Profibus DP – Drive Link
Connect Profibus Master to ACV700/DCV700

1. GENERAL

PE1376B/PD make it possible to connect a Profibus Master to a ACV/DCV700 without using a APC. The application program in APC must be moved to the profibus Master.
The **PE1376B/PD** is a converter connected to profibus DP protocol on one side and Drive Link protocol on the other side. This unit make it possible to connect 4 ACV700/DCV700 to a profibus Master. The converter is operating at max 12Mbaud on Profibus side and 1.5Mbit on the Drive Link protocol.
Max 14 Integer values can be send to the Drive and max 15 Integer values can be read from the Drive. The signal addresses is set from Profibus Master.
The PE1376B/PD contains a 2 characters display for status indication.

2. TECHNICAL DESCRIPTION

2.1 Dimension and mounting

To obtain the best immunity to electric noise the PE1376B/PD must be electrically connected to cubicle through 4 M5 screws in each corner (M5 Screw pos 220mm x135mm).
Dimensions
Size: 240mm x 145mm (w x h)
Required mounting deep: 35mm

2.2 Technical data

Auxiliary Power
+24V DC (12-30V DC), typical 120mA(3W), at startup 1A 10ms,Max fuse: 4A

Drive Link Communication
PE1376B/PD is Master on Drive Link Protocol and can handle up to 4 ACV700/DCV700.
PE1376B/PD can be connected with 1.0mm plastic fiber POF
If there are 2-4 drives connected, an optical distributor is needed.
Transmission speeds 1.5Mbit/s

Communication on Profibus DP protocol
PE1376B/PD is acting as a slave on Profibus.
Supported baudrates: 9.6k,19.2k,93.75k,187.5k,500k,1.5M,3M,6M,12M
Baud rates are detected automatic.

Enclosure class
IP00

Environmental data
Operation +5..+40 degrees C.,Storage -40..+70 degrees C.

2.3 Strapping

STRAPPING	DEFAULT	FUNCTION
B3	OFF	High Drive link transmitter intensity
B4	ON	Medium Drive link transmitter intensity
B5	OFF	Low Drive link transmitter intensity

2.4 Status display 2 digits

First digit shows actual Modbus node addr 1-8
When communication to Profibus DP is broken then communication with ACV/DCV700 will automatic stop.

Status indication 1 will only last for a short time and then 0 will be displayed.
This because PE1376B/PD will automatic stop communication to ACV/DCV700 if communication to Profibus will fail.

SECOND DIGIT	STATUS
0	No contact on Profibus DP
1	Contact with ACV/DCV700 but no contact with Profibus DP
2	Contact with Profibus DP but no contact with ACV/DCV700
-	Communication is OK

2.5 Connections

TERMINAL	FUNCTION
P1	Chassi
P2	+24V DC Power supply
P3	0V
9 pole Dsub	Service aid, RS232 19200 baud Modbus RTU slave
2	Txd RS232
3	Rxd RS232
5	0V
9 pol DSUB	Standard Profibus DP connection (Opto isolated)

2.6 Mapping of Signals from/to ProfibusMaster to ACV700/DCV700

ACV/DCV700 Node 1 to 4 MO00-MO03 (Table shows ACV/DCV700 node 1)

PB Master Data →	**ACV/DCV700**	
MO00 QW0	DRTRA(0) DS90	Basic Data 1
MO00 QW2		Basic Data 2
MO00 QW4		Basic Data 3
MO00 QW6	DRTRA(1) DS1	Normal Cyclic Data 1
MO00 QW8		Normal Cyclic Data 2
MO00 QW10		Normal Cyclic Data 3
MO00 QW12		Normal Cyclic Data 4
MO00 QW14	APC element DRTRA(1) DS3	Normal Cyclic Data 5
MO00 QW16		Normal Cyclic Data 6
MO00 QW18		Normal Cyclic Data 7
MO00 QW20		Normal Cyclic Data 8
MO00 QW22		Normal Cyclic Data 9
MO00 QW24		Normal Cyclic Data 10
MO00 QW26		Normal Cyclic Data 11
MO00 QW28	CONTROL	PE1376B/PD Control Bit0=Start ACV/DCV communication
	Configuration of data from ACV/DCV700 (Same for all Drives)	
Parameter 1	DRREC(0) DS91	BASIC Message Scan ms
Parameter 2		IND1 Drive signal index Basic
Parameter 3		IND2 Drive signal index Basic
Parameter 4		IND3 Drive signal index Basic
Parameter 5	DRREC(1) DS2	Normal Message1 Scan ms
Parameter 6		IND1 Drive signal index Normal Cyclic data
Parameter 7		IND2 Drive signal index Normal Cyclic data
Parameter 8		IND3 Drive signal index Normal Cyclic data
Parameter 9		IND4 Drive signal index Normal Cyclic data
Parameter 10	APC element DRREC(1) DS4	Normal Message 2 Scan ms
Parameter 11		IND5 Drive signal index Normal Cyclic data
Parameter 12		IND6 Drive signal index Normal Cyclic data
Parameter 13		IND7 Drive signal index Normal Cyclic data
Parameter 14		IND8 Drive signal index Normal Cyclic data
Parameter 15		IND9 Drive signal index Normal Cyclic data
Parameter 16		IND10 Drive signal index Normal Cyclic data
Parameter 17		IND11 Drive signal index Normal Cyclic data
Parameter 18		IND12 Drive signal index Normal Cyclic data
	Configuration of data to ACV/DCV700	
Parameter 19	DRTRA(0) DS90	IND1 Drive signal index Basic
Parameter 20		IND2 Drive signal index Basic
Parameter 21		IND3 Drive signal index Basic
Parameter 22	DRTRA(1) DS1	IND1 Drive signal index Normal Cyclic data
Parameter 23		IND2 Drive signal index Normal Cyclic data
Parameter 24		IND3 Drive signal index Normal Cyclic data
Parameter 25		IND4 Drive signal index Normal Cyclic data
Parameter 26	APC element DRTRA(1) DS3	IND5 Drive signal index Normal Cyclic data
Parameter 27		IND6 Drive signal index Normal Cyclic data
Parameter 28		IND7 Drive signal index Normal Cyclic data
Parameter 29		IND8 Drive signal index Normal Cyclic data
Parameter 30		IND9 Drive signal index Normal Cyclic data
Parameter 31		IND10 Drive signal index Normal Cyclic data
Parameter 32		IND11 Drive signal index Normal Cyclic data

ACV/DCV700 Node 1 to 4 MO00-MO03 (Table shows ACV/DCV700 node 1)

PB Master Data ←	**ACV/DCV700**	
MO00 IW0	DRREC(0) DS91	Basic Data 1
MO00 IW2		Basic Data 2
MO00 IW4		Basic Data 3
MO00 IW6	DRREC(1) DS2	Normal Cyclic Data 1
MO00 IW8		Normal Cyclic Data 2
MO00 IW10		Normal Cyclic Data 3
MO00 IW12		Normal Cyclic Data 4
MO00 IW14	APC element DRTRA(1) DS4	Normal Cyclic Data 5
MO00 IW16		Normal Cyclic Data 6
MO00 IW18		Normal Cyclic Data 7
MO00 IW20		Normal Cyclic Data 8
MO00 IW22		Normal Cyclic Data 9
MO00 IW24		Normal Cyclic Data 10
MO00 IW26		Normal Cyclic Data 11
Status information from PE1376B/PD converter		
MO00 IW28	CONNECTSTATUS ACV/DCV700 see description below	
MO00 IW30	CON_STS see TC-LINK Protocol description	
MO00 IW32	TC_STS see TC-LINK Protocol description	
MO00 IW34	NRR_DS see TC-LINK Protocol description	
MO00 IW36	NRT_DS see TC-LINK Protocol description	
MO00 IW38	TIMEOUT counter Drive Link, Number of timeouts on drive link	

USER PARAMETERS 1-32

If any of the 1-32 user parameters on Profibus DP is changed then PE1376B/DP must be restarted. (Recycle of power)

CONNECTSTATUS

This 16 bit word show status for DriveLink communication.
Bit0 Get link status passed ok
Bit1 Open connection done
Bit2 Start cyclic done
Bit3 Basic DataSet is setup ok
Bit4 Cyclic1 DataSet setup ok
Bit5 Cyclic2 DataSet setup ok
Bit6 Used for internal propose
Bit7 All setup is ok

Use Bit7 with a short delay off to detect Communication OK

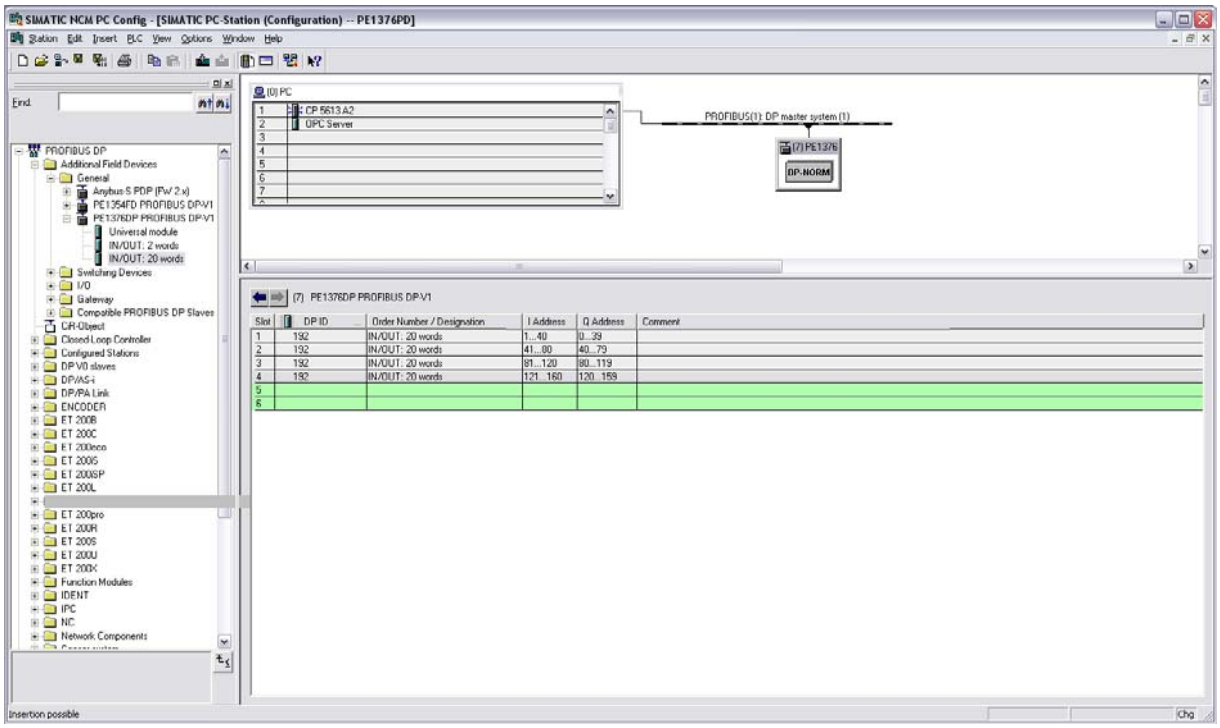
Error handling

When ProfibusDP communication failure then DriveLink communication for all 4 ACV700 nodes are stopped. The PE1376DP display will indicate 0 for the actual node.

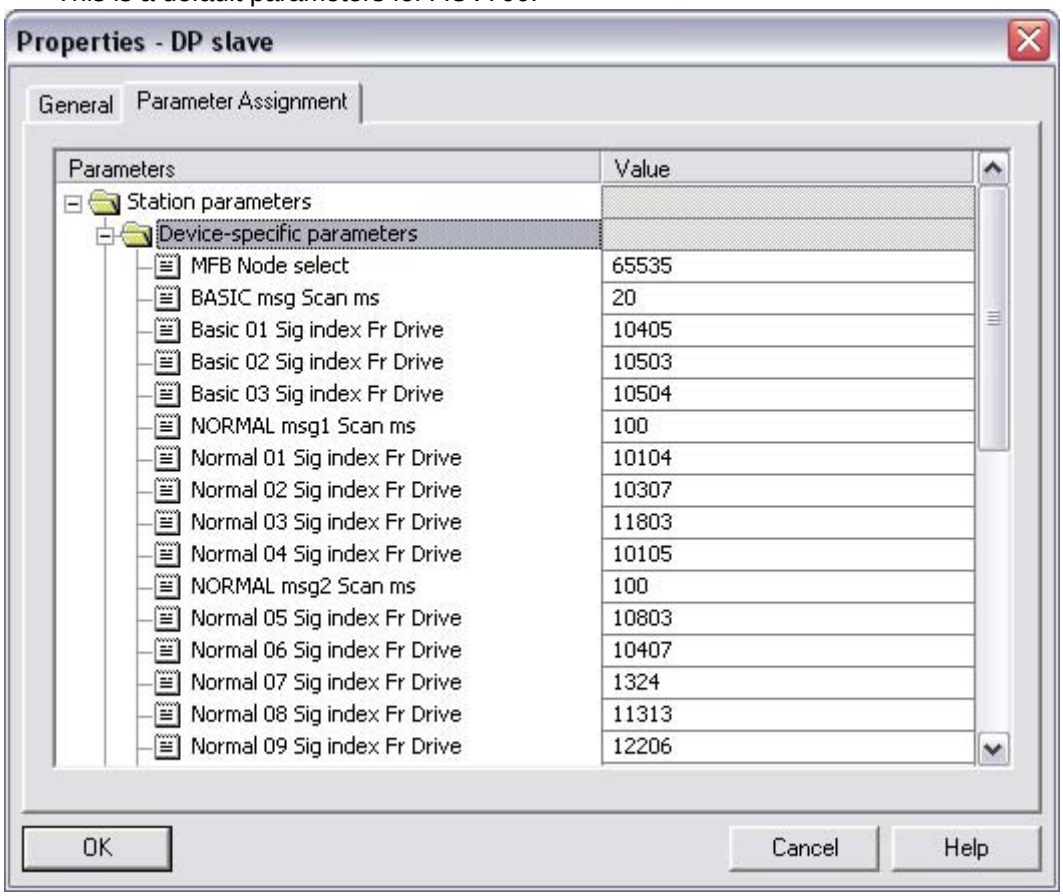
DriveLink communication status can be read on CONNECTSTATUS.
If drive link communication fails then the Profibus communication will still be running.
The Application in ProfibusMaster must check the CONNECTSTATUS and take acktion.

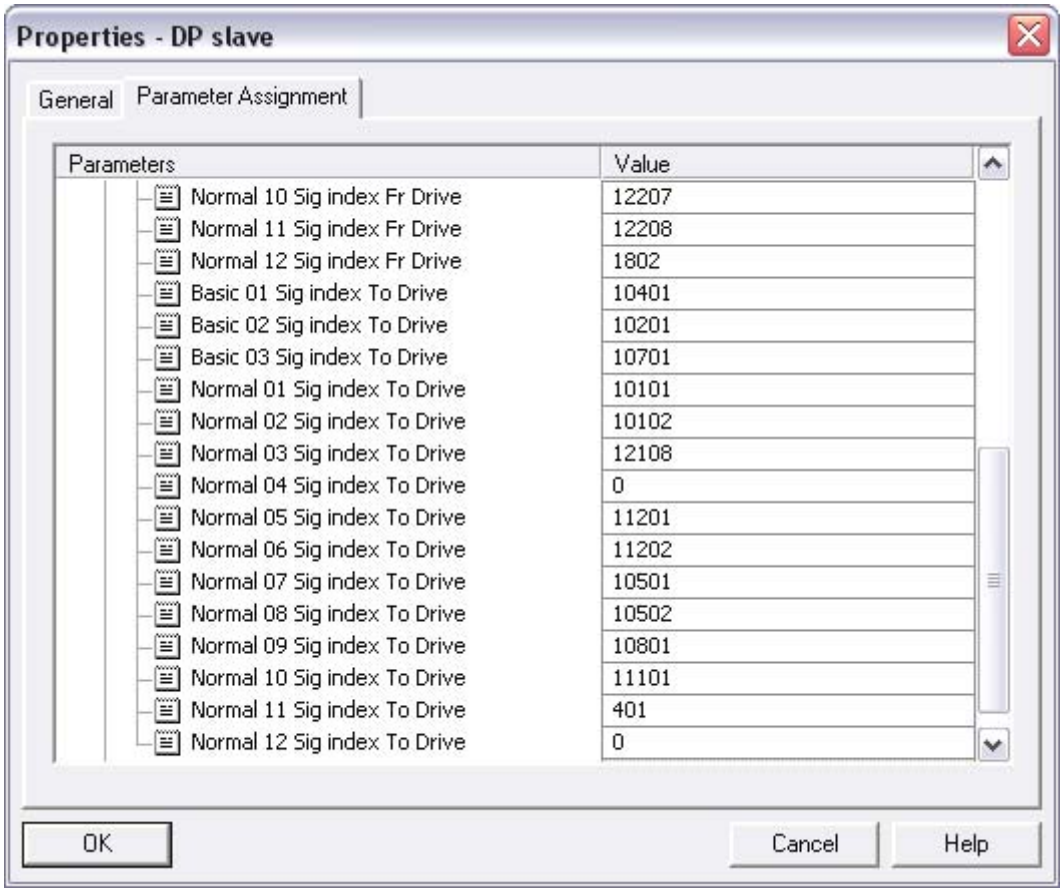
2.7 Profibus configuration and example of Parameter settings

Install the GSD file PE1376PD.GSD.
Set Profibus addr to same address as on the Rotary switches on the PE1376B/PD adapter board.
Set the parameters specifying the ACV/DCV700 addresses and cycle time.
All 4 drives connected to one PE1376BPD must have the same setup of parameters.
Use the module IN/OUT 20 words 4 times, one for each ACV/DCV700 drive.
Configure always for 4 drives even if all are not used.



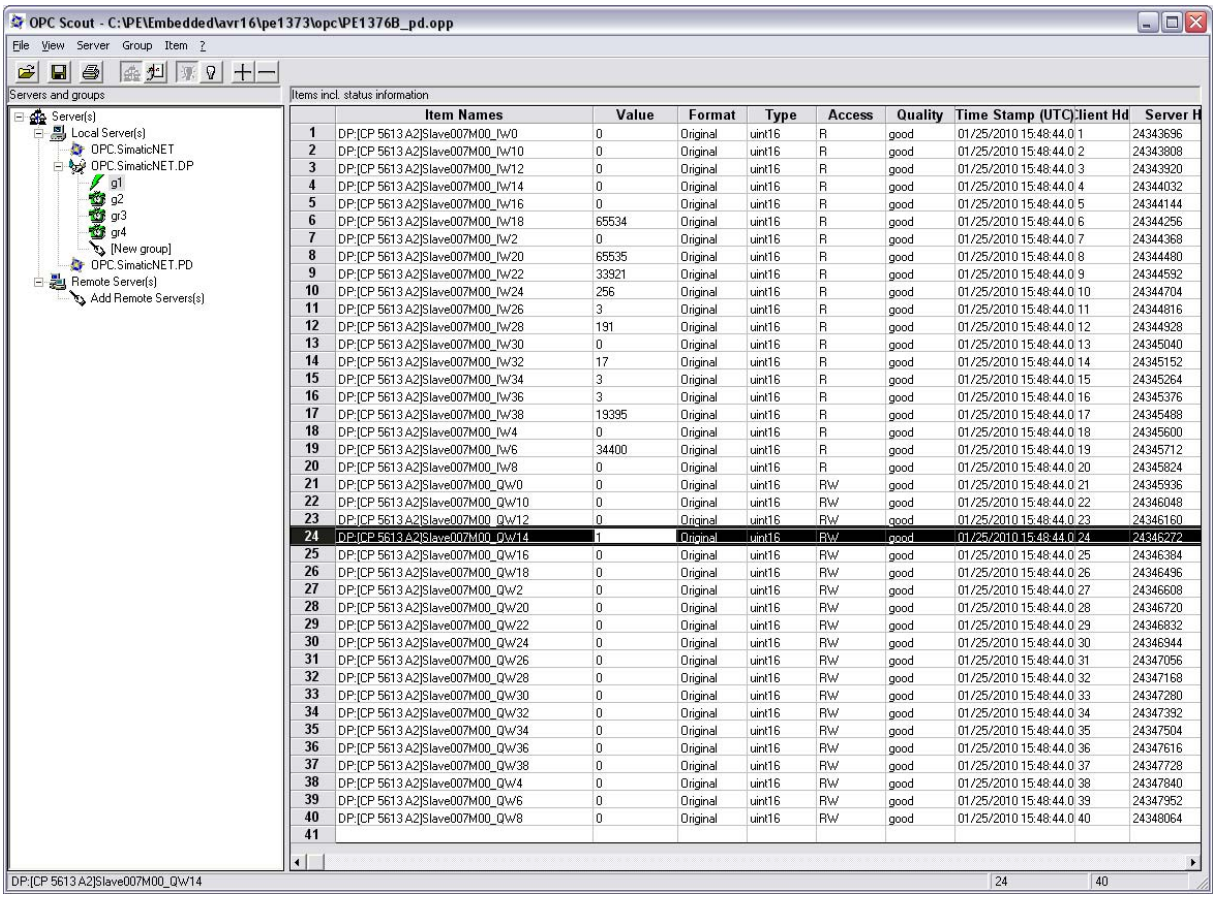
This is a default parameters for ACV700.





Profibus DP – Drive Link
Connect Profibus Master to ACV700/DCV700

QW28 must be set to 1 to Start communication to the ACV/DCV700 drive



	Item Names	Value	Format	Type	Access	Quality	Time Stamp (UTC)	Client Hd	Server H
1	DP:[CP 5613 A2]Slave007M00_IW0	0	Original	uint16	R	good	01/25/2010 15:48:44.0	1	24343696
2	DP:[CP 5613 A2]Slave007M00_IW10	0	Original	uint16	R	good	01/25/2010 15:48:44.0	2	24343808
3	DP:[CP 5613 A2]Slave007M00_IW12	0	Original	uint16	R	good	01/25/2010 15:48:44.0	3	24343920
4	DP:[CP 5613 A2]Slave007M00_IW14	0	Original	uint16	R	good	01/25/2010 15:48:44.0	4	24344032
5	DP:[CP 5613 A2]Slave007M00_IW16	0	Original	uint16	R	good	01/25/2010 15:48:44.0	5	24344144
6	DP:[CP 5613 A2]Slave007M00_IW18	65534	Original	uint16	R	good	01/25/2010 15:48:44.0	6	24344256
7	DP:[CP 5613 A2]Slave007M00_IW2	0	Original	uint16	R	good	01/25/2010 15:48:44.0	7	24344368
8	DP:[CP 5613 A2]Slave007M00_IW20	65535	Original	uint16	R	good	01/25/2010 15:48:44.0	8	24344480
9	DP:[CP 5613 A2]Slave007M00_IW22	33921	Original	uint16	R	good	01/25/2010 15:48:44.0	9	24344592
10	DP:[CP 5613 A2]Slave007M00_IW24	256	Original	uint16	R	good	01/25/2010 15:48:44.0	10	24344704
11	DP:[CP 5613 A2]Slave007M00_IW26	3	Original	uint16	R	good	01/25/2010 15:48:44.0	11	24344816
12	DP:[CP 5613 A2]Slave007M00_IW28	191	Original	uint16	R	good	01/25/2010 15:48:44.0	12	24344928
13	DP:[CP 5613 A2]Slave007M00_IW30	0	Original	uint16	R	good	01/25/2010 15:48:44.0	13	24345040
14	DP:[CP 5613 A2]Slave007M00_IW32	17	Original	uint16	R	good	01/25/2010 15:48:44.0	14	24345152
15	DP:[CP 5613 A2]Slave007M00_IW34	3	Original	uint16	R	good	01/25/2010 15:48:44.0	15	24345264
16	DP:[CP 5613 A2]Slave007M00_IW36	3	Original	uint16	R	good	01/25/2010 15:48:44.0	16	24345376
17	DP:[CP 5613 A2]Slave007M00_IW38	19395	Original	uint16	R	good	01/25/2010 15:48:44.0	17	24345488
18	DP:[CP 5613 A2]Slave007M00_IW4	0	Original	uint16	R	good	01/25/2010 15:48:44.0	18	24345600
19	DP:[CP 5613 A2]Slave007M00_IW6	34400	Original	uint16	R	good	01/25/2010 15:48:44.0	19	24345712
20	DP:[CP 5613 A2]Slave007M00_IW8	0	Original	uint16	R	good	01/25/2010 15:48:44.0	20	24345824
21	DP:[CP 5613 A2]Slave007M00_QW0	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	21	24345936
22	DP:[CP 5613 A2]Slave007M00_QW10	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	22	24346048
23	DP:[CP 5613 A2]Slave007M00_QW12	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	23	24346160
24	DP:[CP 5613 A2]Slave007M00_QW14	1	Original	uint16	RW	good	01/25/2010 15:48:44.0	24	24346272
25	DP:[CP 5613 A2]Slave007M00_QW16	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	25	24346384
26	DP:[CP 5613 A2]Slave007M00_QW18	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	26	24346496
27	DP:[CP 5613 A2]Slave007M00_QW2	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	27	24346608
28	DP:[CP 5613 A2]Slave007M00_QW20	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	28	24346720
29	DP:[CP 5613 A2]Slave007M00_QW22	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	29	24346832
30	DP:[CP 5613 A2]Slave007M00_QW24	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	30	24346944
31	DP:[CP 5613 A2]Slave007M00_QW26	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	31	24347056
32	DP:[CP 5613 A2]Slave007M00_QW28	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	32	24347168
33	DP:[CP 5613 A2]Slave007M00_QW30	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	33	24347280
34	DP:[CP 5613 A2]Slave007M00_QW32	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	34	24347392
35	DP:[CP 5613 A2]Slave007M00_QW34	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	35	24347504
36	DP:[CP 5613 A2]Slave007M00_QW36	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	36	24347616
37	DP:[CP 5613 A2]Slave007M00_QW38	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	37	24347728
38	DP:[CP 5613 A2]Slave007M00_QW4	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	38	24347840
39	DP:[CP 5613 A2]Slave007M00_QW6	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	39	24347952
40	DP:[CP 5613 A2]Slave007M00_QW8	0	Original	uint16	RW	good	01/25/2010 15:48:44.0	40	24348064
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Profibus DP – Drive Link
Connect Profibus Master to ACV700/DCV700

Parameter	Param. value ACV700	Description ACV700
1. MFB Node select		NOT USED
2. Basic MSG scan ms	20	
3. Basic 01 signal Index from Drive	10311	SPEED_REF3 (Speed reference 3)
4. Basic 02 signal Index from Drive	10405	SPEED_ACT (Actual speed)
5. Basic 03 signal Index from Drive	10706	TORQUE_ACT (Actual torque)
6. Normal MSG1 scan ms	100	
7. Normal 01 signal Index from Drive	10104	SPEED_REF (Speed reference)
8. Normal 02 signal Index from Drive	10305	TORQ_REF4 (Torque reference 4)
9. Normal 03 signal Index from Drive	11806	UC_ACT (DC Voltage(relat.))
10. Normal 04 signal Index from Drive	11804	I_ACT_FILT_A (Filt. abs total curr)
11. Normal MSG2 scan ms	200	
12. Normal 05 signal Index from Drive	10409	---
13. Normal 06 signal Index from Drive	11811	ITOT_ACT (Toal current (rel))
14. Normal 07 signal Index from Drive	10503	POS_COUNT_LOW (Position count. LW)
15. Normal 08 signal Index from Drive	10504	POS_COUNT_HIGH (Position count.HW)
16. Normal 09 signal Index from Drive	12210	FAULT_STAT1 (Combined fault stat1)
17. Normal 10 signal Index from Drive	12211	FAULT_STAT2 (Combined fault stat2)
18. Normal 11 signal Index from Drive	12212	ALARM_STAT1 (Combined alarm stat1)
19. Normal 12 signal Index from Drive	0	NOT USED
20. Basic 01 signal Index to Drive	10101	MAIN_CONTOL_WORD (Main control word)
21. Basic 02 signal Index to Drive	10401	SPEED_REF (Speed reference)
22. Basic 03 signal Index to Drive	10705	LOAD_COMPENSATION (Addit.torque refer)
23. Normal 01 signal Index to Drive	10201	VAR_SLOPE_RATE (Variable slope rate)
24. Normal 02 signal Index to Drive	10702	TORQUE_REF_B (Torque reference B)
25. Normal 03 signal Index to Drive	10501	POS_COUNT_INIT_LOW (Initial value low)
26. Normal 04 signal Index to Drive	10502	POS_COUNT_INIT_HIGH (Initial value high)
27. Normal 05 signal Index to Drive	10102	AUX_CONTROL_WORD (Aux contr. word)
28. Normal 06 signal Index to Drive	408	WINDOW_WIDTH (Width of the window)
29. Normal 07 signal Index to Drive	1201	TORQMAX (Positive torque limit)
30. Normal 08 signal Index to Drive	10803	FLUX_ACT_FILT (Actual flux)
31. Normal 09 signal Index to Drive	1313	-
32. Normal 10 signal Index to Drive	12108	-
33. Normal 11 signal Index to Drive	10501	-
34. Normal 12 signal Index to Drive	0	NOT USED

10101 MAIN_CONTROL_WORD

BIT	**Name**	**Description ACV700**
0	DC_ON	LOAD DC-circuit
1	FLUX_ON	Load the chopper and gen a flux to motor
2	RUN	Run the drive with selected reference
3	RESET	Acknowledge a fault indication
4	EN_SPEED_IN_LIMIT	Enable limit indications
5	SYNCH_CMND	Synchronisation command
6	SYNCH_DISABLE	Syncronisation is disabled
7	RESET_SYNCH_READY	Reset synch. Ready
8	STOP_POS_CNTR	Stop pos control counting
9	TRIGG_LOG	Ext. trig for loggers
10	WINDOW_CONTROL	Window function is enabled
11	RAMP	Ramp function is used
12	FORCE_SP_CNTR	Speed controller outp. Is forced
13	DIG_OUT1	Set dig output 1
14	DIG_OUT2	Set dig output 2
15	DIG_OUT3	Set dig output 3

2.8 Service program for commissioning and fault tracing

Install the PE1376DP.MSI file on a PC with a Serial COM port.
Connect PC comx to PE1376B/PD Service RS232 port with a 9 pole DSUB standard modem cable (straight cable connection 1-2,2-2…..)
You will need to remove the cover of the PE1376B/PD

Start the program and Select COM port number and then Click on “Click for Start Comm.
Select the ACV/DCV700 nr1-4 you like to watch.
Set moust pointer over the field you like to know more about.

This example shows values from/to Drive addr 2 (DCV700)