SIEMENS

SIMATIC

Getting Started with SIMATIC iMap

Getting Started

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Preface

Purpose of the manual

The goal of this description is to give you an overview of working with SIMATIC iMap using practical automation tasks.

Required basic knowledge

You require a general knowledge of automation to understand this manual.

Validity of this manual

This manual is valid for the software package SIMATIC iMap V2.0.

Your guide through the manual

This manual contains:

- a description of the automation task
- a brief description of creating a PROFInet component
- the general procedure during plant configuration, online monitoring and process data visualization.

Place of this documentation in the information environment

This manual is part of the SIMATIC iMap documentation package. The documentation is supplied with the software and includes the electronic manuals in PDF format:

- Component-based automation, configuring plants with SIMATIC iMap
- Getting Started with SIMATIC iMap – this manual
- Commissioning Systems, Tutorial
- Creating PROFInet Components

In addition, the entire documentation is available as an HTML Basic Help.

Conventions

Menu commands are written in bold letters, for example: **Project> Save**.

Placeholders are set in angle brackets, for example <File name>.

Further support

Please contact your local SIEMENS partner if you have any further queries on the products described in this manual.

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- a forum for the exchange of information between users and specialists worldwide
- your local Automation & Drives partner via our partner database.
- information on repairs, replacement parts and on-site service. You will find more information under "Services“.

Contents

Getting Started - Introduction

1

Aims and Target Groups

These instructions are intended to provide an overview of working with SIMATIC iMap based on actual automation tasks.

These instructions can be subdivided into two groups of tasks:

Task	Target group
Creating PROFInet components with SIMATIC iMap STEP 7 add-on	Plant and machine constructors
• Planning and commissioning a plant with SIMATIC iMap • Visualizing and analyzing process data	Plant planners and operators

Description of the automation task

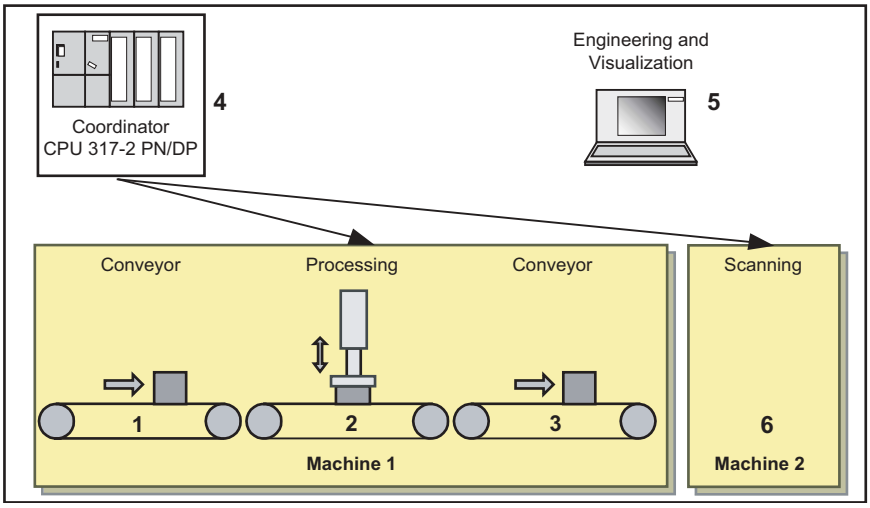


Figure 1-1 Automation task

In the machining station of a machine, workpieces are fed in (1), machined (2) and then removed (3). An upstream controller (4) coordinates the individual partial functions, and makes the necessary data available via integral operator monitoring and control functions (5). The machined workpieces are then moved on to a second machine (6). The number of transported workpieces should also be recorded on the analysis PC (5).

Steps of the solution

The automation task can be broken down into individual steps of the solution, from analysis of the plant through to analysis of the process data. These tasks are generally carried out by different users, each using the necessary software.

You can also select and edit individual steps for this example project when such steps are relevant for your specific tasks.

Table 1-1 Steps of the solution for the automation task

Steps	Tasks	Users	Software
Step 1	Defining PROFInet components	Component creator	-
Step 2	Creating PROFInet components	PLC programmers, STEP 7 users,	STEP 7
Step 3	Importing PROFInet components into a library	Planners, commissioning engineers and plant operators	SIMATIC iMap
Step 4	Inserting PROFInet components into the project	Planners, commissioning engineers and plant operators	SIMATIC iMap
Step 5	Assigning addresses	Planners, commissioning engineers and plant operators	SIMATIC iMap
Step 6	Interconnecting technological functions	Planners, commissioning engineers and plant operators	SIMATIC iMap
Step 7	Generating and downloading	Planners, commissioning engineers and plant operators	SIMATIC iMap
Step 8	Diagnostics	Planners, commissioning engineers and plant operators	SIMATIC iMap
Step 9	Visualizing and analyzing process data	Plant operators, analysis level (instrumentation and control)	SIMATIC iMap, OPC Server

Additional information

The following illustration shows you where to find additional information about SIMATIC iMap and related topics.

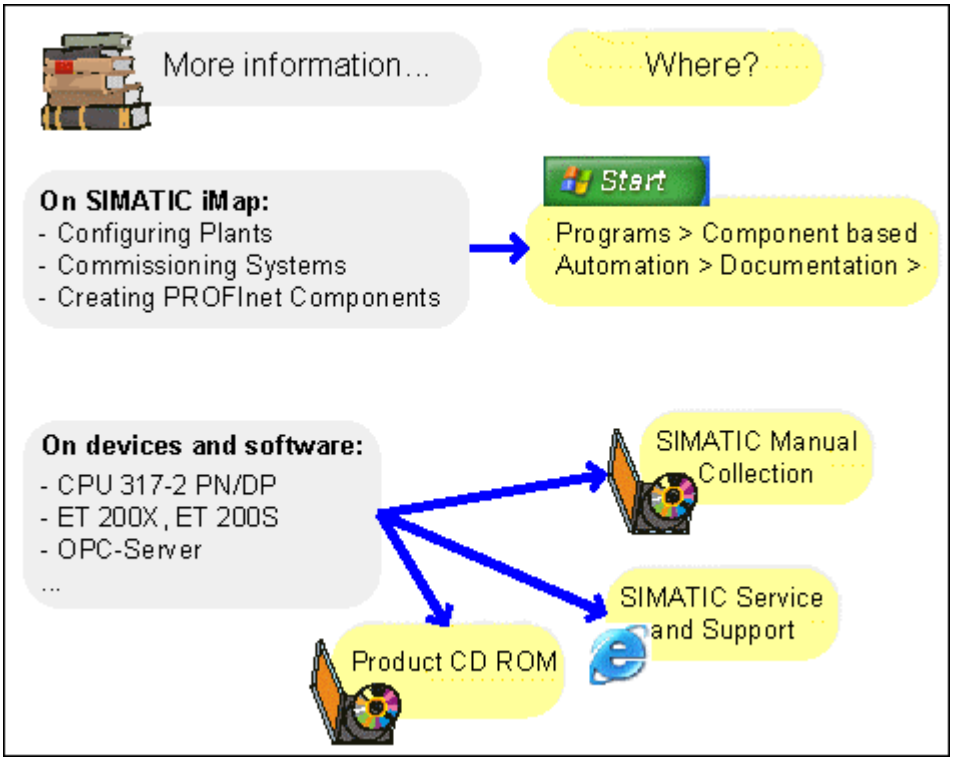


Figure 1-2 Notes

Information	Address (URL)
SIMATIC Manual Collection	http://www4.ad.siemens.de/WW/llisapi.dll?func=cslib.csinfo&lang=en&objId=12283375&lang=en
SIMATIC Service and Support	http://www4.ad.siemens.de/WW/llisapi.dll?func=cslib.csinfo2&siteid=cseus&lang=en

Next Steps

You can get started with SIMATIC iMap in the following ways:

If you want to learn about...	Read ...
How to create PROFInet components	Steps 1 and 2
How to plan a plant with SIMATIC iMap	Steps 3 to 8
How to visualize and analyse process data	Step 9

Step 1: Defining PROFInet Components

2

2.1 Dividing Plants into Modules

Dividing the Plant into Technological Modules

Before you can create PROFInet components using STEP 7 and interconnect the associated technological functions in SIMATIC iMap, you must first break down the plant into reusable modules. These technological modules should form a single unit consisting of electrical, mechanical and control functions. The plant described in the automation task section can be broken down as follows:

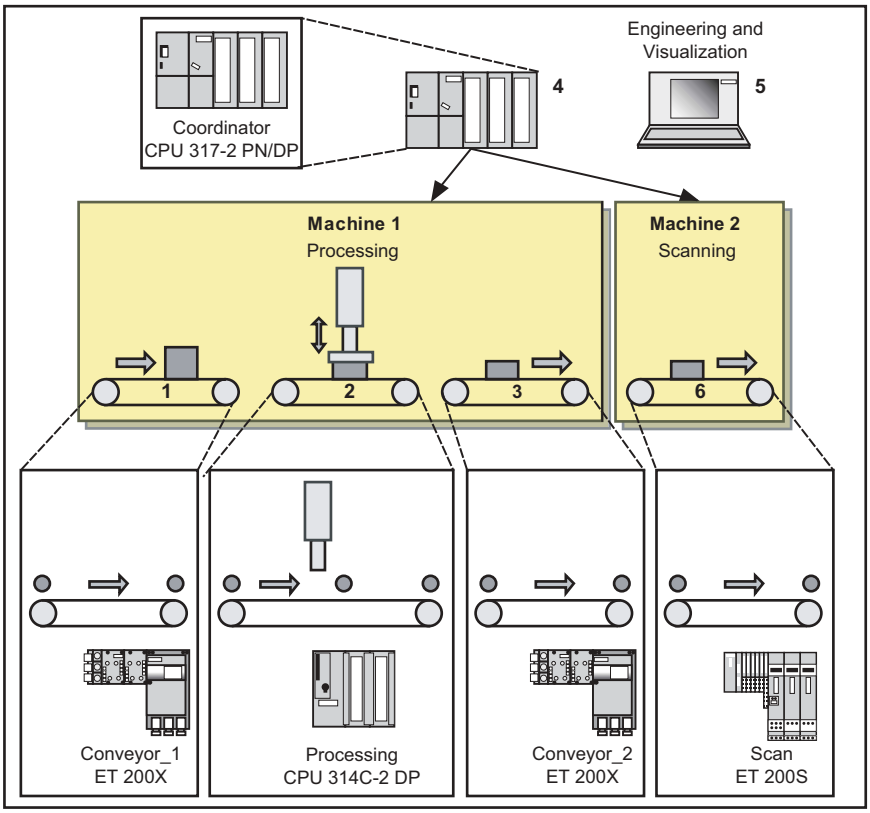


Figure 2-1 Dividing the plant into technological modules

Machine 1

Table 2-1 Technological module, Machine 1

Modules	Designation	Stations
Coordination station (4)	Coordinator	PROFIBUS master: CPU 317-2 PN/DP
Transport module (1) and (3)	ET200X_Conveyor	Intelligent DP slave: SIMATIC ET 200X with basic module BM 147/CPU
Processing station (2)	Processing	PROFIBUS slave: CPU 314C-2 DP as intelligent DP slave

Machine 2

Table 2-2 Technological module, Machine 2

Modules	Designation	Stations
Transport module like (1) and (3)	ET200X_Conveyor	Intelligent DP slave: SIMATIC ET 200X with basic module BM 147/CPU
Scan station (6)	ET200S_Scan	Intelligent DP slave: ET 200S with interface module IM 151/CPU
Network gateway	IE/PB Link	Network gateway Industrial Ethernet / PROFIBUS IE/PB Link

Machine 2 is listed for the sake of completeness and is not mentioned further in the following descriptions.

Analysis and Visualization

Analysis and visualization of the process data is performed on the engineering PC (5) on the Industrial Ethernet.

Configuration of the plant

The following illustration shows the configuration of a plant for the described automation task.

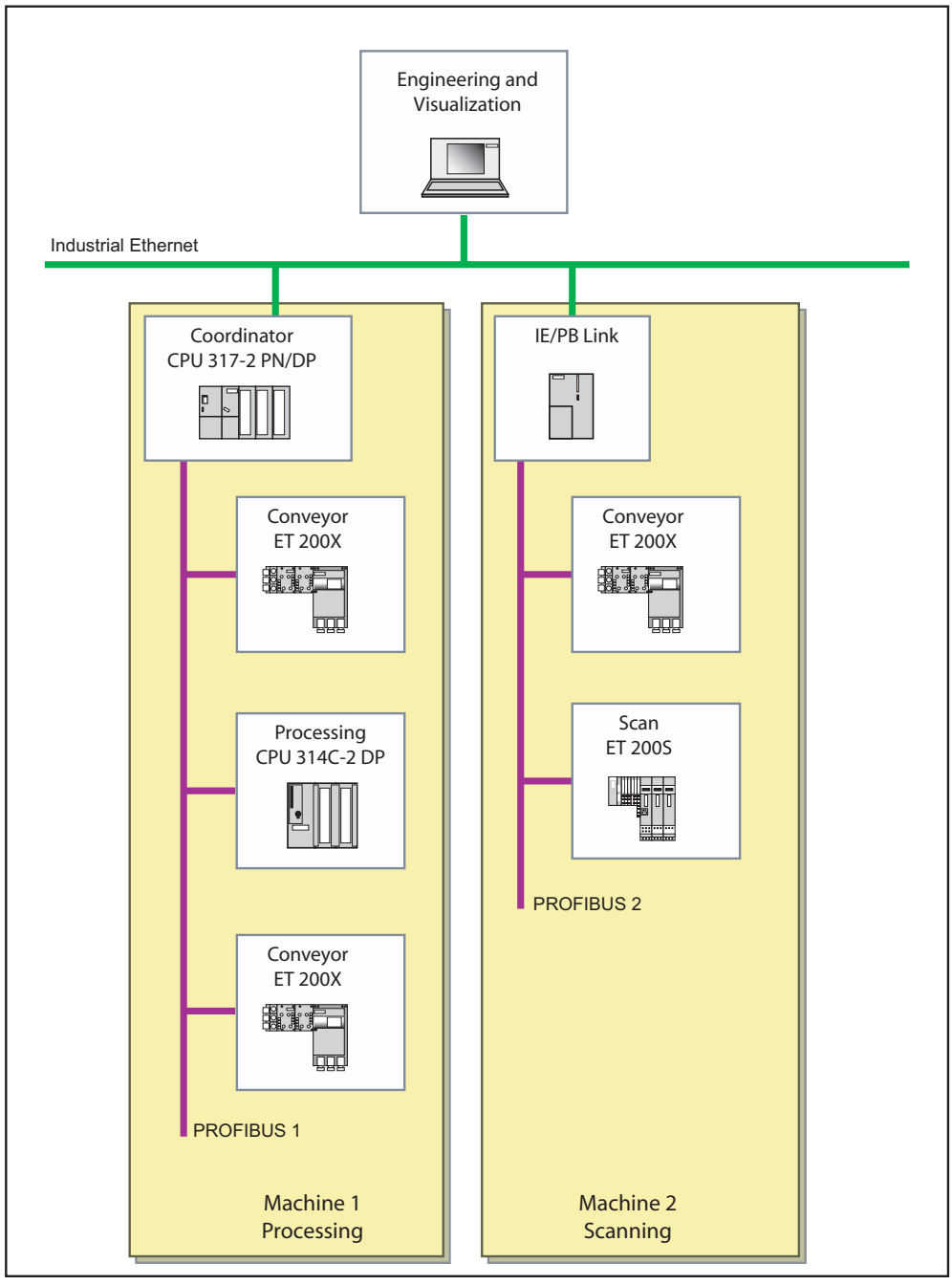


Figure 2-2 Configuration of the plant from the example project

Reusable modules

Breaking down the plant gives the following reusable modules:

- One coordination station
- Several transport modules
- One machining station
- One scan station.

PROFInet components must be created for these modules.

The next step is to define the devices and technological functions for the PROFInet components of Machine 1 to be created.

2.2 Defining Devices and Technological Functions

Devices and component interfaces of the modules

Once you have identified the modules in the plant, you can then define the component interfaces, sometimes referred to as PROFInet interfaces. In STEP 7, the component interface of a PROFInet component is implemented by the interface DB that determines the connections between PROFInet components in SIMATIC iMap.

Interface definitions for the Coordinator, Processing and ET200X_Conveyor components are needed for the plant described in the automation task.

Component coordinator

Table 2-3 Component interface of the coordinator component

Name	Type	Initial value	Description
Inputs			
ON	BOOL	FALSE	Off/On pulse
Ext_Stop	BOOL	FALSE	External Stop signal (e.g. via HMI)
Counter_In	DINT	0	Number or workpieces
Data_In	STRUCT	default	Input data from another coordinator The data is transmitted as a structure with 2 elements.
Ext_Delay	INT	0	Conveyor switch-off delay, variable, e.g. via HMI
Outputs			
StandBy	BYTE	0	Display of the standby mode
Ext_OStop	BOOL	FALSE	Stop signal to next device
Counter_Out	DINT	0	Number of workpieces (looped-through input Counter_In)
Data_Out	STRUCT	default	Output data to another coordinator The data is transmitted as a structure with 2 elements.
Delay	INT	0	Control signal for shutdown delay of the conveyor
Running	BOOL	FALSE	Display of the operating mode (for HMI)

The coordinator contains the upstream functions of a plant. It is switched on and off at the On input. An emergency-off signal can be connected to the Ext_Stop input. The number of workpiece in processing is entered at the Counter_In input. The number is made available for other purposes at the Counter_Out output.

The device is a CPU 317-2 PN/DP serving as a PROFInet device with proxy functionality. The device has a PROFInet connector on the Industrial Ethernet and a PROFIBUS connector as DP master.

ET200X_Conveyor Component

The conveyor is a conveyor element that transports workpieces at a certain speed in one direction. It has a sensor on both the input and the output side.

Table 2-4 Component Interface of the ET200X_Conveyor Component

Name	Type	Initial value	Description
Inputs			
Ext_Start	BOOL	FALSE	External Start signal (e.g. via HMI)
Ext_Stop	BOOL	FALSE	External Stop signal (e.g. via HMI)
Run_Delay	BOOL	FALSE	Shutdown delay
Counter_In	DINT	0	Number or workpieces
Outputs			
Start_Next	BOOL	FALSE	Start next conveyor
Running	BOOL	FALSE	Display of the conveyor mode
Counter_Out	DINT	0	Number of workpieces (looped-through input Counter_In)

The device is an ET 200X with a basic module BM 147/CPU that acts as an intelligent DP slave on the PROFIBUS.

Component processing

The processing station stops the conveyor. The cylinder then moves to the work position and then returns to the idle position once the processing time has finished. The conveyor is then released.

Table 2-5 Component interface of the processing component

Name	Type	Initial value	Description
Inputs			
Ext_Start	BOOL	FALSE	External Start signal (e.g. via HMI)
Ext_Stop	BOOL	FALSE	External Stop signal (e.g. via HMI)
Run_Delay	BOOL	FALSE	Shutdown delay
Proc_In	DINT	0	Number of workpieces to be processed
Outputs			
Start_Next	BOOL	FALSE	Start next conveyor
Running	BOOL	FALSE	Display of the operating mode
Proc_Out	DINT	0	Number of processed workpieces (looped-through input Proc_In)
Processing	BOOL	FALSE	Display of the processing mode

The device is a CPU 314C-2 DP as an intelligent DP slave on the PROFIBUS.

Interconnection diagram

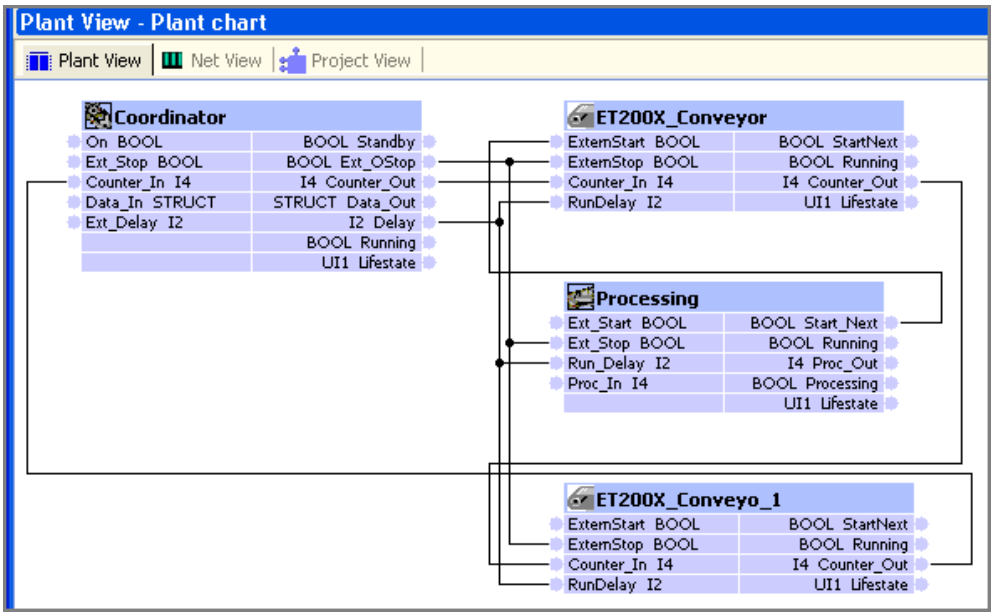


Figure 2-3 Interconnection diagram

Next Steps

- If you want to create your own PROFInet components using STEP 7, go to Step 2.
- If you prefer to design a plant with SIMATIC iMap using preassembled PROFInet components, go to Step 3.

Step 2: Creating PROFInet Components with STEP 7

3

3.1 Basic Procedure for Creating a PROFInet Component

Note

The "Creating PROFInet Components with STEP 7" chapter is only relevant to users who create their own PROFInet components.

Which PROFInet components are created?

Three PROFInet components need to be created for Machine 1 in the example project.

Table 3-1 PROFInet components for the example project

Creating PROFInet components from ...	Device type	Function	Designation of the PROFInet component
CPU 317-2 PN/DP	PROFInet device with proxy functionality (DP master)	Plant controller	Coordinator
ET 200X with BM 147/CPU	PROFIBUS device (intelligent DP slave)	Workpiece feeder	ET200X_Conveyor
CPU 314C-2 DP	PROFIBUS device (intelligent DP slave)	Workpiece machining	Processing

Requirement

The devices and functions of the technological modules must be defined.

Basic procedure

The PROFInet components are created using STEP 7. Carry out the following basic steps:

1. In SIMATIC Manager, create a basic project for a PROFInet component and configure the station hardware in HW Config.
2. Create the interface DB for the component interface.
3. Create the S7 program.
4. Create the PROFInet component using a menu command and save it in a directory.

Tip: Procedure with STEP 7 example projects

You can find example projects for the described automation task in the directory **Step7\Examples**. This completes steps 1 to 3 as described above for this project. You can open and view individual blocks of the STEP 7 projects supplied but you do not have to copy any blocks or type out sections of the program.

Next Steps

Creating a PROFInet "Coordinator" component based on the example of a CPU 317-2 PN/DP. The STEP 7 example project for the "Coordinator" component is located in the directory **Step7\Examples\ZDT27_01**.

3.2 Creating a PROFInet Component Based on an Example of a CPU 317-2PN/DP

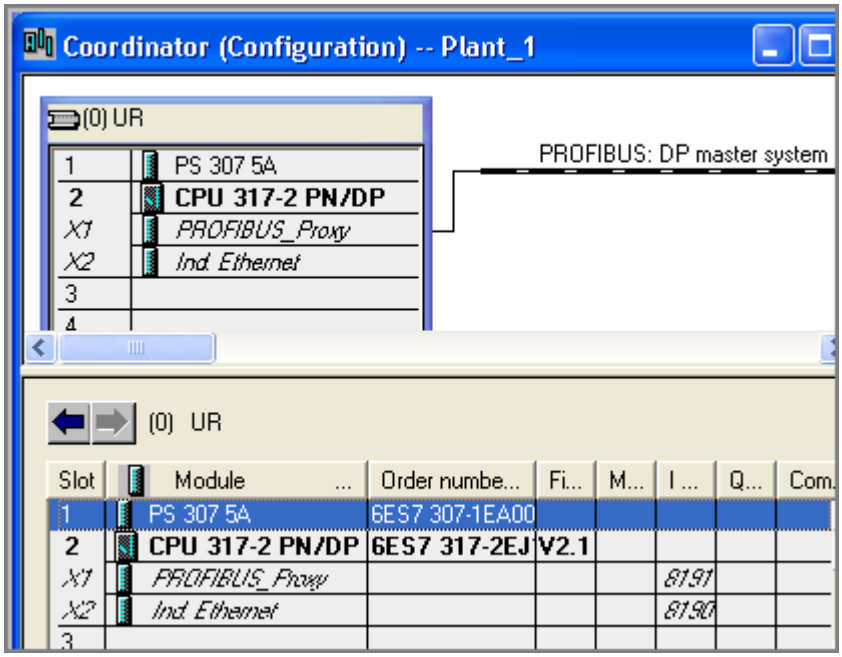
Creating the PROFInet "Coordinator" component for coordination of Machine 1.

Content of the PROFInet component

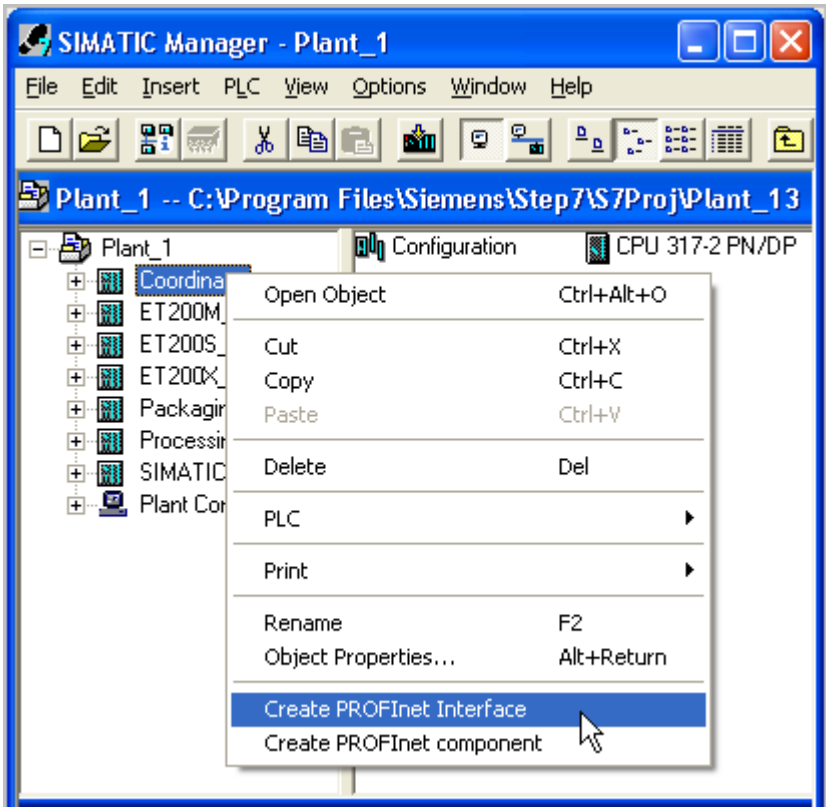
The PROFInet "Coordinator" component contains:

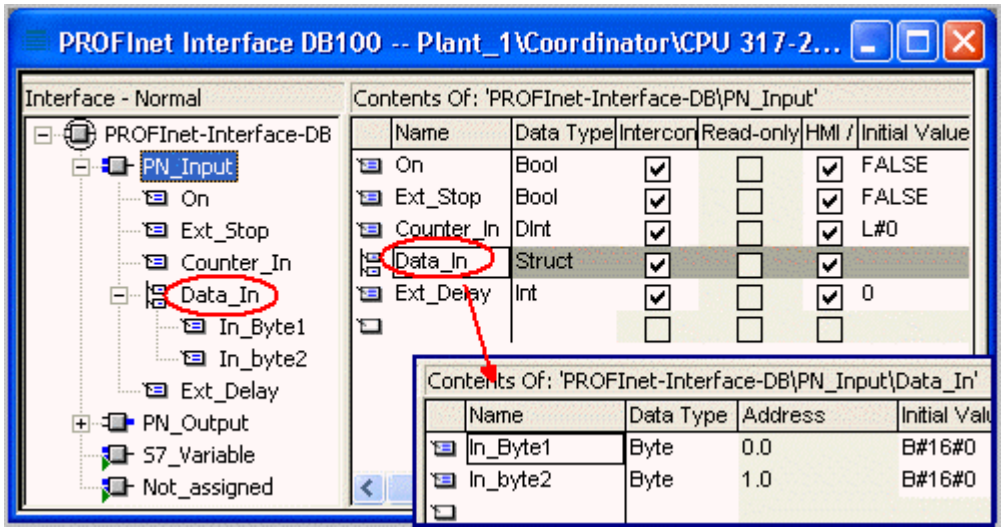
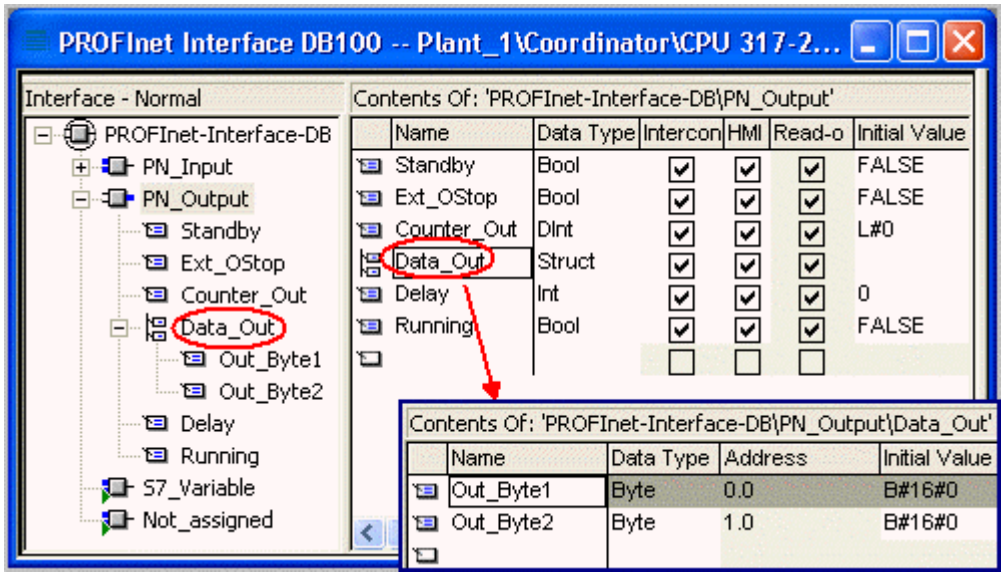
PROFInet component	PROFInet device	Technological function
Coordinator	SIMATIC 300 station with CPU 317-2 PN/DP (PROFInet device with proxy functionality)	Coordination of Machine 1 (S7 program with the component interface)

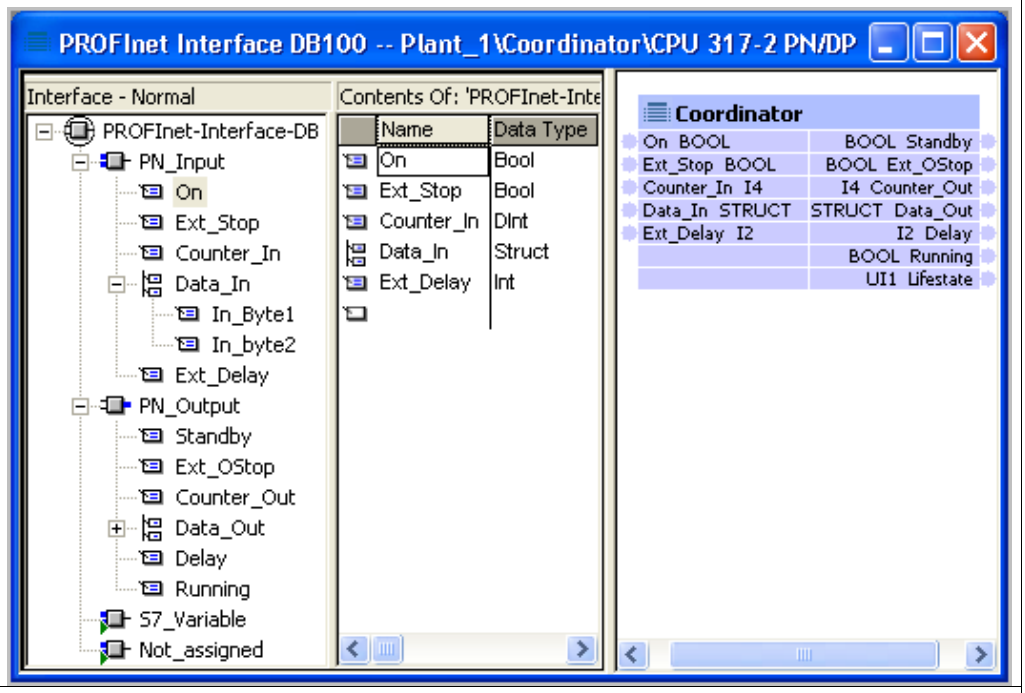
How to configure the hardware

Task	Procedure
1.	Create a project in SIMATIC Manager and insert a SIMATIC 300 station with the name "Coordinator".
2.	Configure the hardware based on the following illustration:  Note: The DP master system (X1) must be connected to a network.

How to create the interface DB

Task	Procedure
1.	In SIMATIC Manager, mark the "Coordinator" station and then select the **Create PROFInet Interface** command from the context menu.  The "New/Open PROFInet Interface" dialog opens.
2.	Select CPU 317-2 PN/DP in the left window of the "New/Open PROFInet Interface" dialog. Activate the "New" option and confirm this by pressing the "OK" button. Result: The properties dialog of the newly created block opens.
3.	In the "Name and type" field, enter the desired block number, DB100 for example, and select the block type, "Global DB". Confirm by clicking on the "OK" button. Result: The interface DB is opened in the PROFInet Interface Editor.

Task	Procedure
4.	Enter the inputs of the technological function in the PN Input section and assign the entries the required properties: Name, Data type, Connectable, HMI/MES, as shown in the following illustration:  The Data_In structure is marked in the picture. Result: The interconnectable connections are graphically display in the right window of the Interface Editor as in the plant view of SIMATIC iMap.
5.	Enter the outputs of the technological function in the PN Output section and assign the entries the required properties: Name, Data type, Connectable, HMI/MES, as shown in the following illustration:  The Data_Out structure is marked in the picture. Result: The interconnectable connections are graphically display in the right window of the Interface Editor as in the plant view of SIMATIC iMap.

Task	Procedure
	The PROFInet interface (technological function) is displayed in the right window of the Interface Editor: 
6.	Save the PROFInet interface DB using the menu command **File > Save**.
7.	Close the PROFInet interface DB using the menu command **File > Close**.

Additional information...

about the interface DB can be found under "Properties of the Interface DB" in the SIMATIC iMap or SIMATIC Manager basic help.

How to create the S7 program

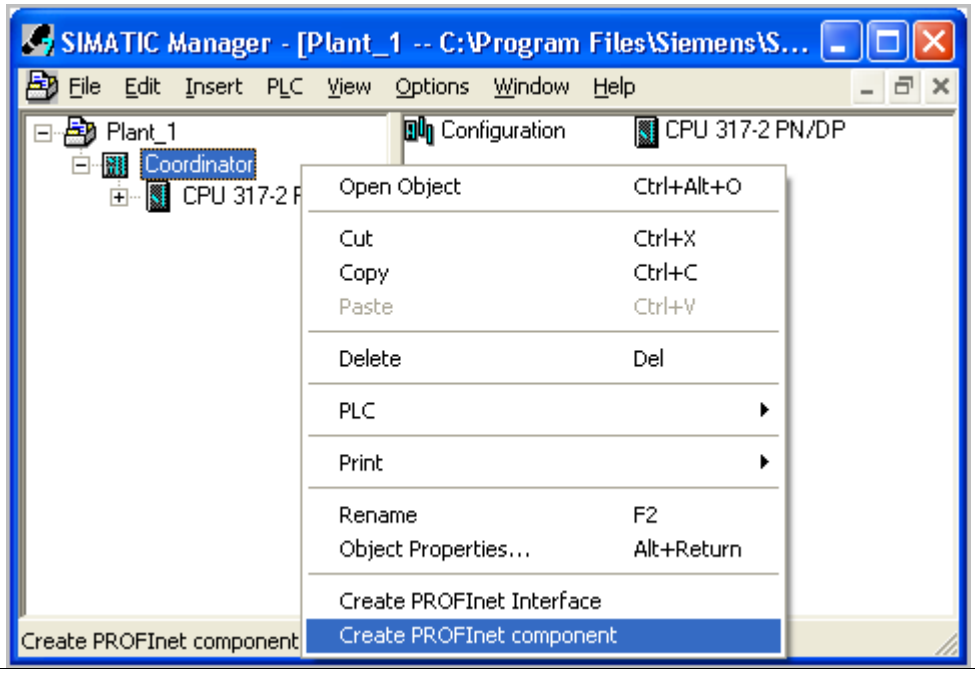
Task	Procedure
1.	Copy all blocks from the "CPU 317-2 PN/DP" block folder of the PROFInet System Library into the block folder of the CPU.

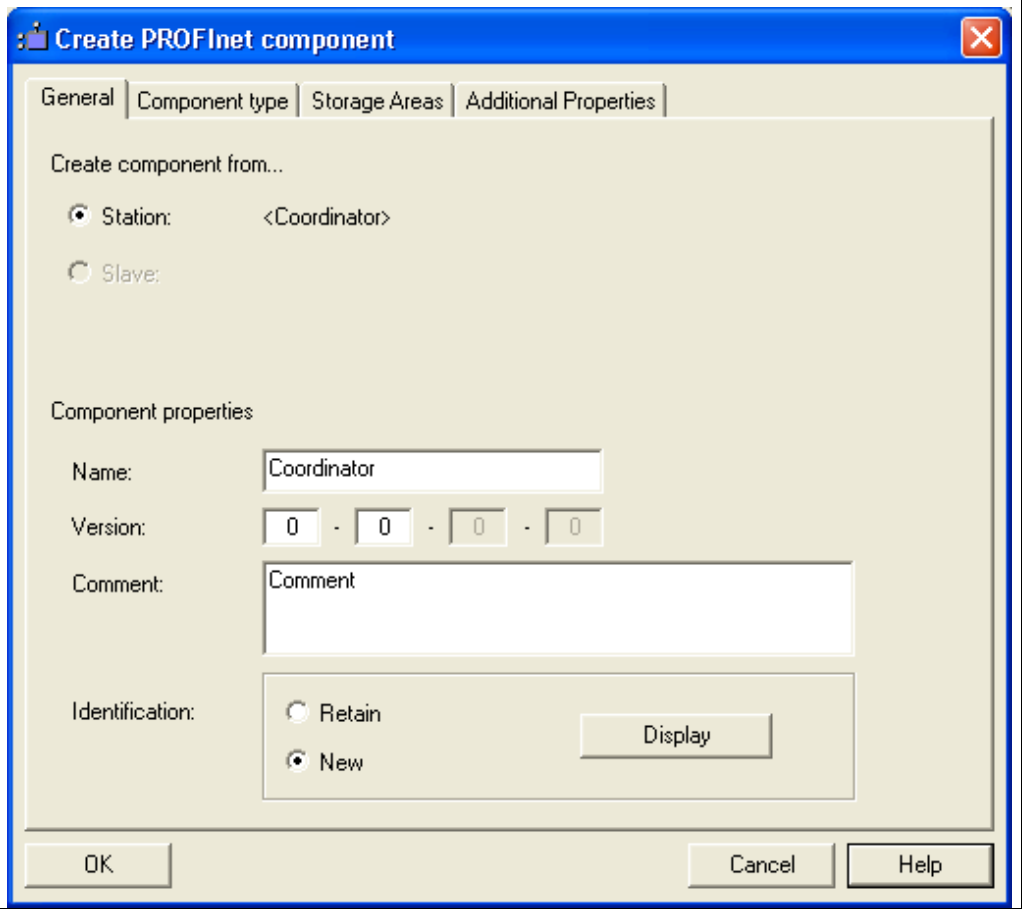
2.	Create the program. The following is an example based on a section from OB1. You can see the reference to the PROFInet interface DB there. The sources can be found in the completed STEP 7 example project.
	…
	//enable component
	A "PN_Interface_DB".On
	JCN noon
	= "PN_Interface_DB".Standby
	//forward HMIStop to Ooutput HMIStop
	A "PN_Interface_DB".Ext_StoP
	= "PN_Interface_DB".Ext_Ostop
	//increments OCnt if Cnt==Ocnt
	L "PN_Interface_DB".Counter_In
	L "PN_Interface_DB".Counter_Out
	<>D
	JC GO
	L "PN_Interface_DB".Counter_Out
	L 1
	+D
	T "PN_Interface_DB".Counter_OutGO: NOP 0
	…

3.	Compile and test the S7 program.

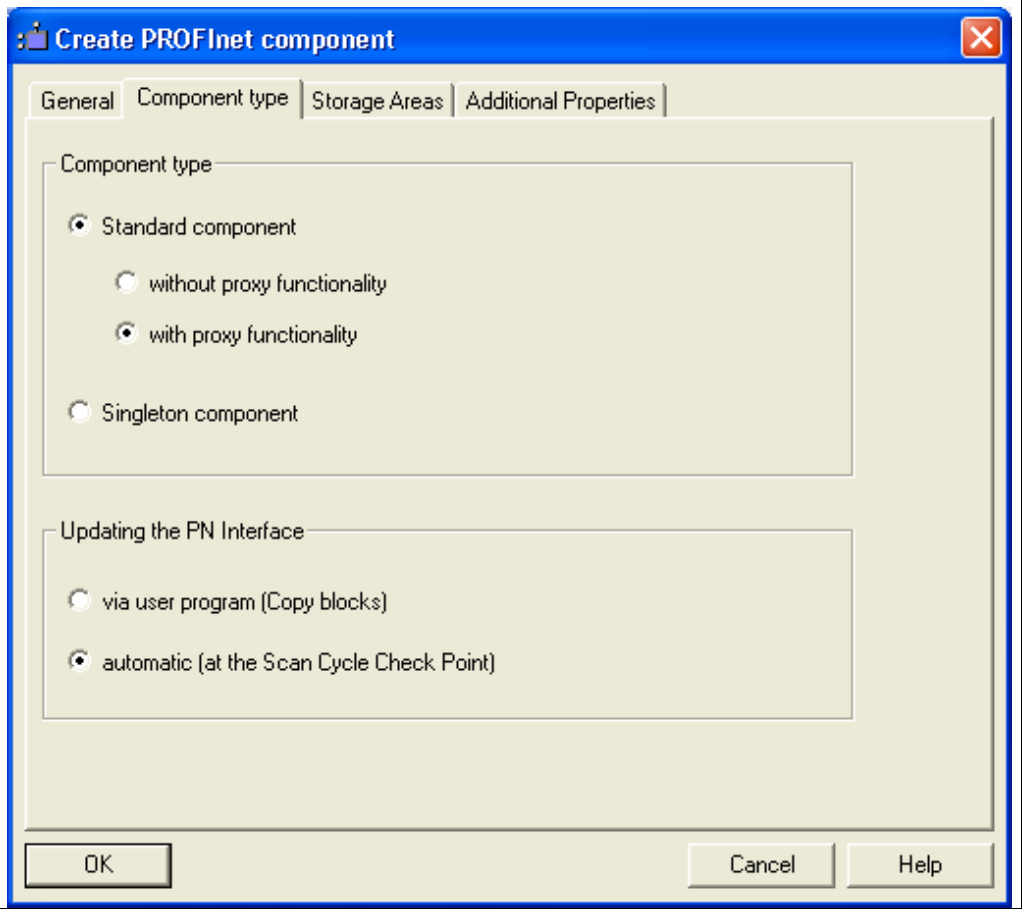
How to create the PROFInet component

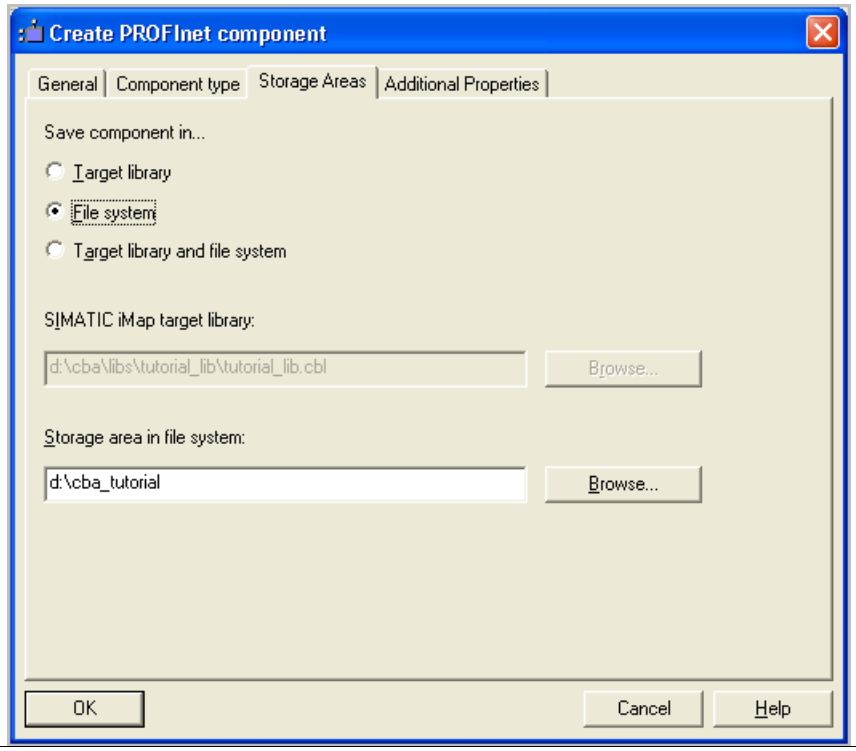
Task	Procedure
1.	In SIMATIC Manager, mark the "Coordinator" station and then select the **Create PROFInet Component** command from the context menu.

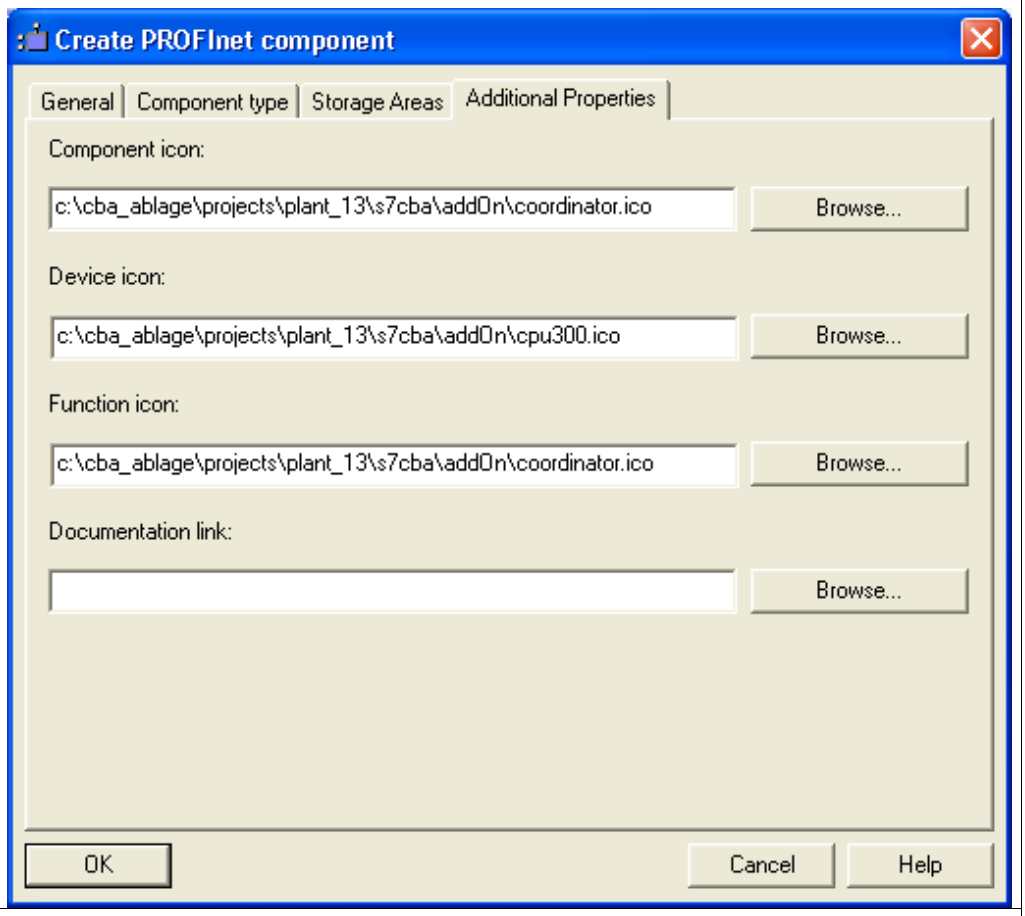


Task	Procedure
2.	In the "General" tab, mark the option "Identification" and enter the following name: "Coordinator“. 

Task	Procedure
3.	In the "Component type" tab, select "Standard component with proxy functionality" and "Updating PN interfaces automatic (at cycle control point)".



Task	Procedure
4.	In the "Storage areas" tab, enter the desired path, for example, **D:\cba_tutorial** (D stands for a drive of your choice). 

Task	Procedure
5.	In the "Additional properties" tab, enter the path of the icon files and optionally the path of the documentation link. You can use the supplied icons as needed (default path: Step7\s7data\s7cbac1x). 
	Result: The PROFInet component is saved as an XML file at the specified location and the archived component project is saved.

Note

The completed PROFInet component can be found in the installation directory of the tutorial under

\CBA_Tutorial\PROFInet_Components\coordinator-{...}

We recommend this as a basis for the next steps to ensure correct performance of the tutorial examples.

Next Steps

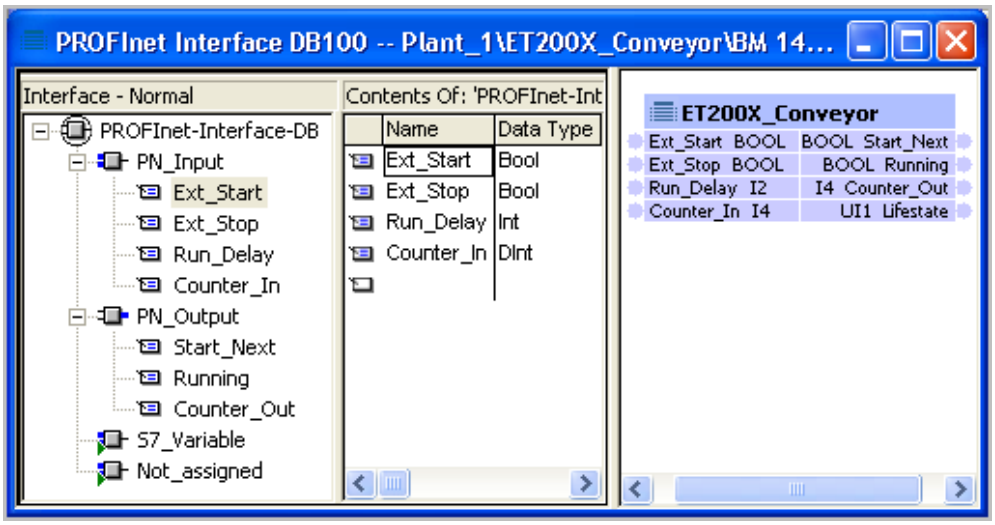
You can create the PROFInet "ET200X_Conveyor" and "Processing" components by repeating the steps described above.

Then you can configure the plant using SIMATIC iMap.

Example: "ET200X_Conveyor" component from an ET 200X

The STEP 7 example project is located in the directory \Step7\Examples\ZDT27_07.

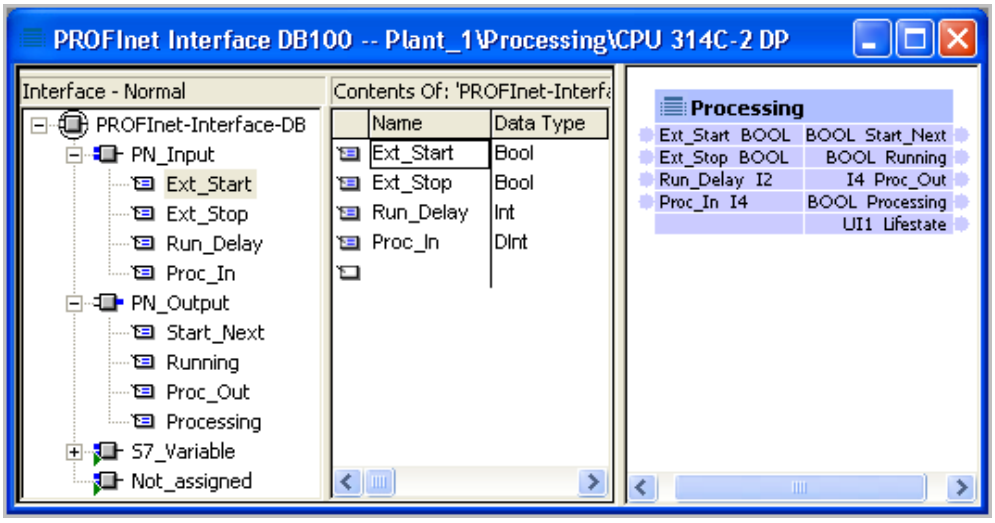
The PROFInet interface is shown in the following illustration.



Example: "Processing" Component from a CPU 314C-2 DP

The STEP 7 example project is located in the directory \Step7\Examples\ZDT27_04.

The PROFInet interface is shown in the following illustration.



Steps 3 to 6: Configuring a Plant with SIMATIC iMap

4

4.1 Step 3: Importing PROFInet Components into a Library

Before you can edit the PROFInet components in the example project, you must first import them from the file system into a SIMATIC iMap library.

Requirements

- SIMATIC iMap must be installed on your PC/PG.
- The PROFInet components have been created and stored in the file system or
- the path to the off-the-shelf PROFInet components is already known, generally Programs\Siemens\iMap\examples\components.

Alternative procedures

There are two ways to insert PROFInet components from the example project into a SIMATIC iMap project:

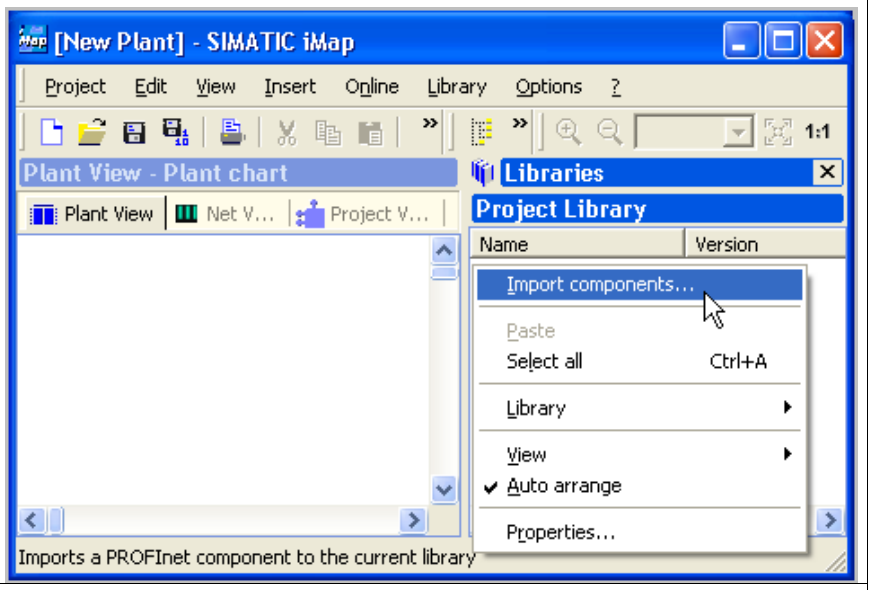
- Create a new project in SIMATIC iMap, then import the PROFInet components created in STEP 7 from the file system into the project library.

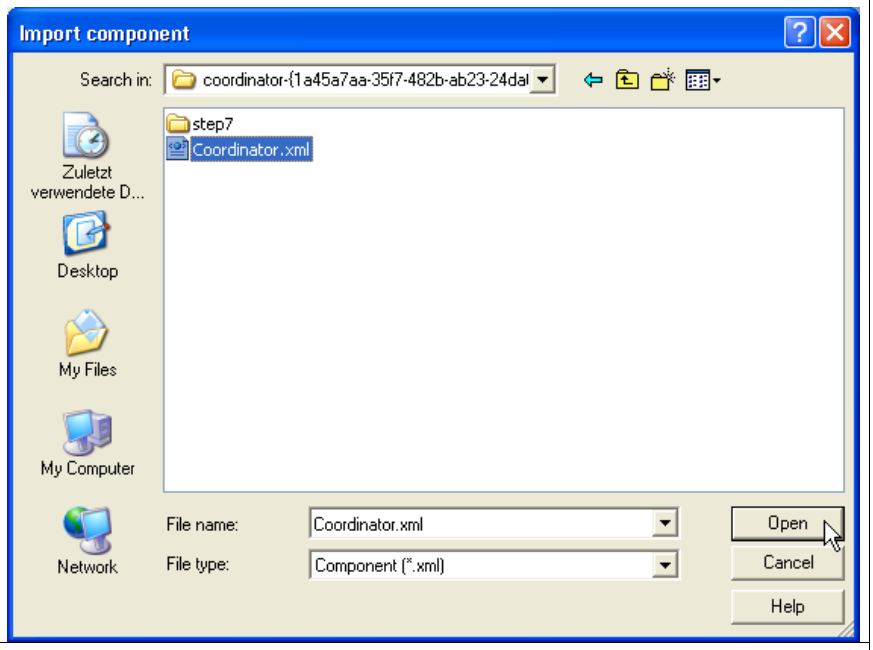
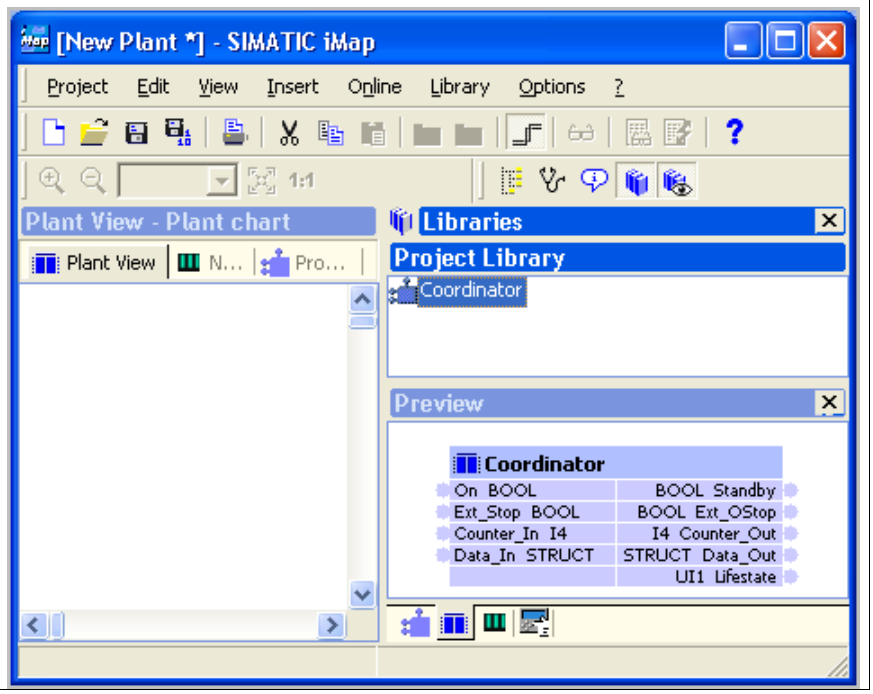
or

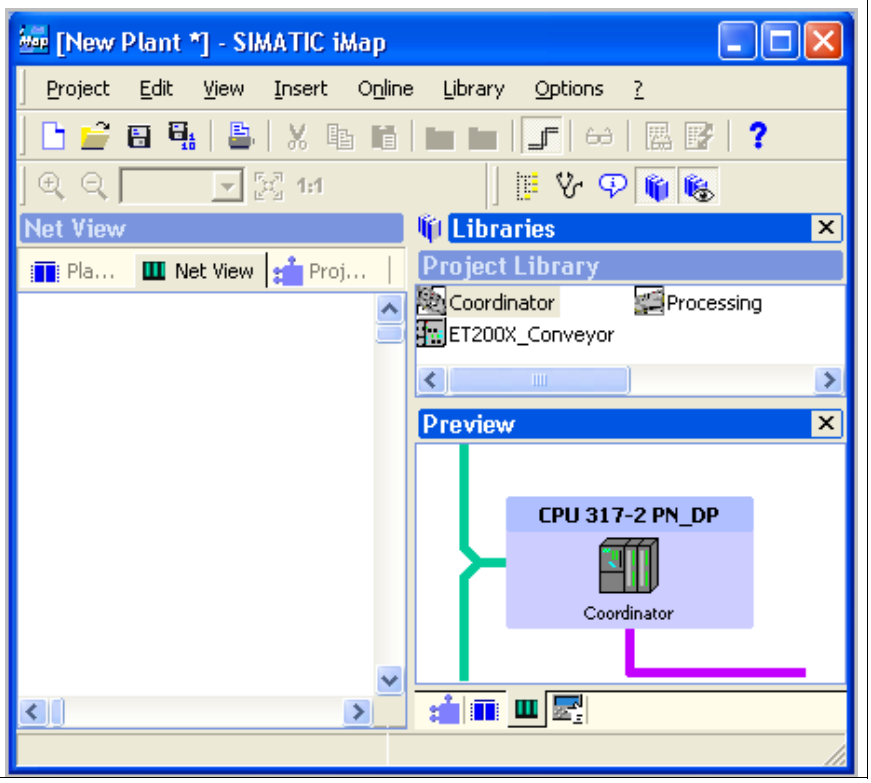
- Open the supplied "Tutorial_Lib" library with the preassembled PROFInet components.

How to import PROFInet components into the project library

Table 4-1 Importing components into the project library

Step	Description
1.	Start SIMATIC iMap. Select **Start > Programs > Component based Automation > SIMATIC iMap** or click on the iMap icon on the desktop.
2.	In SIMATIC iMap select the menu command **Project > New** to create a new project. When a new project is created, the corresponding project library is also opened. You import the required PROFInet component into this project library.
3.	In the project library window, select the command **Import components...** from the context menu. 
4.	Under “Search in“, select the path Programs\Siemens\iMap\components.

Step	Description
5.	Select the "coordinator.xml" file from the "Coordinator..." folder. Click on the "Open" button to confirm your entry. 
	The "Coordinator" PROFInet component is imported into the library and displayed as an icon. 

Step	Description
6.	Repeat steps 3 to 5 with the ET200X_Conveyor" and "Processing" PROFInet components. Now all the required PROFInet components have been imported into the project library. 

Tip: Open the supplied library

A SIMATIC iMap library is available with preassembled PROFInet components in the installation directory of iMap, usually under iMap\Examples\libs\.

Table 4-2 Opening the preassembled library

Step	Description
1.	In SIMATIC iMap, select the menu command **Library > Open...**.
2.	Under “Search in“, select from the SIMATIC iMap install path \iMap\examples\libs.
3.	Open the folder "Tutorial_Lib" and select the library “Tutorial_Lib.cbl". Click on the "Open" button to confirm your entry. The library opens in the library window.

Tips

- In the preview window, the PROFInet component selected in the library window is displayed as a technological function with inputs and outputs or as a device with bus connections (see illustration above).
- You can change the appearance and position of the components and display details using the **View** context menu in the library window.

Next Steps

How to insert instances of PROFInet components into the project from the project library.

4.2 Step 4: Inserting PROFInet Components into the Project

Instances of a PROFInet component

When you insert a PROFInet component from a library into the SIMATIC iMap project, it creates an instance of the PROFInet component in the project, i.e. a copy of the component. One or more instances of a PROFInet component may be inserted into a project. Each instance is assigned additional properties, for example, a name and address.

Requirements

- The PROFInet components must be imported into the project library.

  or

- The "Tutorial_Lib" library must be open.

When you insert the PROFInet components from the "Tutorial_Lib" library into a project, they are also automatically inserted into the project library, if it does not already contain them.

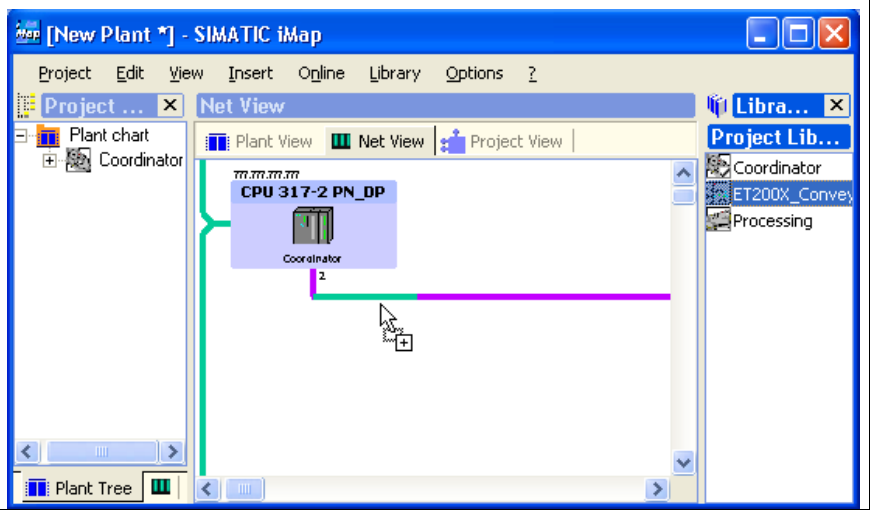
The project library is used in the following description.

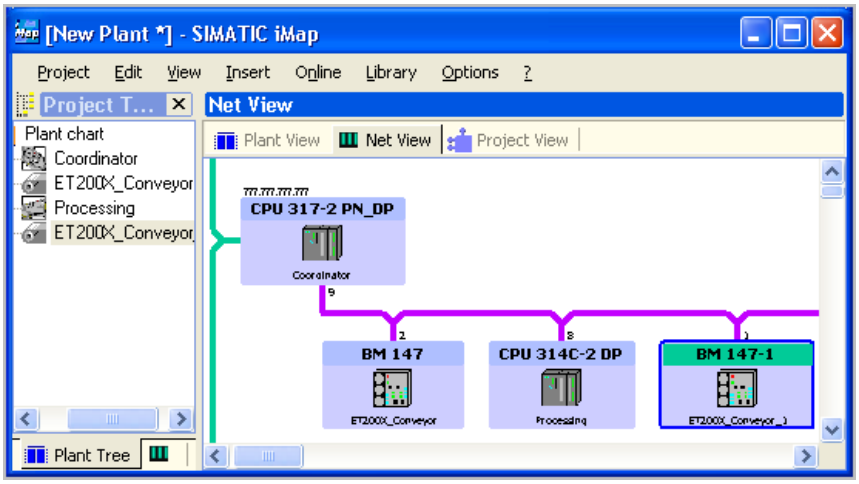
How to insert PROFInet components from the library into the project

PROFInet components can be inserted into the plant view or into the net view for the project in one of the following ways:

- Mark a PROFInet component in the library window and select the menu commands **Copy** and **Paste** from the context menu.
- Drag the PROFInet component from the library into one of the windows – net view, plant view or project window.

Table 4-3 Inserting the PROFInet Components into the Project

Step	Description
1.	Switch from the plant view to the net view.
2.	In the library window, highlight the "Coordinator" component and use drag-and-drop to move it to the project net view. The Ethernet is represented by a green line and the PROFIBUS by a violet line in the net view. The "Coordinator" is automatically coupled to the Ethernet and displayed with a PROFIBUS master system.
3.	Drag the "ET200X_Conveyor" component from the library into the net view. The possible destinations on the PROFIBUS are indicated by green segments. 

Step	Description
4.	Repeat Step 3 for components "Processing" and once again the "ET200X_Conveyor". Now you have inserted all the components that you need for your project.  The technological function is displayed in the project tree under the tab "Plant tree" and the device is shown in the "Net tree " tab.

Note

If a PROFIBUS device (DP slave, e.g. ET 200X) is inserted into the net view first, this device will then appear in the net view above a separating line. It can then be connected to the PROFIBUS using Drag and Drop.

Example of uncoupled PROFIBUS device

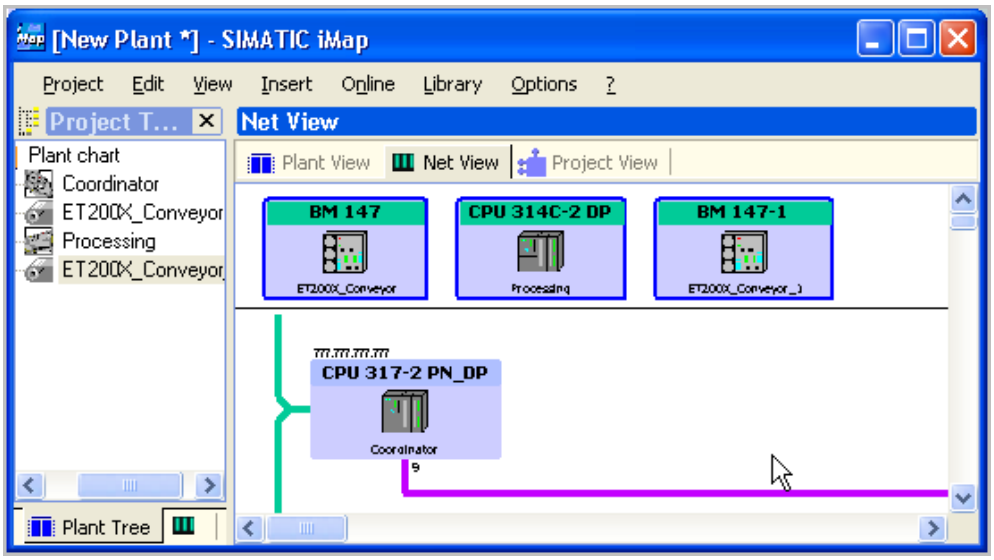


Figure 4-1 Example of uncoupled PROFIBUS device

Tip

Close the windows that you do not need. They can be opened again with the icons or the **View** menu.

Next Steps

How to assign addresses to devices

4.3 Step 5: Assigning Addresses

The IP or PROFIBUS addresses of the devices in the plant are assigned to the devices in the SIMATIC iMap project. Addresses are needed in order to provide unique identification for each PROFInet and PROFIBUS device, and thus enable communication (downloading, online monitoring) between SIMATIC iMap and the devices in the plant.

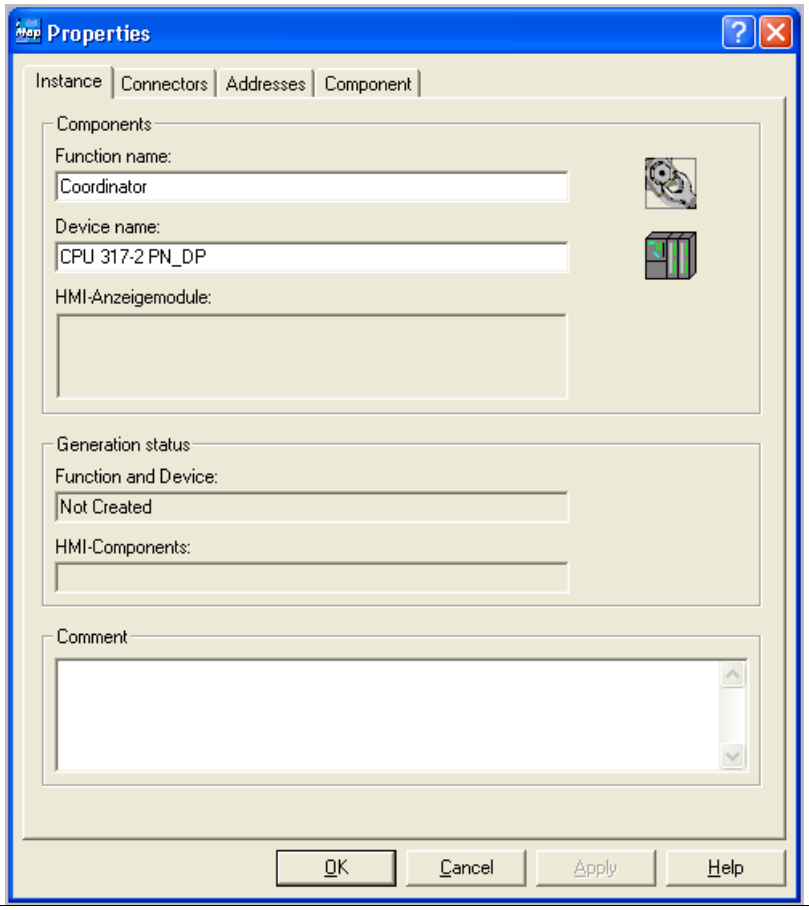
Requirements

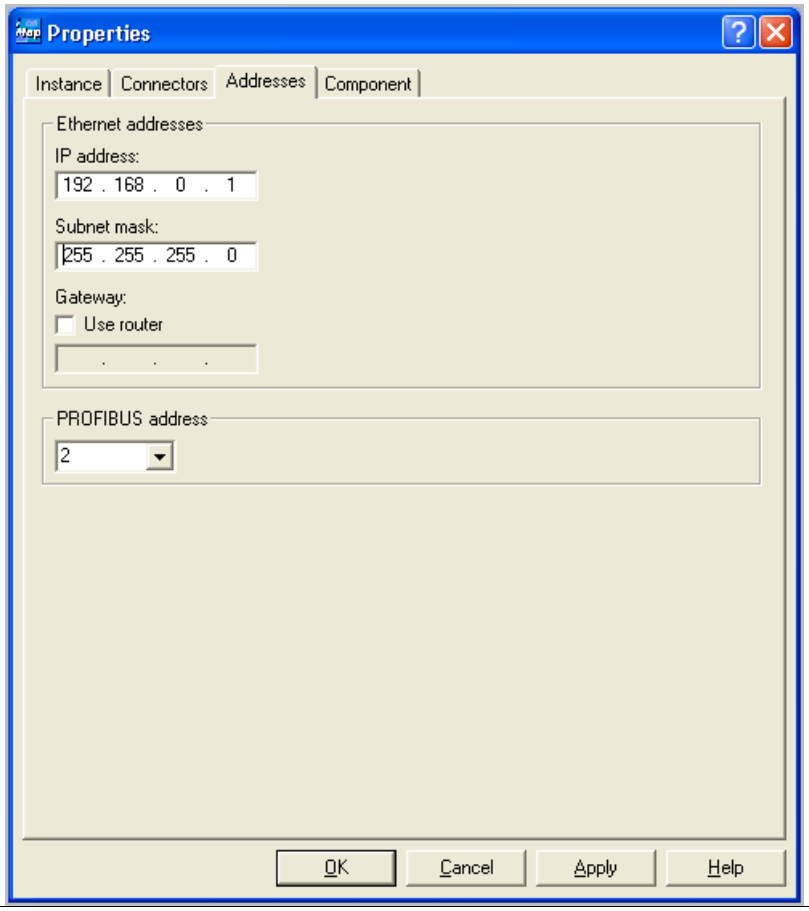
- The PROFInet components have been inserted into the project.
- The IP address and subnet mask for the CPU 317-2 PN/DP are known and assigned.
- The PROFIBUS addresses of the devices are known and assigned.

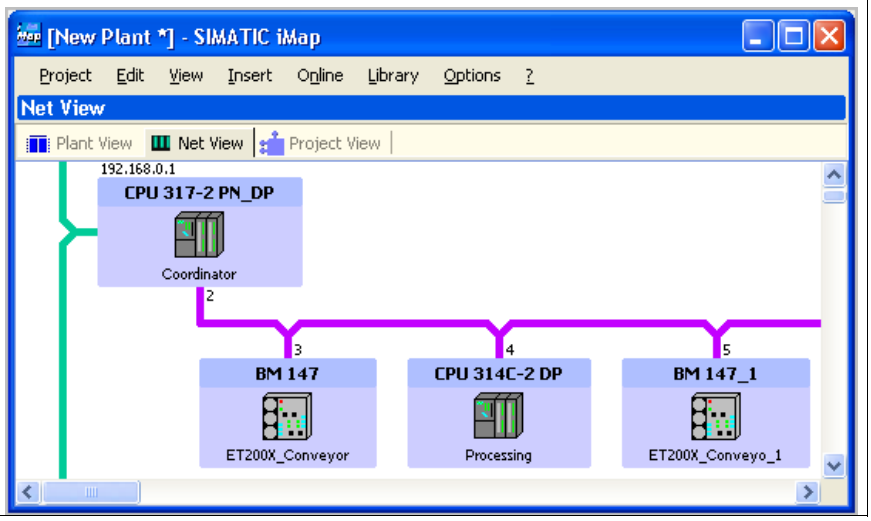
The addresses must be assigned to the target devices in the plant using the device-specific resources normally used for commissioning.

How to assign addresses

Table 4-4 Assigning addresses in SIMATIC iMap

Step	Description
1.	Mark the CPU 317-2 PN/DP device in the net view, then select **Edit > Properties...**. 

Step	Description
2.	Enter the IP address and the subnet mask of the CPU 317-2 PN/DP in the "Addresses" tab. This has to match the IP address and subnet mask of the target device. Select the PROFIBUS address from the drop-down list in the "PROFIBUS address" field. 
3.	In the net view, highlight the "ET200X_Conveyor" device and select **Edit > Properties...**. On the "Addresses" tab, enter the PROFIBUS address, and click on the "OK" button to confirm your input.

Step	Description
4.	Repeat Step 3 for the "ProcessStation" and "ET200X_Conveyor_1" components. All the addresses are now assigned, 

Note

You can assign any names you wish to the devices.

Next Steps

Interconnecting the technological functions in the plant view of the project.

4.4 Step 6: Interconnecting Technological Functions

Requirements

- The PROFInet components must be correctly coupled to the networks.
- The component interfaces, i.e. the connector assignments and the interconnection diagram, must be known.

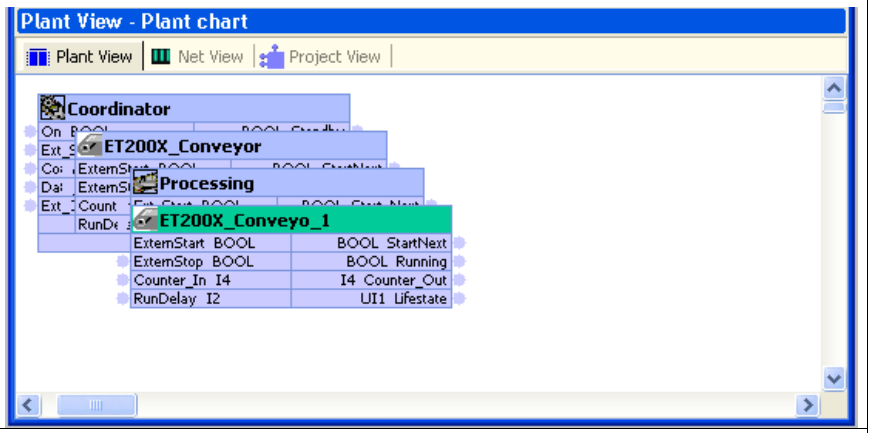
Interconnection rules

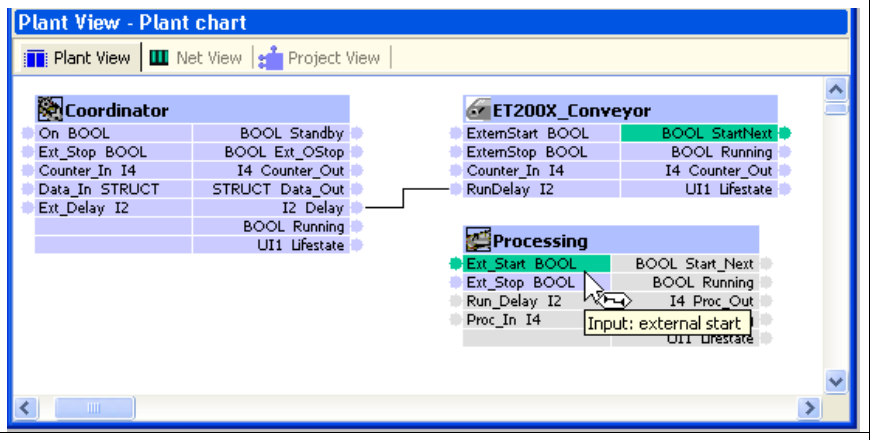
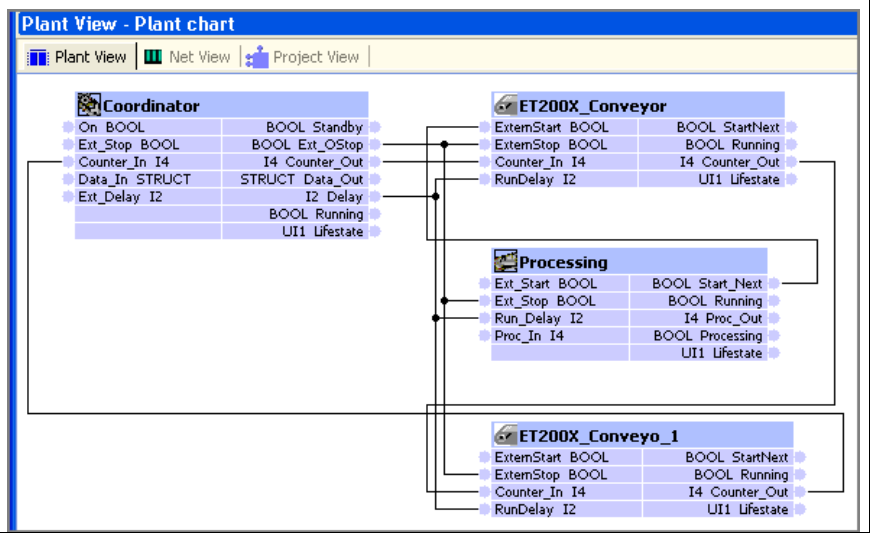
- You must always connect an output to an input but an output may be interconnected to several inputs.
- The two connectors of an interconnection must be of the same data type, e.g. both of type I2 or type U12.

How to interconnect technological functions

You can interconnect technological functions in the plant view.

Table 4-5 Interconnecting technological functions

Step	Description
1.	Switch from the net view to the plant view. When the technological functions first appear in the plant view, they overlap. 
2.	Use Drag and Drop to arrange the technological functions to make the plant clearer and easier to understand. To drag a function, click on its title bar.

Step	Description
3.	a) Click on the "Delay" output of the Coordinator and on the "RunDelay" input of the ET200_Conveyor. a) Click on the "StartNext" output of the Coordinator and on the "Ext_Start" input of the processing component. The interconnection is represented by a line. Connection points of the same type, e.g. BOOL, are shown in green when the mouse pointer moves over a component. The selected output and the currently selected input are also shown in green. 
4.	Interconnect the inputs and outputs of the technological functions as shown in the following connection diagram. 

Note

Interconnections are replaced by numbered continuation lines if a line cannot be represented. You can change the representation of the lines by moving the technological functions as required.

Tips

- You can use the **Properties...** context menu to display information about the connectors of a selected technological function.
- Select **View > Plant view > Dot screen** to display a dot screen that can facilitate positioning the technological functions.
- Select **View > Zoom** to change the size of the plant view on screen.

Next Steps

Saving and generating the project

Step 7: Generating and Download

5

5.1 Saving and Generating the Project

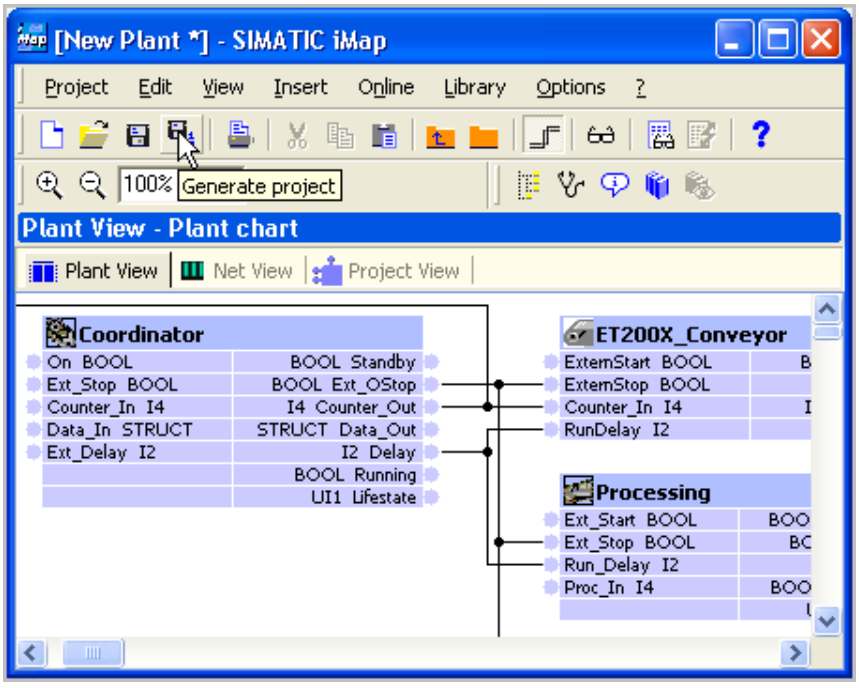
When you generate the SIMATIC iMap project, the current data is prepared for downloading to the target devices of the plant. The PROFInet components used only contain controller units and no HMI parts. Only the controller unit will therefore be generated for the project.

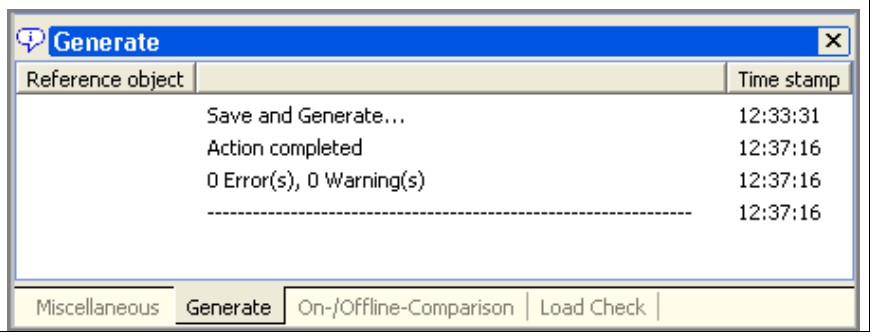
Requirement

STEP 7 must be installed on the same computer as SIMATIC iMap.

Saving and generating a project

Table 5-1 Saving and Generating the Project

Step	Description
1.	Select **Project > Generate > Control unit > Changes only** or the "Generate project" icon (see illustration).  A message appears to tell you that the project must be automatically saved before generating. You are asked whether you wish to continue. Click on "Yes" to confirm. The "Save SIMATIC iMap Project As" dialog opens.

Step	Description
2.	Select any path under "Search in", e.g. Programs\Siemens\iMap\projects.
3.	Enter a file name for the project, for example, "Plant_1" and confirm your entry by pressing the "Save" button. The project is saved and generated. The complete project is generated when you call the **Project > Generate > Control unit > Changes only** menu command for the first time. Thereafter, only the changes are generated when you call this menu command again.
4.	You can follow the generation progress messages in the information window of the "Generate" tab. 

Note

Generation can take a long time for large projects, You can cancel generation at any time by clicking on the "Cancel" button in the message box.

Tip

If generation is successful, all the objects in the project are assigned the generation status "Created" in their properties. The generation status is displayed in the project view.

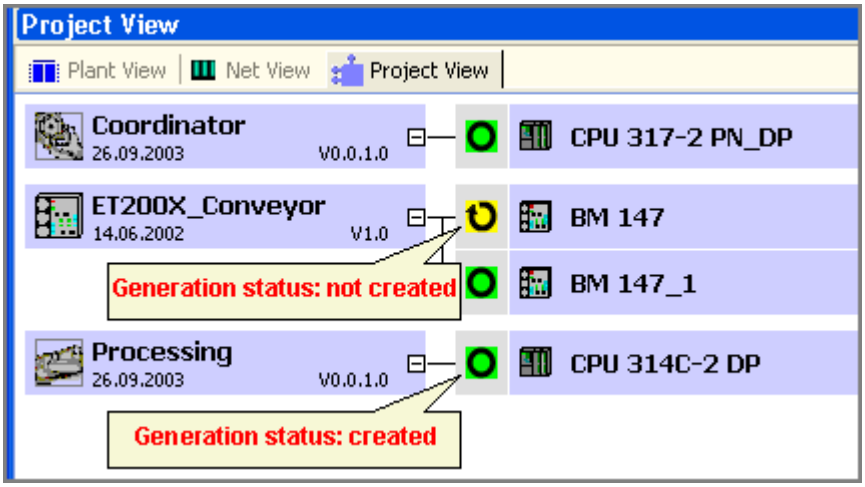


Figure 5-1 Generation status in the project view

Next Steps

Downloading the project data from SIMATIC iMap into the target device of the plant

5.2 Downloading Programs and Interconnections

Downloading - Introduction

Downloading transfers data from SIMATIC iMap to the devices of the plant. All or just the selected instances of the PROFInet components may be downloaded. The following data may be downloaded using the **Online** menu:

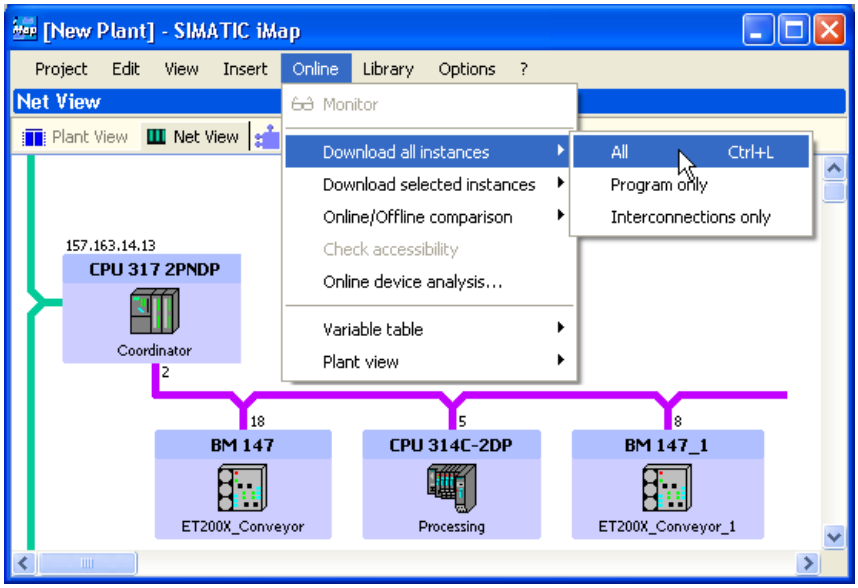
- The user programs you have created, including the hardware and network configuration
- The interconnections between technological functions
- All, i.e.both programs and interconnections

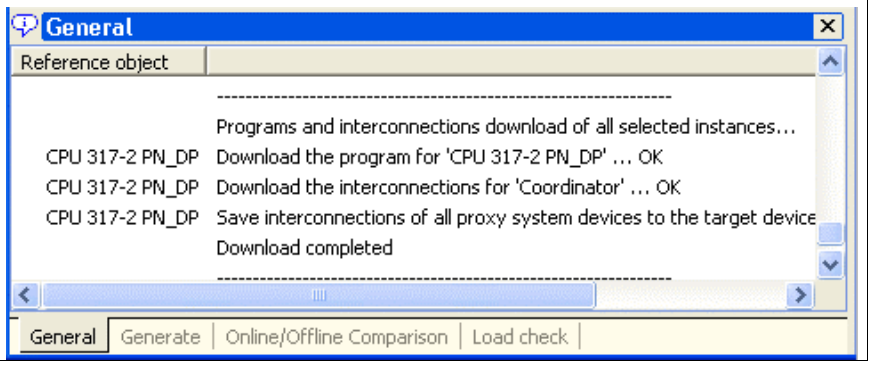
The program must be downloaded when a device is commissioned. Interconnections can be downloaded later if required, in order to test PROFInet communication between the components, for example.

How to download programs and interconnections

For the example project, the programs and interconnections of all the PROFInet components will be downloaded to the devices of the plant.

Table 5-2 Downloading Programs and Interconnections

Step	Description
1.	Select **Online > Download all instances > All** in the net view.  The program and interconnections are downloaded to all target devices.

Step	Description
2.	Messages concerning the progress of the download and asking whether you wish to cancel the action appear in the information window. 

Tips

- The online-offline comparison is used to determine the devices for which a program download or interconnection download is required.
- If you have only changed interconnections in the project, then only the interconnections have to be downloaded. You do not have to download the program again.
- A program download is generally needed only once, while the interconnections can be downloaded as often as required.
- The devices and technological functions that require interconnections to be downloaded are identified by a "download" symbol in the online view and are listed in the "Devices" or "Functions" tab in the diagnostic window.

Next Steps

Learning how to represent the diagnostic information in the diagnostic window with reference to an example.

Step 8: Diagnostics

6

6.1 Monitoring the Plant Online

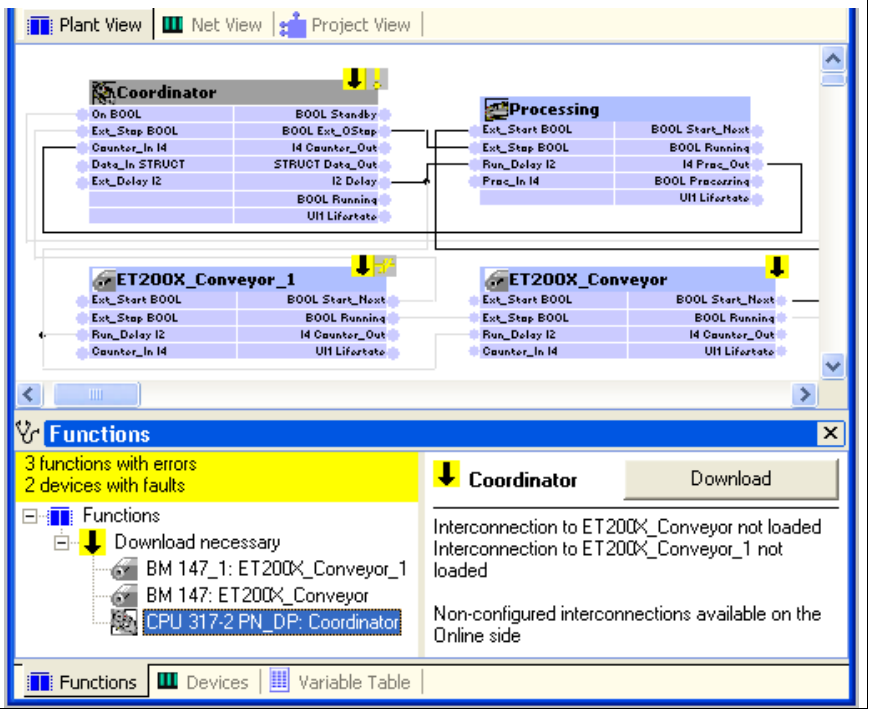
Requirements

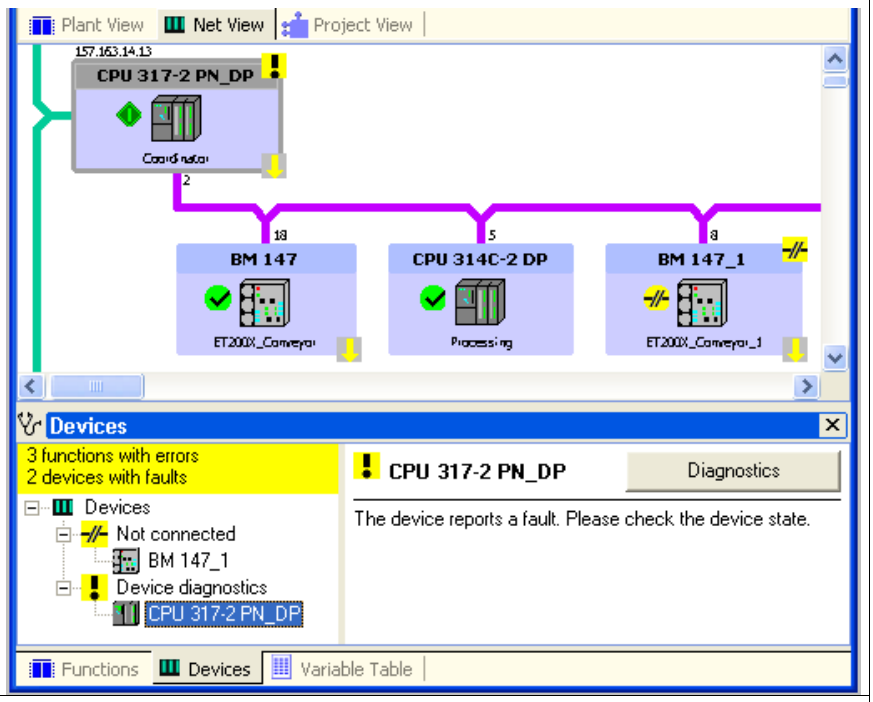
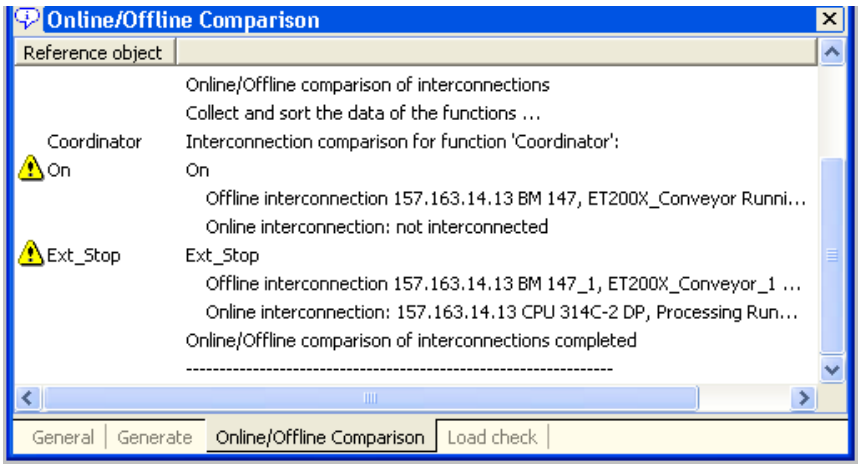
- The SIMATIC iMap project "Plant_1" has been generated.
- The PG/PC is connected to the plant via the Ethernet.
- The programs and interconnections of all the PROFInet components in the project have been downloaded to the devices in the plant.

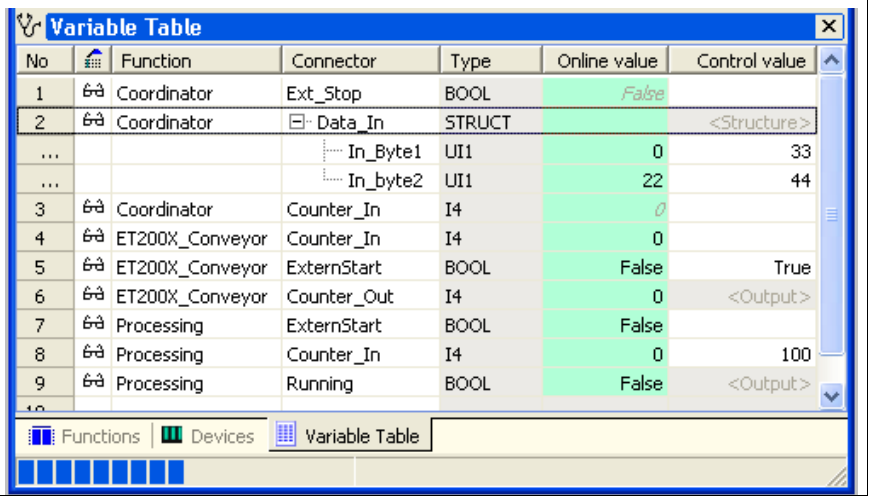
Diagnostics

When the online view is active in SIMATIC iMap, in the plant view and the net view you can see information about the status of the PROFInet communication partners, the interconnections and the operating states of the devices (depending on the type of device) in the diagnostic window.

Table 6-1 Diagnostics

Step	Description
1.	Select **Online > Monitor**. The online view is activated in SIMATIC iMap. A fault displayed in the diagnostic window is identified by a diagnostic symbol on the affected device in the plant and net views.
2.	All faulty functions are displayed on the "Functions" tab in the diagnostic window. 

Step	Description
3.	All faulty devices are displayed in the "Devices" tab in the diagnostic window. Information on the currently selected object is displayed in the right-hand window. Click on the "Diagnostics" button to access the device-specific diagnostics. 
4.	In the net view, highlight the "CPU 317-2 PN/DP" device and select **Online-offline comparison > Interconnections only** from the context menu. The online and offline data for the interconnections are compared and the result appears in the information window of the "Online/offline comparison" tab.  The illustration shows a display in which interconnections have yet to be downloaded.

Step	Description
5.	The variable table provides an overview of the online values and allows you to control the online values of the inputs (menu command **Online > Variable Table > Monitor All Variables**). 

Possible Errors

Possible errors in functions and devices are identified by symbols in the plant and net views. The type of error is described in the diagnostic window.

- Functions
  - The interconnection is faulty.
  - Interconnection download is required.
- Device
  - The device is not available.
  - The device has a fault.
  - Program download is required.

Tips

- Click on the column headers, e.g. on "Reference object", in the information window to create the optimal column width.
- Double click on a faulty function in the diagnostic window to display the affected technological function in the plant view.
- If you double-click on a faulty device in the diagnostic window, the affected device is displayed in the net view.
- If "Download necessary" is signalled as a fault, you can click on the "Download" button to start downloading the interconnections immediately.

Next Steps

Visualizing the process data.

Step 9: Visualizing Process Data

7

7.1 Analyzing with OPC

OPC: OLE for Process Control

In SIMATIC iMap, you can create an OPC symbol file for the project. The OPC symbol file contains address information about individual process data so that it may be accessed via OPC.

Anyone in the office can use an OPC client program to access the data for PROFInet devices at the control and production levels.

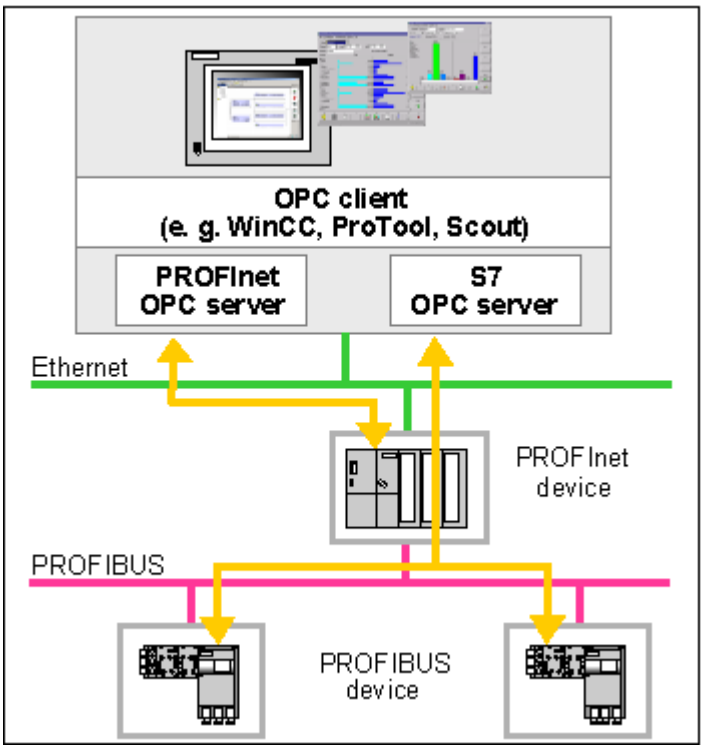


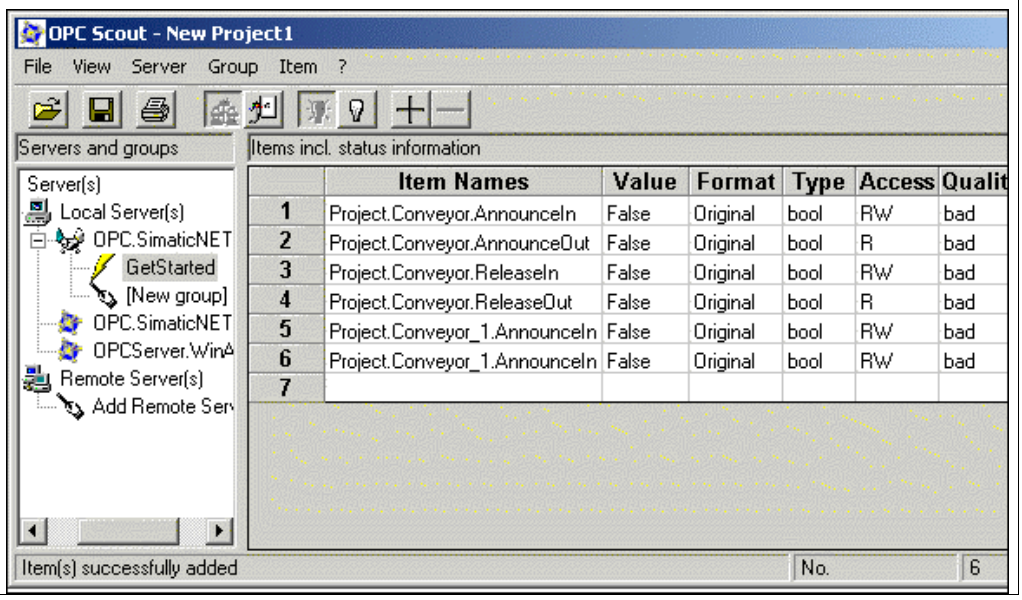
Figure 7-1 Using OPC

Requirements

- An OPC client program must be installed, e.g.OPC Scout from SIMATIC Net.
- The SIMATIC iMap project "Plant_1" is open and has been generated without error.

How to analyze process data

Table 7-1 Creating and editing the OPC symbol file

Step	Description
1.	In SIMATIC iMap, select **Options > Create OPC Symbol File...**.
2.	Select a folder as the storage location in the "Save OPC symbol file As" dialog field. The OPC symbol file Plant_1.sti will be saved in this folder. You can then close SIMATIC iMap.
3.	A table with the selected OPC variables and their status information appears in OPC Scout. 

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