SIEMENS

SIMATIC NET

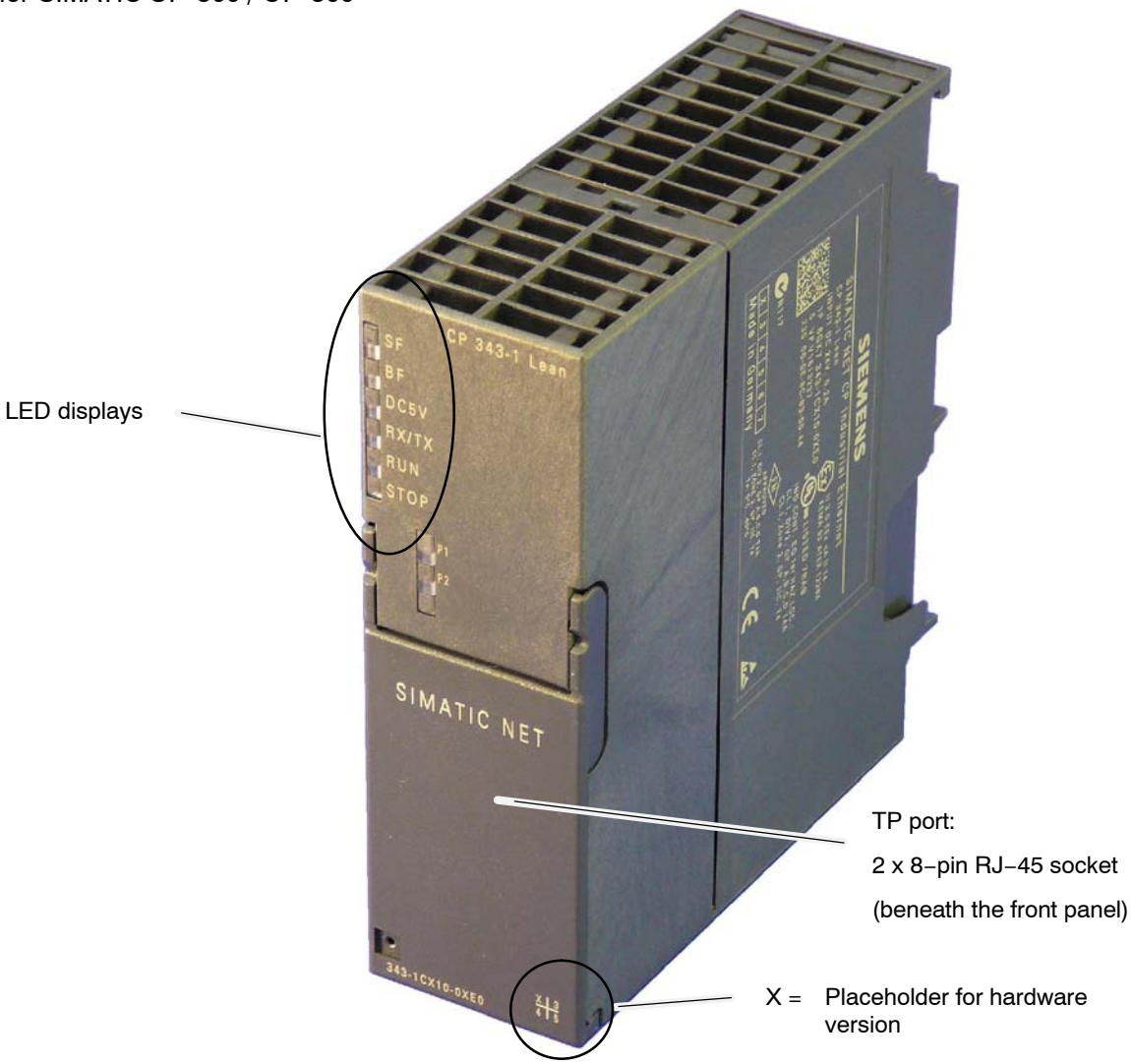
S7-CPs for Industrial Ethernet

Manual Part B3L

CP 343-1 Lean

6GK7 343–1CX10–0XE0 as of hardware version 2, as of firmware version V2.0

for SIMATIC S7–300 / C7–300



Release 03/2007
C79000-G8976-C198-04

Notes on the Product

Product Names

This description contains information on the following product

- CP 343−1 Lean
  Order number 6GK7 343−1CX10−0XE0
  as of hardware version 2 and firmware version V2.0
  for SIMATIC S7−300 / C7−300

Note

In this document, the term CP is used instead of the full product name.

Printed Product Information Supplied with the Product

Note

All the notices in the **Product Information Bulletin** shipped with this device must be adhered to.

Compatibility with the Previous Version

Note

Due to the **increased functionality and restrictions,** pay particular attention to the notes in Chapter 8 of this manual.

Address label: Unique MAC address preset for the CP

The CP ships with a factory-set MAC address.

To ensure a unique address assignment, we recommend that you use this factory set MAC address when configuring the module!

❑

Contents

Contents – Part A

Ethernet CPs – General information . . . . . see general part

Note

Please remember that Part A of the device manual also belongs to the description of the CP. Among other things, it contains explanations of the safety notices and general information that applies to all S7 CPs for Industrial Ethernet.

You will find the references in this Part B of the manual /.../ in the Appendix of the general Part A of the manual.

The following version of the manual Part A of the manual belongs to this version of Part B: Release 01/2007

You can download the general Part from the Internet:

http://www4.ad.siemens.de/view/cs/en/8777865

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1 Properties / Services

Application

The CP 343−1 Lean communications processor is designed for operation in a SIMATIC S7-300 programmable logic controller. It allows attachment of the S7−300 to Industrial Ethernet and supports PROFINET IO.

A 2-port switch with autocrossing, autonegotiation and autosensing was integrated in the CP for simple integration in a line or for attaching a further Ethernet device.

Services

The CP supports the following communication services:

- PROFINET IO device

  Integration of the SIMATIC S7−300 programmable controller over the CP as intelligent PROFINET IO device.

- S7 communication and PG/OP communication
  - PG functions (including routing)
  - Operator control and monitoring functions (HMI)
  - Server for data exchange on S7 connections configured at one end only without communication blocks on the S7-300 / C7-300 station
- S5 compatible communication with
  - SEND/RECEIVE interface over ISO-on-TCP, TCP and UDP connections
  - Multicast over UDP connection

    The multicast mode is made possible by selecting a suitable IP address when configuring connections.
  - FETCH/WRITE services (server; corresponding to S5 protocol) via ISO-on-TCP connections and TCP connections;

    The addressing mode can be configured for FETCH/WRITE access as the S7 or S5 addressing mode.
  - LOCK/UNLOCK with FETCH/WRITE services;

- Time-of-day synchronization over Industrial Ethernet using the following configurable modes:
  - SIMATIC mode

    The CP receives MMS time frames and synchronizes its local time and the time of the CPU (accuracy approx. +/– 1 second);

  or

  - NTP mode (NTP: Network Time Protocol)

    The CP sends time-of-day queries at regular intervals to an NTP server and synchronizes its local time of day and the time of the CPU (accuracy approx. +/– 1 second).
- Time of day for the diagnostic buffer

  If a time master exists (using the NTP or SIMATIC mode), the time for the CP-internal diagnostic buffer is synchronized over the LAN (accuracy approx. +/– 10 ms)
- Addressing using a factory-set MAC address

  The CP can be reached over the default MAC address to allow an IP address to be assigned.
- SNMP Agent

  The CP supports data queries over SNMP in version V1 (**S**imple **N**etwork **M**anagement **P**rotocol) according to the MIB II and LLDP MIB standard.

  You will find more information on MIB in the manual “Commissioning PC Stations” on the SIMATIC NET Manual Collection or at the following SIMATIC NET Internet page:

  http://support.automation.siemens.com/WW/view/en/15177711
- IP configuration

  You can configure how and with which method the CP is assigned the IP address, the subnet mask and the address of a default router.

  It is also possible, as an alternative, to assign the connection configuration to the CP using STEP 7 or using a block interface in the user program (FB55: IP_CONFIG) (see /Part A/).
- Web diagnostics

  With the aid of Web diagnostics, you can read out the diagnostic data from a station connected over the CP to a PG/PC with an Internet browser.

Configuration

It is possible to download the configuration data to the CP over MPI or LAN/Industrial Ethernet. You require STEP 7 with NCM S7 for Industrial Ethernet (NCM IE) with the following version:

Table 1-1

Version STEP 7 / NCM IE	Functions of the CP
V5.2 or higher	The range of functions of the CP 343−1 Lean (CX00) can be configured.
V5.4 or higher	Requirement for configuring the full functionality of the CP 343−1 Lean (CX10 with firmware V1.0) including PROFINET IO.
V5.4 Service Pack 2 *)	Requirement for configuring the full functionality of the CP 343−1 Lean (CX10 with firmware V2.0) including Web diagnostics.

*) To use the CP with V5.4 Service Pack 1, you will need to install Hotfix 2, the corresponding hardware update and a block setup. You will find more information at the following Internet page:
http://www4.ad.siemens.de/WW/news/en/24463868

Programming – Using Blocks

For some communications services, there are pre-programmed blocks (FCs/FBs) available as the interface in your STEP 7 user program.

You will find a detailed description of these blocks in the NCM S7 for Ethernet manuals.

Notice

We recommend that you always use the latest block versions for all module types.

You will find information on the latest block version and links to download the current blocks in our Customer Support area on the Internet:

http://www4.ad.siemens.de/WW/news/en/8797900

If you are using older block types, this recommendation only applies if you also have the latest firmware version.

You will find further information and Internet addresses in the Preface of the General Part of this manual.

2 Requirements for Use

General Operation

The CP can be operated in the following device families:

- S7–300 stations with the CPU types
  - Standard
  - Compact
  - Modular
- C7 control systems in C7 packaging system

The following tables show the devices with which the CP can be operated with this range of functions:

Notice

The tables list the CPUs and devices approved at the time of printing this manual. S7-300 CPUs or C7 or C7 control systems approved later and not listed in the table also support the range of functions described here.

Table 2-1 Use of the CP with S7–300

CPU	Order Number
CPU 312	6ES7 312–1AD10–0AB0 6ES7 312–1AE13–0AB0
CPU 312C	6ES7 312–5BD01–0AB0 6ES7 312–5BE03–0AB0
CPU 312 IFM	6ES7 312–5AC02–0AB0
CPU 313	6ES7 313–1AD03–0AB0
CPU 313C	6ES7 313–5BE00–0AB0 6ES7 313–5BE01–0AB0 6ES7 313–5BF03–0AB0
CPU 313C–2 DP	6ES7 313–6CE00–0AB0 6ES7 313–6CE01–0AB0 6ES7 313–6CF03–0AB0
CPU 313C–2 PtP	6ES7 313–6BE00–0AB0 6ES7 313–6BE01–0AB0 6ES7 313–6BF03–0AB0
CPU 314	6ES7 314–6AE01–0AB0 6ES7 314–6AE02–0AB0 6ES7 314–6AE03–0AB0 6ES7 314–6AE04–0AB0 6ES7 314–1AF10–0AB0 6ES7 314–1AF11–0AB0 6ES7 314–1AG13–0AB0

Table 2-1 Use of the CP with S7−300

CPU	Order Number
CPU 314 IFM	6ES7 314−5AE03−0AB0 6ES7 314−5AE10−0AB0
CPU 314C−2 DP	6ES7 314−6CF00−0AB0 6ES7 314−6CF02−0AB0 6ES7 314−6CG03−0AB0
CPU 314C−2 PtP	6ES7 314−6BF00−0AB0 6ES7 314−6BF01−0AB0 6ES7 314−6BF02−0AB0 6ES7 314−6BG03−0AB0
CPU 315	6ES7 315−1AF03−0AB0
CPU 315−2 DP	6ES7 315−2AF03−0AB0 6ES7 315−2AG10−0AB0
CPU 315−2 PN/DP	6ES7 315−2EG10−0AB0 6ES7 315−2EH13−0AB0
CPU 315F−2 DP	6ES7 315−6FF01−0AB0
CPU 315F−2 PN/DP	6ES7 315−2FH10−0AB0 6ES7 315−2FH13−0AB0
CPU 316	6ES7 316−1AG00−0AB0
CPU 316−2 DP	6ES7 316−2AG00−0AB0
CPU 317−2 DP	6ES7 317−2AJ10−0AB0
CPU 317−2 PN/DP	6ES7 317−2EJ10−0AB0 6ES7 317−2EK13−0AB0
CPU 317F−2 DP	6ES7 317−6FF00−0AB0 6ES7 317−6FF03−0AB0
CPU 317F−2 PN/DP	6ES7 317−2FJ10−0AB0 6ES7 317−2FK13−0AB0
CPU 318−2	6ES7 318−2AJ00−0AB0
CPU 319−3 PN/DP	6ES7 318−3EL00−0AB0
CPU 614	6ES7 614−1AH03−0AB3

Table 2-2 Use of the CP in C7 Control Systems

C7	Order Number
C7−613	6ES7 613−1CA01−0AE03 6ES7 613−1CA02−0AE3
C7−633 DP	6ES7 633−2BF02−0AE03
C7−635 Keys	6ES7 635−2EC01−0AE3 6ES7 635−2EC02−0AE3
C7−635 Touch	6ES7 635−2EB01−0AE03 6ES7 635−2EB02−0AE3
C7−636 Keys	6ES7 636−2EC00−0AE03 6ES7 636−2EC00−0AE3
C7−636 Touch	6ES7 636−2EB00−0AE3

3 Installation and Commissioning

3.1 Procedure / Steps

Step	Explanation / Meaning
1. Install the CP on the S7 standard rail. 2. Establish the connection via the enclosed bus connector to the backplane bus.	Slots 4 to 11 are permitted for the CP in racks 0 to 3 (connected by IM 360/361). Proceed as in the sections dealing with setup and wiring, described in detail in /1/.
Note The CP cannot be used in an extension rack that is connected via the IM 365! Reason: The required communication bus is not connected to the extension rack via the IM 365.	
3. Connect the CP to the power supply.	Follow the steps as described in detail in /1/ when wiring between the power supply and the CPU.
Notes • The CPU, CP and IM (if one exists) must be connected to the same power supply. • Only wire up the S7-300 / C7-300 with the power switched off!	
4. Attach the CP to Industrial Ethernet.	
5. The remaining steps in commissioning involve downloading the configuration data.	To download the configuration, you can connect the PG as follows: • via MPI • via Industrial Ethernet For further details, refer to the general Part A of this manual: – addressing the first time (IP address assignment / node initialization); – downloading the defined configuration The PG/PC requires a LAN attachment, for example via a CP 1613 or CP 1411 and must have the necessary software (for example the S7-1613 package or SOFTNET IE). The TCP/IP protocol must be installed. The protocol used must then be applied to the S7ONLINE access point.
6. User diagnostics for commissioning and to analyze problems.	The following options are available: • The LED displays on the CP • Hardware diagnostics and troubleshooting with STEP 7 • Communication diagnostics with STEP 7 / NCM Diagnostics • Standard information using HW Config • Web diagnostics • If applicable, evaluation of the alarm block FB54 in the user program

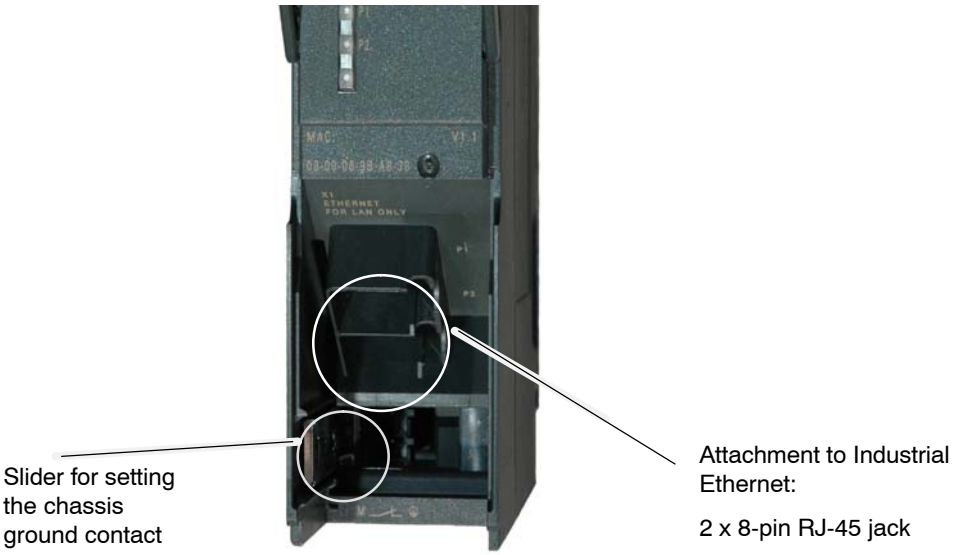


Figure 3-1 Connectors of a CP 343−1 Lean with the Front Panel Open

Ground/Chassis Ground Concept

Notice

Please note the instructions regarding the grounding and chassis ground concept in the SIMATIC S7 installation guides; see “SIMATIC S7 Programmable Controller S7−300 − Installation and Hardware: Installation Manual” /1/.

Behind the hinged panel on the left of the device, you will see a slider with which you can connect or disconnect the chassis ground of the 24 V power supply with reference ground.

- Slider pushed in: chassis and reference ground connected (note: the slider must be felt to lock in place).
- Slider pulled out: No connection between chassis and reference ground.

When shipped: Slider pushed in

Use a screwdriver to set the slider.

Note

An Ethernet cable can also be inserted and removed with the power supply on.

Note

The hinged front panel 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.

Warning

When used under hazardous conditions (zone 2), the devices must be installed in an enclosure.

To comply with ATEX100a (EN 60079−15), this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.

WARNING − EXPLOSION HAZARD: DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

Warning

The device is designed for operation with safety extra-low voltage (SELV). This means that only safety extra-low voltages (SELV) complying with IEC950/EN60950/ VDE0805 may be connected to the power supply terminals.

The power unit for supplying the device must comply with NEC Class 2 as described by the National Electrical Code(r) (ANSI/NFPA 70).

The power of all connected power units in total must correspond to a limited power source (LPS).

4 Displays

The display on the front panel consists of 8 LEDs that indicate the operating mode and the communication status.

Front panel:

The LEDs have the following meaning:

- SF: Group error
- BF: Bus fault PROFINET IO
- DCV5: DC 5 V power supply via the backplane bus (green = OK)
- RX/TX: Acyclic data exchange, for example Send/Receive (not relevant for PROFINET IO data)
- RUN: RUN mode
- STOP: STOP mode
- P1 / P2: Link status of Ethernet port 1 / port 2

LEDs for displaying the mode

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

SF(red)	BF (red)	RUN (green)	STOP (yellow)	CP Operating Mode
●	–	○	●	• Starting up after power “ON” or • Stopped (STOP) with errors In this state, the CPU or intelligent modules in the rack remain accessible using PG functions.
○	○	☼	●	Starting up (STOP->RUN)
○	○	●	○	Running (RUN)
○	○	●	☼	Stopping (RUN->STOP)
○	○	○	●	Stopped (STOP) In the STOP mode configuring and performing diagnostics on the CP remain possible.
–	●	–	–	• No LAN cable plugged in or • Duplicate IP address detected
–	☼	●	–	The CP is configured as a PROFINET IO device; there is no data exchange with the PROFINET IO controller
☼	☼	☼	☼	Module fault / system error
●	●	☼	●	Downloading firmware.
☼	☼	☼	○	Firmware was successfully downloaded.
☼	☼	○	☼	Firmware could not be downloaded.

Legend: ● (colored) on ○ off ☼ (colored) flashing “–” any

LEDs for displaying the CP communication status

In addition to the LEDs that signal the CP state, the following LEDs provide information about the status of the CP interface to Industrial Ethernet.

Table 4-1

LED	Display		Meaning
RX/TX (green)			The CP is sending/receiving over Industrial Ethernet Note: Sending / receiving over PROFINET IO is not signaled here.
P1 / **P2** **(green** / **yellow)**			Port has no connection to Industrial Ethernet.
		green	Existing connection over port to Industrial Ethernet (LINK status).
		green / yellow	LED flashes yellow (constant light green): Port sending/receiving over Industrial Ethernet or PROFINET IO. Note: All received / sent frames are signaled for each specific port including those simply forwarded by the switch.
P1 / **P2** **(green** / **yellow)**		yellow	Continuous data transfer at the port over Industrial Ethernet (for example PROFINET IO).

Legend: ● (colored) on ○ off ☼ (colored) flashing "–" any

5 Performance Data

5.1 Number of Possible Connections over Ethernet

Table 5-1

Characteristic	Explanation / Values
Permitted number of simultaneous connections in total over Industrial Ethernet	12 maximum

Example of Maximum Load

You can operate:

4 S7 connections
4 ISO-on-TCP connections
2 TCP connections
2 UDP connections

Also:

- Further TCP connections for Web diagnostics
- 1 PROFINET connection to a PROFINET IO controller

5.2 Characteristic Data for S7 Communication

Table 5-2

Characteristic	Explanation / Values
Number of connections for S7 communication on Industrial Ethernet for • Operator control and monitoring functions (HMI) • S7 connections configured at one end	4 maximum (the number depends on the CPU type being used. Please refer to /1/ for the values for your CPU.)
LAN interface – data record length per protocol unit • sending • receiving	 240 bytes / PDU 240 bytes / PDU

5.3 Characteristics of the SEND/RECEIVE Interface

Table 5-3

Characteristic	Explanation / Values
Number of ISO-on-TCP connections + TCP connections + UDP connections **in total**	8 maximum Notes: • All UDP connections are also possible in the multicast mode • Free UDP connections are supported by the CP.
Max. data length for blocks AG_SEND (V4.0 and higher) and AG_RECV (V4.0 and higher)	AG_SEND and AG_RECV allow the transfer of data fields of between 1 and 240 bytes. • 1 to 8192 bytes for ISO-on-TCP, TCP; • 1 to 2048 bytes for UDP
Restrictions for UDP	
• Transfer is not confirmed	The transmission of UDP frames is unconfirmed, in other words the loss of messages is not detected or displayed by the send blocks (AG_SEND).
• Data field length	The maximum length of the data fields is 2048 bytes.
• No reception of UDP broadcast	To avoid communication overload resulting from a high broadcast load, the CP does not permit reception of UDP broadcast.

Execution Times of the FCs AG_SEND / AG_RECV

To calculate the CPU cycle times (OB1) with SEND/RECEIVE connections, the execution time for the FCs (FC AG_SEND, FC AG_RECV) required for processing on the S7−300 / C7−300 CPU is the decisive factor.

Table 5-4

Component	Explanation / Values	
Execution time on the CPU 315−2 DP (6ES7 315−2EG10−0AB0)	per AG_SEND block call: • <1 ms at <= 240 bytes	per AG_RECV block call: • <1 ms at <= 240 bytes
Execution time on the CPU 317−2 PN/DP (6ES7 317−2EJ10−0AB0)	per AG_SEND block call: • <0.8 ms at <= 240 bytes	per AG_RECV block call: • <0.8 ms at <= 240 bytes

5.4 Characteristic Data for PROFINET IO

CP as PROFINET IO device

The CP supports the following maximum configuration as a PROFINET IO device:

Table 5-5

Characteristic	Explanation / Values
Size of the input area of the PROFINET IO device	512 bytes max.
Size of the output area of the PROFINET IO device	512 bytes max.
Size of the IO data area per submodule in a PROFINET IO device	
• Inputs	240 bytes
• Outputs	240 bytes
Size of the consistency area for a submodule	240 bytes
Maximum number of submodules	32

Execution times of the FCs PNIO_SEND / PNIO_RECV

The calculation of the reaction times with PROFINET IO is determined by the execution time of the function blocks required on the S7-300 CPU (PNIO_SEND, PNIO_RECV).

Table 5-6

Component	Explanation / Values	
Execution time on the CPU 315−2DP (6ES7 315−2EG10−0AB0)	per PNIO_SEND block call: • < 1 ms at 240 bytes	per PNIO_RECV block call: • < 1 ms at 240 bytes
Execution time on the CPU 317−2PN/DP (6ES7 317−2EJ10−0AB0)	per PNIO_SEND block call: • < 0.8 ms at 240 bytes	per PNIO_RECV block call: • < 0.8 ms at 240 bytes

6 Configuring and Programming the CP as a PROFINET IO Device

"Intelligent" PROFINET IO Device

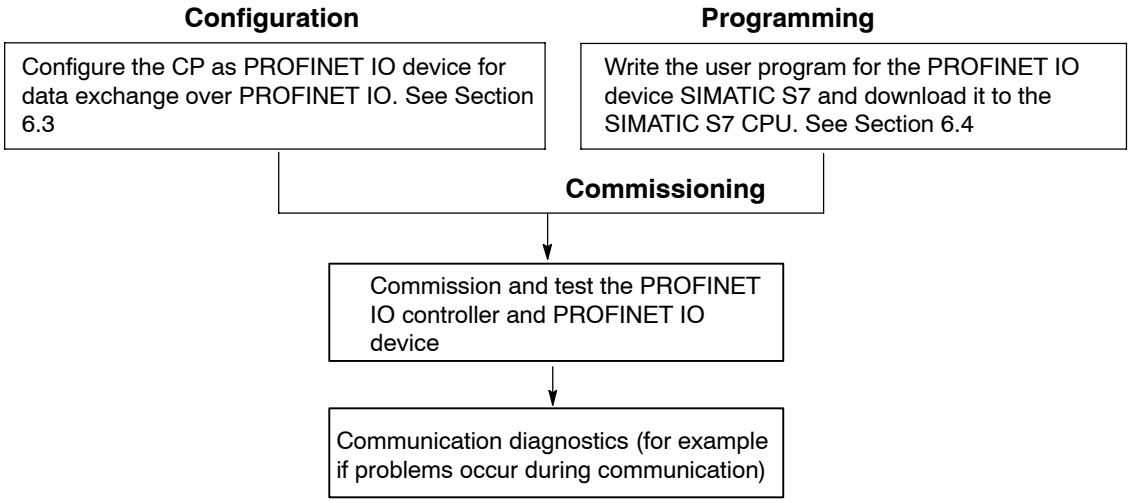
A CP 343−1 Lean can be configured so that the SIMATIC 300 station can be addressed as a PROFINET IO device. Due to the programmability of SIMATIC 300 stations, they are also known as "intelligent" PROFINET IO devices because:

Process data can be processed before it is forwarded to the PROFINET IO controller or after it has been received from it and output to the process I/O.

In the following sections, the name "PROFINET IO device" also refers to the CP located in the S7 station and configured as a PROFINET IO device.

6.1 Overview of the Preparatory Steps

The following steps are necessary to operate the SIMATIC 300 station with the CP as a PROFINET IO device:



6.2 Principle of Data Exchange over PROFINET IO

Data Exchange between controller and CP as PROFINET IO device

Data exchange between a PROFINET IO controller and PROFINET IO device involves the following procedure:

- On the PROFINET IO controller

  Data exchange is initiated by the PROFINET IO controller that writes output data to the configured output area (O addresses) and fetches input data from the configured input area (I addresses).

- On the PROFINET IO device

  Data is processed by the CP in the PROFINET IO device on the interface to the PROFINET IO controller.

  Communication within the PROFINET IO device involves calling the FCs PNIO_RECV and PNIO_SEND in the user program of the CPU.

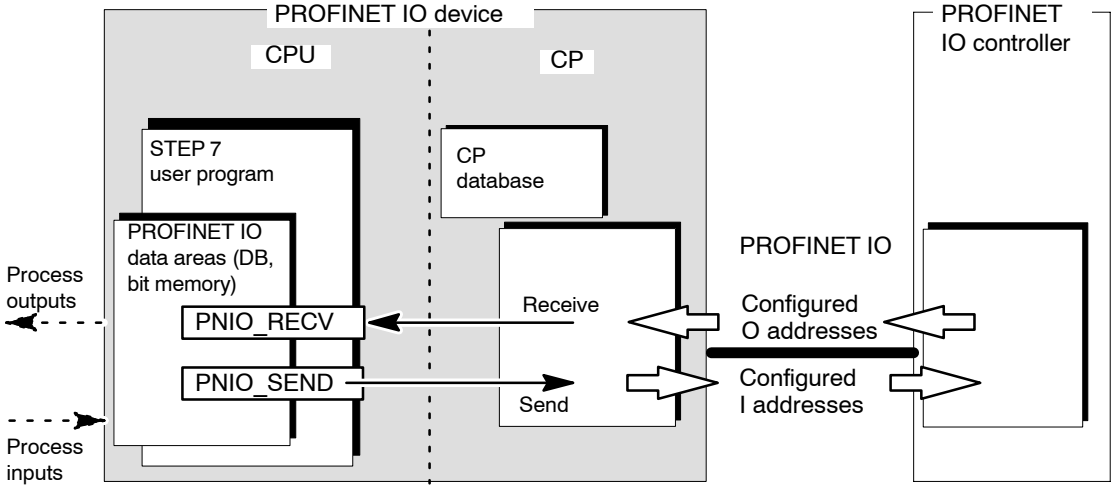


Figure 6-1 Interaction between PROFINET IO Device and PROFINET IO controller

Note

In the CPU of the device, the IO data areas for input data and output data are transferred as an **entire area** to or from one of the data areas (DB, bit memory) including any gaps.

6.3 Configuration

Configuring the CP as a PROFINET IO device involves the two following activities in STEP 7:

1. The CP is inserted in a SIMATIC 300 station in HW Config and enabled for PROFINET IO device mode in the properties dialog.
2. The CP is assigned to a PROFINET IO controller as a PROFINET IO device in HW Config.

Notice

These two configuration steps can be taken independently in HW Config. In both steps, make sure that the configured device name for the PROFINET IO device matches exactly.

6.3.1 Installing the CP and Specifying it as PROFINET IO Device

Follow the steps below in STEP 7 / HW Config:

1. Take the required CP from the hardware catalog and insert the module in the SIMATIC 300 station.

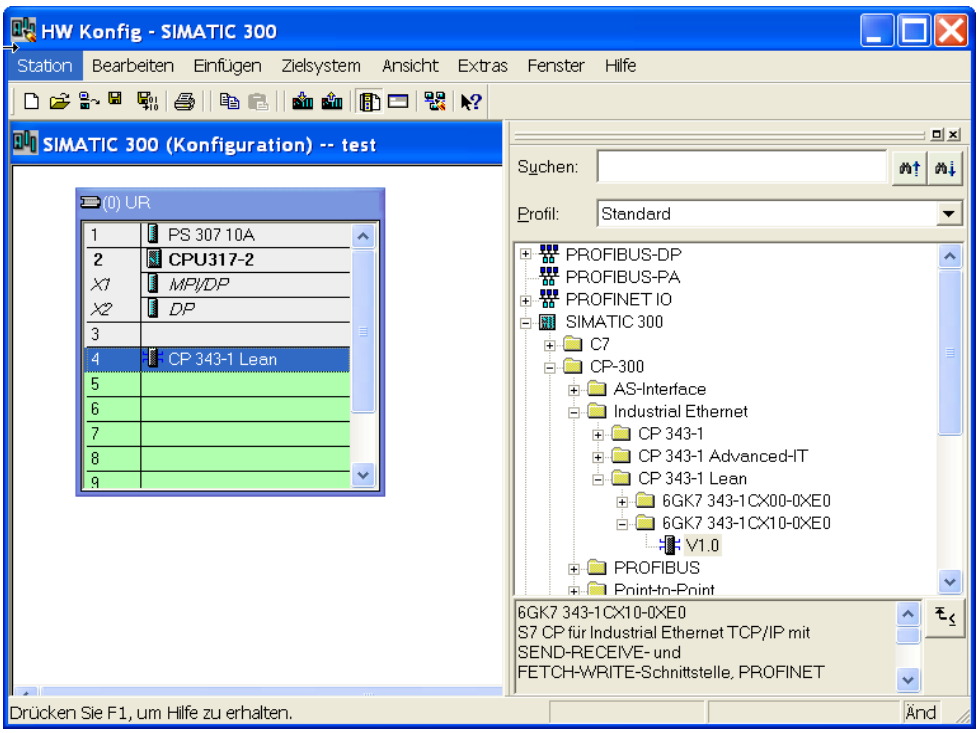


Figure 6-2 Inserting the CP in a SIMATIC Station in HW Config

2. Check and, if necessary, correct the IP address in the “Properties Ethernet” dialog.

Notice

The IP address of the PROFINET IO device and the IP address of the PROFINET IO controller must be located in the same IP subnet.

3. Complete the “Properties Ethernet” dialog with OK.
4. Open the properties dialog of the CP.
5. Assign a unique name to the CP as PROFINET node in the “PROFINET” tab. This name may only be assigned once in the PROFINET IO line.
6. Select the option “Enable PROFINET IO device operation”.

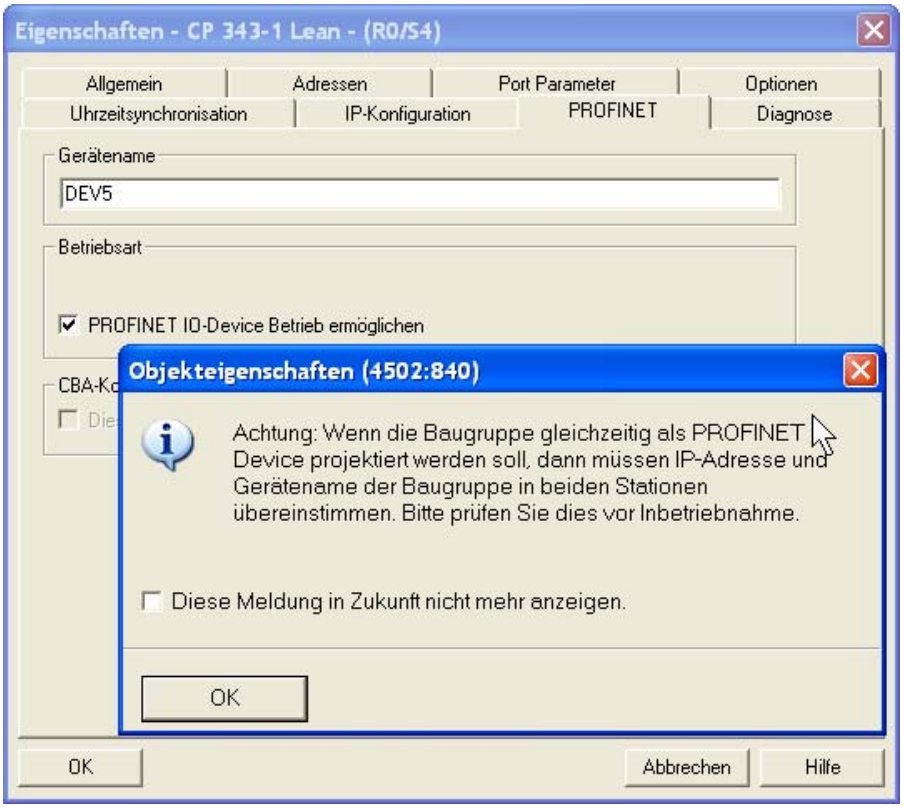


Figure 6-3 Setting the Device Name and the PROFINET IO Device Mode

7. Download the configuration data to the SIMATIC 300 station.

6.3.2 Assigning the PROFINET IO Device to a PROFINET IO Controller

PROFINET IO Controller

This section describes the configuration of PROFINET IO controllers with STEP 7. This includes:

- Stations of the type SIMATIC 300 and SIMATIC 400
  - CPU with integrated PROFINET IO controller (for example CPU 317−2 PN/DP).
  - CPU with external PROFINET IO controller (for example CP 343−1).
- SIMATIC PC station
  - For example with CP 1616

If you do not configure your system with STEP 7, you will need to use the GSDML file of the CP to configure the CP in your configuration system (download address see Section 9.10)

When configuring the PROFINET IO device (see Section 6.3.1), the selected PROFINET IO controller is unimportant.

Requirements for Configuration in STEP 7

There must be a SIMATIC station in the STEP 7 project in which a module (CPU or CP) supports operation as PROFINET IO controller.

Notice

The IP address of the PROFINET IO device and the IP address of the PROFINET IO controller must be located in the same IP subnet.

Step 1: Configuring the PROFINET IO controller

With some PROFINET IO controller types, STEP 7 automatically creates a PROFINET IO system as soon as you insert the module, otherwise you may need to add a PROFINET IO system. Drag the required IO devices from the hardware catalog to this PROFINET IO system.

Configure a PROFINET IO controller as follows:

1. Open the hardware configuration of the station you want as PROFINET IO controller in HW Config.
2. If no PROFINET IO system exists, select the PROFINET IO controller (for example CP 343−1 EX30/GX21, CP 443−1 EX41, CPU 317−2 PN/DP) and insert a PROFINET IO system (menu “Insert” ▸“PROFINET IO System”).

Result:
You will see the connector symbol for the PROFINET IO system beside the PROFINET IO controller. ——▭▭▭▭▭

Step 2: Configuring the PROFINET IO device on the PROFINET IO controller

1. Open the hardware catalog and select a version of the CP V2.0 or higher as the PROFINET IO device from the folder “PROFINET IO” ▸“I/O” ▸“SIMATIC S7−CP” ▸“CP 343−1 Lean”.
2. Connect the CP with the PROFINET IO system (drag and drop).
3. Add input and output modules with the required I/O data length (1 to max. 240 bytes) to the PROFINET IO device.

The following screenshot shows the configuration table of the PROFINET IO controller with an S7−400 station as PROFINET IO controller. The PROFINET IO device shown here, for example, has three modules for process inputs (I address) and process outputs (O address).

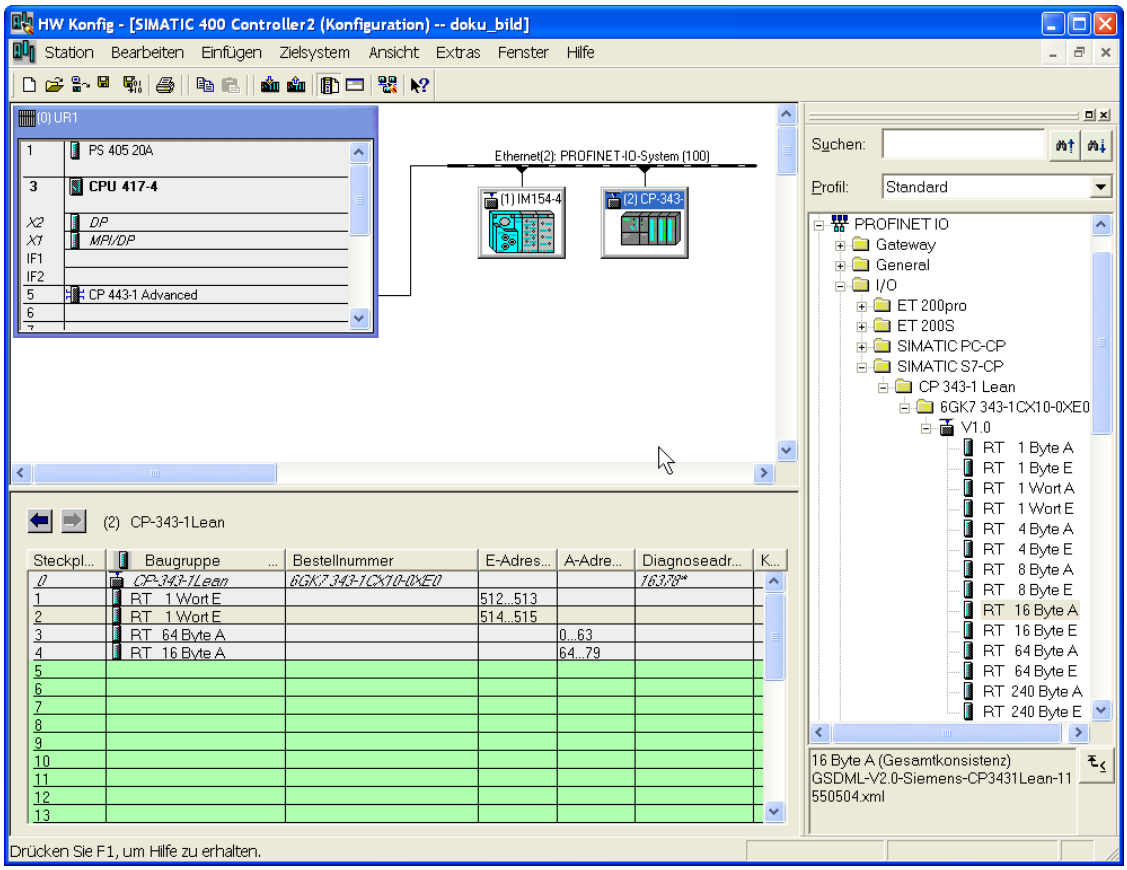


Figure 6-4 SIMATIC Station with PROFINET IO System with the CP as Device with Input (DI) and Output Modules (DO)

Step 3: Configuring the properties of the CP as PROFINET IO device

Continue configuration in HW Config as follows:

1. Open the properties dialog of the PROFINET IO device that you inserted in the PROFINET IO system.
2. In the “General” tab, assign the same device name that you selected in Section 6.3.1.

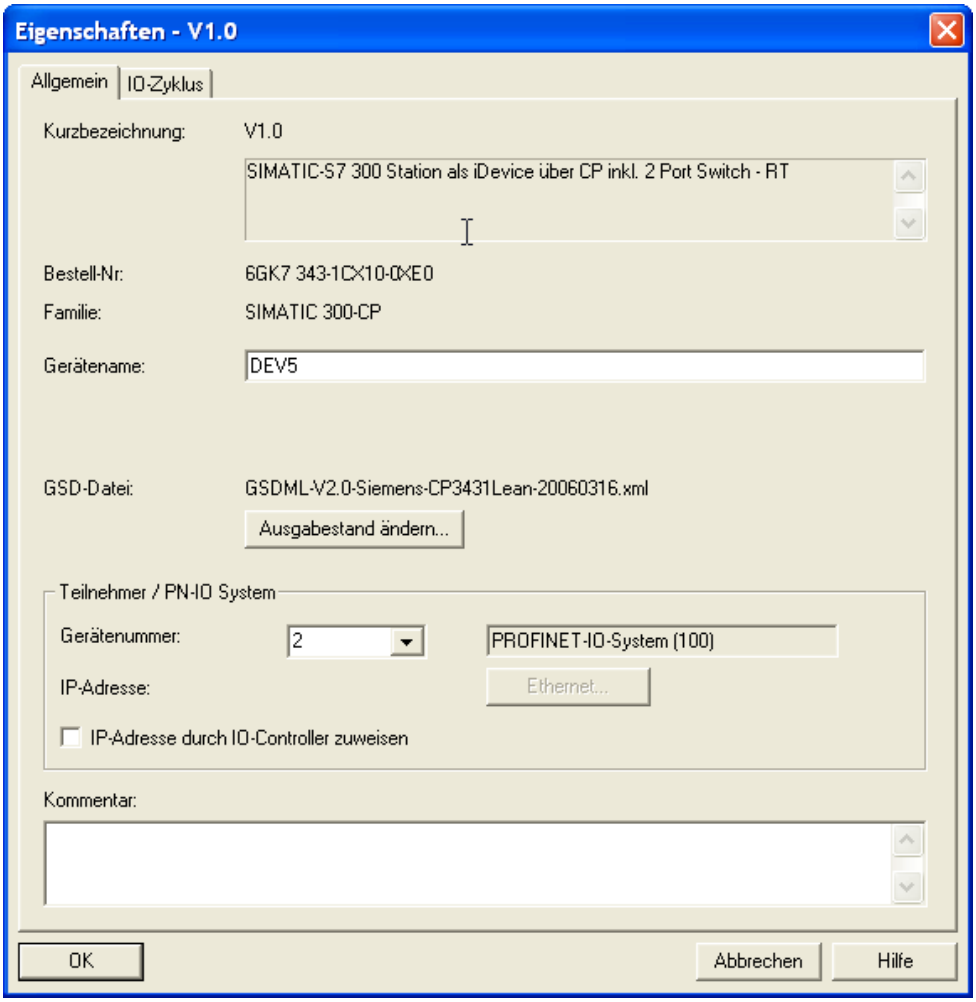


Figure 6-5 Properties Dialog of the Device: Assigning the Device Name

3. Deselect the “Assign IP address by IO controller” option.

   This step is a recommendation!

   By deactivating this option, the IP address you assigned when you installed the CP in the SIMATIC 300 station (see Section 6.3.1) comes into effect on the PROFINET IO device. Otherwise the IP address you selected there will be overwritten by an IP address assigned by the PROFINET IO controller. If it is overwritten, any configured connections (S7, ISO-on-TCP, TCP) will no longer be established.

No further parameter assignment of the modules is necessary.

Note

By selecting suitable network components and setting the network properties (Section 9.2) make sure that in PROFINET IO mode, the PROFINET line can be operated without exception at 100 Mbps full duplex.

6.4 Programming

By programming, you specify the sequence of the user program for the CPU and therefore also access to the I/O data.

To write and read process data, use the FCs PNIO_SEND (FC11) or PNIO_RECV (FC12) from the SIMATIC NET block library in your user program.

How to use the existing functions (FCs) in your user program for PROFINET IO device mode is described in the following sections of this chapter.

You will find an example matching the configuration described in the previous chapter in Section 6.5.

6.4.1 Interface for Programming on the PROFINET IO Device

FCs

Two functions (FCs) are available for data exchange using the STEP 7 user program:

- PNIO_SEND (FC11)

  This FC reads the preprocessed process inputs of the CPU and transfers them to the PROFINET IO controller (configured I addresses).

  The preprocessed process inputs are available in a DB or bit memory area.

- PNIO_RECV (FC12)

  The block accepts the data transferred by the PROFINET IO controller (configured O addresses) and writes it to the data areas of the CPU reserved for process outputs.

You will find the precise syntax of the FCs and the meaning of the block parameters in the chapter on FCs in the general part of the manual or in the online help for the block library in STEP 7.

Data consistency

The length information in the block call must be identical to the total length of the input or output data configured for this PROFINET IO device.

The entire input or output data area of the PROFINET IO controller is transferred in its entirety between the CP and CPU and is therefore consistent.

Note: Remember, however, that in terms of the “IO user data” within a PROFINET IO system, only the data consistency of individual IO slots can be guaranteed. This applies regardless of whether consistent data transfer between the CPU and CP is guaranteed for the blocks described here.

6.4.2 Initialization and Configuration

Initialization

As a PROFINET IO device, the CP requires the following information in the user program for configuration by the PROFINET IO controller at every startup:

- Length of the input data (when FC11 is called)
- Length of the output data (when FC12 is called)

When the connection is established between the PROFINET IO controller and the PROFINET IO devices of a PROFINET IO line, the entire length of the input and output data is checked. The PROFINET IO controller compares the configured entire length of the input and output data with the LEN parameter of FC11 and FC12 in the user program of the device for every PROFINET IO device.

If the length information for the input and output data does not match, the block is terminated with an error.

During this initialization phase, the two blocks must be called until FC11 signals DONE=1 and FC12 signals NDR=1.

Notice

Remember that the successful configuration by the PROFINET IO controller is only possible after local initialization by the FC calls PN IO_SEND (FC11) for the input data and PN IO_RECV (FC12) for the output data.

Note

During initialization, the data of PNIO_SEND (FC11) is not evaluated and the data of PNIO_RECV (FC12) is initialized with default values.

FC11 and FC12 transfer valid data only following the subsequent calls.

Reasons for reinitialization

The PROFINET IO device requests reinitialization by the user program in the following situations:

- The length information of the input and output areas in the FCs does not match the information configured for this PROFINET IO device on the PROFINET IO system. A change in the length in the FC calls in the user program counts as a configuration change.
- The CPU or CP changes to STOP mode.
- The watchdog time was exceeded (see below).
- Following a connection abort between the PROFINET IO controller and PROFINET IO device (for example because the PROFINET IO controller was turned off).

Watchdog

FC11 and FC12 each have their own watchdog. Depending on the average CPU cycle time, the connection to the PROFINET IO controller is terminated if one of the two blocks is no longer called following the initialization phase.

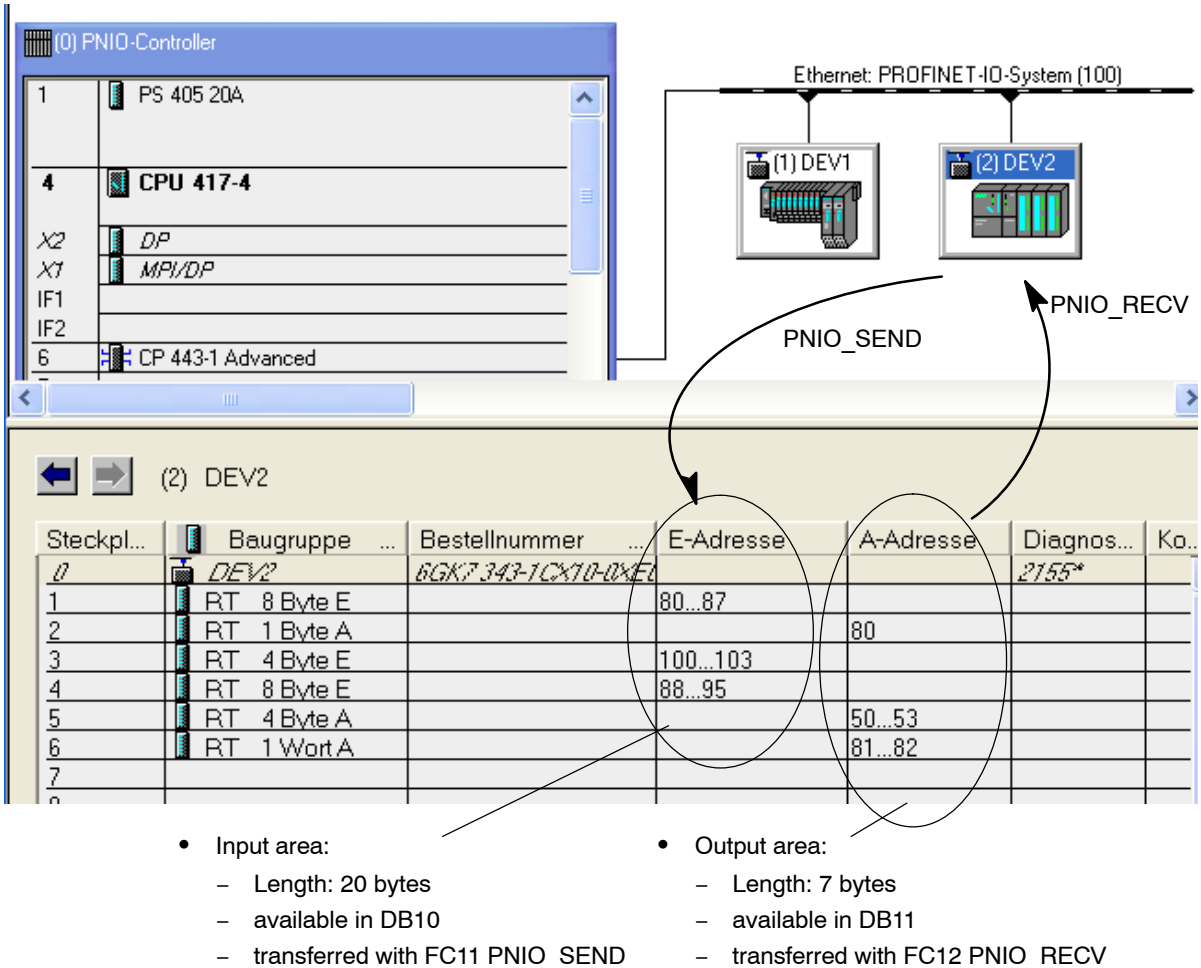
6.5 Example of Configuration and Programming

The configured input/output modules must be accessed in the user program of the PROFINET IO device using FCs. The FCs provide the process data preprocessed in the user program of the PROFINET IO device on the interface to the PROFINET IO controller (PNIO_SEND) or fetch the data provided by the PROFINET IO controller for further processing in the user program of the PROFINET IO device (PNIO_RECV).

The following example shows the configuration in HW Config and excerpts of the user program of the CPU.

I addresses and O addresses configured on the PROFINET IO controller

The schematic shows the CP configured as a PROFINET IO device in the PROFINET IO system with three modules for process inputs and process outputs.



- Input area:
  - Length: 20 bytes
  - available in DB10
  - transferred with FC11 PNIO_SEND
- Output area:
  - Length: 7 bytes
  - available in DB11
  - transferred with FC12 PNIO_RECV

Figure 6-6 Configuration of a PROFINET IO device in HW Config

Transfer the process inputs (DB10) to the I addresses with PNIO_SEND

For the configured I addresses, you will need to make data areas available on the PROFINET IO device, for example in a DB (in this example in a DB10) that contains not only the process data but also the data areas for the IOCS status information.

KOP/AWL/FUP - [DB10 -- doku_bild\SIMATIC 300 Device\CPU 314]

Datei Bearbeiten Einfügen Zielsystem Test Ansicht Extras Fenster Hilfe

Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	RT_8_Byte_E_1	ARRAY[1..8]		log. Input-Address 80...87 of Controller (Slot 1)
*1.0		BYTE		
+8.0	RT_4_Byte_E_3	ARRAY[1..4]		log. Input-Address 100...103 of Controller (Slot 3)
*1.0		BYTE		
+12.0	RT_8_Byte_E_4	ARRAY[1..8]		log. Input-Adress 88...95 of Controller (Slot 4)
*1.0		BYTE		
+20.0	IOCS_8_Byte_E_11	BOOL	FALSE	IOCS for log. INPUT-Address 80...87 of Controller (Slot 1)
+20.1	IOCS_8_Byte_E_12	BOOL	FALSE	
+20.2	IOCS_8_Byte_E_13	BOOL	FALSE	
+20.3	IOCS_8_Byte_E_14	BOOL	FALSE	
+20.4	IOCS_8_Byte_E_15	BOOL	FALSE	
+20.5	IOCS_8_Byte_E_16	BOOL	FALSE	
+20.6	IOCS_8_Byte_E_17	BOOL	FALSE	
+20.7	IOCS_8_Byte_E_18	BOOL	FALSE	
+21.0	IOCS_4_Byte_E_31	BOOL	FALSE	IOCS for log. INPUT-Address 100...103...f Controller (Slot 3)
+21.1	IOCS_4_Byte_E_32	BOOL	FALSE	
+21.2	IOCS_4_Byte_E_33	BOOL	FALSE	
+21.3	IOCS_4_Byte_E_34	BOOL	FALSE	
+21.4	IOCS_8_Byte_E_41	BOOL	FALSE	IOCS for log. INPUT-Address 88...95 of Controller (Slot 4)
+21.5	IOCS_8_Byte_E_42	BOOL	FALSE	
+21.6	IOCS_8_Byte_E_43	BOOL	FALSE	
+21.7	IOCS_8_Byte_E_44	BOOL	FALSE	
+22.0	IOCS_8_Byte_E_45	BOOL	FALSE	
+22.1	IOCS_8_Byte_E_46	BOOL	FALSE	
+22.2	IOCS_8_Byte_E_47	BOOL	FALSE	
+22.3	IOCS_8_Byte_E_48	BOOL	FALSE	
=24.0		END_STRUCT		

Figure 6-7 Data Structure for PNIO_SEND in the PROFINET IO Device

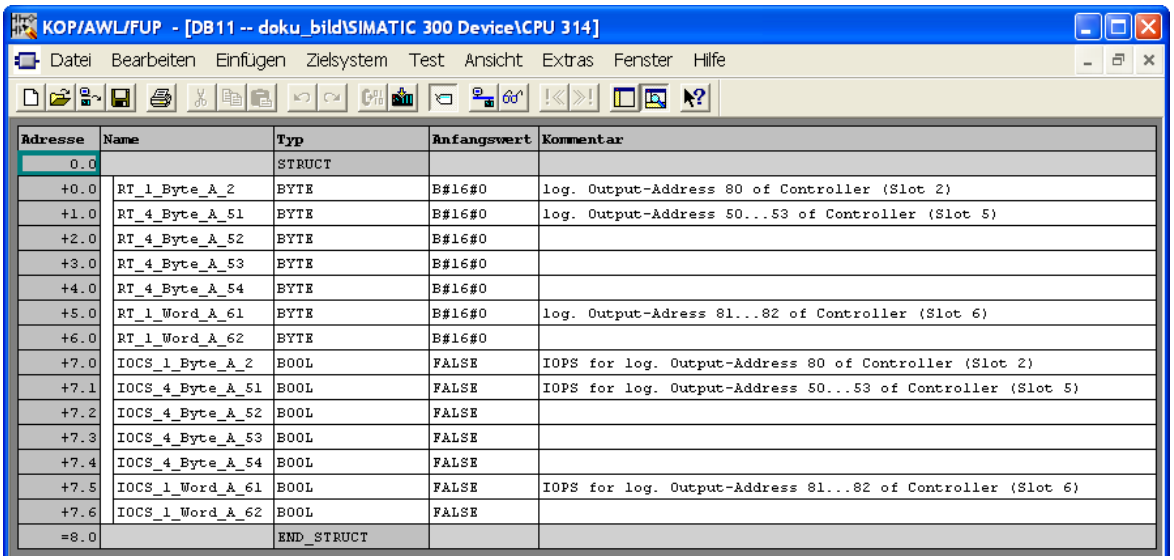
The call interface PNIO_SEND in the user program

```
STL                                  Explanation
call fc 11                           //PNIO_SEND block call
                                     //(transfer inputs to IO controller)
CPLADDR:=      W#16#0100             //Module address from hardware configuration
LEN     :=     20                    //No. of log. I addressesto transfer. in bytes

IOCS    :=     P#DB10.DBX20.0 BYTE 3 //Per send data byte, one bit status in DB10
DONE    :=     M 70.0                //Address for return parameter DONE
ERROR   :=     M 70.1                //Address for return parameter ERROR
STATUS  :=     MW 72                 //Address for return parameter STATUS
CHECK_IOCS := M 70.2                 //Address for return parameter CHECK_IOCS
SEND    :=     P#DB10.DBX0.0 BYTE 20 //Data area to be transferred from DB10
                                     //(20 bytes)
```

Transfer the O addresses to the process outputs (DB11) with PNIO_RECV

For the configured O addresses, you will need to make data areas available on the PROFINET IO device, for example in a DB (in this example in a DB11) that contains not only the process data but also the data areas for the IOPS status information.



Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	RT_1_Byte_A_2	BYTE	B#16#0	log. Output-Address 80 of Controller (Slot 2)
+1.0	RT_4_Byte_A_51	BYTE	B#16#0	log. Output-Address 50...53 of Controller (Slot 5)
+2.0	RT_4_Byte_A_52	BYTE	B#16#0	
+3.0	RT_4_Byte_A_53	BYTE	B#16#0	
+4.0	RT_4_Byte_A_54	BYTE	B#16#0	
+5.0	RT_1_Word_A_61	BYTE	B#16#0	log. Output-Adress 81...82 of Controller (Slot 6)
+6.0	RT_1_Word_A_62	BYTE	B#16#0	
+7.0	IOCS_1_Byte_A_2	BOOL	FALSE	IOPS for log. Output-Address 80 of Controller (Slot 2)
+7.1	IOCS_4_Byte_A_51	BOOL	FALSE	IOPS for log. Output-Address 50...53 of Controller (Slot 5)
+7.2	IOCS_4_Byte_A_52	BOOL	FALSE	
+7.3	IOCS_4_Byte_A_53	BOOL	FALSE	
+7.4	IOCS_4_Byte_A_54	BOOL	FALSE	
+7.5	IOCS_1_Word_A_61	BOOL	FALSE	IOPS for log. Output-Address 81...82 of Controller (Slot 6)
+7.6	IOCS_1_Word_A_62	BOOL	FALSE	
=8.0		END_STRUCT		

Figure 6-8 Data Structure for PNIO_RECV in the PROFINET IO Device

The call interface PNIO_RECV in the user program

```
STL                                  Explanation
call fc 12                           //PNIO_RECV block call
                                     //(read outputs from IO controller)
CPLADDR:=      W#16#0100             //Module address from hardware configuration
LEN     :=     7                     //No. of log. O addresses to transfer in bytes
IOPS    :=     P#DB11.DBX7.0 BYTE 1  //Per receive data byte one status bit in DB11
NDR     :=     M 74.0                //Address for return parameter NDR
ERROR   :=     M 74.1                //Address for return parameter ERROR
STATUS  :=     MW 76                 //Address for return parameter STATUS
CHECK_IOPS := M74.2                  //Address for return parameter CHECK_IOPS
RECV    :=     P#DB11.DBX0.0 BYTE 7  //Received data in DB11 (7 bytes)
ADD_INFO:=     MW 26                 //Diagnostic information
```

7 Web Diagnostics

With Web diagnostics, the CP provides you with the option of calling up the most important settings of a connected station and the status of their network connections and communication partners from an HTTP client on a PG/PC. You can also query the diagnostic buffer entries of the modules of the rack in which the CP is located.

Using Web diagnostics, you can only read the data of the connected station.

7.1 Requirements and Use

Settings for Access to Diagnostic Data

Check the following settings that are necessary for access to the diagnostic data:

- To load diagnostic data, Java Script must be enabled in the Internet browser.
- The browser must support frames.
- Cookies must be accepted.
- The browser should be set so that it downloads the current data from the server automatically each time it accesses a page.

  In Internet Explorer, you will find these settings in the “Tools” menu ▶“Internet Options” ▶“General” tab ▶“Temporary Internet Files” group box ▶ “Settings” button.
- When using a firewall on your PG/PC, the following port must be enabled for Web diagnostics: “http port 80/TCP”

Note

Station or device names configured in STEP 7 with special characters (for example umlauts ä, ü etc.) may possibly be incorrectly interpreted in Web diagnostics.

Starting and Working with Web Diagnostics

Follow the steps outlined below to start Web diagnostics:

1. Connect your PC with the LAN to which the CP is connected.
2. Start the Internet browser and enter the following address in the address line of your Internet browser:

   `http:\\<IP address of the CP>`

   Web diagnostics opens with the “Start Page”.

3. Select the display language you require from the “Language” drop-down list box at the top right. The following languages are available:

- English
- Deutsch
- Français
- Español
- Italiano

4. You open the other pages using the navigation panel to the left of the window.

7.2 Diagnostics Pages of the CP

Layout of the Diagnostics Pages

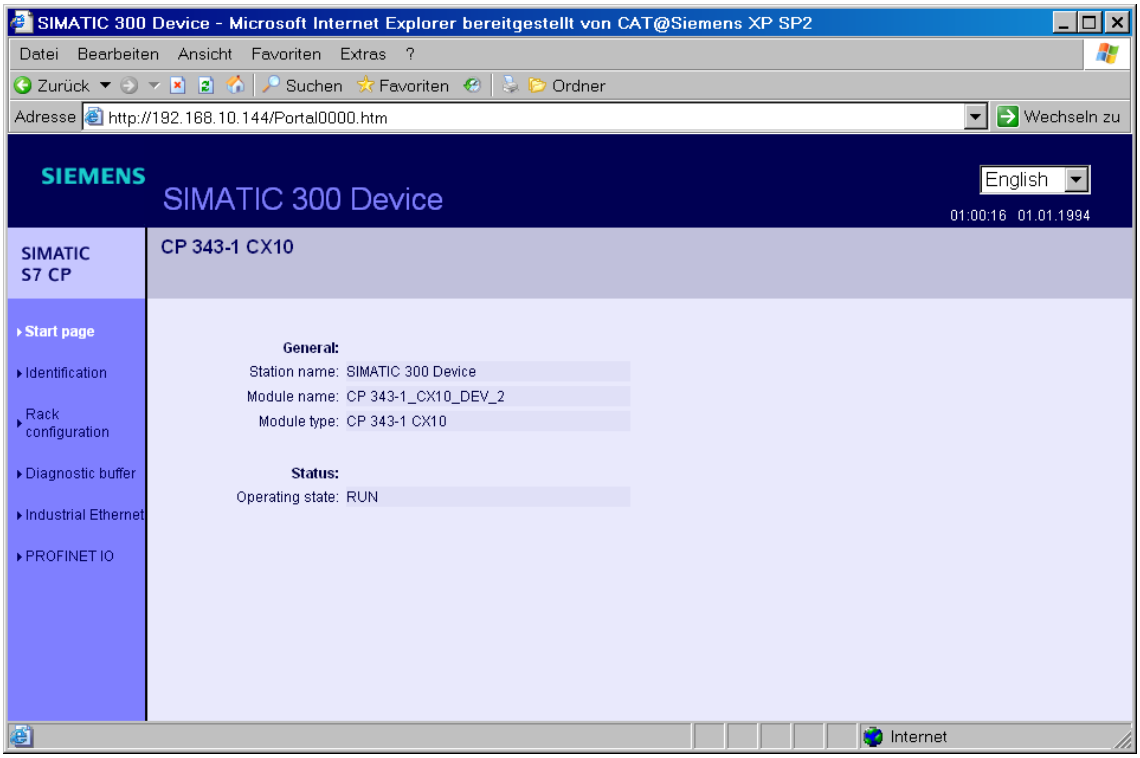
The title bar of the Web diagnostics page displays the STEP 7 station name of the S7 station in which the CP is located.

Below the title bar of the start page, you can see the CP type (here: CP 343−1 CX10).

Above the navigation panel to the left, you can see the module type (here: “SIMATIC S7 CP”).

7.2.1 Start Page

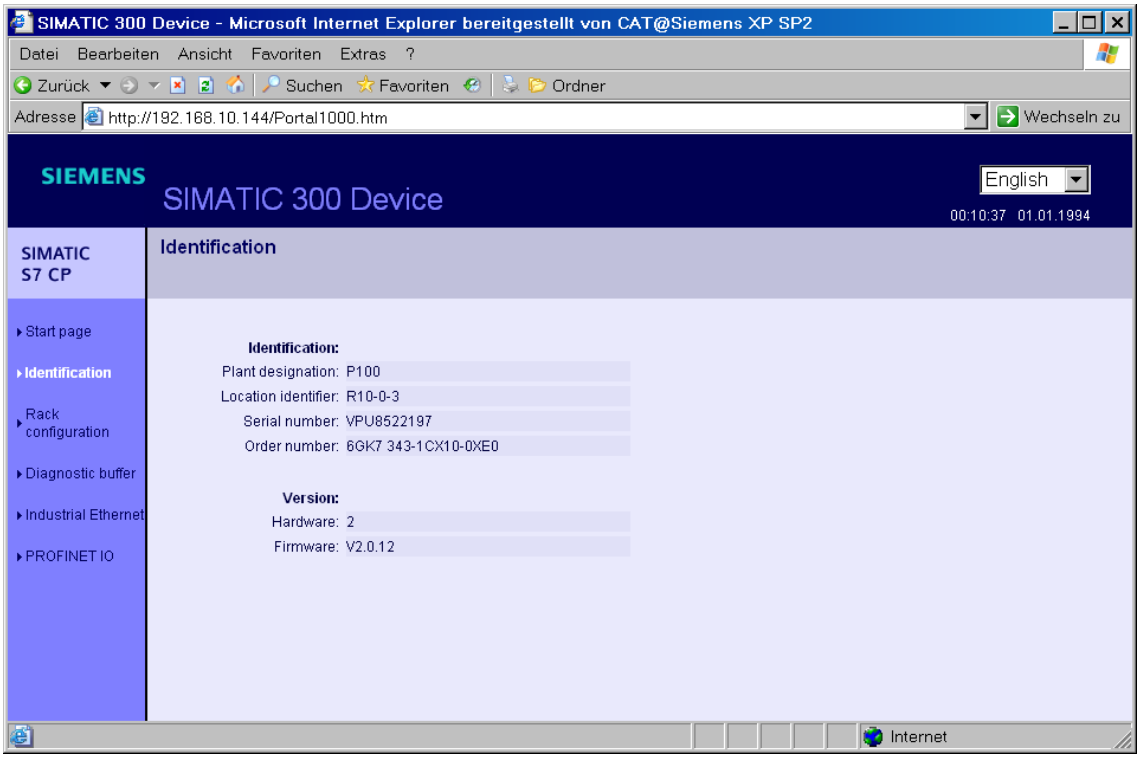
This page displays general device data and the status of the connected CP.



Parameter	Function
General	
Station name	Configured name of the station in which the CP is installed.
Module name	Configured name of the module
Module type	Name of the module type
Status	
Operating mode	Current mode of the CP: • Starting • RUN (CP in productive mode) • Stopping • STOP • Stopped with error

7.2.2 Identification

Here, you can see a variety of information on the CP for identification and maintenance.

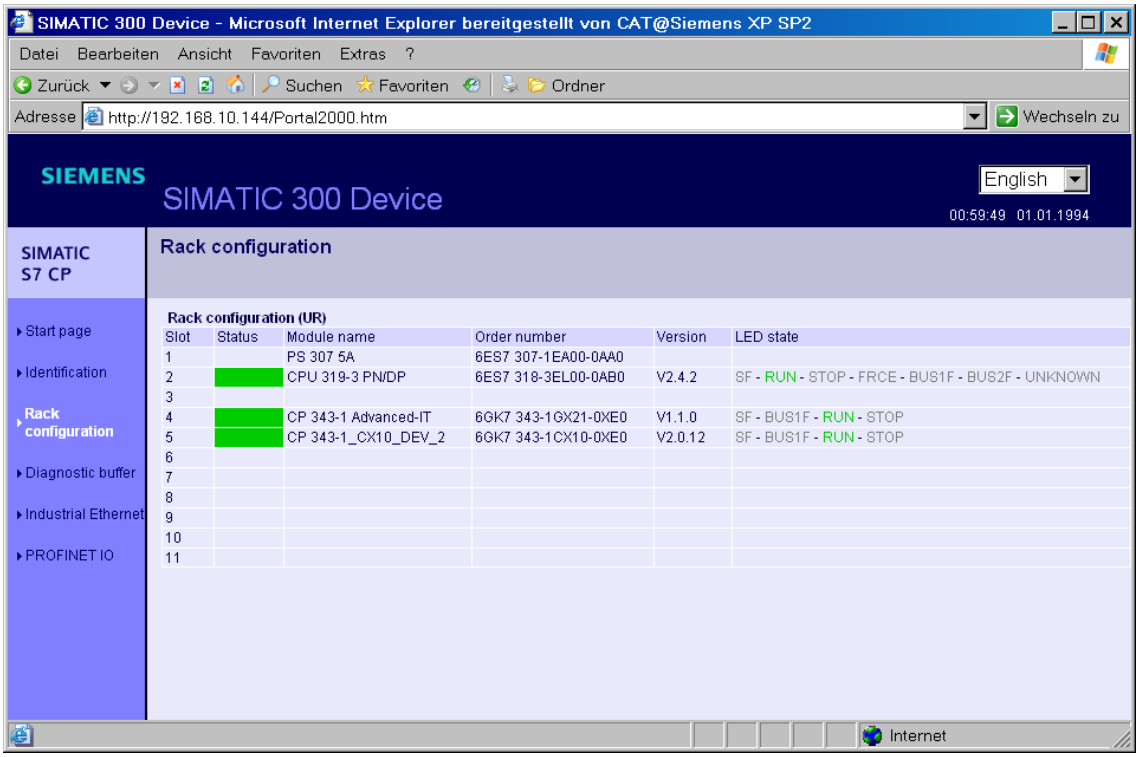


Parameter	Function
Identification	
Plant designation [1)]	Plant designation of the CP if this was configured.
Location identifier [1)]	Location identifier of the CP if this was configured.
Serial number	Serial number of the CP
Order number	Order number of the CP
Version	
Hardware	Hardware version of the module
Firmware	Version of the stored firmware

1) A CP acting as PROFINET IO device can be informed of the plant designation and location identifier by the PROFINET IO controller using the “write data record” function. This is done using the maintenance data record “IM1” with index $AFF1_H$.
The “write data record” function is explained in detail in the general part A of the manual in the description of the FCs for PROFINET IO.

7.2.3 Rack Configuration

The slots of the station and general data along with the status of the devices is displayed here.



Parameter	Function
Rack Configuration (rack name)	
Slot	Slot of the individual modules in the rack
Status	Status display of the relevant module: • Green (OK, module in operation) • Red (a problem has occurred) • Yellow (module changed to STOP) The last column “LED Status” contains more information.
Module name	Name of the module configured in HW Config
Order number	Order number of the module

Parameter	Function
Version	Firmware version of the module
LED Status	LED display of the module: • Gray (inactive LED, the LED is off) • Colored (active LED, the LED is lit) The number of type of the LEDs depends on the particular module type. You will find an explanation of the significance of the LEDs in the documentation for the particular module.

7.2.4 Diagnostic Buffer

This table lists all the events in the chronological order in which they were received. The latest entry is at the start and the oldest entry at the end of the table.

By clicking on the various tabs above the table, you can select the individual modules in the rack.

Parameter	Function
Events	
Number	Consecutive number of the entry
Time	Time of the entry **Note** If the module has synchronized itself with a time server, the current time is displayed. Otherwise the time since the last restart is displayed.
Date	Date of the entry if the module is synchronized. Otherwise the default time of the module (01.01.1994) or the day of the last restart is displayed.
Event	Displays the diagnostic buffer entry (entries only in English)
Details: “no. of the event”	
Event ID	Event ID of the diagnostic buffer entry
Text of the event entry	

7.2.5 Industrial Ethernet

“Parameters” Tab

This page shows you the various parameters of the MAC address, the IP address and the LAN attachments.

Parameter	Function
Network attachment	
MAC address (active)	Active MAC address of the CP
MAC address (factory setting)	MAC address set in the factory
Device name	Device name configured in STEP 7 (properties dialog, “PROFINET” tab)
IP parameters	
IP address	IP address of the CP
Subnet mask	Configured subnet mask
Default router	IP address of a configured router
IP settings	How the IP address is assigned (for example, STEP 7, DHCP ...)
Physical properties	
Port number	Number of the LAN port of the CP: 1, 2
Link status	Status of the LAN port: • OK • no link
Setting	Display of the individual network settings configured in STEP 7: • Configured • automatic (automatic setting / autonegotiation)
Mode	Displays the current network properties (transmission rate and direction). Possible values: • 10 Mbps half duplex • 10 Mbps full duplex • 100 Mbps half duplex • 100 Mbps full duplex

"Statistics" Tab

This page displays information on sent and received frames since the last module restart.

Parameter	Function
Data packets sent	
Number of error-free frames sent, number of unicast, multicast and broadcast frames and the frames canceled due to a collision	
Received data packets	
Number of error-free received frames, received unicast, multicast and broadcast frames, frames rejected due to checksum or alignment errors and frames rejected due to a lack of resources	

"TCP Connections" Tab

This page informs you about existing TCP connections.

Parameter	Function
Number	Consecutive number of the TCP connection
Local IP address	IP address of the CP
Partner IP address	Partner IP address
Local port	Number of the port used for the TCP connection
Partner port	Number of the port on the partner used for the TCP connection
Status	Connection status of the TCP connection, for example: • LISTEN (waiting for connection) • ESTABLISHED (existing connection) • TIME WAIT (wait state prior to connection termination) and • other interim statuses such as SYN SENT, SYN RECV, CLOSING etc.)

"UDP Connections" Tab

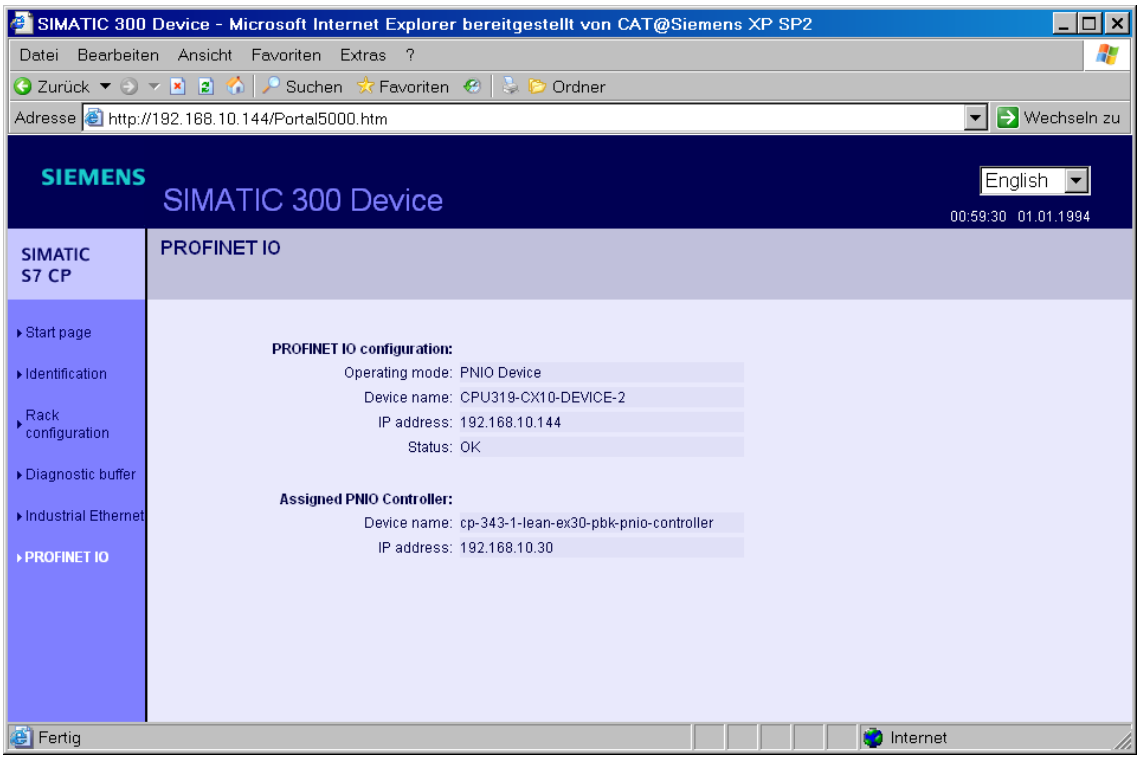
This page informs you about existing UDP connections.

Parameter	Function
Number	Consecutive number of the UDP connection
Local IP address	IP address of the CP
Partner IP address	Partner IP address
local port	Number of the port used for the UDP connection
Partner port	Number of the port on the partner used for the UDP connection

7.2.6 PROFINET IO

This page provides you with information on the most important parameters of the PROFINET IO configuration.

Parameters of a PROFINET IO Device



Parameter	Function
PROFINET IO Configuration	
Mode	PROFINET IO mode of the CP (here: PROFINET IO device): • PROFINET IO controller • PROFINET IO device • No PROFINET IO configuration
Device name	Device name
IP address	IP address of the device

Parameter	Function
Status	Status of the device: • OK (problem-free operation) • No connection to PROFINET IO controller (connection disrupted or broken down) • PROFINET IO blocks are not called correctly (the blocks are not called or not correctly called)
Assigned PNIO controller	
Device name	Device name of the assigned controller
IP address	IP address of the controller

8 Compatibility with Predecessor Products

8.1 Extended Functionality

New: Enhanced functions compared with module 6GK7 343−1CX10−0XE0 with firmware version V1.0

The following properties, services and functions are new:

- Web diagnostics
- New GSDML file

8.2 Replacing Older Modules / Replacing Faulty Modules

Use as a Replacement:

The CP 343−1 Lean with order number 6GK7 343−1CX10−0XE0 (firmware version 2.0) described here can be used as a replacement for the following predecessor products:

- CP 343−1 Lean (6GK7 343−1CX00−0XE0)

  If you replace a CP 343−1 Lean (CX00) module with a CP 343−1 Lean (CX10) and have STEP 7 version < V5.4, all the previous functions of the module remain available. Any port settings relating to Ethernet are adopted for port 1.

  The additional second RJ−45 port is also available in the “Automatic setting” mode.

- CP 343−1 Lean (6GK7 343−1CX10−0XE0, firmware version 1.0)

  All previous functions remain available. They are supplemented by the functions of Web diagnostics.

Notice

For new user programs, please make sure that you always use the latest block versions. You will find information on the latest block version and links to download the current blocks on the Internet:

http://www4.ad.siemens.de/WW/news/en/8797900

Module Replacement

When replacing an older module with the module described here, keep to the steps outlined below:

Table 8-1

Originally configured module	Configuration Steps
6GK7 343−1CX00−0XE0	Case a: Configuration unchanged If you do not have any new requirements compared with the previous CP (for example, PROFINET IO mode), no modification of the project engineering is necessary. Case b: Adapted project engineering data If you want to use the extended functionality of the new CP, follow the steps below: 1. In STEP 7 / HW Config, replace the previously configured CP Lean with the new module from the hardware catalog. 2. Extend your configuration to match your requirements, for example, by enabling the CP for PROFINET IO device mode. 3. Save, compile and download the configuration data to the CPU again.

9 Further Notes on Operation

9.1 Memory Reset

Available Functions

The CP has a two-level function available for resetting memory:

- Clear / reset

  Following this memory reset, the CP retains the preset MAC address and the retentive parameters. The CP is therefore immediately ready for downloads using the IP address.

  The retentive parameters include:

  – IP address, subnet mask and, if applicable, router address

  – LAN settings

- Resetting to factory settings

  After this memory reset, the CP retains only the factory-set MAC address (as shipped).

Note

Using the functions described here to reset the memory, you do not modify the configuration data on the CPU!

If you subsequently upload the configuration data from the CPU to a PG you will always obtain the configuration data that were previously on the CP (with parameters, connections, IP address).

How to Use the Function

You can start the memory reset functions in STEP 7.

- Clear / reset

  In STEP 7 / /HW Config with **PLC ▸ Clear/Reset**

  or

  In STEP 7 / NCM Diagnostics with **Operating Mode ▸ Clear/Reset Module**

- Factory defaults reset

  In STEP 7 / NCM Diagnostics with **Operating Mode ▸ Reset to Factory Defaults**

Behavior after Memory Reset

The CPU in the S7 station does not recognize that the CP memory was reset. The CP therefore changes to the “stopped with error” state (see Chapter 4).

The configuration data must then be reloaded.

You can initiate this loading by turning the power off and on again.

9.2 Working with Fast Ethernet – automatic switchover

How Automatic Switchover of the Network Settings Works

The CP has two 10/100 Mbps half/full duplex ports with autosensing and autonegotiation of the network settings. After turning on the CP, these functions work as explained below:

- The CP attempts to detect the transmission rate (10/100 Mbps) being used by the partner.

  If no connection is established between partners in PROFINET IO mode, you should check whether the devices involved are set to “automatic setting” or 100 Mbps full duplex.
- If detection is possible, the CP attempts to negotiate a full duplex with the partner.
- If no negotiation is possible, the CP uses the previously detected transmission rate and half duplex.

Duration of the procedure: up to 2 seconds

You set the network properties of the CP in STEP 7 in the properties dialog of the CP, “Port Parameters” tab.

Autocrossing

The automatic setting also includes an “autocrossing” mechanism. With autocrossing, you can connect network components and end devices using either crossover or straight–through cables.

Automatic Setting or Individual Network Settings

As default, the CP is configured for automatic detection (autosensing). As soon as you define a configuration manually when configuring the CP with STEP 7/HW Config (in the properties dialog of the CP – “Port Parameters” tab), the automatic negotiation of the network settings (autonegotiation) is no longer in effect. If, on the other hand, the communication partner works with autonegotiation, no communication will be established.

Only use manual configuration when the communication partner works with the same manually set configuration.

Notice

When operating with PROFINET IO, a transmission rate of 100 Mbps full duplex is necessary.

Further Notes:

- Autocrossing

  If you disable the “automatic setting” option in the “Port Parameters” tab, autocrossing is also disabled; which cable you can then use depends on the role of the CP (network component or end device).

- 10/100 Mbps network components without “Autonegotiation”

  If you use 10/100 Mbps network components that do not support “Autonegotiation”, you may have to set the mode manually during CP configuration using STEP 7 / HW Config (in the properties dialog of the CP). As default, the CP is configured for automatic detection.

- Forcing a specific network setting instead of “Autonegotiation”

  If your application requires a fixed network setting instead of “Autonegotiation”, both partner devices must have the same setting.

- No reaction to Autonegotiation query with manual configuration

  Remember that if you configure the CP manually, it will not react to an autonegotiation query! As a result, a connected partner will not be able to make the required network setting and communication will not be established.

  Example:
  If, for example, the CP is set to “100 Mbps – full duplex”, a CP connected as partner will set “100 Mbps – half duplex”. Reason: Due to the fixed setting, no autonegotiation response is possible; the connected partner recognizes the 100 Mbps with autosensing but nevertheless remains in half duplex.

- Recommendation: Change “individual network settings” only over MPI.

  If you modify the LAN settings in the properties dialog of the CP in the “Port Parameters” tab, these changes will be adopted by the CP and activated when the configuration data is downloaded to the CP.

  We therefore recommend that you download configuration data to the S7 station over an MPI connection if you change this setting.

  If you download the configuration data over the LAN interface, depending on the selected setting, it is possible that the current download will not be completed due to the changes to the configuration taking immediate effect.

STEP 7 / NCM Diagnostics and Web diagnostics display the network setting

You will find information on the network settings currently being used in NCM Diagnostics in the “Industrial Ethernet” diagnostic object in the “Network Attachment” section or in Web diagnostics on the “Industrial Ethernet” page in the “Parameters” tab.

9.3 SNMP Agent

SNMP (**S**imple **N**etwork **M**anagement **P**rotocol)

The CP supports data queries over SNMP in version 1.

SNMP is protocol language for managing networks. To transmit data, SNMP uses the connectionless UDP protocol.

The information on the properties of SNMP−compliant devices is entered in MIB files (MIB = Managed Information Base). For more detailed information on working with MIB files, refer to the documentation of the SNMP client you are using (example of an SNMP client: SNMP OPC Server from SIMATIC NET).

Supported MIB Objects

The CP supports all MIB objects according to the MIB standard MIB II (RFC 1213) and LLDP MIB.

Exceptions / restrictions:

- Write access is permitted only for the following MIB objects:

  sysContact, sysLocation and sysName;

  For security reasons, only read access is permitted for all other MIB objects.

- Traps are not supported by the CP.

Access Permissions using Community Name

The CP uses the following community names for assigning permissions:

- For read access: “public”
- for read and write access: “private”

(note the use of lower−case letters!)

9.4 Possible Security Gaps on Standard IT Interfaces / Preventing Illegal Access

With various SIMATIC NET components, such as OSMs/ESMs, a wide range of parameter assignment and diagnostic functions (for example, Web servers, network management) are available over open protocols and interfaces. The possibility of unauthorized misuse of these open protocols and interfaces by third parties, for example to manipulate data, cannot be entirely excluded.

When using the functions listed above and these open interfaces and protocols (for example, **SNMP**, HTTP), you should take suitable security measures to prevent unauthorized access to the components and the network particularly from within the WAN/Internet.

Notice

We expressly point out that automation networks must be isolated from the rest of the company network by suitable gateways (for example using tried and tested firewall systems). We do not accept any liability whatsoever, whatever the legal justification, for damage resulting from non−adherence to this notice.

If you have questions on the use of firewall systems and IT security, please contact your local Siemens office or representative. You will find the address in the SIMATIC catalog IK PI or on the Internet at http://www.automation.siemens.com/net > Contact & Partners > Local Partners.

9.5 Influence of MPI on Connections via Industrial Ethernet

If a station on **MPI** is added or removed, for example because a service PG has been connected or disconnected, it is possible that active communication connections on the communications bus are aborted. This has the following effects on the communication connections on Industrial Ethernet:

- All S7 connections are temporarily aborted.
  This does not apply when using CPUs with a separate K bus (for example, the CPU 318−2, CPU 317−2 PN/DP, CPU 319−3 PN/DP).

- The connections on which a job on the communication bus with a data length > 240 bytes is being processed are aborted temporarily.
- FETCH/WRITE connections are temporarily aborted.

On the FC interface in the user program, the condition codes made up of the DONE, ERROR and STATUS parameters must be evaluated in FC11 / FC12.

9.6 Special Features of IP Configuration

Configured S7 connections cannot be operated if the IP address is assigned over DHCP

Notice

If you obtain the IP address over DHCP, any S7 connections you may have configured will not work. Reason: The configured IP address is replaced by the address obtained over DHCP during operation.

9.7 Reserved Port Numbers

The following local port numbers are reserved; You should not use these for other purposes in the connection configuration.

Table 9-1 Reserved Port Numbers

Protocol	Port number	Service
TCP	20, 21	FTP
TCP	25	SMTP
TCP	80	HTTP
TCP	102	RFC1006
TCP	135	RPC−DCOM
UDP	161	SNMP_REQUEST
UDP	34964	PN IO
UDP	65532	NTP
UDP	65533	NTP
UDP	65534	NTP
UDP	65535	NTP

9.8 Restart after Detection of a Duplicate IP Address in the Network

To save you time-consuming troubleshooting in the network, the CP detects double addressing in the network.

When you eliminate the cause by removing the device with the same IP address or changing its address, you must then restart the CP.

9.9 Obtaining the IP Address over DHCP – CP STOP on Expiry of the Lease

If you have configured “Obtain IP address from a DHCP server”, when the CP starts up, it is assigned a valid IP address by the DHCP server for a restricted time (period of the lease).

When the lease expires the reaction of the CP is as follows:

The CP changes to STOP and loses the previously assigned IP address if the DHCP server does not assign a new IP address on expiry of the lease. All communication connections are terminated.

9.10 Other information available about the CP

FAQ

You will find detailed information (FAQs) on using the CP described here on the Internet under the following entry number:

http://www4.ad.siemens.de/WW/news/en/10806025 > “FAQ” tab

GSDML file

You will find the GSDML file for the CP described here on the Internet under the following entry ID:

http://support.automation.siemens.com/WW/view/en/19698639/133100

10 How to Load New Firmware

Requirements

You download new firmware to a SIMATIC NET CP using the firmware loader shipped with STEP 7 / NCM S7.

Requirements for Downloading

- To download firmware, you require an Industrial Ethernet CP module in the PG/PC (for example, CP 1613) or a normal Ethernet module with the “Softnet” software package.
- The S7-ONLINE interface must be set to the “ISO – Industrial Ethernet” protocol. It is not possible to download using TCP/IP (and therefore not to other networks).

How to Download New Firmware

You always start the download using the active MAC address of the CP!

LEDs to Indicate the CP Mode

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

Table 10-1

SF (red)	BF (red)	RUN (green)	STOP (yellow)	CP Operating Mode
●	●	☼	●	Downloading firmware.
☼	☼	☼	○	Firmware was successfully downloaded.
☼	☼	○	☼	Firmware could not be downloaded.

Legend: ● (colored) on ○ off ☼ (colored) flashing “–” any

What to do if a Download is Interrupted

Disturbances or collisions on the network can lead to packets being lost. In such cases, this can lead to an interruption of the firmware download. The firmware loader then signals a timeout or negative response from the module being loaded.

In this case, turn the station off and on again and repeat the download.

11 Technical Specifications

Transmission rate	10 Mbps and 100 Mbps
Interfaces Connection to Ethernet	 2 x RJ−45 jack
Power supply	DC +24 V (permitted range: +20.4 V through +28.8 V)
Current consumption • from backplane bus • from external 24 V DC	 200 mA maximum TP: approx. 0.2 A maximum
Power loss approx.	5.8 W
Permitted ambient conditions • Operating temperature • Transportation/storage temperature • Relative humidity max. • Altitude	 0 °C to +60 °C −40 °C to +70 °C 95% at +25 °C up to 2000 m above sea level
Design • Module format • Dimensions (W x H x D) in mm • Weight approx.	 Compact module S7-300; single width 40 x 125 x 120 220 g

Table 11-1 Description of the Approvals

c−UL−us	UL 508
	CSA C22.2 No. 142
c−UL−us for hazardous locations	UL 1604, UL 2279PT.15 CL. 1, Div. 2 GP.A.B.C.D T.. CL. 1, Zone 2, GP. IIC, T.. CL. 1, Zone 2, AEx nC IIC T..
FM	FM 3611 CL. 1, Div. 2 GP.A.B.C.D T.. CL. 1, Zone 2, GP.IIC. T.. Ta:..
C−TICK	AS/NZS 2064 (Class A).
CE	EN 61000−6−2, EN 61000−6−4 (replaces EN 50081−2)
ATEX Zone 2	EN60079−15 II 3 G EEx nA II T.. KEMA 03 ATEX 1228 X

Temperature code “T..” and maximum ambient temperature “Ta:..” as listed on the type plate

Notice

The approvals printed on the purchased device apply.

In addition to this, all the information in the S7−300 reference manual “Module Data” /1/ in the chapter “General Technical Specifications” applies to the CP.

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

CP 343-1 Lean for Industrial Ethernet / Manual Part B3L
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