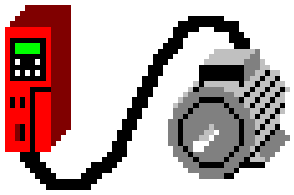
GSD file information for

MOVIDRIVE Compact 41

with PROFIBUS-DP



Contents

1 Revision status GSD file

1. Release: Version 1.31 of 24. March 2000

The syntax of this GSD file was checked with the GSD-Editor V2.1 and GSD-Checker V2.2 of the Profibus Usergroup.

For the drive inverter family MOVIDRIVE Compact 41 use the following files:

SEW_6002.GSD	- GSD file
SEW6002N.BMP	- Bitmap file with inverter icon
SEW6002S.BMP	- Bitmap file with inverter icon

Note:
The latest version of the GSD files for SEW inverters can be downloaded from the SEW homepage, URL ***http://www.SEW-EURODRIVE.de.***

2 How to install the GSD file

The GSD file is supplied for project planning for the DP master. The GSD file must be copied into a special folder for your project planning software. Please refer to the manuals of your project planning software for information about the precise procedures.

The standardized GSD file can be read from all DP master systems.

2.1 How to install a new GSD file with STEP 7

1. Start the Simatic Manager program.

2. Open an existing project and start the hardware configuration tool (HW-Config).

3. Please close the Configuration window in between the HW-Config, otherwise you cannot install the new version of the GSD file.

4. Use the menu "Options / Install new GSE..." to select the new GSD file "***SEW_6002.GSD***".

5. Click OK to open the new GSD file. The Message box asks, if you really want to exchange the current GSD file with the revision 1. Choose YES to overwrite the old file. Now the new GSD and bitmap files will be loaded into the STEP7 system. The contents of the hardware catalog will be automatically updated.

   IMPORTANT: The current GSD file bases on GSD revision 1. This number is not the version number of the GSD file. Open the sew_6002.gsd file (e.g. with notepad.exe) to check the version number of the GSD file.

6. You'll find the SEW inverter in the Hardware catalog in the section:

```
PROFIBUS DP
   +--Additional Field Devices
        +--Drives
           +--MOVIDRIVE + DFP11
```

→ The new GSD file is successfully installed now.

3 Project planning for the DP master

The following section describes the scenario for the project planning for the DP master:

1) Install (copy) the GSD file in accordance with the requirements of your project planning software. Once the installation has been completed correctly, the inverter appears in the slave family „***Drives***“ with the designation „***MOVIDRIVE Compact 41***“.

2) For project planning purposes, add the interface module „***MOVIDRIVE Compact 41***“ into the PROFIBUS structure and assign the station address.

3) Select the process data configuration for your application (see chapter „PROFIBUS DP Configuration“).

4) Specify the I/O addresses for the configured process data configuration.

5) If diagnosis alarm processing should be activated for the inverter, select „External diagnosis = Enabled (on)“ of the slave parameter setting (chapter 4.2 External Diagnosis).

→ Startup PROFIBUS DP following the project planning steps. The red „BUS FAULT“ LED signals the status of the project planning process (OFF = project planning OK).

4 PROFIBUS DP Configurations

It is necessary for the DP master to send the drive inverter a certain DP configuration in order to be able to define the type and number of input and output data used for transfer. In doing this, you have the opportunity to
• control the drive using process data
• read and write all drive parameters using the parameter channel
• exchange a freely defined data block between IPOSplus and DP master

The “Process data configuration” column lists the names of the configurations. These texts also appear as a selection list in your project planning software for the DP master. The DP configurations column shows which configuration data are sent to the inverter when the PROFIBUS-DP connection is being established.

Process data configuration	Meaning / information	DP configurations	
		0	1
1 PD	Control by 1 process data word	240_{dez}	-
2 PD	Control by 2 process data words	241_{dez}	-
3 PD	Control by 3 process data words	242_{dez}	-
6 PD	Control by 6 process data words (PD4-PD6 can only be used with IPOS^{plus})	0_{dez}	245_{dez}
10 PD	Control by 10 process data words (PD4-PD10 can only be used with IPOS^{plus})	0_{dez}	249_{dez}
Param + 1 PD	Control by 1 process data word Parameter setting using 8-byte parameter channel	243_{dez}	240_{dez}
Param + 2 PD	Control by 2 process data words Parameter setting using 8-byte parameter channel	243_{dez}	241_{dez}
Param + 3 PD	Control by 3 process data words Parameter setting using 8-byte parameter channel	243_{dez}	242_{dez}
Param + 6 PD	Control by 6 process data words Parameter setting using 8-byte parameter channel (PD4-PD6 can only be used with IPOS^{plus})	243_{dez}	245_{dez}
Param + 10 PD	Control by 10 process data words Parameter setting using 8-byte parameter channel (PD4-PD10 can only be used with IPOS^{plus})	243_{dez}	249_{dez}
Universal Configuration	Reserved for special configurations	0_{dez}	0_{dez}

Tabelle 1: DP-Configurations of MOVIDRIVE Compact 41

Note:
“Special identifier formats” coding is not supported! Only use the “Total length consistency” setting for data transmission!

4.1 Data consistency

Consistent data are data which have to be transmitted between the programmable controller
and the drive inverter as one block at all times and are never allowed to be transmitted separately from one another.
Data consistency is very important for transmitted position values or complete positioning tasks. This is because data which is not transmitted consistently could be from different program cycles of the programmable controller, which would lead to undefined values being transmitted to the drive inverter.
With PROFIBUS-DP, data communication always takes place between the programmable controller and drives using the “Data consistency = total length” setting.

4.2 External Diagnosis

For the drive inverter MOVIDRIVE Compact 41, it is possible to activate automatic generation of external diagnosis alarms via PROFIBUS-DP during the project planning in the DP master. If this function has been activated, MOVIDRIVE Compact 41 sends an external diagnosis signal to the DP master every time a malfunction occurs. It is then necessary to program corresponding algorithms in the program of the DP master system in order to evaluate the diagnosis information. These algorithms can sometimes be quite complex.

4.2.1 Recommendation

It is basically not necessary to activate the external diagnosis function because the inverter transmits the current drive status in status word 1 during every PROFIBUS-DP cycle.

4.2.2 Note regarding Simatic S7 DP-Masters

Diagnostic alarms may be triggered by the PROFIBUS-DP system in the DP master at any time even when external diagnosis signal generation is inactive. This means the corresponding operation blocks (e.g. OB84 for S7-400 or OB82 for S7-300) should always be created in the controller.

4.2.3 Activation of External Diagnosis

Additional application-specific parameters can be defined in every DP master during the configuration of a DP slave. These parameters are transferred to the slave when the PROFIBUS-DP starts up. Ten application-specific parameter data items are provided for MOVIDRIVE Compact 41. Their functions are as follows:

Byte:	Permitted value	Function
0	00 hex	reserved
1	00 hex 01 hex	Inverter generates external diagnosis alarm due to malfunction Inverter does not generate external diagnosis alarm due to malfunction **(factory setting in GSD file)**
2-9	00 hex	reserved

Tabelle 2: User-specific parameter data

No unlisted values are permitted. They can lead to malfunctions!

4.2.4 Activating the external diagnosis in STEP 7

The project planning programs of the DP master systems either offer the option of activating the external diagnosis in plain text format, such as with STEP7, or of stating the information directly in hex code.

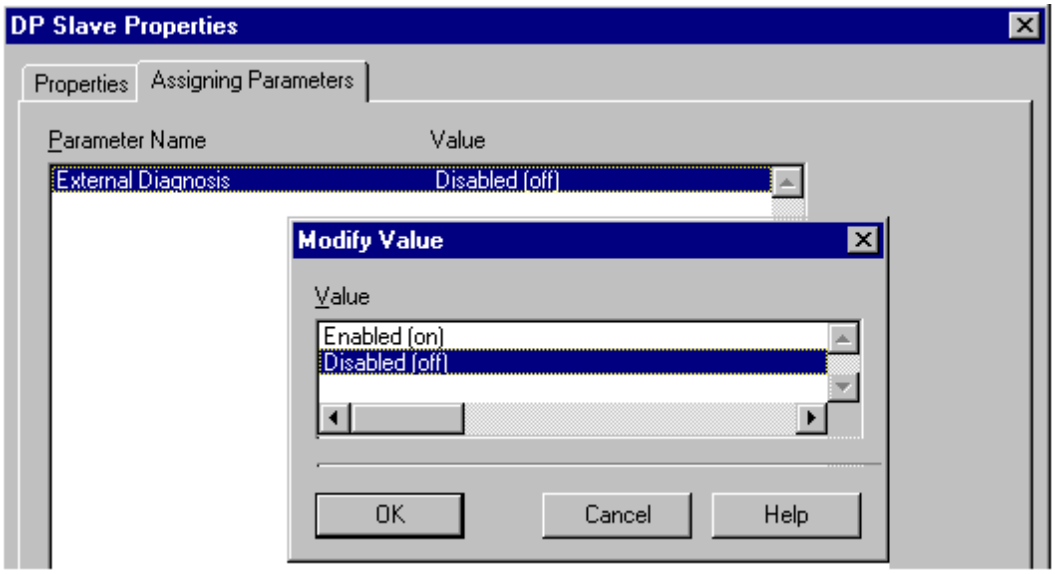


Bild 4-1: Akctivating external diagnosis with STEP7

Parameter data (hex)	Function
00,00,00,00,00,00,00,00,00,00,	External diagnosis alarms are also generated if there is an inverter malfunction (enabled = on)
00,**01**,00,00,00,00,00,00,00,00,	External diagnosis alarms are not generated if there is an inverter malfunction (disabled = off, facory setting in GSD file)

Tabelle 4-3: Hex code for activating external diagnosis generation

5 Sample program for STEP 5

Hardware configuration:

In this example, the project planning for the inverter defines the process data configuration “3 PD” on input addresses PW156, PW158, PW160 and output addresses PW156 , PW158, PW160. In this case, for example, consistent access takes place in the “last word first” sequence.

Note:
In the Simatic S5, data consistency is principally determined by the CPU type. Please refer to the manuals for the CPU or the DP master module of the Simatic S5 for further information about correct programming with data consistency.

```
//Read in actual values consistently

L PW 160    //Load PI3 (no function)
L PW 158    //Load PI2 (actual speed value)
L PW 156    //Load PI1 (status word 1)

//Output setpoints consistently

L KH 0
T PW 160 //Write 0hex on PO3 (no function, however)

L KF +1500
T PW 158 //Write 1500dec on PO2 (speed setpoint = 300 rpm)

L KH 0006
T PW 156 //Write 6hex on PO1 (control word = enable)
```

6 Sample program for STEP 7

The inverter is controlled using Simatic S7 in accordance with the selected process data configuration either directly using load and transfer commands or by means of special system functions, SFC 14 DPRD_DAT and SFC15 DPWR_DAT.
In principle with S7, data lengths of 3 bytes or more than 4 bytes have to be transferred with the S7 system functions SFC14 and SFC15. The following table therefore applies:

Process data configuration	STEP7 program access via	
1 PD	Load/transfer commands	
2 PD	Load/transfer commands	
3 PD	System functions SFC14/15 (length 6 Byte)	
6 PD	System functions SFC14/15 (length 12 Byte)	
10 PD	System functions SFC14/15 (length 20 Byte)	
Param + 1 PD	Parameter channel: Process data:	System functions SFC14/15 (length 8 Byte) Load/transfer commands
Param + 2 PD	Parameter channel: Process data:	System functions SFC14/15 (length 8 Byte) Load/transfer commands
Param + 3 PD	Parameter channel: Process data:	System functions SFC14/15 (length 8 Byte) System functions SFC14/15 (length 6 Byte)
Param + 6 PD	Parameter channel: Process data:	System functions SFC14/15 (length 8 Byte) System functions SFC14/15 (length 12 Byte)
Param + 10 PD	Parameter channel: Process data:	System functions SFC14/15 (length 8 Byte) System functions SFC14/15 (length 20 Byte)

Hardware configuration:

In this example, the project planning for the inverter defines the process data configuration “3 PD” on input addresses PIW576, PIW 578, PIW 560 (PIW = Process In Words) and output addresses POW576, POW 578, POW 560 (POW = Process Out Words). A data block DB3 is created with about 50 data words.
When SFC14 is called, the process input data are copied into data block DB3, data words 0, 2 and 4. When SFC15 is called after the control program has been processed, the process output data are copied from data words 20, 22 and 24 into the output addresses.
Note the length information in bytes in the case of the RECORD parameter. This must correspond to the configured length. The function parameter LADDR has to be an hex coded value.

Please refer to the online help for STEP7 for further information about the system functions.

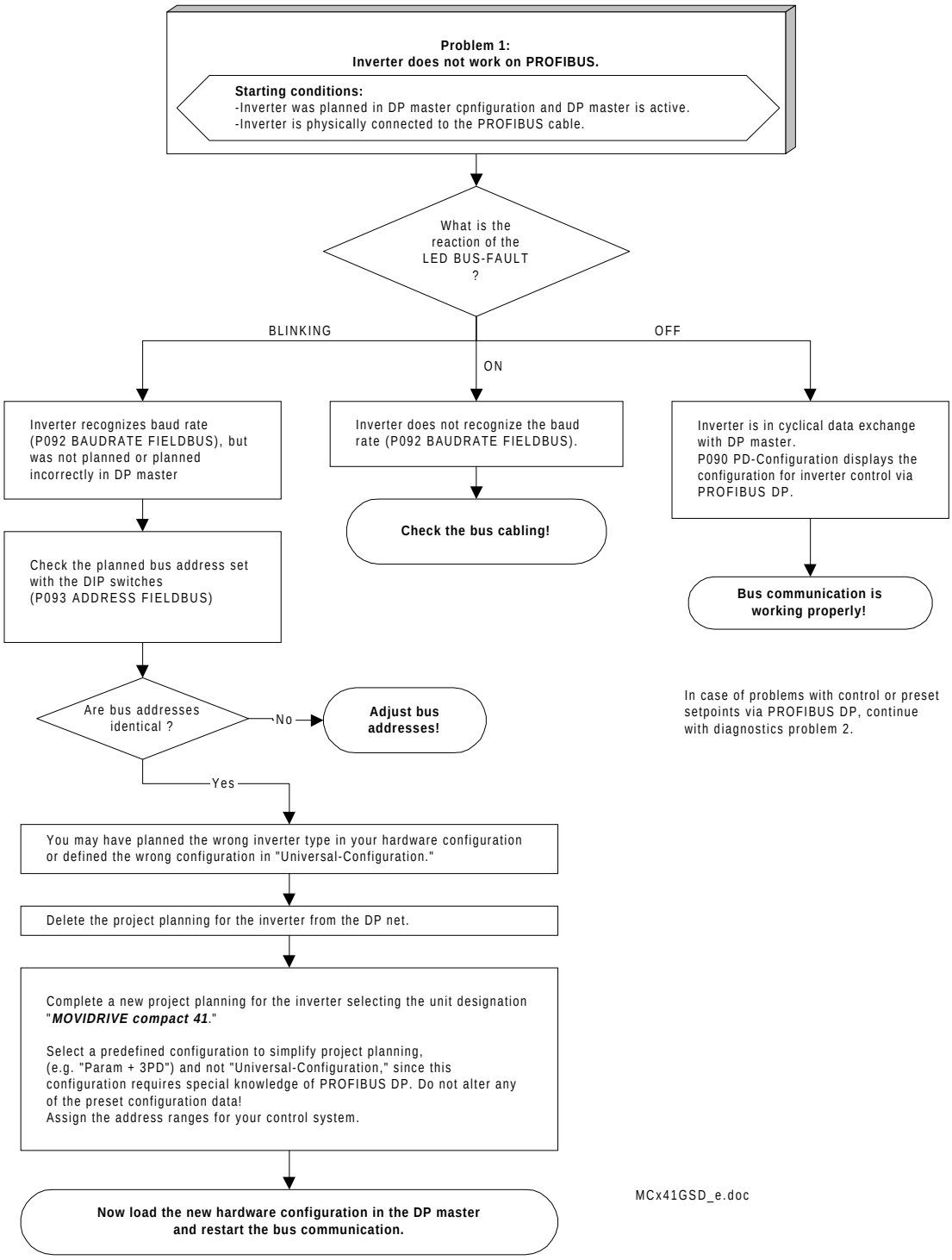
```
//Start of cyclical program processing in OB1
BEGIN
NETWORK
TITLE = Copy PI data from inverter to DB3, word 0/2/4
CALL SFC 14 (DPRD_DAT)              //Read DP slave record
   LADDR := W#16#240                //Input address 576
   RET_VAL:= MW 30                  //Result in flag word 30
   RECORD := P#DB3.DBX 0.0 BYTE 6   //Pointer

NETWORK
TITLE = PLC program with drive application
// PLC program uses the process data in DB3 for
// controlling the drive
L DB3.DBW 0                         //LOAD PI1 (status word 1)
L DB3.DBW 2                         //Load PI2 (actual speed value)
L DB3.DBW 4                         //Load PI3 (no function)

L W#16#0006                         //Write 6hex on PO1
T DB3.DBW 20                        //(control word = enable)

L 1500                              //Write 1500dec on PO2
T DB3.DBW 22                        //(speed setpoint = 300 rpm)

L W#16#0000                         //Write 0hex on PO3
T DB3.DBW 24                        //(no function, however)
//End of cyclical program processing in OB1

NETWORK
TITLE = Copy PO data from DB3, word 20/22/24 to inverter
CALL SFC 15 (DPWR_DAT)              //Write DP slave record
   LADDR := W#16#240                //Output address 576 = 240hex
   RECORD := P#DB3.DBX 20.0 BYTE 6  //Pointer to DB/DW
   RET_VAL:= MW 32                  //Result in flag word 32
```

Please refer to the Fieldbus Unit Profile manual (publication number 0919 1607) for more detailed information and sample applications for control via the process data channel, in particular concerning the coding of the control and status word.

7 PROFIBUS DP fault diagnosis

The following diagnostic procedures indicate the troubleshooting methods for the most frequent problems.

7.1 Inverter does not work on PROFIBUS DP



7.2 Inverter cannot be controlled via DP master