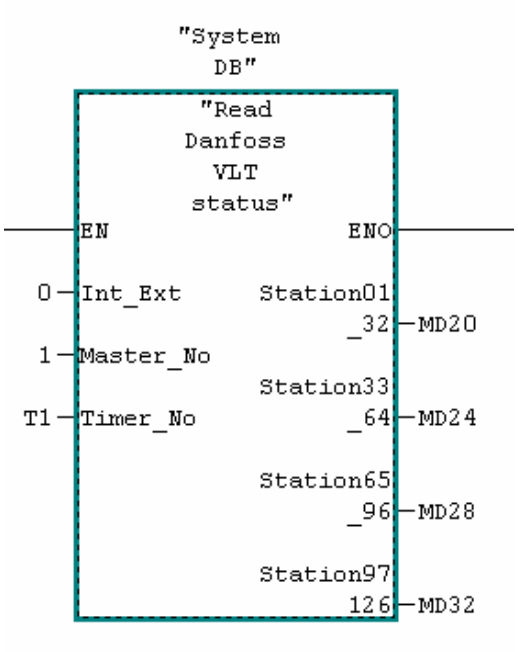
Description on FB1 Read Danfoss VLT status

This Function block reads the actual status of the configured slaves on a Profibus master system. If a VLT frequency converter has no power supply connected and therefore also not active on the Profibus system the VLT frequency converter station address will be read as logical 0. When power is supplied to the VLT frequency converter and the master starts to exchange data with the VLT frequency converter the station address will be read as logical 1.
This Function Block can be used in conjunction with FB2 "Danfoss VLT PCA block" to start a parameter download after the power supply is applied to the VLT frequency converter. See a application example in the Step 7 project "PCA blocks".
SFC 51 "RDSYSST" will only read the list of active slaves that are configured in the Hardware configuration. Note that slaves that are not configured in the Hardware configuration will not be shown.
This Function Block can be used on all Danfoss Drives frequency converters.



INPUTS

Int_Ext (Integer):
0 means that Profibus DP master is integrated in the PLC.
1 that Profibus DP master is not integrated in the PLC, but it is an external master.

Master_No (Integer):
The Profibus master system number. See Hardware configuration.

Timer_No (S7 Timer):
Assign a S7 timer.

OUTPUTS

---

1 means that the configure slave is active on the specific address.
0 means no slave is active on the specific address.

Station01_32 (Double word): Reads the actual slaves from address 1 to 32
Station33_64 (Double word): Reads the actual slaves from address 33 to 64
Station65_96 (Double word): Reads the actual slaves from address 65 to 96
Station97_127 (Double word): Reads the actual slaves from address 97 to 127

Example of slave allocations:

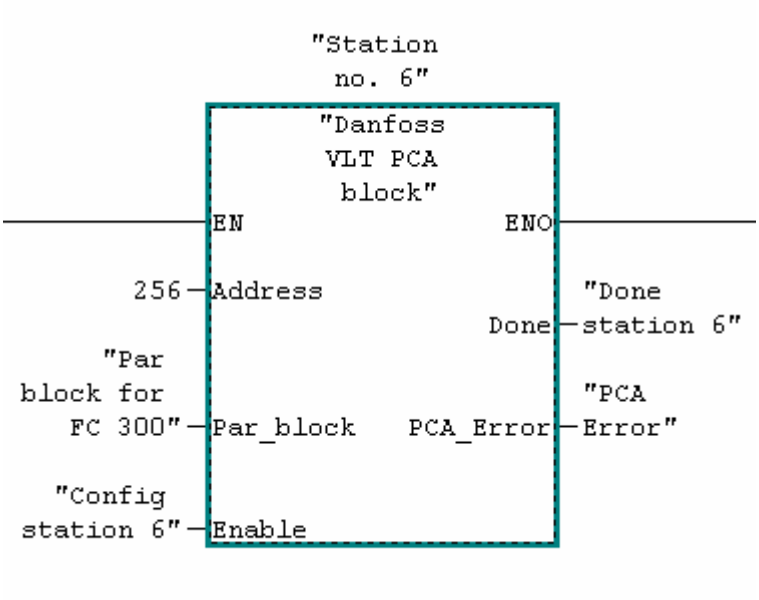
MB 20	M20.7	M20.6	M20.5	M20.4	M20.3	M20.2	M20.1	M20.0
Slave number	8	7	6	5	4	3	2	0

MB 21	M21.7	M21.6	M21.5	M21.4	M21.3	M21.2	M21.1	M21.0
Slave number	16	15	14	13	12	11	10	9

Slave number 6 will in this example be mapped to M20.5 and slave 12 to MB21.3.

Description on FB2 Danfoss VLT PCA block

FB2 "Danfoss VLT PCA block" can be used to read or write to a Danfoss VLT frequency converter via the parameter channel of Profibus. To use this Function Block a PPO type which contain the parameter channel should be used, i.e. use PPO type 1, type 2 or type 5.
SFC 14 "DPRD_DAT" and SFC 15 "DPWR_DAT" is used in FB2 "Danfoss VLT PCA block".



INPUTS

Address (Integer):
The peripheral start address for the VLT frequency converter. The address is specified in Hardware configuration.

Par_block (Block_DB):
The database block that contains which parameters that should be read or written to. See the structure on next page.

Enable (Bool):
A rising edge on Enable will start the parameter block. A rising edge will also reset a fault in the Function Block.

OUTPUTS

Done (Bool):
This output is set high when all parameter in the specified data block has been written to the VLT frequency converter once.

PCA_Error:
There was an error in the parameter interface to a parameter and the read or write is stopped. A new rising edge on Enable will reset the PCA error output.

Data blocks to FB2 Danfoss VLT PCA block

In the S7 project "PCA blocks" a User Define Data type (UDT1 "PCA Channel") is available for easy creating a new parameter in a data block.

UDT1 "PCA Channel"

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	PCA	INT	0	Parameter number in decimal
+2.0	Index	WORD	W#16#0	Index and RC in Hex numbers.
+4.0	PVA_High	WORD	W#16#0	Parameter value high in Hex
+6.0	PVA_Low	WORD	W#16#0	Parameter value low in Hex
=8.0		END_STRUCT		

PCA (Integer): Type in the parameter number in decimal. A 0 in the PCA will end the data block and the output "Done" is set high. If the input Enable is constant high it will start from the beginning of the data block again.

Index (Word): First byte in index field specifies the index number of parameters that have the structure of indexes/arrays. Next byte in the Index specifies the request number from the below table:

Request	Function
0	No request
1	Read parameter value
2	Change parameter value (word)
3	Change parameter value (double word)
6	Read parameter value (index)
7	Change parameter value array (word)
8	Change parameter value array (double word)

PVA_High: Here the parameter value high is placed in Hexadecimal.
PVA_Low: Here the parameter value Low is placed in Hexadecimal.

In this example parameter 518 is read and the actual value is placed in Parameter1.PVA_High and Parameter1.PVA_Low:

2.0	Parameter1.PCA	INT	0	518
4.0	Parameter1.Index	WORD	W#16#0	W#16#1
6.0	Parameter1.PVA_High	WORD	W#16#0	W#16#0
8.0	Parameter1.PVA_Low	WORD	W#16#0	W#16#0

In this example Index 3 of parameter 615 is read and the actual value is placed in Parameter1.PVA_High and Parameter1.PVA_Low:

34.0	Parameter5.PCA	INT	0	615
36.0	Parameter5.Index	WORD	W#16#0	W#16#301
38.0	Parameter5.PVA_High	WORD	W#16#0	W#16#0
40.0	Parameter5.PVA_Low	WORD	W#16#0	W#16#0

In this example 190 Hex (400) is written to parameter 120. The Request is 3, because parameter 120 has the data type 7 (unsigned integer) in FC 302:

10.0	Parameter2.PCA	INT	0	120
12.0	Parameter2.Index	WORD	W#16#0	W#16#3
14.0	Parameter2.PVA_High	WORD	W#16#0	W#16#0
16.0	Parameter2.PVA_Low	WORD	W#16#0	W#16#190

In this example 3E8 Hex (1000) is written to index 1 in parameter 310:

66.0	Parameter9.PCA	INT	0	310
68.0	Parameter9.Index	WORD	W#16#0	W#16#107
70.0	Parameter9.PVA_High	WORD	W#16#0	W#16#0
72.0	Parameter9.PVA_Low	WORD	W#16#0	W#16#3E8

Create a new data block and insert the UDT1 "PCA Channel". Notice that the data block need to have the same structure as shown below, i.e. address 0.0 should be marked as Reserved with the data type Word and with the initial value of W#16#0.
The first parameter starts at address 2.0.

Address	Name	Type	Initial value
0.0		STRUCT	
+0.0	Reserved	WORD	W#16#0
+2.0	Parameter1	"PCA channel"	
+10.0	Parameter2	"PCA channel"	
+18.0	Parameter3	"PCA channel"	
+26.0	Parameter4	"PCA channel"	
+34.0	Parameter5	"PCA channel"	
+42.0	Parameter6	"PCA channel"	
+50.0	Parameter7	"PCA channel"	
+58.0	Parameter8	"PCA channel"	
+66.0	Parameter9	"PCA channel"	
+74.0	Parameter10	"PCA channel"	
+82.0	Parameter11	"PCA channel"	
+90.0	Parameter12	"PCA channel"	
+98.0	Parameter13	"PCA channel"	
+106.0	Parameter14	"PCA channel"	
+114.0	Parameter15	"PCA channel"	
+122.0	Parameter16	"PCA channel"	
+130.0	Parameter17	"PCA channel"	

Open the data block in Data View (Ctrl+4) and specify the parameters and read or write commands.

Address	Name	Type	Initial value	Actual value
0.0	Reserved	WORD	W#16#0	W#16#0
2.0	Parameter1.PCA	INT	0	1
4.0	Parameter1.Index	WORD	W#16#0	W#16#2
6.0	Parameter1.PVA_High	WORD	W#16#0	W#16#0
8.0	Parameter1.PVA_Low	WORD	W#16#0	W#16#0
10.0	Parameter2.PCA	INT	0	120
12.0	Parameter2.Index	WORD	W#16#0	W#16#3
14.0	Parameter2.PVA_High	WORD	W#16#0	W#16#0
16.0	Parameter2.PVA_Low	WORD	W#16#0	W#16#190
18.0	Parameter3.PCA	INT	0	122
20.0	Parameter3.Index	WORD	W#16#0	W#16#2
22.0	Parameter3.PVA_High	WORD	W#16#0	W#16#0
24.0	Parameter3.PVA_Low	WORD	W#16#0	W#16#19F
26.0	Parameter4.PCA	INT	0	123
28.0	Parameter4.Index	WORD	W#16#0	W#16#2
30.0	Parameter4.PVA_High	WORD	W#16#0	W#16#0
32.0	Parameter4.PVA_Low	WORD	W#16#0	W#16#32
34.0	Parameter5.PCA	INT	0	0
36.0	Parameter5.Index	WORD	W#16#0	W#16#0
38.0	Parameter5.PVA_High	WORD	W#16#0	W#16#0

In this example the PLC master will start to write a 0 for English to parameter number 001 Language. When the VLT frequency converter has confirm this change it will write the next parameter; here 120.
The parameter list stops at DB address 34.0 as the PCA is set to 0.

See application example in the Step 7 project “PCA blocks”.