

Danfoss

Drives and Controls

Frequency converters

VLT® 5000



Incorporating a VLT 5000 Profibus, Siemens Simatic



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■ Incorporating a VLT 5000 Profibus into a Siemens Simatic S7-315-2 DP PLC system

This document is an instruction which will help you to incorporate a VLT 5000 with a Profibus card into a Siemens Simatic S7-315-2 DP PLC system. Only the steps which are required in order to establish communication between the VLT 5000 Profibus and the Simatic S7-315-2 DP PLC are shown. It is assumed that you are already familiar with the Simatic S7 system. In this instruction, the STEP 7 software version 5.0 is used.

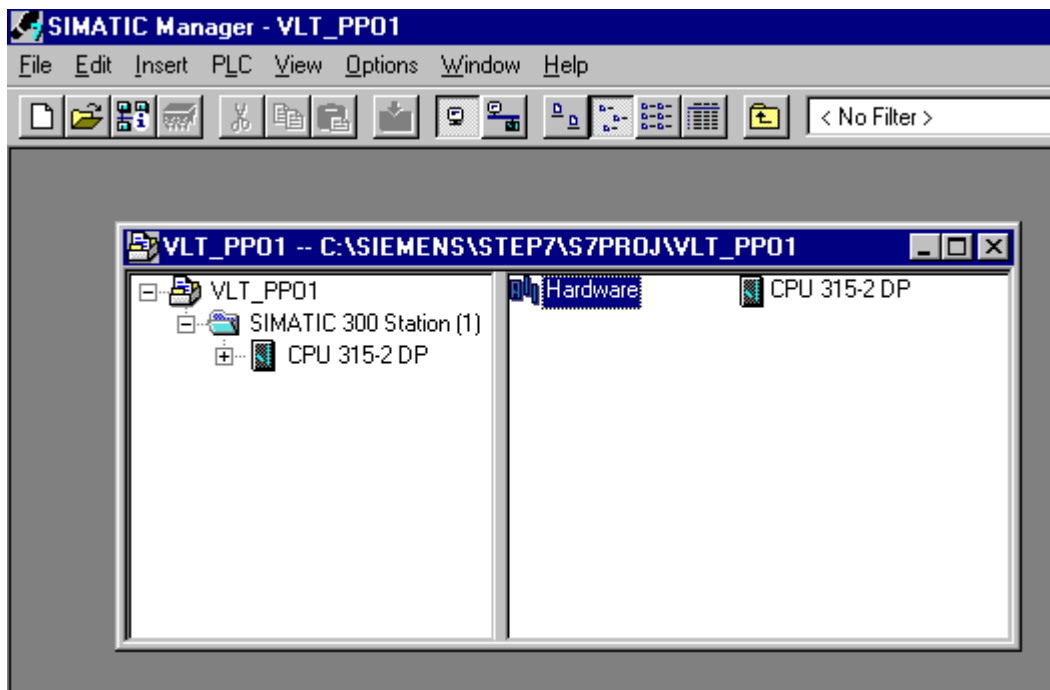
■ Step 1 Install GSD/GSE file

First step is to import the GSD/GSE of VLT 5000 into Siemens S7 Manager. S7 Manager requires a GSD/GSE file for every DP slave on a Profibus network.

In the VLT 5000 GSD/GSE file all the properties of our DP slave are described in a database. The file can be ordered from your local Danfoss representative.

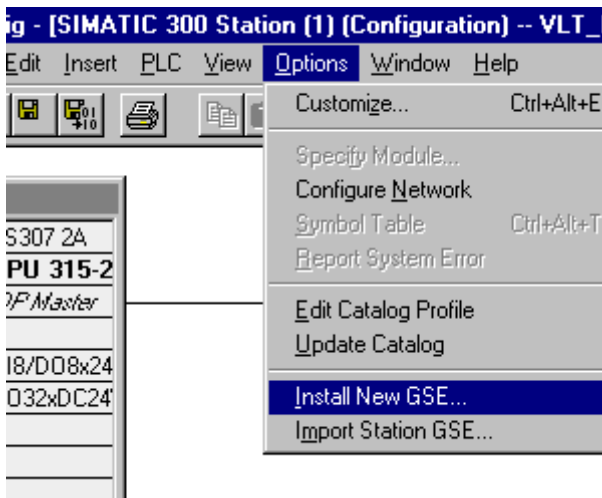
Start a new project and click on Simatic 300 station. Now double click on *Hardware*.

In *Hardware* the Profibus DP network is configured.



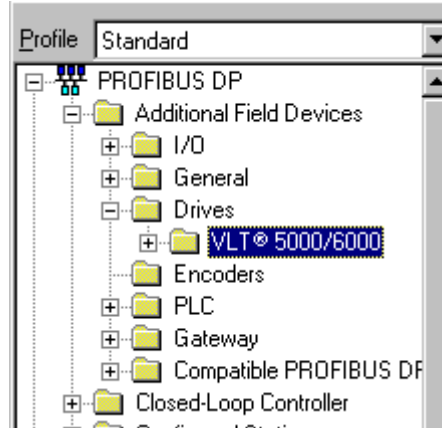
Step 1 Install GSD/GSE file

Go to *Option* and choose *Install New GSE* to read in VLT 5000 GSD/GSE to the "Hardware Catalog".



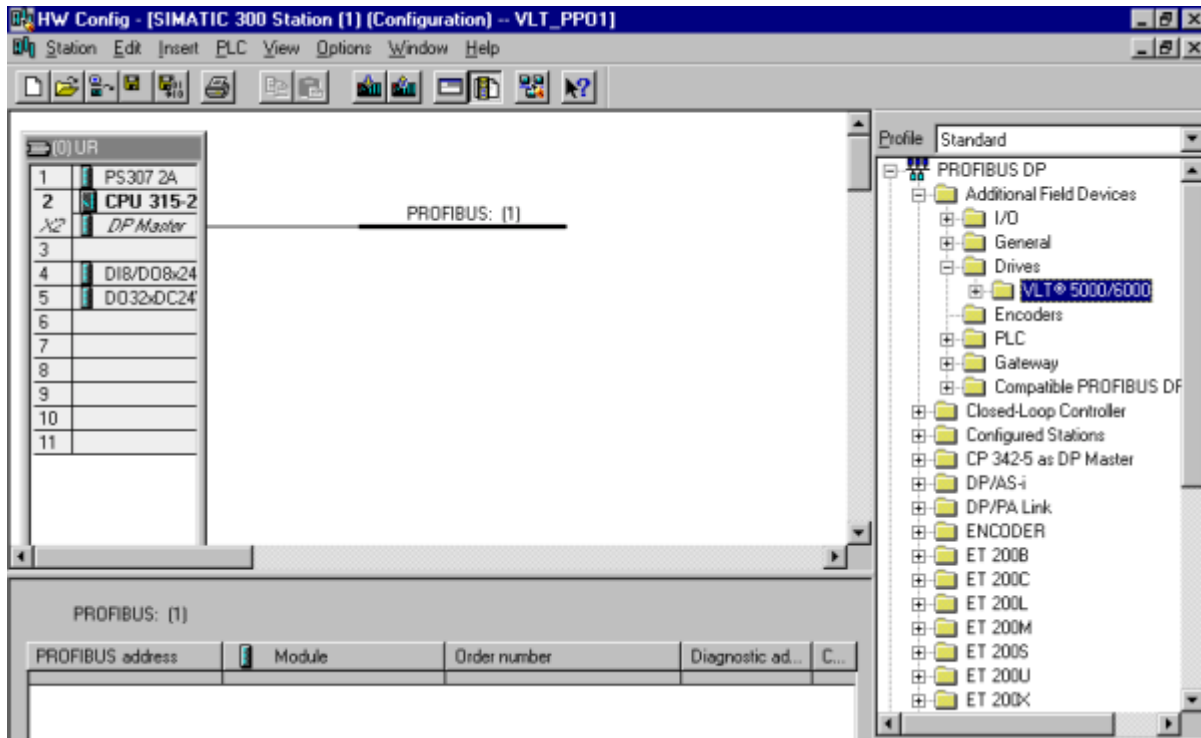
The "Hardware Catalog" must be updated before the VLT 5000 GSD/GSE file is active. Go to *Option* and choose *Update Catalog*.

The VLT 5000 GSD/GSE file is now available under the following path:



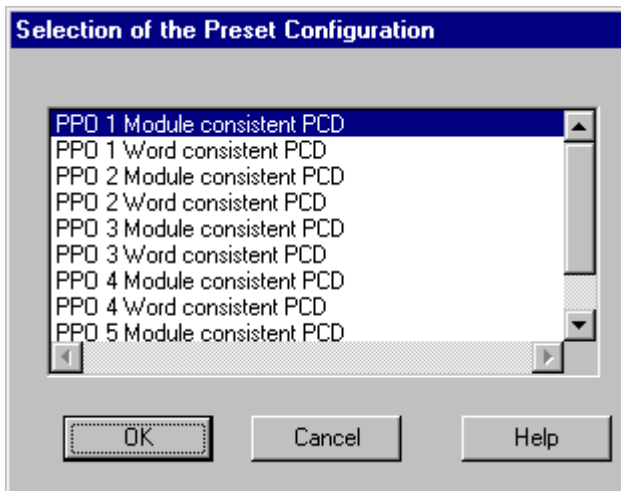
Step 2 Insert the VLT 5000

Insert the VLT 5000 by double clicking on the VLT 5000.



■ Step 3 PPO type

Insert the VLT 5000 by double clicking on the VLT 5000. Chose a PPO type and click on OK.

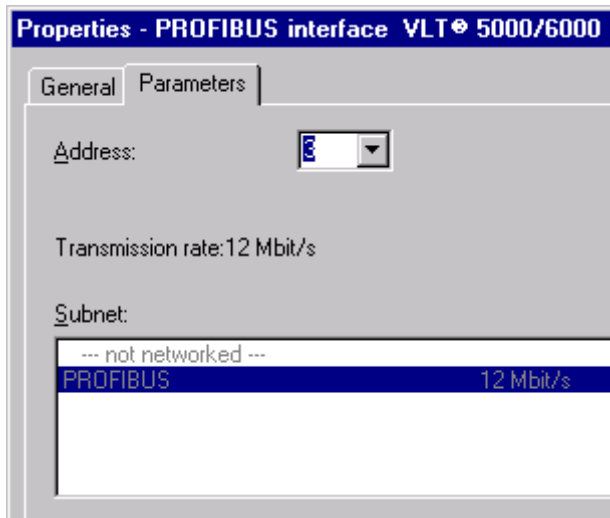


The choice here must correspond to the setting in parameter *904 PPO type*.

Module consistent data means that all the data exchange between the master and slave is transfer at one time. By Word consistent the data exchange between the master and slave is split up 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.

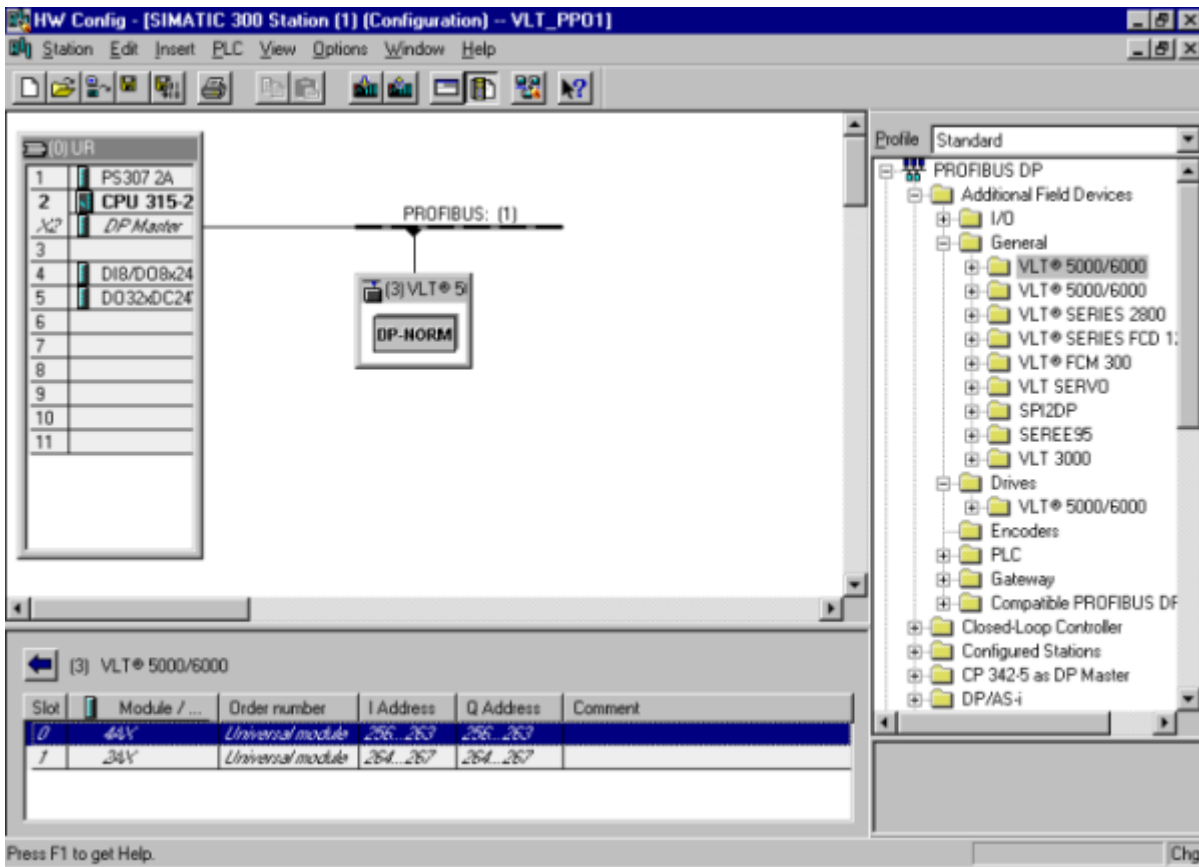
■ Step 4 Address

Next is the setting of the VLT 5000 address. The choice here must correspond to the setting in parameter *918 Station address*.



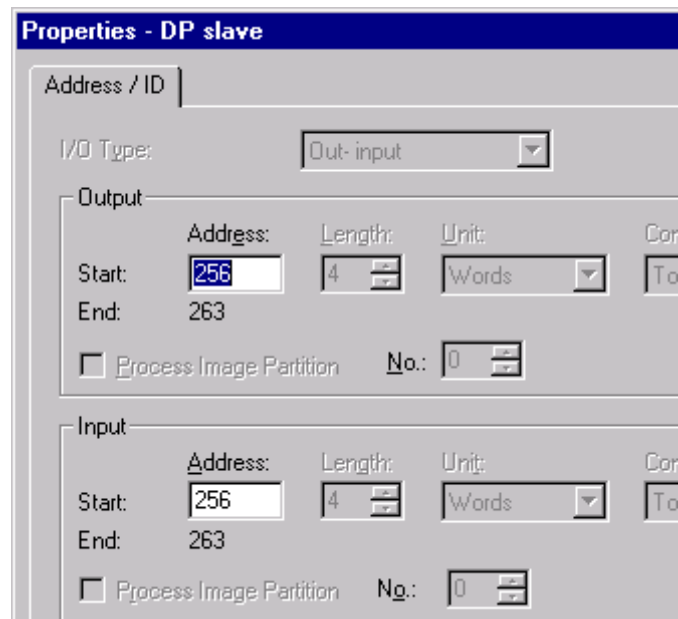
■ Step 5 I/O mapping

The VLT 5000 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. for PPO type 1 for communication with VLT 5000.



■ Step 5 I/O mapping

Now your system is set up to use the PPO1 communication and the following information is available in the Simatic S7-315-2 DP PLC:

Parameter Characteristic (PCA), i.e. read an write to parameters.

Process data, i.e write a Control word and Reference and receiving a Status word and Main Actual Value.

4AX				2AX	
PCA	IND	PVA	PVA	CTW	MRV
PAW 256	PAW 258	PAW 260	PAW 262	PAW 264	PAW 266

4AX				2AX	
PCA	IND	PVA	PVA	STW	MAV
PEW 256	PEW 258	PEW 260	PEW 262	PEW 264	PEW 266

The Simatic S7-315-2 DP System can only send and receive up to 4 bytes of I/O without special commands.

The first module (4AX) cannot be handled without System Functions Call (SFCs), see example on the next page. The System Functions Calls are SFC 14 for receiving data from a slave and SFC 15 for writing data to a slave.

The second module (2AX) can be handled without the use of SFCs.

■ Step 6 Downloading

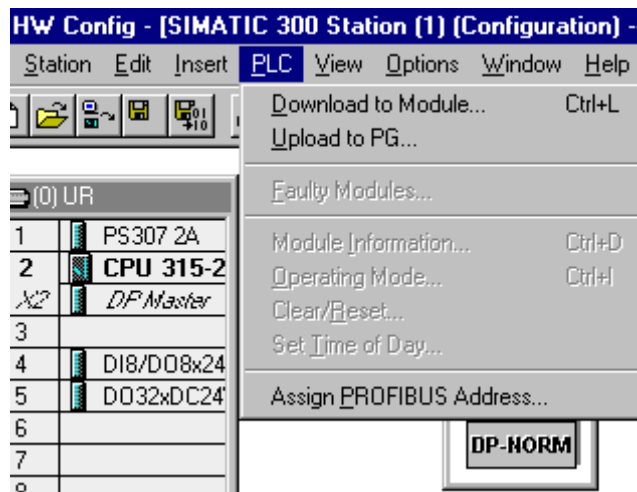
Set the PLC in stop with the key on the PLC processor and download the program. Please note that the VLT frequency converter will show Warning 34 *HPFB communication fault* while the PLC is in Stop mode.

Before the PLC can be set in RUN mode ensure that the following VLT parameter corresponding to the program:

- Par. 800 Protocol: *Profibus DP [1]*
- Par. 801 Baud rate: According to the Master
- Par. 904 PPO type: According to the Master
- Par. 918 Station address: According to the Master

Note that a change of the above parameters are first executed at next power up.

After the download of the PLC program the two LED 1 and LED 2 on the Profibus card should be solid green when the key on the S7 master is set in RUN. This indicate that the master and slave is communicating.



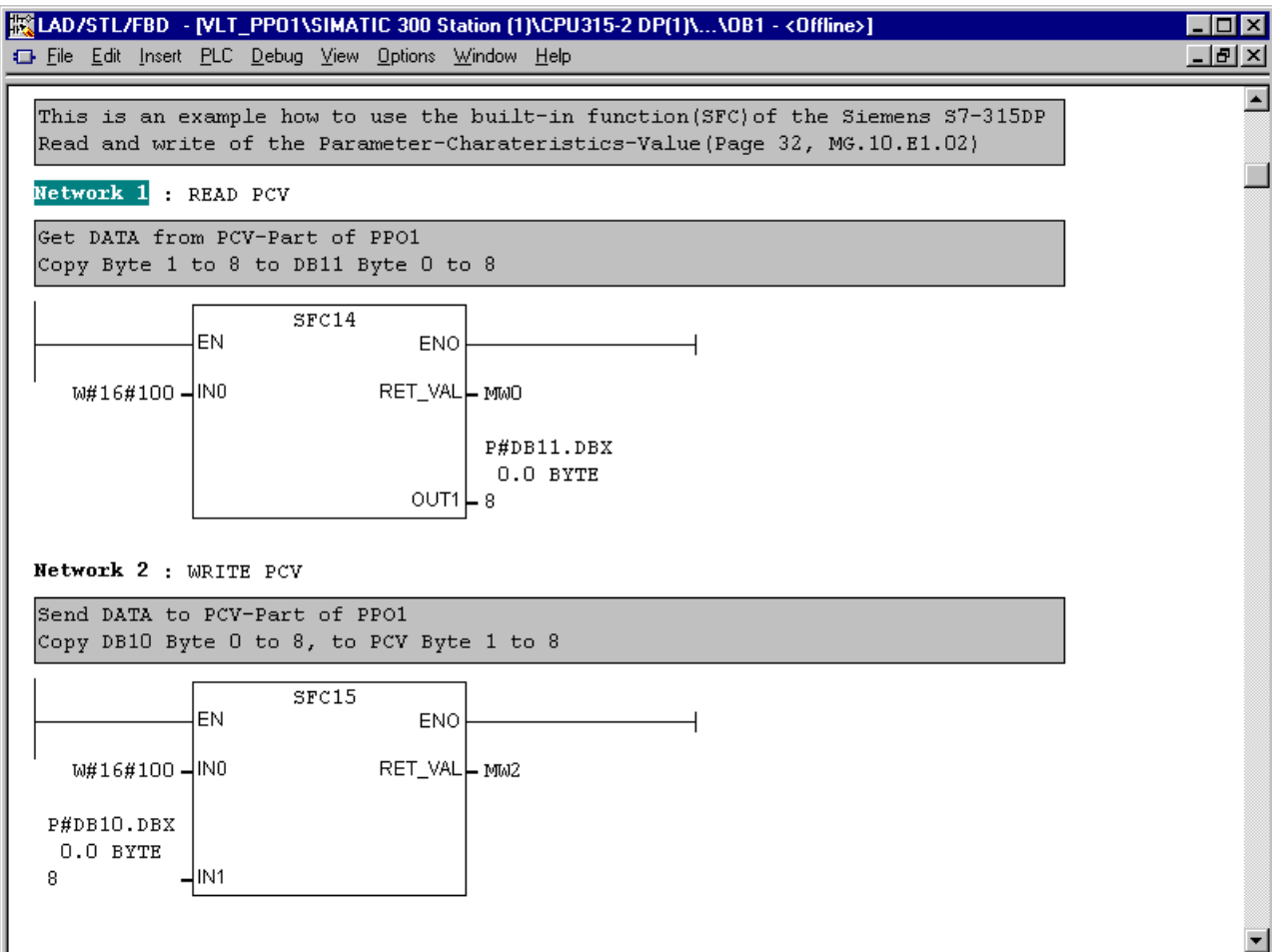
If the two LED's on the VLT 5000 Profibus card not are solid green the fault could be:

- Wrong parameter setting in the above mention list according to the master.
- After changing the Profibus parameters the power hasn't been recycle.
- Wrong cable connection, check the cable by the master and the VLT 5000.

■ **Example of how to programme the Simatic S7-315-2 DP**

Danfoss provides a small demo program. This demo program (ARJ File) can be loaded to your system and downloaded to your Simatic S7-315-2 DP PLC system.

The program copies information from DB11.0 - DB11.6 to PAW 256 -262 and from PEW 256 - 262 to DB10.0 - DB10.6.



By using the above program, the following information can be found on these PLC Addresses:

4AX				2AX	
PCA	IND	PVA	PVA	CTW	MRV
DBW10.0	DBW10.2	DBW10.4	DBW10.6	PAW 264	PAW 266

4AX				2AX	
PCA	IND	PVA	PVA	STW	MAV
DBW11.0	DBW11.2	DBW11.4	DBW11.6	PEW 264	PEW 266

In order to control the VLT 5000 from the Profibus only, set parameter 502 - 509 for Serial. If reversing is required, set also parameter 200 for 132Hz Both directions.



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