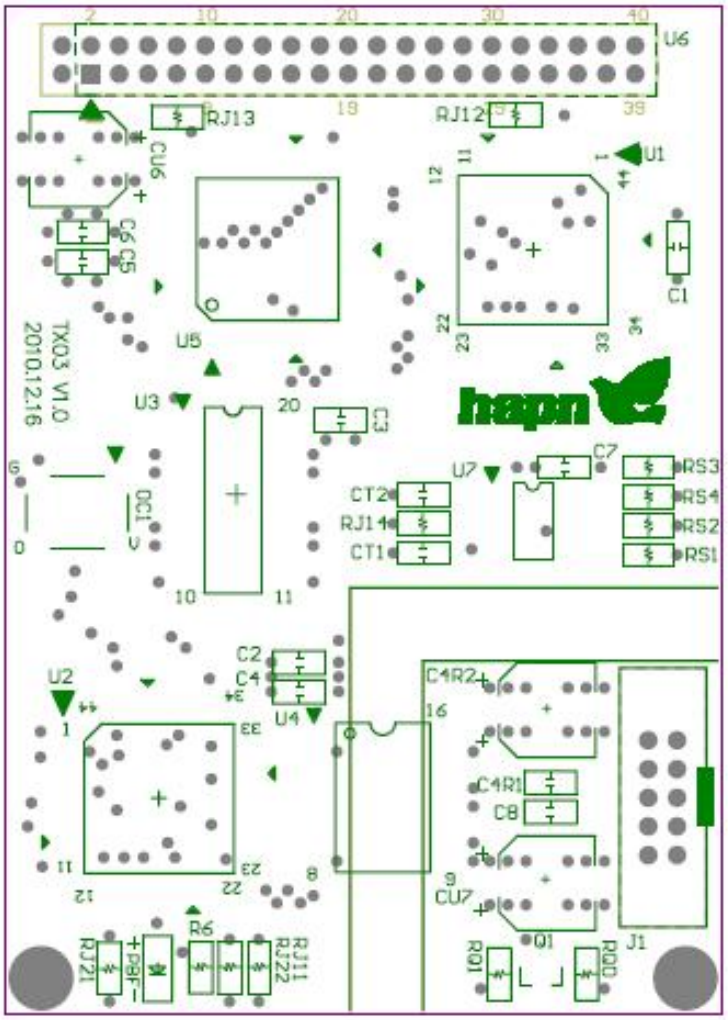

Figure 1. Profibus DP circuit board

1. Communication activate

Parameter	Menu	Set	Description
P27.0	PB_Connect	[0]Disable [1]Enable	

2. Sub-station define

Parameter	Menu	Set	Description
P27.1	Station_No	0~127	ProfibusDP sub-station setting

Note: The products does not support broadcast commands.

The number of sub-station does not define to 0.

3. Communication fault

Parameter	Menu	Set	Description
P27.2	PB_Err_Act	[0]Normal STOP [1]E-STOP [2]Free-RUN [3]IGNORE	

Data setting

4. The delay time of communication fault

Parameter	Menu	Set	Description
P27.3	PB_Err_Dly	1ms-3000mS	The delay time when communication fault

5. Input data setting

Parameter	Menu	Set	Description
P27.4	PB_DI_Cfg	1-16Words 16Word	Data exchange bit 16 (do not change)

6. Output data setting

Parameter	Menu	Set	Description
P27.5	PB_DO_Cfg	1-16Words 16Word	Data exchange bit 16 (do not change)

7. Output data 1. Data connection setting

Parameter	Menu	Set	Description
P27.6	PB_DO[1]	Ref figure	Output data 1 connection set

8. Output data 1. Data connection setting

Parameter	Menu	Set	Description
P27.7	PBDO1_Scl	[0]Percent[%] [1]Actual	The type of output data 1 [0] percent [1] actual

Note: when chose the data as [0] percent, output data should be x10.

For example: output data as 1324(dec), means 123.4%

9. Output data2~16 Data connection setting

Parameter	Menu	Set	Description
P27.8 P27.10 P27.12 P27.14 P27.16 P27.18 P27.20 P27.22 P27.24	PB_DO[2] PB_DO[3] PB_DO[4] PB_DO[5] PB_DO[6] PB_DO[7] PB_DO[8] PB_DO[9] PB_DO[10]	Ref figure	Output data 2~16 connection set

P27.26 P27.28 P27.30 P27.32 P27.34 P27.36	PB_DO[11] PB_DO[12] PB_DO[13] PB_DO[14] PB_DO[15] PB_DO[16]		

Data setting

10. Output data 2~16 data setting

Parameter	Menu	Set	Description
P27.9 P27.11 P27.13 P27.15 P27.17 P27.19 P27.21 P27.23 P27.25 P27.27 P27.29 P27.31 P27.33 P27.35 P27.37	PBDO2_Scl PBDO3_Scl PBDO4_Scl PBDO5_Scl PBDO6_Scl PBDO7_Scl PBDO8_Scl PBDO9_Scl PBDO10_Scl PBDO11_Scl PBDO12_Scl PBDO13_Scl PBDO14_Scl PBDO15_Scl PBDO16_Scl	[0]Percent[%] [1]Actual	

11. Control word 1 data connection setting

Parameter	Menu	Set	Description
P27.38	CtrlWord1	[0]Not Used [1]PB Drive Input 1 ~ [16] PB Drive Input 16	Ctrl word 1 data connection

12. Control word 2 data connection setting

Parameter	Menu	Set	Description
P27.39	CtrlWord2	[0]Not Used [1] PB Drive Input 2 ~ [16] PB Drive Input 16	Ctrl word 2 data connection

13. Control word 3 data connection setting

Parameter	Menu	Set	Description
P27.40	CtrlWord3	[0]Not Used [1] PB Drive Input 3 ~ [16] PB Drive Input 16	Unused

Note:

When Ctrl word 1~3 connect with PB Drive Input directly, the digital input interface is invalid.

Note:

After program, have to shut down and re-start the power to activate the new setting.

Example of parameter setting

A. Output data setting

1、PB_DO1 set as status word 1（ST_WORD1）. Know the ST_WORD1 concatenated coding from link list as 64

Set P27.6=64，P27.7=Actual on menu

2、PB_DO2 set as status word 2（ST_WORD2）. Know the ST_WORD1 concatenated coding from link list as 65

Set P27.8=65，P27.9=Actual on menu

3、PB_DO3 set as （Digital Inputs）.

Know Digital Inputs concatenated coding as 63

Set P27.10=63，P27.11=Actual on menu

4、PB_DO4 set as （Error Code）.

Know the Error Code concatenated coding as 62

Set P27.12=62，P27.13=Actual on menu

5、PB_DO5 set as（Output Frequency）

Know Output Frequency concatenated coding from link list as 85

Set P27.14=85，P27.15=Actual on menu

6、PB_DO6 set as（Output Current）

Know Output Current（rms）concatenated coding from link list as 97

Set P27.16=97，P27.17=Actual on menu

7、PB_DO7 set as（Output Voltage）

Know Output Voltage（rms）concatenated coding from link list as 98

Set P27.18=98，P27.19=Actual on menu

8、PB_DO8 set as（Line Voltage）

Know Line Voltage（rms）concatenated coding from link list as 99

Set P27.20=99，P27.21=Actual on menu

9、PB_DO9 set as（Torque Output）

Know Torque Output concatenated coding from link list as 88

Set P27.22=88，P23.23=Actual on menu

10、PB_DO10 set as（Load Torque）

Know Load Torque concatenated coding from link list as 89

Set P27.24=89，P27.25=Actual on menu

11、PB_DO11 set as（DC-BUS Voltage）

Know DC-BUS Voltage concatenated coding from link list as 78

Set P27.26=78，P27.27=Actual on menu

12、PB_DO12 set as（Measured motor speed）

Know Measured motor speed concatenated coding from link list as 87

Set P27.28=87，P27.29=Actual on menu

13、PB_DO13 set as（Warning Code）

Know Warning Code concatenated coding from link list as 61

Set P27.30=61，P27.31=Actual on menu

14、PB_DO14 set as（Heat-sink Temperature）

Know Heat-sink Temperature concatenated coding from link list as 96

Set P27.32=96，P27.33=Actual on menu

Example of parameter setting

B. Control words

1. Set CtrlWord1 as PB_DRIVE_IN1 to activate PB_DRIVE_IN1 to control drives.

Set P27.38=1 on menu and P3.0=3 （Fieldbus）

2. Set CtrlWord2 as PB_DRIVE_IN2 to activate PB_DRIVE_IN2 to control drives and PID

Set P27.39=2 on menu

3. Activate PB_DRIVE_IN3 to control output frequency. Know PB_DRIVE_IN3 concatenated coding from link list as 44

Set P31.0=44 on menu and P3.1=3（Free_Func）

C. Able communication to control and set sub-station serial number.

1. P27.0=1 able communication control
2. P27.1=6 set sub-station serial number as 6
3. P27.2=3 if communication fault, ignore
4. P27.4=16
5. P27.5=16

Note:

After program, have to shut down and re-start the power to activate the new setting.

Data connection

Code	Name	Value
0	Empty	Constant 0
1	Invariable 1(P30.0)	0-8192（0x2000）->100%
2	Invariable 2(P30.1)	0-8192（0x2000）->100%
3	Invariable 3(P30.2)	0-8192（0x2000）->100%
4	Invariable 4(P30.3)	0-8192（0x2000）->100%
5	Invariable 5(P30.4)	0-8192（0x2000）->100%
6	Invariable 6(P30.5)	0-8192（0x2000）->100%
7	Invariable 7(P30.6)	Actual
8	Invariable 8(P30.7)	Actual
9	1 input function f(x1)=	0-8192（0x2000）->100%
10	1 input function f(x2)=	0-8192（0x2000）->100%
11	1 input function f(x3)=	0-8192（0x2000）->100%
12	1 input function f(x4)=	0-8192（0x2000）->100%
13	1 input function f(x5)=	0-8192（0x2000）->100%
14	2 input function f(x1,y1)=	0-8192（0x2000）->100%
15	2 input function f(x2,y2)=	0-8192（0x2000）->100%
16	2 input function f(x3,y3)=	0-8192（0x2000）->100%
17	2 input function f(x4,y4)=	0-8192（0x2000）->100%
18	2 input function f(x5,y5)=	0-8192（0x2000）->100%
19	2 input function f(x6,y6)=	0-8192（0x2000）->100%
20	2 input function f(x7,y7)=	0-8192（0x2000）->100%
21	3 input function f(x1,y1)=	0-8192（0x2000）->100%
22	3 input function f(x2,y2)=	0-8192（0x2000）->100%
23	3 input function f(x3,y3)=	0-8192（0x2000）->100%
24	3 input function f(x4,y4)=	0-8192（0x2000）->100%
25	Filter function LPF(x1)=	0-8192（0x2000）->100%
26	Filter function LPF(X2)=	0-8192（0x2000）->100%
27		
28		
29		
30		
31		
32	PID ctrl output	0-8192（0x2000）->100%
33	Timer function output	0-8192（0x2000）->100%
34	Analogue input 1	0-8192（0x2000）->100%
35	Analogue input 2	0-8192（0x2000）->100%
36	Analogue input 3	0-8192（0x2000）->100%
37	Analogue input 4	0-8192（0x2000）->100%
38	Analogue input 5	0-8192（0x2000）->100%
39	Analogue reference	0-8192（0x2000）->100%

Data connection

Code	Name	Value
40	RS232C setting	0-8192（0x2000）->100%
41	Multi-speed setting	0-8192（0x2000）->100%
42	PB communication input 1	0-65535
43	PB communication input 2	0-65535
44	PB communication input 3	0-65535
45	PB communication input 4	0-65535
46	PB communication input 5	0-65535
47	PB communication input 6	0-65535
48	PB communication input 7	0-65535
49	PB communication input 8	0-65535
50	PB communication input 9	0-65535
51	PB communication input 10	0-65535
52	PB communication input 11	0-65535
53	PB communication input 12	0-65535
54	PB communication input 13	0-65535
55	PB communication input 14	0-65535
56	PB communication input 15	0-65535
57	PB communication input 16	0-65535
58	Asynchronous ctrl info 1	0-65535
59	Asynchronous ctrl info 2	0-65535
60	Asynchronous ctrl info 3	0-65535
61	Alarm code	
62	Fault code	
63	Digital input	0-65535
64	Status word 1	0-65535
65	Status word 2	0-65535
66	Status word 3	0-65535
67	Status word 4	0-65535
68	PB communication ctrl word 1	0-65535
69	PB communication ctrl word 2	0-65535
70	PB communication ctrl word 3	0-65535
71	Asynchronous ctrl word	0-65535
72	**instantaneous** value of output current	[%]0-8192（0x2000）->100% [Actual]x0.1A
73	Phase A current **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1A
74	Phase B current **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1A

75	Phase C current **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1A
76	Axis D current **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1A
77	Axis Q current **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1A
78	DC bus line voltage 直流母线电压	[%]0-8192（0x2000）->100% [Actual]x0.1V
79	Output voltage current **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1V

Data connection

Code	Name	Value
80	Axis D voltage **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1V
81	Axis Q voltage **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1V
82	Main voltage **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1V
83	Axis D voltage **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1V
84	Axis Q voltage **instantaneous** value	[%]0-8192（0x2000）->100% [Actual]x0.1V
85	Output frequency	[%]0-8192（0x2000）->100% [Actual]x0.01Hz
86	Motor speed monitor value	[%]0-8192（0x2000）->100% [Actual]x1rpm
87	Motor speed estimated value	[%]0-8192（0x2000）->100% [Actual]x1rpm
88	Output torque	[%]0-8192（0x2000）->100% [Actual]x0.1Nm
89	Motor torque	[%]0-8192（0x2000）->100% [Actual]x0.1Nm
90	Stator magnetic flux	[%]0-8192（0x2000）->100% [Actual]x0.01Wb
91	Rotator magnetic flux	[%]0-8192（0x2000）->100% [Actual]x0.01Wb
92	Motor input power	[%]0-8192（0x2000）->100% [Actual]x0.1KW
93	Motor output power	[%]0-8192（0x2000）->100% [Actual]x0.1KW
94	Active power	[%]0-8192（0x2000）->100% [Actual]x0.1KW
95	Reactive power	[%]0-8192（0x2000）->100% [Actual]x0.1KW
96	Cooling temperature	[Actual]x0.1DEG
97	Real value of output current	[%]0-8192（0x2000）->100% [Actual]x0.1A
98	Real value of output voltage	[%]0-8192（0x2000）->100% [Actual]x0.1V
99	Real value of power supplier	[%]0-8192（0x2000）->100% [Actual]x0.1V

Data address description

[68] Control word1

byte	Name	description
0	Run/stop ctrl	0->stop 1->run
1	Fwd/rev ctrl	0->fwd 1->rev
2	Driver	0->able 1->disable
3	Multi speed ctrl 0	0000-> disable 0001~1111 speed grade 1~15
4	Multi speed ctrl 1	
5	Multi speed ctrl 2	
6	Multi speed ctrl 3	
7	Fault reset	1->reset
8	Step run control	1->step run speed value =Jog_SetPt（P9.0）
9	Analogue input reference	
10	Analogue input control	0->AI 1 as ref 1->AI 2 as ref
11	External fault A	0->fine 1->fault
12	External fault B	0->fine 1->fault
13	Motor select	0->motor 1 1->motor 2
14	Motor brake	0->brake off 1->brake on
15		

[69] Control word 2

Byte	Name	Description
0	Ref+	0->stop 1->run
1	Ref-	0->fwd 1->rev
2	acc/dec bypass	0->disable 1->able
3	PID control able	
4	PID auto control	
5	PID gain select	
6	PID integral reset	
7	Torque bypass	
8	Torque signal change	

9	Torque output 0	
10	Step run method	
11	Sub-unit run/stop status	
12		

[70]Control word 3
Undefined, programmable

[71]Control word 4

byte	name	Description
0	Synchronous control run	
1	Synchronous control fault reset	
8	RS232C run	
9	RS232C fault reset	
10	RS232C directional control	
14	Overall work	
15	Overall fault reset	