

SIMATIC NET

IE/PB Link Gateway Manual

6GK1411-5AA00
Version 2 and higher
(Firmware version V1.3 and higher)



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Classification of Safety-Related Notices

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:



Danger

indicates that death or severe personal injury **will** result if proper precautions are not taken.



Warning

indicates that death or severe personal injury **can** result if proper precautions are not taken.



Caution

with warning triangle indicates that minor personal injury can result if proper precautions are not taken.

Vorsicht

without warning triangle indicates that damage to property can result if proper precautions are not taken.

Notice

indicates that an undesirable result or status can result if the relevant notice is ignored.

Note

highlights important information on the product, using the product, or part of the documentation that is of particular importance and that will be of benefit to the user.

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Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

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Note the following:



Warning

This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Before you use the supplied sample programs or programs you have written yourself, make certain that no injury to persons nor damage to equipment can result in your plant or process.

EU Directive: Do not start up until you have established that the machine on which you intend to run this component complies with the directive 89/392/EEC.

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Warning

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Before you use the supplied sample programs or programs you have written yourself, make certain that no injury to persons nor damage to equipment can result in your plant or process.

Prior to Startup

Prior to startup, note the following:

Caution

Prior to startup, note the information and follow the instructions in the latest documentation. You will find the ordering data for this documentation in the relevant catalogs or contact your local Siemens office.

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Disclaimer of Liability

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

Technical data subject to change.

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1 Properties and Services

Application

The IE/PB Link is a gateway that links Industrial Ethernet (management level) and PROFIBUS (cell level / field level).

The design of the IE/PB Link matches the components of the SIMATIC S7-300 range of devices.

Services

The IE/PB Link supports the following communication services:

- Gateway in standard operation
 - PG/OP communication

PG/OP communication is used to download programs and configuration data, run test and diagnostic functions, and monitor the plant (HMI systems).
 - Assigning Parameters to Field Devices (data record routing)

You can use the IE/PB Link as a router for data records intended for field devices (DP slaves). This means that devices that are not directly linked to PROFIBUS and therefore do not have direct access to the field devices (DP slaves), can transfer data to the field devices via the IE/PB Link.

The SIMATIC PDM (Process Device Manager) is an example of a tool that creates data records for assigning parameters to field devices.
 - Gateway to a DP master system with constant scan time mode

The IE/PB Link serves as a gateway between Ethernet and the field devices of a DP master system. The IE/PB Link is then operated as an active node along with a DP master on PROFIBUS operating in the constant scan time mode.

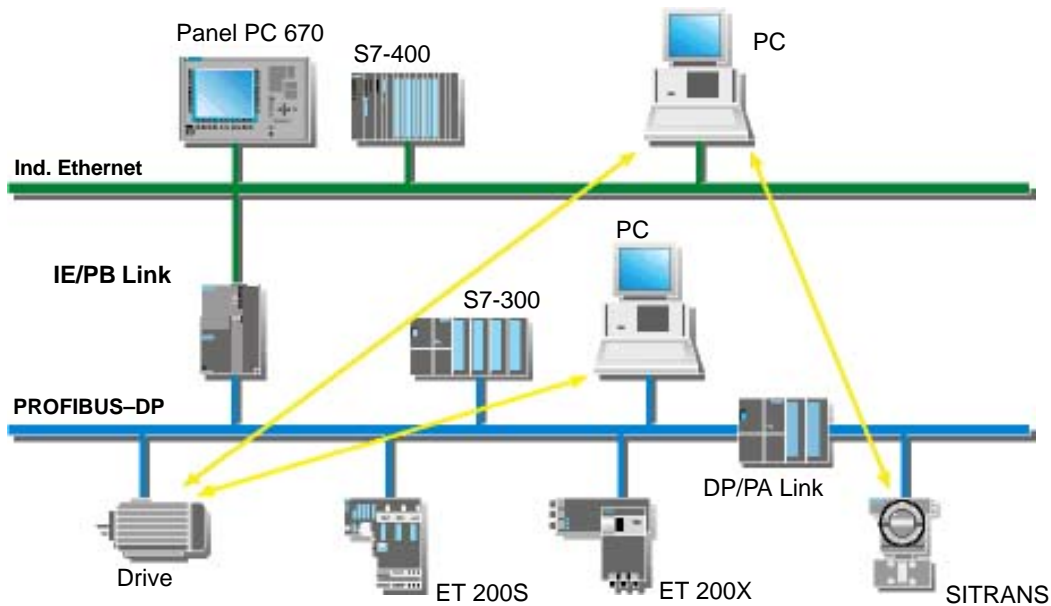


Figure 1-1 Example of Using the IE/PB Link in the Standard Mode

- Gateway with PROFINet

The IE/PB Link is an important component for the operation of PROFINet. It connects the PROFINet components to Industrial Ethernet and the DP slaves to PROFIBUS.

When the IE/PB Link is used as a PROFINet component, the following application is possible in addition to those listed standard operation:

DP master functionality in PROFINet:

The IE/PB Link assumes a proxy master role for the DP slaves configured as PROFINet components in SIMATIC iMap.

This means

- PROFINet components attached to Industrial Ethernet can be connected to the process inputs and outputs of the DP slaves using the SIMATIC iMap configuration
- The inputs and outputs of the DP slaves can be interconnected

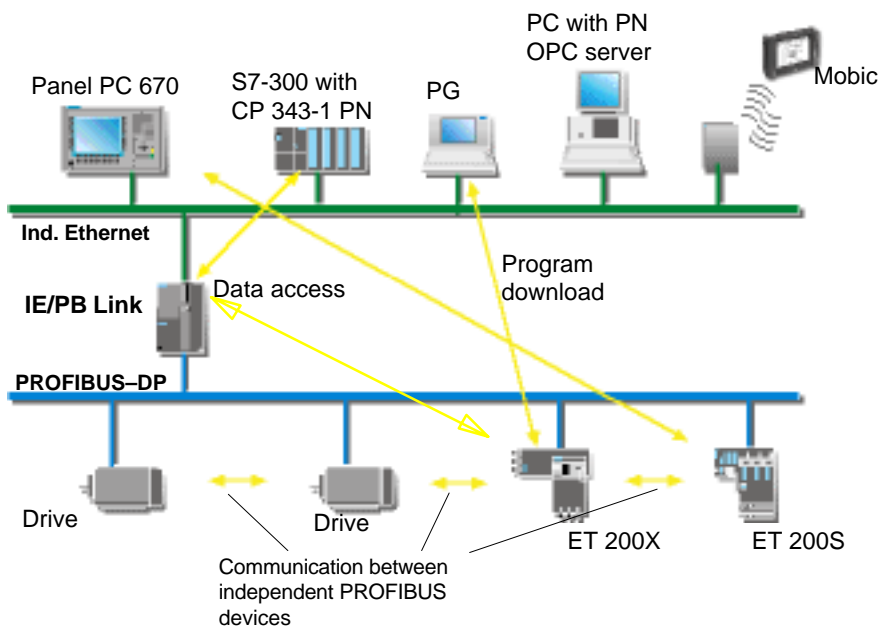


Figure 1-2 Example of Using the IE/PB Link with PROFInet

Further Properties

- Fast Ethernet

The IE/PB Link provides a 10/100 Mbps half/full duplex connection with “autonegotiation” for automatic switchover; this is available over the RJ-45 or 15-pin sub-D port.

- Time-of-day Synchronization

If a time master exists on Industrial Ethernet, the IE/PB Link uses the time frames for time stamping the diagnostic buffer entries and process signals.

Forwarding time-of-day frames (as of hardware version 2)

The IE/PB Link can forward the time-of-day frames received from a time transmitter as follows:

- from Ethernet to PROFIBUS
- From PROFIBUS to Ethernet

- Downloading Firmware

The IE/PB Link supports the updating of firmware (FW) with the Firmware Loader.

A firmware update can be downloaded at any time from the PC/PG via the Ethernet port.

Configuration

You can configure the IE/PB Link over Industrial Ethernet or PROFIBUS. You require the STEP 7 configuration software with a version as shown below:

Table 1-1

Version STEP 7/NCM IE	Function of the IE/PB Link
V5.1 + SP3	The same functionality can be used as was available with the previous versions of the IE/PB Link. <ul style="list-style-type: none"> • Configuration data created with these STEP 7 or NCM versions can be downloaded to the IE/PB Link.
V5.1 + SP4 or higher	The full functionality of the device with hardware version 2 and firmware version V1.3 can be used. Note / recommendation: If your IE/PB Link module has a firmware version older than V1.3, you should configure the module with firmware version V1.2 in HW Config if you are using this STEP 7 version!

Configuration for Use with PROFINet

If you want to use the module in a PROFINet environment, you require the engineering tool SIMATIC iMap Version V1.1 or higher. SIMATIC iMap requires attachment to Industrial Ethernet (TCP/IP protocol).

2 Compatibility with the Previous Product

The IE/PB Link device with hardware version 2 and firmware version V1.3 described here can be used to replace the previous product with hardware version 1 and firmware version V1.2.

The IE/PB Link described here includes **enhanced and new functions**.

Please note the information below.

New: Enhanced functions compared with hardware version 1 and firmware version V1.2:

- Gateway to a DP master system with constant scan time mode
This function is possible only with STEP 7 version V5.1 SP4 or higher.
- Forwarding time-of-day frames
- New version of the PROFINet functionality with improved performance

3 Design

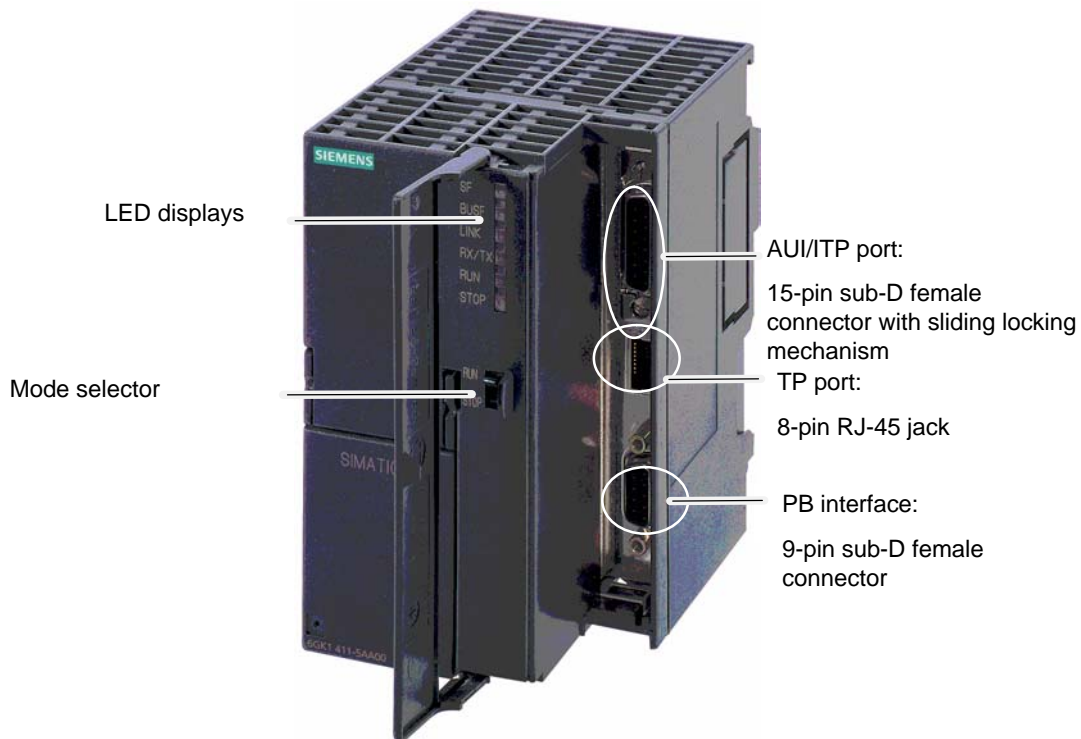


Figure 3-1

The module has been designed to match the components of the S7-300 programmable logic controller and has the following features:

- Double-width module for simple installation in the S7-300 rack
- The operator controls and displays are all located on the front panel
- No fan necessary
- 8-pin RJ-45 jack for attaching the IE/PB Link to twisted-pair Ethernet; this jack is designed for use in network areas with low EMI levels
- 15-pin sub-D female connector with sliding locking mechanism for attaching the IE/PB Link to Industrial Ethernet (automatic switchover between the AUI port and Industrial Twisted Pair port when the AUI or ITP cable is plugged in)
- 9-pin sub-D female connector for attaching the IE/PB Link to PROFIBUS

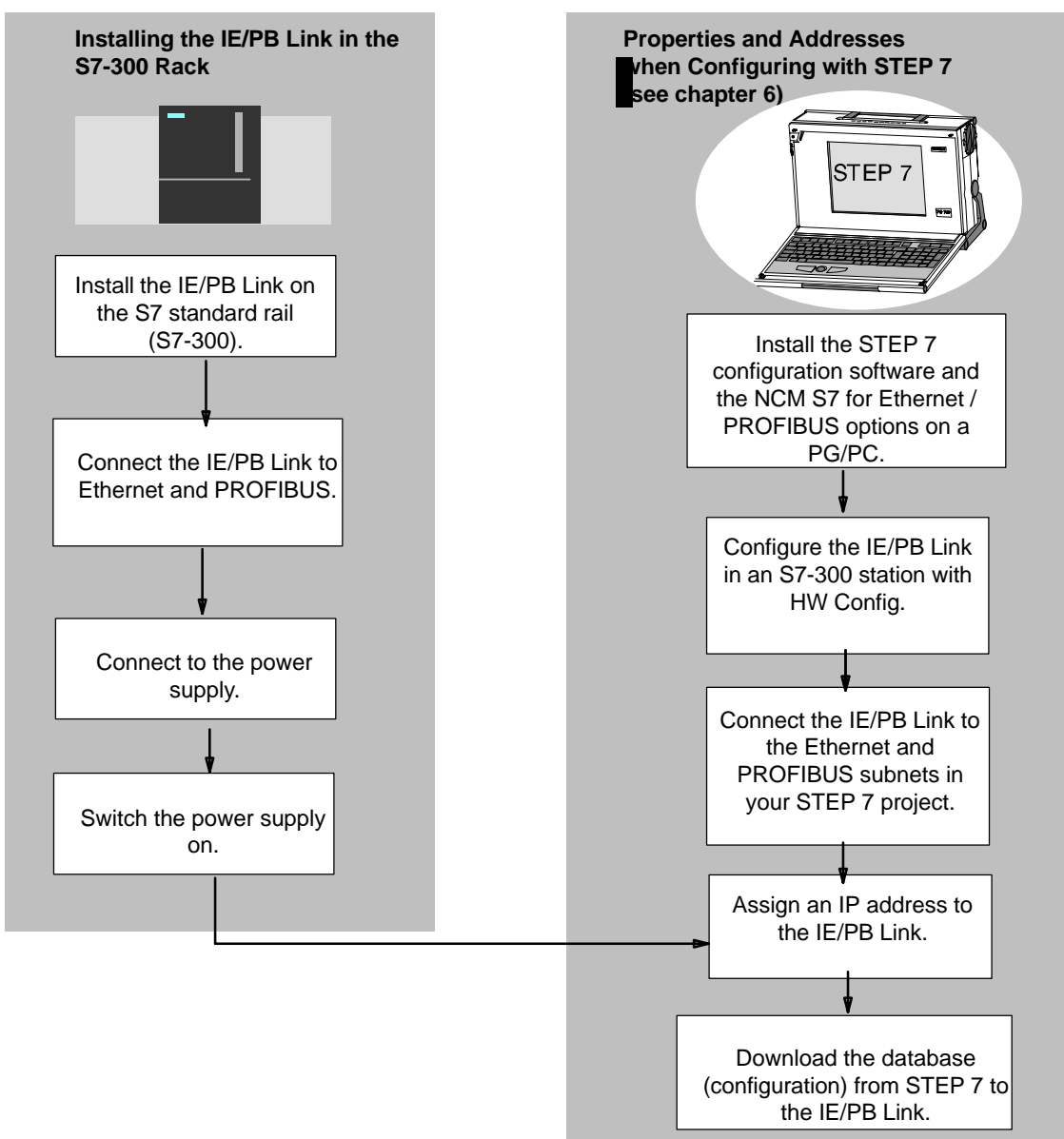
4 Commissioning the IE/PB Link – Overview

The following overviews show the essential steps when commissioning the IE/PB Link for

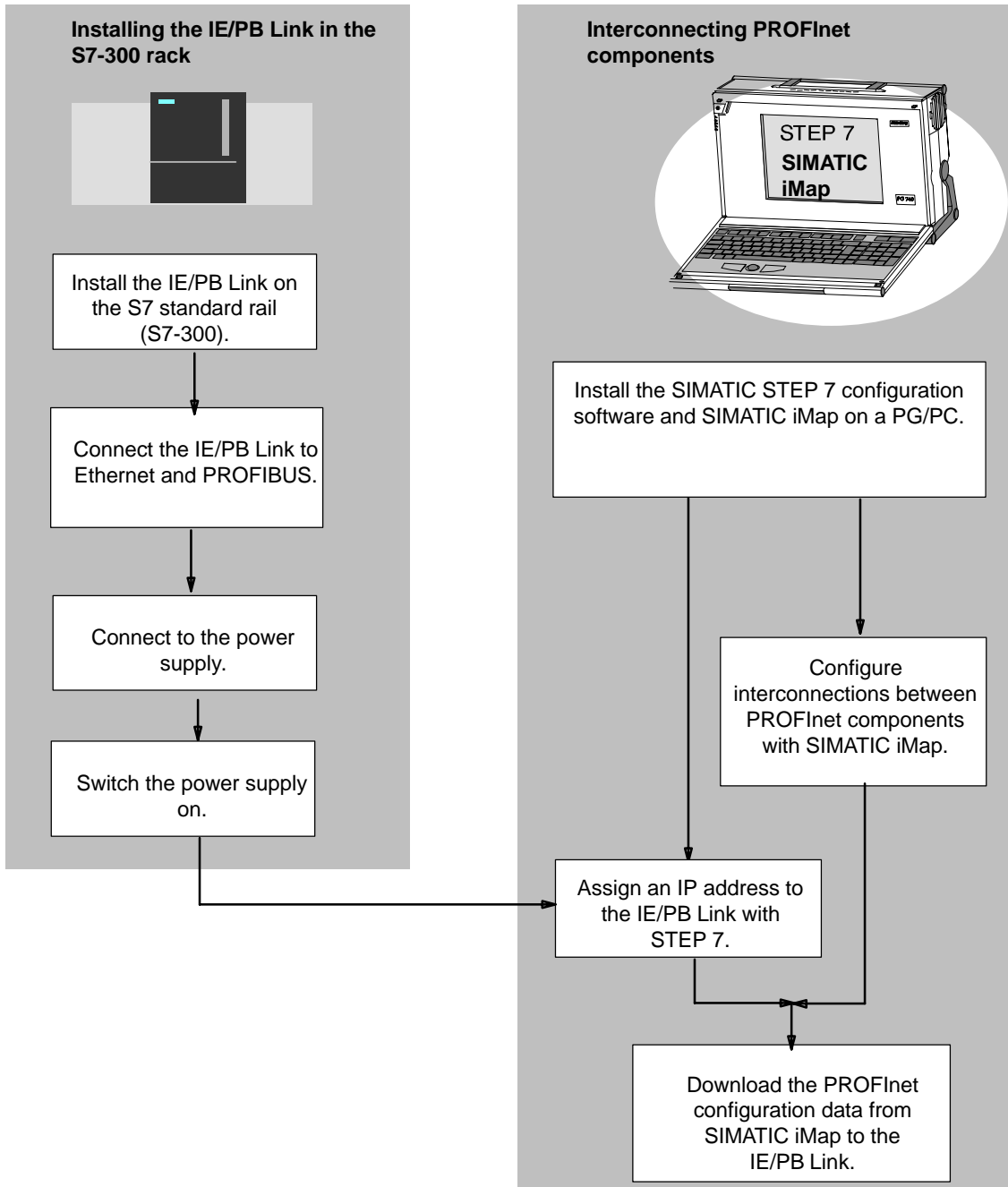
- Standard application
- PROFINet application

You will find more information on these steps in the following chapters.

Standard application:



PROFINet Application



5 Installation

5.1 Module Accessories

The accessories required to connect the IE/PB Link to an Industrial Ethernet and PROFIBUS LAN (S7 standard rail, power supply) must be ordered extra. You will find detailed information in these documents: /3/, /4/, /6/.

5.2 Procedure

Steps in Installation

Installing the IE/PB Link involves the following steps:

1. Place the IE/PB Link on the standard rail and secure with screws.
2. Connect the IE/PB Link to Industrial Ethernet.

Notice

Please note that for problem-free operation, **either** the AUI/ITP connector **or** the TP connector must be inserted, but not both.

If you change from one Ethernet port to the other during operation, it is possible that the changeover will not be detected by the hardware. To avoid this, you should only change ports when the device is turned off!

-
3. Connect the IE/PB Link to PROFIBUS.
 4. Connect a 24V power supply.

Note

You can connect to Ethernet and PROFIBUS even with the power switched on.

Notice

The two front panels must be kept closed during operation.

The module must be installed so that its upper and lower ventilation slits are not covered, allowing adequate ventilation.

PG/PC Connection

You can connect the PG when configuring the CP as follows:

- via PROFIBUS

You can only configure the IE/PB Link via PROFIBUS after it has been assigned its PROFIBUS address. Please follow the instructions for addressing in Chapter 6.

- via Industrial Ethernet

You can only configure the IE/PB Link via Industrial Ethernet after it has been assigned its IP address. Please follow the instructions for addressing in Chapter 6.

Notice

You can download the PROFINet interconnections with SIMATIC iMap only over Ethernet (TCP/IP protocol).

6 Configuring with STEP 7

To connect (initial addressing) and configure the IE/PB Link, you require the STEP 7 configuration software, see Chapter 1.

NCM S7 for Industrial Ethernet / PROFIBUS is installed as a STEP 7 option and is therefore integrated in STEP 7; NCM S7 also allows you direct access to NCM Diagnostics in the Start menu and provides you with the Firmware Loader (see Section 8.3.1).

6.1 Initial Address Assignment

Significance of the Address Assignment

The IE/PB Link ships with a factory-set MAC address. Without further configuration, the device can only be accessed over the Ethernet port using this MAC address.

As shown in the flow chart on page 12, you must assign an IP address to the IE/PB Link, before you can download configuration data to the device using this IP address.

Assigning the Address – Options and Recommendations

There are two ways of assigning this address in STEP 7:

- In the SIMATIC Manager

This option allows you to assign the address without having to set up a STEP 7 project. This procedure is preferable if you use the IE/PB Link in PROFINET and therefore do not need to carry out any further configuration in STEP 7.

This method will be described later in the chapter.

- In HW Config or NetPro

This option assumes that the IE/PB Link was networked in STEP 7. The advantage of this method is that the IP parameters set during configuration in STEP 7 / NetPro can be used.

In the “Addressing” tab, you assign the previously configured IP address and IP parameters to the IE/PB Link.

Only then can the configuration data be downloaded to the IE/PB Link using a PG/PC.

This is described in Section 6.4.

Requirement

Before you can assign the address as described here, the IE/PB Link must be reachable online, which means:

- An attachment to the Ethernet LAN must already exist; there must be no routers between subnets in the path.
- STEP 7 must be able to reach the Ethernet interface of your PG/PC (set the PG/PC interface to S7Online).

Follow the steps below to assign the IP address the first time:

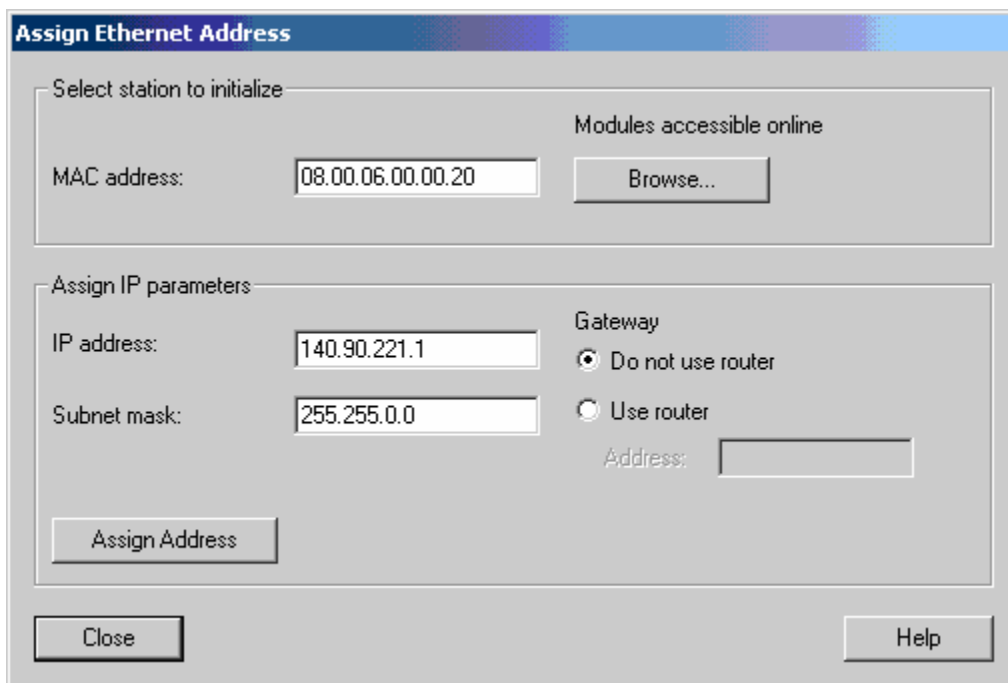
1. Open the SIMATIC Manager
2. Click on the menu command **PLC ▶ Assign Ethernet Address**.

Note

If the DLC protocol is not installed on your PG/PC, an error message appears when you select the above menu command. If this is the case, you must then install the DLC protocol for your Ethernet port in the network settings (Control Panel / Network / Protocols).

3. Start a network search for available modules by selecting the “Browse...” button.
4. Select the IE/PB Link with the matching MAC address from the components listed.

5. Enter the required IP parameters and assign them to the IE/PB Link using the "Assign Address" button.



The image shows a dialog box titled "Assign Ethernet Address". It is divided into two main sections. The top section, "Select station to initialize", contains a "MAC address:" label with a text box containing "08.00.06.00.00.20" and a "Browse..." button. To the right of this section is the text "Modules accessible online". The bottom section, "Assign IP parameters", contains an "IP address:" label with a text box containing "140.90.221.1", a "Subnet mask:" label with a text box containing "255.255.0.0", and a "Gateway" section with two radio buttons: "Do not use router" (which is selected) and "Use router". Below the "Use router" radio button is an "Address:" label and an empty text box. At the bottom of the dialog box are three buttons: "Assign Address", "Close", and "Help".

Note

For more detailed information on addressing, refer to the online help in STEP 7 ("Help" button in the displayed dialog).

Note

The information in Sections 6.2 to 6.4 is not relevant when configuring PROFINet operation with STEP 7!

6.2 Creating the Device in the STEP 7 Project

Configuring Properties and Addresses with STEP 7

To provide the IE/PB Link with address information and further parameters, you must create a loadable database (configuration) in STEP 7.

How to...

...configure the IE/PB as an S7-300 station with STEP 7/HW Config:

1. Open an existing STEP 7 project or create a new project.
2. Create a SIMATIC 300 station.
3. Double-click the station you have created to open the hardware configuration tool HW Config.
4. Take the gateway-IE/PB Link device type from the SIMATIC 300 hardware catalog.

...connect the IE/PB Link to the Ethernet and PROFIBUS subnet in your STEP 7 project:

5. After taking the IE/PB Link from the hardware catalog, you will be prompted to network the IE/PB Link over the Ethernet interface and then over the PROFIBUS interface.

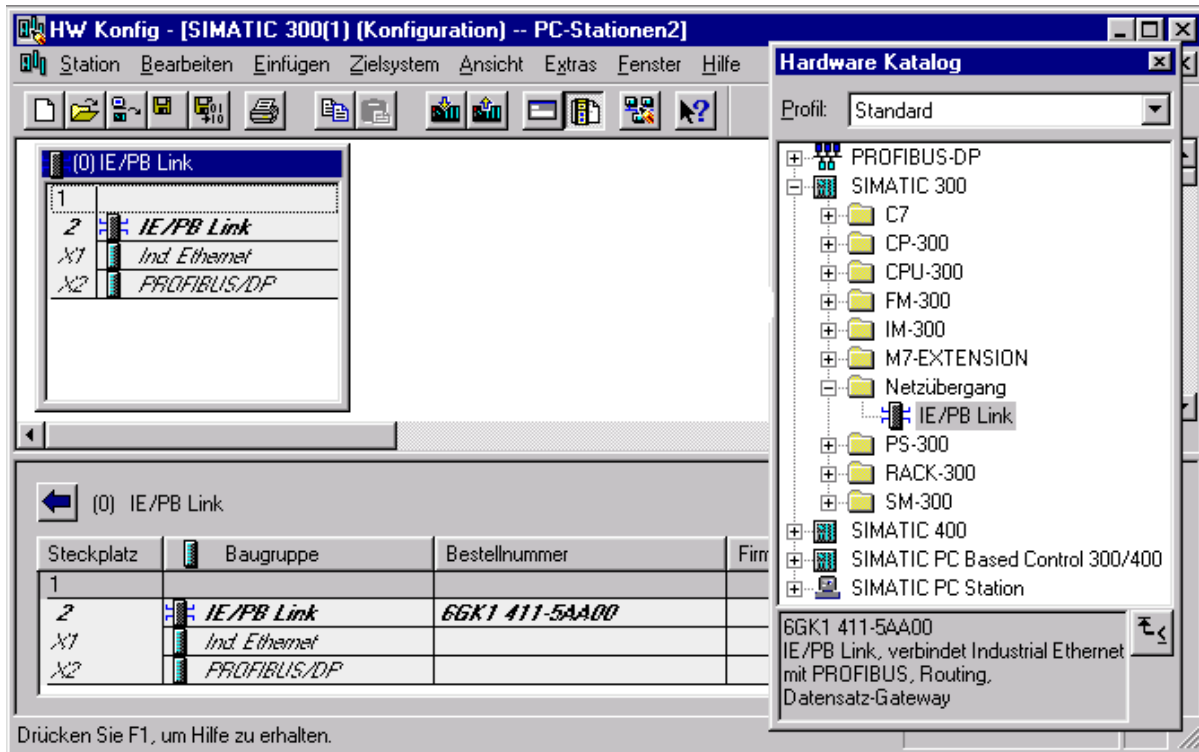
If you have not yet created the required subnets, you can do this now by selecting the relevant entry.

Result: You have created the IE/PB Link component with a basic module and the Ethernet and PROFIBUS submodules in the S7-300 station in HW Config.

6. Set any other properties of the IE/PB Link you require. For more detailed information, please refer to the following sections 6.3 to 6.5.
7. Assign an IP address to the IE/PB Link if you have not already done so in the SIMATIC Manager outside the configuration steps described here (see "Assigning Addresses the First Time")
8. Download the database (configuration) from STEP 7 to the IE/PB Link. Depending on the PG network attachment, the download can take place from PROFIBUS or from Industrial Ethernet over the TCP/IP interface.

Notice

Please note that the IE/PB Link is a special configuration component containing all the necessary station components. This means that you cannot place any other components such as a DIN rail or modules alongside the IE/PB Link in the S7-300 station you have created!



Note

Mode of the PROFIBUS Submodule

It is advisable to configure the IE/PB Link firmware version V1.3 or higher with a STEP 7 version V5.1 SP4 or higher. In this case, you can be certain that the default mode setting for the IE/PB Link is “No DP” and that the IE/PB Link does not create any unnecessary load on PROFIBUS.

You can check that the mode of the PROFIBUS submodule is set to “No DP” in the “Operating Mode” tab. Do **not** select the “DP master” option here. A DP master system is not configured in STEP 7 but, for example, in the SIMATIC iMap engineering tool (see note below).

Notice

Displaying a DP Chain

If you configure with a STEP 7 version older than V5.1 SP4 or configure an IE/PB Link in a version older than V1.3, there is no default mode and no mode can be set. You will then see a DP chain attached to the PROFIBUS submodule in HW Config.

Display of the DP chain connected to the PROFIBUS submodule in HW Config:

The DP master system displayed in HW Config which has been connected to the PROFIBUS submodule has **no significance** for configuration! Please ignore this display. Do not configure any DP slaves for this system.

Reason:

The IE/PB Link supports the DP master function in PROFINet. The IE/PB Link acts as a proxy acting in the DP master role. This role is simply indicated by the display of the DP chain.

In this case, the DP master system itself is not configured in STEP 7 but, for example, in the SIMATIC iMap engineering tool.

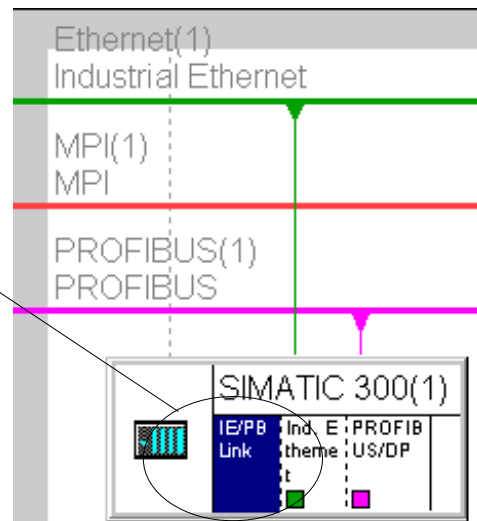
If you configure DP slaves here and then do not download a SIMATIC iMap configuration to the IE/PB Link, the DP master (IE/PB Link) switches the DP slaves to the safe state (CLEAR).

6.3 Setting the Properties in the IE/PB Link Basic Module

Opening the Properties Dialog

You can set the remaining properties of the IE/PB Link in HW Config or in the component view in NetPro.

After selecting the basic module and opening the object properties, you can make the following settings:



- “General” Tab

Here, you can enter general information such as a technological name to be used for component management in the STEP 7 project.

- “Options” Tab

- Time-of-day Synchronization

Here, you can decide whether or not the IE/PB Link forwards time-of-day frames from a time transmitter. Selectable directions: from PROFIBUS to Ethernet or from Ethernet to PROFIBUS.

- Assigning Parameters to Field Devices (data record routing)

Here, you can decide whether or not the device will support data record routing for assigning parameters to field devices. As default, the option is activated.

- “Diagnostics” Tab

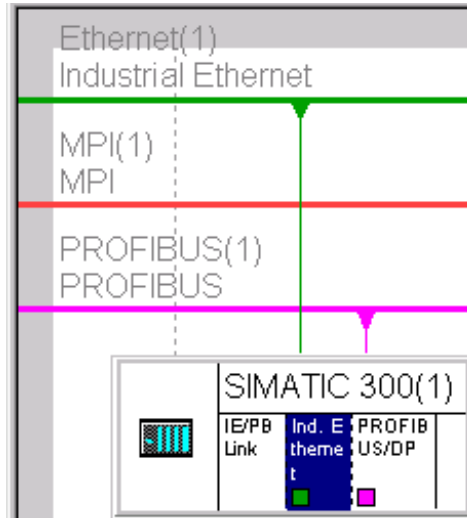
Here, you can start NCM Diagnostics directly for the online IE/PB Link.

Note

You will find more detailed information in the STEP 7 online help.

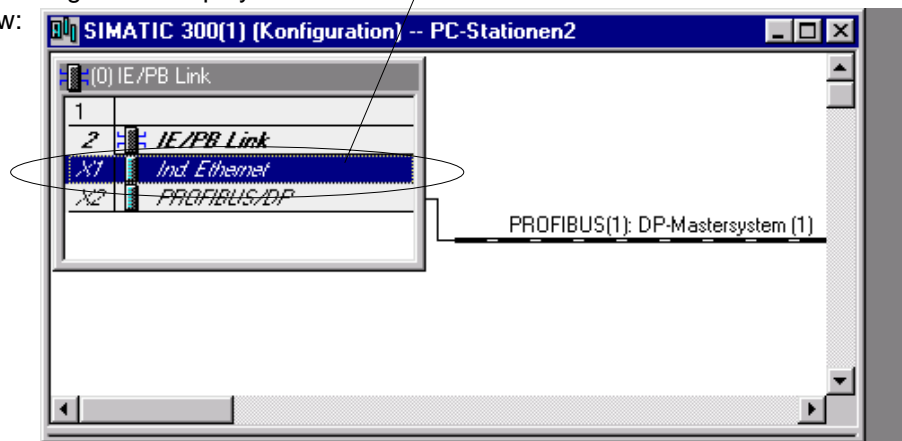
6.4 Setting Properties in the Ethernet Submodule

In NetPro, the S7-300 station you have configured is displayed as shown here:



After you have selected the Ethernet submodule and opened the object properties, you can make the settings described here:

In HW Config, the S7-300 station you have configured is displayed as shown below:



These properties can be configured:

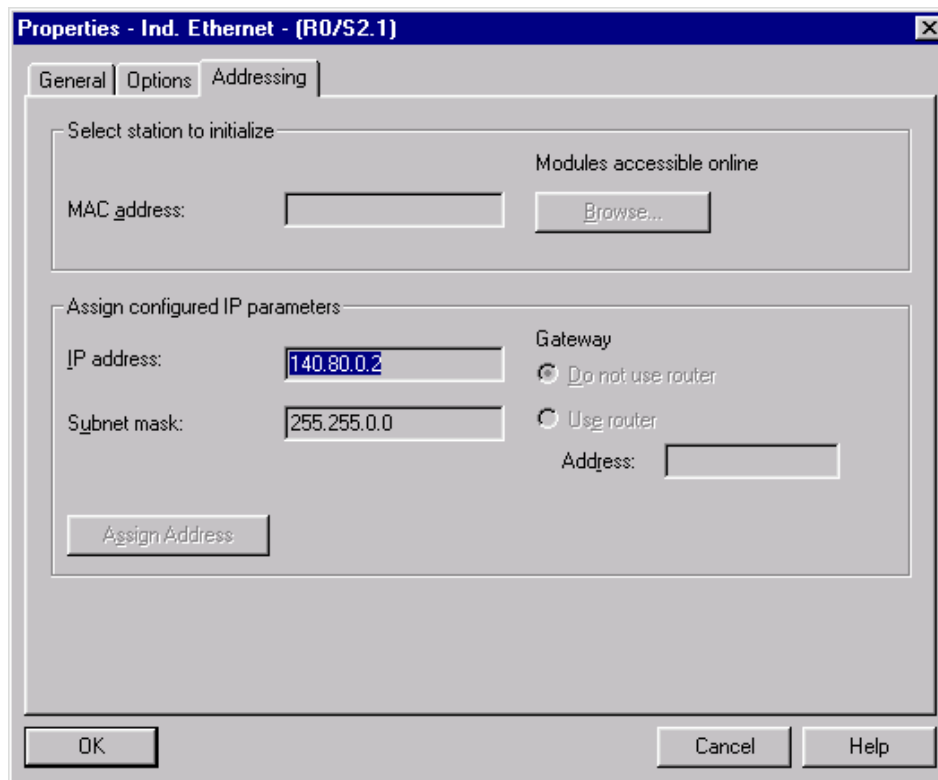
- “General” Tab
Here, you can enter general information to be used for component management in the STEP 7 project. You can also set parameters for the interface to Ind. Ethernet.
- “Options” Tab
Here, you can make any individual network settings that may be necessary; as default, automatic setting is selected here.

- “Addressing” Tab

In the “Addressing” tab, you must assign the previously configured IP address and the IP parameters to the IE/PB Link once; these are simply displayed here and cannot be modified.

Only after these steps are completed, can you download the configuration data to the IE/PB Link from the PG/PC over Ethernet or PROFIBUS.

Without this step (the IE/PB Link is as it left the factory) you can reach the IE/PB Link over Ethernet only using the fixed, unique MAC address. The MAC address of the IE/PB Link is fixed and cannot be modified.



Requirements

Before you can assign the address as described here, the IE/PB Link must be reachable online, which means:

- An attachment to the Ethernet LAN must already exist; there must be no routers between subnets in the path.
- The Ethernet port of your PG/PC must be accessible to STEP 7.
- The IP address for the device must already be configured in the STEP 7 project.

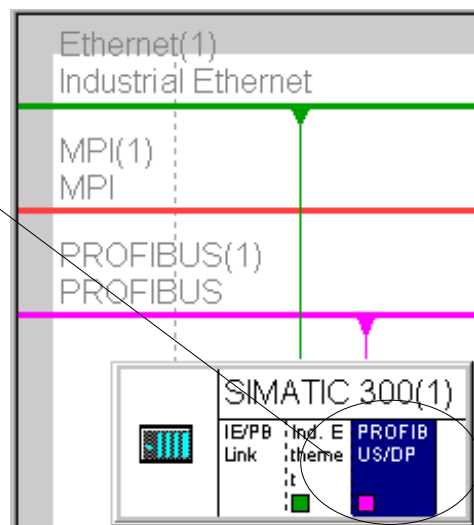
When you create the IE/PB Link in HW Config, a dialog is displayed in which you can network the device and assign the IP address.

Note

You will find more detailed information on this procedure in the STEP 7 online help.

6.5 Setting the Properties in the PROFIBUS Submodule

After selecting the PROFIBUS/DP submodule and opening the object properties, you can make the following settings:



- “General” Tab

Here, you can set the parameters for the interface to PROFIBUS; in other words, assign the network and the PROFIBUS address.

You can also enter general information to be used in component management in the STEP 7 project.

- “Addresses” Tab

The address parameter for diagnostics displayed here has no significance for the IE/PB Link.

Note

You will find more detailed information in the STEP 7 online help.

7 Configuring with SIMATIC iMap – Using the IE/PB Link in PROFINet

Functionality in PROFINet

The IE/PB Link is a PROFINet-compliant device with fixed functionality that is displayed only in the network view in SIMATIC iMap.

The IE/PB Link operates as a PROFINet device with PROXY functionality. PROFIBUS devices for which a component was created using STEP 7 can communicate with each other and with PROFINet devices connected to Industrial Ethernet via the IE/PB Link.

You configure the interconnections between the PROFINet components in the plant view of SIMATIC iMap.

Display in SIMATIC iMap

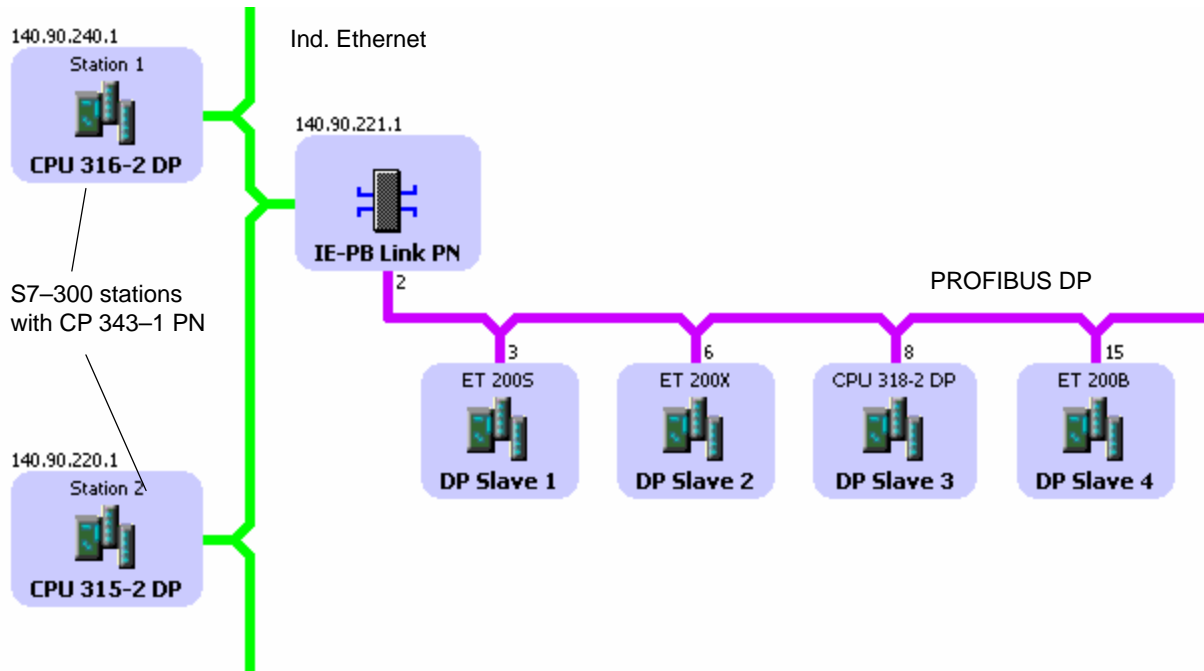
SIMATIC iMap contains ready-made components for the various function types of the IE/PB Link. The parameters of these function types differ from each other, such as the transmission speed.

You do not therefore need to create a display in SIMATIC iMap. It is neither possible nor necessary to create components for the IE/PB Link in STEP 7.

- Network View in SIMATIC iMap

The IE/PB Link is visible in the network view as a component linking Ethernet and PROFIBUS. The IE/PB Link can therefore be selected and configured here.

The picture below shows the network view of SIMATIC iMap and illustrates how the IE/PB Link creates the connection between DP slaves on PROFIBUS-DP and an S7-300 station on Industrial Ethernet.

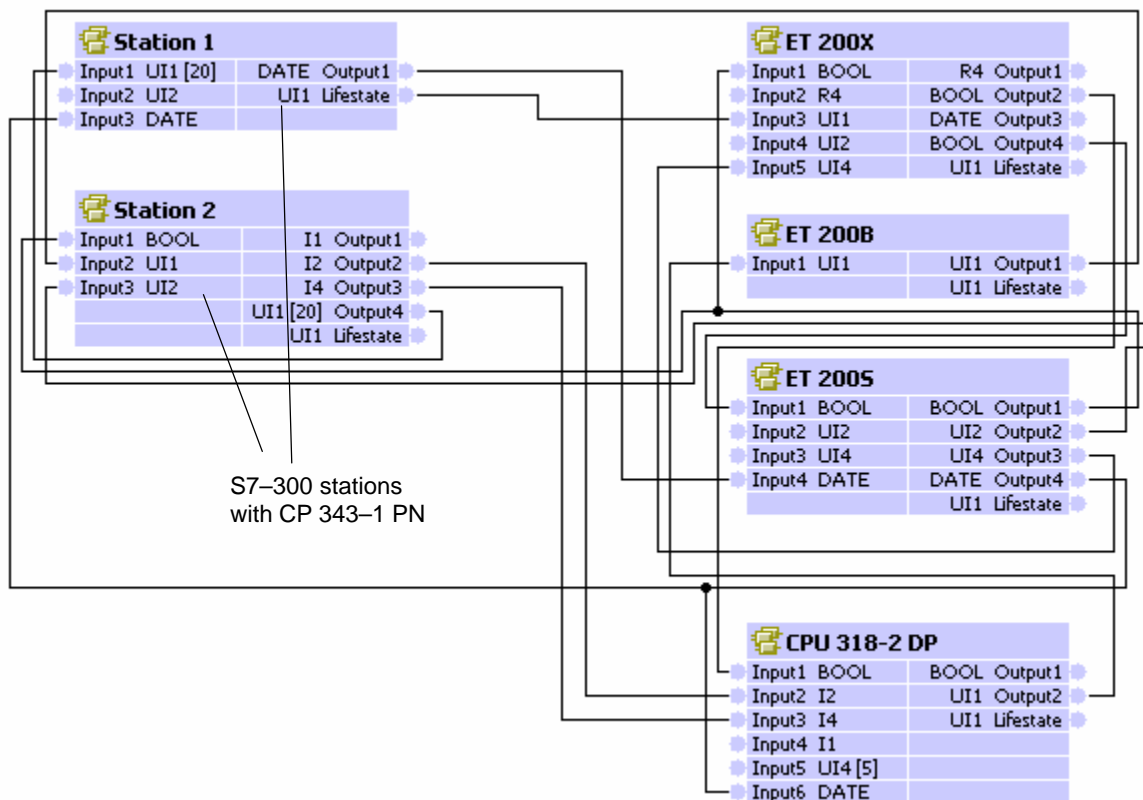


- Plant View in SIMATIC iMap

In the plant view, the IE/PB Link is hidden. Here, you can only see the PROFINet components with their interconnections to the process inputs and process outputs.

Note the following apparent discrepancy in the representation of the interconnections:

- A process input is displayed as an interconnectable output of the DP slave (right-hand side in the component display)
- A process output is displayed as an interconnectable input of the DP slave (left-hand side in the component display)



Assigning Addresses and Properties in SIMATIC iMap

Notice

Please remember that you must assign an address for the IE/PB Link once in STEP 7; this is described in Section 6.1

If you select the IE/PB Link in the network view, you can set the IP and PROFIBUS addresses.

You can also enter management information (technological names).

Note

Apart from the initial assignment of an address, you do not need to supply the IE/PB Link with address information using a STEP 7 project.

Downloading Configuration Data

Using SIMATIC iMap, you download the configuration data with information about the interconnections of the process inputs and process outputs to the IE/PB Link via the Ethernet port.

Diagnostics in SIMATIC iMap

When the IE/PB Link is operating online, you can use the diagnostic functions in SIMATIC iMap and, for example, read out the diagnostic buffer of the device.

Note

For more detailed information about adopting the STEP 7 configuration and using it in PROFINet and in the SIMATIC iMap engineering tool, refer to the documentation on SIMATIC iMap LEERER MERKER.

8 Operation – Operator Control and Displays

8.1 Controlling the Operating Mode

There are different ways in which you can control the mode of the IE/PB Link, as follows:

- Mode selector
- SIMATIC Manager in STEP 7

To control the mode from STEP 7 / NCM S7, the mode selector must be set to RUN.

Mode selector

With the mode selector, you can set the following modes:

- Switch from STOP to RUN:

The IE/PB Link reads the configured and/or modified data into the work memory and then changes to the RUN mode.

Note

The modes can only be controlled using NCM S7 or the SIMATIC Manager when the selector is set to RUN.

- Switch from RUN to STOP:

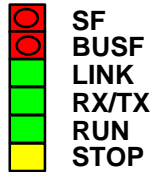
The IE/PB Link changes to the STOP mode and behaves as follows:

- In the STOP mode configuring and performing diagnostics on the IE/PB Link remain possible.
- Access to DP slaves or other PROFIBUS stations is not possible.

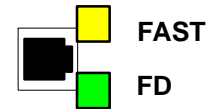
8.2 LED Displays

Along with the six LEDs on the front panel that are used to indicate the mode, an additional display with two LEDs is located beside the RJ-45 jack (hidden by the front panel) and indicates the communication status.

Front panel:



RJ-45 jack



LEDs Displaying the Status

The different combinations of the LEDs on the front panel indicate the status:

Table 8-1

SF (red)	BUSF (red)	RUN (green)	STOP (yellow)	Operating Mode
○	○	☼	●	Starting up (STOP->RUN)
○	○	●	○	Running (RUN)
○	○	●	☼	Stopping (RUN->STOP)
○	○	○	☼	Ready for firmware loading (this mode is active for ten seconds following power up when the mode selector is set to STOP)
○	○	☼	○	Downloading firmware
●	●	○	☼	Waiting for firmware update (CP contains incomplete firmware)
○	○	○	●	Stopped (STOP)
●	○	○	●	Stopped (STOP) with errors
○	●	●	○	Running (RUN) with problems on PROFIBUS or no PROFIBUS configuration suitable for the system
○	☼	●	○	Running (RUN) with DP slave error(s)
☼	☼	☼	☼	Module error /system error 1)

Key: ● on ○ off ☼ flashing (0.5 Hz)

1) Note:

If this status occurs, the module must be turned off and on again; simply activating the RUN selector will not bring about a restart.

Communication Status of the Device on Industrial Ethernet

In addition to the LEDs that signal the mode, the front panel also includes LEDs that provide information about the status of the interface to Industrial Ethernet.

Table 8-2

LED		Meaning (LED on)
Front panel	RJ-45 jack	
LINK LED (green)		Signals an existing connection to ITP/TP
RX/TX LED (green)		Flashing: the IE/PB Link is sending/receiving via TP/ITP/AUI
	FAST LED (green)	Signals an existing connection to ITP/TP at 100 Mbps (Fast Ethernet)
	FD LED (green)	Signals an existing full duplex connection

Note

Read the explanations of the operating modes in the NCM S7 for Industrial Ethernet manual /2/.

8.3 Further Information on Operation

8.3.1 Loadable Firmware

The IE/PB Link supports the updating of firmware (FW) with the Firmware Loader.

An update of the firmware can be downloaded from the PC/programming device at any time.

The IE/PB Link remains in the firmware load mode for ten seconds after turning on the power with the mode selector set to STOP; the LEDs indicate this status (see Section 8.2).

Note

Please note that the port of the PG must be set to ISO and the PG must be in the same subnet!

After downloading the firmware, the device must be started again (power off/on).

For more information on downloading the firmware, refer to the README file of the NCM S7 for Industrial Ethernet / PROFIBUS configuration software.

8.3.2 Working with Fast Ethernet – Automatic Switchover

The IE/PB Link has a 10/100 Mbps full duplex port with “autonegotiation” for automatic switchover.

You will find more information about the current mode in NCM diagnostics in the diagnostic object “Industrial Ethernet” in the Section “Network Attachment”.

8.3.3 Substitute Values for DP Slaves in PROFINET

In the DP master function under PROFINET, the IE/PB Link is configured for the use of substitute values.

If the IE/PB Link detects the failure of an attached DP slave (interconnected in PROFINET), it applies the substitute value "0" to the inputs interconnected with this DP slave.

To be able to recognize whether the input values supplied are substitute values, you can activate and evaluate a lifestate monitoring function.

Note

The substitute values cannot be configured.

8.3.4 Changing Interface Parameters during the Download

If you change the current settings of interface parameters (for example, the transmission rate), this can lead to the download being aborted.

If this occurs, adapt the PG/PC interface and the network configuration according to the new interface parameters and then repeat the entire download.

9 Performance Data

9.1 Features of PG/OP Communication

Unconfigured S7 connections are used for PG/OP communication.

Table 9-1

Characteristics:	Explanation / Values
Maximum number of connections for PG/OP communication	32

9.2 Features of Data Record Routing

Assigning Parameters to Field Devices (data record routing)

You can use the IE/PB Link as a router for data records intended for field devices (DP slaves). This means that devices that are not directly linked to PROFIBUS and therefore do not have direct access to the field devices (DP slaves), can transfer data to the field devices via the IE/PB Link.

The SIMATIC PDM (Process Device Manager) is an example of a tool that creates data records for assigning parameters to field devices.

As default, the function is activated.

Table 9-2

Characteristics:	Explanation / Values
Maximum number of connections to DP slaves	32
Maximum data record size for the parameters that can be transferred via a connection per DP slave	240 bytes

9.3 Total Number of Connections

You can use a total of maximum 48 connections (S7 connections and connections to the DP slaves).

Notice

Please note that the maximum number of 48 connections may be not be possible if you use the maximum values listed in Table 9-3 in Section 9.4!

Recommendation: If you find that you cannot use 48 connections, you should, for example, reduce the number of interconnected inputs/outputs or change the frequency with which data is transferred (see chapter 9.4) .

Notice

Please note that one TCP/IP connection on Industrial Ethernet is occupied implicitly per S7 connection used.

9.4 Featured of PROFINet Communication

The IE/PB Link supports PROFINet interconnections between PROFINet components both for communication between Ethernet devices and PROFIBUS devices (DP slaves) and for communication between PROFIBUS devices (DP slaves)

Table 9-3

Characteristics:	Explanation / Values
Maximum number of interconnections	256 remote / 800 local ¹⁾
Transmission interval for interconnections The transmission interval specified here is the interval after which a variable value is retransmitted from the sender (output of one component) to the recipient (input of the other component). Transmission on local interconnections is always as fast as possible...	Multiple of 100 ms
Maximum number of interconnectable inputs/outputs	1600
Maximum number of communications partners (PROFINet components on Industrial Ethernet)	64
Maximum number of operable DP slaves ²⁾ Requirement for the maximum value: DP slaves with a user data length of maximum 1 byte or 1 word are used.	64
Maximum number of inputs per DP slave ²⁾	244 bytes

Table 9-3 , continued

Characteristics:	Explanation / Values
Maximum number of outputs per DP slave	244 bytes
Maximum size of the consistent area for a module	128 bytes
Maximum number of S7 connections for access to variables with the PROFINet "s7extended" attribute. Note: The PROFINet attribute "s7extended" is used only by OPC applications over the OPC server; variables with this attribute can be used only with OPC applications.	32 Note: Remember the maximum total number of connections as explained in Section 9.3

- 1) Local interconnections are interconnections between two devices on the same PROFIBUS segment.
- 2) The total of 128 TCP/IP connections to connection partners can never be exceeded. TCP/IP connections are used by the remote interconnections, the OPC connections, the S7 connections and the connections for data record routing.

Note

All PROFINet components to be connected to the IE/PB Link must be created with STEP 7 as PROFIBUS-DPV0 (standard slaves).

10 Technical Specifications

10.1 General Technical Specifications of the IE/PB Link

Table 10-1 Technical Specifications

Supported Transmission Rates <ul style="list-style-type: none"> • Ind. Ethernet • PROFIBUS 	10 Mbps and 100 Mbps 9.6 Kbps 19.2 Kbps 45.45 Kbps 93.75 Kbps 187.5 Kbps 500 Kbps 1.5 Mbps 3 Mbps 6 Mbps 12 Mbps
Interfaces	
Attachment to Industrial Ethernet (10/100 Mbps)	15-pin sub-D female connector (automatic switchover between AUJ and Industrial Twisted Pair)
Attachment to twisted pair	RJ-45 jack
Attachment to PROFIBUS	9-pin sub-D female connector
Power supply	+24 V DC (+/-5%)
Current consumption <ul style="list-style-type: none"> • from external 24 V DC 	Approx. 0.6 A
Power loss	7.5 W
Permitted ambient conditions <ul style="list-style-type: none"> • Operating temperature • Transportation/storage temperature • Relative humidity max. • Altitude 	0 °C to +60 °C -40 °C to +70 °C 95% at +25 °C 2000 m above sea level
Design <ul style="list-style-type: none"> • Module format • Dimensions (W x H x D) in mm • Weight approx. 	Compact module S7-300; double width 80 x 125 x 120 600 g

All the information in /1/ in the Section “General Technical Data” regarding the following topics also applies to the IE/PB Link:

- Electromagnetic compatibility
- Transportation and storage conditions
- Mechanical and climatic ambient conditions
- Insulation tests, class of protection and degree of protection

10.2 Pinout

15-pin sub-D female connector for Industrial Ethernet

On the front panel of the IE/PB Link, there is a 15-pin sub-D female connector with a sliding locking mechanism for connecting a transceiver cable. The signals of an ITP interface can also be applied to this connector (switchover by relay).

For operation via the AUI interface, use the 727-1 transceiver cable. A special SIMATIC NET ITP cable must be used when operating via the ITP interface.

Pin No.	Signal Name	Function
1	MEXT	External ground, shield
2	CLSN	Collision +
3	TRMT / TPETXD	Transmit + / TPE transmit data +
4	Ground	Ground 5 V
5	RCV / TPERXD	Receive + / TPE Receive data +
6	M 15 V	Ground 15 V
7	TPE_SEL	AUI/ITP switchover
8	Ground	Ground 5 V
9	CLSN_N	Collision –
10	TRMT_N / TPETXD_N	Transmit – / TPE Transmit data –
11	Ground	Ground 5 V
12	RCV_N / TPERXD_N	Receive – / TPE Receive data –
13	P15 V	+15 V
14	Ground	Ground 5 V
15	–	

The pinout complies with the IEEE 802.3 AUI interface.

The signals TPETXD / TPETXD_N and TPERXD / TPERXD_N form the ITP interface.

RJ-45 Jack for Twisted Pair Ethernet

In areas with low EMI levels, the IE/PB Link can be attached to twisted-pair Ethernet via the 8-pin RJ-45 jack.

Pin	Signal	Function
1	TD	TP- / Transmit+
2	TD_N	TP- / Transmit-
3	RD	TP- / Receive+
6	RD_N	TP- / Receive-

The pinout of the RJ-45 jack corresponds to the IEEE 802.3 twisted-pair interface.

9-pin sub-D Female Connector for PROFIBUS

Pin No.	Signal Name	PROFIBUS Designation	Used with RS-485
1	PE	Protective earth	yes
2	-	-	-
3	RxD/TxD-P	Data line B	yes
4	RTS (AG)	Control-A	-
5	M5V2	Data reference potential	yes
6	P5V2	Power supply plus	yes
7	BATT	-	-
8	RxD/TxD-N	Data line-A	yes
9	-	-	-

11 Notes on the CE Mark of SIMATIC NET Products

Product Name:

IE/PB Link Order no.: 6GK1411-5AA00

EU Directive EMC 89/336/EEC

The SIMATIC NET products listed above meet the requirements of the EU directive 89/336/EEC "Electromagnetic Compatibility".



The EU conformity certificates are available for the relevant authorities

according to the EU directives and are kept at the following address:
Siemens Aktiengesellschaft, Bereich A&D
Industrielle Kommunikation SIMATIC NET (A&D PT 2)
Postfach 4848
D-90327 Nürnberg
Germany

Area of Application

The product is designed for use in an industrial environment.

Area of Application	Requirements	
	Noise emission	Noise immunity
Industrial	EN 50081-2 : 1993	EN 50082-2 : 1995

Directive on Machines

The product remains a component in compliance with Article 4(2) of the EU directive on machines 89/392/EEC.

According to the directive on machines, we are obliged to point out that this product is intended solely for installation in a machine. Before the final product is started up, it must be established that it conforms to the directive 89/392EEC.

Installation Guidelines

The product meets the requirements providing you adhere to the guidelines for installation and operation in the following documentation /1/, /4/, /6/.

A References

The following documentation contains additional information on configuration and operation:

- /1/** For installing and starting up the IE/PB Link:
Manual: S7-300 Programmable Controller, Hardware and Installation
- /2/** For configuring PROFINet components and systems:
Basic Help System of the SIMATIC iMap Engineering Tool
- /3/** For configuring in STEP 7:
User's Guide to STEP 7
Part of the basic STEP 7 package.
- /4/** SIMATIC NET Manual: Triaxial Networks for Industrial Ethernet
- /5/** Ethernet Manual (HIR)
- /6/** SIMATIC NET Manual: ITP Networks for Industrial Ethernet
- /7/** For installing and operating a SIMATIC NET PROFIBUS network:
Industrial Communications Networks, PROFIBUS Networks Manual

Order Numbers

The order numbers for the SIEMENS documentation listed above can be found in the catalogs "SIMATIC NET Industrial Communication, Catalog IK PI" and "SIMATIC Programmable Logic Controllers SIMATIC S7 / M7 / C7", catalog ST70.

These catalogs and additional information about the products and training courses can be obtained from your local SIEMENS office.



B Glossary

Component based Automation

Concept for implementing modular, distributed automation applications based on open standards for data processing and data communications.

Component based Automation is an extension of Totally Integrated Automation (TIA).

Device

In Component based Automation, this is part of the PROFINet component that contains the hardware-specific data for the PROFINet component. In SIMATIC iMap, a device is the software representation of the physical device for which the PROFINet component was created. It is represented as an object with one or more bus ports in the SIMATIC iMap network view. A distinction is made between → PROFINet devices and → PROFIBUS devices according to the communication functions performed.

Interconnection

General: A logical data link between two objects. In SIMATIC iMap: A connection between two technological functions. An output is always connected to an input of the same data type. Interconnections are represented by lines in SIMATIC iMap.

Network view

Representation of the devices and networks (Ethernet, PROFIBUS) in SIMATIC iMap.

Plant view

Representation of the technological functions of the automation system and its interconnections in SIMATIC iMap. The plant view displays one chart.

PROFIBUS device

In Component based Automation, a PROFIBUS device has just one PROFIBUS connection as a slave. It does not participate directly in PROFINet communication and is integrated via a proxy PROFINet device.

PROFINet

Standard published by the Profibus User Organization (PNO) to define a cross-vendor communication and engineering model.

PROFINet component

Software representation of a technological module with defined functionality. An automation system is made up of several PROFINet components.
A PROFINet component essentially consists of a technological function and the associated device.

PROFINet device

A device on Ethernet is a PROFINet device. A PROFINet device may also have a PROFIBUS connection as a master and a proxy PROFINet device for PROFIBUS devices.

PROFINet device, proxy

A PROFINet device that acts as the master for PROFIBUS devices. This allows PROFIBUS slaves to be integrated into PROFINet communication.

SIMATIC IMap

Engineering tool from Siemens for Component based Automation. This allows the configuration, commissioning, and monitoring of modular, distributed automation systems based on the PROFINet standard.

SIMATIC iMap – STEP 7 AddOn

Software for die SIMATIC iMap interfacing to STEP 7.