SIEMENS

SIMIT 7

Profibus DP Gateway

User Manual

SIEMENS

Edition

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Siemens offers simulation software to plan, simulate and optimize plants and machines. The simulation- and optimization-results are only non-binding suggestions for the user. The quality of the simulation and optimizing results depend on the correctness and the completeness of the input data. Therefore, the input data and the results have to be validated by the user.

Siemens AG
Industry Sector
Industry Automation Division
Process Automation

SIMIT HB-V7Profibus-2013-01-en

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1 PREFACE

1.1 Target Group

This manual addresses you as a user of the SIMIT simulation system. Here you will get to know how to use and handle a Profibus-DP gateway in SIMIT.

As a prerequisite you need to be familiar with the general use of a personal computer and windows. Furthermore, knowledge of both SIMIT as well as common features of all SIMIT gateways is required, as described in the SIMIT gateways manual. Since Profibus-DP is one of SIMITs SIMATIC gateways, you also need to know the common aspects of all SIMATIC gateways, as described in the SIMIT gateways manual.

1.2 Content

Chapter 2 shows how the Profibus-DP gateway works. Basic principles are described as well as hardware interfaces required. Configurations supported are visualized for easier understanding.

Chapter 3 provides information how to configure a Profibus-DP gateway. You learn how to add a gateway and how to configure it by importing data from your SIMATIC project.

The Profibus DP gateways editor is described in chapter 4. Here you find all necessary information to edit both signals as well as the gateways properties.

Chapter 5 focuses on special topics with respect to failsafe and redundant systems.

Chapter 6 concudes with a description of how to configure the Profibus-DP gateway.

1.3 Symbols

Particularly important information is highlighted in the text as follows:

NOTE

Notes contain important supplementary information about the documentation contents. They also highlight those properties of the system or operator input to which we want to draw particular attention.

CAUTION

This means that the system will not respond as described if the specified precautionary measures are not applied.

WARNING

This means that the system may suffer irreparable damage or that data may be lost if the relevant precautionary measures are not applied.

2 FUNCTIONING OF THE PROFIBUS DP GATEWAY

SIMIT simulates the behavior of the Profibus DP slaves on the bus and allows data to be exchanged between the Profibus DP masters and SIMIT. Dedicated hardware interface modules are required for SIMIT to communicate with Profibus DP masters.

NOTE

SIMIT simulates the behavior of the Profibus DP slaves. In principle it does not matter which Profibus DP Master is connected. However, the Profibus DP gateway is configured by use of data that is output from the HW Config tool (STEP 7 Software). Therefore, the configuration that is to be simulated has to be created using the HW Config tool.

2.1 How it works

To illustrate the principle of the Profibus DP gateway with SIMIT, as shown in Figure 2-1, it is assumed that a non-redundant automation system with a single Profibus DP master system are to be configured. A dedicated Profibus DP interface module then forms the gateway between SIMIT and the PLC. The Profibus DP cable is connected to the interface module instead of the Profibus slaves (see Figure 2-2).

The interface module simulates the configured Profibus DP slaves, i.e. it communicates with the Profibus DP Master in exactly the same way as with the Profibus DP slaves. Otherwise communication via the Profibus DP would not be error free.

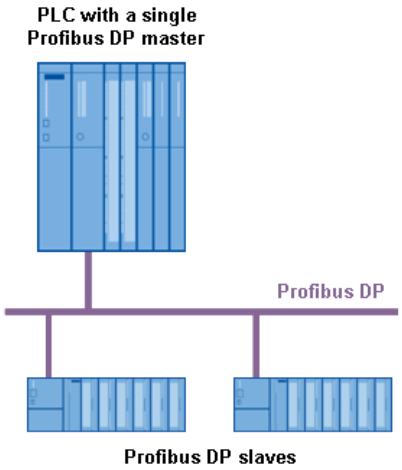

Figure 2-1: Configuration with a single fieldbus Profibus DP

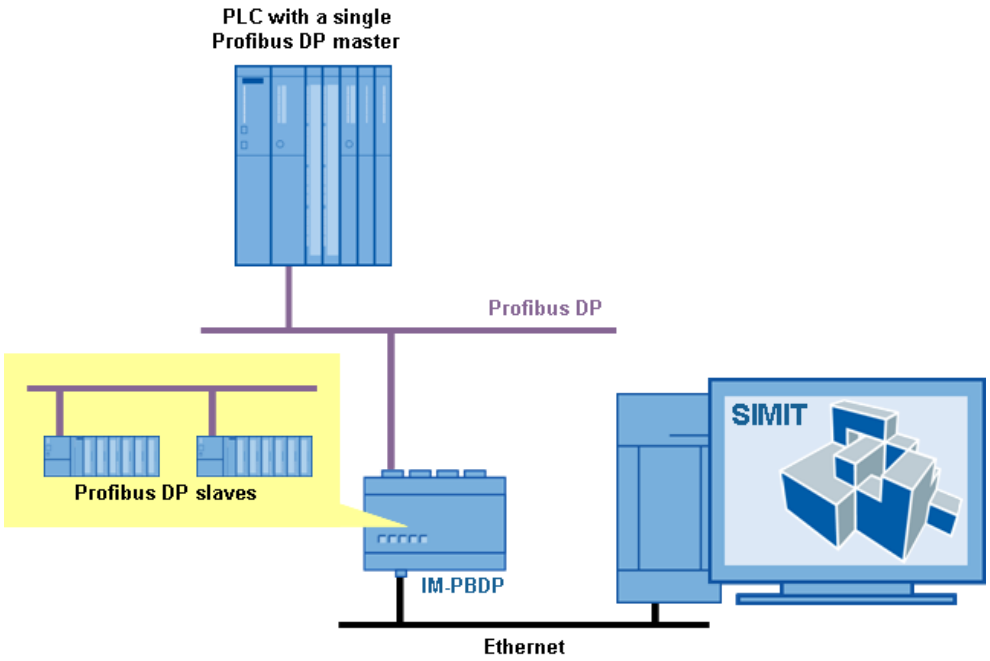

Figure 2-2: SIMIT interface for Profibus DP

2.2 The Profibus DP interface module

The Profibus DP interface module is available in several configurations:

- IM-PBDP-2
  Two-channel interface module, simulating a maximum of 125 profibus slaves per channel.
- IM-PBDP-4
  Four-channel interface module, simulating a maximum of 125 profibus slaves per channel.
- IM-PBDP-8
  Eight-channel interface module, simulating a maximum of 125 profibus slaves per channel.

The interface module is always equipped with eight profibus plugs: four on each the upper and the lower side of the module (see Figure 2-3). Depending on the configuration the first two, first four or all eight plugs are usable, labeled CH0 through CH7.

Please plug the connection cable to your PC to the RJ45 plug labeled *Control Port 1*. A crossed or uncrossed LAN cable (twisted pair) can be used as connection cable to the interface module, as its port supports auto-crossover.

A 24V – 1300mA DC power supply is needed to operate each interface. This power supply is not supplied with the interface. The interface has a socket labeled *PS1* for a main power adapter with a round plug. Where appropriate, you can also use the 24V power supply of a SIMATIC S7-300 and connect it to the interface with a 2-pin plug-in terminal block.

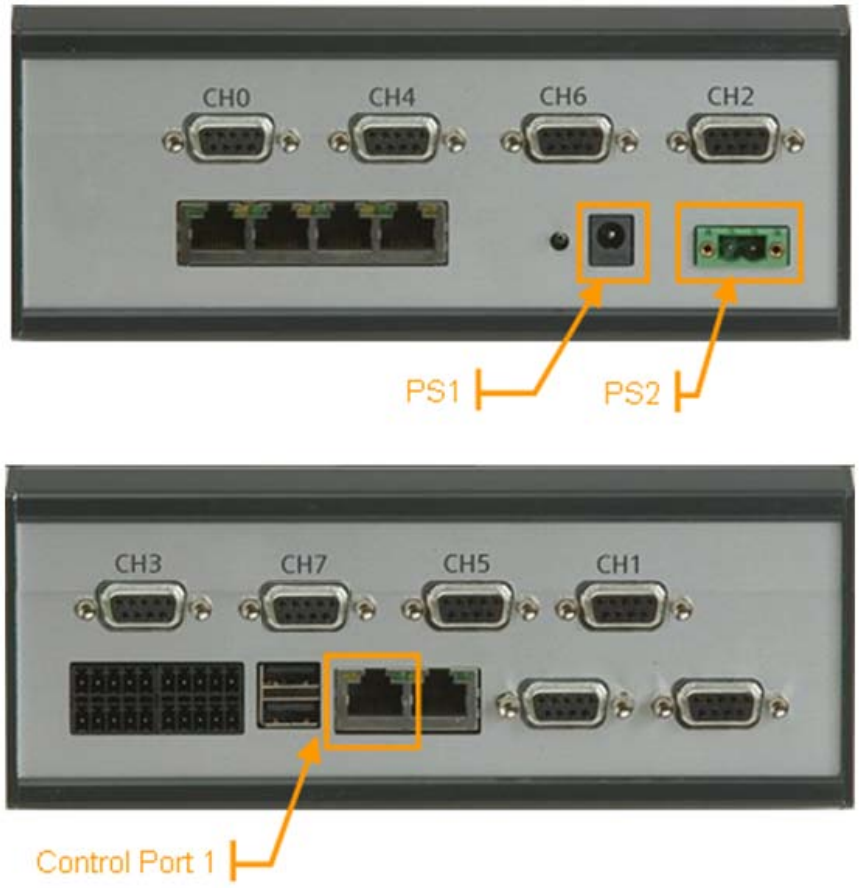

Figure 2-3: Connections of the Profibus DP interface module

2.3 Supported Profibus DP configurations

Typical Profibus DP configurations supported by SIMIT are listed in the following section. The illustration on the left of each figure shows how the automation system is actually configured, the one on the right shows the configuration with SIMIT. This section contains examples of configurations with non-redundant automation systems

- Automation system with a single bus (Figure 2-4),
- Two automation systems, each with a single bus (Figure 2-5),
- Automation system with two buses (Figure 2-6) and
- Two automation systems with one common bus (Figure 2-7).

The following examples of redundant configurations are provided:

- A redundant automation system with a redundant fieldbus (Figure 2-8),
- Two redundant automation systems, each with a redundant fieldbus (Figure 2-9) and
- Two redundant automation systems with a one-sided fieldbus only (Figure 2-10).

For all configurations, a mixed configuration of real and simulated Profibus DP slaves is possible.

Bus couplers can also be used, either as DP-DP couplers, as DP-PA couplers, or in redundant configurations as a "Y link".

Fail-safe peripherals can also be simulated in redundant H/F systems.

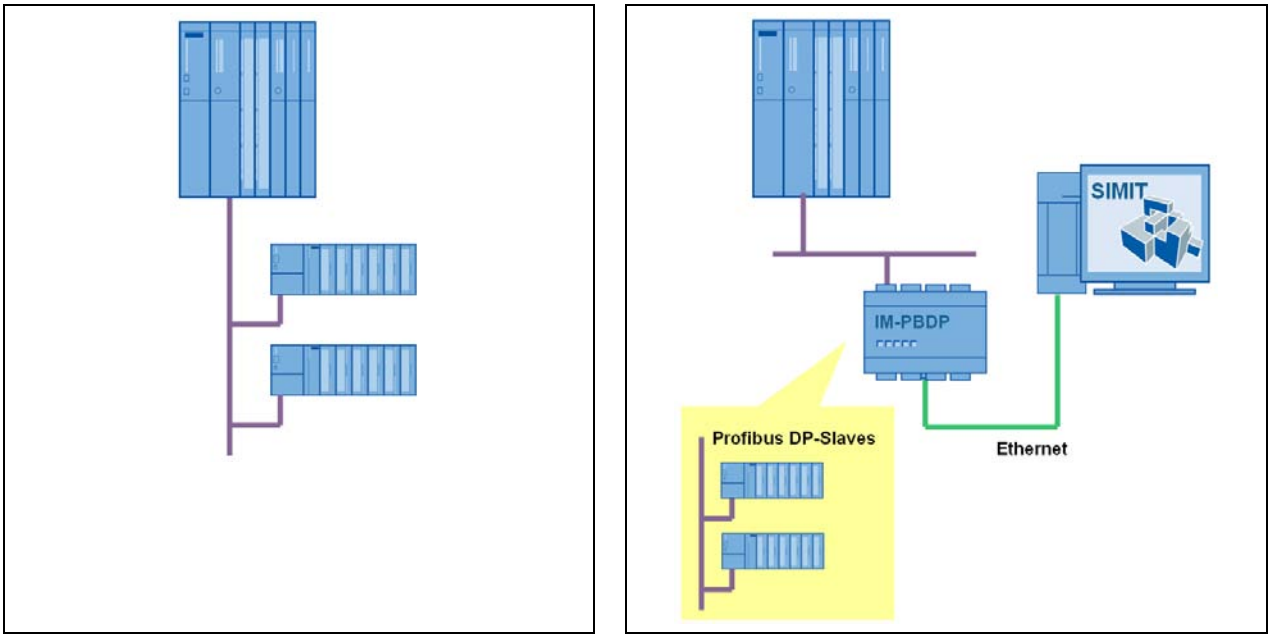

Figure 2-4: Non-redundant automation system with a single fieldbus

NOTE

In this configuration, only one channel of a multi channel module is used.

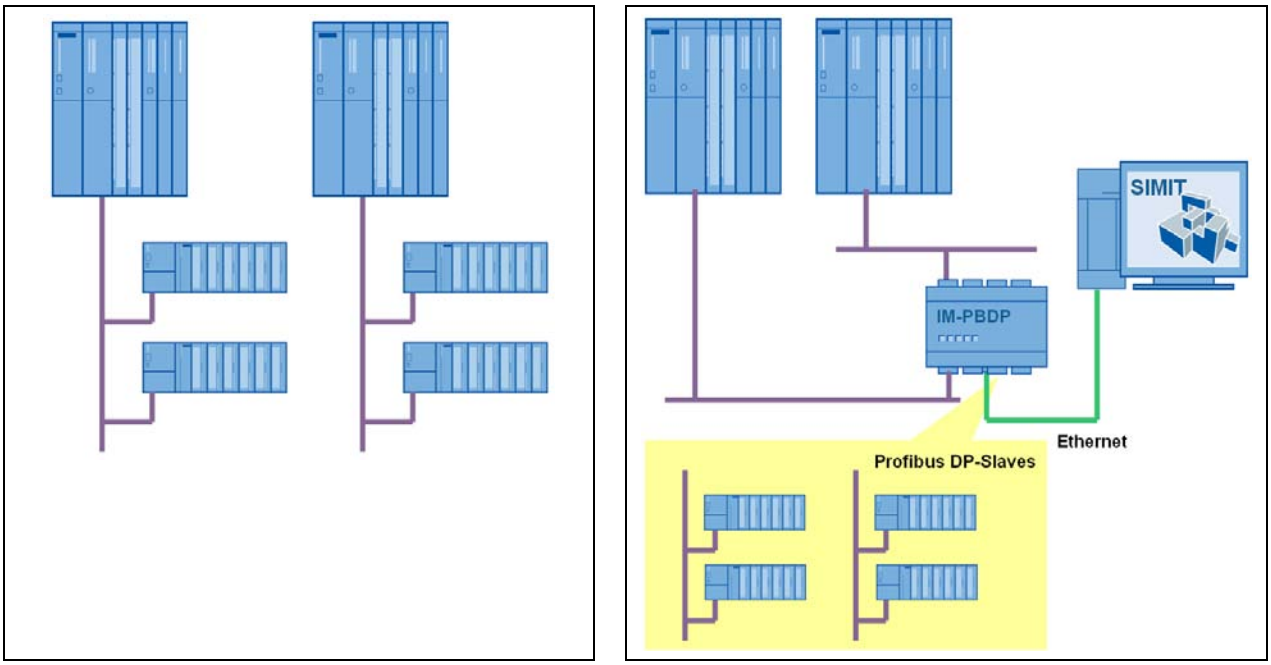

Figure 2-5: Two non-redundant automation systems, each with a single fieldbus

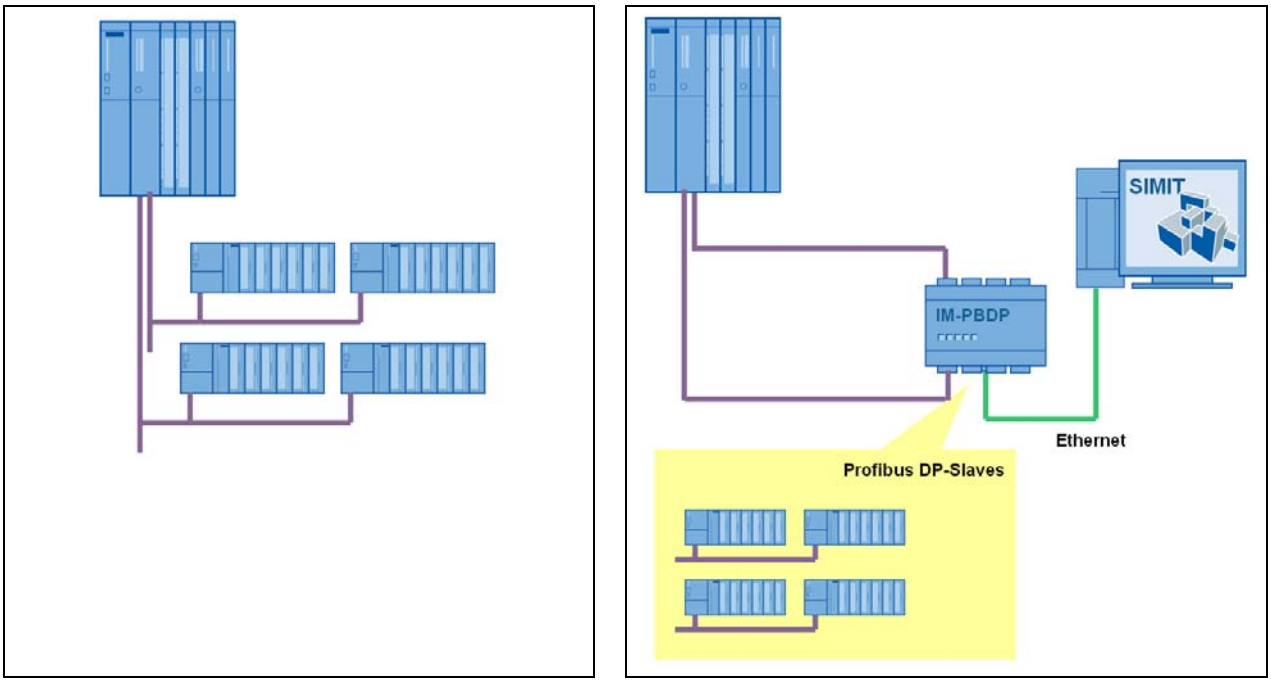

Figure 2-6: A non-redundant automation system with two fieldbuses

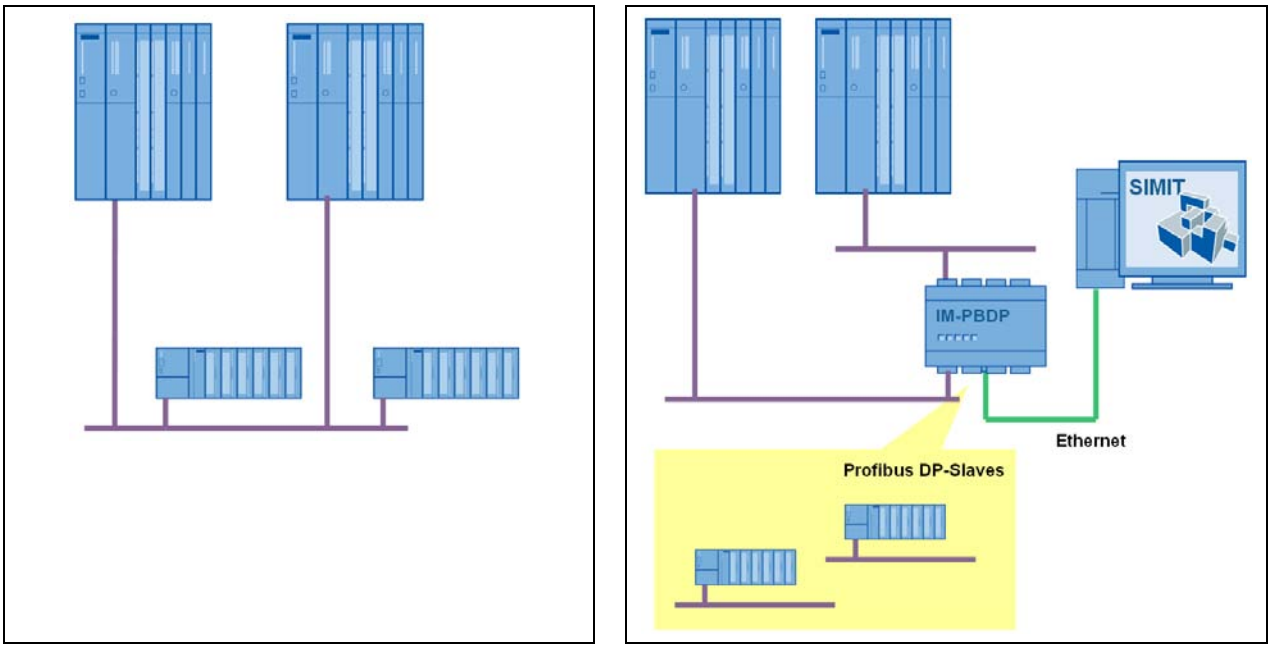

Figure 2-7: Two non-redundant automation systems on a common fieldbus

For each PLC, corresponding system data blocks are created with SIMATIC Manager (HW Config). One of the system data blocks must be loaded onto each of the two channels of the interface module (see chapter 3).

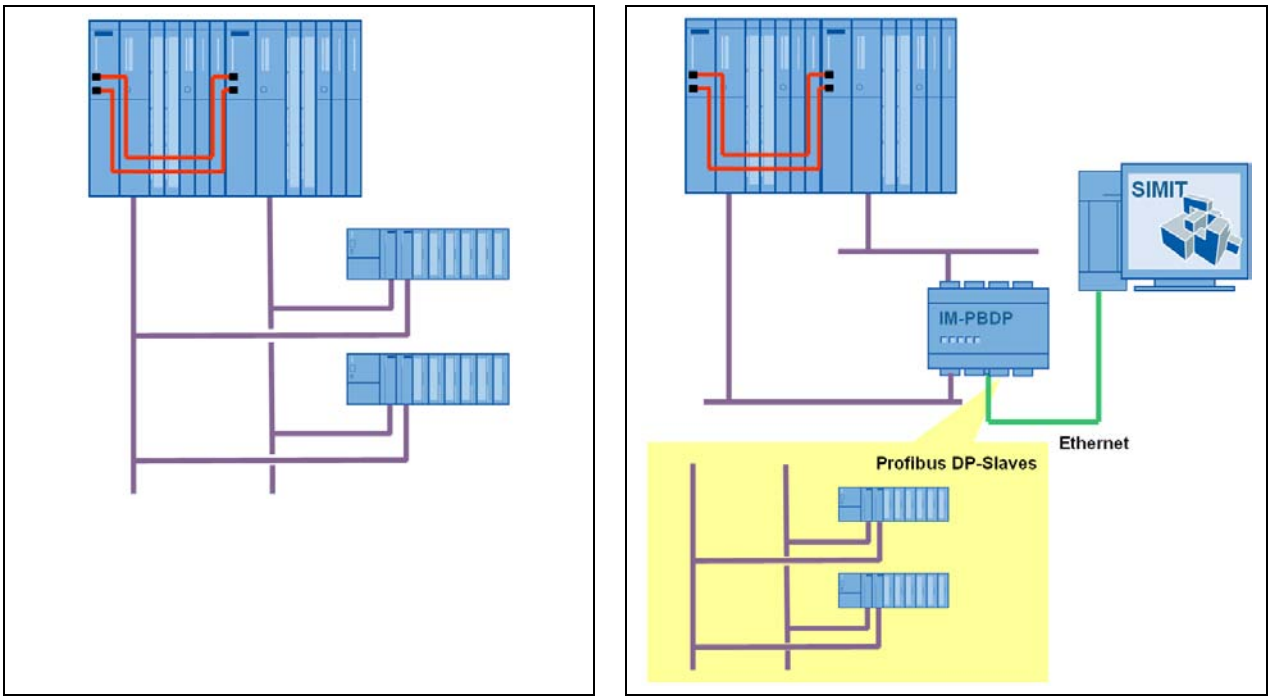

Figure 2-8: A redundant automation system with a redundant fieldbus

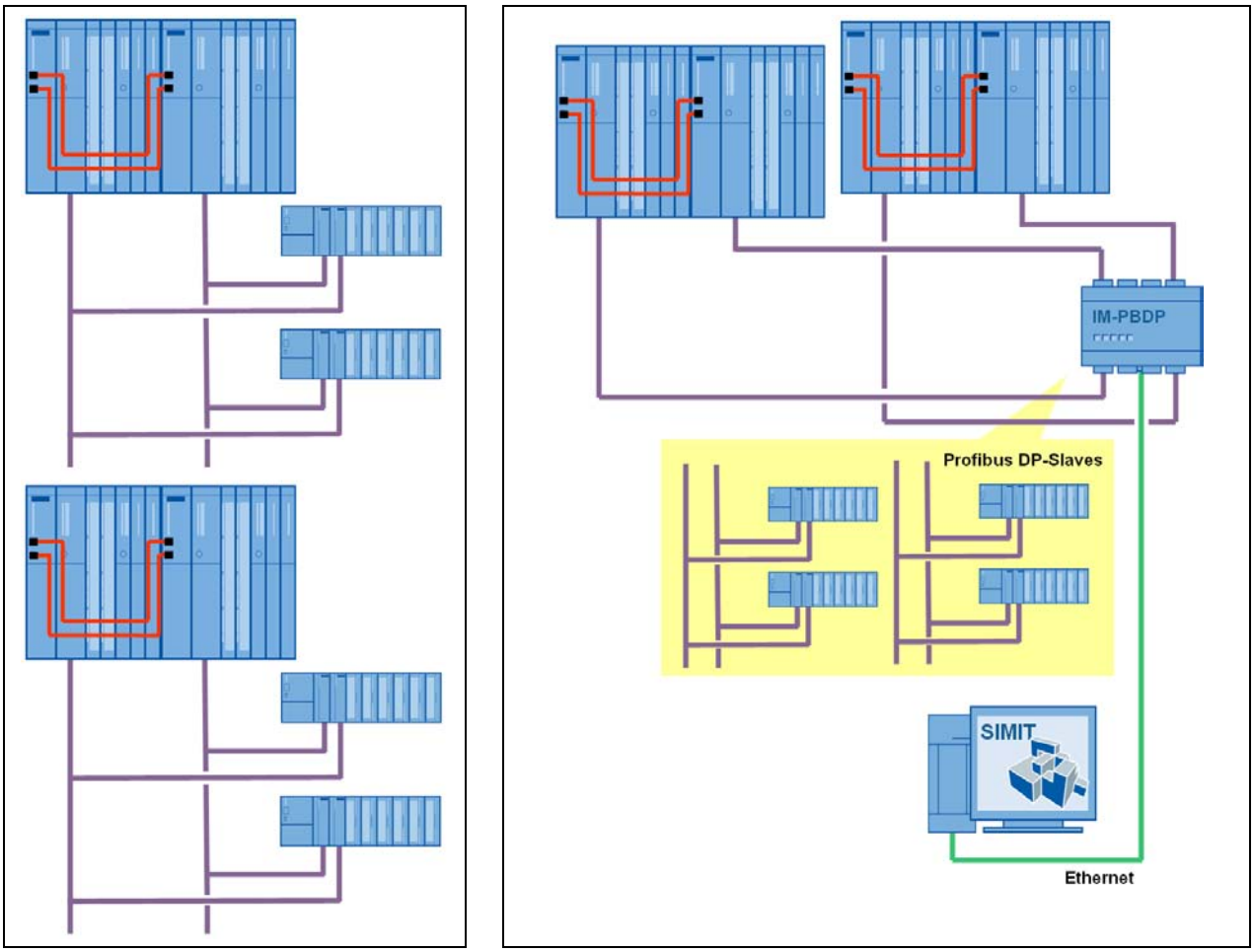

Figure 2-9: Two redundant automation systems, each with a redundant

fieldbus

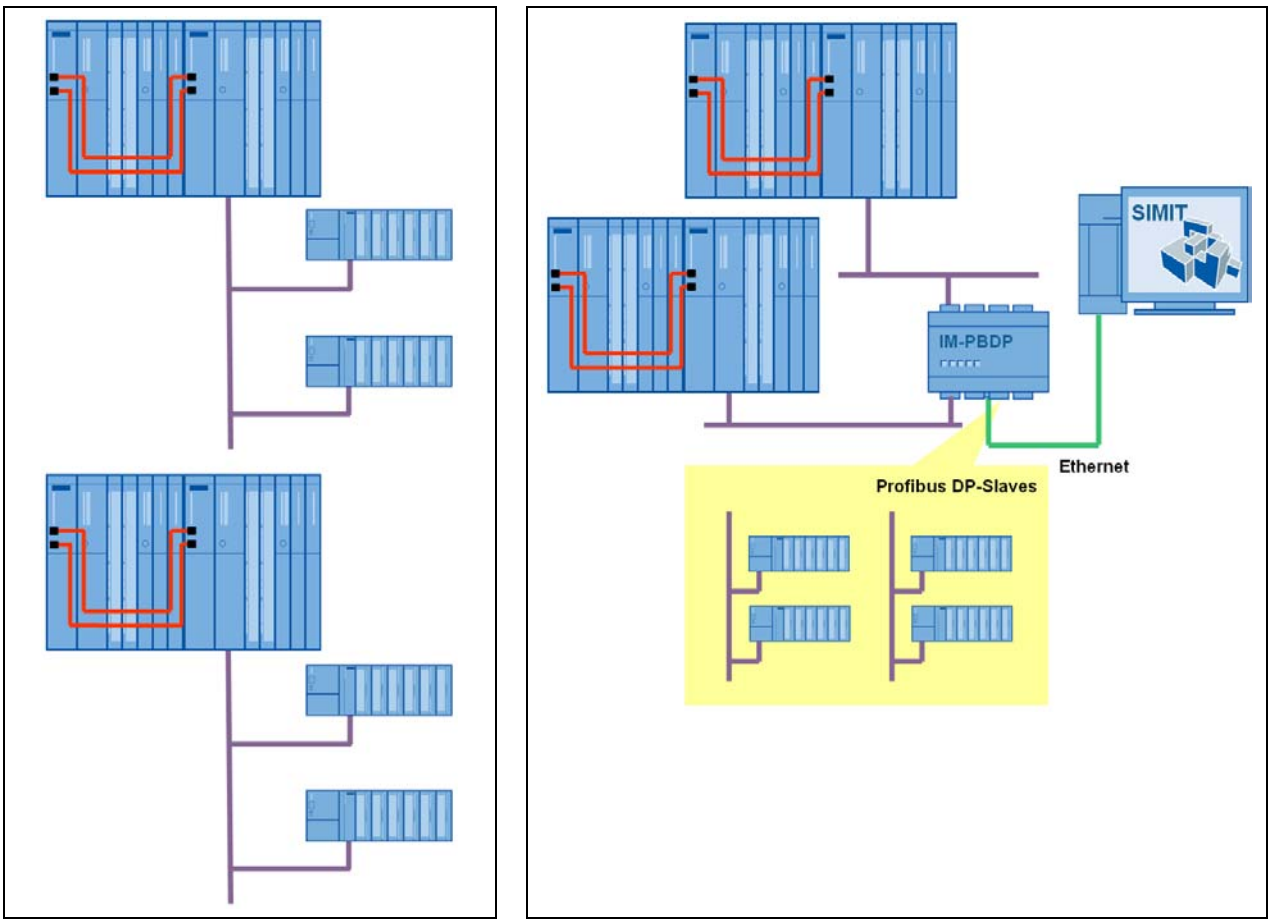

Figure 2-10: Two redundant automation systems with a one-sided fieldbus

3 CONFIGURING THE PROFIBUS DP GATEWAY

To configure a Profibus DP gateway, three steps are required:

1. Adding the gateway
2. Importing the system data block and optionally a symbol table
3. Assigning a channel in the interface module

For each Profibus DP master system one gateway is to be configured according to this scheme.

3.1 Adding a Profibus DP gateway

Double click *New Gateway* (

) in the project navigation to create a new gateway and select *Profibus DP* in the selection dialog to follow (see Figure 3-1).

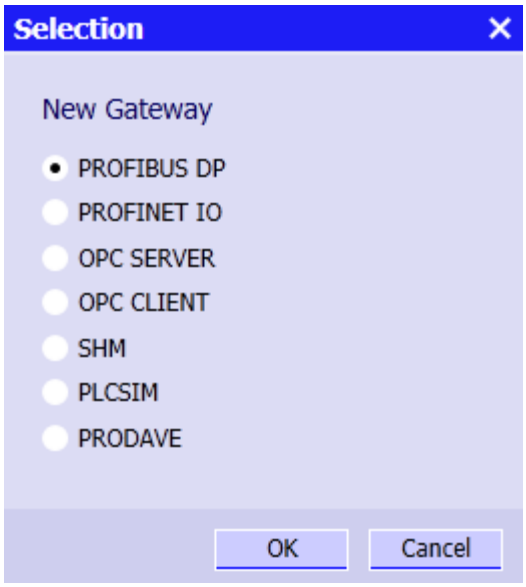

Figure 3-1: Choosing a gateway

As name of the gateway you may use the default name *Profibus* or assign an arbitrary name.

3.2 Importing system data blocks

After adding the gateway select the system data block (sdb file) in the import dialog (see Figure 3-2). Optionally you may also import a symbol table.

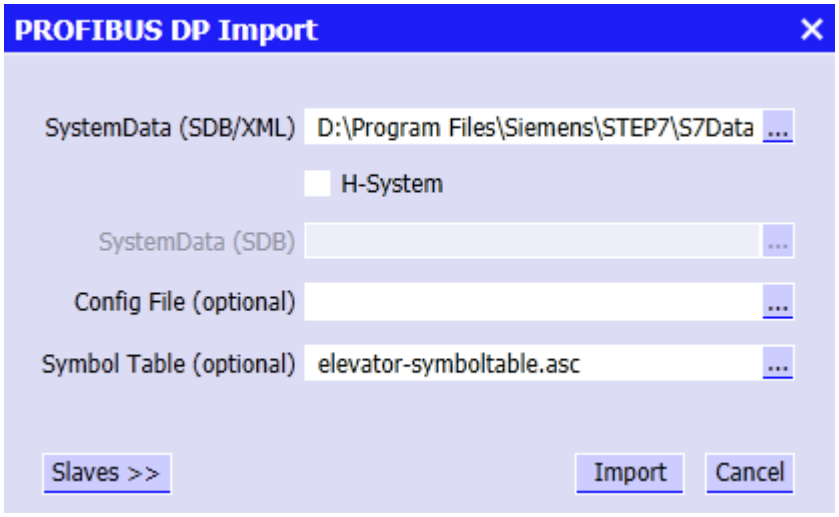

Figure 3-2: Import-Dialog in the Profibus DP gateway

For each Profibus DP master system a set of system data blocks is created (sdb files). To select a system data block just filter the file chooser to *System data block (filtered)*. In addition to standard file information the title bar will display the number of the master system and the number of slaves (see Figure 3-3).

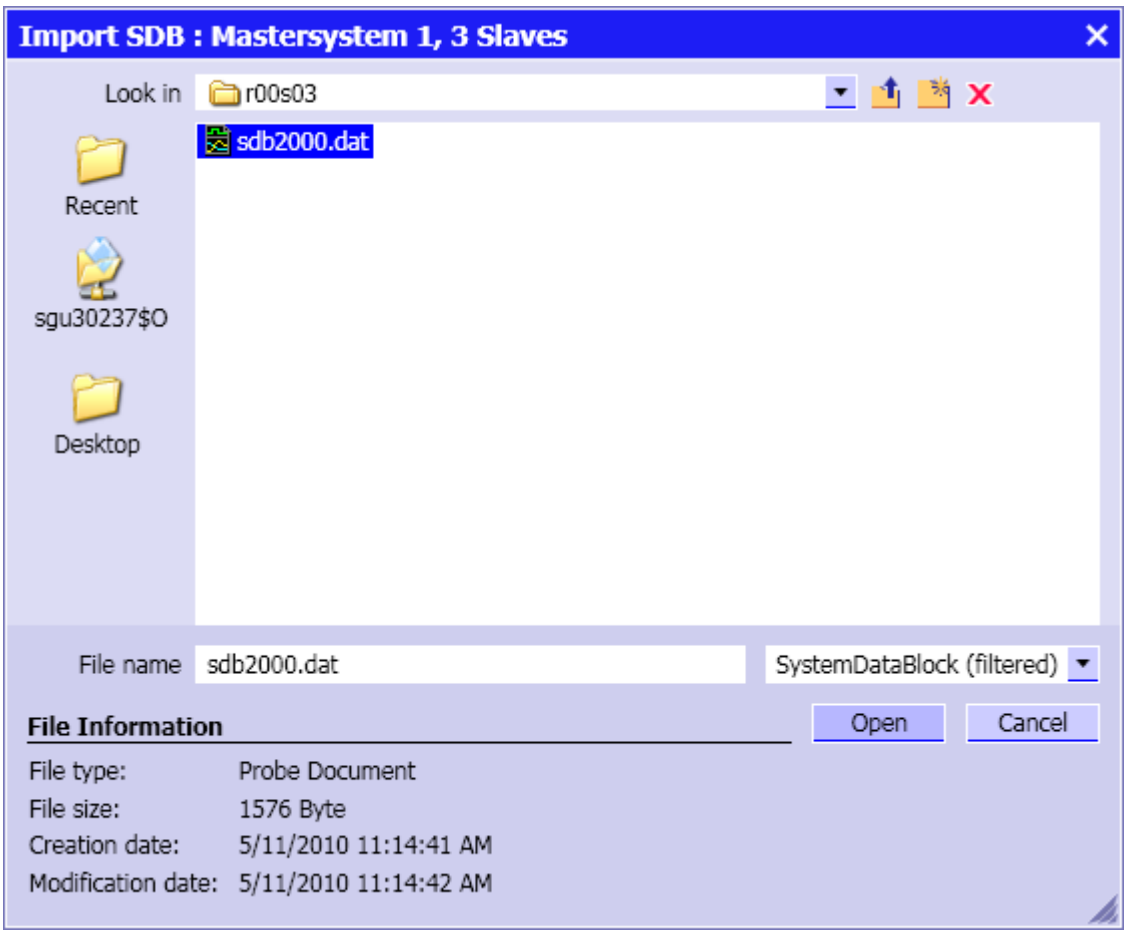

Figure 3-3: File chooser for system data blocks

CAUTION

System data blocks are newly created when the configuration is compiled in HW Config. After each change in HW Config the resulting SDB files need to be newly imported into the Profibus DP gateway, otherwise the PLC would use information different to the Profibus DP gateway in SIMIT. Bus errors in the communication between SIMIT and PLC will occur.

After selecting a sdb file you can use the *Slaves>>* button for a preview of all slaves to be imported (see Figure 3-4). If you do not wish to simulate individual slaves but rather connect them as real slaves, just uncheck them in the preview.

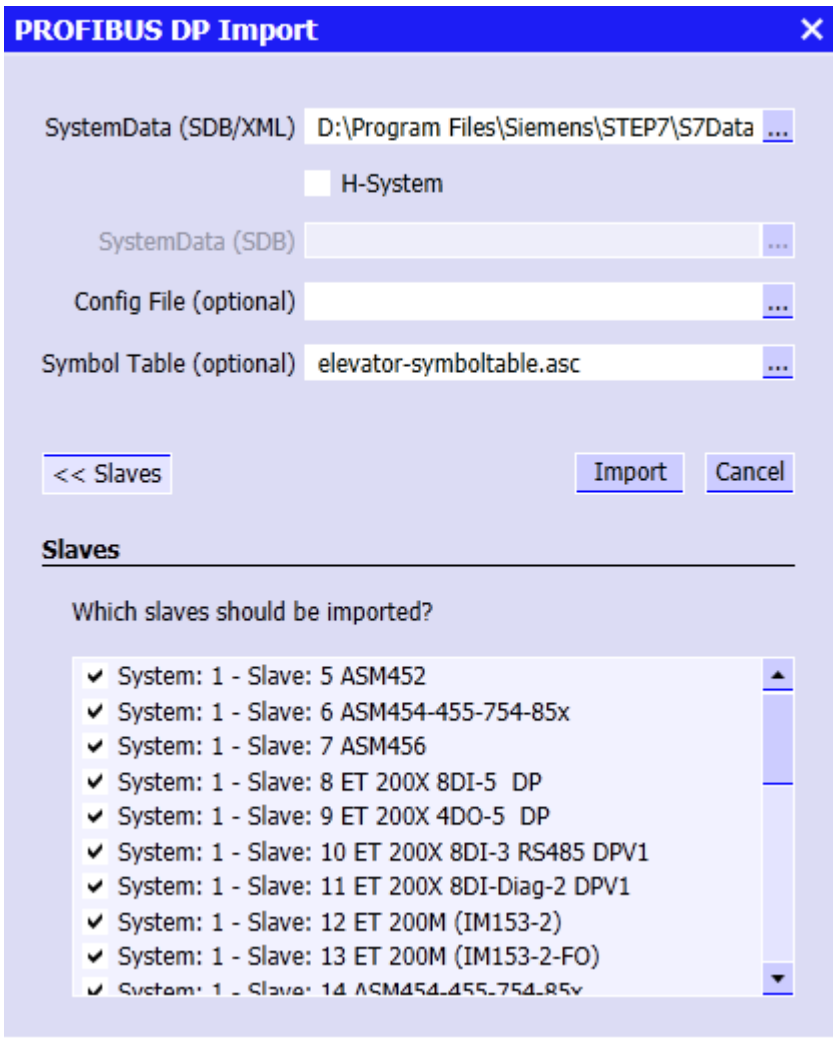

Figure 3-4: Preview in Profibus DP import

After import the gateway editor will open with all imported signals in the work area. Use (Save) to save the configuration.

Use (Import) to open the import dialog as shown in Figure 3-2 at any time later, e.g. to import a modified Profibus DP configuration.

3.2.1 Copying system data blocks

If the STEP 7 software you use to edit your SIMATIC project is installed on a PC different to the PC you have installed SIMIT on, you need to transfer the sdb files from the STEP 7 PC to the SIMIT PC (see Figure 3-5).

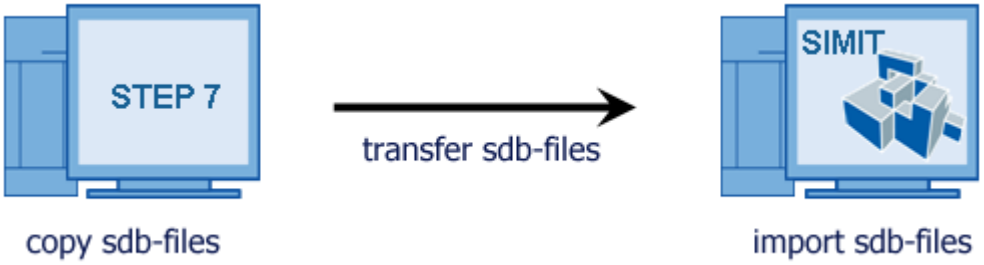

Figure 3-5: Copying system data blocks

First ensure that after compiling the hardware configuration in *HW Config*, the system data blocks (sdb files) in the temporary folder on the SIMATIC PC are not deleted. After installing your STEP 7 software, double click the *UnlockHWConfig.exe* file, which can be found in the *tools\SIMATIC* folder on the SIMIT CD. This creates all necessary entries in the registry of the operating system.

We provide a utility program to copy the system data blocks (sdb files). This program, *CopyHWConfig.exe*, can also be found in the *tools\SIMATIC* folder on the SIMIT CD. This program does not need to be installed and can be accessed from any location. The dialog window of this program looks like this (see Figure 3-6).

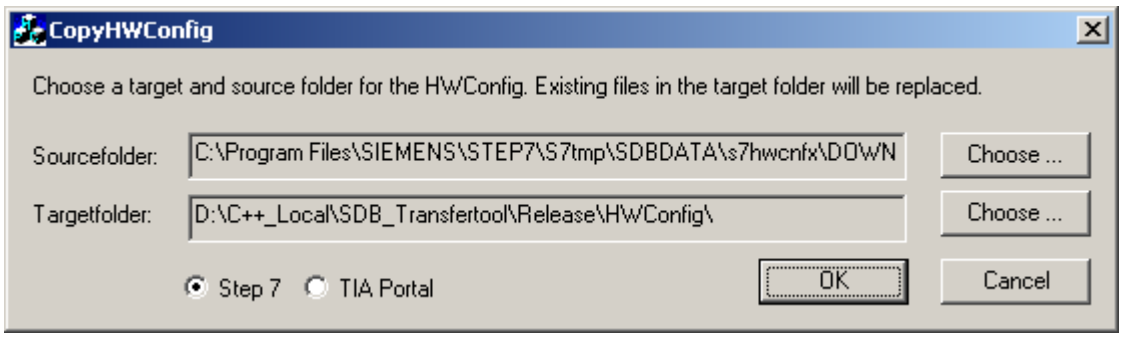

Figure 3-6: CopyHWConfig tool

We suggest you use the temporary STEP 7 folder as the source folder.

3.2.2 Importing system data from TIA portal

You may also import a hardware configuration from the TIA portal v11. If you have modeled a SIMATIC S7-300 or S7-400, the configuration will be read from system data blocks (.sdb files), in case of a S7-1200 an .xml file is used. For TIA portal to provide necessary data, on the machine TIA portal is installed on you need either to install SIMIT V7.1 or launch *UnlockHWConfig.exe* once. You find this tool on the SIMIT installation CD in the

Tools\SIMATIC folder.TIA portal will then place configuration files in the folder <*Shared Documents*>*\TIAExport*.

In order to import system data of a S7-1200 choose “System data (*.xml)” as file type in the file dialog (Figure 3-7)

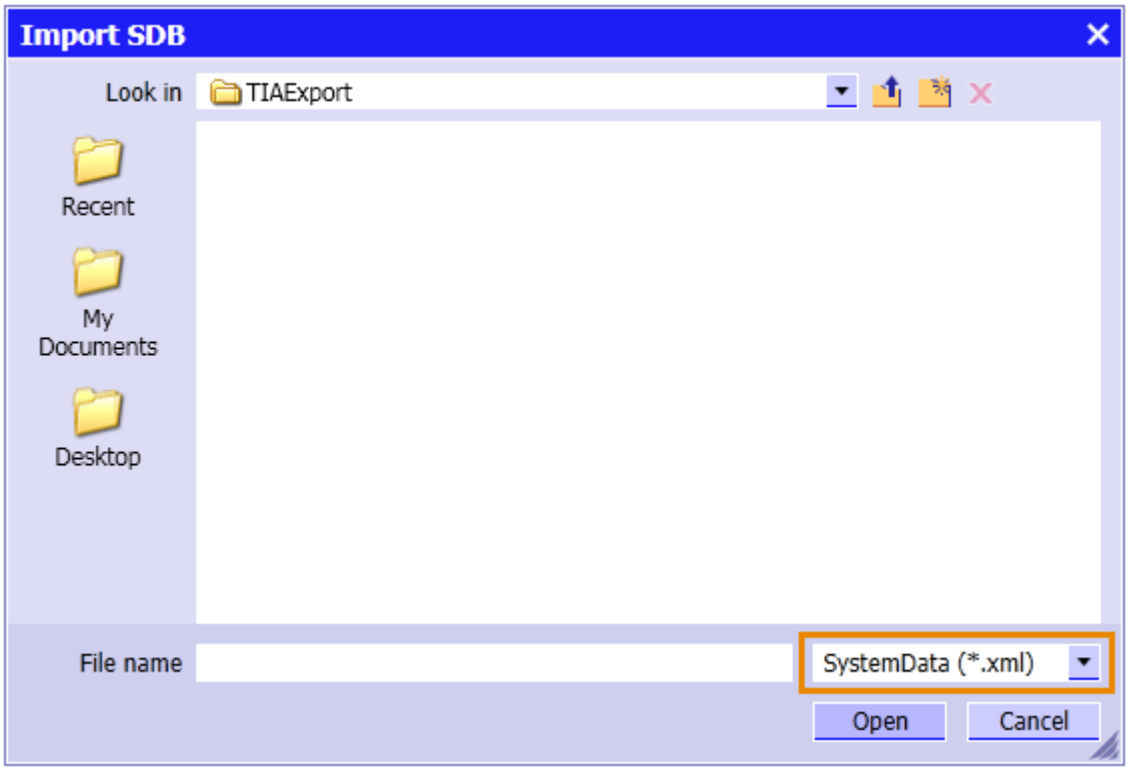

Figure 3-7: Importing system data from TIA portal

NOTE

When importing the hardware configuration of a SIMATIC S7-1200, there is no preview available. Therefore, it is not possible to exclude individual slaves or devices from the simulation during import.

3.3 Importing the configuration file

Usually, all information that is required for configuring the gateway can be read from the system data blocks. Only in case your configuration uses one of the following HART-modules of an ET200M-station, the configuration file is required additionally in order to configure all signals of a module correctly:

6ES7 331-7TF00-0AB0 AI8x16Bit HART/TC

6ES7 331-7TF01-0AB0 AI8x16Bit HART/TC

6ES7 331-7PF00-0AB0 AI8x16Bit HART/TC

6ES7 331-7PF01-0AB0 AI8x16Bit HART/TC

6ES7 331-7PF10-0AB0 AI8x16Bit HART/TC

6ES7 331-7PF11-0AB0 AI8x16Bit HART/TC

6ES7 331-7SF00-0AB0 AI8x16Bit HART/TC

You can create the configuration file using the hardware configuration tool (HW-Config) in Step 7 by exporting the .cfg format. The import dialog Figure 3-8 allows you to select the configuration file.

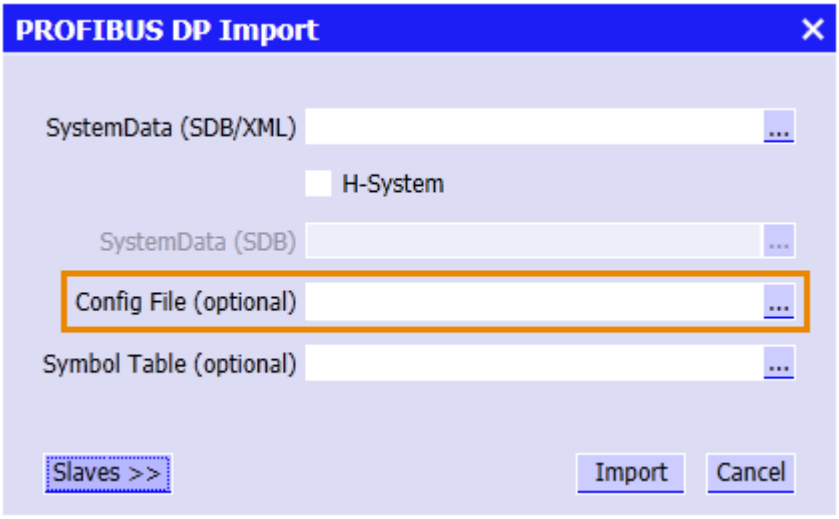

Figure 3-8: Importing the configuration file

3.4 Retrospective import of the symbol table

Usually you will import the symbol table along with the system data blocks into the Profibus DP gateway. You may also import the symbol table later. Just use (Import) in the gateway editor to open the import dialog again, now providing a symbol file only (see Figure 3-9).

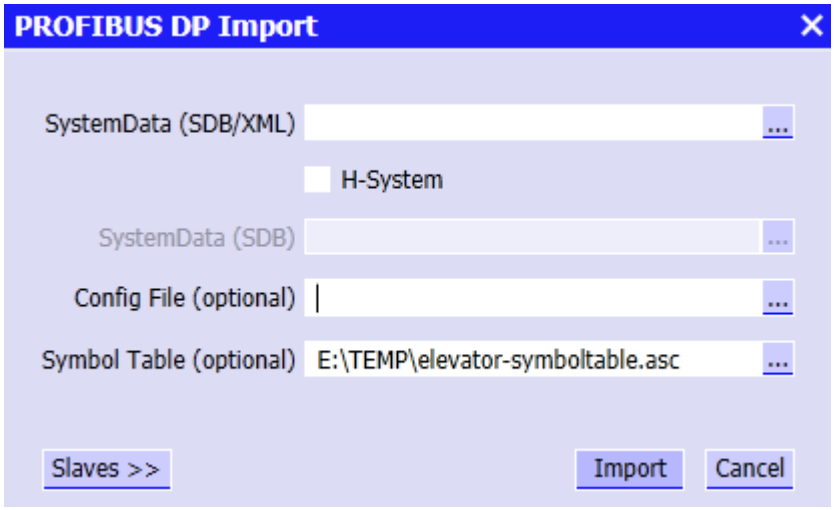

Figure 3-9: Import-Dialog for a symbol table

When importing a symbol table you can decide how signals should be handled that exist in the gateway already. There are three alternatives available:

- **New**
  All signals that exist in the gateway already are removed. The gateway is newly built based on the imported symbol table. If necessary, signals are split or merged to match the data type as required by the symbol table.
- **Add**
  If a signal has a symbolic name specified in the imported symbol table but has no symbol name in the gateway yet, it is assigned the symbol name as specified in the symbol table. Symbol names that exist in the gateway already are not overwritten!

  If there is a signal in the imported symbol table that overlaps with signals that exist in the gateway already because they share an address range, it will be ignored. There is no merging or splitting of signals.
- **Replace**
  If a signal exists in the gateway already and has a symbolic name specified in the imported symbol table, it is assigned the symbol name as specified in the symbol table, even if it had a symbol name assigned in the gateway already.

  If there is a signal in the imported symbol table that overlaps with signals that exist in the gateway already because they share an address range, it will be taken into the gateway configuration and will be assigned the symbol name as provided by the symbol table. All overlapping signals will be split or merged in order to make the data type available as required by the symbol table.

3.5 Assigning a channel

In the gateways properties view you assign the gateway one of the available channels of the Profibus DP interface modules as configured in SIMIT. All available channels are made available in the *Hardware Channel* using the interface modules name (see Figure 3-10). After saving, a channel that was assigned to a gateway will not be available any more.

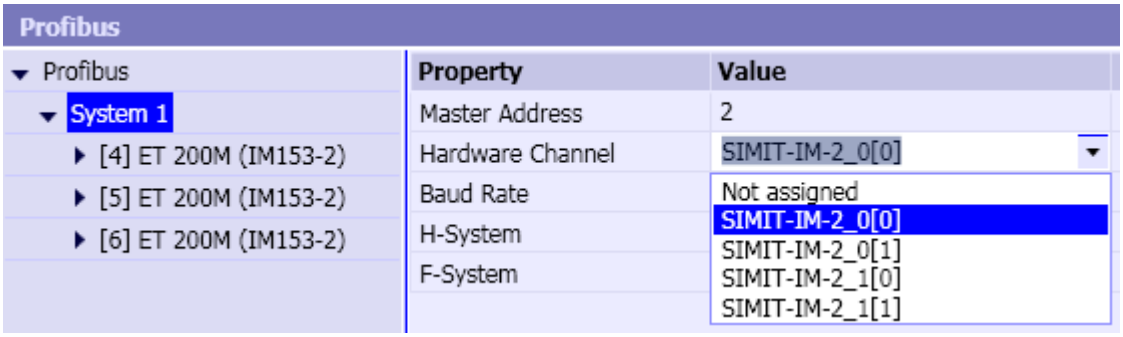

Figure 3-10: Assigning a hardware channel

3.5.1 Loading the interface module

If you have configured a Profibus DP gateway, or have changed its configuration, the configuration must be loaded into the interface modules before starting the simulation. The interface modules only behave like the real field devices in their communication with the automation system, i.e. with the Profibus DP masters in the automation system, when they have been loaded with Profibus DP configurations that match the automation system.

If you start a simulation for a project that contains a Profibus DP gateway, a check is automatically performed during startup to see whether the interface modules have already been loaded with the correct configuration data. If not, you can use the dialog in Figure 3-11 to load the interface modules or to cancel the start of the simulation. The simulation can only be started if the interface modules have been loaded with the correct configuration data.

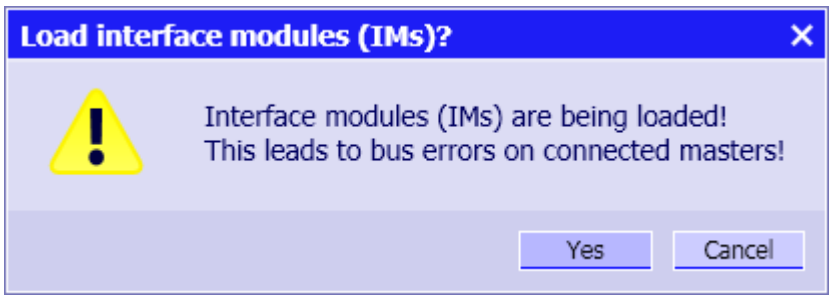

Figure 3-11: Dialog for loading the interface modules

This dialog also appears on starting the simulation if your PC has been switched off since the last loading.

CAUTION

When turning off the interface modules, i.e. turn off power supply, or using an application different to SIMIT and interfere with the configuration, SIMIT cannot make sure anymore that the currently loaded configuration matches the SIMIT project. This may lead to unpredictable behavior!

You can also initiate the loading of the interface modules manually at any time. Just click *Save and Load* in the Profibus DP gateways tool bar (see Figure 3-12).

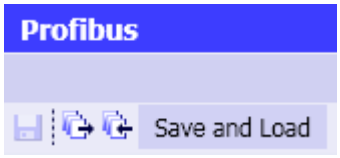

Figure 3-12: Loading the interface modules in the gateway

CAUTION

While the interface modules are being loaded, they will not be able to communicate with the connected Profibus DP masters, at least for a short time. Automation systems could therefore go into the “Stop” state.

3.5.2 Configuration in RUN (CiR)

CiR allows for certain changes in the hardware configuration to be performed in full operation.

SIMIT does not support CiR. You need to change your hardware configuration in HW-Config and import the modified system data blocks into the Profibus DP gateway again. Then the interface modules need to be newly loaded.

4 EDITING THE PROFIBUS DP GATEWAY

This chapter provides information about editing the Profibus DP gateway in the gateway editor. You learn how to edit signals and how to use properties of slaves and modules.

4.1 Editing signals

The gateway editor will display signals in an input and an output section. As usual in SIMIT, input signals are inputs of the PLC, output signals are outputs of the PLC. Signals are shown in the gateway editor with properties as follows:

- Symbol Name,
- Address,
- Data Type,
- Master system number,
- Slave number,
- Modules slot number and
- Comment

All properties of the currently selected signal are visible in the properties view. Here you can edit scaling information such as Type of *Scaling*, *Lower Scale Value* and *Upper Scale Value* for analog signals (see Figure 4-1).

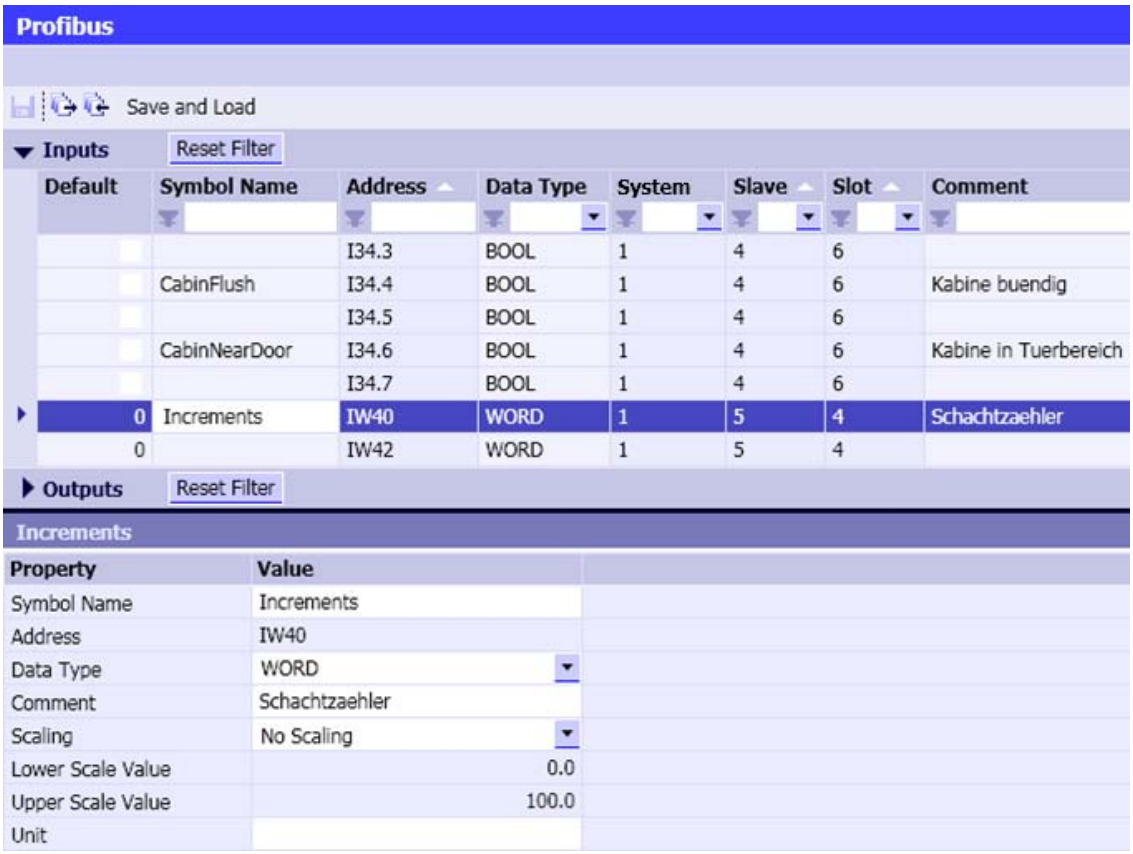

Figure 4-1: Properties of an analog signal

NOTE

Please note that only signals of data type WORD can be scaled.

4.1.1 Providing default values

The first column *Default* is used to provide default values for input signals, e.g. setting binary inputs in the PLC (see Figure 4-2).

Profibus

Save and Load

Inputs | Reset Filter

Default	Symbol Name	Address	Data Type	System	Slave	Slot	Comment
	CabinButtonFloor1	I33.1	BOOL	1	4	5	Anwahl Innenkabine 1.OG
	CabinButtonFloor2	I33.2	BOOL	1	4	5	Anwahl Innenkabine 2.OG
	CabinButtonFloor3	I33.3	BOOL	1	4	5	Anwahl Innenkabine 3.OG
	CabinButtonFloor4	I33.4	BOOL	1	4	5	Anwahl Innenkabine 4.OG
	FeedbackRun	I33.5	BOOL	1	4	5	Antrieb laeuft
	FeedbackStop	I33.6	BOOL	1	4	5	Antrieb steht
✔	DoorOpened	I33.7	BOOL	1	4	5	Sensor Tuer auf
	DoorClosed	I34.0	BOOL	1	4	6	Sensor Tuer zu
	OpenDoorManually	I34.1	BOOL	1	4	6	Tuer Hand auf
	CloseDoorManually	I34.2	BOOL	1	4	6	Tuer Hand zu
		I34.3	BOOL	1	4	6	
	CabinFlush	I34.4	BOOL	1	4	6	Kabine buendig
		I34.5	BOOL	1	4	6	
	CabinNearDoor	I34.6	BOOL	1	4	6	Kabine in Tuerbereich
		I34.7	BOOL	1	4	6	
900	Increments	IW40	WORD	1	5	4	Schachtzaehler
0		IW42	WORD	1	5	4	

Figure 4-2: Input signals in the Profibus DP gateway

4.1.2 Merging and splitting signals

When the system data blocks are imported, the signals belonging to the imported Profibus DP configuration are created automatically in the gateway. This takes into account whether they are binary signals with the data width "bit" or analog signals with the data width "byte", "word" (2 byte), "double word" (4 byte) etc.

In certain cases the data width may need to be changed, e.g. to merge eight successive binary signals into one single byte signal. Just select all signals to be merged and choose *Merge* in the context menu (see Figure 4-3).

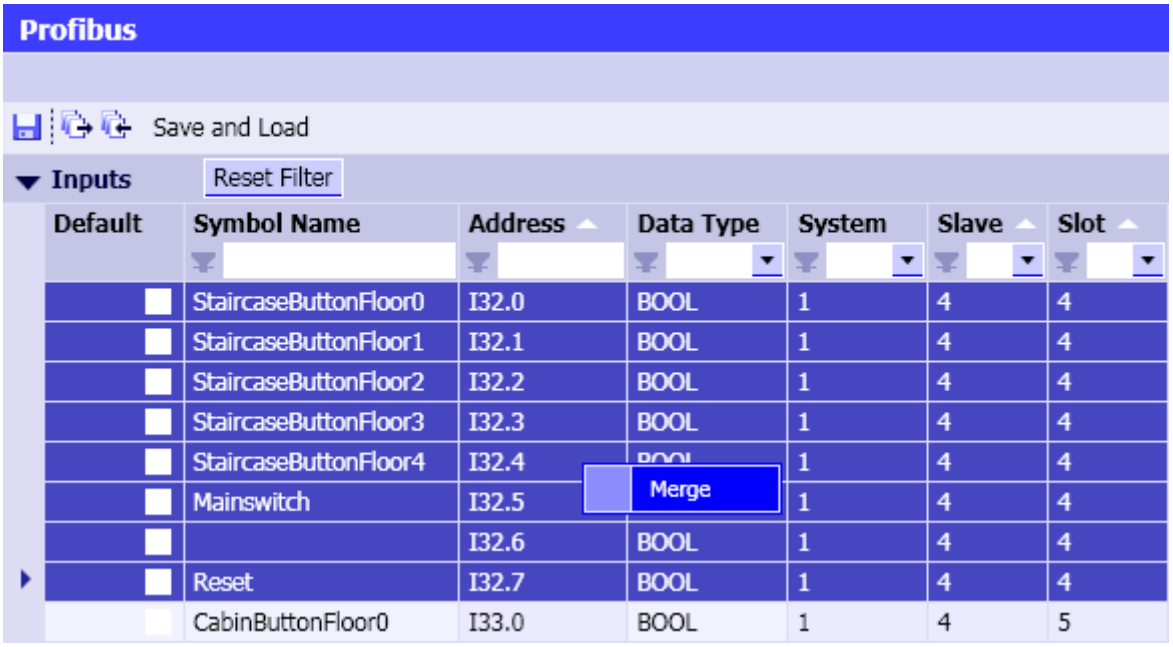

Figure 4-3: Merging signals

Signals can be splitted accordingly. Just select the signal to be splitted and choose *Split* in the context menu (see Figure 4-4).

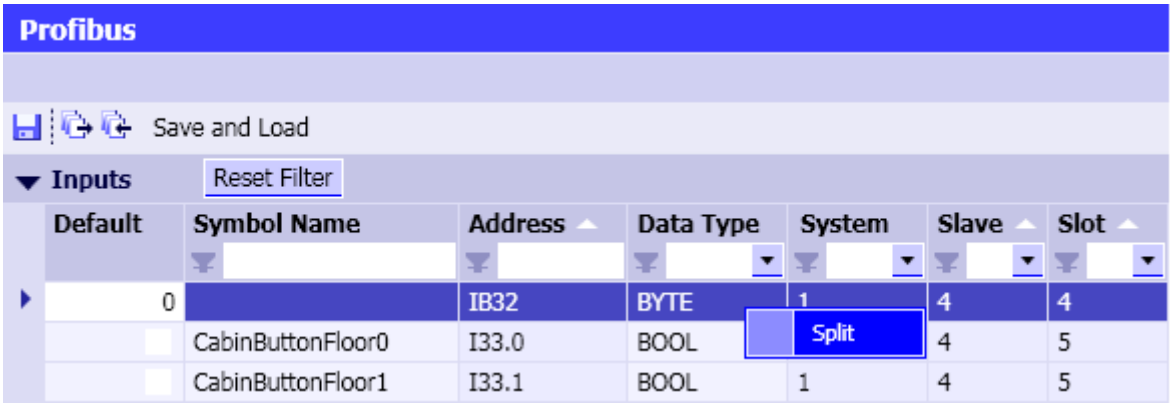

Figure 4-4: Splitting a signal

Table 4-1 shows how a signals data width can be modified. To merge signals, read the table from left to right; to split signals, read the table from right to left.

Number of signals	Data Type	Data width		Number of Signals	Data Type	Data width
8	BOOL	1 Bit	↔	1	BYTE	1 Byte
2	BYTE	1 Byte	↔	1	WORD (INT)	2 Byte
2	WORD (INT)	2 Byte	↔	1	DWORD (DINT, REAL)	4 Byte

Table 4-1: Ways to change data width

Note

After changing data width, symbol names get lost.

Signals can only be converted if they have been created in the Profibus DP gateway by importing the system data blocks. Address ranges cannot be removed or created by changing the data width of signals, as the entire address range is determined by how Profibus DP is configured in SIMATIC Manager.

NOTE

Signals that are not on the same module, as well as failsafe signals, cannot be merged!

4.2 Properties of a Profibus DP gateway

After opening the Profibus DP gateway the left side of the properties view will show a tree structure of slaves and their modules (see Figure 4-5).

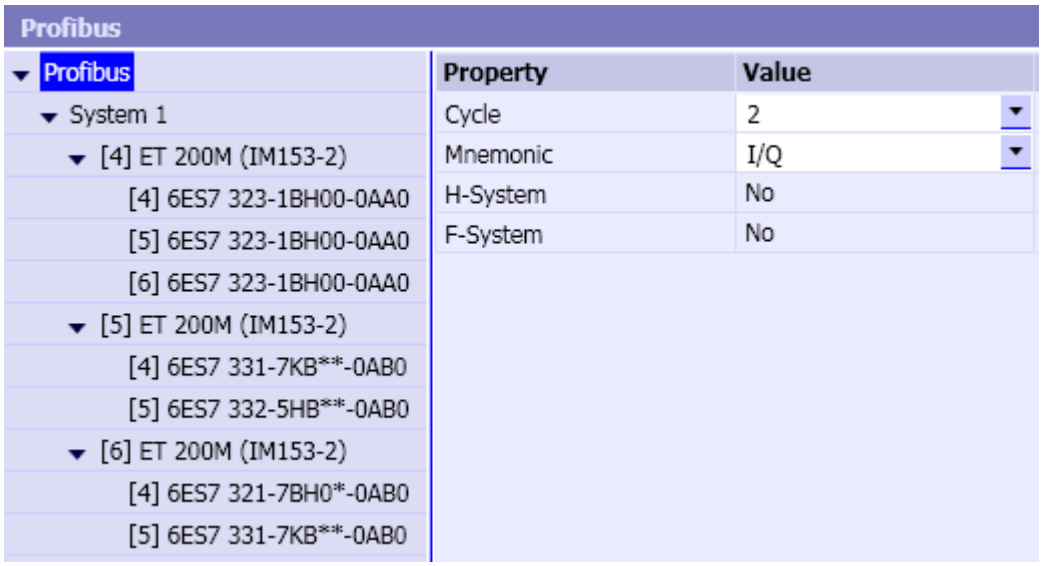

Figure 4-5: Properties view of a Profibus DP gateway

You can define properties of the gateway as follows:

- **Cycle**

  Here you can define the cycle the gateway will use for data exchange. Use the project manager to assign absolute values to the eight available cycles throughout the project. The default value for cycle 2 is 100ms. For further detail concerning a gateways data exchange please see the general SIMIT gateway manual.

- **Mnemonik**

  Here you can choose between international (*I/Q)* and German (*E/A*) syntax of inputs and outputs.

The Properties ***H-System*** and ***F-System*** are for your information only and indicate whether you are using a redundant and/or failsafe system.

4.2.1 Activating and deactivating slaves

If a slave is selected the right side of the properties view will show its properties (see Figure 4-6). Use the *Deactivate Slave* Property to deactivate the slave. It will not be simulated when the simulation is started.

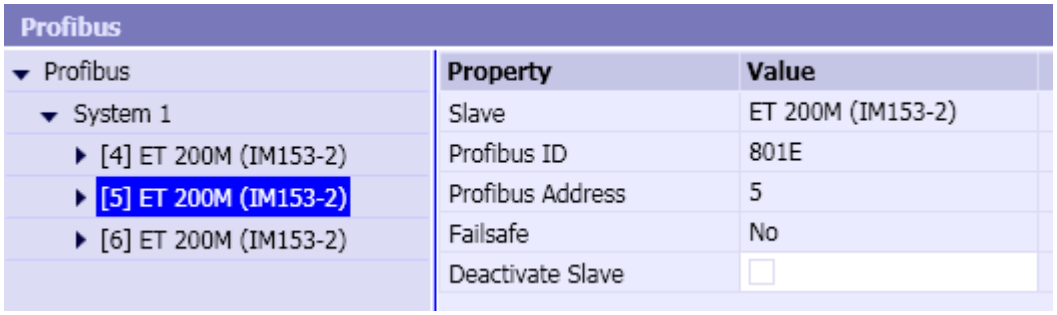

Figure 4-6: Properties of a slave

You may also set this property of a slave when the simulation is already running. This allows you to test the PLCs behavior when a slave fails or returns.

4.2.2 Unplugging and plugging of modules

A modules properties are also shown on the right side of the properties view (see Figure 4-7). Modules can be deactivated using the *Pull Module* property.

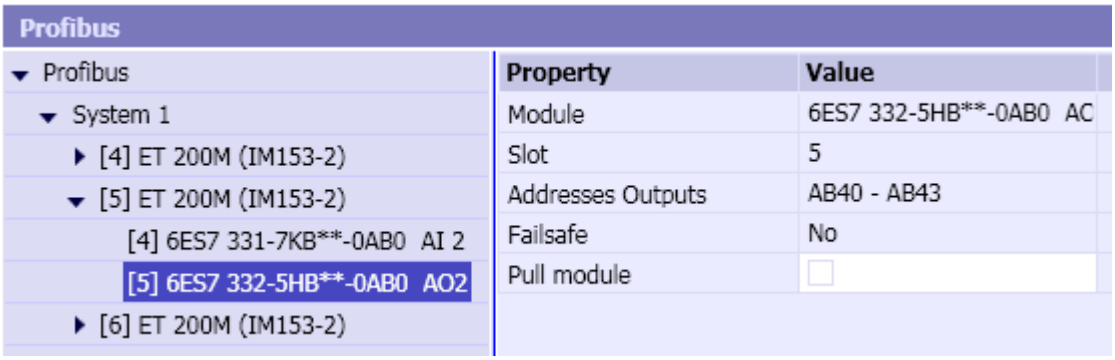

Figure 4-7: Properties of a module

In order to test your PLC's behavior when a module is pulled you may also use this property when the simulation is already running.

4.2.3 Modules with process alarms

SIMATIC PLCs use process alarms to monitor binary or analog peripheral signals: When an analog value is exceeded or undershot, or when a binary value is set or reset, the cyclical operation of the controller is interrupted to allow the control program to react appropriately to this alarm. Whether and under what conditions a Profibus DP slave triggers process alarms is determined in its configuration in the SIMATIC project (HW Config).

Process alarms for the modular peripheral systems ET200M and ET200S can be generated with SIMIT. Table 4-2 lists the interfaces and modules of the ET200M for which process alarms are supported in SIMIT. Table 4-3 lists the interfaces and modules of the ET200S for which process alarms are supported in SIMIT.

ET200M (IM153-1)	**ET200M (IM153-2)**	**ET200M (IM153-3)**
6ES7 153-1AA01-0XB0 6ES7 153-1AA02-0XB0 6ES7 153-1AA03-0XB0 6ES7 153-1AA82-0XB0 6ES7 153-1AA83-0XB0	6ES7 153-2AA00-0XB0 6ES7 153-2AA01-0XB0 6ES7 153-2AA02-0XB0 6ES7 153-2BA00-0XB0 6ES7 153-2BA01-0XB0	6ES7 153-3AA00-0XB0 6ES7 153-3AA01-0XB0

DI16	**AI2**	**AI4**	**AI8**
6ES7 321-7BH00-0AB0 6ES7 321-7BH01-0AB0 6ES7 321-7BH80-0AB0	6ES7 331-7KB01-0AB0 6ES7 331-7KB02-0AB0 6ES7 331-7KB81-0AB0 6ES7 331-7KB82-0AB0	6ES7 331-7RD00-0AB0	6ES7 331-7KF01-0AB0 6ES7 331-7KF02-0AB0 6ES7 331-7HF00-0AB0 6ES7 331-7HF01-0AB0 6ES7 331-7NF00-0AB0 6ES7 331-7SF00-0AB0

Table 4-2: Slaves and modules within ET200M that support process alarms

ET200S (IM151-1 HF)		
6ES7 151-1BA00-0AB0 6ES7 151-1BA01-0AB0 6ES7 151-1BA02-0AB0		
DI2	**DI4**	**AI2**
6ES7 313-4BB00-0AB0 6ES7 313-4BB01-0AB0	6ES7 313-4CD00-0AB0 6ES7 313-4BD00-0AB0 6ES7 313-4BD01-0AB0	6ES7 313-4LB02-0AB0

Table 4-3: Slaves and modules within ET200S that support process alarms

To generate process alarms in SIMIT you must enable the required alarms in the properties mask of the module. For binary signals, process alarms can be generated on the rising or falling edge of the binary signal through settings in the properties mask of the module, as shown in Figure 4-8 for example.

The grouping of several channels for one process alarm is a typical SIMATIC feature and depends on how the corresponding module can be configured in the hardware manager.

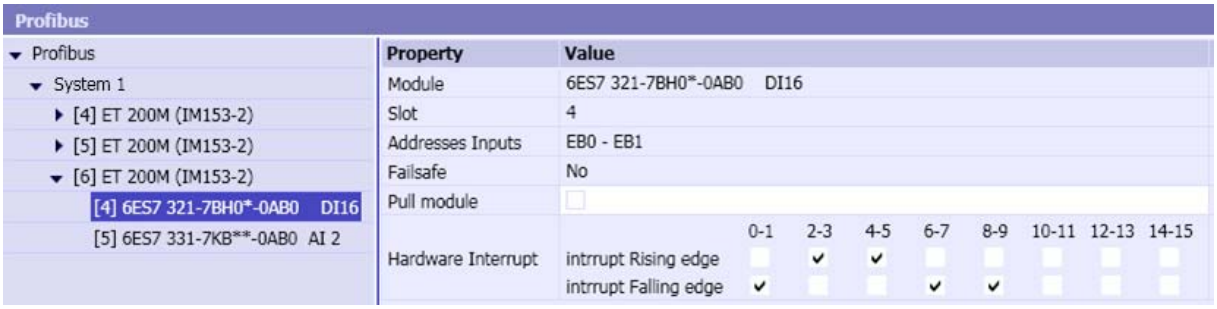

Figure 4-8: Activation of process alarms for binary signals in SIMIT

In the case of analog signals an alarm can be generated on exceeding or undershooting an adjustable limit value. The limit value is set as a percentage related to the value range of the signal. 100% corresponds to a raw value of 27648. With scaled analog signals, this means the upper scaling value of the scale. If no percentage is entered, no process alarm will be triggered for this analog channel. As an example, Figure 4-9 shows a process alarm configured to trigger when an upper limit of 90% is exceeded or a lower limit of 10% is undershot.

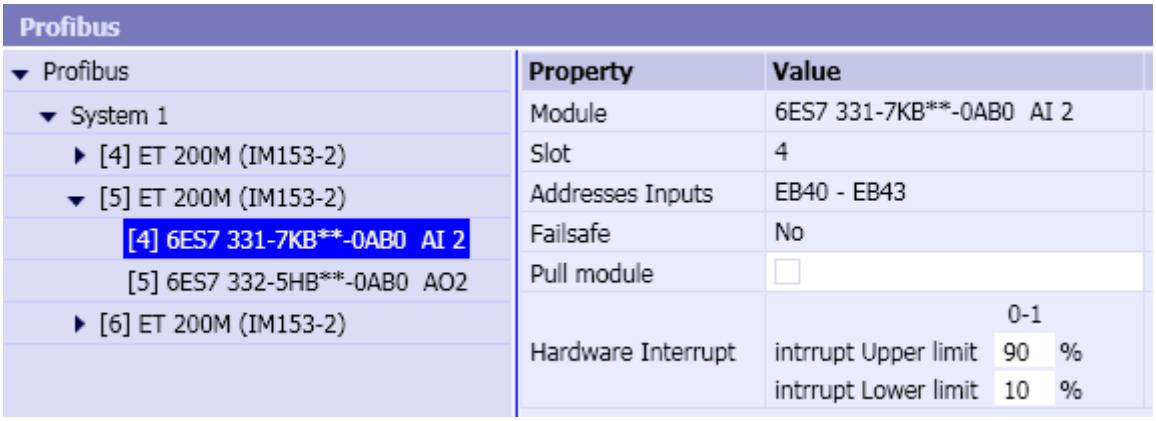

Figure 4-9: Setting process alarms for analog signals in SIMIT

5 REDUNDANT AND FAILSAFE CONFIGURATIONS

This chapter focuses on special topics that need to be considered when using the Profibus DP gateway with a redundant and/or failsafe system.

5.1 Redundant configurations (H-Systems)

If your SIMATIC configuration contains a redundant Profibus DP, this system can also be simulated redundantly.

In a redundant configuration, two sdb files are created when the hardware configuration is compiled in HW Config. These files must be imported into SIMIT to configure the Profibus DP gateway. To do so, just check the *H-System* option in the gateways import dialog (see Figure 5-1).

One sdb file needs to be imported for each channel of the interface module.

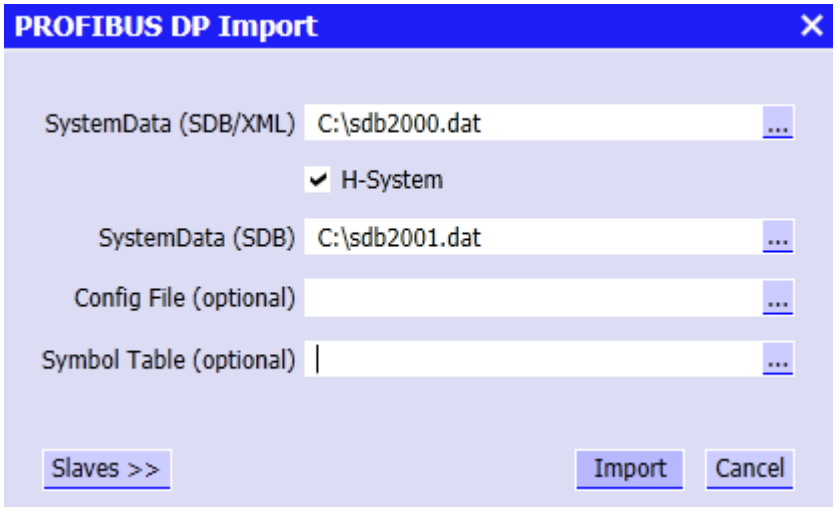

Figure 5-1: Importing sdb files for a redundant configuration

In a redundantly connected system, all necessary redundant diagnostic signals are generated by the IM-2 interface module, so you can also perform Master/Standby switchovers on your automation system.

In SIMIT, only the signals from the first redundant Profibus DP channel (channel 0) are used as gateway signals, regardless of which of the two buses is active. Bus switchovers are handled by SIMIT: the assignment of the gateway signals to the active channel is performed automatically. The redundant signals from the second channel are not listed. However, the signal list indicates that these signals are assigned to two master systems (1 and 2). The *H-System* property tells you whether or not a slave is redundant (see Figure 5-2).

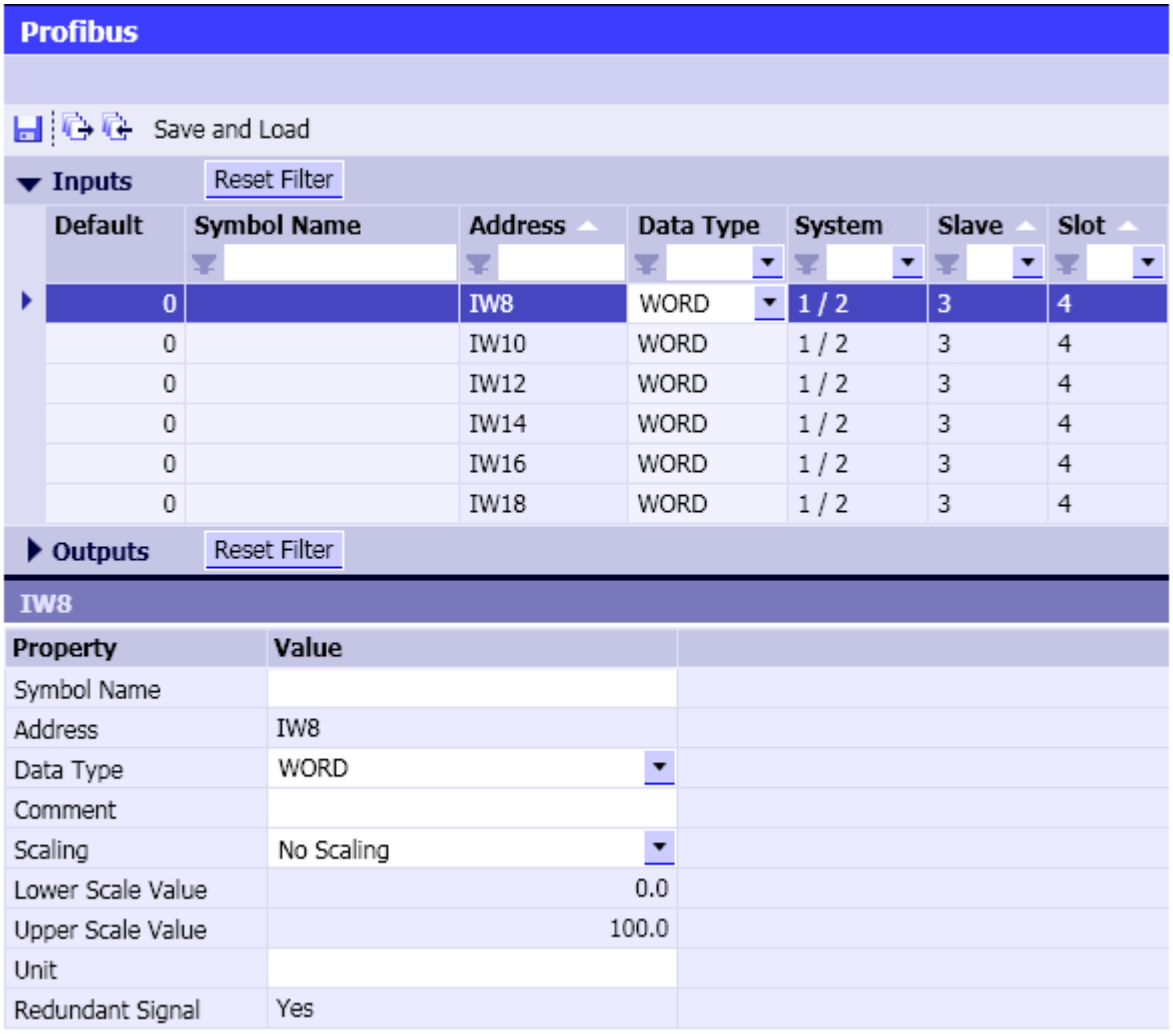

Figure 5-2: Gateway signals in redundant systems

DP/DP couplers can be included as a Y link in redundant systems. The gateway signals of bus nodes that are connected behind the Y link are also available in SIMIT in the same way as the gateway signals from nodes that are connected directly to the redundant bus.

5.2 Failsafe configurations (F-Systems)

When a fail-safe configuration is imported, the associated quality signals for all binary fail-safe signals are automatically created and labeled accordingly (see Figure 5-3).

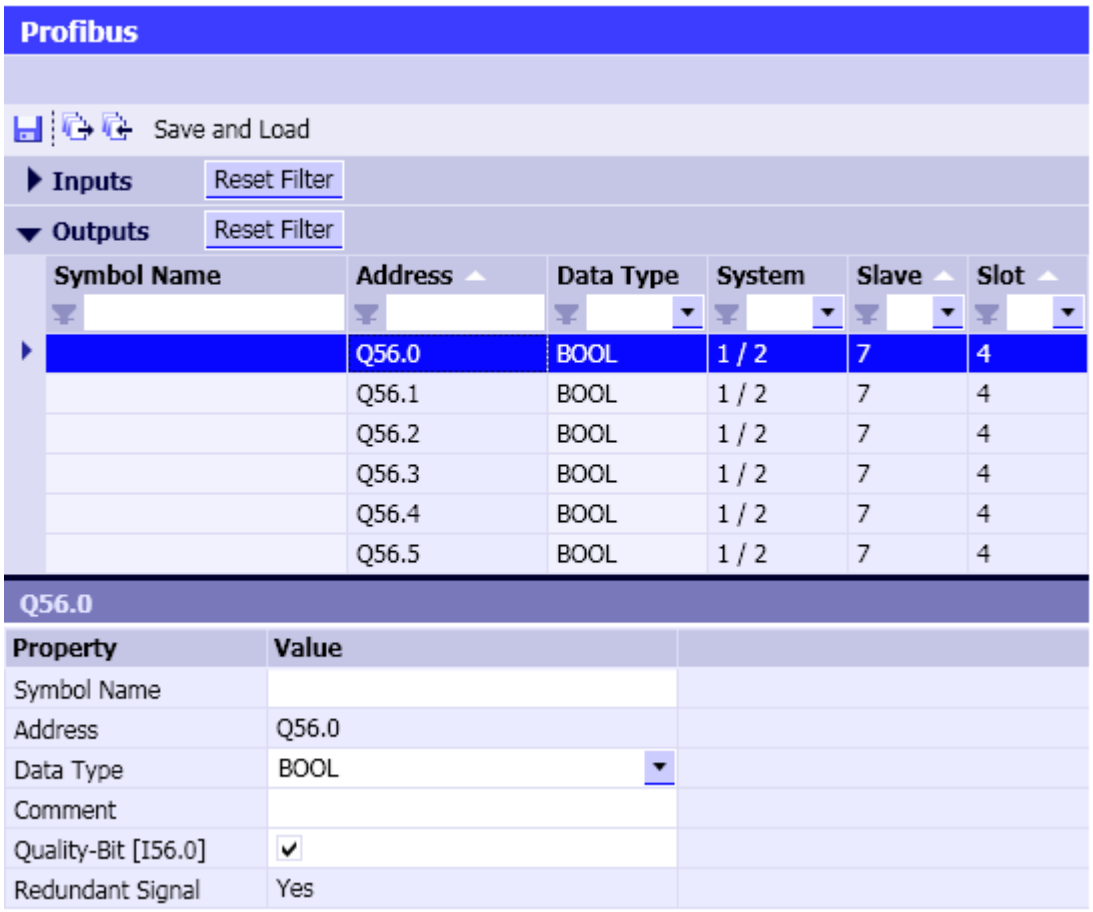

Figure 5-3: Quality signals in the gateway of failsafe systems

All quality signals have a default setting of one, i.e. "valid". If you wish to deliberately set a signal to "invalid", for example to test the reaction of your control program to a signal fault, you only need to set the corresponding quality signal to zero. Just uncheck the *Quality Bit* property.

NOTE

After loading the interface module with a failsafe configuration, the connected SIMATIC CPU needs to be restarted!

5.3 Redundant and failsafe configurations (HF-Systems)

Redundant, fail-safe systems, also known as H/F systems, can also be simulated. The redundant, fail-safe signals and their quality signals are handled as described above.

Mixed configurations, i.e. fail-safe and non fail-safe bus nodes, as well as redundant and non-redundant bus nodes, can also be simulated.

6 CONFIGURING THE PROFIBUS DP INTERFACE MODULE

To access an Profibus DP interface module (IM-PBDP) with SIMIT via LAN you first need to assign an IP address to the module. To do so you need a PC with SIMATIC Manager installed and plug the module to this PC – if only temporarily. To configure the module it does not matter if you are using a direct connection to the PC or a switch or hub.

Configure the PG/PC interface in SIMATIC Manager to use the LAN card connected to the module. Then choose *PLC* | *Edit Ethernet Node* from the menu. In the dialog shown in Figure 6-1 click *Browse* below *Nodes accessible online*.

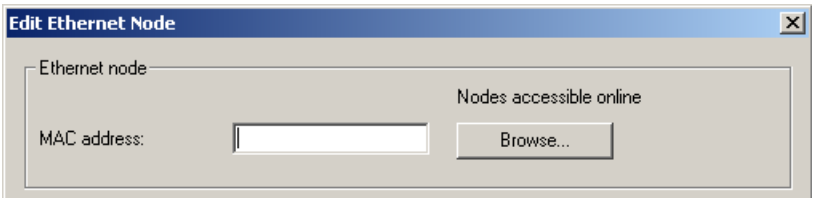

Figure 6-1: Browse for Ethernet Nodes

You get a dialog as shown in Figure 6-2 that displays all available nodes. Please select your module's entry, it will display *SIMIT IM-PBDP-x* as device name. When clicking *Flash*, the LEDs on the modules upper side will flash briefly.

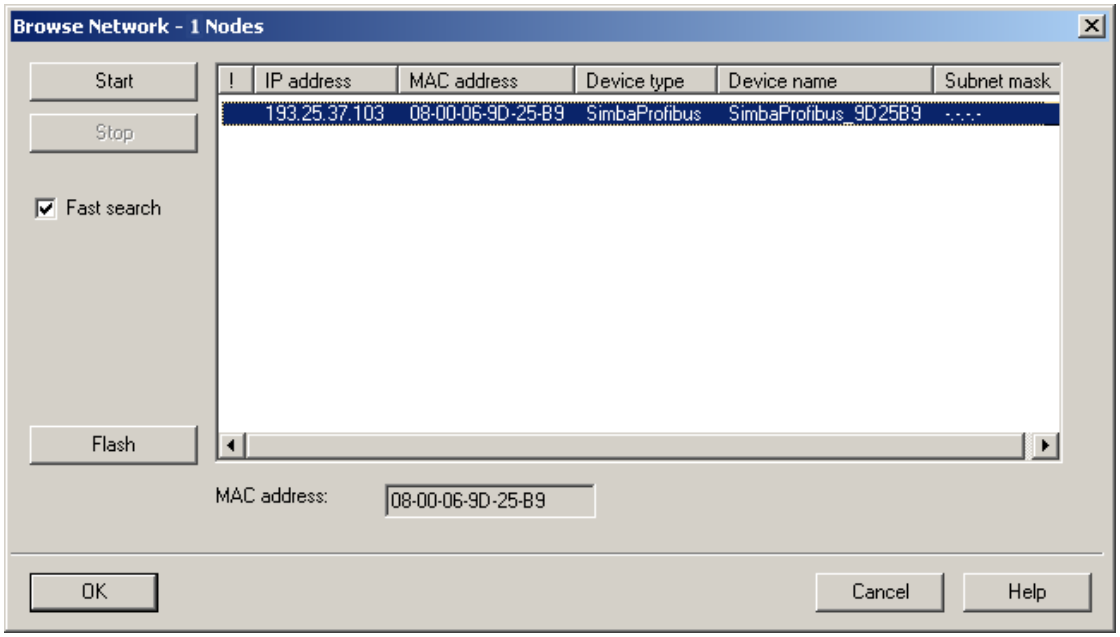

Figure 6-2: Ethernet nodes found

Confirm this dialog by clicking *OK*. In the previous dialog you now see the modules data (see Figure 6-3). You may adopt the settings for IP address and subnet mask and change them if necessary. In any case please confirm by clicking *Assign IP configuration*.

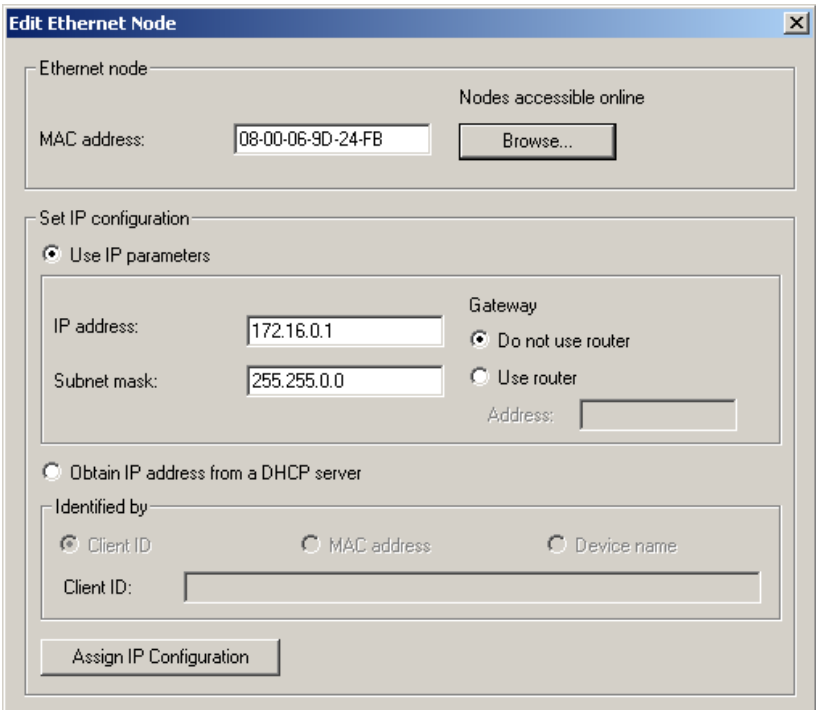

Figure 6-3: Assigning the IP configuration

Now connect the module to your SIMIT PC and copy the module's IP address into SIMIT's IM configuration options dialog. Assign the module an arbitrary name so that it can be distinguished from other modules that may be available (see Figure 6-4) When clicking *Refresh* the module's type and status are read. The interface module is now ready for use with SIMIT.

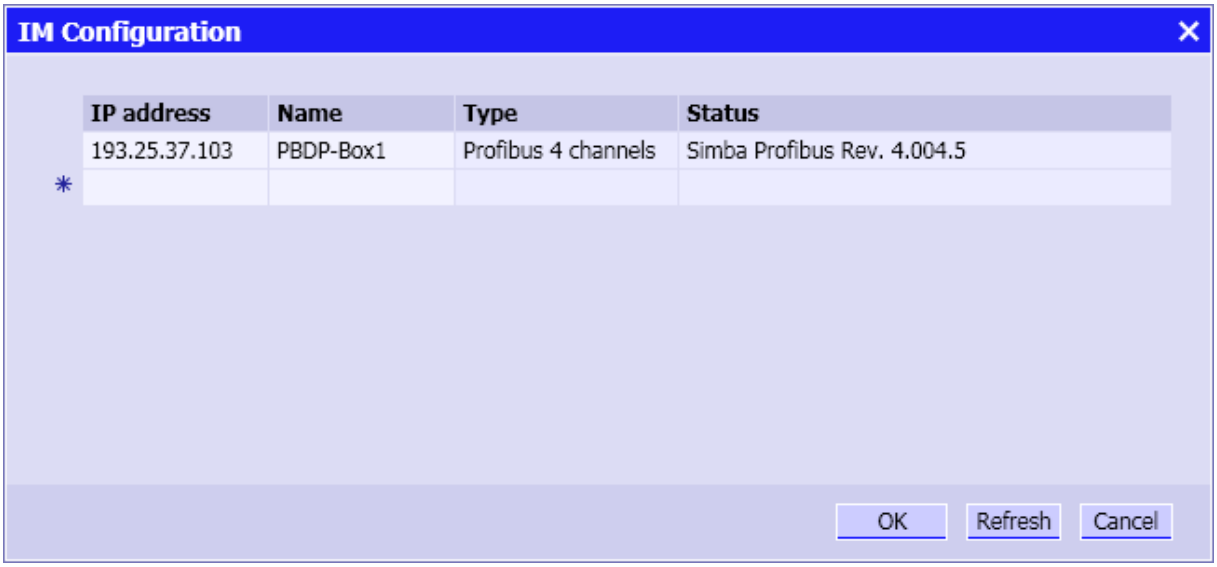

Figure 6-4: IM Configuration in SIMIT