Profibus DP V1

About this Document

This document describes the features supported of the Profibus DP V1 functions in all Danfoss Drives with a Profibus option.The functionality is described at a level, which will be sufficient for most system configuration and managing activities.

Beside the drive behavior, a brief description of master applications of master class 1 and master class 2 can be found.

For full system overview, please refer to the following documents:

- Operating Manual for FCM300 (ordering no. MG03BXYY), FCD300 (ordering no.MG04BXYY), VLT2800 (ordering no. MG28AXYY)
- Profibus Manual for FCM300, FCD300, VLT2800 (ordering no. MG90AXYY)

where *X* is referring to the version number code and *YY* the language code.

For non-Danfoss equipment, please refer to the appropriate specifications.

For further detailed description of this matter, the following documents might be useful:

- Technical Guide “PROFIBUS – DP Extensions to EN 50170 (DPV1)” V2.0, April 1998, Order no. 2.082
- Draft PROFIBUS Profile PROFIdrive Profile Drive Technology V3.0 September 2000, Order no. 3.172

Even if you are an experienced Profibus system builder, we suggest you to read this Guide in its entirety before you start programming, since important information can be found in all chapters.

Assumptions

This guide assumes, that you are using a Danfoss frequency converter with Profibus DP V1 functionality. It is also assumed, that you as a master are using a PLC and/or PC equipped with a Communication card supporting all the Profibus communication services required by your application.

It is assumed, that the following Specifications / limitations are fully respected:

- Profibus DP specifications.
- Profidrive Profile V 2 specifications.
- Profidrive Profile V3 specifications concerning the DP V1 Profidrive parameter channel.
- Limitations in DP V1 features supported

What you should already know

The Danfoss Profibus is designed to communicate with any master abiding by the Profibus DP standard.

It is therefore assumed, that you have full knowledge of the PC or PLC you intend to use as a master in your system. Any questions pertaining non-Danfoss hardware or software products is beyond the scope of this manual, and is no concern to Danfoss.

If you have questions about how to set up Master – Master connection or communication to non-Danfoss slaves, the appropriate manuals should be consulted.

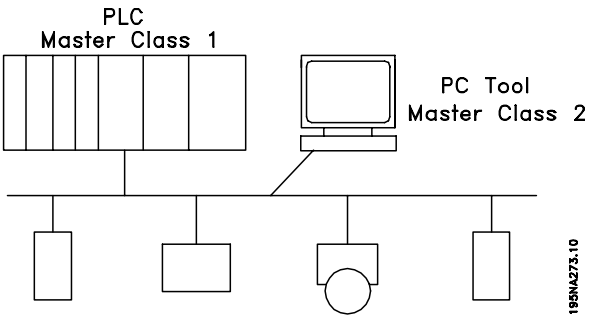
Software versions

The following table shows from which software versions Profibus DPV1 is supported. The software version can be read-out in parameter 624 *Software versions.*

Unit	Software version
FCD 300	Ver. 1.30 / 2.00
VLT 2800	Ver. 2.62 / 2.00
VLT 5000	Ver. 3.61 / 4.00

Profibus DPV1 introduction

The Profibus DP extension DPV1 offers additional to the cyclical data communication of DP V0, an a-cyclical communication. This feature is possible by a DP master class1 (e.g. PLC) , as well as a DP master class 2 (e.g. PC Tool).



Cyclical communication means that data transfer takes place all the time with a certain update rate. This is the known DP V0 function normally used for quick update of I/O Process Data.
A-cyclical communication means a one time event, mainly used for Read / Write on parameters from Process controllers, PC based tools or monitoring systems.

Features of a Master class 1 system:

- Cyclical data exchange (DP V0).
- A-cyclical read/write on parameters.

The a-cyclical connection is fixed , and can not be changed during operation.

In general a master class 1 is used as Process controller, responsible for commands, speed reference, status of the application etc (PLC or PC based controller.)

The MC 1 a-cyclical connection might be used for general parameter access in the slaves.

Features of a Master class 2 system:

- Initiate / Abort a-cyclical connection.
- A-cyclical read/write on parameters.

The a-cyclical connection can dynamically be established (Initiate) or removed (Abort) even though a master class 1 is active on the network.

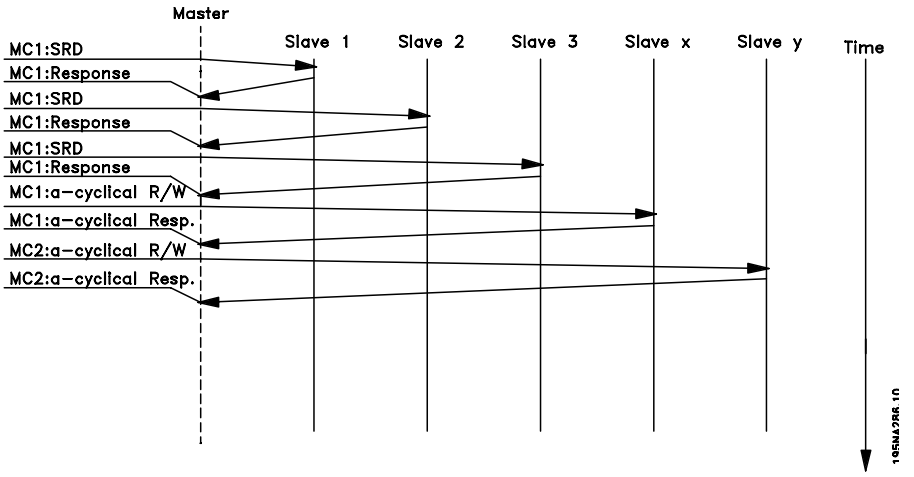
The MC 2 a-cyclical connection is typically used for configuration or commissioning tools for easy access to each parameter in any slave in the system.

The frequency converter supports a subset of the V1 specifications shown in the table below.

Type of Danfoss Frequency converter	Master type	Read (read data) from slave)	Write (read data) to slave)	Data transport (read and write data)	Initiate (open a connection)	Abort (close a connection)	Alarm
FCD 300, VLT2800	MC 1	OK	OK	-	-	-	-
FCM 300	MC 2	OK	OK	-	OK	OK	-
VLT5000, VLT6000	MC 1	OK	OK	-	-	-	-
VLT8000 AQUA	MC 2	OK	OK	OK	OK	OK	-

Principle of data exchange by Profibus DPV1

In a DP cycle the MC 1 will first update the cyclical process data for all slaves in the system. After that the MC 1 has the possibility of sending one a-cyclical message to one slave. If a MC 2 is connected, the MC 1 will handle over the Token to MC 2 who now is aloud to send one a-cyclical message to one slave. After that, the token is handled back to the MC 1, and a new DP cycle is started



MC : Master Class
C1...Cn: Cyclical data
AC1: Acyclical data Master Class 1
AC2: Acyclical data Master Class 2

Profibus telegram

A DP V1 Read/Write service takes place via a Profibus SD2 telegram, which is a telegram of variable length as shown on the figure below.

DP telegram:

SD	LE	LEr	SD	DA	SA	FC	DSAP	SSAP	DU	FCS	ED
68H	x	X	68H	xx	xx	x	xx	xx	x...	xx	16H

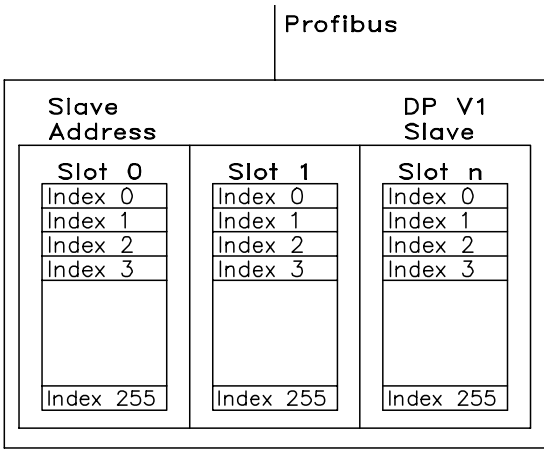
SD	Start Delimiter
LE	Length
Ler	Length repeat
DA	Destination Address
SA	Source Address
FC	Function Code
DSAP	Destination Service Access Point
SSAP	Source Service Access Point
DU	Data Unit for DP services
FCS	Frame Checking Sequence
ED	End Delimiter

Profibus DP services is activated via specific Service Access Point's (SAP). For a-cyclical communication, the following SAP are specified:

Master SAP	Slave SAP	Meaning
50 (32H)	49 (31H)	Master Class 2: Initiate request
50 (32H)	0..48 (0..30H)	Master Class 2: Abort, Read, Write, Data transfer
51 (33H)	50, 51 (32H, 33H)	Master Class 1: Alarm
51 (33H)	51	Master Class 1: Read, Write

■ Addressing scheme for DP V1

The structure of a DP V1 slave is shown in the figure.
A DP V1 slave consists of a number of physical or virtual slots. Slot 0 is always present, and represents the basic unit.
Each slot can contain until 255 data blocks addressed by an index and of until 255 byte length.
The master must address a variable in the DP V1 slave as follows:
/Slave address/Module #/Index #



■ Accessing VLT parameters on DP V1

This section describes how DP V1 can be used for accessing VLT parameters.

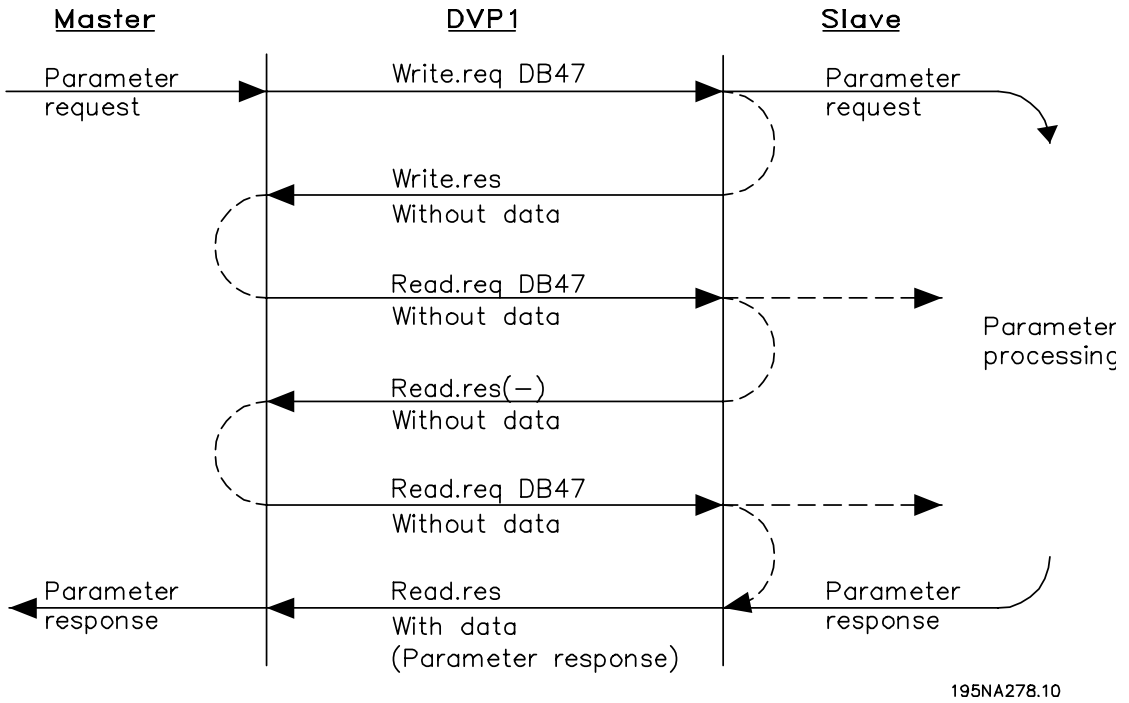
A Danfoss DP V1 slave only contains Slot 0.
Because of the complex parameter structure of drives, a specific procedure for accessing parameters for drives is defined. This is named the "Profidrive Parameter Channel", and is part of the Profidrive Profile V3 specifications.

According to this, parameter access must be made trough one single DP V1 object with the following address:

Slot = 0.
Index = 47.

DP V1 Read/write request sequence

A Read or Write service on a VLT parameter will take place as described in the table below.



A Read or Write on a VLT parameter must be initiated by a DP V1 write service on index 47 (DB 47). If this Write request is valid, a positive write response without data is returned from the VLT immediately. If not, a negative write response is returned from the VLT. The table on page 12 shows the possible DP V1 response status codes.

The VLT will now interpret the “Profidrive parameter channel” part of the Data Unit, and start to perform this command internal in the VLT.
As the next step, the master will send a Read request. If the VLT is still busy of performing the internal parameter request, a negative response without data is returned from the VLT.

This request will be repeated by the master, until the VLT has the response data ready for the VLT parameter request.

The example shown in section “Example of DP V1 Read Parameter Service“, shows the details of the telegrams needed for the DP V1 Read / Write service.

■ Description of DP V1 Read / Write Telegram

The Read / Write telegram has the following principle structure.

Profibus Telegram Header				Data Unit						Profibus Telegram trailer	
				DP V1 Command/response				Profidrive V3 Parameter Channel			
				DU 0	DU 1	DU 2	DU 3	Req. / Res. Header	Data		

The DP V1 command/response part is used for the standard DP V1 read/Write on the Slot 0, Index 47 data block.
The Profidrive V 3 Parameter Channel is used for accessing the particular parameter data in the VLT.

In the following the DP V1 command/response handling is described.

■ Attributes of the DP V1 command / Response part (DU0 trough DU3)

The Names and functions of the attributes of the DP V1 command/response field (DU0 trough DU3) is described in the table below.

DU Byte #	Value	Meaning	Specified
0 : Function number	0x48	Idle REQ, RES	Profibus DP V1
	0x51	Data transport REQ, RES	
	0x56	Resource Manager REQ	
	0x57	Initiate REQ, RES	
	0x58	Abort REQ	
	0x5C	Alarm REQ, RES	
	0x5E	Read REQ, RES	
	0x5F	Write REQ, RES	
	0xD1	Data transport negative response	
	0xD7	Initiate negative response	
	0xDC	Alarm negative response	
	0xDE	Read negative response	
	0xDF	Write negative response	
1 : Slot #	Always zero	Slot number in slave	
2 : Index #	47	Index number in slot / slave	
3 : Data length	Xx	Data length of Profidrive data field	
4..n		User data	PNO Drive Profild V3.0

■ Write Service

For a DP V1 Write service, the DP V1 Command/ Response header must be filled out as shown in the table below.
The DU3 must contain the length of the data field of the Profidrive Parameter Channel

SD		DU 0	DU 1	DU 2	DU 3	DU 4..243	FCS	ED
68H	.....	fct. no 5FH	Slot no. 0	Index 47	Length of data field	Profidrive data	xx	16H

The response of a write service contains no additional data,. Only the DPV1 data DU 0..3 are set. The function number is equal to the request function number, if the response is positive. In case of an negative response, an error code is written in DU2.

Write positive response:

SD		DU 0	DU 1	DU 2	DU 3	FCS	ED
68H	.....	fct. no 5FH	Slot no. 0	Index 47	Length 0	xx	16H

Write negative response:

SD		DU 0	DU 1	DU 2	DU 3	FCS	ED
68H	.....	fct. no DFH	Error De-code 80H	Error Class/Code See next page	0	xx	16H

Read Service

For a DP V1 Read service, the DP V1 Command/ Response header must be filled out as shown in the table below.

SD		DU 0	DU 1	DU 2	DU 3	FCS	ED
68H	.....	fct. no 5EH	Slot no. 0	Index 47	0	xx	16H

Only the positive response of a read service contains additional data. In case of an negative response an error code is written in DU2.

Read positive response:

SD		DU 0	DU 1	DU 2	DU 3	DU 4..243	FCS	ED
68H	.....	fct. no 5EH	Slot no. 0	Index 47	Length data field	Profidrive data	xx	16H

Read negative response

SD		DU 0	DU 1	DU 2	DU 3	FCS	ED
68H	.....	fct. no DEH	Error De-code 80H	Error Class/Code See next page	0	xx	16H

DP V1 Class/Error codes

The table below shows the possible error Classes / codes For the DP V1 Read/write services.

The DU2 will contain the combination of Error Class and Error Code. As an example a “access error / invalid parameter” will be shown as : B8H

Error Class	Meaning	Error Code
10 (0x0A)	application	0: read error 1: write error 2: module failure 3 to 7 reserved 8: version conflict 9:feature not supported 10 to 15 user specific
11 (0x0B)	access	0: invalid index 1: write length error 2: invalid slot 3: type conflict 4: invalid area 5: state conflict 6: access denied 7: invalid range 8: invalid parameter 9: invalid type 10 to 15 user specific
12 (0x0C)	resource	0: read constrain conflict 1: write constrain conflict 2: resource busy 3: resource unavailable 4 to 7 reserved 10 to 15 user specific

■ Function of Profidrive parameter channel

The table below shows the structure of the Profidrive Parameter channel. By this it is possible to access the following VLT parameter values and attributes:

- Parameter values of simple variable, array and visible string.
- Parameter description elements such as type, Min./max. value etc.
- Describing text to parameter values.

Beside this it is possible to access multiple parameters in one telegram.

Profibus DP V1 telegram for Read/write on VLT parameter.

Profibus Telegram Header				Data Unit						Profibus Telegram trailer	
				DP V1 Command/response				Profidrive V3 Parameter Channel			
				DU 0	DU 1	DU 2	DU 3	Req. / Res. Header	Data		

The Profidrive Parameter Channel part of the Data Unit is responsible of accessing the particular parameter in the VLT

The table below shows the principle structure of the Profidrive Parameter Channel.

The DP V1 Parameter Request telegram consists of 3 blocks of data:

- A Request Header, which defines the kind of request (Read or Write), and the number of parameters to access. The Request Reference is set by the master, which uses this information to evaluate the response.
- An address field, where all addressing attributes of the desired parameters are defined.
- A Data field, where all parameter data values are placed

DP V1 Parameter Request Byte

Request Header	Request Reference	ID	0 / 1
	Axis	No. of Parameter	2 / 3
1st Parameter Address	Attribute	No. of Elements	4 / 5
	Parameter Number		6 / 7
	Subindex		8 / 9
-			
-			
nth Parameter Address			
…			
1st Parameter Value(s)	Format	No. of Values	
(only for change	Values		
parameter request)			
-			
nth Parameter Values			
…			

The DP V1 Parameter response telegram consists of 2 blocks of data:

- A response header which indicates if the request is performed without errors (Response ID), the number of parameters, and the Request Reference set by the master within the corresponding request telegram.
- A Data field, where the requested data are placed. If one or more internal requests has failed, an Error Code is placed instead of the data values.

DPV1 parameter response:

			Byte
Response Header	Request Reference mirrored	Response ID	0 / 1
	Axis mirrored	No. of Parameters	2 / 3
1st Parameter Value(s) (only for request "Request")	Format	No. of Values	4 /5
	Values or Error Values		6
	…		
-			
nth Parameter Values ...	…		

As the response telegram do not include parameter addressing information, the master must identify the structure of the respose data from the request telegram.

On page 30 various examples for Parameter access are shown.

■ Request / Response Attributes

The table contains an overview of the possible attributes of the Profidrive parameter channel.

Field	Datatype	Values		Remark
Request reference	Unsigned8	0x01..0xFF		
Request ID	Unsigned8	0x01 0x02	request par value change par value	Identifier for read or write request
Response ID	Unsigned8	0x01 0x02 0x81 0x82	request parameter(+) change parameter(+) request parameter(-) change parameter(-)	Identifier for the response
Axis	Unsigned8	0x00..0xFF	number (always 0)	
Number of Parameter	Unsigned8	0x01..0x25	Quantity 1..37	Limitation : DPV1-telegram length
Attribute	Unsigned8	0x10 0x20 0x30	value description text	Describing the kind of data.
Number of elements	Unsigned8	0x00 0x01..0x75	special function Quantity 1..117	Limitation : DPV1-telegram length
Parameter number	Unsigned16	0x0001... 0xFFFF	number 1..65535	VLT parameter number.
Subindex	Unsigned16	0x0000... 0xFFFF	number 0..65535	For pointing out array ,text and description elements
Format	Unsigned8	0x01..0x36 0x40 0x41 0x42 0x43 0x44	datatypes Null Byte Word doubleword error	
Number of values	Unsigned8	0x00..0xEA	Quantity 0..234	Limitation : DPV1-telegram length
Error Number	Unsigned16	0x0000... 0x00FF	Error number, see appendix	

In the following the attributes for the Request/ response headers are described.

Request Reference

Unique identification of request/response pair for the master. The master changes the request reference with each new request. The slave mirrors the request reference in the response.

Request ID

Two request identifications are defined:

- Request VLT parameter = 01H (read)
- Change VLT parameter = 02H (write)

A parameter change is in general stored in volatile memory. (RAM). Via parameter 971 the data can be stored in non volatile memory (EEPROM).

Response ID

Mirroring of the request ID with supplement information whether the request was executed positively(+) or negatively(-). If the response is negative, error codes are entered per partial response instead of values.

Axis

Always zero.

No. of Parameters

For multi parameter request specifying the number of the Parameter Address and/or Parameter Value areas. For single request the number is 1. The value range for multiple request is 1..37.

Attribute

The attribute determines which kind of data to access.
The VLT will respond on the attributes Value (10H) , Description (20H) and Text (30H)

Attribute Value (10H)
The attribute value allows to read or write parameter values.

Attribute Description (20H)
The attribute description allows to read parameter description.
It is possible to read out one single description element, or all elements for one parameter in one telegram.
The table below shows a overview of the existing Parameter Description which exists for each parameter in the VLT.

Parameter description elements (all elements are read-only) :

Subindex	Meaning	Data Type
1	Identifier ID	V2
2	Number of array elements or length of string	U16
3	Standardization factor	float
4	Variable attribute	Octetstring 2
5	reserved	Octetstring 4
6	Name	visiblestring 16
7	Lower limit	Integer 32 *
8	Upper limit	Integer 32 *
9	reserved	Octetstring 2
10	ID extension	V2
11	PZD reference parameter (not supported)	U16
12	PZD normalization (not supported)	V2
0	Complete description	Octetstring 46

* The actual format of Upper/Lower Limits is equal to the format of the actual parameter value, and can be determined by read of the Identifier ID and the Variable attribute of the actual parameter.

In the following each description element is described.

Identifier ID
Additional characteristic of a parameter.

Bit	Meaning
15	reserved
14	array
13	par value can be reset only
12	par has been changed from factory setting
11	reserved
10	additional text array available
9	parameter is read only
8	standardization factor and variable attribute not relevant
7..0	data type (see appendix)

Number of array elements
contains the amount of array elements, if the parameter is an array, the string length, if parameter value is a string or 0 if the parameter is none of both.

Standardization factor
This function is not supported. The value 0 is returned (Float format)

Variable attribute
Consists of 2 bytes, the first byte contains the variable index, the second the conversion index, refer to the section “Size Attributes”.

Name
contains the parameter name, limited to 16 characters, e.g. “LANGUAGE” for parameter 1. This text is available in the language selected in par 1.

Lower limit
contains the min value of the parameter. Format is equal to the format of the actual parameter.

Upper limit
contains the max value of the parameter. Format is equal to the format of the actual parameter.

ID extension
Not supported

PZD Reference parameter
not supported

Field PZD normalization
not supported

Complete description
this delivers back the complete parameter description with the fields 1..12 in order. Length = 46 byte.
For not supported elements, the value zero will be returned.

Attribute Text (30H)
For some VLT parameters a describing text to parameter value exists, which can be read out by this attribute. The availability of a text description for a parameter is indicated by a bit set in the Identifier (ID) Parameter Description element, which can be read out by the Description Attribute (20H) subindex = 1. If bit 10 is set, a describing text exists for each value of the parameter.

As an example parameter 01 (Language) has the setting values 0 trough 5. For each of these values a specific text exists: (0 = ENGLISH, 2 = DEUTSCH etc.).

Format
Format specify the type of each parameter (word, byte, etc.), see below

Values
If the values consist of an odd number of bytes, a zero byte is appended in order to secure the word structure of the telegrams.

In the case of a positive partial response, the parameter value contains the following:

- Format = (Data Type or Byte, Word, Double Word)
- Number of values
- the values

In the case of a negative partial response, the parameter value contains the following:

- Format = error (44H)
- No. of values = 1
- Value = error value = error number

Error Number for Drive Profile V3.0
By a invalid parameter request, the VLT will return the corresponding error code. The table below shows the possible error codes.

error numbers for DPV1 parameter requests

Error number	Meaning	Additional Info
0x00	unknown parameter	0
0x01	parameter is read-only	subindex
0x02	value out of range due to max/min value	subindex
0x03	wrong subindex	subindex
0x04	par is no array	0
0x05	wrong datatype (wrong data length)	0
0x06	it is not allowed to set this par (only reset)	subindex
0x07	descriptive element is read-only	subindex
0x09	no description available (only value)	0
0x0b	process control not possible	0
0x0f	no text array available (only value)	0
0x11	not possible in current state	0
0x14	value out of range due to drive state/configuration	subindex
0x15	reply too long (more than 240 bytes)	0
0x16	wrong parameter address (unknown or unsupported value for attribute, element, par number or subindex or illegal combination	0
0x17	illegal format (for writing)	0
0x18	value amount not consistent	0
0x65	wrong axis : action not possible with this axis	-
0x66	unknown service request	-
0x67	this service is not possible with multi parameter access	-
0x68	parameter value can not be read from bus	-

■ Profibus DPV1 on a Siemens S7 PLC

This chapter describes how to set up a Profibus DPV1 communication between a Danfoss VLT frequency converter and S7 315-2 DP PLC from Siemens. The Profibus DPV1 telegrams are in these examples handle by the S7 315-2 DP PLC. It is assumed that you are already familiar with the Simatic S7 system.

This chapter describes:

- Hardware configuration
- Function block FB 36 "PDAT_AC2"
- Single read and write commands
- Multiple parameter download
- Extented diagnose

NOTE!:
The examples do not describe all the functions needed for a real application, for example error handling.

Only the steps that are required in order to establish communication between the VLT frequency converter and the S7 PLC are shown.

Details of some of the components/software:

- FCD 300 with DPV1
- PLC S7-315-2 DP version 1.1
- S7 Manager version 5.1
- Siemens Drive ES Simatic

■ Hardware configuration

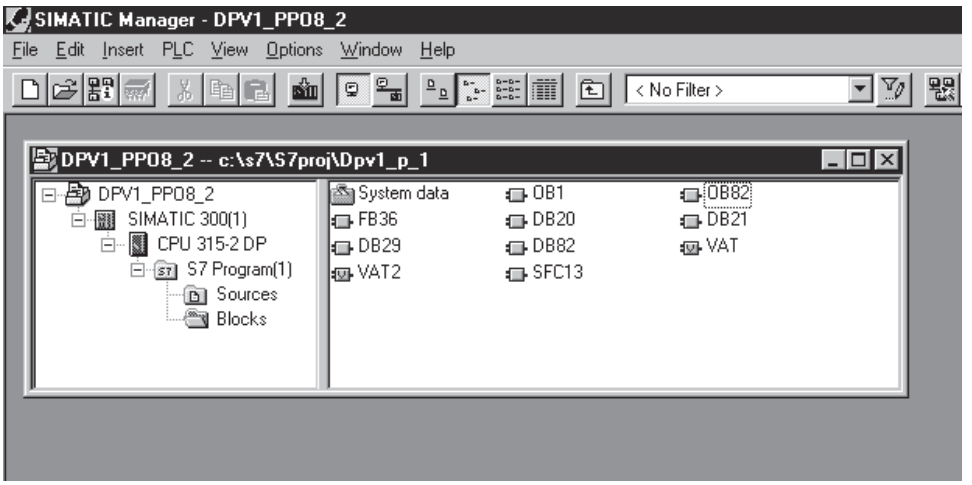
First step is to import a new GSD/GSE of FCD 300 into Siemens S7 Manager.

A GSD/GSE files of our VLT frequency converters must be installed to support DPV1. Please check your GSD/GSE in the list on page 36.

The GSD/GSE file can be ordered from your local Danfoss representative or it can be downloaded at www.danfossdrives.com.

Start a new project and click on Simatic 300 station. Now double click on Hardware.

In Hardware the Profibus DP network is configured.



OB1: Contains a call to FB 36 "PDAT_AC2"

OB 82: Is used to the extended diagnose. Contains SFC 13 "DPNRM_DG"

FB36: Pre-define Function block from Siemens which handle Profibus DPV1 telegrams.

DB20: Request (send) telegrams for DPV1.

DB21: Receive (response) telegrams for DPV1.

DB29: This data block is used together with FB 36, which handles the communication.

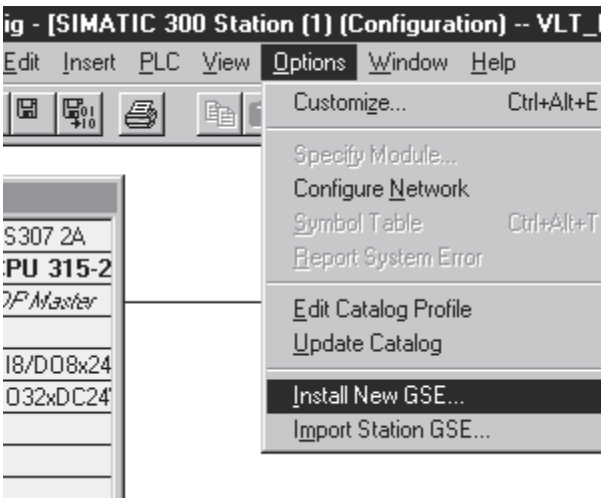
DB82: This data block is used together with OB 82 Extended diagnose.

VAT: Variable Table.

SFC13: A Special Function Call that is used to gether with extended diagnose.

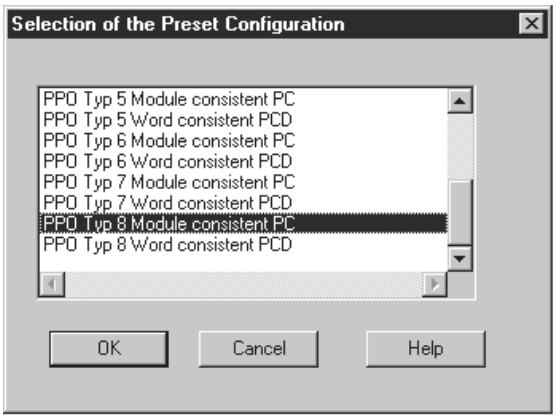
■ Step 1 Install GSD/GSE file

Go to *Option* and choose *Install New GSE* to read in the new GSD/GSE to the "Hardware Catalog".



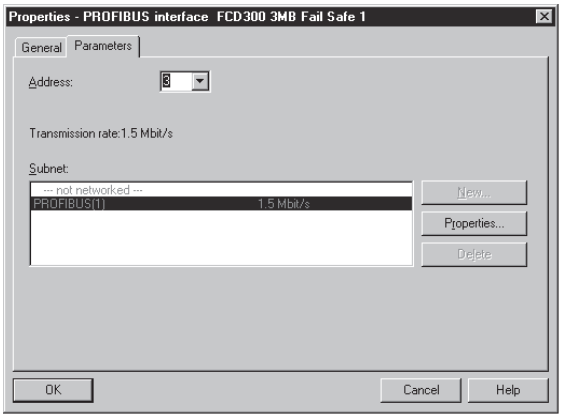
The "Hardware Catalog" must be updated before the new GSD/GSE file is active. Go to *Option* again and choose *Update Catalog.*
The new GSD/GSE file is now available in the "Hardware Catalog".

Drag and drop the FCD 300 from the "Hardware Catalog" to the Profibus network. Chose a PPO type and click on OK.

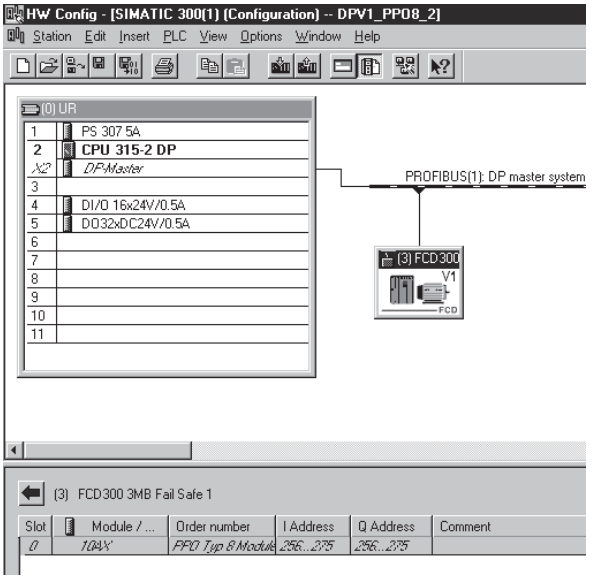


The selected PPO type can be seen in parameter *904 PPO type* after the Master have initialise the communication.
Module consistent data means that all the data exchange between the PLC and the Profibus master is transfer at one time (module consistent).
By Word consistent the data exchange between the PLC and Profibus master is consistent in words.
The first 4 words of PPO type 1, type 2 and type 5 consist of a PCA part (Parameter Characteristic) and this is always module consistent.

Next is the setting of the VLT frequency converter address. The choice here must correspond to the setting in VLT parameter *918 Station address*.
Note that a change in parameter *918 Station address* is first valid at next power up.



The FCD 300 can now be seen on the Profibus network.



Select an I/O address in your Simatic S7 PLC.
By double clicking the first module (4AX in the DP-Slave) in the Slave Station, you can either select the address in the Simatic S7 PLC or use the default addresses.
In this example we have chosen the start address to be 256 dec. and a PPO type 8 for communication with FCD 300.

Download the configuration to the PLC.

Function block FB 36 "PDAT_AC2"

FB 36 “PDAT_AC2” is a pre-define function block from Siemens that can handle the DPV1 communication. FB 36 “PDAT_AC2” uses a pre-define datablock DB29.
In this example FB 36 is placed in OB1.

LADDR is the address in the I/O area where the VLT frequency is mapped. In this example the address starts at 256 dec. (100 Hex).

START will trigger FB 36 and starts a DPV1 telegram.

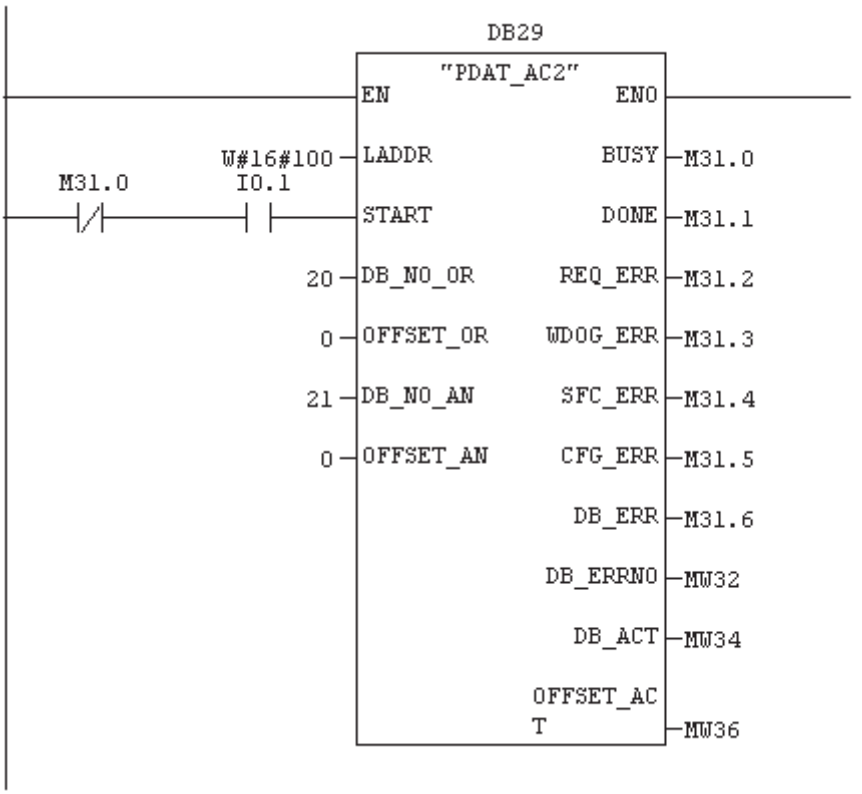
DB_NO_OR is the datablock for sending telegrams and DB_NO_AN is the response. In OFFSET_OR and OFFSET_AN a offset in the datablocks can be define.

In this example Datablock DB20.0 is the start of sending a telegram to the VLT frequency converter and Datablock DB21.0 is the where the response is. Please refer to S7 Manager to get a description on how a Datablock is made.

The BUSY bit indicates that a DPV1 telegram is active.

The DONE bit shows that the DPV1 communication is finished.

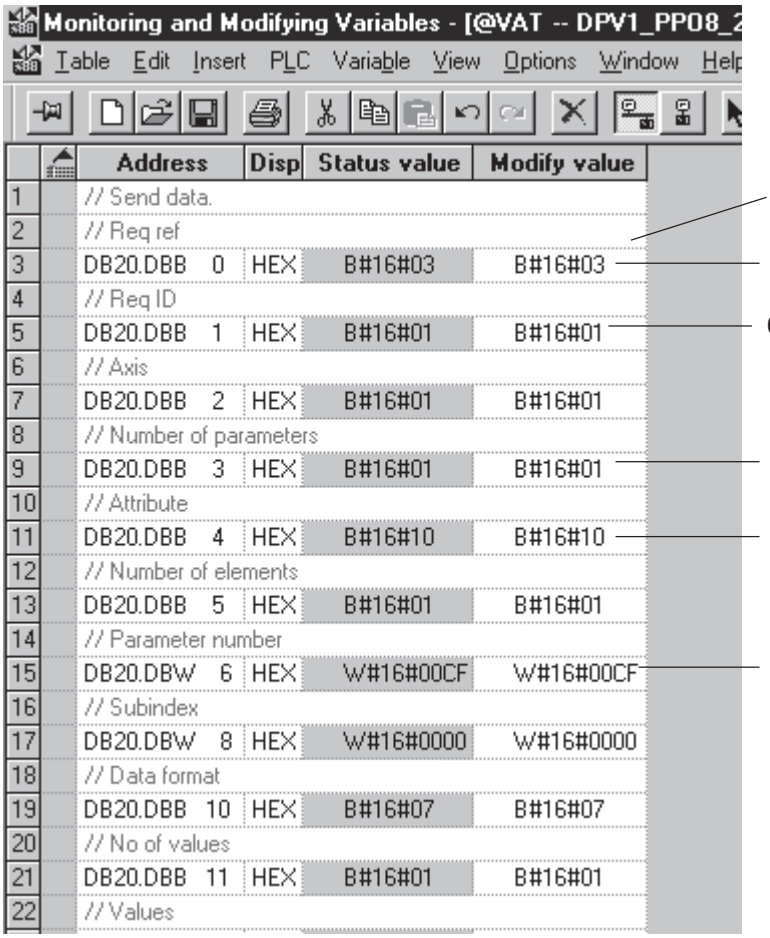
The rest of the bits are error bits if the communication was interrupted.

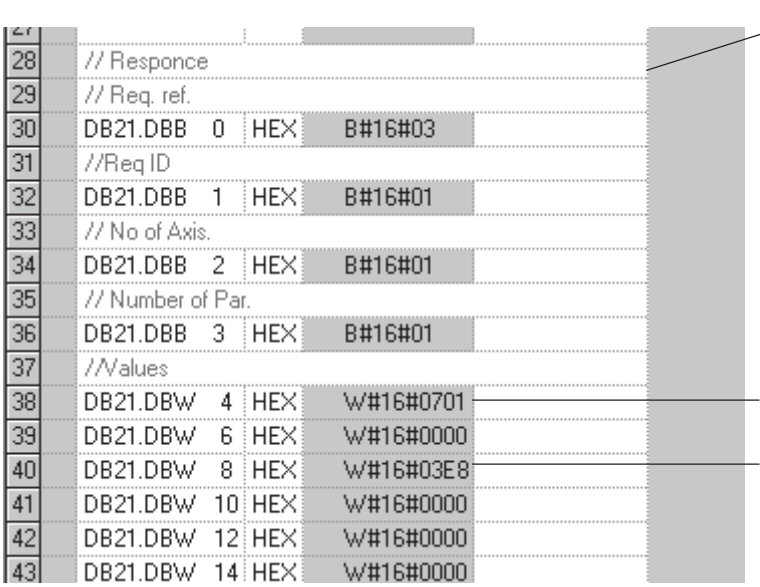


■ Single parameter read

This example shows a single parameter read command of parameter 207 *Ramp up time 1*. The ramp up time is 10.00 sec.

Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.

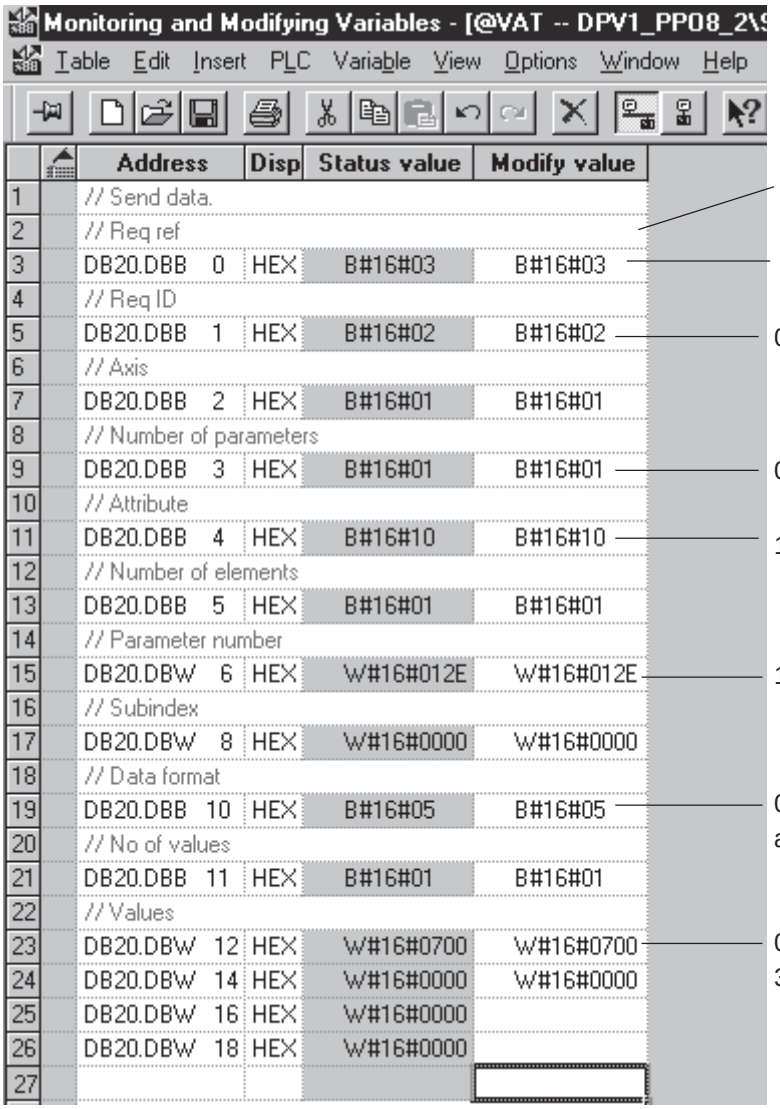




■ Single parameter write (Byte)

This example shows a single parameter write command to parameter 302 *Digital input 18*. The value of parameter 302 *Digital input 18* is set to *Start* [7].

Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.



	Address	Disp	Status value	Modify value
1	// Send data.			
2	// Req ref			
3	DB20.DBB 0	HEX	B#16#03	B#16#03
4	// Req ID			
5	DB20.DBB 1	HEX	B#16#02	B#16#02
6	// Axis			
7	DB20.DBB 2	HEX	B#16#01	B#16#01
8	// Number of parameters			
9	DB20.DBB 3	HEX	B#16#01	B#16#01
10	// Attribute			
11	DB20.DBB 4	HEX	B#16#10	B#16#10
12	// Number of elements			
13	DB20.DBB 5	HEX	B#16#01	B#16#01
14	// Parameter number			
15	DB20.DBW 6	HEX	W#16#012E	W#16#012E
16	// Subindex			
17	DB20.DBW 8	HEX	W#16#0000	W#16#0000
18	// Data format			
19	DB20.DBB 10	HEX	B#16#05	B#16#05
20	// No of values			
21	DB20.DBB 11	HEX	B#16#01	B#16#01
22	// Values			
23	DB20.DBW 12	HEX	W#16#0700	W#16#0700
24	DB20.DBW 14	HEX	W#16#0000	W#16#0000
25	DB20.DBW 16	HEX	W#16#0000	
26	DB20.DBW 18	HEX	W#16#0000	
27				

Request telegram

The request reference is handle by FB 36.

02 Hex for a write command

01 Hex for a single parameter

10 Hex for a Value

12E Hex for parameter 302

05 Hex as parameter 302 is a Unsigned 8

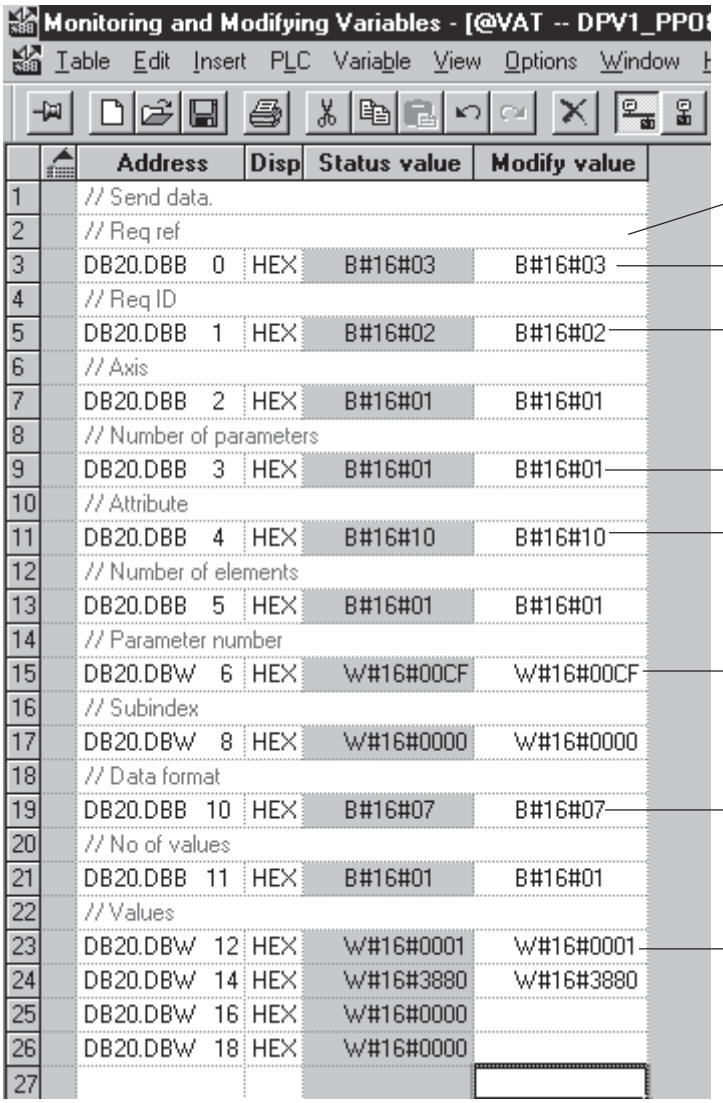
07 Hex is start [7] in parameter 302.

NOTE!:
Please note as this is a Unsigned 8 the value is align left.

■ Single parameter write (long word)

This example shows a single write command to parameter 207 *Ramp up time 1*. The value of parameter 207 is set to 800.00 sec.

Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.



		Address	Disp	Status value	Modify value
1		// Send data.			
2		// Req ref			
3		DB20.DBB 0	HEX	B#16#03	B#16#03
4		// Req ID			
5		DB20.DBB 1	HEX	B#16#02	B#16#02
6		// Axis			
7		DB20.DBB 2	HEX	B#16#01	B#16#01
8		// Number of parameters			
9		DB20.DBB 3	HEX	B#16#01	B#16#01
10		// Attribute			
11		DB20.DBB 4	HEX	B#16#10	B#16#10
12		// Number of elements			
13		DB20.DBB 5	HEX	B#16#01	B#16#01
14		// Parameter number			
15		DB20.DBW 6	HEX	W#16#00CF	W#16#00CF
16		// Subindex			
17		DB20.DBW 8	HEX	W#16#0000	W#16#0000
18		// Data format			
19		DB20.DBB 10	HEX	B#16#07	B#16#07
20		// No of values			
21		DB20.DBB 11	HEX	B#16#01	B#16#01
22		// Values			
23		DB20.DBW 12	HEX	W#16#0001	W#16#0001
24		DB20.DBW 14	HEX	W#16#3880	W#16#3880
25		DB20.DBW 16	HEX	W#16#0000	
26		DB20.DBW 18	HEX	W#16#0000	
27					

Request telegram

The request reference is handle by FB 36.

02 Hex for a write command

01 Hex for a single parameter

10 Hex for a Value

CF Hex for parameter 207

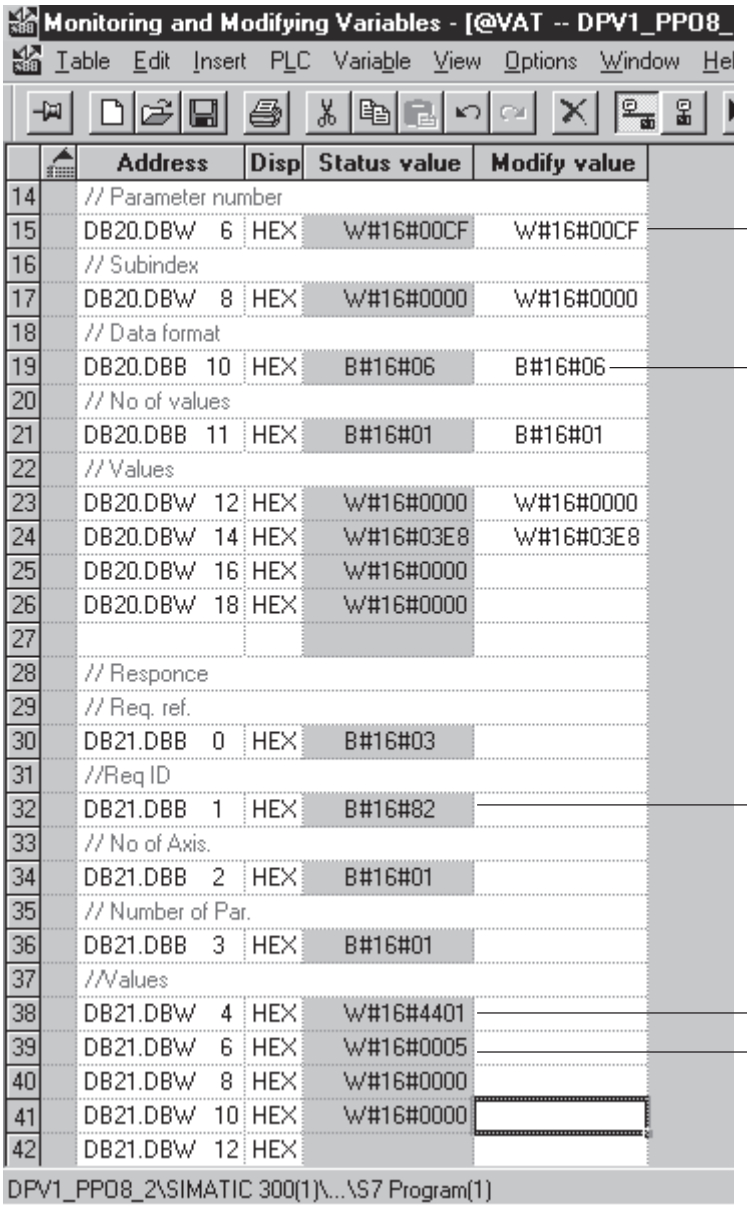
07 Hex as parameter 207 is a Unsigned 32

13880 Hex = 80000 dec corresponding to 800.00 sec.

■ Single parameter write - error response

This example shows a single parameter write command to parameter 207 *Ramp up time 1* where the format is wrong. The format of parameter 207 is 7. In this example the format is set to 6 and the error response back 05 Hex means wrong datatype.

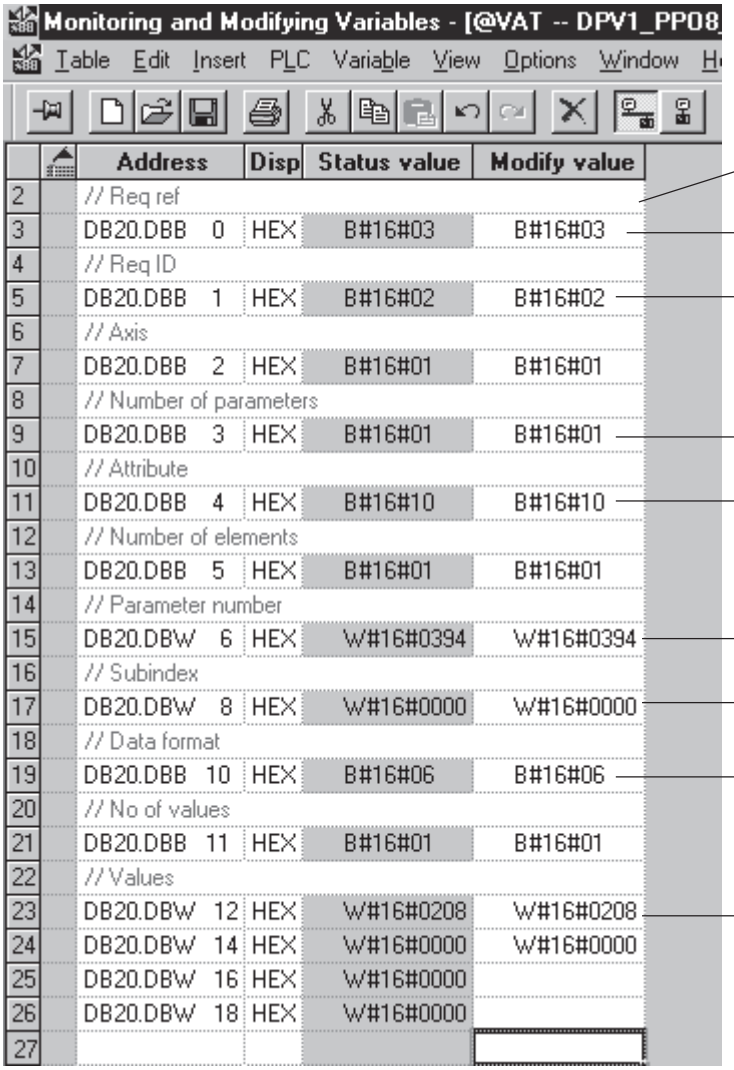
Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.



■ Single parameter write (array element)

This example shows a single parameter write command to parameter 916 *PCD Read configuration* index number 1. The value in index number 1 is set to 520.

Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.



	Address	Disp	Status value	Modify value
2	// Req ref			
3	DB20.DBB 0	HEX	B#16#03	B#16#03
4	// Req ID			
5	DB20.DBB 1	HEX	B#16#02	B#16#02
6	// Axis			
7	DB20.DBB 2	HEX	B#16#01	B#16#01
8	// Number of parameters			
9	DB20.DBB 3	HEX	B#16#01	B#16#01
10	// Attribute			
11	DB20.DBB 4	HEX	B#16#10	B#16#10
12	// Number of elements			
13	DB20.DBB 5	HEX	B#16#01	B#16#01
14	// Parameter number			
15	DB20.DBW 6	HEX	W#16#0394	W#16#0394
16	// Subindex			
17	DB20.DBW 8	HEX	W#16#0000	W#16#0000
18	// Data format			
19	DB20.DBB 10	HEX	B#16#06	B#16#06
20	// No of values			
21	DB20.DBB 11	HEX	B#16#01	B#16#01
22	// Values			
23	DB20.DBW 12	HEX	W#16#0208	W#16#0208
24	DB20.DBW 14	HEX	W#16#0000	W#16#0000
25	DB20.DBW 16	HEX	W#16#0000	
26	DB20.DBW 18	HEX	W#16#0000	
27				

Request telegram

The request reference is handle by FB 36.

02 Hex for a write command

01 Hex for a single parameter

10 Hex for a Value

0394 Hex for parameter 916

0000 Hex for index 1, see note

06 Hex as parameter 916 is a Unsigned 16

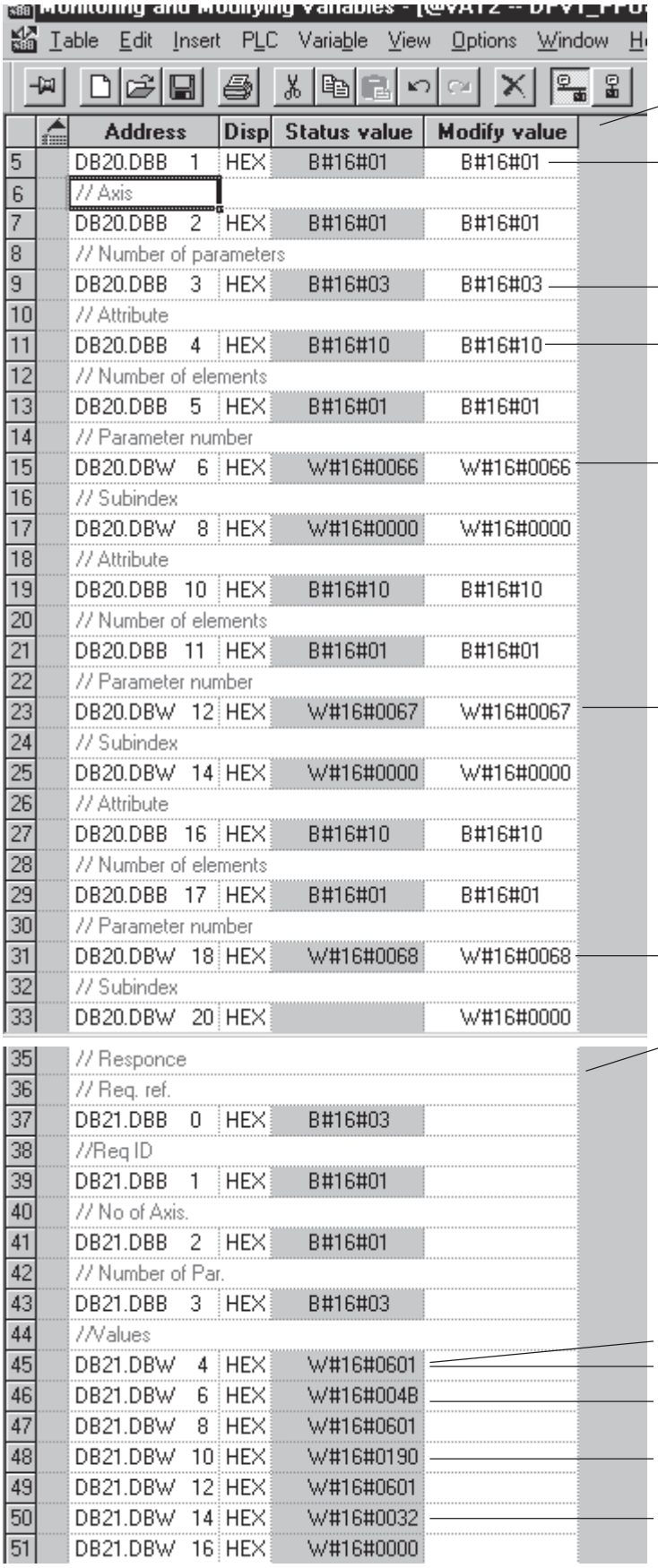
208 Hex = 520 dec.

NOTE:
Note that sub-indexes starts in the VLT with index 1 and the Profibus DPV1 starts with index 0 i.e. that a VLT parameter sub-index 1 is equal to DPV1 index 0.

■ Multiple parameter read

This example shows a multiple read command to parameter 102 *Motor power*, parameter 103 *Motor voltage* and parameter 104 *Motor frequency*.

Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.



	Address	Disp	Status value	Modify value
5	DB20.DBB 1	HEX	B#16#01	B#16#01
6	// Axis			
7	DB20.DBB 2	HEX	B#16#01	B#16#01
8	// Number of parameters			
9	DB20.DBB 3	HEX	B#16#03	B#16#03
10	// Attribute			
11	DB20.DBB 4	HEX	B#16#10	B#16#10
12	// Number of elements			
13	DB20.DBB 5	HEX	B#16#01	B#16#01
14	// Parameter number			
15	DB20.DBW 6	HEX	W#16#0066	W#16#0066
16	// Subindex			
17	DB20.DBW 8	HEX	W#16#0000	W#16#0000
18	// Attribute			
19	DB20.DBB 10	HEX	B#16#10	B#16#10
20	// Number of elements			
21	DB20.DBB 11	HEX	B#16#01	B#16#01
22	// Parameter number			
23	DB20.DBW 12	HEX	W#16#0067	W#16#0067
24	// Subindex			
25	DB20.DBW 14	HEX	W#16#0000	W#16#0000
26	// Attribute			
27	DB20.DBB 16	HEX	B#16#10	B#16#10
28	// Number of elements			
29	DB20.DBB 17	HEX	B#16#01	B#16#01
30	// Parameter number			
31	DB20.DBW 18	HEX	W#16#0068	W#16#0068
32	// Subindex			
33	DB20.DBW 20	HEX		W#16#0000
35	// Responce			
36	// Req. ref.			
37	DB21.DBB 0	HEX	B#16#03	
38	//Req ID			
39	DB21.DBB 1	HEX	B#16#01	
40	// No of Axis.			
41	DB21.DBB 2	HEX	B#16#01	
42	// Number of Par.			
43	DB21.DBB 3	HEX	B#16#03	
44	//Values			
45	DB21.DBW 4	HEX	W#16#0601	
46	DB21.DBW 6	HEX	W#16#004B	
47	DB21.DBW 8	HEX	W#16#0601	
48	DB21.DBW 10	HEX	W#16#0190	
49	DB21.DBW 12	HEX	W#16#0601	
50	DB21.DBW 14	HEX	W#16#0032	
51	DB21.DBW 16	HEX	W#16#0000	

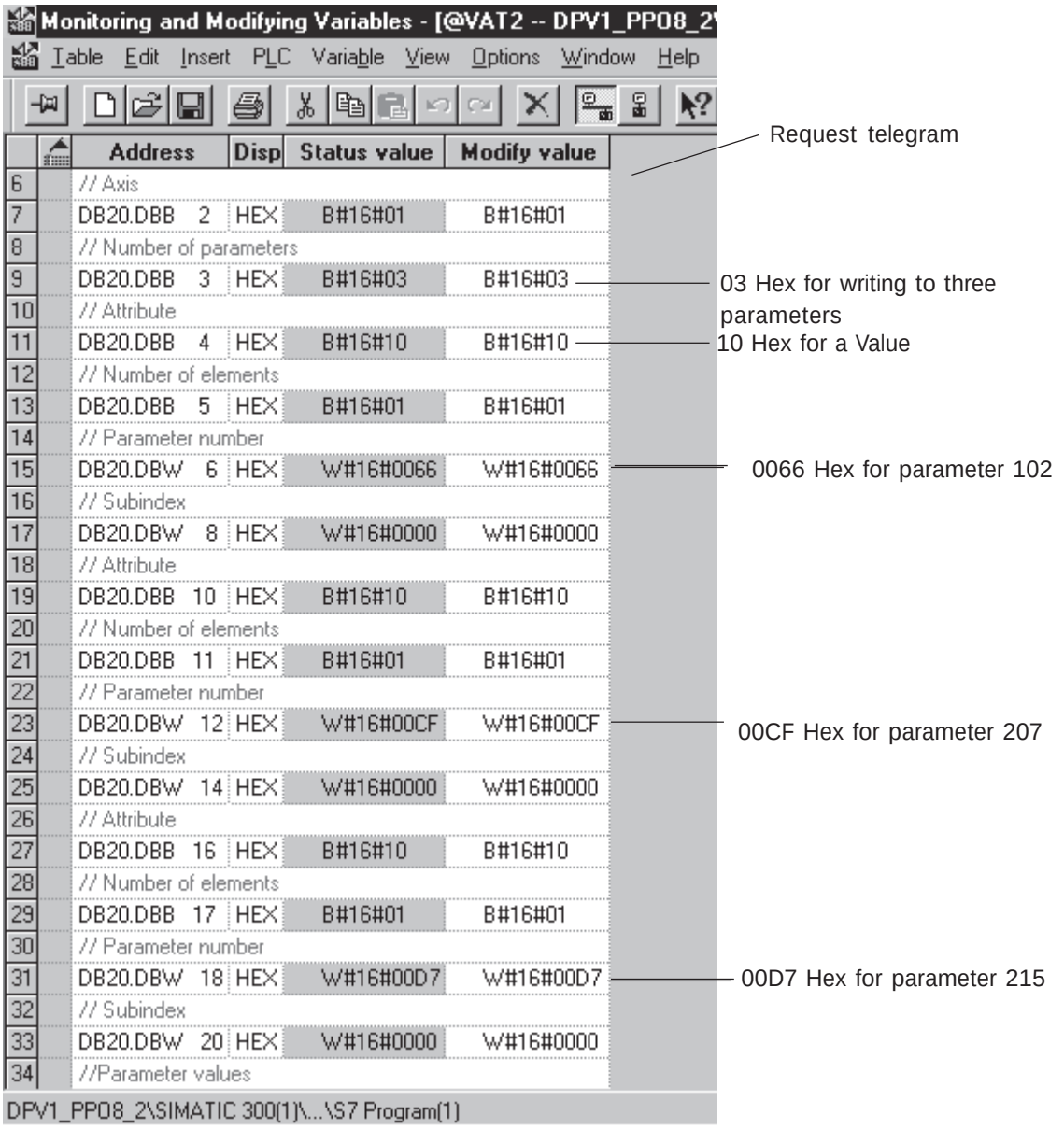
■ Multiple parameter write

This example shows a multiple write command to parameter 102 *Motor power*, parameter 207 *Ramp up time 1* and parameter 215 *Preset reference 1*.

The following values are written:

Parameter 102 *Motor power*	1.1 kW
Parameter 207 *Ramp up time 1*	1.0 Sec
Parameter 215 *Preset reference 1*	10.00 %

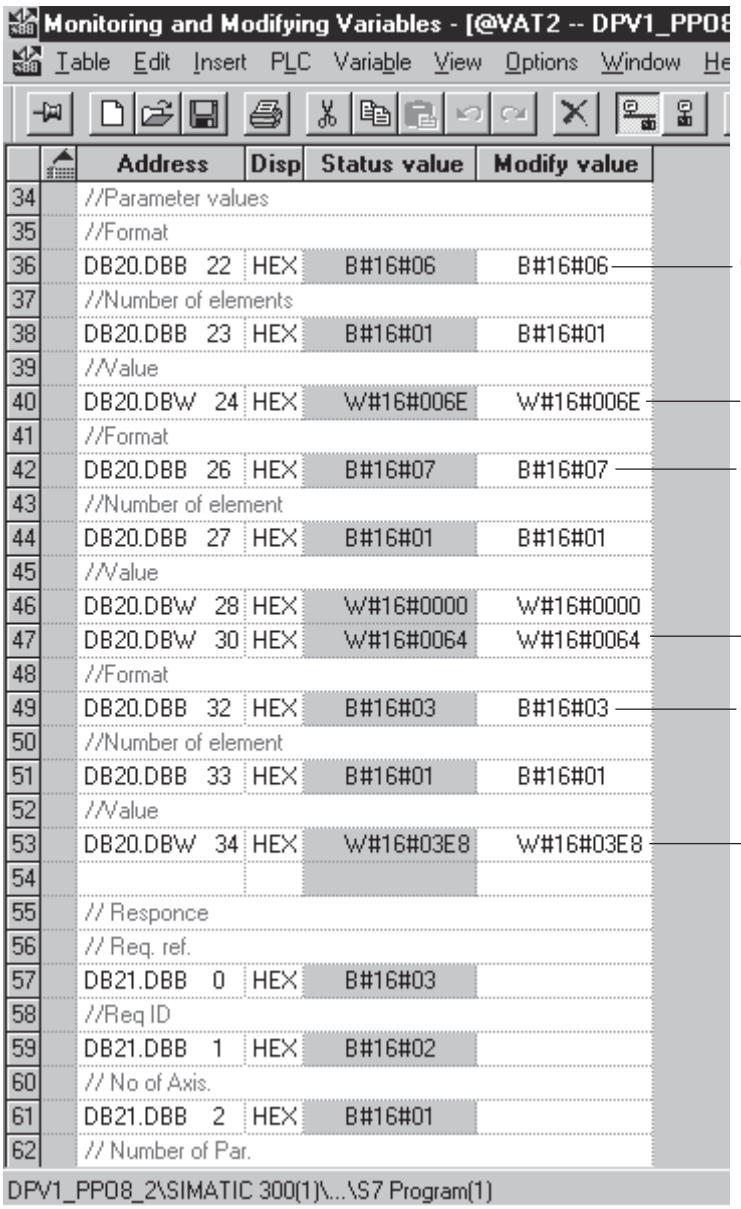
Please also see the chapter *Description of DP V1 Read/Write Telegram* to see how the telegram is built up.



	Address	Disp	Status value	Modify value
6	// Axis			
7	DB20.DBB 2	HEX	B#16#01	B#16#01
8	// Number of parameters			
9	DB20.DBB 3	HEX	B#16#03	B#16#03
10	// Attribute			
11	DB20.DBB 4	HEX	B#16#10	B#16#10
12	// Number of elements			
13	DB20.DBB 5	HEX	B#16#01	B#16#01
14	// Parameter number			
15	DB20.DBW 6	HEX	W#16#0066	W#16#0066
16	// Subindex			
17	DB20.DBW 8	HEX	W#16#0000	W#16#0000
18	// Attribute			
19	DB20.DBB 10	HEX	B#16#10	B#16#10
20	// Number of elements			
21	DB20.DBB 11	HEX	B#16#01	B#16#01
22	// Parameter number			
23	DB20.DBW 12	HEX	W#16#00CF	W#16#00CF
24	// Subindex			
25	DB20.DBW 14	HEX	W#16#0000	W#16#0000
26	// Attribute			
27	DB20.DBB 16	HEX	B#16#10	B#16#10
28	// Number of elements			
29	DB20.DBB 17	HEX	B#16#01	B#16#01
30	// Parameter number			
31	DB20.DBW 18	HEX	W#16#00D7	W#16#00D7
32	// Subindex			
33	DB20.DBW 20	HEX	W#16#0000	W#16#0000
34	//Parameter values			

See the parameter values on the next page.

■ **Multiple parameter write, cont.**



06 Hex is the word format unsigned 16 for parameter 102

6E Hex = 110 corresponding to 1.10 kW

07 Hex is the long word format unsigned 32 for parameter 207

64 Hex = 100 corresponding to 1.00 sec

03 Hex is the word format Interger 16 for parameter 215

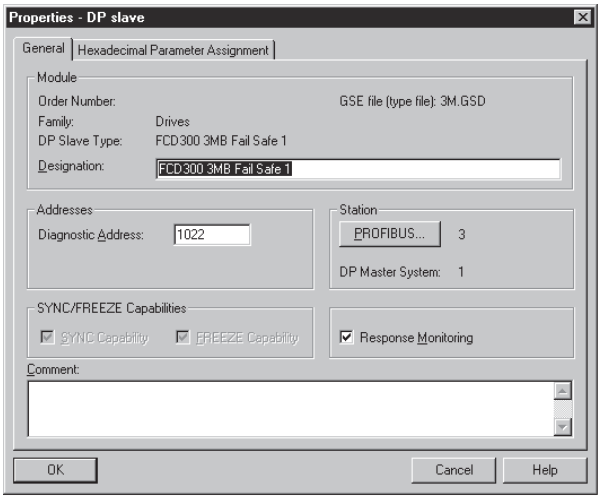
3E8 Hex = 1000 corresponding to 10.00%

Extended Diagnose

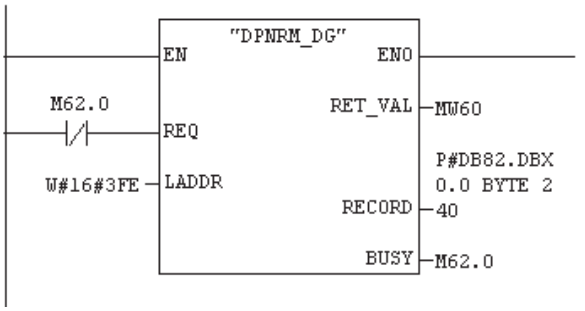
If a warning or alarm should occur on a VLT frequency converter it is possible to automatic give the Master a diagnose telegram that contains information about the warning or alarm.
In the VLT frequency converter the following parameter are mapped into the diagnose telegram:
Parameter 540 *Warning word* (byte 10-13)
Parameter 541 *Extended status word* (byte 14-17)
Parameter 538 *Alarm word* (byte 18-21)
Parameter 953 *Com. warning word* (byte 22-23)

In parameter 849 *Extended diagnose* it is possible to select between the following:
Disable [0]: Standard diagnose will be sent. This choice is compatible with DPV0.
Alarms [1]: An alarm (parameter 538 *Alarm word*) or an event in parameter 953 *Com. warning word* will trigger a diagnose telegram and the extended diagnose telegram will be send to the master.
Alarms and warnings [2]: An alarm (parameter 538 *Alarm word*) or an warning (parameter 540 *Warning word*) or a event in parameter 953 *Com. warning word* will trigger a diagnose telegram and the extended diagnose telegram will be send to the master.

I S7 Manager the Diagnose address is set up in the Hardware and by Properties of the slave.
In this example the Diagnostic address is set to 1022 dec.



To read the diagnostic data SFC 13 "DPNRM_DG" in Siemens is used. This Special Function Call is placed in OB 82 which will be called once if the extended diagnose is active due to an alarm or warning.
SFC 13 "DPNRM_DG" will then read the diagnostic address 1022 (LADDR = 3FE Hex) and copy the data into Datablock DB82.

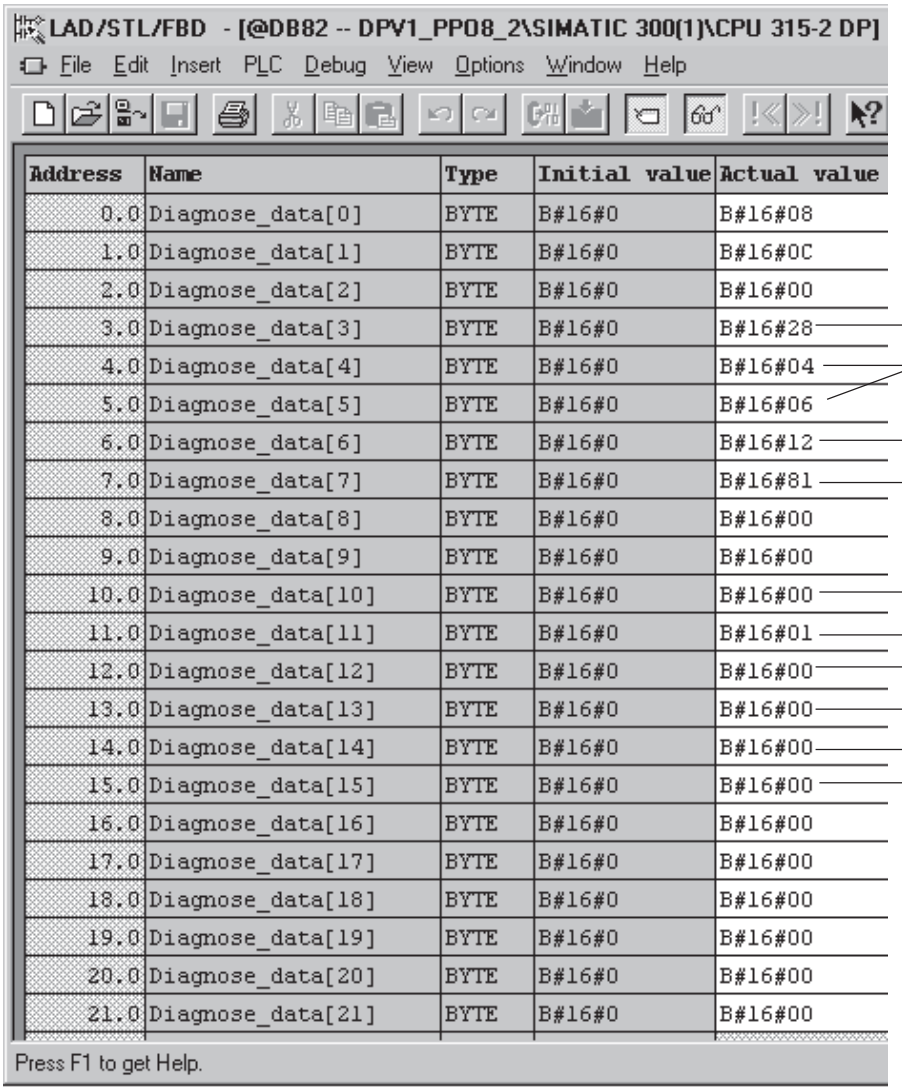


See examples on the next page.

■ Extended Diagnose

In this example the VLT frequency converter have a Live zero error, i.e. the current signal on terminal 60 is lower than parameter 315 *Term. 60 minimum scaling*. This warning will according the warning table give a live zero error of 10000 Hex.
Parameter 849 *Extended diagnose* is programmed to *Alarms and warnings* [2].

The returned value 010000 Hex in Diagnose_data [11] indicates a live zero error.



Address	Name	Type	Initial value	Actual value
0.0	Diagnose_data[0]	BYTE	B#16#0	B#16#08
1.0	Diagnose_data[1]	BYTE	B#16#0	B#16#0C
2.0	Diagnose_data[2]	BYTE	B#16#0	B#16#00
3.0	Diagnose_data[3]	BYTE	B#16#0	B#16#28
4.0	Diagnose_data[4]	BYTE	B#16#0	B#16#04
5.0	Diagnose_data[5]	BYTE	B#16#0	B#16#06
6.0	Diagnose_data[6]	BYTE	B#16#0	B#16#12
7.0	Diagnose_data[7]	BYTE	B#16#0	B#16#81
8.0	Diagnose_data[8]	BYTE	B#16#0	B#16#00
9.0	Diagnose_data[9]	BYTE	B#16#0	B#16#00
10.0	Diagnose_data[10]	BYTE	B#16#0	B#16#00
11.0	Diagnose_data[11]	BYTE	B#16#0	B#16#01
12.0	Diagnose_data[12]	BYTE	B#16#0	B#16#00
13.0	Diagnose_data[13]	BYTE	B#16#0	B#16#00
14.0	Diagnose_data[14]	BYTE	B#16#0	B#16#00
15.0	Diagnose_data[15]	BYTE	B#16#0	B#16#00
16.0	Diagnose_data[16]	BYTE	B#16#0	B#16#00
17.0	Diagnose_data[17]	BYTE	B#16#0	B#16#00
18.0	Diagnose_data[18]	BYTE	B#16#0	B#16#00
19.0	Diagnose_data[19]	BYTE	B#16#0	B#16#00
20.0	Diagnose_data[20]	BYTE	B#16#0	B#16#00
21.0	Diagnose_data[21]	BYTE	B#16#0	B#16#00

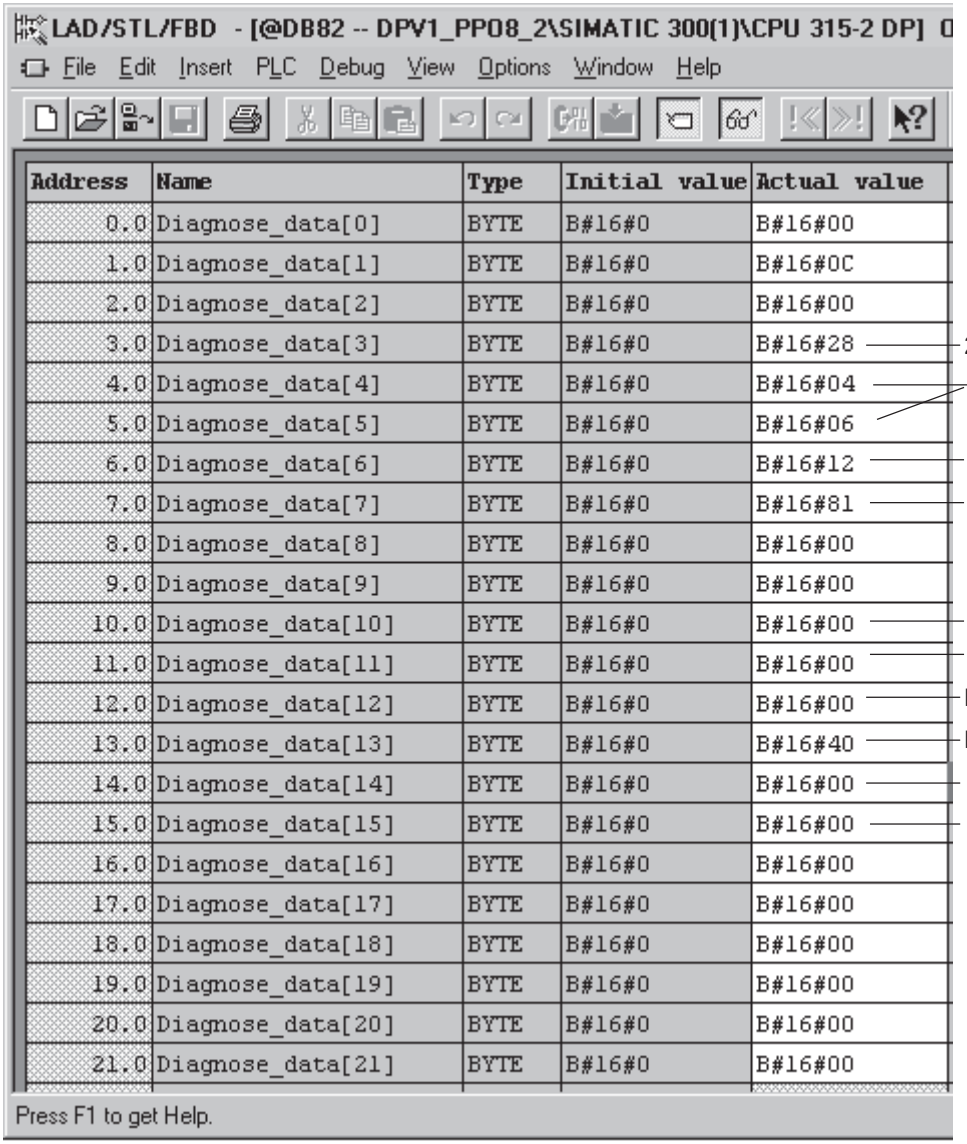
28 Hex = Master address
0406 Hex = FCD 300 3 MB ident number
12 Hex = length of the block
81 Hex = Status message
82 Hex = Module status
Par. 540 Warning Byte 3
Par. 540 Warning Byte 2
Par. 540 Warning Byte 1
Par. 540 Warning Byte 0
Par. 541 Status Byte 3
Par. 541 Status Byte 2

■ Extended Diagnose

In this example the VLT frequency converter is current limit. This warning will according the warning table give a live zero error of 40 Hex.

Parameter 849 *Extended diagnose* is programmed to *Alarms and warnings* [2].

The returned value 40 Hex in Diagnose_data [13] indicates a current limit.



Address	Name	Type	Initial value	Actual value
0.0	Diagnose_data[0]	BYTE	B#16#0	B#16#00
1.0	Diagnose_data[1]	BYTE	B#16#0	B#16#0C
2.0	Diagnose_data[2]	BYTE	B#16#0	B#16#00
3.0	Diagnose_data[3]	BYTE	B#16#0	B#16#28
4.0	Diagnose_data[4]	BYTE	B#16#0	B#16#04
5.0	Diagnose_data[5]	BYTE	B#16#0	B#16#06
6.0	Diagnose_data[6]	BYTE	B#16#0	B#16#12
7.0	Diagnose_data[7]	BYTE	B#16#0	B#16#81
8.0	Diagnose_data[8]	BYTE	B#16#0	B#16#00
9.0	Diagnose_data[9]	BYTE	B#16#0	B#16#00
10.0	Diagnose_data[10]	BYTE	B#16#0	B#16#00
11.0	Diagnose_data[11]	BYTE	B#16#0	B#16#00
12.0	Diagnose_data[12]	BYTE	B#16#0	B#16#00
13.0	Diagnose_data[13]	BYTE	B#16#0	B#16#40
14.0	Diagnose_data[14]	BYTE	B#16#0	B#16#00
15.0	Diagnose_data[15]	BYTE	B#16#0	B#16#00
16.0	Diagnose_data[16]	BYTE	B#16#0	B#16#00
17.0	Diagnose_data[17]	BYTE	B#16#0	B#16#00
18.0	Diagnose_data[18]	BYTE	B#16#0	B#16#00
19.0	Diagnose_data[19]	BYTE	B#16#0	B#16#00
20.0	Diagnose_data[20]	BYTE	B#16#0	B#16#00
21.0	Diagnose_data[21]	BYTE	B#16#0	B#16#00

28 Hex = Master address

0406 Hex = FCD 300 3 MB ident number

12 Hex = length of the block

81 Hex = Status message

82 Hex = Module status

Par. 540 Warning Byte 3

Par. 540 Warning Byte 2

Par. 540 Warning Byte 1

Par. 540 Warning Byte 0

Par. 541 Status Byte 3

Par. 541 Status Byte 2

■ Examples of DPV1 Parameter access services

The following examples show some of the parameter access services for the Profidrive Parameter Channel.

This example shows a single read command of parameter 207 Ramp up time 1. The ramp time is 3.00 sec.

Request header	Request reference = 01	Request id = 01
	Axis = 00	Amount Parameter = 01
Par number	Attribute = 10	Amount Elements = 01
	Par number = 00 CF	
	Subindex = 00 00	

Byte 0 Request reference: 01 Hex the master normally handles the Request reference.
Byte 1 Request id: 01 Hex for a read command (get par value)
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter read.
Byte 4 Attribute: 10 Hex for a read or write parameter values.
Byte 5 Amount elements: 01 Hex
Byte 6-7 Par. Numbers: 00 CF Hex for parameter 207
Byte 8-9 Sub index: 00 00 Hex. Par. 207 doesn't consist of sub-indexes.

reply positive

Reply-Header	Reply reference mirror = 01	Reply id = 01
	Axis 00	Amount Parameter = 01
Parametervalue	Format = 07	Amount of values = 01
	Value = 00 00	
	Value = 01 2C	

Byte 0 Reply reference mirror: The Reply reference mirror is handle by the master.
Byte 1 Request id: 01 Hex means a positive read request
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter read.
Byte 4 Format: 07 Hex means that parameter 207 data type is Unsigned 32.
Byte 5 Amount of values: 01 Hex
Byte 6-9 Value: 00 00 01 2C Hex for 300 corresponding to 3.00 sec.

This example shows a single write command to parameter 207 Ramp up time 1. The ramp time is change to 10.00 sec.

request:

Request header	Request reference = 01	Request id = 02
	Axis = 0	Amount Parameter = 01
Par number	Attribute = 10	Amount Elements = 01
	Par number = 00 CF	
	Subindex = 00 00	
Parameter value	Format = 07	Amount Values= 01
	Value = 00 00 03 E8	

Byte 0 Request reference: 01 Hex the master normally handles the Request reference.
Byte 1 Request id: 02 Hex for a write command (change par value)
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter read.
Byte 4 Attribute: 10 Hex for a read or write parameter values.
Byte 5 Amount elements: 01 Hex
Byte 6-7 Par. Numbers: 00 CF Hex for parameter 207
Byte 8-9 Sub index: 00 00 Hex. Par. 207 doesn't consist of sub-indexes.
Byte 10 Format: 07 Hex as parameter 207 is a Unsigned 32.
Byte 11 Amount of values: 01 Hex
Byte 12-14 Value: 00 00 03 E8 Hex for 1000 corresponding to 10.00 sec.

reply positiv:

Request header	Request reference = 01	Request id = 01
	Axis = 00	Amount Parameter = 01

Byte 0 Reply reference mirror: The Reply reference mirror is handle by the master.
Byte 1 Request id: 02 Hex means a positive change parameter request
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter writes.

If the format of parameter 207 was wrong set the reply will be negative. In this example the format is set to an Unsigned 16 (06) instead of Unsigned 32 (07).

reply negative:

Reply-Header	Reply reference mirror = 01	Reply id = 82
	Axis mirror = 00	Amount Parameter = 01
Parametervalue	Format = 44	Amount of values = 01
	Error value = 00 05	

Byte 0 Reply reference mirror: The Reply reference mirror is handle by the master.
Byte 1 Request id: 82 Hex means a negative change parameter request
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter writes.
Byte 4 Format: 44 Hex means error.
Byte 5 Amount of values: 01 Hex
Byte 6-7 Value: 00 05 Hex means wrong datatype.

This example shows a single write command to index 3 in parameter 916 PCD configuration read. Value 520 is written to index 3.

NOTE: Note that sub-indexes starts in the VLT with index 1 and the Profibus DPV1 starts with index 0 i.e. that a VLT sub-index 1 is equal to DPV1 index 0.

Request header	Request reference = 01	Request id = 02
	Axis = 0	Amount Parameter = 01
Par number	Attribute = 10	Amount Elements = 01
	Par number = 03 94	
	Subindex = 00 02	
Parameter value	Format = 06	Amount Values= 01
	Value = 02 08	

Byte 0 Request reference: 01 Hex the master normally handles the Request reference.
Byte 1 Request id: 02 Hex for a write command (change par value)
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter writes.
Byte 4 Attribute: 10 Hex for a read or write parameter values.
Byte 5 Amount elements: 01 Hex
Byte 6-7 Par. Numbers: 03 94 Hex for parameter 916
Byte 8-9 Sub index: 00 02 Hex for writing to sub index 3 in par. 916.
Byte 10 Format: 06 Hex as parameter 916 is a Unsigned 16.
Byte 11 Amount of values: 01 Hex
Byte 12-14 Value: 02 08 Hex for 520

reply positive

Reply-Header	Reply reference mirror = 01	Reply id = 02
	Axis mirror = 00	Amount Parameter = 01

Byte 0 Reply reference mirror: The Reply reference mirror is handle by the master.
Byte 1 Request id: 02 Hex means a positive change parameter request
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter writes.

If the index number was wrong set the reply will be negative. In this example sub-index 10 is written which is not a valid index for parameter 916.

reply negative:

Reply-Header	Reply reference mirror = 01	Reply id = 82
	Axis mirror = 00	Amount Parameter = 01
Parametervalue	Format = 44	Amount of values =01
	Error value = 00 03	

Byte 0 Reply reference mirror: The Reply reference mirror is handle by the master.
Byte 1 Request id: 82 Hex means a negative change parameter request
Byte 2 Axis: Always 00 Hex
Byte 3 Amount parameter: 01 Hex as it is a single parameter writes.
Byte 4 Format: 44 Hex means error.
Byte 5 Amount of values: 01 Hex
Byte 6-7 Value: 00 03 Hex means wrong subindex.

This example shows a multiple read telegram of parameters 102-104.
Parameter 102 Motor power = 00.75 kW
Parameter 103 Motor voltage = 400 V
Parameter 104 Motor frequency = 50 Hz

request:

Request header	Request reference = 01	Request id = 01
	Axis = 00	Amount Parameter = 03
1. Par number	Attribute = 10	1. Par number
	Par number = 00 66 Hex (par. 102)	
	Subindex = 00 00	
2. Par number	Attribute = 10	2. Par number
	Par number = 00 67 Hex (par. 103)	
	Subindex = 00 00	
3. Par number	Attribute = 10	3. Par number
	Par number = 00 68 (par. 104)	
	Subindex = 00 00	

Byte 3 Amount parameter: 03 Hex, as this telegrams should read 3 parameters.

reply positive (complete):

Reply-Header	Reply reference mirror = 01	Reply id = 01
	Axis mirror = 00	Amount Parameter = 03
1. Parametervalue	Format = 06	Amount of values = 01
	Value = 00 4B Hex (0.75 kW)	
2. Parametervalue	Format = 06	Amount of values = 01
	Value = 01 90 Hex (400 Volt)	
3. Parametervalue	Format = 06	Amount of values = 01
	Value = 32 Hex (50 Hz)	

This example shows a multiple write telegram to par. 102-104. The parameters are change to:
Parameter 102 Motor power = 01.10 kW
Parameter 103 Motor voltage = 380 V
Parameter 104 Motor frequency = 60 Hz

request:

Request header	Request reference = 01	Request id = 02
	Axis = 00	Amount Parameter = 03
1. Par number	Attribute = 10	Amount Elements = 01
	Par number = 00 66 Hex (par. 102)	
	Subindex = 00 00	
2. Par number	Attribute = 10	Amount Elements = 01
	Par number = 00 67 Hex (par. 103)	
	Subindex = 00 00	
3. Par number	Attribute = 10	Amount Elements = 01
	Par number = 00 68 (par. 104)	
	Subindex = 00 00	
1. Parametervalue	Format = 06	Amount of values = 01
	Value = 00 6E Hex (110)	
2. Parametervalue	Format = 06	Amount of values = 01
	Value = 01 7C (380)	
3. Parametervalue	Format = 06	Amount of values = 01
	Value = 00 3C (60)	

Byte 3 Amount parameter: 03 Hex to write to three parameters.

reply positive:

Reply-Header	Reply reference mirror = 01	Reply id = 02
	Axis mirror = 00	Amount Parameter = 03

This example shows a single read telegram that reads the name of parameter 001 Language.

request:

Request header	Request reference = 01	Request id = 01
	Axis = 00	Amount Parameter = 01
Par number	Attribute = 20H	Amount Elements = 1
	Par number = 00 01	
	Subindex = 06	

Byte 4 Attribute: 20 Hex for read parameter descriptions.
Byte 8-9 Sub index: 06 Hex for read the name of a parameter.

reply positive with text:

Reply-Header	Reply reference mirror = 01	Reply id = 01H
	Axis mirror = 00	Amount Parameter = 01
Parameter value	Format = 09	Amount of values = 10
	Byte 1 = 4C (L)	Byte 2 = 41 (A)
	Byte 3 = 4E (N)	Byte 4 = 47 (G)
	Byte 5 = 55 (U)	Byte 6 = 41 (A)
	Byte 1 = 47 (G)	Byte 2 = 45 (E)

This example shows a single read telegram that reads index number [3] DANSK of parameter 001 Language.

request

Request header	Request reference = 01	Request id = 01
	Axis = 00	Amount Parameter = 01
Par number	Attribute = 30	Amount of Elements = 01
	Par number = 00 01	
	Subindex = 00 03	

Byte 4 Attribute: 30 Hex for read parameter text.
Byte 8-9 Sub index: 3 Hex for read the text in array number 3.

reply positive:

Reply-Header	Reply reference mirror = 01	Reply id = 01
	Axis mirror = 00	Amount Parameter = 01
Parameter value	Format = 09	Amount of values = 10
	Byte 1 = 44 (D)	Byte 2 = 41 (A)
	Byte 3 = 4E (N)	Byte 4 = 53 (S)
	Byte 5 = 4b (K)	Byte 6
	Byte 7	Byte 8
	Byte 9	Byte 10
	Byte 11	Byte 12
	Byte 13	Byte 14
	Byte 15	Byte 16

■ Example of DP V1 Read Parameter Service

This example gives a detailed description of the telegrams and data needed for a Read of the value of VLT parameter o1 (Language).
The data bytes 0 trough 3 controls the Profibus DP V1 Read / Write services including V1 error messages..
The data bytes 3 trough 13 controls the specific Read of the VLT parameter 01.

1: Write request service 5FH:

Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value (Hex)	5F	00	2F	0A	BB	01	00	01	10	01	00	01	00	00
Meaning	Funct. no.	slot	index	length	Req. ref.	Req. ID = Read	Axis	No. of para.	Attri. = Value	No. of elem.	Par. No. High	Par. No. low	Sub. No. high	Sub. No. low
DP	V1				Drive profile V 3.0									

2: Write response service 5FH: means request successfully received by the slave.

Byte	0	1	2	3
Value	5F	00	2F	00
Meaning	Funct. no.	slot	index	length
DP	V1			

3: Read request service 5EH: The master asks the slave if the reuested data is ready.

Byte	0	1	2	3
Value	5E	00	2F	00
Meaning	Funct. no.	slot	index	length
DP	V1			

4: Read response - service DEH: Means the data is not ready yet.

Byte	0	1	2	3
Value	DE	80	B5	00
Meaning	Funct. no.	Error code	Error code	
DP	V1			

5: Read response+ service 5EH: The data is returned. Must be encoded from the Drives Profile part.

Byte	0	1	2	3	4	5	6	7	8	9	10	11
Value	5E	00	2F	08	BB	01	00	01	5	01	00	00
Meaning	Funct. no.	slot	index	length	Req. ref.	Res. ID	Axis	No. of para.	Format (unsigned 8)	No. of values.	Value 0, English	Empty, for byte alignment
DP	V1				Drive profile V 3.0							

■ DP V1 Identifications.

The V1 functionalities require a GSD file supporting V1. Of compatibility reasons in general the V1 versions got the same DP ident number as the corresponding V0 version. This means, that a V1 unit can replace a V0 unit without changing the master configuration. The table shows the available GSD files for FCM 300/FCD300/VLT 2800.
GSD files are placed on http://www.danfoss.com/drives.

GSD File Name FCM 300	**Description**	**Ident nr.**	**GSD Revision**
DA010403.GSD	FCM 300 V0 3 Mbaud	0403H (old version)	01
DA020403.GSD	FCM 300 V0 3 Mbaud	0403H (actual version)	02
DA010408.GSD	FCM 300 V0 12Mbaud	0403H (old version)	01
DA020408.GSD	FCM 300 V0 12Mbaud	0403H (actual version)	02
GSD File Name FCD 300	**Description**	**Ident nr.**	**GSD Revision**
DA010406.GSD	FCD 300 V0 3 Mbaud	0406H (old version)	01
DA010407.GSD	FCD 300 V0 12 Mbaud	0407H (old version)	01
DA020406.GSD	FCD 300 V0 3 Mbaud	0406H (actual version)	02
DA020407.GSD	FCD 300 V0 12 Mbaud	0407H (actual version)	02
DA030406.GSD	FCD 300 V1 3 Mbaud	0406H (actual version)	03
DA030407.GSD	FCD 300 V1 12 Mbaud	0407H (actual version)	03
GSD File Name VLT 2800	**Description**	**Ident nr.**	**GSD Revision**
DA010404.GSD	VLT 2800 V0 3 Mbaud	0404H (old version)	01
DA020404.GSD	VLT 2800 V0 3 Mbaud	0404H (actual version)	02
DA010405.GSD	VLT 2800 V0 12 Mbaud	0405H (old version)	01
DA020405.GSD	VLT 2800 V0 12 Mbaud	0405H	02

Data types

Coding	PB type	VLT type	comment
1	BOOL	BOOLEAN	standard type
2	INTEGER8	SIGNED8	standard type
3	INTEGER16	SIGNED16	standard type
4	INTEGER32	SIGNED32	standard type
5	UNSIGNED8	UNSIGNED8	standard type
6	UNSIGNED16	UNSIGNED16	standard type
7	UNSIGNED32	UNSIGNED32	standard type
8	FLOAT	FLOAT	standard type
9	VISIBLE STRING	VISIBLE STRING	standard type
10	OCTET STRING	OCTET STRING	standard type
11	TIMEOFDAY	-	standard type
12	TIMEOFDAY with date indication	-	standard type
13	TIMEDIFFERENCE	-	standard type
33	N2	-	profile specific
34	N4	-	profile specific
35	V2 (bit sequence)	V2_TYPE (new)	profile specific
36	L2	-	profile specific
37	R2	-	profile specific
38	T2	-	profile specific
39	T4	-	profile specific
40	NULL	-	profile specific
41	Byte	-	profile specific
42	Word	-	profile specific
43	double word	-	profile specific
44	error	-	profile specific
50	DATE	-	standard type
52	TIMEOFDAY without date indication	-	standard type
53	TIMEDIFFERENCE with date indication	-	standard type
54	TIMEDIFFERENCE without date indication	-	standard type

■ Size Attributes

physical variable	variable index	unit	abbrev.	conversion index
	0	none		0
Time				
	4	Sekunde	s	0
		Minute	min	70
		Stunde	h	74
		Tag	d	77
		Millisekunde	ms	-3
		Mikrosekunde	ms	-6
Force	5	Newton	N	0
		Kilonewton	kN	3
		Meganewton	MN	6
Energy, Work	8	Joule	J	0
		Kilojoule	kJ	3
		Megajoule	MJ	6
		Wattstunde	Wh	74
		Kilowattstunde	kWh	75
		Megawattstunde	MWh	76
Effective Power	9	Watt	W	0
		Kilowatt	kW	3
		Megawatt	MW	6
		Milliwatt	mW	-3
Apparent Power	10	Voltampere	VA	0
		Kilovoltampere	kVA	3
		Megavoltampere	MVA	6
		Millivoltampere	mVA	-3
Speed	11	1/Sekunde	s^{-1}	0
		1/Minute	min^{-1}	67
		1/Stunde	h^{-1}	72
Torque	16	Newtonmeter	Nm	0
		Kilonewtonmeter	kNm	3
		Meganewtonmeter	MNm	6
Temperature	17	Kelvin	K	0
		Grad Celsius	°C	100
		Grad Fahrenheit	°F	101
			V	
Voltage	21	Volt	kV	0
		Kilovolt	mV	3
		Millivolt	mV	-3
		Mikrovolt		-6
Current	22	Ampere	A	0
		Milliampere	mA	-3
		Kiloampere	kA	3
		Mikroampere	mA	-6
Resistance	23	Ohm	W	0
		Milliohm	mW	-3
		Kiloohm	kW	3
		Megaohm	MW	6
relative change	27	Prozent	%	0
Frequency	28	Hertz	Hz	0
		Kilohertz	kHz	3
		Megahertz	Mhz	6
		Gigahertz	GHz	9