Application Note

Configuration of S7-300 with CPU315-2 DP and a Multiturn Encoder 9080/5860 as a PROFIBUS-DP Master

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1  Introduction

This manual describes the configuration of an S7-300 PLC with CPU 315-2 DP for PROFIBUS-DP Master to connect to a Kübler PROFIBUS-DP Slave. The example describes the configuration for four bytes input and four bytes output.

2  Hints and Validity

- This manual describes the S7-300 as Master on PROFIBUS-DP
- STEP7 Version 3.1 under Windows 95 > (already installed)
- This manual describes the configuration for a data exchange only. The PLC programmer is responsible for the error handling. This is not part of this manual.
3  Steps

3.1  Project

The first step is to create a project. To create a project select menu File - New - Project. Enter the name for the project, e.g. S7DPM.

3.2  Stations

This manual describes the configuration for a PRODIBUS-DP master a S7-300 and a Kübler PROFIBUS-DP slave. The next steps are to insert these two stations.

3.2.1  S7-300 Station

To insert the S7-300 station select menu Insert - Station - SIMATIC 300 Station.
3.2.2 Kübler Multiturn Encoder PROFIBUS-DP Slave

Later you will need the GSD file for the Kübler PROFIBUS-DP slave device. The following table shows the device and its corresponding GSD file name.

<table>
<thead>
<tr>
<th>Device</th>
<th>GSD file name</th>
<th>Slave type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiturn Encoder 9080</td>
<td>KUEB9080.GSD</td>
<td>Modular slave</td>
</tr>
<tr>
<td>Multiturn Encoder 5860</td>
<td>KUEB06AE.GSD</td>
<td>Modular slave</td>
</tr>
</tbody>
</table>

These files are on the Kübler CD-ROM named ProfibusDP Software or on the homepage of the PNO at [www.profibus.com](http://www.profibus.com) or on [www.kuebler.com](http://www.kuebler.com)
3.3 Hardware Configuration S7 300 Station

Open the software for hardware configuration of the S7 station.

Select the icon Hardware. Then select the menu **Edit - Open Object** or double click the Hardware icon to start the Hardware Configurator.

Select the menu **View - Catalog**.

Select now step by step the hardware components of the S7 300 station.
3.3.1 The Rail

3.3.2 The Power Supply
3.3.3 The CPU

Select for example CPU 315-2DP.

Because this CPU type is usable for PROFIBUS-DP the following window appears. Set the node is connected to the selected network to active.

Set the PROFIBUS address, e.g address 2.
Create a subnet by pressing the button New.

Select Network Settings to open the following window.

Select the transmission rate, e.g. 1.5 Mbps.
Select the Profile, e.g. the Distributed I/O profile.

Press several times OK to reach the following window.

Save the current setting by selecting the menu Station - Save.
3.3.4 Add GSD

Open the Explorer and copy the GSD file KUEB9080.GSD or KUEB06AE.GSD into the directory of C:\Siemens\Step7\S7data\GSD.

Then select the menu **Options - Update DDB Files**.

In the hardware catalogue you will find the Kübler PRODIBUS-DP slave now under section **Additional Field Devices**.
3.3.5 Insert PROFIBUS-DP Slave Device

Now select the line of **DP Master System (1)** by a click with the left mouse button on it! The line will become a **solid** line.

Select the folder of

- Kübler Multiturn Encoder 9080
- Kübler Multiturn Encoder 5860

and **drop it on the solid DP Master System (1) line**.

A window is opened to set the station address of this slave.
Press OK to open the following window.

**Properties - PROFINET Nodes**

- **General**
  - Check box: The node is connected to the selected network
  - **PROFINET**
    - **Address**: 8

- **Subnet**
  - **PROFINET:**
    - **PROFINET-DP**: 1.5 Mbit/s

- **OK**

Press the OK button.

**Eigenschaften - DP-Slave**

- **Allgemein**
  - **Bauphase**: 8.9080.xxxx.xxxx
  - **Bestellnummer**: 8.9080.xxxx.xxxx
  - **GSD-Datei (Typdrei)**: KUEB9080.GSD
  - **Familie**: Encoder
  - **DP-Slave-Typ**: Multiturn Encoder 9080 PROFIBUS
  - **Bezeichnung**: Multiturn Encoder 9080 PROFIBUS

- **Adresse**
  - **Dienstagadresse**: 1022

- **SYNC/FREEZE-Fähigkeiten**
  - **SYNC-fähig**: checked
  - **FREEZE-fähig**: unchecked

- **Teilnehmer/Mastersystem**
  - **PROFINET**: 3
  - **DP-Mastersystem (1)**

- **Kommentar**

- **OK**
3.3.6 Assigning addresses of **input and output**

Open the folder of the device in the hardware catalogue.
Select first the module **4 byte input (256)**. The following windows appears.

Set the start address of the **4 byte input** and press OK.

This address is very important for the PLC program.
Select first the module **and then** change the parameter e.g. scaling.
That module result in the value 256 ... 259.

3.3.7 Download the hardware configuration

Select the menu PLC - Download.

Select All and press OK.
Press OK. The Download Window shows Module currently being processed [0/0/2/0] CPU 315-2DP(1)

3.3.8 Save and Exit the Hardware Configurator

Select menu **Station - Save** and the select the menu **Station - Exit**.
3.4 Data Blocks

The data block contains the values that are **read and write** over the PROFIBUS. First the data blocks have to be created.

Select **Insert -S7 Block - Data Block**. Enter the number of the data block, e.g. DB1.

Press OK.
Now the dat block appears in the block container.

Select DB1 and then select the menu **Edit - Open Object** or double click the icon of DB1.

The software LAD/STL/FBD starts.

Press OK.
Enter name, type and initial value of DB1.

Select the menu **File - Save.**
Insert from the Library StdLib30 all OB necessary for your project, e.g. OB86.

Open OB1 and add the following program instructions.

```
Network 1

???

L DB100.DBW  0
T FAM  0
L PMW  0
T DB101.DBW  0
```

Select **File - Save** and **File - Exit**.

Select the menu **PLC - Download**.
3.5 Monitor/Modify Variables

Select the menu **View - Online**. Then select **CPU 315-2DP**. Then select the menu **PLC - Monitor/Modify Variables**.

Add the variables.  

Go online and monitor/modify values.