WAGO I/O SYSTEM 750

Configuration a Profibus-DP node using Step7 and WAGO-I/O components

Application note

A100800, English
Version 1.0.3

WAGO
INNOVATIVE CONNECTIONS

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WAGO Kontakttechnik GmbH & Co. KG
Hansastraße 27
D-32423 Minden

Phone: +49 (0) 571/8 87 – 0
Fax: +49 (0) 571/8 87 – 1 69

E-Mail: info@wago.com

Web: http://www.wago.com

Technical Support
Phone: +49 (0) 571/8 87 – 5 55
Fax: +49 (0) 571/8 87 – 4 30

E-Mail: support@wago.com

Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded we would appreciate any information or ideas at any time.

We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally trademark or patent protected.

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1 Important comments

To ensure fast installation and start-up of the units described in this manual, we strongly recommend that the following information and explanation is carefully read and adhered to.

1.1 Legal principles

1.1.1 Copyright

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1.1.2 Personnel qualification

The use of the product detailed in this manual is exclusively geared to specialists having qualifications in PLC programming, electrical specialists or persons instructed by electrical specialists who are also familiar with the valid standards. WAGO Kontakttechnik GmbH & Co. KG declines all liability resulting from improper action and damage to WAGO products and third party products due to non-observance of the information contained in this manual.

1.1.3 Intended use

For each individual application, the components supplied are to work with a dedicated hardware and software configuration. Modifications are only admitted within the framework of the possibilities documented in the manuals. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please direct any requirements pertaining to a modified and/or new hardware or software configuration directly to WAGO Kontakttechnik GmbH & Co. KG.

1.2 Range of validity

This application note is based on the stated hardware and software of the specific manufacturer as well as the correspondent documentation. This application note is therefore only valid for the described installation.

New hardware and software versions may need to be handled differently. Please note the detailed description in the specific manuals.

2 Description

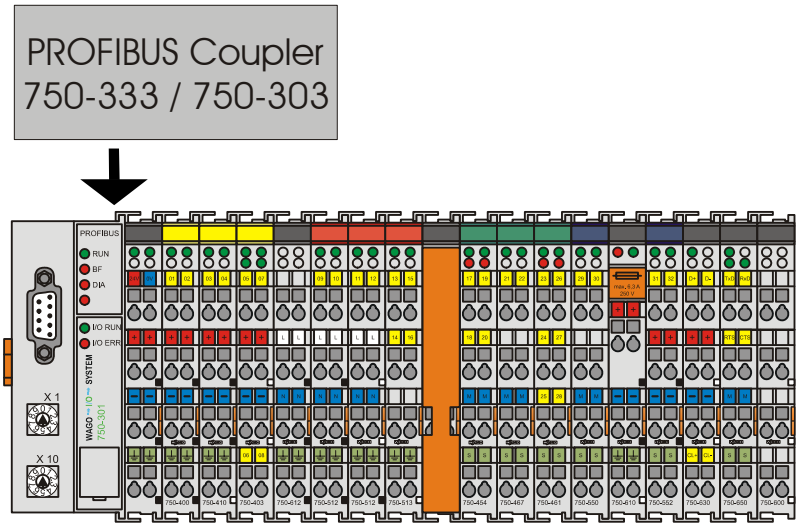
This application note should provide information on setting up a Profibus-DP network using WAGO I/O hardware components and the Simatic Step7 configuration software.

3 Reference Material

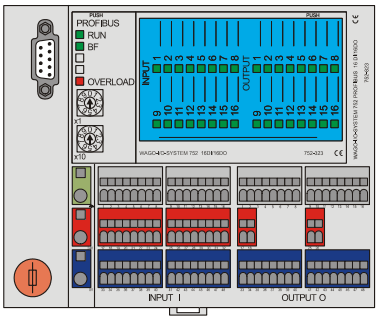
3.1 Hardware

WAGO offers different modules for the Profibus-DP. On the one hand there are the compact modules within the series 752 and 755 with fixed input and output sizesand on the other hand is the modular 750 series.

Series 750



Series 752

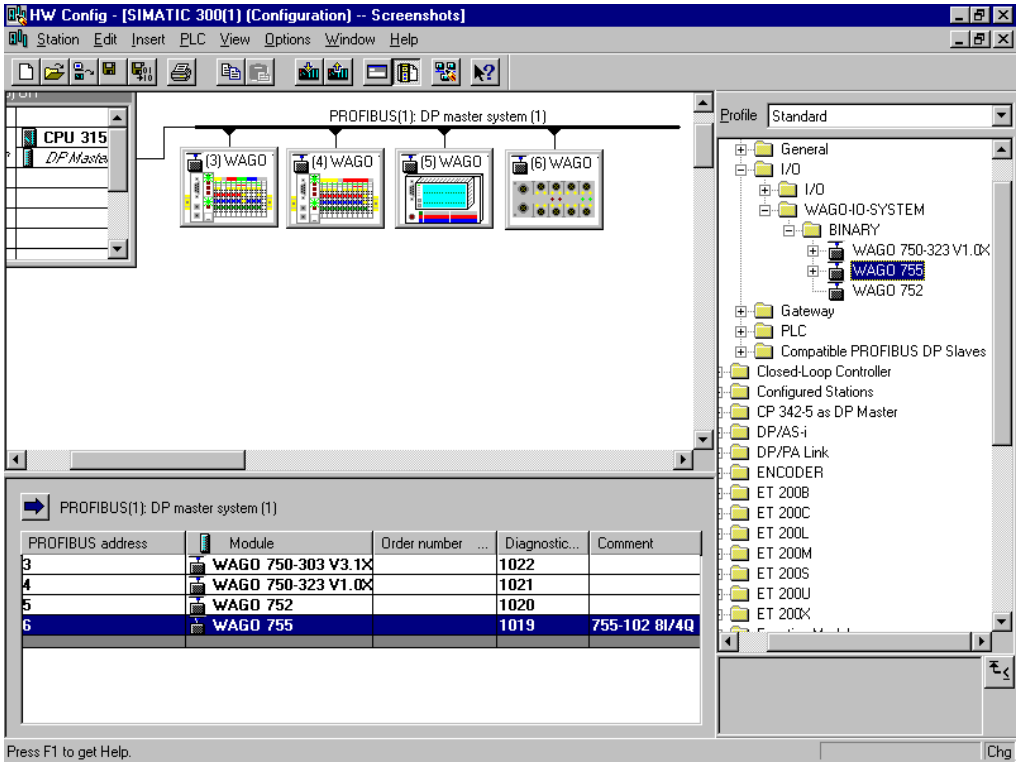


Series 755

3.2 Software

Configurating software Simatic Step7 (version 5)

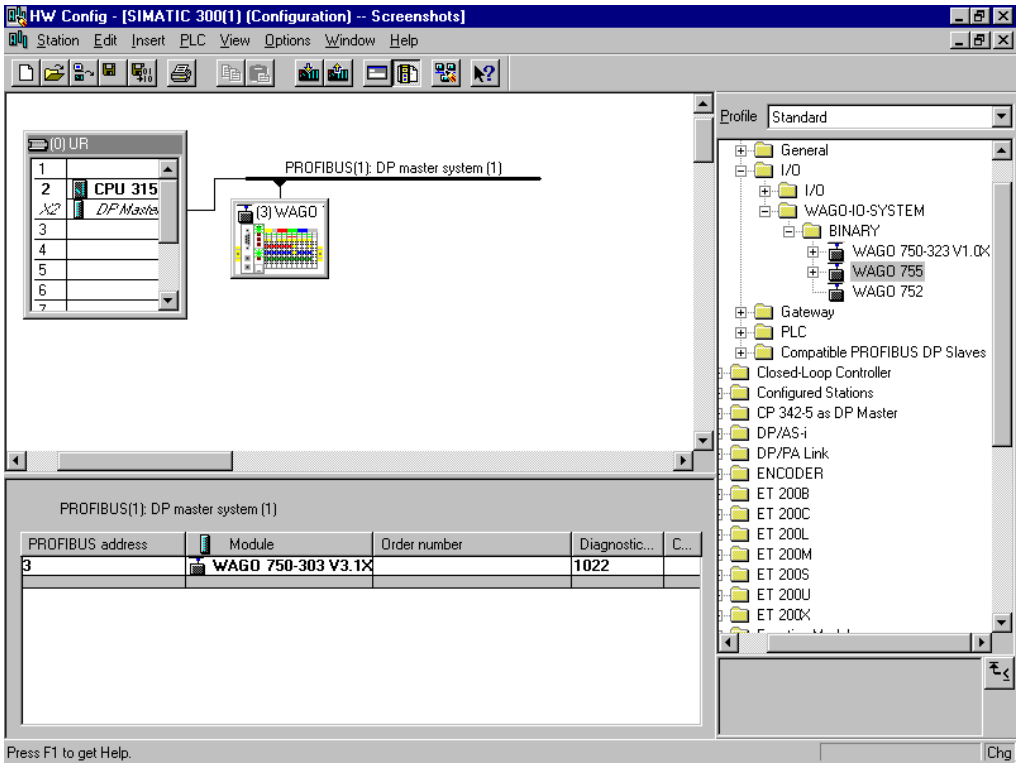
Simatic Step7 offers the user the ability to configure a Profibus-DP network. Within the hardware configuration, choose the item for **PROFIBUS DP** components **(Catalog** must be set to active under the **View** Menu). Open the folders **Additional Devices** and **General,** then select the appropriate modules. If there are no WAGO modules listed, the WAGO GSD files must be installed first (see chapter 3.3). I/O mapping of the different bus modules can also be done.



3.3 Implementig GSD files for the WAGO components

3.3.1 How can I get the GSD files ?

You may order the GSD files using the part no. 750-910.
Furthermore you may obtain those files free off charge via the internet at (WWW//:Wago.com).Go to the download area under the support menu and select the item for **GSD- and type files for Profibus with installation programm.** Start the `setup` programm (GSDSetup.exe).
If the dialog for “Choose Components” appears, select **Standard Configuration Files.** The setup programm will install the WAGO files in the appropriate Siemens folders.Update the catalog by chosing the update command from the **Options** menu. Now youwill find the WAGO Profibus-DP modules in the folders for either **Additional field devices** or **Genera**l.



4 Solution

4.1 Configurating a node using components serie 750

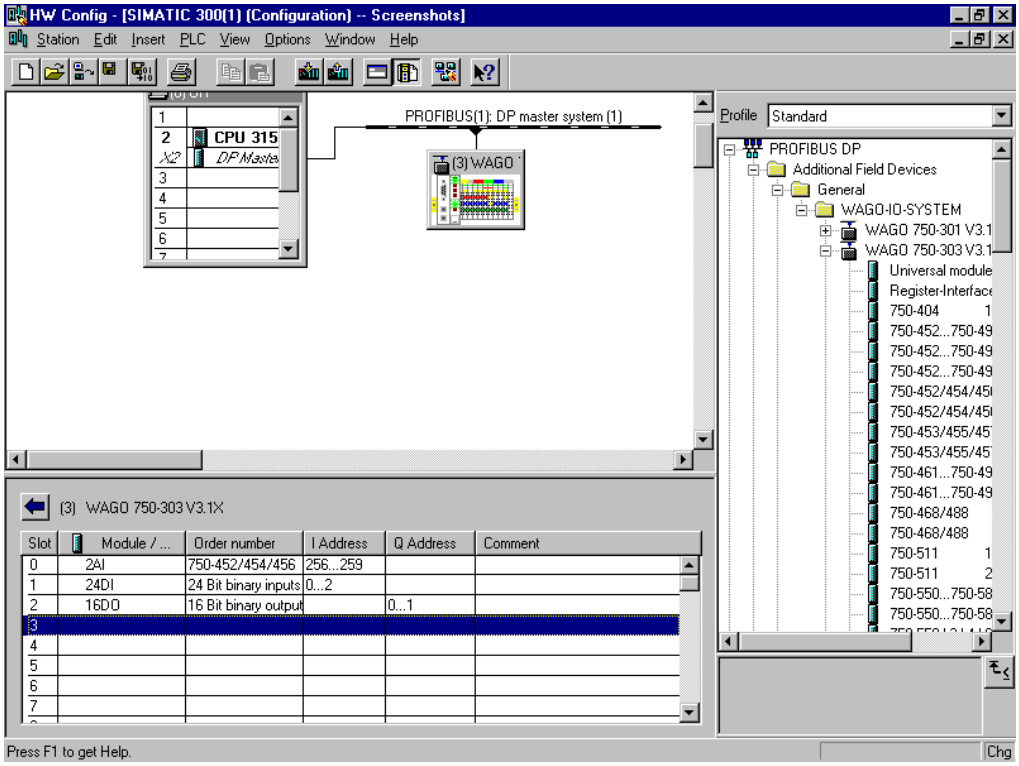
The principle layout of a WAGO I/O node is shown in picture 3. You find different types of modules as digital, analog and complex. No special order is required when mounting modules. Configuring your node, choose the hardware configuration menu and mark the Profibus-Master system (a table with rows for the different modules will be opened). Select Profibus-DP and open the folders **Additional field devices** and **Genera**l. Select your bus coupler module and place it with a double click on the network. A window will open asking for the WAGO node address. Choose any number from 0 to 99 and make sure this number matches with the switch settings on the coupler module. After placing the coupler on the network you have to specify the exact node configuration. By clicking on the WAGO node a table will open. Fill in this table according to the order of modules. Therefore open the bus coupler folder and choose the appropriate items. Mark a row in the configuration table and start inserting your modules.

4.1.1 Buscoupler 750-333

The first module should be **750-333 No PI-Channel**. Now insert the modules exactly by the order they are plugged to the coupler. For each module you have to distinguish between a ***-Entry** or a direct module Entry (*750-402 or 750-402). A direct entry will cause the main plc to reserve address space for the module. The *-entry allows to save address space, which is especially useful for digital modules. The entry 750-400 will reserve 8 bit in the main plc, thouth the module only offers 2 bit of information. To fill in the following bits it is useful to choose the *-entry for the next modules **(*750-400).**

4.1.2 Buscoupler 750-303

according to the following rule: **first the analog and complex modules in the order they are placed at the node and then the digital ones.** Digital modules will be configured according to the total amount of input and output channels. Calculate the number of digital inputs and choose the next higher entry of the list ,e.g. 20 digital inputs have to be configured as 24 digital input.



The I- and Q-address is automatically assigned by the Step 7 software. You may reassign addresses.

4.2 Access to process data

Bit, byte, word and dword values can be directly read and written in the process image.

Continuous reading and writing is required when using complex modules with a data width of more than 4 bytes (e.g. 750-404 “up/down counter).

The SFC14 and SFC15 function blocks are required for the continuous reading or writing of 3 bytes or more to and from a DP normslave. The maximum length depends on the CPU (see technical data of the CPU).

The following parameters are assigned to the function blocks:
- LADDR: Start address in DP normslave.
- RECORD: Local memory area.
- RET_VAL: Address for error message output.

The length of the target area must be the same as the length of the module that has been configured using Step7.

The continuous data of a DP normslave can be read using the SFC14 „DPRD_DAT“ (read continuous data from a DP normslave).
After successful reading, the LADDR data is entered into the target area (RECORD).

The continuous data of a DP normslave can be written using the SFC15 „DPWD_DAT“ (write continuous data to a DP normslave).
After successful writing, the RECORD data is entered into the target area (LADDR).

Example:
Read 6 bytes from L2DP starting from address EB100(0x64) and write them to MB100.

```
CALL SFC 14
   LADDR  := W#16#64             Read from address EB100
   RET_VAL:= MW20                Error messages to MW20
   RECORD := P#M 100.0 BYTE 6    Write 6 bytes into MB100
```

Example:
Read 5 bytes from MB120 and write them to L2DP starting from address AB80(0x50).

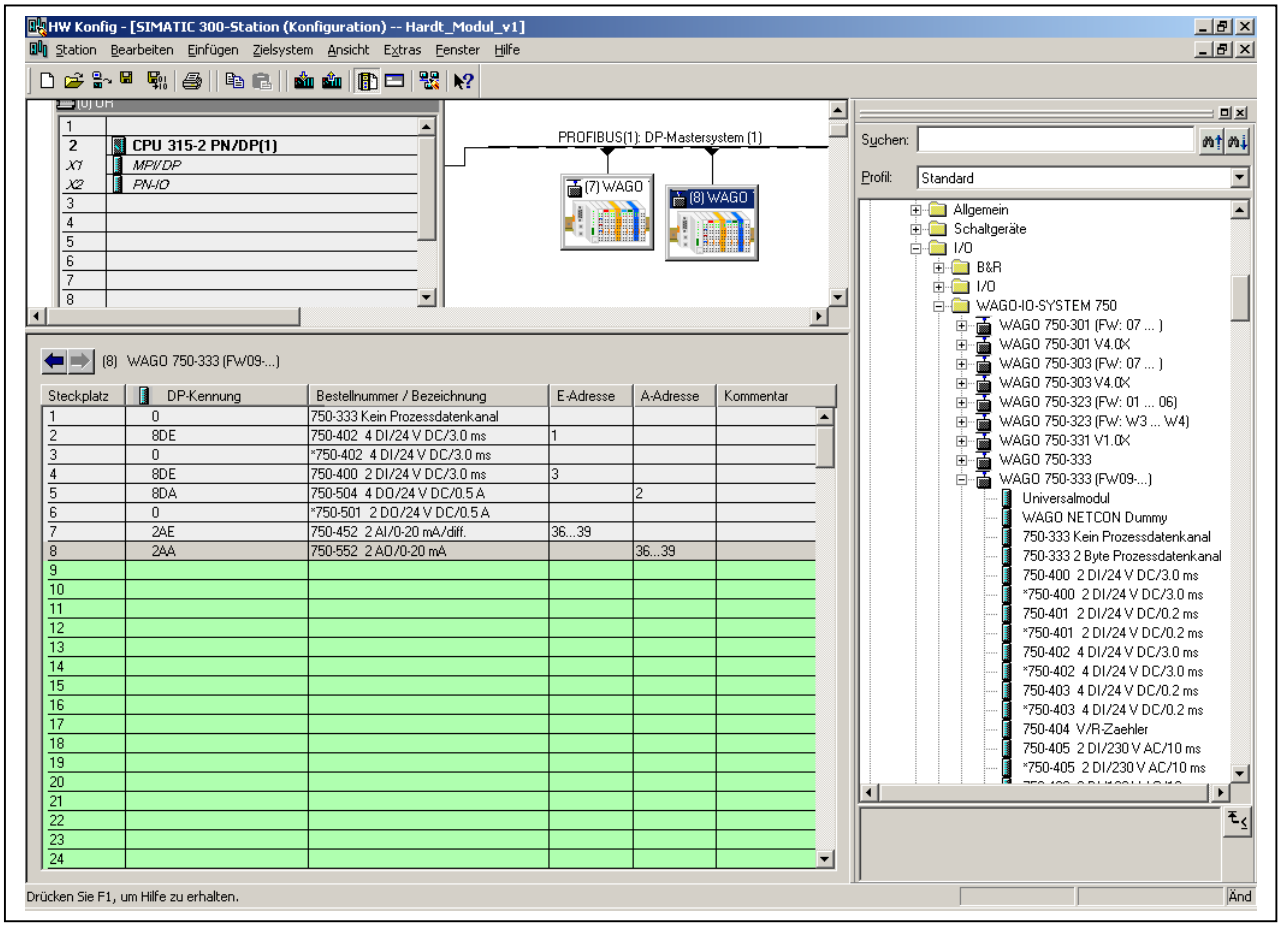
```
CALL SFC 15
   LADDR  := W#16#50             Write to address AB80
   RECORD := P#M 120.0 BYTE 5    Read 5 bytes from MB100
   RET_VAL:= MW24                Error messages to MW24
```

5 Examples

5.1 Bus coupler 750-333

Using a SIMATIC S7-315/DP
and a WAGO 750-333 bus coupler with
-10 digital inputs (750-402, 750-402, 750-400)
- 6 digital outputs (750-504, 750-501)
- 2 analog inputs (750-452)
- 2 analog outputs (750-552)
the configuration will be explained.

5.1.1 Profibus-DP configuration



The first module should be a 750-333 No PI-Channel (will be inserted automatically by the Simatic Manager).

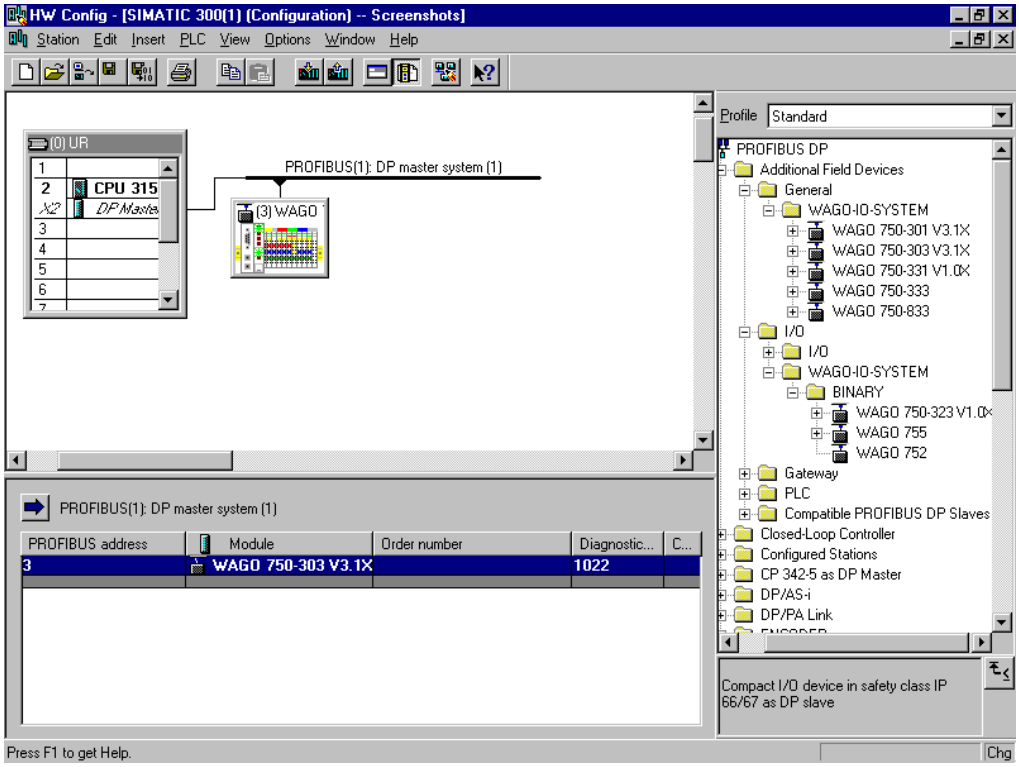
The first digital module should be a “750-402”. Since this module provides only 4 bit, the next entry is a “*750-402. The first byte is completed by the 4 bits of the second module. Therefore the next entry should be “750-400”. The addresses in the main plc are listed below:

Modul	Adresse
750-402	E1.0 - E1.3
750-402	E1.4 - E1.7
750-400	E3.0 - E3.1
750-504	A2.0 - A2.3
750-501	A2.4 - A2.5
750-452	EW36,EW38
750-552	AW36,AW38

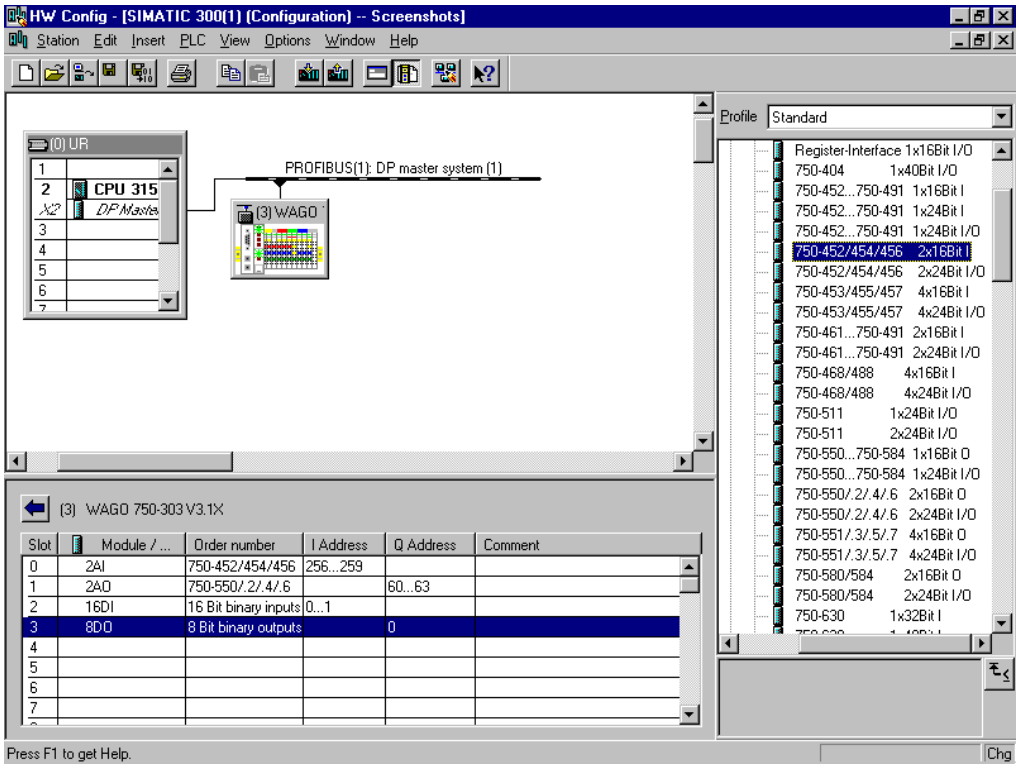
5.2 Bus coupler 750-303

Using a SIMATIC S7-315/DP
and a WAGO 750-303 bus coupler with
-10 digital inputs (750-402, 750-402, 750-400)
- 6 digital outputs (750-504, 750-501)
- 2 analog inputs (750-452)
- 2 analog outputs (750-552)
the configuration will be explained.

5.2.1 Profibus-DP configuration



5.2.2 Node specification



Important: The analog and complex modules have to be configured first (in this example slot 0 and 1).

digital input I0.0-I0.7;I1.0-I1.7
digital output Q0.0-Q0.7
analog input IW 60, IW 62
analog output QW 60, QW 62

WAGO Kontakttechnik GmbH & Co. KG
Postfach 2880 • D-32385 Minden
Hansastraße 27 • D-32423 Minden
Telefon: 05 71/8 87 – 0
Telefax: 05 71/8 87 – 1 69
E-Mail: info@wago.com

Internet: http://www.wago.com