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SIEMENS

SIMATIC NET

CP 243-1 IT Communications Processor

for Industrial Ethernet and Information Technology

Technical Manual

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Preface

Purpose of this manual

This manual will be helpful when you use your CP 243-1 IT communications processor. It provides you with information on how to communicate with this communications processor via Industrial Ethernet and how to use the Information Technology functions.

Prerequisites

A knowledge of this manual as well as the manual on SIMATIC S7-200 programmable controllers is required for understanding the functions of the CP 243-1 IT. In addition, you will need a basic knowledge of such topics as TCP/IP, FTP, E-Mail, HTML, Web Browser and Java.

Target group

This manual is written for engineers, programmers, commissioning personnel and maintenance personnel with a general knowledge of automation and communication systems as well as user interface systems.

Sample program

This manual contains a sample program which gives you an example of how to program your CP 243-1 IT. This program was prepared with STEP 7-Micro/WIN 32 V3.2.3 and will run on an S7-200 CPU (type 224). If you want to run this sample program on another S7-200 CPU, you may have to adjust this CPU to the configuration expected by the sample program.

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Product Information

Address label: MAC address

The CP 243-1 IT is delivered with a permanently set MAC address. This MAC address is shown on a label underneath the upper door of the device.

MLFB number, scope of delivery

Product Name	MLFB	Scope of Delivery
CP 243-1 IT	6GK7 243-1GX00-0XE0	CP, documentation on CD-ROM

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1 Introduction

Definition and application

The CP 243-1 IT is a communications processor designed for use with an S7-200 programmable controller. It permits an S7-200 system to be connected to Industrial Ethernet (IE). This makes communication via Ethernet possible even in the S7 product family. Using STEP 7 Micro/WIN 32, an S7-200 can be configured, programmed, and diagnosed via Ethernet even at a geographical distance. Using a CP 243-1 IT, an S7-200 can communicate via Ethernet with another S7-200, S7-300, or S7-400 controller. Communication with an OPC server is also possible.

The IT functions of the CP 243-1 IT form the basis for monitoring and, if necessary, also manipulating automation systems with a Web browser from a networked PC. In addition, diagnostic messages can be e-mailed from a system. Using the IT functions, it is very easy to exchange entire files with other computer and controller systems.

Industrial Ethernet is the network for the process control level and the cell level of the SIMATIC NET open communication system. Physically, Industrial Ethernet is an electrical network based on shielded, coaxial lines, twisted pair cabling, and an optical network of fiber optic conductors. Industrial Ethernet is defined by the international standard IEEE 802.3.

Continuous communication in the industrial area - worldwide

Industrial Ethernet is embedded in the SIMATIC NET concept which permits continuous networking of process control level, cell level, and field level with PROFIBUS and AS Interface. The IT functions, characterized by their worldwide uniform standards and protocols, serve as the bridges between the world of industrial controllers and the typical PCs used by the office world of today.

Compatibility

The CP 243-1 IT (6GK7 243-1GX00-0XE0) described here can be used for S7 communication. The CP 243-1 IT can be connected to various types of S7-200 CPUs (222, 224, 226 and 226XM).

- CPU 222 rel. 1.10 or higher (Rel. 1.20 or higher is recommended)
- CPU 224 rel. 1.10 or higher (Rel. 1.20 or higher is recommended)
- CPU 226 rel. 1.00 or higher (Rel. 1.20 or higher is recommended)
- CPU 226XM rel. 1.10 or higher (Rel. 1.20 or higher is recommended)

A maximum of 2 expansion modules can be installed on the CPU 222. In contrast, up to 7 expansion modules can be connected to CPUs 224, 226 and 226XM.

The CP 243-1 IT is fully compatible with the CP 243-1. This means that user programs which were written for the CP 243-1 can also be run on a CP 243-1 IT.

A detailed compatibility specification you will find in Appendix D.

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Caution

Only one CP 243-1 or one CP 243-1 IT may be connected per S7-200 CPU. If additional CP 243-1 or CP 243-1 IT processors are connected, the S7-200 system may no longer function correctly.

The software of the CP 243-1 IT is compatible with the following standards.

- S7 XPUT/XGET and S7 READ/WRITE
- S7-200 I/O bus specification
- HTTP 1.0 in acc. w. RFC1945
- FTP in acc. w. RFC959
- SMTP in acc. w. RFC2821/2822 (only functions for sending e-mails)

The position in an S7-200 system in which a CP 243-1 IT can be operated depends on the firmware version of the S7-200 CPU, see also chapter 3 (Installation)

Configuration

The CP 243-1 IT is configured with STEP 7 Micro/WIN 32 starting with version 3.2.3. The standard CP 243-1 IT is delivered with a fixed MAC address. IP address and subnet mask must be configured or obtained from a BOOTP server.

Programming

Use the Internet wizard of STEP 7 Micro/WIN 32 to program communication in the user program (see chapters 4 and 5).

Configuration

The firmware of the CP 243-1 IT is programmed on flash memory during production and is stored there permanently. System states or dynamic variables which occur during operation of the CP 243-1 IT are not stored permanently.

Configuration of the CP 243-1 IT is divided into Industrial Ethernet and IT services.

The Ethernet configuration is retentively stored in the V-Memory of the S7-200 CPU. During startup, the CP 243-1 IT reads the configuration from the CPU and initializes itself accordingly.

The configuration of the IT services is stored in the file system of the CP 243-1 IT in the form of one configuration each for user administration, FTP client and e-mail service. These configuration files are continuously evaluated during running operation.

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2 Features and Functions

2.1 Overview

The CP 243-1 IT offers the following functions.

- S7 communication
  - Performant data communication via Industrial Ethernet. Communication is based on standard TCP/IP.
  - Ethernet access via RJ45 socket
  - Easy connection to an S7-200 system via the S7-200 bus
  - Permits flexible and distributed automation structure
  - Basis for simple further processing and archivation of process data
  - Permits simultaneous communication with up to eight S7 communication partners
  - Offers a link to S7-OPC
  - Simple network administration
  - S7 communication services "XPUT/XGET" as client and server
  - S7 communication services "READ/WRITE" as server
  - For Keep Alive connection checks, a time can be configured for all TCP transport connections with active and passive partners.
- IT communication
  - File system for permanent storage of Web and configuration files on the CP 243-1 IT
  - SMTP client for sending e-mails. In addition to pure text information, embedded variables can also be transmitted. The current value of such a variable is not determined until the e-mail is sent.
  - Configuration of up to 32 e-mails with up to 1024 characters each
  - FTP server for access to the file system of the CP 243-1 IT
  - FTP client for exchanging data with an FTP server
  - Configuration of up to 32 FTP client operations
  - The FTP client function supports the commands READ, WRITE and DELETE.
  - Access of the FTP client to the FTP server of the CP 243-1 IT
  - HTTP server for the read and write access to process and status data of the S7-200 system via up to four Web browsers at one time
  - Provided HTML pages for diagnosis of the S7-200 system and for access to process variables
  - Sending a test e-mail via a provided HTML page

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  - Storage of own HTML pages and Java Applets in the file system of the CP 243-1 IT
  - Provision of Java Applets and Beans for development of user-specific HTML pages and Java Applets
  - User administration for up to 8 users with user-specific privileges for access to files, status information and process variables.

- Configuration
  - Programming, configuring and diagnosing an S7-200 system from a geographical distance (e.g., program upload and download or status indications) via Industrial Ethernet and STEP 7 Micro/WIN 32
  - Exchanging modules possible without having to program/configure the Ethernet functions again (Plug & Play). Since the configuration of the IT functions is stored on the CP 243-1 IT, this must be loaded again to the module when the CP 243-1 IT is replaced.
- Watchdog timer

  The CP 243-1 IT is equipped with a watchdog circuit. The watchdog starts each time the CP 243-1 IT boots. The watchdog monitoring time is usually 5 seconds. Tolerances due to components may increase this time to 7 seconds. If watchdog monitoring triggers, the CP 243-1 IT is automatically reset. This restarts the CP 243-1 IT. During this time, the CP 243-1 IT reports a "Parity Error" to the S7-200 CPU. Handling such an error is described in the documentation of STEP 7 Micro/WIN 32.
- Ability of preset MAC addresses (48-bit value) to be addressed

  The MAC address is assigned to each CP 243-1 IT at the plant. The MAC address is located on a label under the upper front door. An IP address can be assigned to the CP 243-1 IT via the preset MAC address using BOOTP.

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2.2 S7 Communication via Industrial Ethernet

2.2.1 Preliminary Comments

S7 communication via Industrial Ethernet permits program-controlled communication via communication FBs and configured S7 connections. The CP 243-1 IT supports S7 communication via Industrial Ethernet with the XPUT/XGET and READ/WRITE services. Up to 212 bytes of user data can generally be transmitted per request. If the CP 243-1 IT is running as a server, up to 212/222 bytes of user data can even be transferred in read requests (see Appendix A).

The CP 243-1 IT supports a maximum of eight S7 communication channels to clients or servers on one or more remote communication partners. The CP 243-1 IT works according the client/server principle for each channel. Only one request at a time per channel is accepted, processed and answered with a positive or negative response. Not until a response has been sent does the CP 243-1 IT accept a new request.

If the CP 243-1 IT receives several requests on a channel configured as server, only the first request is processed. The subsequent requests are ignored until the end of the transaction (i.e., until a response is sent). The CP 243-1 IT has no channel-specific request administration and does not buffer requests.

Prerequisites for communication with a PC/PG

A PG/PC can access the S7-200 CPU via the PPI interface. In addition, this access is possible via the Ethernet using a CP 243-1 IT. The following prerequisites must be fulfilled for this.

- An Ethernet card is installed and configured on the PG/PC and an Ethernet and TCP/IP connection to the CP 243-1 IT exists (via routers, firewalls, and so on).
- STEP 7 Micro/WIN 32 (starting with version 3.2.2) is installed on the PG/PC.
- The CP 243-1 IT has a valid IP address. This address may be permanently specified in the configuration or obtained from a BOOTP server.

At the same time only one STEP 7 Micro/WIN 32 can simultaneously communicate via a CP 243-1 IT with the S7-200 CPU. Use of the Ethernet interface is mandatory for configuration of the IT services.

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2.2.2 Types of Communication

The CP 243-1 IT has three types of S7 communication relationships which can be used individually and in combination.

1. Coupling with STEP 7-Micro/WIN 32
2. Coupling with other, remote stations of the SIMATIC S7 family
3. Coupling with OPC-based applications on a PC/PG

2.2.3 Communication Partners

- S7-200 CPU with CP 243-1 or CP 243-1 IT
- S7-300 CPU with CP 343-1 or CP 343-1 IT
- S7-400 CPU with CP 443-1 or CP 443-1 IT
- PG/PC with OPC server
- PG/PC with STEP 7 Micro/WIN 32

The STEP 7 HW-Config program shows you the types of S7-300 CPUs and S7-400 CPUs which support the S7 protocol XPUT/XGET (i.e., can communicate with the CP 243-1 IT). When you select an S7-300 or S7-400 CPU in the catalog box there, this CPU must support the function "S7 communication."

With systems from the S7-300 family, that XPUT/XGET client can only be used with a related communications processor starting with version 1.1. You will find the version of your communications processor in the MLFB number, among others. If you are using a CP 343-1, the MLFB number must contain the character string "EX11" or higher.

Always remember that the CP 243-1 IT does not support pure ISO connections. Since the CP 443-1 ISO has neither TCP/IP nor RFC 1006, it is not able to communicate with a CP 243-1 IT.

Caution

Only one CP 243-1 or one CP 243-1 IT may be connected to an S7-200 CPU. If additional SP 243-1 or CP 243-1 IT processors are connected, the S7-200 system may not function correctly.

Note

Concerning communication with an OPC server, remember that the CP 243-1 IT does not support automatic querying of the objects (e.g., DBxx, and so on) on the S7-200.

A CP 243-1 IT can only communicate with an OPC server when this server supports the two S7 services READ and WRITE.

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Overview

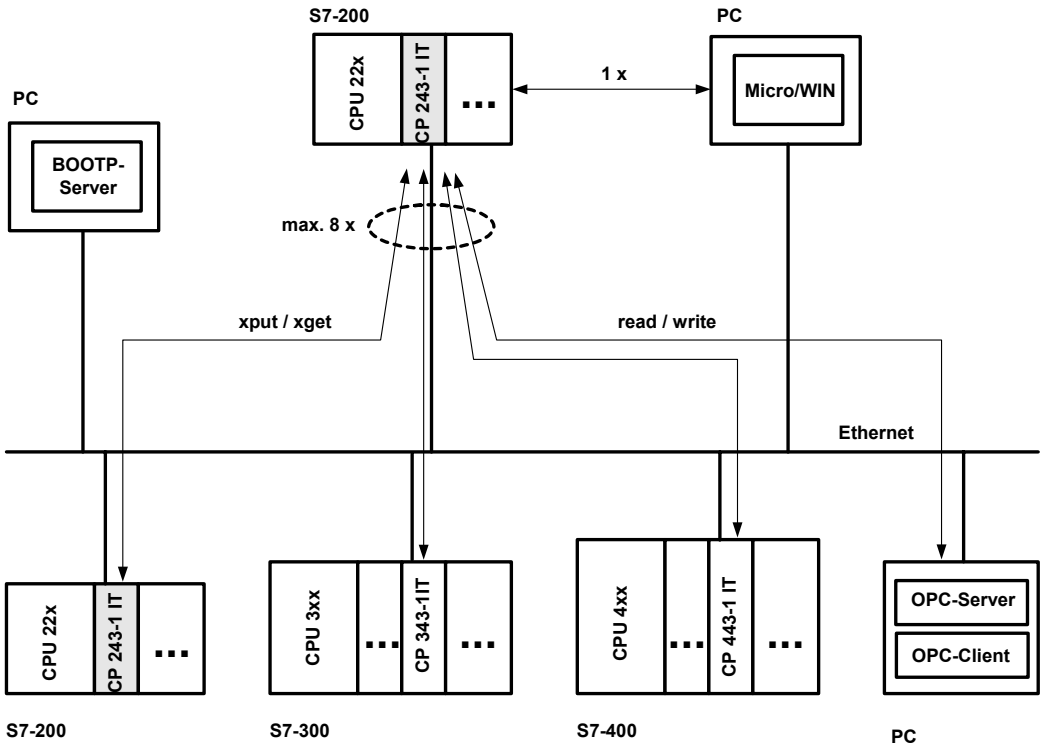


Fig. 1 System overview

A CPU 22x with CP 243-1 IT can communicate both with other S7-200, S7-300 and S7-400 systems and with an OPC server. A maximum of 8 connections (see Fig. 1) are possible in addition to a STEP 7 Micro/WIN connection.

Configuring and programming connections for S7 stations

To configure communication between an S7-200 and an S7-300, S7-400 or an OPC server, you will need both STEP 7 Micro/WIN 32 (starting with version 3.2.3) and STEP 7 (starting with version 5.1 with service pack 3 or higher, with NCM for Industrial Ethernet).

The S7-200 station is configured and programmed with STEP 7 Micro/WIN 32. You will need STEP 7 with NCM for Industrial Ethernet to configure and program the S7-300 or S7-400 or the OPC server.

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Data communication via Industrial Ethernet

Data communication via the CP 243-1 IT is based on Ethernet. Ethernet is not deterministic so specific response times are not guaranteed. 10 and 100-Mbit networks are supported in full and half-duplex.

In addition, the CP 243-1 IT supports the auto-negotiation function for automatically negotiating the operating mode and the transmission speed to be used. The mode and the transmission speed can also be permanently specified by the user when configuring the CP 243-1 IT. If the CP 243-1 IT doesn't have a valid configuration, it always uses "auto-negotiation" mode.

Note

Auto-negotiation mode only works when all connected network components support this mode.

Industrial Ethernet and TCP/IP do not allow time-deterministic data flow. There is no way to know when a remote CPU will execute the requests. The responses of the removed CPU are asynchronous to the CPU scan of the local S7-200 CPU. This is why TCP/IP-based communication is only partly suitable for use in widespread applications with time requirements (e.g., control circuits, cyclic precisely timed applications).

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S7 communication

The XPUT and XGET S7 services are used to communicate data between two controllers. The CP 243-1 IT can be used both as client and as server.

Communication between a CP 243-1 IT and an OPC server running on a PC/PG uses the READ and WRITE S7 services. The CP 243-1 IT is always the server. Other S7 services (e.g., the service for automatic scanning of objects on an S7-200 - DBs, and so on) are not supported.

The following data types or data areas are supported by the CP 243-1 IT.

CP 243-1 IT as client

Read and write accesses

- Data type is always BYTE.
- Only variables can be accessed on the local system.
- Accessible memory areas on the partner system are inputs, outputs, memory and variables with an S7-200 as partner.
- Accessible memory areas on the partner system are inputs, outputs, memory and data areas with an S7-300 or an S7-400 as partner.

CP 243-1 IT a server

Write accesses

- Data type is BOOL, BYTE, WORD or DWORD.
- Use of data types CHAR, INT, DINT and REAL depends on the firmware version of the S7-200 CPU being used.
- Accessible memory areas on the local system are inputs, outputs, variables, memory and status bits.

Read accesses

- Data type is BOOL, BYTE, WORD or DWORD.
- Use of data types CHAR, INT, DINT and REAL depends on the firmware version of the S7-200 CPU being used.
- Accessible memory areas on the local system are inputs, outputs, variables, memory, system area and status bits.

Further compatibility see Appendix D.

Note

When an S7-300 or S7-400 is the server and an S7-200 is the client, the CP 243-1 IT expects this server to always behave passively. This means that, the S7-300 or S7-400 system is not allowed to send S7 requests to the S7-200 system.

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Communication with STEP 7 Micro/WIN 32

With communication between a CP 243-1 IT and STEP 7 Micro/WIN 32, the CP 243-1 IT is always the server. STEP 7 Micro/WIN 32 is always the client.

S7 bus communication

All accesses to all data areas of the S7-200 CPU are always possible. Read and write accesses are not dependent on whether the CPU is in the RUN, TERM or STOP state.

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2.3 IT Communication

2.3.1 Preliminary Overview

In addition to S7 communication via Industrial Ethernet, the CP 243-1 IT also supports the services XPUT/XGET and READ/WRITE simultaneously to a variety of IT functions. These include data communication via FTP, sending e-mails, and the capability of permitting up to four Web browsers to access simultaneously data and status information on the S7-200 system. See Fig. 2.

Sending an e-mail or active file access via FTP is initiated by the S7-200 user program. Only one request at a time can be active for each of these two functions. The user cannot start another job until the CP 243-1 IT has positively or negatively acknowledged the currently active request.

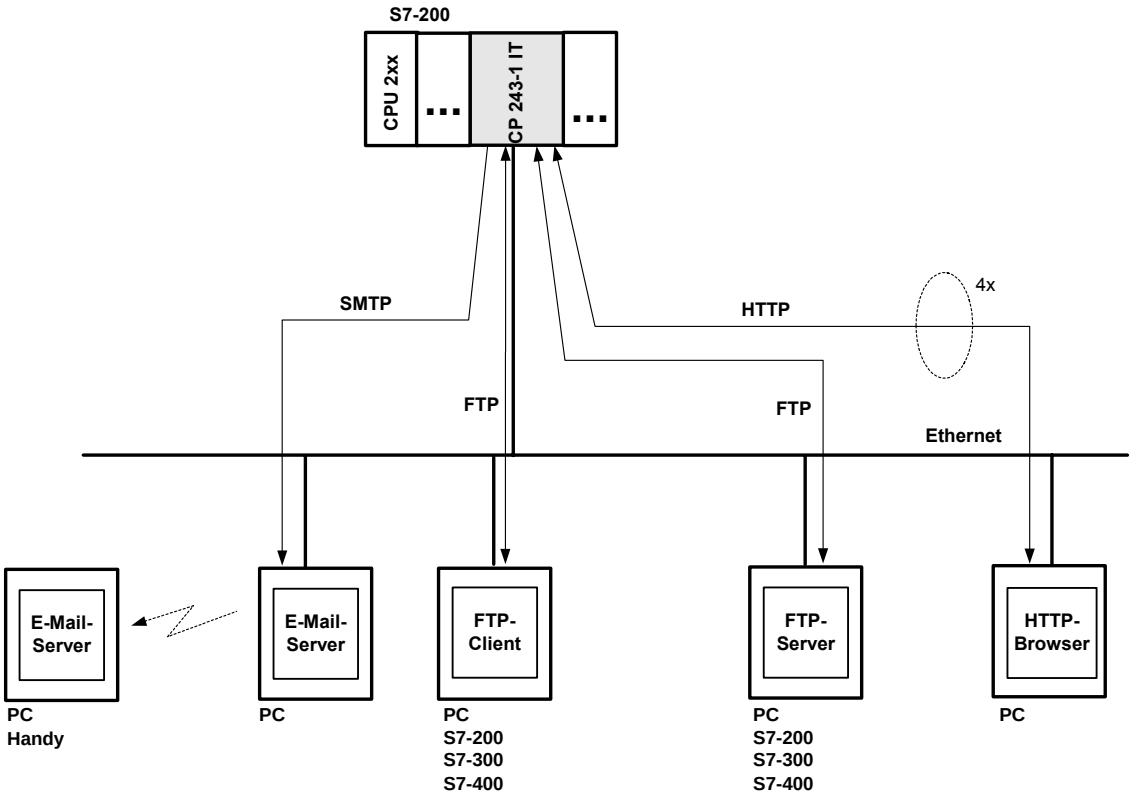


Fig. 2 Overview of the IT functions

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2.3.2 Types of Communication

In addition to the S7 communication relationships described in chapter 2.2.2, the CP 243-1 IT offers four types of IT communication relationships which can be used individually or in combination.

1. Communication with an e-mail server
2. Communication with an FTP client
3. Communication with an FTP server. However, a coupling to the FTP server running on the CP 243-1 IT of the local S7-200 system is also possible.
4. Communication with up to four Web browsers running

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2.3.3 E-Mail

How it works

The SMTP protocol controls the transmission of e-mails. An e-mail consists of one or two address fields, a subject field and a field for the actual text message.

The text message consists of ASCII characters. The text may contain placeholders for variables which reference data values within the local S7-200 system. When the e-mail is sent, the CP 243-1 IT reads each specified value from the local S7-200 CPU and inserts it in the desired format at the specified location in the message. The CP 243-1 IT makes it possible to send e-mails preconfigured by a user program to an e-mail server already specified via IP address and an port during the configuration phase. The e-mail server then sends the e-mail to the recipient specified in the address field of the e-mail.

The e-mail server specified in the configuration by an IP address and a port number must be located in the subnetwork of the CP 243-1 IT or be able to be accessed via a gateway. If this e-mail server cannot be accessed, the e-mail is sent to a substitute e-mail server which is also specified when the CP 243-1 IT is configured. If this substitute e-mail server is also not accessible, an appropriate error message is generated.

Caution

The CP 243-1 IT only monitors whether an e-mail could be delivered to the configured e-mail server. It is unable to tell whether this e-mail was forwarded to and read by the specified recipient.

Note

Since memory areas of the S7-200 CPU must be read in accordance with the configuration when an e-mail is sent, a reset in between or power failure of the S7-200 CPU may cause the e-mail transmission to be terminated altogether before it can even be sent.

This means that a message stating that an S7-200 CPU reset has occurred cannot be sent via e-mail.

The CP 243-1 IT does not support the receipt of e-mails. The e-mails and the address parameters of the e-mail server are configured by STEP 7 Micro/WIN 32.

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Note

Before e-mails can be sent from the CP 243-1 IT, you must make sure that a functioning e-mail server can be accessed.

General accessibility of an e-mail server can be tested with the HTML page "sendmail.htm," among others, which is included with the CP 243-1 IT (see chapter 2.3.6).

Configuration

Configuration of the e-mails and the address parameters of the e-mail server is performed with the Internet wizard of STEP 7 Micro/WIN 32. The configuration data entered here is stored permanently in a file with the extension .edb in the file system of the CP 243-1 IT. Transfer of this data from the system on which the configuration was prepared with STEP 7 Micro/WIN 32 to the CP 243-1 IT is handled via FTP.

Up to 32 e-mails can be configured. Each e-mail text may consist of up to 1024 characters.

The structure of each e-mail is shown below.

- E-mail number
  This number can be used to reference a configured e-mail by the S7-200 user program.
- Receiver address
  The e-mail address of the receiver. This address must always be specified.
- Additional receiver address
  The address of a recipient who is to receive a copy of the e-mail. This address does not have to be specified.
- Subject
  A short description of the e-mail. The subject must always be specified.
- E-mail text including placeholders and formatting characters. The actual information to be transferred is located here.

Each address field may only contain one receiver address. When an e-mail is to be sent to several recipients, a distribution list must be set up on the e-mail server and this list must be specified as the e-mail receiver.

In addition to the control characters for the placeholders of data values, the following format characters are supported in the e-mail text.

- \n Line feed
- \t Tabulator

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Note

The maximum length of the e-mail text of 1024 characters refers to the actual message text including all embedded placeholders and all format characters ("\n" and "\t").

If the maximum permissible length of 1024 characters is exceeded by resolution of the placeholders when an e-mail is sent, the e-mail text is truncated after 1024 characters and an appropriate error message is returned. The truncated e-mail is sent.

Conversion procedures such as MIME or UUENCODE are not supported. In addition, files cannot be appended to e-mails.

The e-mail function of the CP 243-1 IT can always be activated or deactivated within the CP 243-1 IT configuration.

Communication partners

In addition to conventional PCs, it is possible to specify any terminal with e-mail capability as a possible e-mail recipient (e.g., cell phones or FAX machines).

Performance/general conditions

Sending of e-mails is subordinate to S7 communication.

Reaction times when sending an e-mail depend on the configuration and cannot be specified in general. The greater the number of simultaneous S7 connections and the larger the amount of data to be transmitted over these connections, the longer it takes to process and send e-mails.

Caution

The embedded variables in the e-mail text are read out individually from the S7-200 CPU. Only one such value can be transferred per S7 scan cycle from the S7-200 CPU to the CP 243-1 IT. This means that the time needed to set up an e-mail depends on the amount of data to be included, the cycle time of the S7-200 CPU and the load of the S7-200 bus.

2.3.4 FTP Server

How it works

The FTP server of the CP 243-1 IT can be used to read and write Web files and configuration files from a remote FTP client via Ethernet to the file system of the CP 243-1 IT.

The FTP client always initiates the data transfer. The FTP server of the CP 243-1 IT never initiates FTP transmissions itself.

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All types of files can be transferred to the file system of the CP 243-1 IT. Relevance of these files to operation of the CP 243-1 IT is not checked.

Caution

BINARY-type transmission should be used to transfer files between the FTP server of the CP 243-1 IT and a remote FTP client. The transmission type must be set on the FTP client side.

Note

Since the CP 243-1 IT does not provide the time, the files stored on or read from the CP 243-1 IT via FTP all have the date 01.01.1980 and the time 00:00.

Access protection

FTP is a protocol in which the user must authenticate himself before gaining access to the FTP server. This requires a user name and a password which is valid on the server. After a connection between the FTP client and the FTP server of the CP 243-1 IT is established, the user name and password must be entered. After successful authentication, the user can then access the file system of the CP 243-1 IT. He can move through the directory tree, transmit files and manage directories.

Up to 8 users as well as an administrator can be configured for the CP 243-1 IT. The administrator is distinguished from the up to 8 users with special rights and the location at which the fixed user name and the related password are stored.

The user names and passwords are configured with STEP 7 Micro/WIN 32. The configuration file created by the Internet wizard is transferred with FTP to the CP 243-1 IT and stored permanently in the file system in a file with the extension .udb. The user name and the password of the administrator are required before the user configuration can be transferred to the CP 243-1 IT.

Note

The CP 243-1 IT does not support an FTP access without specification of a user name or password. Anonymous login is not supported.

Auto logout

Simultaneous access by several FTP clients of the FTP server of the CP 243-1 IT is not supported.

The FTP server is equipped with an auto logout procedure to prevent it from being blocked by an unexpected connection termination of an FTP client.

If the FTP server located on the CP 243-1 IT is connected to an FTP client and a second FTP client wants to establish a connection to the FTP server, the server checks to determine whether there was FTP-based communication between it and the first FTP client during the last 60 seconds. If not, the connection to the first FTP client is disconnected and the second FTP client's request to establish a connection is accepted. Otherwise, the connection to the first FTP client is maintained and the second FTP client's request for a connection is rejected.

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Supported FTP commands

After the HELP command is entered in the console box of the FTP client, a list of the FTP commands supported by this client usually appears. While these commands are being executed, they are converted internally by the FTP client into subcommands and sent to the FTP server.

Some FTP clients on the market offer additional commands which are not included in the RFC959 standard or whose specification is not generally binding. You cannot be sure whether the FTP server on the CP 243-1 IT supports each of these commands.

Communication partners

All FTP clients which communicate via Ethernet and which complies with RFC959 standards are always considered possible communication partners of the FTP server located on the CP 243-1 IT. This means communication is not only possible with PC-based FTP clients but also with S7-200, S7-300 or S7-400-supported FTP clients.

Performance/general conditions

FTP communication is subordinate to S7 communication. This means that the reaction times of FTP communication depend on the particular configuration and cannot be generally specified in advance.

Note

Only one FTP client may access the FTP server at a time. When the FTP server of the CP 243-1 IT is accessed by the S7 user program via the FTP client function, a remote FTP client cannot be accessed. The reverse also applies.

2.3.5 FTP Client

How it works

The FTP client of the CP 243-1 IT can be used to transfer parts of the V-Memory in an S7-200 system to the file system of an FTP server, or the contents of a file can be copied into V-Memory within S7-200 system.

A distinction can be made as to whether a file is to be completely or only partially transferred. The number of bytes to be transmitted can be specified in a read or write request.

When 0 is specified as the number of bytes to be transferred in a write request, an empty file with the name specified in the write request is created in the file system of the addressed FTP server. A length of 0 in a read request means that the specified file is completely transmitted starting at the V-Memory address of the local S7-200 system if this does not exceed its storage space. If the number of bytes to be read is specified for a read request, this must match the length of the file to be read. If not, the CP 243-1 IT reports an error when the read request is executed.

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The FTP client can delete specified files in the file system of an FTP server from the local S7-200 system.

During the FTP transfer, the files to be exchanged are not modified and the data therein is not converted. All data to be transferred is treated as if it was in byte format. The data to be written is stored as bytes in the specified file.

The FTP client of the CP 243-1 IT always initiates the file transfer, triggered by the S7-200 user program. An FTP server does not generate FTP requests.

The CP 243-1 IT only accepts one FTP client request from the S7-200 user program at a time. As soon as this is completely processed, the CP 243-1 IT returns a positive or negative acknowledgment. The S7-200 user program cannot issue a new FTP client request until the pending job has completed.

The FTP servers specified in the configuration with their IP address must be located in the subnetwork of the CP 243-1 IT or must be accessible via a gateway.

Caution

The data transferred from or to the memory of the S7-200 CPU via FTP is transmitted in binary mode. There is no conversion or formatting of this data. The data to be transferred is not stored permanently on the CP 243-1 IT.

Configuration

The FTP requests are configured with the Internet wizard of STEP 7 Micro/WIN 32. The configuration data entered here is permanently stored in the file system of the CP 243-1 IT in a file with the extension .fdb. Transmission of this data from STEP 7 Micro/WIN 32 to the CP 243-1 IT is handled via FTP.

Up to 32 FTP requests can be predefined with one file transaction each. Each of these requests requires the following information to be defined:

- FTP request number
  Every configured FTP request can be referenced from the S7-200 user program with this number.
- IP address on the FTP server
  IP address of the system whose file system is to be accessed
- User name on the FTP server
  The login on the FTP server takes place under this name. This means that the name specified here must have access rights for the addressed FTP server.
- Password for on the FTP server
  The encrypted password specified here is used to log in on the FTP server.
- Path name of the applicable file
  The file name including the complete path must be specified here.
- Request type to be executed. Possible request types are:
  - Write to file system of the FTP server
  - Read from file system of the FTP server
  - Delete files from file system of the FTP server

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- Start address and length of the data in the data block
  Specify here the starting address at which the data to be read is to be stored in the memory of the S7-200 CPU or the starting address from which the data to be written is to be sent to the FTP server. The Number of bytes to be transferred is also specified.

Note

The connection to an FTP server always uses port 20 for data communication and port 21 for transmission of commands.

Note

The FTP client supports file names in upper case/lower case letters if the FTP server and its applicable file system permit file names with upper case/lower case letters.

Caution

During configuration, the Internet wizard of STEP 7 Micro/WIN 32 only checks the correctness of the FTP client configuration's syntax. Checks of this configuration's semantics cannot be performed until the file transaction takes place.

The FTP client function of the CP 243-1 IT can always be activated/deactivated with the CP 243-1 IT configuration.

Communication partners

All FTP clients which communicate via Ethernet and which comply with RFC959 standards are always considered possible communication partners of the FTP client. This means communication is not only possible with PC-based FTP servers but also with FTP servers running on S7-200, S7-300 or S7-400 systems, for instance.

Performance/general conditions

Note

If data from a remote FTP server is stored in the local S7-200 CPU, it is up to the user to ensure that this data is not stored in memory areas which are already being used. The CP 243-1 IT only performs rudimentary security checks for this.

The CP 243-1 IT does not ensure that all data to be transferred is read from the same scan cycle in the S7-200 CPU. The transmission of this data to and from the local S7-200 CPU is asynchronous to the cycle of the local S7-200 CPU and the duration of the cycle cannot be predicted.

With FTP write requests, the CP 243-1 IT can read 246 bytes per cycle from the memory of the S7-200 CPU. With FTP read requests, the CP 243-1 IT can transfer up to 254 bytes per cycle to the memory of the S7-200 CPU.

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To ensure consistency with large amount of data, appropriate measures must be provided in the S7-200 application program.

When a transmission between the FTP client of the CP 243-1 IT and an FTP server is interrupted, only part of the transferred data may have been stored on the destination system. In such cases, an error message is returned to the S7-200 user program. The transaction is not repeated automatically.

On the CP 243-1 IT, data communication via FTP is subordinate to S7 communication. Reaction times vary with the particular configuration as well as the length of the S7-200 application program and generally cannot be predicted in advance.

Note

The file DB routine of communications processors CP 343-1 IT and CP 443-1 IT is not supported by the CP 243-1 IT. The CP 243-1 IT reads or writes one binary image of the V-Memory from/to a file. This file contains no other information on length, source address, and so on.

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2.3.6 HTTP Server

Fundamentals

Java Applets are little application programs prepared in the programming language Java. At a browser's request, such Applets are usually transferred from an HTTP server to a browser and executed there. The browser must have Java capability and must permit execution of Applets. Most browsers offer Java capability. They can usually be configured to allow execution of Java Applets.

Java Beans are software components with a standardized interface written in the programming language Java. It is easy to link these Beans into conventional Java development environments and connect them with graphic tools for complete Java applications or Java Applets.

How it works

The functionality of an HTTP server integrated on the CP 243-1 IT permits the user to access the S7-200 system with popular Web browsers to read status information or read/change process values.

Predefined HTML pages and Java Applets stored in the file system of the CP 243-1 IT are available to the user. In addition, the user can prepare his own HTML pages or Java Applets and transfer them to the file system of the CP 243-1 IT with the help of an external FTP client.

Java Beans are provided on the documentation CD of the CP 243-1 IT for simple creation of Java Applets. They can be copied from there to a development computer and then, with the aid of a Java development environment (e.g., "Visual Age" from IBM), linked to your own Java Applets. The Beans included with the CP 243-1 IT are Java components which provide functions which can always be used when creating a user interface environment. This not only includes functions for read or write accesses to individual process values but also graphic functions for visualization of such values.

The document "SIMATIC NET IT-CP Programming Help" included with the CP 243-1 IT on the documentation CD contains a more detailed description of the individual Beans. A precise description of how to combine these Beans into Java Applets is provided. If the Java Beans described in this document are used with the purpose of accessing an S7-200 via a CP 243-1 IT, symbolic addressing cannot be used in these Beans.

Using the HTML pages and Java Applets supplied in the file system of the CP 243-1 IT, the following data areas and data types of the S7-200 system can be accessed.

- Data types
  BOOL, BYTE, CHAR, WORD, INT, DWORD, DINT and REAL
- Data areas
  Inputs (I), outputs (Q), memory (M), variable area (V) and system memory / special flags (SM)

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Note

The availability of the data types CHAR, INT, DINT and REAL depends on the firmware version of the S7-200 CPU being used, see Appendix D

Access protection

Calling the HTML pages stored in the file system of the CP 243-1 IT with a Web browser is not subject to access protection. Such protection is not activated until status or process variables are accessed from a Web browser or when an attempt is made to send a test e-mail via the applicable HTML page.

The basic access authentication scheme described in RFC2617 is used as the authentication routine for all password-protected HTML pages.

In this case, the user must authenticate himself with his user name and the related password. Access to the HTTP server of the CP 243-1 IT is then granted or refused depending on the access rights assigned to the user by user administration.

The HTTP server of the CP 243-1 IT can always be activated/deactivated with the configuration.

HTML pages on the CP 243-1 IT

The file system of the CP 243-1 IT contains already pre-defined HTML pages in English which supply status and diagnostic information via integration of the included Java Applets. These HTML pages can be edited or further processed by the user with an HTML editor such as Netscape Composer or a standard editor.

The following table lists the pre-defined HTML pages which are included in the file system of the CP 243-1 IT or which can be dynamically assembled by the CP 243-1 IT as soon as a request from a Web browser is received. These HTML pages have been optimized for monitor screen settings.

- Resolution: 1152 x 864
- Size of type: No type fonts

It is recommended using the Internet Explorer 6.0 from Microsoft as your Web browser.

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HTML Page Call	Meaning
http://<destination IP address>/index.htm	Start page of the CP 243-1 IT with links to further internal and external HTML pages If only <destination IP address> is specified on the Web browser, index.htm is automatically opened.
http://<destination IP address>/__S7Sys/rack	Indicates the setup of the S7-200 destination system. In addition, the available status information for each module is shown. This page is not automatically updated. To indicate the present status of the S7-200 system correctly, this page must be loaded again to the Web browser. Note: "Rack" is not an HTML page located physically in the file system of the CP 243-1 IT. When the adjacent address is called from a Web browser, the HTTP server dynamically sets up an HTML page with the system-specific information. The layout of this page cannot be changed by the user.
http://<destination IP address>/__S7Sys/sendmail.htm	Indicates a page with which a test e-mail can be sent to a specified receiver. The address fields (TO, CC) and the fields of the subject and the text are limited to a maximum of 64 characters each. When the page is called, the user is asked to authenticate himself with a user name and a password. Only the administrator is authorized to send a test e-mail. The errors which can occur are described in chapter 6.3.
http://<destination IP address>/__S7Sys/it_info	Present status of the CP 243-1 IT. This page contains data relevant to operation of the CP 243-1 IT. Some examples are listed below. • Module name • Firmware and hardware version • Network parameters • Status of the Micro/WIN connection • Configuration and availability of S7, FTP and e-mail connections • Information pertaining to the file system This information is only provided to users authorized by user administration. These users must authenticate themselves with a user name and a password. This page is not automatically updated. To correctly indicate the present status of the CP 243-1 IT, the Web browser must load this page again. Note: "It_info" is not an HTML page located physically in the file system of the CP 243-1 IT. When the adjacent address is called from a Web browser, the HTTP server dynamically sets up an HTML page with the system-specific information. The layout of this page cannot be changed by the user.

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HTML Page Call	Meaning
http://<destination IP address>/examples/info.htm	General information page of the CP 243-1 IT with external links to the IT CP and SIMATIC NET Web page. An internal link refers to the Web page readme.htm.
http://<destination IP address>/examples/statuschart.htm	This page can be used to read process values of the S7-200 system. The data or data areas to be read are designated by address. Remember that the values shown on this page are read out cyclically. Depending on the cycle time, an indicated value may differ from the value actually in the S7-200 system at the same time.

Table 1 Predefined HTML pages

Note

Some of the HTML pages included with the CP 243-1 IT link in Java Applets. To ensure that this functions correctly, the execution of Java Applets must be enabled on the Web browser.

Communication partners

All HTTP clients (e.g., Web browsers) represent potential communication partners of the HTTP server. The HTTP server of the CP 243-1 IT supports simultaneous access of up to 4 Web browsers.

The TCP/IP connection to the HTTP server is always handled by port 80.

Performance/general conditions

On the CP 243-1 IT, HTTP communication is subordinate to S7 communication. Reaction times vary with the particular configuration and cannot be predicted generally in advance.

The HTTP server located on the CP 243-1 IT has four communication channels (i.e., it can process up to four requests at the same time). When a request arrives at the HTTP server when all four communication channels are occupied, the request is rejected. New requests cannot be processed until at least one of the four communication channels is free again.

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2.4 File System

How it works

A file system is available on the CP 243-1 IT to permanently store Web and configuration files. This file system uses flash memory technology and offers a storage capacity of 8 Mbytes minus the memory needed for administration of the flash file system.

Note

The amount of memory which is actually available in the file system can be called with HTML page "CP 243-1 IT Information" (included with the CP 243-1 IT) via a Web browser under the address:

http://<destination IP address>/__S7Sys/it_info.htm

Due to the formatting of the file system, the amount of memory specified on this page cannot always be fully utilized.

The file system supports path and file names up to a total length of 254 characters. The drive name of the flash file system (/flash:) is also added to the 254 characters. This means that, after the drive name is deducted, 247 characters remain for a maximum path including the file name. The actual file name and every name of a directory can have a maximum length of 99 characters. The maximum nesting depth of the directories is 49.

The following characters may not be used in either file or directory names:
**** ; **/** ; **<** ; **>** ; **“** ; **:** ; ***** ; **?**

Note

It is always recommended storing files in suitable subdirectories and not in the root directory.

Since the CP 243-1 IT has neither date nor time, all files stored in the file system of the CP 243-1 IT have the date 01.01.1980 and the time 00:00.

Access

The file system can only be accessed with the FTP server of the CP 243-1 IT. The file system does not distinguish between upper case and lower case letters.

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Restrictions

Caution

The life of a file system based on flash memory technology is primarily determined by the total number of write or deletion operations performed on it. Obviously such a file system is not suited to highly cyclic write or delete operations.

The file system of the CP 243-1 IT uses an internal optimization routine to assign all available locations of the flash memory uniformly. When individual memory locations fail due to old age, these locations are detected and marked internally as unusable. Despite this, highly cyclic write or delete accesses to the file system of the CP 243-1 IT should be avoided.

Structure of the file system

Directory	Meaning
/flash:	The root directory of the file system contains a predefined homepage of the CP 243-1 IT (index.htm) which you can adjust to your specific requirements. This homepage requires files from the directories /__S7Sys and /examples. When storing user files, appropriate subdirectories should always be set up to store these files.
/flash:/applets	This directory contains several *.jar files which are required for S7 Applets. These *.jar files contain the Java Beans (included with the CP 243-1 IT on the documentation CD) in compressed format. This directory should not be deleted.
/flash:/config	This directory contains the configuration files of the CP 243-1 IT which were created by STEP 7 Micro/WIN 32. This directory should not be deleted.
/flash:/examples	This directory contains HTML files of the CP 243-1 IT which can be accessed via the predefined HTML start page with links. Some HTML pages contain Java Applets.
/flash:/__S7Sys	This directory contains important, write-protected system pages. These pages are needed to assemble the dynamic HTML pages rack and it-info. This directory should not be deleted. Only the administrator has access to this directory.
/flash:/user	User-defined HTML pages and user data should be stored in this directory.

Table 2 Directory structure of the CP 243-1 IT

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2.5 User Administration

How it works

When process data is exchanged via Intranet/Internet services, security becomes very important.

To ensure security, user administration with password protection was integrated on the CP 243-1 IT. Up to 8 users can be configured with the Internet wizard of STEP 7 Micro/WIN 32. During configuration, each of these users is assigned a user name, a password and certain access rights. These access rights control authorization to access process data and the file system.

The configuration of up to 8 users is stored on the file system of the CP 243-1 IT in a file with the extension .udb. For security's sake, the passwords assigned during the configuration are stored in this file are encrypted.

Note

The user administration of the CP 243-1 IT does not support user groups.

Administrator

In addition to these 8 users, the user administration of the CP 243-1 IT recognizes another user with special access rights - the administrator. The administrator is the only user who may access the directory /__S7Sys and store the .udb configuration file for user administration via FTP in the file system of the CP 243-1 IT.

The user name and the password of the administrator are configured with the Internet wizard of STEP 7 Micro/WIN 32. However, unlike the configuration of the users, this configuration is not stored in the file system of the CP 243-1 IT but on the S7-200 CPU. Before the configuration of the 8 users can be transferred via FTP to the file system of the CP 243-1 IT, an administrator with user name and password must be configured for the CP 243-1 IT.

Granting of access rights

Access rights are organized by rights for the administrator and rights for the 8 other users.

The following user rights can be configured for the administrator.

- Access to all IT functions
- Access to the FTP server

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The following user rights can be configured for the other 8 users.

- Read access to process data of the S7-200 system from a Web browser
- Read and write access to process data of the S7-200 system from a Web browser
- Read access to status information of the CP 243-1 IT from a Web browser
- Access to the file system via the FTP server with the following restrictions
  - Only the administrator may access the directory /__S7Sys.
  - Only the administrator may store the configuration file for the user administration (.udb file) in the file system of the CP 243-1 IT.

Note

HTML pages can be accessed by a Web browser without password protection. Password protection is not activated until process values of the S7200 system are accessed by such pages.

Note

It is recommended not allowing the 8 configurable users access to the FTP. If a user is permitted access to the FTP, this user has the opportunity to change the configuration data stored in the file system of the CP 243-1 IT.

Note

To keep configuration effort as low as possible with regard to user administration, it is recommended using abstract users with special rights (e.g., "commissioning," "maintenance," or "manufacturing") instead of natural users (e.g., "Jack Sprat").

Character set/number for entering user name/password

Role	User Name	Password
Administrator	1 to 16 characters	8 to 16 characters
User	1 to 32 characters	1 to 32 characters

Table 3 Length of the user names and passwords

All ASCII characters between 0x21 and 0x7E can be used for user name and password.

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2.6 Security

2.6.1 Configuration

Part of the configuration of the CP 243-1 IT is retentively stored on the S7-200 CPU and part in the file system of the CP 243-1 IT. The validity of the portion of the configuration stored on the S7-200 CPU is secured by a CRC routine. In contrast, no CRC routine is used for the portion of the configuration stored in the file system of the CP 243-1 IT.

While storing a configuration on the CP 243-1 IT, STEP 7 Micro/WIN 32 calculates a CRC checksum. This checksum is stored together with one part of the configuration. While reading out the portion of its configuration stored on the S7-200 CPU, the CP 243-1 IT checks this checksum so that it can detect undesired changes in the stored configuration data.

This CRC routine can also be deactivated. The configuration can then be changed manually or by an S7-200 user program.

Caution

Since, after the CRC check is disabled, the CP 243-1 IT is no longer able to check the configuration data for consistency concerning desired or undesired changes, there is no guarantee that the CP or the components connected to the network will function correctly.

Caution

The CP 243-1 IT recognizes that the CRC is disabled by a special value of a byte in its configuration. This value is set in the configuration either coincidentally or intentionally, this may disable the CRC test. This is why it is strongly recommend only creating the configuration with the Internet wizard integrated in STEP 7 Micro/WIN 32 and checking the S7-200 program for memory operations which affect in the data area in which the configuration data of the CP 243-1 IT is stored.

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2.6.2 Data Security

The CP 243-1 IT is a physical connection between the Internet, Ethernet and S7-200 bus. It offers:

- No protection against intended or accidental manipulations of the data areas and/or system states of the local or remote CPUs
- No firewall functionality

Possible Internet access by the CP 243-1 IT to data stored on the S7-200 CPU always harbors the danger of misuse. For this reason, it is a good idea to change the passwords assigned to the various users at regular intervals.

Additional information on the subject of security can be found in the document on information technology for the Siemens AG automation technology.

The CP 243-1 IT disconnects an active STEP 7 Micro/WIN 32 connection when no STEP 7 Micro/WIN request was sent to the CPU during the last 50 seconds. This prevents the Micro/WIN server on the CP 243-1 IT from being blocked by network errors which in turn prevents a new connection to STEP 7 Micro/WIN 32.

Note

Server accesses via the CP 243-1 IT to the S7-200 CPU are possible both in RUN and STOP modes of the CPU. In STOP mode, however, program variables or I/O values are not updated.

Caution

The user name and related password required to log in on an FTP server are not encrypted when transmitted over the network in accordance with valid general specifications of the FTP protocol.

2.6.3 Communication Security

The CP 243-1 IT is equipped with a "Keep Alive" routine. This means that the CP 243-1 IT is able to automatically recognize the failure of a communication partner or the applicable connection within a configurable period of time.

The Keep Alive time which is specified when the CP 243-1 IT is configured is the time after which this internal routine is started. The routine attempts to reach the communication partner. It takes approx. 10 seconds for this routine to be performed. If the communication partner cannot be reached during this time, the CP 243-1 automatically terminates the connection to this partner. If the CP 243-1 IT is the client, it then attempts to establish this connection again. Failure of the communication partner is reported to the user with the routines described in chapter 6.

You should always activate the Keep Alive monitoring routine on all systems involved in communication (if these systems have such a routine).

Note

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The Keep Alive routine will not work unless the communication partner also supports this routine in accordance with RFC1122 and RFC793.

2.7 Connections

Front view



Fig. 3 Connections

The CP 243-1 IT is equipped with the following connectors.

- Terminal block for 24 V DC power and grounding connector
- 8-pin RJ45 socket for Ethernet connector
- Pin plug connector for S7-200 bus
- Integrated ribbon cable with connection socket for the S7-200 bus

The connectors are located under the covers of the front doors.

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2.8 Indicators: Front LEDs



Fig. 4 Front with the LEDs

There are 5 LED indicators on the front.

LED Indicator	Color	Meaning
SF	Red, continuously on	System error: On when an error has occurred
	Red, flashing	System error: Flashing (approx. once per second) when configuration is incorrect or no BOOTP server could be found
LINK	Green, continuously on	Connection via the RJ45 interface: Ethernet connection is established.
RX/TX	Green, flickering	Ethernet activity: Data is received or sent via Ethernet. **Note**: A packet received via Ethernet may not be intended for the CP 243-1 IT. The CP 243-1 IT first accepts all packets transmitted via Ethernet and then decides whether the packet is intended for itself. The RX/TX-LED flashes even when the Ethernet cable is disconnected as soon as the CP 243-1 IT attempts to send a packet.
RUN	Green, continuously on	Ready for operation: The CP 243-1 IT is ready for communication.

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LED Indicator	Color	Meaning
CFG	Yellow, continu-ously on	Configuration: Is on when STEP 7 Micro/WIN 32 actively maintains a connection to the S7-200 CPU via the CP 243-1 IT.

Table 4 Function of the individual LEDs

During the startup phase of the CP 243-1 IT, the SF LED flashes twice. The LINK and the RX/TX LEDs then flash several times. As soon as the RUN LED goes on, the CP 243-1 IT startup has completed.

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3 Installation and Commissioning

Installation

You can install the devices of the S7-200 family either in an operator panel or on a DIN rail. You can arrange the modules both horizontally and vertically. The S7-200 CPU and the expansion modules are designed for natural heat dissipation via convection. For this reason, leave at least 25 mm of free space above and below the devices so that the heat is free to escape. Long operating times at maximum ambient temperatures and maximum loads will shorten the lifespan of the electronic components of the device.

Note

The position in an S7-200 system in which a CP 243-1 IT can be operated depends on the firmware version of the S7-200 CPU you are using.

When using firmware version 1.20 or higher, the CP 243-1 can be installed in any one of 7 positions in an S7-200 system. For firmware versions below version 1.20, the CP 243-1 IT must be installed in position 0 unless another intelligent module occupies position 0 then the CP 243-1 IT may be installed in position 1.

Wiring



Warning

If you attempt to install or remove the CP 243-1 IT or other devices while they are on, you may receive an electric shock or the devices may not work properly.

If the power is not switched off for the CP 243-1 IT and all connected devices while the devices are being installed/removed, this may cause injury and/or property damage.

Take all necessary safety precautions and make sure that the power for the S7-200 and the CP 243-1 IT is turned off before you begin wiring.

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General guidelines

Below are some general guidelines for wiring your programmable controller.

- Be sure to comply with all valid and binding standards when you wire your CP 243-1 IT. When installing and operating the device, adhere to applicable national and regional regulations. Ask your local authorities for the standards and regulations which apply to your special situation.
- Only wire the S7-200 CPU and the CP 243-1 IT in a de-energized state!
- Use lines with the cross section appropriate for the particular electricity strength. The 24 V power supply of the CP 243-1 IT can be wired with lines with a cross section between 0.50 mm² and 1.50 mm². For the wiring of the grounding terminal, use lines with a cross section of 1.50 mm².
- Do not tighten the connection terminals too tightly. The maximum tightening moment is 0.56 Nm.
- Keep the lines as short as possible. Lines should be installed in pairs - one neutral or directly grounded conductor together with a phase conductor or a signal line.
- Separate alternating current wiring and high voltage direct current wiring with fast switching sequences from the low voltage signal wiring.
- Provide suitable overvoltage protection for lines which may be hit by lightning.
- The S7-200 CPU and the CP 243-1 IT should be connected to the same power supply!
- The CP 243-1 IT is equipped with an integrated ribbon cable with connection socket for fast connection to other S7-200 components.
- The slot on which a CP 243-1 IT can be operated depends on the firmware version of the S7-200 CPU being used. See note on page 45.
- A maximum of one CP 243-1 or one CP 243-1 IT is supported per CPU.

Electrical requirements

The input voltage must always be +24 V DC. Apply 24 V direct current only from current sources which offer secure electrical separation from 120/230 V AC and similar sources of danger. Secure electrical separation is defined in the following standards.

- PELV in acc. w. EN60204-1
- Class 2 or current circuit with limited voltage/current in acc. w. UL 508

The power supply on the S7-200 bus is provided by the particular S7-200 CPU.

Make sure that the CP 243-1 IT is correctly grounded.

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Space requirements during installation

When installing your module, adhere to the following guidelines.

- The CP 243-1 IT is designed for natural heat dissipation by convection. For this reason, leave at least 25 mm of free space above and below the device so that the heat is free to escape. Long operating times at maximum ambient temperatures and maximum loads will shorten the lifespan of the electrical components of the device.
- When installed vertically, the maximum permissible ambient temperature drops by 10 °C. The CP 243-1 IT must be positioned above the CPU. If you are using a vertical standard DIN rail, you should use standard DIN rail stoppers to prevent the module from slipping.
- Installation depth is 75 mm.

Note

Set up your devices so that there is still enough space to wire the inputs and outputs and for the connections of the communication cables.

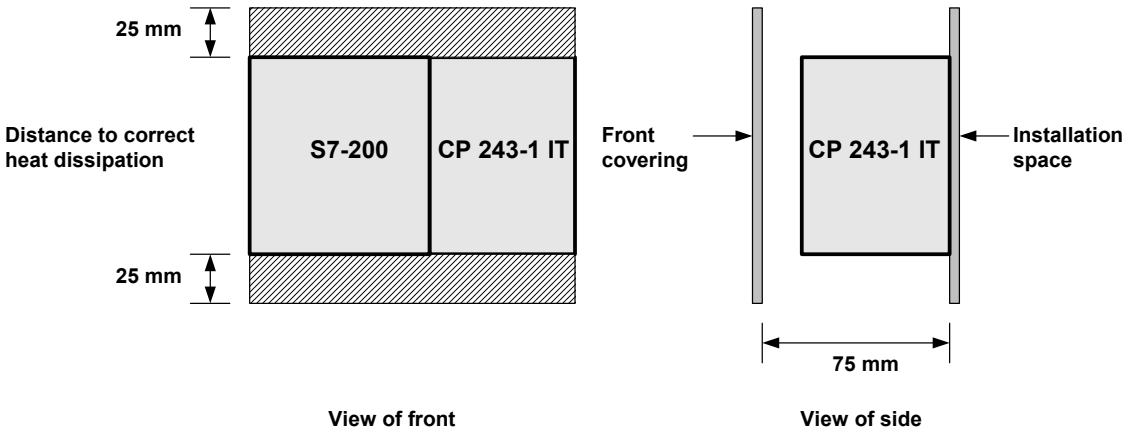


Fig. 5 Space requirements during installation

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3.1 Dimensions for Installation in a Control Panel

The CP 243-1 IT is equipped with bored holes for installation in a control panel.

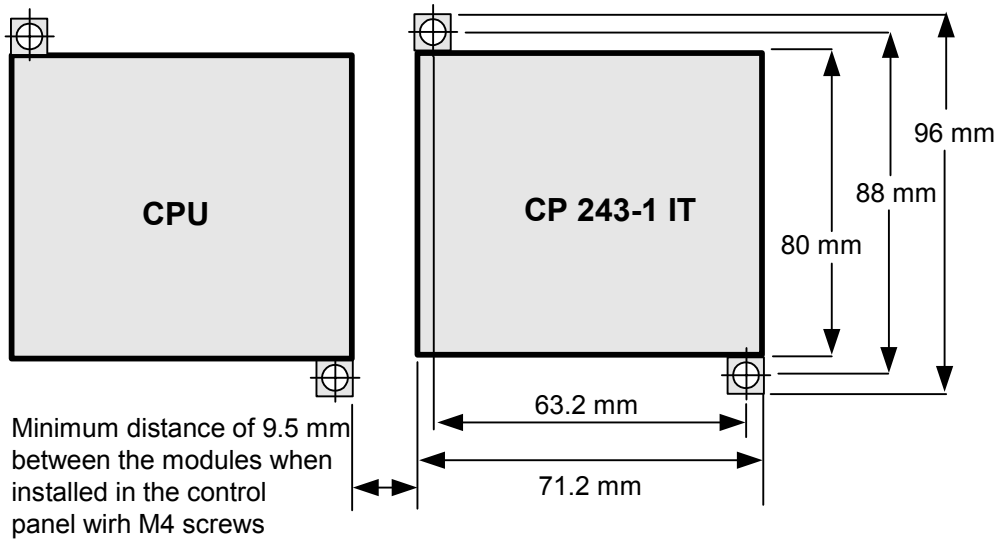


Fig. 6 Dimensions for installation in a control panel

3.2 Dimensions for Installation on a DIN Rail

The CP 243-1 IT can be mounted on a DIN rail (DIN EN 50 022).

The following figure shows the dimensions of a standard DIN rail.

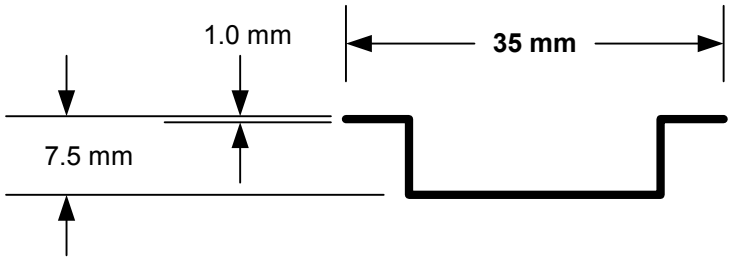


Fig. 7 Dimensions for installation on a DIN rail

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3.3 Installation in a Control Panel

What to do/steps

1. Bore holes for the DIN M4 screws on the control panel. Read and follow the notes and dimensions given in chapters **Fehler! Verweisquelle konnte nicht gefunden werden.** and 3.1 on installation in a control panel.
2. With horizontal installation to the right next to the CPU and with vertical installation above the CPU, screw the CP 243-1 IT to the control panel. Use DIN M4 screws.
3. Insert the ribbon cable of the CP 243-1 IT in the connection provided under the front door of the adjacent module or the S7-200 CPU. The shape of the plug connector prevents it from being incorrectly inserted.
4. Connect the grounding terminal.
   Connect the grounding terminal of the CP 243-1 IT with the next available ground to obtain the highest possible interference immunity. It is recommended connecting all grounding terminals individually. Use lines with a cross section of 1.5 mm^2 for this.
5. Connect the power supply.
6. Connect the Ethernet cable.
   The transmission medium is a 2 x 2-core, twisted pair, shielded line with a ripple resistance of 100 Ohm. The transmission properties of this line must meet category 5 requirements (Cat5Cable). The maximum length of the connection between terminal and network components (link segment) is limited to 100 m with the components defined in IEEE802.3.
   The RJ45 plug connector on the CP 243-1 IT is shielded so that, in combination with a shielded Ethernet cable, a continuous cable shield is created which ensures interference-free Ethernet transmission. The shield of the RJ45 plug connector is connected via the grounding terminal of the CP 243-1 IT.
   It is recommended shielding and grounding the Ethernet connection as described in the document on SIMATIC NET twisted pair and fiber optic networks.

Installation is complete.

Note

Keep the front door of the CP 243-1 IT closed during operation.
During installation, make sure that the upper and lower ventilation slits of the module are not obstructed and good ventilation is possible.

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3.4 Installation on a Standard DIN Rail

What to do/steps

1. Open the snap catch and hang in the CP 243-1 IT on the DIN rail to the right next to or above the CPU.
2. Close the snap catch to secure the CP 243-1 IT to the rail. Make sure that the catch is snapped in correctly and the device is firmly secured to the rail.

Note

In environments in which strong vibration occurs or the devices are installed vertically, it may be necessary to use standard DIN rail stoppers to keep the devices from slipping on DIN hat rail.

3. Insert the ribbon cable of the CP 243-1 IT in the connection provided under the front door of the adjacent module or the S7-200 CPU. The shape of the plug connector prevents it from being incorrectly inserted.
4. Connect the grounding terminal.
   Connect the grounding terminal of the CP 243-1 IT with the next available ground to obtain the highest possible interference immunity. It is recommended connecting all grounding terminals individually. Use lines with a cross section of 1.5 mm^2 for this.
5. Connect the power supply.
6. Connect the Ethernet cable.
   The transmission medium is a 2 x 2-core, twisted pair, shielded line with a ripple resistance of 100 Ohm. The transmission properties of this line must meet category 5 requirements (Cat5Cable). The maximum length of the connection between terminal and network components (link segment) is limited to 100 m with the components defined in IEEE802.3.
   The RJ45 plug connector on the CP 243-1 IT is shielded so that, in combination with a shielded Ethernet cable, a continuous cable shield is created which ensures interference-free Ethernet transmission. The shield of the RJ45 plug connector is connected via the grounding terminal of the CP 243-1 IT.
   It is recommended shielding and grounding the Ethernet connection as described in the document on SIMATIC NET twisted pair and fiber optic networks.

Installation is complete.

Note

Keep the front door of the CP 243-1 IT closed during operation.
During installation, make sure that the upper and lower ventilation slits of the module are not obstructed and good ventilation is possible.

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3.5 Replacement Parts

When the CP 243-1 IT (6GK7 243-1GX00-0XE0) module is replaced, no new programming is required on the S7 communication side since configuration data and the user program is stored retentively on the S7-200 CPU. The CP 243-1 IT must be programmed again for the IT functions since the configuration files, among others, for the IT services are stored in the file system of the CP 243-1 IT.

3.6 Unmounting the CP 243-1 IT



Warning

If you attempt to install or remove the CP 243-1 IT or other devices while they are on, you may receive an electric shock or the devices may not work properly.

If the power is not switched off for the CP 243-1 IT and all connected devices while the devices are being installed/removed, this may cause injury and/or property damage.

Take all necessary safety precautions and make sure that the power for the S7-200 and the CP 243-1 IT is turned off before you begin wiring.

Proceed as shown below to remove the CP 243-1 IT/another expansion module of the S7-200.

1. Turn off the power supply of the S7-200 CPU, the CP 243-1 IT and all expansion modules.
2. Disconnect all cables and lines from the device which you want to remove.
3. Open the front door and disconnect the ribbon cable from the adjacent modules.
4. Disconnect the screws or open the snap catch and remove the module from the control panel or the DIN rail.



Warning

If you install the wrong device, the S7-200 may become unpredictable.

If the CP 243-1 IT is replaced by a different model or not aligned correctly, this may cause injury and/or property damage.

Only replace the CP 243-1 IT with the same model and align it correctly.

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4 Configuration

4.1 Possible Configurations

Using the CP 243-1 IT, an S7-200 system can communicate via the S7 protocol with another S7-200 system or an S7-300 / S7-400 or an OPC-based system. Using the IT protocols SMTP, FTP and HTTP, communication is also possible with any computer system which supports this protocols.

There are two ways to configure one of the communication modes for an S7-200 system.

- Configuration via STEP 7 Micro/WIN 32 starting with version 3.2.3
- Configuration via an S7-200 user program

The configuration data for the IT services is kept in the file system of the CP 243-1 IT. They are read during startup and then monitored continuously for changes. This means that every change to this data during running operation is immediately accepted by CP 243-1 IT. All other configuration data is stored in the data block of the S7-200 CPU. From there, this data is read once each time a new start of the CP 243-1 IT occurs.

Caution

A change to the configuration stored on the S7-200 CPU by an S7-200 user program is only possible when the CRC routine is disabled.

Since, after being disabled, the CRC routine of the CP 243-1 IT can no longer completely check this configuration data for consistency of intended or unintended changes, there is no guarantee whatsoever that the CP or the components connected in the network will function correctly for this application.

Caution

To ensure that the configuration data of the CP 243-1 IT stored on the S7-200 CPU will also be retained when a power failure occurs, this data must be stored in a retentive memory area on the S7-200 CPU.

With a standard S7-200 system, the entire data block is defined as retentive. However, this default setting may have been changed on your S7-200 system when the configuration is modified.

Changes to the configuration data stored on the S7-200 CPU do not take effect until the next new start of the CP 243-1 IT. When STEP 7 Micro/WIN 32 is used for new/modified configuration of the CP 243-1 IT, this automatically triggers a new start of the CP 243-1 IT as soon as the operating mode changes from STOP to RUN. If, in contrast, the configuration of the CP 243-1 IT is done directly by the S7-200 user program, this configuration can be activated from the user program by calling the subroutine "ETHx_CFG." Calling this subroutine also triggers a new start of the CP 243-1 IT.

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The TCP/IP address parameters (IP address, subnet mask, IP address of a gateway) can be specified during configuration in one of two ways. They can be specified permanently or dynamically (the CP 243-1 IT takes the TCP/IP address parameters from a BOOTP server during startup).

The configuration data stored in the memory of the CP 243-1 IT can be loaded via the PPI interface to the S7-200 CPU. If the CP 243-1 IT already has a TCP/IP address, this configuration data can also be loaded to the S7-200 CPU via TCP/IP and the Ethernet interface of the CP 243-1 IT. The CP 243-1 IT must already have an IP address before the configuration data of the IT services can be loaded to the CP 243-1 IT.

If an S7-200 system should communicate via a CP 243-1 IT with an S7-300, an S7-400 or an OPC-based system, use an STEP 7 system with at least version 5.1 inclusive service pack 3 or higher (with NCM S7 for Industrial Ethernet) for configuration.

Note

After startup, the CP 243-1 IT may automatically change the configured gateway due to special network-based services ("ICMPRedirect"). After approx. 30 seconds, the CP 243-1 IT returns to the originally configured gateway, however. This means that the gateway actually used by the CP 243-1 IT may sometimes differ from the one in the configuration.

You can change the gateway which the CP 243-1 IT is currently using with the diagnostic screen for the CP 243-1 IT in STEP 7 Micro/WIN 32 and a user program, by reading from the memory area of the S7-200 CPU in which the NPB data block is stored (see chapter 4.4.3).

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4.2 Value Ranges of the Configuration Data

4.2.1 IP Addresses

The IP addresses which must be specified at various points in the configuration must comply with the general conventions governing the validity of IP addresses.

According to this convention, the following IP addresses have a special significance.

- Loopback: 127.0.0.0 - 127.255.255.255
- Class D addresses: 224.0.0.0 - 239.255.255.255
- Class E addresses: 240.0.0.0 - 247.255.255.255
- Broadcast addresses: Example: 255.255.255.255

The CP 243-1 IT does not accept these addresses. The only exception is the loopback address 127.0.0.1 which can be used during configuration of the FTP client service. This causes data to be transferred between the memory of the local S7-200 CPU and the file system of the local CP 243-1 IT when the appropriate function is called.

4.2.2 Subnet Mask

If a subnet mask is specified in the configuration, its layout must comply with the general conventions governing the validity of subnet masks.

Remember that the validity of an IP address and a related subnet mask are dependent on each other.

4.2.3 TSAPs

TSAPs consist of 2 bytes. The first byte specifies the connection. The second byte is created from the rack number and the slot of the communications module. The following value ranges apply to the first byte.

- Value range, local TSAP: 16#02, 16#10 - 16#FE
- Value range, remote TSAP: 16#02, 16#03, 16#10 - 16#FE

The CP 243-1 IT does not check the value of the second byte (see also chapter 4.5)

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4.2.4 Ports

Each standard protocol from the TCP/IP protocol family (e.g., HTTP, FTP or SMTP) is assigned to its own fixed port number with which a related communication service can usually be accessed in a TCP/IP network. These permanently assigned port numbers are called "well-known" port numbers since they were specified worldwide in the definition of the protocol. Standard protocols usually use port numbers between 0 and 1024. Port numbers greater than 1024 are not fixed and can be assigned by the user programs as desired.

Thanks to modern protective routines on TCP/IP networks (e.g., firewalls), the ports usually used by standard protocols are rerouted to other ports. To make it possible for the CP 243-1 IT to also be able to communicate with external SMTP servers in such environments, you can explicitly specify the port via which such a server can be accessed when you configure the e-mail service with the Internet wizard of STEP 7 Micro/WIN 32. Standard SMTP servers can be accessed with port 25.

4.2.5 E-Mail Tags

An e-mail consists of one or two address fields, a field for the subject and a field for the text message. The text message is made up of ASCII characters. In addition to the two control characters \n and \t, the text may contain placeholders defining an embedded data value. When sending an e-mail, the CP 243-1 IT reads the current value of such a placeholder from the local S7-200 CPU, formats it and inserts it in the message.

Such placeholders use the following syntax.

%address:positions_before_decimal.positions_after_decimalFormat%

The percent character (%) marks the beginning and the end of a placeholder. The colon (:) separates the address from the formatting instructions. The period (.) separates the positions before the decimal point and the positions after the decimal point within the formatting instructions.

Note

Use the notation %% to represent individual % characters in a text message.

Example:

Desired text:	The filling level is specified in %.
Text to be entered：	The filling level is specified in %%.

The address element specifies the address, the data type and the size of the embedded data value (e.g., VD100, VW50 or MB20). Permitted data types: input, output, memory, system memory / special flags, variable memory and analog input. The CP 243-1 IT supports both the German designations of these data types (E, A, M, SM, V and AE) and the international notations (I, Q, M, SM, V and AI).

Each of these data types can be addressed as byte, word and double word. The size of the address depends on the type of data or the type of S7-200 CPU used. (A CPU 226XM offers a variable memory area of 10,240 bytes.)

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The element "positions_before_decimal" defines the minimum number of digits which may be indicated to the left of the decimal point. This value should be large enough to hold the expected data value including a sign if necessary.

If the number of positions specified in the element "positions_before_decimal" is not sufficient to completely indicate a current value, this value is still presented completely. The specified format is ignored in such cases. If the representation of a current value requires fewer positions than specified in the element "positions_before_decimal," the remaining positions are filled with blanks. The valid range for the element "positions_before_decimal" is between 1 and 10.

The element "positions_after_decimal" defines the number of digits shown to the right of the decimal point. If a data value to the right of the decimal point contains zeros, these are represented as defined by the element "positions_after_decimal." If the element "positions_after_decimal" is zero, the value is indicated without decimal point. The valid range for the element "positions_after_decimal" is between 01 and 10.

The format element specifies the format for indicating the embedded value. The format element permits the following characters.

- I,i: Whole number with sign
- U,u: Whole number without sign
- H,h: Hexadecimal
- F,f: Floating point, real

Example:

Below are several examples of how different formatting instructions affect the presentation of a current value.

Current Value	Formatting Instruction	Output (□ = One Blank)
16#F4 in address VB0	%VB0:1.0I%	-12
16#F4 in address VB0	%VB0:6.0I%	□□□-12
16#F4 in address VB0	%VB0:6.3I%	□□□□-0.012
16#0C in address VB0	%VB0:2.0H%	16#0C
16#0C in address VB0 (16#00 for the next byte)	%VW0:4.0H%	16#000C
16#0C in address VB0 (16#00 for the next 3 bytes)	%VD0:8.0H%	16#0000000C

Table 5 Examples of formatting instructions for placeholders in e-mails

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Note

Whole numbers with sign (format element) and whole numbers without sign (format element U) can be interpreted as fixed point decimal numbers.

Example:
VD 100 contains the fixed point number for the to-be-interpreted value 12345_{dec}.

If the placeholder %VD100:2.3U% is used for this value in an e-mail, this value is transmitted in the e-mail as 12.345.

Calculation: Result = value / (10^number of desired positions after the decimal point) ➔ 12.345 =12345/10^3

Note

Received e-mails may also contain #### in the placeholder instead of the expected value. This always happens when a placeholder could not be filled with a value that conformed to the formatting instructions.

4.3 Configuration of a CP 243-1 IT with STEP 7 Micro/WIN 32

After you have installed and started STEP 7 Micro/WIN 32 on your PC, start the wizard for the CP 243-1 IT. The wizard is located in "Tools" under the item "Internet-Assistent..." or also in the group bar on the left area of STEP 7 Micro/WIN 32 in the box with the navigation bar under the item "Tools" (if this view is activated on your STEP 7 Micro/WIN 32).

You can use the Internet wizard to configure your CP 243-1 IT. You can enter all relevant configuration data in several screens. User prompting is designed so that you cannot switch to the next dialog until all your entries are correct and complete. If not, an error message appears.

The Internet wizard consists of four internal wizards which are used to configure the various IT services. First, open the configuration wizard. In this wizard, basic configuration data is specified (such as TCP/IP address parameters) and S7 communication is configured. All configuration information specified here are stored on the S7-200 CPU when loaded to your S7-200 system. After you have completed this wizard, you can exit the configuration or configure the various IT services of the CP 243-1 IT.

The Internet wizard offers an FTP wizard and an e-mail Wizard plus a wizard for configuring user administration. The information specified in these wizards is stored in the file system of the CP 243-1 IT when loaded to the S7-200 system. The configuration of each CP 243-1 IT can be concluded after one of these three wizards has been passed through. If one of these wizards is not passed through before concluding the configuration, this IT service is not configured.

Below is a short description of the individual wizards and the individual steps of configuration which these wizards lead you through.

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Note

For detailed information, see the STEP 7 Micro/WIN 32 documentation included with the STEP 7 Micro/WIN 32.

4.3.1 Basic Configurations

After starting the Internet wizard, you will see the configuration wizards. All specifications which you enter here will be stored on the S7-200 CPU when loaded to the S7-200 system.

The introductory dialog of the configuration wizard gives you general information. After reading this, click "Next>" to continue with the wizard.

Specification of the Position of the CP 243-1 IT in the S7-200 system

The position of the CP 243-1 IT in the S7-200 system must be specified in the second dialog.

This position can be manually specified or the wizard can look for a CP 243-1 IT in your S7-200 system. If it finds a CP 243-1 IT, its position in the S7-200 system is automatically indicated. Double-clicking the indicated CP 243-1 IT accepts its position in the configuration.

Specifying TCP/IP address parameters and transmission type

The next dialog is used to specify the TCP/IP address parameters and the type of transmission to be used.

There are two ways to enter the TCP/IP address parameters.

1. Enter these parameters manually in the applicable input boxes.
2. Activate the access to a BOOTP server. In this case, the CP 243-1 IT obtains the TCP/IP address parameters from a BOOTP server during startup. If the CP 243-1 IT is unable to find a BOOTP server in its TCP/IP network, it performs a reset, restarts and tries again to establish contact with a BOOTP server. It continues to do this until it finds a BOOTP server from which it can obtain TCP/IP address parameters.

Specifying the module command byte and the number of S7 Peer-to-Peer connections

Use the next dialog to enter the address of those bytes in the address area of your S7-200 system via which the CP 243-1 IT can be accessed from the S7-200 CPU. This address depends on the position of the CP 243-1 IT in your S7-200 system and the number of outputs in your S7-200 system. If you "told" the Internet wizard at the beginning of the configuration to determine the position of the CP 243-1 IT in your S7-200 system, the wizard will give you the address here.

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You can always use STEP 7 Micro/WIN 32 to determine the address areas occupied by the modules in your S7-200 system by activating the entry "Information…" in the menu "PLC". You will also find the address under which your CP 243-1 IT can be accessed in your S7-200 system.

This dialog is used to specify how many S7 connections are to be set up on your CP 243-1 IT. Up to 8 such connections are possible. A dialog appears for each connection that you specify here. You can then configure the connection with this dialog.

Configuring the individual S7 connections

The following dialogs are used to configure the S7 connections which you set up in the previous dialog. First, specify for each of these connections whether your S7-200 system is to be a client or a server. Depending on which option you choose, the layout of the dialog changes.

If your S7-200 system is to be a client for a connection, enter the address of the communication partner and the Transfer Service Access Point ("TSAP") for this partner. The data to be exchanged between your S7-200 system and the specified communication partner must also be specified in an extra dialog. This is where you specify whether this data is to be read or written. Up to 32 read/write requests can be specified per connection.

If your S7-200 system is to be a server for a connection, you can assign an IP address to specify which communication partner will have access to your system. You can also set each server so that it allows access from every IP address. In addition, you must specify the communication access point ("TSAP") for that communication partner which you allow to access to your S7-200 system.

Keep Alive monitoring can be activated for both client and server connections.

For the communication access points ("TSAP") of your communication partner, see the configuration of that particular partner. With an S7-200 system, this is done with STEP 7 Micro/WIN 32. With an S7-300, S7-400 or OPC-based system, use STEP 7 (see also chapter 4.4).

Note

Specifications of the communication access points ("TSAPs") in STEP 7 and in STEP 7 Micro/WIN 32 must be compatible.

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Activating/deactivating the CRC routine and specifying the monitoring time

After you have finished configuring the S7 connection, you must specify in the next dialog whether your configuration data on the S7-200 CPU is to be protected with a CRC routine against accidental overwriting.

If the CRC routine is activated, the CP 243-1 IT checks during startup to determine whether its configuration data which it reads from the memory of the S7-200 CPU was overwritten from the user program. If so, it terminates startup and attempts to obtain its TCP/IP address parameters from a BOOTP server. If it succeeds, startup is continued. However, only the MicroWN channel is activated afterwards. The CP 243-1 IT can then only communicate with STEP 7 Micro/WIN 32 but not with other communication partners.

It is recommended always activating the CRC routine. This is the only way in which the CP 243-1 IT can detect that the user program has made undesired changes to the configuration data.

If the CRC routine is not activated, your user program can change the configuration data of the CP 243-1 IT. However, the CP 243-1 IT does not "notice" when this data is accidentally overwritten.

Caution

An S7-200 user program can only change the configuration data on the S7-200 CPU when the CRC routine is off.

Since, after the CRC routine is disabled, the CP 243-1 IT is no longer able to completely check the configuration data for consistency concerning desired and undesired changes, there is no guarantee whatsoever that the CP or the components connected in the network will function correctly.

In the same dialog you also can set a common monitoring time (Keep Alive time) for all configured connections. The value entered here determines the time after which the CP 243-1 IT recognizes the communication problem described in chapter 2.6.3.

You have already specified which connections are to be monitored with this time when you configured the individual connections.

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Setting up an administrator

The next dialog (administrator account) is used to specify the user identifier and the password for the administrator. You also specify whether the administrator will have the right to access the process data of the S7-200 system with a Web browser.

Activating the individual IT services

The next dialog can be used to activate various IT services of the CP 243-1 IT individually. Every IT service which is to be used later with the CP 243-1 IT must be marked active in this dialog. All unmarked services on this dialog will not be started when the CP 243-1 IT starts up and thus will also be unavailable.

Exception: the FTP server on the CP 243-1 IT which is always activated.

When configuring the CP 243-1 IT, only activate those IT services which will actually be used in your application.

At this point in the configuration, activation or non-activation of an IT service has no effect on the configuration steps below.

Specifying the area in which to store the configuration

In the next dialog, specify the memory area in which your configuration data is to be stored on the S7-200 CPU. The wizard will prompt you through.

Information on the subroutines

In the next dialog, the wizard tells you which subroutines it has set up for your configuration and where their configuration data is stored.

Caution

Make sure that the memory area in which the configuration data of the Internet wizard is stored is not used by your S7-200 user program.

Concluding the first configuration phase

You have now gone through all the screens of the configuration wizard and concluded the first phase of configuration. The next dialog offers you the opportunity to call the wizards of the IT services. Click the appropriate icon in the left-hand box of the dialog.

If you don't want to use any of the IT services on your CP 243-1 IT, conclude the configuration at this point and click "Finish."

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4.3.2 Configuration of User Administration

To branch to the wizard to configure user administration, click the appropriate icon in the left-hand box of the dialog. All the information entered in this wizard is stored in the file system of the CP 243-1 IT in a file with the extension .udb when the configuration is loaded to the S7-200 system.

Configuring the users

Using the screens which appear, you can configure up to 8 users. You must assign a user identifier, a password and user-specific access rights to each user.

Make sure that the user identifiers are unique.

As soon as you have configured the desired number of users, you can click "Next" to conclude user configuration.

Then you can either branch to another wizard or conclude the configuration of the CP 243-1 IT by clicking "Finish".

4.3.3 Configuration of the E-Mail Functions

To branch to the wizard to configure the e-mail functions, click the appropriate icon in the left-hand box of the dialog. All the information entered in this wizard is stored in the file system of the CP 243-1 IT in a file with the extension .edb when the configuration is loaded to the S7-200 system.

Configuring the e-mail address and the e-mail server to be used

In the first dialog of the e-mail wizard, assign an e-mail address to your S7-200 system. The e-mail address specified here will be entered as the sender address in all transmitted e-mails.

Then choose an e-mail server to which your CP 243-1 IT is to transmit the e-mails to be sent. Enter the IP address and the port of this e-mail server. An e-mail server can usually be accessed via port 25. This port is preset. If the e-mail server you specified uses a different port, enter this port in the appropriate box.

For reliability's sake, you can enter a second e-mail server. The CP 243-1 IT attempts to send an e-mail to the e-mail server specified first. If this server cannot be reached (e.g., due to a network malfunction), the CP 243-1 IT then attempts to send the e-mail to the second e-mail server. If the second e-mail server also cannot be reached, the CP 243-1 IT terminates its attempts to send the e-mail and generates an appropriate error message.

Configuring the e-mails

The next dialog is used to configure the e-mails. The address to which the e-mail is to be sent must be entered in this dialog for every e-mail which is to be sent from the CP 243-1 IT. In addition, a second recipient of a copy of the e-mail can be specified. The subject can also be entered here.

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Placeholders for data from the S7-200 system can be inserted in the actual e-mail text to be sent. When the e-mail is sent, the CP 243-1 IT replaces each of these placeholders with the current value of the data.

To insert such a placeholder in your e-mail, click "Insert Data". In the dialog which appears, create the placeholder to be inserted. Specify the address of the data to be transferred and the format in which this piece of data is to be indicated in the e-mail.

A total of up to 32 different e-mails can be configured.

As soon as you have configured the desired number of e-mails, click "Next" to exit the e-mail wizard.

Then either branch to another wizard or conclude the configuration of the CP 243-1 IT by clicking "Finish".

4.3.4 Configuration of the FTP Functions

To branch to the wizard for configuring the FTP functions, click the appropriate icon in the left-hand box of the dialog. All the information entered in this wizard is stored in the file system of the CP 243-1 IT in a file with the extension .fdb when the configuration is loaded to the S7-200 system.

Using the FTP wizard, you can configure the FTP requests which are to be sent from your S7-200 user program via the FTP client on the CP 243-1 IT.

The FTP server does not need to be configured. This server is automatically started by the CP 243-1 IT during startup. Access rights to this FTP server are specified in the configuration of the user administration.

Configuring the FTP requests

To configure an FTP request, you must first specify whether this is a read, write or delete request and the FTP server to which the request is to be sent.

With write requests, enter which data from the memory of your S7-200 CPU you want to send to the specified FTP server. The start address and the length of the data to be transferred are required.

With read requests, specify whether the received data is to be stored in the memory of your S7-200 CPU. Also specify how many bytes are to be transmitted. If you enter a zero as the length, the entire contents of the specified file are copied to the memory of your S7-200 CPU, starting at the specified start address.

Caution

The CP 243-1 IT and the FTP wizard are only able to perform very limited plausibility checks on the address and length information entered when the FTP requests are configured.

In particular with read requests, only a rudimentary check can be made as to whether system or user data is overwritten in the memory of the S7-200 CPU based on the specified address and length information. This is the general responsibility of the user.

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For each FTP request, you must specify the FTP server to which the request is to be sent and the name of the file which is to be processed by the request. For this, enter the IP address of the FTP server and the name of the file including any required path information. Execution of an FTP request also requires the specification of a valid user identifier for the FTP server including the related password.

Up to 32 FTP requests can be configured.

As soon as you have configured the desired number of FTP requests, click "Next" to exit the FTP wizard.

Then either branch to another wizard or conclude the configuration of the CP 243-1 IT by clicking "Finish".

4.3.5 Conclusion of Configuration

During conclusion of the configuration of the CP 243-1 IT, the Internet wizard sets up all required subroutines so that an S7-200 user program can access the CP 243-1 IT in the manner specified in the configuration. This means that the subroutine required to activate a certain service is only set up if this service was actually activated in the configuration.

4.4 Additional Ways to Configure a CP 243-1 IT

Some of the configuration data of the CP 243-1 IT is stored in the memory of the S7-200 CPU while some are stored in the file system of the CP 243-1 IT.

The memory of the S7-200 CPU contains the Ethernet configuration and the basic settings (e.g. activation or deactivation of individual IT services) made for an IT configuration. While it is booting, the CP 243-1 IT reads this part of the configuration from the memory of the S7-200 CPU and evaluates it (during running operation monitors them continuously for changes)

The IT-specific configurations consisting of the configuration of the e-mail client, the FTP client and the user administration are stored in the file system of the CP 243-1 IT in the directory /flash:/config in files having extension of .edb, .fdb and .udb.

Each one of these configuration files has a TIMESTAMP element containing a time stamp which is cyclically read by the CP 243-1 IT. If the CP 243-1 IT determines that a TIMESTAMP element has changed since it was read the last time, the applicable file is completely read and the CP 243-1 IT reconfigures itself dynamically with the configuration in this file. This means that a change in one of the three configuration files only affects the CP 243-1 IT if the TIMESTAMP element also changed.

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Access to the configuration data in the memory of the CPU

The configuration data stored in the memory of the S7-200 CPU can also be changed directly from an S7-200 user program. Before the CP 243-1 IT can accept configuration data which has been changed like this when it boots again, the CRC protective routine for configuration data must be disabled. The value 16#AC must be entered in byte 13 of the CDB data structure. This takes place automatically as soon as the CRC routine is disabled in the Internet wizard.

Caution

Configuration of the CP 243-1 IT from a user program is only recommended for experienced programmers.

Since, after the CRC check is disabled, the CP 243-1 IT is no longer able to completely check the configuration data on the S7-200 CPU for consistency in relation to desired and undesired changes, there is no guarantee whatsoever for this application that the CP or the components connected on the network will function correctly.

Note

Data of type "WORD" (2 bytes) or "DWORD" (4 bytes) is stored on an S7-200 in "big-endian" format.

Address n:	MSB	
Address n+1:	LSB	(for DWORD accordingly)

Alternate configuration of the IT functions

STEP 7 Micro/WIN 32 creates the configuration files for the IT functions. In principle, these files could also be created or manipulated by a conventional text editor without STEP 7 Micro/WIN 32. For the structures of the configuration files, see chapters 4.4.6, 4.4.7 and 4.4.8.

Caution

Only STEP 7 Micro/WIN 32 should be used to create and change the IT configuration files. If other tools (e.g., text editors) are used to create or change these files, configuration errors may not be detected. If you do this anyway, there is no guarantee whatsoever that the CP 243-1 IT or the components connected in the network will function correctly.

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4.4.1 Occupied System Flag Area (SM Area)

The CP 243-1 IT occupies 50 bytes in the system flag area of the S7-200 CPU. The address of these 50 bytes depends on the current position a CP 243-1 IT occupies in an S7-200 system. These 50 bytes primarily contain general information and status information of the CP 243-1 IT. The last four bytes contain a pointer with which the configuration data of the CP 243-1 IT can be accessed. These configuration data is located consecutively in the variable memory of the S7-200 CPU. These data is divided into the following data blocks.

- Configuration Data Block (CDB)
- Network Parameter Block (NPB)
- Network Data Block (NDB)
- Internet Data Block (IDB)

The following table shows the relationship between the position of a module in the S7-200 system and the related system memory / special flags.

Position in S7-200 System	Occupied System Flag Area
CPU	-
0	200 to 249
1	250 to 299
2	300 to 349
3	350 to 399
4	400 to 449
5	450 to 499
6	500 to 549

Table 6 System flag area

Note

When using firmware version less than 1.20 then the CP 243-1 IT must be in position 0 (next to the CPU) or it may be in position 1 if another intelligent module occupies position 0.

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4.4.2 Structure of Configuration Data Block (CDB)

The CDB is created by the Internet wizard in STEP 7 Micro/WIN 32. The structure of the CDB is shown below in the following table.

Byte Offset in Variable Memory	Description	Data Format	Example
Header			
0-4	Module name	5 bytes, ASCII	16#4350323433 “CP243”
5-6	Length of the CDB	2 bytes, hex	16#006C (108, decimal)
7-8	Length of the NPB	2 bytes, hex	16#0014 (20, decimal)
General information			
9	Internal system use	1 byte, hex	
10	Internal system use	1 byte, hex	
11-12	Reserved for STEP 7 Micro/WIN 32	2 bytes, hex	
13-14	Common flag Bit [0] Duplex mode 0: Half duplex 1: Full Duplex Bit [1] Data rate 0: 10 Mbit/sec 1: 100 Mbit/sec Bit [2] Auto negotiation 0: No auto negotiation 1: Auto negotiation Bit [3] BOOTP 0: Use configured network parameters 1: BOOTP Bit [4-7] Not used Bit [8-15] CRC validation 16#00 CRC check activated 16#AC CRC check deactivated	2 bytes, hex	16#0004: Auto negotiation Use configured network parameters CRC check activated 16#AC04: Auto negotiation Use configured network parameters CRC check activated
15-18	Configured IP address This field should be set to 16#00000000 when BOOTP is being used.	4 bytes, hex	192.12.45.23: 16#C00C2D17
19-22	Configured subnet mask This field should be set to	4 bytes, hex	255.255.255.0: 16#FFFFFF00

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Byte Offset in Variable Memory	Description	Data Format	Example
	16#00000000 when BOOTP is being used.		
23-26	IP address of the gateway 16#00000000 means: Don't use gateway. This field should be set to 16#00000000 when BOOTP is being used.	4 bytes, hex	192.12.45.24: 16#C00C2D18
27-28	Keep Alive time parameter in seconds	2 bytes, hex	16#001E: 30 seconds
S7 connection 0 section (If not all bytes of this section are used, fill them with16#00.)			
29	Flag byte Bit [0] Server/client 0: Server 1: Client Bit [1] Keep Alive 0: No Keep Alive support 1: Keep Alive support Bit [2-6] Not used Bit [7] Section valid 0: Section not used 1: Section used	1 byte, hex	16#82: Server. Keep Alive support. S7 connection 0 is being used and contains valid data.
30-33	With server functionality: IP address area of client for access protection 16#00000000: No protection 16#XXXXXX00 Client of same class-C segment is permitted. 16#XXXXXXXX Only exactly the same address is permitted. With client functionality: IP address of the S7 server	4 bytes, hex	192.12.45.22: 16#C00C2D16.
34-35	Local TSAP	2 bytes, hex	16#1000
S7 connection 1 section (If not all bytes of this section are used, fill them with16#00.)			
38	Flag byte See S7 connection 0 section.	1 byte, hex	See S7 connection 0 section.
39-42	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.
43-44	Local TSAP	2 bytes, hex	16#1100
45-46	Remote TSAP	2 bytes, hex	See S7 connection 0 section.

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Byte Offset in Variable Memory	Description	Data Format	Example
S7 connection 2 section (If not all bytes of this section are used, fill them with16#00.)			
47	Flag byte See S7 connection 0 section.	1 byte, hex	See S7 connection 0 section.
48-49	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.
52-53	Local TSAP	2 bytes, hex	16#1200
54-55	Remote TSAP	2 bytes, hex	See S7 connection 0 section.
S7 connection 3 section (If not all bytes of this section are used, fill them with16#00.)			
56	Flag byte See S7 connection 0 section.	1 byte, hex	See S7 connection 0 section.
57-60	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.
61-62	Local TSAP	2 bytes, hex	16#1300
63-64	Remote TSAP	2 bytes, hex	See S7 connection 0 section.
S7 connection 4 section (If not all bytes of this section are used, fill them with16#00.)			
65	Flag byte See S7 connection 0 section.	1 byte hex	See S7 connection 0 section.
66-69	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.
70-71	Local TSAP	2 bytes, hex	16#1400
72-73	Remote TSAP	2 bytes, hex	See S7 connection 0 section.
S7 connection 5 section (If not all bytes of this section are used, fill them with16#00.)			
74	Flag byte See S7 connection 0 section.	1 byte, hex	See S7 connection 0 section.
75-78	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.
79-80	Local TSAP	2 bytes, hex	16#1500
81-82	Remote TSAP	2 bytes, hex	See S7 connection 0 section.
S7 connection 6 section (If not all bytes of this section are used, fill them with16#00.)			
83	Flag byte See S7 connection 0 section.	1 byte, hex	See S7 connection 0 section.
84-87	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.

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Byte Offset in Variable Memory	Description	Data Format	Example
88-89	Local TSAP	2 bytes, hex	16#1600
90-91	Remote TSAP	2 bytes, hex	See S7 connection 0 section.
S7 connection 7 section (If not all bytes of this section are used, fill them with16#00.)			
92	Flag byte See S7 connection 0 section.	1 byte, hex	See S7 connection 0 section.
93-96	IP address of the partner See S7 connection 0 section.	4 bytes, hex	See S7 connection 0 section.
97-98	Local TSAP	2 bytes, hex	16#1700
99-100	Remote TSAP	2 bytes, hex	See S7 connection 0 section.
STEP 7 Micro/Win server section			
101	Flag byte Bit [0] Server 0: Server 1: Not supported Bit [1] Keep Alive 0: No Keep Alive support 1: Keep Alive support Bit [2-6] Not used Bit [7] Section valid 0: Not supported 1: Section used	1 byte, hex	16#82: Server. Keep Alive support. STEP 7 Micro/WIN server section is being used and contains valid data.
102-105	Internal system use	4 bytes, hex	
CRC section			
106-107	CRC covering all CDB bytes without the CRC section itself	2 bytes, hex	

Table 7 Structure of the CDB

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4.4.3 Structure of the Network Parameter Block (NPB)

The CP 243-1 IT creates this data block automatically based on the current record of the network parameters. It contains the currently used TCP/IP parameter values if the CP 243-1 IT was configured correctly. If configuration errors occurred, the NPB does not contain valid entries.

Byte Offset in Variable Memory	Description	Calculation of the Value	Data Format	Example
108-109	Common flag byte Bit [0] Duplex mode 0: Half duplex 1: Full duplex Bit [1] Data rate 0: 10 Mbit/sec 1: 100 Mbit/sec Bit [2] Auto negotiation 0: No auto negotiation 1: Auto negotiation Bit [3] BOOTP 0: Use configured network parameters. 1: BOOTP Bit [4-15] Not used	Varies with the current configuration	2 bytes, hex	16#04: Auto negotiation Use configured network parameters.
110-113	Current IP address	Varies with the current configuration	4 bytes, hex	192.12.45.23: 16#C00C2D17
114-117	Current subnet mask	Varies with the current configuration	4 bytes, hex	255.255.255.0: 16#FFFFFF00
118-121	IP address of the current gateway	Varies with the current configuration	4 bytes, hex	192.12.45.24: 16#C00C2D18
122-127	MAC address	Read from hardware	6 bytes, hex	16#080006021F04 08-00-06-02-1F-04

Table 8 Structure of the NPB

4.4.4 Structure of the Network Data Block (NDB)

The NDB is created by the Internet wizard in STEP 7 Micro/WIN 32. The read/write requests possible for clients are configured in this data block. Up to 32 read/write requests can be configured for each of the 8 possible S7 transmission channels. When the CP 243-1 IT is the server on a channel, there is no entry in the NDB structure for this channel.

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The structure of the NDB is shown in the following table. The identifiers for read/write requests are represented by the letters n, m, p = 0, ..., 31 and the channel identifiers with the letters r = 0, ...,7.

Byte Offset in Variable Memory	Name	Description	Data Format
Header			
128-129	NDB_LENGTH	Specifies the length of the NDB	2 bytes, hex
Entries for the first client			
130	COM_CH0_ID	Identifier of the first client channel	1 byte, hex
131	COM_CH0_OFF	Specifies the offset to the first communication block (COM0)	1 byte, hex
132	COM_CH0_LEN0	Specifies the length of the first communication block (COM0)	1 byte, hex
	...		n bytes
n+132	COM_CH0_LENn	Specifies the length of the COMn structure	1 byte, hex
n+5	COM_CH0_0	COM0 structure for read/write request 0 for first client channel "<op>=<cnt>,<local_buffer>,<remote_buffer>" (For a description, see Table 10)	ASCII
...	...	...	ASCII
$n+5+\sum_{i=0}^{n-1} COM_CH0_LENi$	COM_CH0_n	COMn structure for read/write request n for first client channel "<op>=<cnt>,<local_buffer>,<remote_buffer>" (For a description, see Table 10)	ASCII
Entries for the second client channel			
...	COM_CH1_ID	Identifier of the second client channel	1 byte, hex
...	COM_CH1_OFF		1 byte, hex
...	COM_CH1_LEN0		1 byte, hex
...	...		1 byte, hex
...	COM_CH1_LENm		1 byte, hex
...	COM_CH1_0		ASCII
...	...		ASCII
...	COM_CH1_m		ASCII
...	...	(up to 8 channels)	
Entries for the rth client channel			
...	COM_CHr_ID	Identifier of the last client channel	1 byte, hex
...	COM_CHr_OFF		1 byte, hex
...	COM_CHr_LEN0		1 byte, hex
...	...		1 byte, hex
...	COM_CHr_LENp		1 byte, hex
...	COM_CHr_0		ASCII

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Byte Offset in Variable Memory	Name	Description	Data Format
...	...		ASCII
...	COM_CHr_p		ASCII
CRC section			
The last two bytes of the NDB	CRC for all NDB bytes without the CRC section itself	2 bytes, hex	The last two bytes of the NDB

Table 9 Structure of the NDB

Name	Description	Data Format
<op>	Request type Value range: R for read W for write	ASCII
<cnt>	Number of bytes to be transferred Value range: 1 to 212	ASCII
<local_buffer>	Address of the memory area in the local system Value range: VB0 to VBx, whereby x is the max. V address	ASCII
<remote_buffer>	Address of the memory area on the communication partner Value range: IB0 to IBx, whereby x is the max. input address (S7-200 / S7-300 / S7-400) QB0 to QB, whereby x is the max. output address (S7-200 / S7-300 / S7-400) MB0 to MBx, whereby x is the max. memory address (S7-200 / S7-300 / S7-400) VB0 to VBx, whereby x is the max. variable address (S7-200) DB0.DBB0 to DBx.DBBy, whereby x is the max DB number, and y is the highest address in the data block within the DB (S7-300 / S7-400)	ASCII

Table 10 Configuration of the read/write requests

4.4.5 Structure of the Internet Data Block (IDB)

The IDB is created by the Internet wizard in STEP 7 Micro/WIN 32. The structure of the IDB is shown in the following table.

The IDB immediately follows the NDB in variable memory. Since the length of the NDB varies with the current configuration, no general start address can be given for the IDB. The byte offsets in the table below all refer to this start address.

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Byte Offset in Variable Memory	Description	Data Format	Example
Header			
0-1	Length of the IDB (with CRC)	2 bytes, hex	16#43 = 67 bytes
2	Length of the general section	1 byte, hex	16#32 = 50 bytes
3	Length of the SMTP client section	1 byte, hex	16#02 = 2 bytes
4	Length of the FTP client section	1 byte, hex	16#02 = 2 bytes
5	Length of the FTP sever section	1 byte, hex	16#02 = 2 bytes
6	Length of the HTTP sever section	1 byte, hex	16#02 = 2 bytes
General section			
7	Internal system use	1 byte, hex	
8	Global flag byte Bit [0] Admin rights flag 0: Access only to FTP server 1: Access to all IT functions (incl. Web) Bit [1] - [7] Reserved	1 byte, hex	16#01 Admin. is enabled for all IT functions.
9 - 24	CP 243-1 IT admin. user name User name, min. of 1, max. of 16 characters long Unused bytes are filled with 16#00.	16 ASCII characters (bytes)	"admin" 16#61 'a' Byte 0 16#64 'd' Byte 1 16#6d 'm' Byte 2 16#69 'i' Byte 3 16#6e 'n' Byte 4 16#00 '\0' Bytes 5 - 15
25 - 56	CP 243-1 IT admin password The password is encrypted and stored with a character length of up to 32 characters. The actual password length is a min. of 8 and a max. of 16 characters. Unused bytes are filled with 16#00.	32 ASCII characters (bytes)	"admin123" 16#31 '1' Byte 0 16#72 'r' Byte 1 16#4A 'J' Byte 2 16#7B '{' Byte 3 16#66 'f' Byte 4 16#77 'w' Byte 5 16#79 'y' Byte 6 16#72 'r' Byte 7 16#00 '\0' Bytes 8 - 31
SMTP client section			
57- 58	SMTP client flag Bit [0] Enable bit 0: Disabled 1: Enabled Bit [1] - [15] Reserved	2 bytes, hex	16#0001 SMTP client enabled

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Byte Offset in Variable Memory	Description	Data Format	Example
FTP client section			
59 - 60	FTP client flag Bit [0] Enable bit 0: Disabled 1: Enabled Bit [1] - [15] Reserved	2 bytes, hex	16#0001 FTP client enabled
FTP server section			
61 - 62	FTP server flag Bit [0] - [15] Reserved	2 bytes, hex	16#0000
HTTP client section			
63 - 64	HTTP server flag Bit [0] Enable bit 0: Disabled 1: Enabled Bit [1] - [15] Reserved	2 bytes, hex	16#0001 HTTP client enabled
CRC section			
65 - 66	CRC	2 bytes, hex	

Table 11 Structure of the IDB

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4.4.6 Structure of the Configuration File for User Administration (.udb File)

The configuration file for the user administration is created by the Internet wizard in STEP 7 Micro/WIN 32 and stored in a file with the extension .udb. The structure of this file is shown in the following table.

Only the administrator entered in the configuration of the CP 243-1 IT is permitted to transmit a .udb file via FTP to the file system of the CP 243-1 IT. It is thus not possible to transfer the configuration file for the user administration to the file system of the CP 243-1 IT until such an administrator is created.

Key Word in the .udb File	Description	Example
General information		
TIMESTAMP	Time stamp Time in seconds since 01.01.1970, in hexadecimal format (PC time with reference to the creation of the file *.udb by STEP 7 Micro/WIN 32) During running operation, the CP 243-1 IT continuously monitors this element for change. When a change is determined, the .udb file is completely read and the user administration of the CP 243-1 IT is reconfigured.	TIMESTAMP=3D2C4E48 Corresponds to 15:10:00 o'clock on 07.10.2002
FILETYPE	File type Used internally by the system	FILETYPE=UDB Don't change. Fixed value!
FILEFORMAT	File format Used internally by the system	FILEFORMAT=xx Don't change. Fixed value!
User 00 (identification of the 8 possible users with 00, 01, ...06, 07)		
00|	Parameter record of user 00 Access rights, user name, password, each separated by |	00|<*access rights*>|<*User name*>|<*password*> For a description, see Table 13
User 01 (identification of the 8 possible users with 00, 01, ...06, 07)		
01|	Parameter record of user 01 Access rights, user name, password, each separated by |	01|<*Access rights*>|<*User name*>|<*Password*> For a description, see Table 13
...	...	...
...	...	...
User 07 (identification of the 8 possible users with 00, 01, ...06, 07)		
07|	Parameter record of user 07 Access rights, user name, password, each separated by |	07|<*Access rights*>|<*User name*>|<*Password*> For a description, see Table 13
END	End identifier	

Table 12 Structure of the configuration file for user administration

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Parameter	Description	Example
Access rights	The access rights are represented in hexadecimal format. Bit [0-1] Not used Bit [2] Read access to data of the S7-200 CPU via the HTTP server 0: No 1: Yes Bit [3] Read and write access to data of the S7-200 CPU via the HTTP server 0: No 1: Yes Bit [4-5] Not used Bit [6] Access to status page of the CP 243-1 IT via HTTP server 0: No 1: Yes Bit [7-15] Not used Bit [16] Access to all FTP functions 0: No 1: Yes Bit [17-31] Not used	00|00010048|<*User name*>|<*Password*> - Read and write access via HTTP - Access to status page of the CP 243-1 IT via HTTP server - Access to all FTP functions
User name	The user name is presented in plain text and consists of 1 to 32 characters.	00|00000040|Status_CP|<*Password*> The user with the user name Status_CP is authorized to read the status of the CP 243-1 IT.
Password	The password is encrypted and stored with a character length of up to 64 characters (actual password length is between 1 and 32 characters).	00|00010000|<*User name*>|W9vQ}G cfH The user with the password !state_Cp1 (encrypted: W9vQ}G cfH) is authorized to execute all FTP functions.

Table 13 Structure of the parameter record of a user

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Example of a user configuration file

```
# This is a comment
TIMESTAMP=3D2C4E48
FILETYPE=UDB
FILEFORMAT=01
00|00010048|Benutzer_mit_allen_Rechten|C~WB1"
01|00000040|Status_CP|UX3MUppLjRzn*R
02|00010000|FTP_Zugriff|W9vQ}G cfH
03|00000000||
04|00000000||
05|00000000||
06|00000000||
07|00000000||
END
# End of File
```

Note

- Comments are added to the file with the # character.
- A blank user entry is rejected in the .udb file as follows: *0x|00000000|||* (whereby x stands for the current user number)
- The last character of a line is a \n.
- All ASCII characters between $0x21_{HEX}$ and $0x7E_{HEX}$ can be used for the user name and password if they are acceptable to the communication partners involved.
- Blank lines are not permitted.

Caution

When you change the .udb file manually, be sure to use a unique user name. Also adhere to the specified lengths for the user names and the passwords. The maximum number of users may not be exceeded.

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4.4.7 Structure of the Configuration File for the E-Mail Client (.edb File)

The configuration file for the e-mail client is created by the Internet wizard in STEP 7 Micro/WIN 32 and stored in a file with the extension .edb. The table below shows the structure of this file.

Key Word in the .edb File	Description	Example
General		
TIMESTAMP	Time stamp Time in seconds since 01.01.1970, in hexadecimal format (PC time with reference to the creation of the file *.edb by STEP 7 Micro/WIN 32) During running operation, the CP 243-1 IT continuously monitors this element for change. When a change is determined, the .edb file is completely read and the e-mail service of the CP 243-1 IT is reconfigured.	TIMESTAMP=3D2C4E48 Corresponds to 15:10:00 o'clock on 07.10.2002
FILETYPE	File type Used internally by the system	FILETYPE=EDB Don't change. Fixed value!
FILEFORMAT	File format Used internally by the system	FILEFORMAT=xx Don't change. Fixed value!
FROM	Sender address of the station sending the e-mail	FROM=Anlage.Werk2@Firma.com
SMTPSA1	IP address of the e-mail server	SMTPSA1=192.168.1.10
SMTPSP1	Port address of the e-mail server	SMTPSP1=25
SMTPSA2	IP address of the substitute e-mail server	SMTPSA2=192.168.162.97
SMTPSP2	Port address of the substitute e-mail server	SMTPSP2=25
E-mail 00 (identification of the 32 possible e-mails with 00, 01, 02...30, 31)		
00|TO|	Recipient address of e-mail 00	00|TO|Name.Name@provider.de
00|CC|	Optional recipient address which is to receive a copy of e-mail 00 (max. of 64 characters)	00|CC|Name.Name@provider.de
00|SU|	Subject	00|SU|Status Station 4
00|TX|	Text	00|TX|Malfunction in system section 10
E-mail 01 (identification of the 32 possible e-mails with 00, 01, 02...30, 31)		
01|TO|	Recipient address of e-mail 01	01|TO|Name.Name@provider.de
01|CC|	Optional recipient address which is to receive a copy of e-mail 01	01|CC|Name.Name@provider.de
01|SU|	Subject	01|SU|Note for station 4

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Key Word in the .edb File	Description	Example
01|TX|	Text	01|TX|This is a \n\t text with formatting.
...	...	...
...	...	...
E-mail 31(identification of the 32 possible e-mails with 00, 01, 02...30, 31)		
31|TO|	Recipient address of e-mail 31	31|TO|Name.Name@provider.de
31|CC|	Optional recipient address which is to receive a copy of e-mail 31	31|CC|Name.Name@provider.de
31|SU|	Subject	31|SU|Temperature station 4
31|TX|	Text	31|TX|Temperature = %VD100:4.2F%°C
END	End identifier	

Table 14 Structure of the configuration file for the e-mail client

Example of an e-mail configuration file

```
# This is a comment
TIMESTAMP=3D2C4E48
FILETYPE=EDB
FILEFORMAT=01
FROM= Anlage.Werk2@Firma.com
SMTPSA1=192.168.1.10
SMTPSP1=25
SMTPSA2=192.168.162.97
SMTPSP2=25
00|TO|Name.Name@provider.de
00|CC|Name.Name@provider.de
00|SU|Status Station 4
00|TX|Störung im Anlagenabschnitt 10
01|TO|Name.Name@provider.de
01|CC|Name.Name@provider.de
01|SU|Hinweis Station 4
01|TX|Dies ist ein Text \n\t mit Formatierung
02|TO|
02|CC|
02|SU|
02|TX|
....
30|TO|
30|CC|
30|SU|
30|TX|
31|TO|Name.Name@provider.de
31|CC|Name.Name@provider.de
31|SU|Temperatur Station 4
31|TX|Temperatur = %VD100:4.2F%°C
END
# End of File
```


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Note

- Commentary is added to the file with the # character.
- Valid e-mails must have entries in the fields TO, SU and TX.
- The last character of a line is \n.
- The recipient address TO and CC may not contain more than 64 ASCII characters.
- The subject SU may not contain more than 128 ASCII characters.
- The e-mail text TX may not contain more than 1024 ASCII characters (incl. e-mail tags and formatting characters).
- The sender address FROM may not contain more than 64 ASCII characters.
- All characters between $0x21_{HEX}$ and $0x7E_{HEX}$ can be used for TO, CC, SU and TX if this is acceptable to the e-mail partners involved.
- Blank lines are not permitted.

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4.4.8 Structure of the Configuration File for the FTP Client (.fdb File)

The configuration file for the FTP client is created by the Internet wizard in STEP 7 Micro/WIN 32 and stored in a file with the extension .fdb. The structure of this file is shown in the table below.

Key Word for the .fdb File	Description	Example
General		
TIMESTAMP	Time stamp Time in seconds since 01.01.1970, in hexadecimal format (PC time with reference to the creation of the file *.fdb by STEP 7 Micro/WIN 32) During running operation, the CP 243-1 IT continuously monitors this element for change. When a change is determined, the .fdb file is completely read and the FTP client service of the CP 243-1 IT is reconfigured.	TIMESTAMP=3D2C4E48 Corresponds to 15:10:00 o'clock on 07.10.2002
FILETYPE	File type Used internally by the system	FILETYPE=FDB Don't change. Fixed value!
FILEFORMAT	File format Used internally by the system	FILEFORMAT=xx Don't change. Fixed value!
FTP request 00 (identification of the 32 possible FTP requests with 00, 01, ...30, 31)		
00|	Parameter record of FTP request 00 Action, number of bytes, DB start address, path/file name, server address, user name, password, all separated by a |	00|*<Action>*|*<Number of bytes>*|*<DB start address >*|*<Path/file name>*|*<Server address >*|*<User name>*|*<Password>* For a description, see Table 16
FTP request 01 (identification of the 32 possible FTP requests with 00, 01, ...30, 31)		
01|	Parameter record of FTP request 01 Action, number of bytes, DB start address, path/file name, server address, user name, password, all separated by a |	01|*<Action>*|*<Number of bytes>*|*<DB start address >*|*<Path/file name>*|*<Server address >*|*<User name>*|*<Password>* For a description, see Table 16
...	...	...
...	...	...
FTP request 32 (identification of the 32 possible FTP requests with 00, 01, ...30, 31)		
31|	Parameter record of FTP request 31 Action, number of bytes, DB start address, path/file name, server address, user name, password, all separated by a |	31|*<Action>*|*<Number of bytes>*|*<DB start address >*|*<Path/file name>*|*<Server address >*|*<User name>*|*<Password>* For a description, see Table 16
END	End identifier	

Table 15 Structure of the configuration file for the FTP client

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Parameter	Description	Example
Action	The FTP client supports the following actions. W: Read the data block or part of the data block and store in a file in binary format. This file is then transferred to an FTP server and copied to the file system there. R: Request file from an FTP server. Contents of the file are then copied to this data block or parts of this data block. D: Delete file from file system of the FTP server.	00|**W**|<*Number of bytes*>|<*DB start address*>|<*Path/file name*>|<*Server address* >|<*User name*>|<*Password*> 00|**R**|<*Number of bytes*>|<*DB start address*>|<*Path/file name*>|*Receiver address* >|<*User name*>|<*Password*> 00|**D**|||<Path/file name>|<Receiver address>|<User name>|<Password>
Number of bytes	Number of bytes (0 to max. of 10240 with CPU226XM) which can be written to the DB or read from the DB.	00|W|**5354**|<*DB start address*>|<*Path/file name*>|*Server address*>|<*User name*>|<*Password*> Starting with address <*DB start address*>, 5354 bytes are read from the DB of the CPU and, using <*User name*> and <*Password*>, written to the file <*Path/file name*> on the computer specified by <*Server address*>.
DB start address	Start address starting at which the DB block can be read or written. The value range refers to the size of the actual DB (varies with the CPU, with CPU226XM between 0 and 10239).	00|R|5354|**VB2308**|<*Path/file name*>|<*Server address*>|<*User name*>| <*Password*> The file <*Path/file name*> is transferred from the file system of the FTP server addressed via the IP <*Server address*> (stating <*User name*> and <*Password*>) to the FTP client of the CP 243-1 IT. There 5354 bytes from the file are written to the DB of the CPU starting at address VB2308.
Path/file name	Specification of the file in which/to which data is to be read or written, including the related path information. The file name may contain up to 254 characters. The complete path including file name may not exceed 1024 characters.	00|R|23|VB11|**/flash:/dat/CPU10_VB11_23.dat**| <*Server address*>|<*User name*>| <*Password*> The file /flash:/dat/CPU10_VB11_23.dat is transferred from the file system of the FTP server addressed via the IP <*Server address*> (stating <*User name*> and <*Password*>) to the CP 243-1 IT. There 23 bytes from the file are written to the DB of the CPU starting at address VB11.

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Parameter	Description	Example
Server address	Entry of the IP address under which the FTP server can be accessed	00|R|23|VB11|/flash:/dat/CPU10_VB11_23.dat| **192.168.162.65**|<*User name*>| <*Password*> The file /flash:/dat/CPU10_VB11_23.dat is transferred from the file system of the FTP server which can be accessed via IP address 192.168.162.65 (stating <*User name*> and <*Password*>) to the CP 243-1 IT. There 23 bytes from the file are written to the DB of the CPU starting at address VB11
User Name	Valid user name on the addressed FTP server Is written in plain text and consists of 1 to 32 characters.	00|R|23|VB11|/flash:/dat/CPU10_VB11_23.dat| 192.168.162.65|**FTP_Server_4**| <*Password*> The file /flash:/dat/CPU10_VB11_23.dat is transferred from the file system of the FTP server which can be accessed via IP address 192.168.162.65 (stating user name FTP_Server4 and <*Password*>) to the CP 243-1 IT. There 23 bytes from the file are written to the DB of the CPU starting at address VB11
Password	The password belonging to the specified user name Is encrypted and stored with a character length of up to 64 characters. The actual password length is between 1 and 32 characters.	00|R|23|VB11|/flash:/dat/CPU10_VB11_23.dat| 192.168.162.65|FTP_Server_4| **W9vQ}G cfH** The file /flash:/dat/CPU10_VB11_23.dat is transferred from the file system of the FTP server which can be accessed via IP address 192.168.162.65 (stating user name FTP_Server4 and password Istate_Cp1) to the CP 243-1 IT. There 23 bytes from the file are written to the DB of the CPU starting at address VB11

Table 16 Structure of the parameter record for an FTP request

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Example of an FTP client configuration file

```
# This is a comment
TIMESTAMP=3D2C4E48
FILETYPE=FDB
FILEFORMAT=01
00|W|1|VB0|station99_VB0_1.dump|192.168.232.13|FTP_Server_2|3AqW&4Cv
01|W|1024|VB256|/station36_VB256_1024.data|192.168.232.13|FTP_Server_2|3AqW&4Cv
02|R|5|VB2|/data/station36_VB2_5.err|192.168.232.2|FTP_Server_3|asw345Df
03|R|23|VB11|/flash:/dat/CPU10_VB11_23.dat|192.168.162.65| FTP_Server_4| W9vQ}G cfH
04|||||||
05|||||||
06|||||||
07|D|||/data/station36_VB2_5.err|192.168.232.2|FTP_Server_3|asw345Df
08|||||||
.....
30|||||||
31|||||||
END
# End of File
```

Note

- Commentary is added to the file with the # character.
- A blank user entry in the .fdb file is stored as follows: *xx*||||||| (whereby xx stands for the running FTP client request number)
- The last character of a line is \n.
- All characters between $0x21_{HEX}$ and $0x7E_{HEX}$ can be used for path, file name, user name and password if this is acceptable to the communication partners involved.
- The following additional restrictions apply to directory and file names.
  Not supported: blanks ; \ ; / ; | ; < ; > ; “ ; : ; * and ?
- Blank lines are not permitted.

Caution

With a READ action, <*Number of bytes*> is usually between 0 and 10240 (maximum with the CPU 226XM).

When the value 0 is entered, the CP 243-1 IT does not check the actual file length. All data in the file are read and, starting with <*DB start address*>, copied to the V-Memory of the S7-200 CPU if this does not exceed the memory size.

If the number of data bytes to be read is not 0, the CP 243-1 IT checks during the data transmission to determine whether the specified number of bytes has already been reached and, if so, concludes the copy procedure. This procedure offers a high degree of security and protects the unsecured memory area of the S7-200 CPU from being overwritten accidentally.

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4.5 Configuration of a Communication Partner with STEP 7

Using the example of an S7-300 system, this chapter describes the configuration steps that must be performed in STEP 7 so that such a system is able to communicate with an S7-200 system via the related Ethernet communications processor. The procedure is similar for S7-400 systems.

For detailed information on the configuration steps, see the STEP 7 description or the manuals of the CP 343-1 and CP 443-1.

With S7-300 and S7-400 systems, a distinction is made between configured and free connections. With configured connections, the connection parameters are specified by the user. Free connections must not be configured in STEP 7.

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Configured connections

If you want to use a configured connection, first insert a new S7 connection in the STEP 7 program packet NetPro. In the dialog "Insert new connection," specify the type of station with which you want to establish a connection. As connection partner, select the type "unspecified."

The next step is to configure this connection. In the dialog "Properties - S7-connection" (see Fig. 8), specify whether your S7-300 or S7-400 system is to be the active or passive station. If your S7-300 or S7-400 system is to communicate with an S7-200 system, you must also specify whether your system is the client or the server. If you want your S7-300 or S7-400 to be the client, activate the entry "Establish an active connection". If this entry is not activated, your system will be the server. Then specify that your S7 connection is to be handled via TCP/IP. Select the item "TCP/IP." Also specify its IP address so that a TCP/IP connection can be established with your partner.

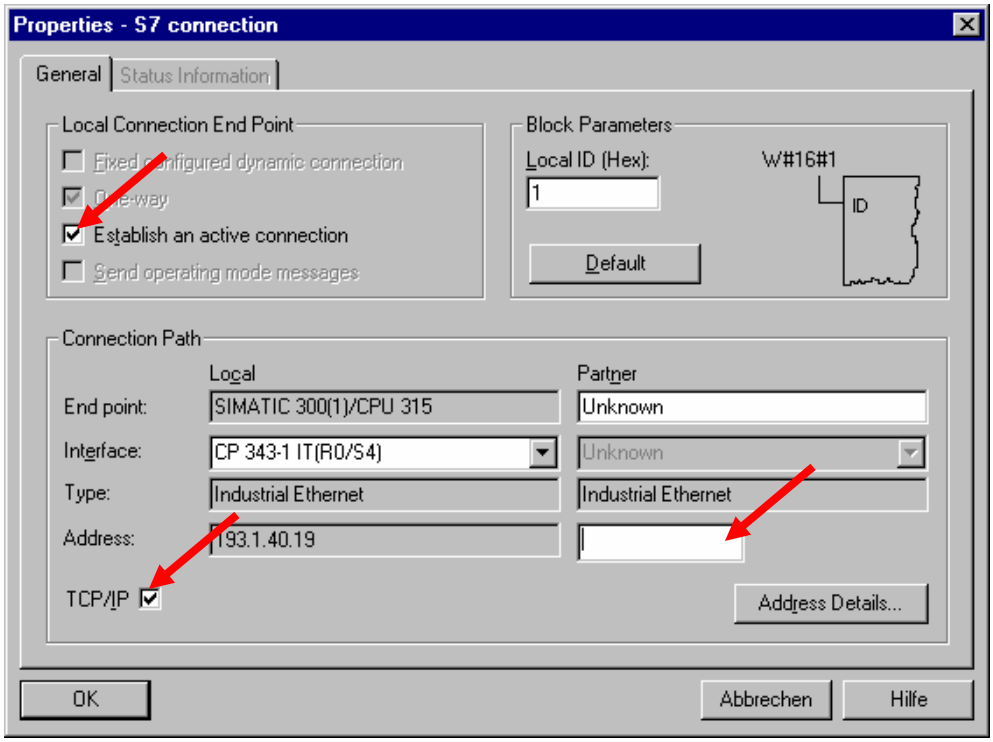


Fig. 8 Dialog "Properties – S7 connection"

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In the dialog "Adress details" you can specify the communication access points ("TSAPs") to be used. You will find the TSAP of a connection in the S7-200 system in STEP 7 Micro/WIN 32 in the dialog in which you configured the individual connections under the entry "Local Properties." Enter the communication access point specified there in the dialog "Adress details" in the fields provided for the TSAP of the partner. The communication access point assigned in your S7-300 or S7-400 system for the connection is located in the same dialog under the entry "Local" in the field "TSAP." Take the value indicated there and enter it in the entry "Remote Properties" in the field "TSAP" with STEP 7 Micro/WIN 32 in the dialog from which you took the communication access point used there.

S7-300 system as client

If you want to use an S7-300 system as client (i.e., you have activated "Active connection generation" in the dialog " Properties - S7 connection "), you can't just use STEP 7 Micro/WIN 32 and enter the TSAP specified in STEP 7 in the entry "Local" as the connection access point for your S7-300 system. Instead you must first reshape this TSAP according to the following rules.

1st byte of the TSAP:
Is taken from STEP 7, dialog "Adress details," entry "Local," field "TSAP"

2nd byte of the TSAP:
Is derived from the rack and the slot of your Ethernet communications processor on your S7-300 system. The first 3 bits contain the number of the rack in which your Ethernet communications processor is installed on your S7-300 system. The remaining 5 bits contain the slot of your Ethernet communications processor in your S7-300 system.
You will find these two pieces of information in the STEP 7 program packet HW-Config.

Example

Your S7-300 system contains a CP 343-1 in slot 4 of rack 0. When you configure a connection with STEP 7, this is indicated as local TSAP value 10.02. With STEP 7 Micro/WIN 32 use TSAP 10.04 as the communication access point on the S7-300 system. 1st byte (10 in our example) is accepted. 2nd byte is derived from the rack (0 in our example) and the slot (4 in our example).

Caution

The specifications of communication access points ("TSAPs") in STEP 7 and in STEP 7 Micro/WIN 32 must be compatible with each other. No client services operated from communication partners are allowed to a CP's client connection. A clear client-server connection is indispensable.

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Free connections

A free connection can only be used when your S7-300 or S7-400 system is to be the server. Free connections do not have to be configured in STEP 7. Standard S7-300 and S7-400 systems are designed so that they can communicate via free connections.

If you want to take advantage of the free connection routine on your S7-300 or S7-400 system, the client side must still be configured for each of these connections. STEP 7 Micro/WIN 32 does not distinguish between the use of such connections and communication via connections which were configured on the S7-300 or S7-400 system. Just remember that, with free connections, the first byte of the TSAP with which such connections run on S7-300 and S7-400 systems must always have the value 0x03. The second byte of the TSAP is derived similar to the above described procedure from the rack and the slot number of the CPU used on your S7-300 or S7-400 system. This means that, with a free connection, the communication access point on the S7-300 or S7-400 system is always located on the CPU and not on the Ethernet communications processor.

Note

S7-200 systems do not support free connections. This means that, with an S7-200 system, you will always have to configure each connection no matter whether your system is being used as a client or a server.

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4.6 Reaction of the CP 243-1 IT to Configuration Errors

When the CP 243-1 IT detects an invalid configuration, it tries to obtain its TCP/IP address parameters (IP address, subnet mask and IP address of the gateway) via a BOOTP service. The CP 243-1 IT continues to attempt this for approx. 1 minute. When it fails to receive a reply from a BOOTP service within this time or the reply is invalid or has errors, the red LED ("SF") flashes for approx. 30 seconds. This procedure continues cyclically until the CP 243-1 IT either finds a valid configuration in the memory of the S7-200 CPU or receives a valid reply from a BOOTP server.

When the CP 243-1 IT receives a valid BOOTP response, it configures itself as shown below.

- IP address, subnet mask and IP address of the gateway are taken from the BOOTP response.
- The transmission type is set to "Auto Negotiation" (Auto Detect Communications)
- The monitoring time for connections (Keep Alive) is set to 30 seconds.

With this configuration, the CP 243-1 IT is finally able to access the S7-200 CPU via Ethernet from STEP 7 Micro/WIN 32. A new valid configuration can now be obtained in this way. Communication with other controllers is not possible in this state. After a reset, the CP 243-1 IT then accepts the settings of the new configuration.

Note

Auto-Negotiation (Auto Detect Communications) mode will only work when all connected network components support this mode.

Note

If no valid CDB/NDB/IDB configuration exists but the CP 243-1 IT will boot with the aid of a BOOTP server, the functions FTP server and client, e-mail client and HTTP server are not supported. Not until configuration of the administrator with STEP 7 Micro/WIN 32 can the file system of the CP 243-1 IT be accessed. Not until then can the configuration files be transferred to the CP 243-1 IT via FTP again.

Caution

The configuration files stored in the file system of the CP 243-1 IT are detected by the CP 243-1 IT with their extensions (.edb, .udb and .fdb). The configuring user must make sure that only one file of each configuration file type is located in the file system of the CP 243-1 IT.
If the file system contains several configuration files with the same extension, there is no way to predict which of these files will be loaded by the CP 243-1 IT.

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5 Programming

Use STEP 7 Micro/WIN 32 to develop S7-200 user programs. The version STEP 7 Micro/WIN 32 must be V3.2.3 or higher so that you can use the functions of the CP 243-1 IT in these programs.

To be able to use the CP 243-1 IT as an S7, e-mail or FTP client, at least one of the communication channels of the CP 243-1 IT must be configured appropriately. In addition, the user program of the S7-200 must be programmed appropriately.

The CP 243-1 IT is programmed in the S7-200 user program with the following subroutines. The subroutines are named for the position in which a CP 243-1 IT is located in the S7-200 system.

- ETHx_CTRL (x corresponds to the slot position, possible values: 0,1, ...6)
- ETHx_CFG (x corresponds to the slot position, possible values: 0,1, ...6)
- ETHx_XFR (x corresponds to the slot position, possible values: 0,1, ...6)
- ETHx_EMAIL (x corresponds to the slot position, possible values: 0,1, ...6)
- ETHx_FTPC (x corresponds to the slot position, possible values: 0,1, ...6)

At the end of configuration, these subroutines are generated by the Internet wizard integrated in STEP 7 Micro/WIN 32. You will find these subroutines in STEP 7 Micro/WIN 32 in the box with the operations tree under the entry "Subroutine". The data which you entered during configuration determine which subroutines the wizard creates at the end of the configuration.

Note

Regardless of the timeouts defined in appendix C, it is highly recommended for all application programs to define a specific timeout time in the user program for these functions after the S7, e-mail or FTP client requests are started. When this time is exceeded, the request can be terminated by the "abort command" of subroutines ETHx_XFR, ETHx_EMAIL or ETHx_FTPC.

Calls of a Web browser to the HTTP server of the CP 243-1 IT can usually be cancelled by clicking a button in the Web browser dialog.

Caution

The subroutines for programming the CP 243-1 IT may not be called from interrupt routines in the S7-200 user program.

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5.1 ETHx_CTRL

The subroutine ETHx_CTRL initializes and monitors the CP 243-1 IT. You must call this subroutine in your S7-200 user program at the beginning of every cycle if you want to utilize the functions of a CP 243-1 IT. After a user program or a new configuration is downloaded by SETP 7 Micro/Win 32 to the S7-200 CPU and the S7-200 CPU is started again, this subroutine commands the CP 243-1 IT to check for changes in the configuration data. If the CRC checking is enabled the CP 243-1 IT will only restart if a new configuraton is detected. If the CRC checking is disabled then the CP 243-1 It will always restart.

The return values contain information on the general state of the CP 243-1 IT, the state of up to eight possible S7 communication channels and the state of the IT services.

When an error occurs on the CP 243-1 IT, you can read out the error or message code with the Error return parameter. This code is available for a maximum of 60 seconds. The CP 243-1 IT assumes that, during this time, the S7-200 user program has evaluated the error or message code and sets the Error return parameter back to 0 after 60 seconds. This routine prevents outdated error or message codes of the CP 243-1 IT from being returned via the Error parameter for a long period of time.

The subroutine ETHx_CTRL is always created by the Internet wizard of STEP 7 Micro/WIN 32 as soon as the configuration CP 243-1 IT is concluded.

Call:

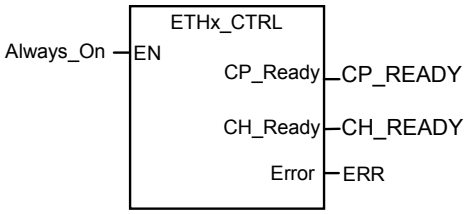


Fig. 9 Calling the subroutine ETHx_CTRL

Input parameters:

Name	Type	Meaning
-	-	-

Table 17 Input parameters (ETHx_CTRL)

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Return parameters:

Name	Type	Meaning
CP_Ready	BOOL	Status of the CP 243-1 IT 0: CP not ready 1: CP ready
CH_Ready	WORD	Status of the individual channels or IT services: (first byte) Bit 0 corresponds to channel 0 Bit 1 corresponds to channel 1 Bit 2 corresponds to channel 2 Bit 3 corresponds to channel 3 Bit 4 corresponds to channel 4 Bit 5 corresponds to channel 5 Bit 6 corresponds to channel 6 Bit 7 corresponds to channel 7 (second byte) Bit 0 corresponds to e-mail service Bit 1 corresponds to FTP client service Bit 2 corresponds to FTP server service Bit 3 corresponds to HTTP server service Bit 4 – 7: Reserved 0: Channel or service not ready 1: Channel or service ready
Error	WORD	Error or message code 0x0000: No error Other: Error (for a description, see chapter 6.2) The error or message code is only available for a maximum of 60 seconds.

Table 18 Return parameters (ETHx_CTRL)

The value 1 in a bit of the CH_Ready return parameter indicates that the related channel or service is ready. This means that a communication connection to the partner specified in the configuration could be established with the communication parameters specified there (IP address, TSAPs, and so on) or an appropriate service was started on the CP 243-1 IT.

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5.2 ETHx_CFG

Calling the subroutine ETHx_CFG causes the CP 243-1 IT to read in the configuration data which is stored in the memory of the S7-200 CPU. The CP 243-1 IT then automatically performs a reset after the subroutine ETHx_CFG is called. The configuration read from the memory of the S7-200 CPU takes effect after the restart following the reset.

You will need this subroutine if you want to reconfigure a CP 243-1 IT dynamically from this program while your S7-200 user program is running. This program is only created by the Internet wizard on STEP 7 Micro/WIN 32 when the CRC routine is not activated there for your configuration. When the subroutine ETHx_CFG is called, the CP 243-1 IT terminates all existing connections and performs a reset. As soon as the CRC routine is activated, however, you can no longer change the configuration from a user program. This is then only possible via the Internet wizard in STEP 7 Micro/WIN 32.

Call:

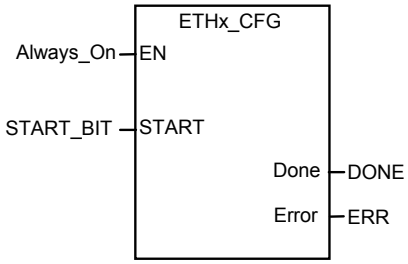


Fig. 10 Call of the subroutine ETHx_CFG

Input parameters:

Name	Type	Meaning
START	BOOL	Input conditions for triggering a new configuration 0: Don't trigger new configuration 1: Trigger new configuration

Table 19 Input parameters (ETHx_CFG)

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Return parameters:

Name	Type	Meaning
Done	BOOL	Status of the subroutine call 0: Subroutine not executed yet 1: Subroutine executed, ready for next execution
Error	BYTE	Error code 16#00: No error Other: Error (for a description, see chapter 6.2)

Table 20 Return parameters (ETHx_CFG)

5.3 ETHx_XFR

Calling the subroutine ETHx_XFR causes the CP 243-1 IT to transfer or request data to another S7 system. The type of data access which your CP 243-1 IT uses is specified in the configuration. This means that you have already specified the following during configuration.

- What data is to be accessed
- Whether the data is to be read or written
- The communication partner from which this data is obtained or to which this data is transferred

When you call the subroutine ETHx_XFR, you specify which of the configured client channels you want to use for which configured data accesses.

The subroutine ETHx_XFR is only created by the Internet wizard in STEP 7 Micro/WIN 32 if you have configured at least one of the channels of the CP 243-1 IT as client. after this action you can trigger data accesses from a S7-200 user program via a CP 243-1 IT.

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Only one subroutine ETHx_XFR per channel can be active at a time. Since parallel execution of several data accesses to one channel is impossible, it is recommended linking the input "START" with both the return value "Done" of the subroutine ETHx_XFR and the applicable bit of the return value "CH_Ready" from the subroutine ETHx_CTRL.

Call:

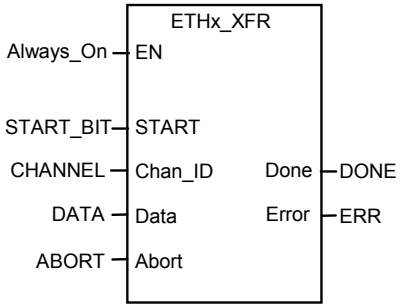


Fig. 11 Call of the subroutine ETHx_XFR

Input parameters:

Name	Type	Meaning
START	BOOL	Input condition for triggering a read/write request 0: Don't trigger read/write request 1: Trigger read/write request
Chan_ID	BYTE	Number of the channel via which the data is to be accessed. This channel must be configured as client. Value range: 0 to 7
Data	BYTE	Number of the channel-specific data block from the configuration which describes the read/write request to be executed. Value range: 0 to 31
Abort	BOOL	Input condition for canceling a data access 0: Don't cancel data access 1: Cancel data access

Table 21 Input parameters (ETHx_XFR)

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Return parameters:

Name	Type	Meaning
Done	BOOL	Status of the subroutine call 0: Subroutine not executed yet 1: Subroutine executed, read/write request concluded, subroutine ready for next request
Error	BYTE	Error code 16#00: No error Other: Error (for a description, see chapter 6.2)

Table 22 Return parameters (ETHx_XFR)

Caution

The execution time of an S7-200 user program has a direct effect on the duration of the read/write requests used therein.

If you want to minimize the execution time of your read/write requests, try to keep the cycle time of your user program as short as possible.

5.4 ETHx_EMAIL

Calling the subroutine ETHx_EMAIL causes the CP 243-1 IT to transfer a predefined e-mail to an e-mail server. Both the e-mail to be transmitted and the e-mail server to be used are specified in the configuration of the CP 243-1 IT.

A total of up to 32 different e-mails can be configured.

The following is specified already during configuration.

- Which e-mail server is to be used
- Which data from the S7-200 system, in addition to the actual e-mail text, will be embedded in the e-mail
- Who will receive the e-mail

When you call the subroutine ETHx_EMAIL, you specify which of the configured e-mails will be sent by the subroutine.

The subroutine ETHx_EMAIL is created by the Internet wizard in STEP 7 Micro/WIN 32 if you activated the e-mail service while configuring the CP 243-1 IT. Only then can you send e-mails via the CP 243-1 IT from an S7-200 user program.

Only one ETHx_EMAIL subroutine can be active at a time. Since several e-mails cannot be sent at the same time, it is recommended linking the input "START" with both the return value "Done" of the subroutine ETHx_E-MAIL and the applicable bit of the return value "CH_Ready" from the subroutine ETHx_CTRL.

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Call:

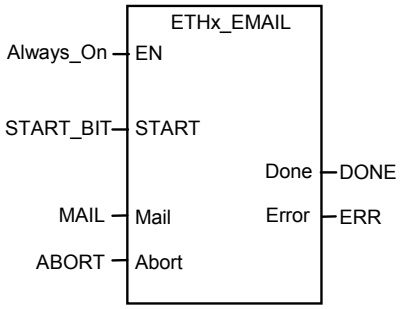


Fig. 12 Call of the subroutine ETHx_EMAIL

Input parameters:

Name	Type	Meaning
START	BOOL	Input condition for triggering an e-mail request 0: Don't trigger e-mail request 1: Trigger e-mail request
Mail	BYTE	Number of the e-mail from the configuration which describes the e-mail request to be executed Value range: 0 to 31
Abort	BOOL	Input conditions for canceling an e-mail request 0: Don't cancel e-mail request 1: Cancel e-mail request

Table 23 Input parameters (ETHx_EMAIL)

Return parameters:

Name	Type	Meaning
Done	BOOL	Status of the subroutine call 0: Subroutine not executed yet 1: Subroutine executed, e-mail request concluded, subroutine ready for next execution.
Error	BYTE	Error code 16#00: No error Other: Error (for a description, see chapter 6.2)

Table 24 Return parameters (ETHx_EMAIL)

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Caution

E-mail communication is subordinate to S7 communication.

Since reaction times vary depending on the particular configuration, no general predictions can be made. The greater the number of simultaneous S7 connections and the larger the amount of data transferred per request, the longer the reaction times will be for an e-mail request.

5.5 ETHx_FTPC

Calling the subroutine ETHx_FTPC causes the CP 243-1 IT to transfer data to an FTP server or request data from such a server. In addition, this subroutine can be used to delete files from the file system of an FTP server.

The type of data access which your CP 243-1 IT uses is specified by you during configuration.

A total of up to 32 FTP requests can be configured.

The following is specified during configuration.

- Whether you want data to be read from your S7-200 CPU and transferred to an FTP server
- Whether you want to request a file from an FTP server and copy it to your S7-200 CPU
- Whether you want to delete a file from the file system of an FTP server
- Which data lengths, start addresses, file names, FTP server addresses, user names and passwords you want to use for the action

When the subroutine ETHx_FTPC is called, you specify which of the configured FTP client requests you want the subroutine to execute.

The subroutine ETHx_FTPC is created by the Internet wizard in STEP 7 Micro/WIN 32 if you activated the FTP client service in the configuration of the CP 243-1 IT. Only then can you sent FTP client requests via a CP 243-1 IT from an S7-200 user program.

Only one ETHx_FTPC subroutine can be active at a time. Since several FTP client requests cannot be send at the same time, it is recommended linking the "START" input with both the return value "Done" of the ETHx_FTPC subroutine and the applicable bit of the return value "CH_Read" from the ETHx_CTRL subroutine.

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Call:

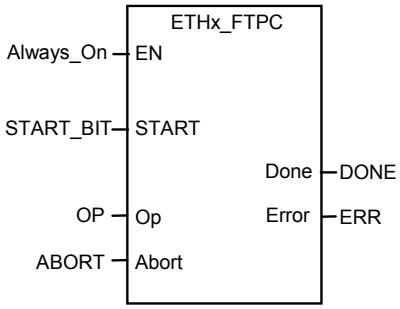


Fig. 13 Call of the subroutine ETHx_FTPC

Input parameters:

Name	Type	Meaning
START	BOOL	Input condition for triggering a read/write/delete request 0: Don't trigger read/write/delete request 1: Trigger read/write/delete request
Op	BYTE	FTP client request number from the configuration which describes the read/write/delete request to be executed Value range: 0 to 31
Abort	BOOL	Input condition for termination of an FTP client request 0: Don't cancel FTP client request 1: Cancel FTP client request

Table 25 Input parameters (ETHx_FTPC)

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Return parameters:

Name	Type	Meaning
Done	BOOL	Status of the subroutine call 0: Subroutine not executed yet 1: Subroutine executed, read/write/delete request concluded, subroutine ready for next request.
Error	BYTE	Error code 16#00: No error Other: Error (for a description, see chapter 6.2)

Table 26 Return parameters (ETHx_FTPC)

Caution

FTP client communication is subordinate to S7 communication. Reaction times vary with the configuration and cannot be predicted in general terms.

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6 Diagnostics

6.1 Diagnostic Capabilities

The following aids are available for diagnosis.

- Ping server

  Using the "ping" program which is present on all standard computers with a Windows operating system from Microsoft, you can determine whether a CP 243-1 IT can always be reached under an IP address to be specified.

- STEP 7 Micro/WIN 32

  Under the entry "Information ..." in the menu "PLC," you are given all information on your S7-200 system. This also includes the information concerning which modules are connected to your S7-200 system. After you double-click the module "CP 243-1 INTERNET" in the module overview, a box appears with the following specific information on your CP 243-1 IT.

  - General module information (module type and version states used)
  - TCP/IP address parameters (IP address, subnet mask, IP address of the gateway and the MAC address). When a configuration error occurs and booting is performed later with the BOOTP routine, the values shown here are not valid. This same applies when the user program has not completed at least one cycle.
  - Status messages
  - Information on the embedding of the CP 243-1 IT in the address area of the S7-200 CPU
  - Configuration and states of the S7 channels
  - Error messages
  - Configuration and states of the IT functions (FTP server, FTP client, HTTP server and e-mail client)

- Reading the SM memory area

  During run time, CP 243-1 IT-specific information can also be read and processed by an S7-200 user program from the SM area currently used by the CP (see Table 5). When global errors occur on a CP 243-1 IT, the related error identifiers are located in this area. The location of the individual pieces of information will be now specified.

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Byte Offset in SM Area	Meaning	Format
0-15	Module type	16 bytes, ASCII
16-19	Software version	4 bytes, ASCII
20-21	Error code (see chapter 6.2)	2 bytes, hex
22	Status CP 243-1 IT Bit [0] 0: CP 243-1 IT not in startup 1: CP 243-1 IT performing startup Bit [1] 0: BOOTP sequence not performed 1: BOOTP sequence performed Bit [2] 0: CP 243-1 IT not ready 1: CP 243-1 IT ready Bit [3] 0: STEP 7 Micro/Win 32 not active 1: STEP 7 Micro/Win 32 active Bit [4] 0: Configuration in acc. w. CDB 1: No valid configuration in CDB Bit [5] Reserved Bit [6] 0: No Ethernet connection 1: CP 243-1 IT connected with Ethernet Bit [7] 0: No error on CP 243-1 IT 1: CP 243-1 IT in error state	1 byte, hex
23	Reserved	
24	Hardware version	1 byte, ASCII

Table 27 Addressing of global errors and module information

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- Reading the NPB memory area

  A pointer to the memory area in which the configuration data of the CP 243-1 IT are stored is located in bytes 46 to 49 of the SM area currently used for the CP 243-1 IT. If you increase this pointer by 108, you will find the NPB memory area in which the TCP/IP configuration parameters currently used by the CP 243-1 IT are stored (provided the CP 243-1 IT was configured correctly and has completed at least one cycle of the user program). If the configuration is not correct, the values of the NPB are not valid. The following table indicates the layout of this memory area.

Byte Offset in Variable Memory	Meaning	Format
108 - 109	Common flag byte Bit [0] Duplex mode 0: Half duplex 1: Full duplex Bit [1] Data rate 0: 10 Mbit/sec 1: 100 Mbit/sec Bit [2] Auto negotiation 0: Auto negotiation not active 1: Auto negotiation active Bit [3] BOOTP 0: Network parameters from configuration 1: Network parameters from BOOTP Bit [4] - Bit [15]: Reserved	2 bytes, hex
110-113	Current IP address	4 bytes, hex
114- 117	Current subnet mask	4 bytes, hex
118-121	IP address of the currently used gateway	4 bytes, hex
122-127	MAC address	6 bytes, hex

Table 28 Layout of the NPB memory area

- LED indicators (see chapter 2.8)
- Test e-mail

  The CP 243-1 IT can send a test e-mail with an HTML page which is called from a Web browser. This routine makes it very easy to determine whether a desired e-mail server or e-mail receiver can be reached from the CP 243-1 IT. The user name and the password of the administrator must be specified before this test e-mail routine can be triggered. The error messages which can occur while a test e-mail is being sent are discussed in chapter 6.3.

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- Status Applet

  Using the Web browser, an HTML page can be requested by the CP 243-1 IT indicating the status information of the S7-200 system. This page includes, among others, information on the status of the S7 and IT channels. The call of this page is specified in table 1 together with an overview of the information on this page.

- FTP server

  Using the FTP server, the contents of the file system can be changed. If there are indications of errors in the file system while the CP 243-1 IT is running, the contents of the file system on the CP 243-1 IT should be checked from an FTP client. If necessary, faulty files can sometimes be corrected with this method.

Note

The abrupt shutdown of a CP 243-1 IT with active client connections (e.g., due to a power failure) while the server continues running may result in the server's not recognizing that the connections have been interrupted. When the client then attempts to connect itself again, a wait time (determined by the configured Keep Alive time) may occur when the CP 243-1 IT goes on again until all connections have been reestablished.

Note

During the startup of the CP 243-1 IT, its file system is automatically checked for consistency. If inconsistencies are found, these are corrected to the extent possible.

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6.2 Error Messages of the CP 243-1 IT

This section lists the error messages of the CP 243-1 which are of primary importance to the user. All other error messages indicate special internal errors of the CP 243-1 IT. If such error messages occur, please contact your service hotline.

Caution

The module must be turned off and on again when a module error/system error occurs.

The CP 243-1 IT uses two different routines to report errors.

- As return value of a subroutine

  Errors are reported here with the return value "Error". This parameter can be type BYTE or type WORD depending on which subroutine is involved.

- Error codes returned via the SM memory area of the S7-200 CPU

  Which SM memory area is being used currently depends on the position where your CP 243-1 IT is connected on the S7-200 system (see Table 5). Depending on the type of error, the following bytes are used for the error message in the current SM area of your CP 243-1 IT.

  – Global errors and general messages are transferred at byte offset 20 and 21. They are interpreted as a word (SMW). The error or message codes transmitted here are deleted again after a maximum of 60 seconds. This routine prevents outdated error or message codes from blocking these two bytes for a longer period of time.

  – Channel-specific errors are transferred in the following bytes based on the related S7 channel.

Byte offset 25	For channel 0
Byte offset 26	For channel 1
Byte offset 27	For channel 2
Byte offset 28	For channel 3
Byte offset 29	For channel 4
Byte offset 30	For channel 5
Byte offset 31	For channel 6
Byte offset 32	For channel 7

  – Command-specific errors are returned in the byte with offset 33.

  – E-mail-specific errors are returned in the byte with offset 34.

  – The FTP client reports errors with the byte with offset 35.

  – Errors on the FTP server are returned with the byte with offset 36.

  – The HTTP server reports errors with the byte with offset 37.

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The next few sections list the error codes for the individual errors together with their meaning. Also covered: how the individual errors are returned, which error codes apply to which subroutines, and which error in which byte of the current SM memory area is transferred. If error messages occur which are not described in these sections, please contact your service hotline.

If these next few sections do not provide a solution, manual correction of the errors via STEP 7 Micro/WIN 32 is always required. The Internet wizard of STEP 7 Micro/WIN 32 should always be used to configure the CP 243-1 IT.

If your CP 243-1 IT returns errors indicating a problem with the configuration, check to determine whether your user program may have overwritten the configuration.

Caution

During power failures (24 V), the CP 243-1 IT is unable to return any additional errors.

6.2.1 Error Messages in Byte Format

Error Byte		Description	Reaction/Correction	Transfer Routine	
Hex	Dec			Byte Offset in SM Area	Return Value (ETHx_)
16#01	1	Time exceeded on the S7-200 bus	Automatic restart	25 - 32 33 34 35	_XFR _CFG _EMAIL _FTPC
16#02	2	Data access terminated due to an ABORT command.	A new read/write request can be started.	25 - 32 34 35	_XFR _EMAIL _FTPC
16#03	3	The transfer parameter DATA or MAIL or OP is outside the configured area.	Check user program or configuration.	25 - 32 34 35	_XFR _EMAIL _FTPC
16#04	4	The connection could not be set up at the S7 level.	The attempt to establish a connection is repeated.	25 - 32	_XFR

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Error Byte		Description	Reaction/Correction	Transfer Routine	
Hex	Dec			Byte Offset in SM Area	Return Value (ETHx_)
16#05	5	The connection was terminated or an attempt was made to execute a read/write request on a channel which was not ready.	Check connection path to the communication partner or configuration of the communication partner.	25 - 32	_XFR
		The connection could not be established or was terminated. Or the e-mail configuration file on the CP 243-1 IT was changed. Or an attempt was made to execute a request and the e-mail service was not correctly parameterized.	Check connection path to the communication partner. Check .edb file on the CP 243-1 IT for uniqueness and completeness.	34	_EMAIL
		The connection could not be established or was terminated. Or the FTP configuration file on the CP 243-1 IT was changed. Or an attempt was made to execute a request and the FTP client service was not correctly parameterized.	Check connection path to the communication partner. Check .fdb file on the CP 243-1 IT for uniqueness and completeness.	35	_FTPC
		The FTP connection was terminated.	Check connection path to the communication partner. Check FTP server configuration for completeness.	36	
		The connection could not be established or was terminated. Or an attempt was made to execute a request and the HTTP server was not correctly parameterized.	Check connection path to the communication partner. Check HTTP server configuration for completeness.	37	
16#06	6	The response packet contains logical errors.	A new read/write request can be triggered. Check the configuration.	25 - 32 34 35	_XFR _EMAIL _FTPC
16#07	7	The read request failed.	A new read/write request can be triggered. The parameters of the read request should be checked.	25 - 32	_XFR
16#08	8	The write request failed.	A new read/write request can be triggered. The parameters of the write request should be checked.	25 - 32	_XFR
16#09	9	Channel not configured	A new read/write request with other parameters can be triggered.	25 - 32 34 35	_XFR _EMAIL _FTPC
16#0A	10	The channel is configured as SERVER but an attempt was made to trigger a read/write request.	A new read/write request with other parameters can be triggered.	25 - 32	_XFR

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Error Byte		Description	Reaction/Correction	Transfer Routine	
Hex	**Dec**			**Byte Offset in SM Area**	**Return Value (ETHx_)**
16#0B	11	Previous read/write request not yet concluded	A new read/write request can be triggered. Evaluate "DONE" return parameter of the previous read/write request.	25 - 32 34 35	_XFR _EMAIL _FTPC
16#0C	12	Invalid request identifier	A new read/write request can be triggered.	25 - 32 34 35	_XFR _EMAIL _FTPC
16#0D	13	All data transmissions are terminated because a new configuration was triggered by the user program.	New start of the system	25 - 32 33 34	_XFR _CFG _EMAIL
16#0E	14	The data to be transferred could not be read from the CPU.	Check configuration, particularly the .fdb file.	35	_FTPC _EMAIL
16#0F	15	The data to be transferred could not be written the CPU.	Check configuration, particularly the .fdb file.	35	_FTPC
16#10	16	Connection to one of the configured e-mail servers not possible	Check connection path to the configured e-mail servers. Check configuration, particularly the .edb file.	34	_EMAIL
16#11	17	The registration was rejected by the e-mail server.	Check to determine whether the e-mail server is configured correctly. Check configuration, particularly the .edb file.	34	_EMAIL
16#12	18	An error occurred while generating the e-mail to be sent.	Check configuration, particularly the .edb file and the placeholders used in the e-mail.	34	_EMAIL
16#13	19	The e-mail configuration was found to be incorrect.	Check configuration, particularly the .edb file and the placeholders used in the e-mail.	34	_EMAIL
16#14	20	The generated e-mail text is too long.	Check configuration, particularly the .edb file and the placeholders used in the e-mail.	34	_EMAIL
16#17	23	No connection to the configured FTP server possible	Check communication path to the FTP server. Check configuration, particularly the .fdb file.	35	_FTPC
16#18	24	Registration with FTP server failed.	Check to determine whether the FTP server is configured correctly. Check configuration, particularly the .fdb file.	35	_FTPC

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Error Byte		Description	Reaction/Correction	Transfer Routine	
Hex	Dec			Byte Offset in SM Area	Return Value (ETHx_)
16#19	25	Error in the FTP transmission protocol	Check to determine whether the FTP server is configured correctly. Check to determine whether this file can always be accessed. Check configuration, particularly the .fdb file.	35	_FTPC
16#1A	26	A memory area was exceeded while files were being transferred or the specified length does not agree with the actual length of the file.	Check to determine whether this file has sufficient memory space. Check configuration, particularly the .fdb file.	35	_FTPC
16#1B	27	Error during data transmission via FTP	Check to determine whether the FTP server is configured correctly. Check to determine whether network problems exist. Check configuration, particularly the .fdb file.	35	_FTPC
16#80	128	External 24 V is not present.	Apply voltage or wait till ready.	25 - 37	_XFR _CFG _EMAIL _FTPC
16#81	129	This channel is not ready or is faulty.	Wait till ready. Evaluate the return parameters of the subroutine ETHx_CTRL.		_XFR _CFG _EMAIL _FTPC
16#82	130	This channel is busy or there was no START pulse for this instruction.	Wait till ready. Activate the START input.		_XFR _CFG _EMAIL _FTPC
16#83	131	A request was started with an illegal channel number.	A new read/write request can be triggered. Check the user program.		_XFR
16#84	132	A request was started with an illegal data block number.	A new read/write request can be triggered. Check the user program.		_XFR _EMAIL _FTPC

Table 29 Error messages in byte format

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6.2.2 Error Messages in Word Format

Error Word		Description	Reaction/Correction	Transfer Routine	
Hex	Dec			Byte Offset in SM Area	Return Value (ETHx_)
16#0001	1	Time exceeded on the S7-200 bus	Automatic restart	20, 21	_CTRL
16#000D	13	All data transmissions are terminated because a new configuration was triggered by the user program.	New start of the system	20, 21	_CTRL
16#0030	48	The configuration could not be called by the CPU within the time specified.	Automatic restart	20, 21	_CTRL
16#0031	49	No CDB configuration with correct syntax found in the memory of the S7-200 CPU	Check the configuration.	20, 21	_CTRL
16#0032	50	The CRC checksum of the configuration data (CDB, NDB, IDB) is wrong.	New configuration of the CP 243-1 IT with STEP 7 Micro/WIN 32 Check the user program to see whether configuration data was accidentally overwritten.	20, 21	_CTRL
16#0033	51	The configuration data for the CP 243-1 IT contain errors or is not stored correctly.	New configuration of the CP 243-1 IT with STEP 7 Micro/WIN 32	20, 21	_CTRL
16#0034	52	The pointer to the CDB is wrong or no CDB is loaded.	Make sure that subroutine ETHx_CTRL generated by wizard is called at the beginning of the user program.	20, 21	_CTRL
16#0035	53	The format identifier of the transferred configuration is wrong.	Check the configuration.	20, 21	_CTRL
16#0036	54	TSAPs are not unique in the configuration or exist more than once.	Check the configuration.	20, 21	_CTRL
16#0038	56	The configuration is not unique (IP addresses are wrong, neither clients nor servers are configured, channel for STEP 7 Micro/WIN 32 not activated).	Check the configuration.	20, 21	_CTRL

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Error Word		Error Byte	Reaction/Correction	Transfer Routine	
Hex	Dec			Byte Offset in SM Area	Return Value (ETHx_)
16#003A	58	The module name for the CP 243-1 IT was changed in the configuration.	Check the configuration.	20, 21	_CTRL
16#003B	59	The configuration has an invalid IP address.	Check the configuration.	20, 21	_CTRL
16#003C	60	The configuration has an invalid gateway address.	Check the configuration.	20, 21	_CTRL
16#003D	61	The configuration has an invalid value in the Keep Alive parameter.	Check the configuration.	20, 21	_CTRL
16#003E	62	No valid configuration received from memory or S7-200 CPU or via BOOTP	Cyclic attempt to obtain a valid configuration either from the memory of the S7-200 CPU or via a BOOTP server	20, 21	_CTRL
16#0042	66	The NDB contains syntax mistakes in the read/write requests or lengths.	Check the configuration.	20, 21	_CTRL
16#0093	147	The BOOTP request failed.	Automatic restart	20, 21	_CTRL
16#0094	148	The reply of the BOOTP server contains invalid data.	Automatic restart	20, 21	_CTRL
16#0095	149	The TCP/IP stack did not accept the specified monitoring time (Keep Alive).	Automatic restart	20, 21	_CTRL
16#0096	150	The TCP/IP stack did not accept the IP address specified for a client.	Automatic restart	20, 21	_CTRL
16#0097	151	The TCP/IP stack did not accept the specified subnet mask.	Automatic restart	20, 21	_CTRL
16#0098	152	The TCP/IP stack did not accept the specified gateway address.	Automatic restart	20, 21	_CTRL
16#00B0	176	The IDB contains invalid values.	Prepare configuration with STEP 7 Micro/WIN 32.	20, 21	_CTRL
16#00B1	177	The CRC check of the IDB failed.	Prepare configuration with STEP 7 Micro/WIN 32. Check the user program to see whether configuration data was accidentally overwritten.	20, 21	_CTRL
16#00B2	178	No administrator name is specified in IDB.	Prepare configuration with STEP 7 Micro/WIN 32.	20, 21	_CTRL

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Error Word		Error Byte	Reaction/Correction	Transfer Routine	
Hex	**Dec**			**Byte Offset in SM Area**	**Return Value (ETHx_)**
16#00B3	179	The administrator password check failed or no password was specified.	Prepare configuration with STEP 7 Micro/WIN 32.	20, 21	_CTRL
16#00B7	183	The administrator password is too short.	Prepare configuration with STEP 7 Micro/WIN 32.	20, 21	_CTRL
16#00BB	187	Wrong IDB format	Prepare configuration with STEP 7 Micro/WIN 32.	20, 21	_CTRL
16#00BD	189	Initialization of the file system failed.	Delete files from the file system.	20, 21	_CTRL
16#00BF	191	System files could not be set up in the file system.	Delete files from the file system.	20, 21	_CTRL
16#00F0	240	The S7-200 CPU failed to recognize the CP 243-1 IT.	Check configuration and setup of the S7-200 system.		_CTRL
16#00F1	241	The address of the output byte via which the CP 243-1 IT is supposed to be accessible according to the configuration is not compatible with the current position of the CP 243-1 IT on the S7-200 system.	Check configuration and setup of the S7-200 system		_CTRL
16#0100 to 16#0108	256 to 264	Time was exceeded on the S7-200 bus.	Automatic restart	20, 21	_CTRL
16#8080	32896	CP 243-1 IT not yet completely booted.	If necessary, check 24 V supply.	20, 21	_CTRL

Table 30 Error messages in word format

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6.3 Error Messages of the Test Routine for E-Mails

The error messages of the test routine for e-mails are indicated on the Web browser as an error code with explanatory text in English. The errors which can occur here are listed in the table below.

Error Code	Error Text	Description
0	E-Mail successfully delivered to E-Mail server	Self-explanatory
1	No valid configuration file	No valid e-mail configuration file on the CP 243-1 IT
2	General error	Contact hotline if necessary.
3	General error	Contact hotline if necessary.
4	No E-Mail server reachable	E-mail server not configured or not accessible
5	No E-Mail server reachable	E-mail server not configured or not accessible
6	No E-Mail server reachable	E-mail server not configured or not accessible
7	General protocol error	Error during transmission via SMTP
8	General protocol error	Error during transmission via SMTP
9	General protocol error	Error during transmission via SMTP
10	FROM command failed	FROM (CP's own e-mail address) not correctly configured or unknown to e-mail server
11	TO command failed	TO addressee not specified correctly or unknown to e-mail server
12	CC command failed	CC addressee not specified correctly or unknown to e-mail server
13	General protocol error	Error during transmission via SMTP
14	Sending E-Mail failed	Error during transmission of the e-mail
15	General protocol error	Error during transmission via SMTP
16	Expanding E-Mail text failed	Error while expanding e-mail data tags. Check e-mail text configuration.
17	Expanding E-Mail text failed	Error while expanding e-mail data tags. Check e-mail text configuration.
18	Expanding E-Mail text failed	Error while expanding e-mail data tags. Check e-mail text configuration.
19	Timeout sending E-Mail	Timeout during sending, e-mail server not accessible.
20	Test-E-Mail functionality already in use	Another user called the test e-mail function at the same time. Try again.
21	General error	Contact hotline if necessary.
22	General error	Contact hotline if necessary.

Table 31 Error messages for test routine for e-mails

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Appendix A Technical Data

Construction • Module format • Dimensions (W x H x D) Weight	 S7-200 expansion module 71.2 x 80 x 62 mm Approx. 150 g
Transmission rate Flash memory size SDRAM memory size	10 Mbit/sec and 100 Mbit/sec 8 Mbytes as ROM for firmware of the CP 243-1 IT and 8 Mbytes as RAM for the file system 16 Mbytes
Guaranteed life of flash memory for the file system	1 million write or delete operations
Interfaces Connection to Industrial Ethernet (10/100 Mbit/sec)	 8-pin RJ45 socket
Input voltage	+24 V DC (-15%/+20%) = 20.4 to 28.8 V
Current consumption • From S7-200 bus • From external 24 V DC	 55 mA 60 m A
Power dissipation	1.75 W
Max. number of connections	Max. of 8 S7 connections (XPUT/XGET or READ/WRITE) + 1 connection to STEP 7 Micro/WIN 32
Max . number of IT connections	One connection each for the FTP server, the FTP client and the e-mail client plus 4 HTTP connections
Permissible ambient conditions • Operating temperature • Transport/storage temperature • Relative humidity (max.) • Operating altitude	 0 °C to +55 °C with horizontal installation 0 °C to +45 °C with vertical installation -40 °C to +70 °C 95% at +25 °C Up to 2000 m above sea level. At higher altitudes, cooling may be reduced which then requires reduction of the maximum operating temperature.
Protection rating Ethernet standard Other standards	IP 20 IEEE 802.3 CE seal UL 508 or cULus CSA C22.2, number 142 or cULus FM 3611 EN 50081-2 / EN 61000-6-4 EN 60529 EN 61000-6-2 EN 61131-2
Booting time or restart time after a reset	Approx. 10 seconds
Amount of user data	As client: With XPUT/XGET: up to 212 bytes As server: With XGET or READ: up to 222 bytes With XPUT or WRITE: up to 212 bytes

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Max. e-mail size	1024 characters	
File system	Max. path length incl. file and drive names:	254 characters
	Max. length of a file name:	99 characters
	Max. nesting depth of the directory:	49
Server ports used	HTTP:	80
	FTP command channel:	21
	FTP data channels for FTP server:	3100 - 3199
	S7 connection establishment:	102
	S7 server:	3000 - 3008

Table 32 Technical data

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Appendix B Example

Below is an example of how to run the CP 243-1 IT as an S7 client. This example shows how to use the subroutines which are created by the Internet wizard integrated in STEP 7 Micro/WIN 32 at the end of configuration. The data block in which the configuration is stored by the Internet wizard is specified at the end of the program code.

The sample program is included on the QuickStart-CD for SIMATIC NET together with the related configuration as a STEP 7 Micro/WIN 32 project. To execute this program you will need Ethernet access to a second S7-200 system on which an appropriately configured S7 server is running.

The user name, which is used in the sample program for the administrator, is “root”. The corresponding password is “rootroot”.

Program code

Project name:	Example_Client
Version:	02.01
Date	20.02.2003
Target hardware:	CPU 224 with CP 243-1 IT in slot 0
Description:	Sample program for communication between two S7-200 stations via Industrial Ethernet

A character string (“CP243”) that is stored at address VB500 and higher and that has a length of 5 bytes is sent from the local S7-200 system to another S7-200 system, stored there at the same address and then read back from there. This procedure is repeated continuously.

The associated server must be configured as a corresponding counterpart. The user program that runs on the server merely has to call up the ETHx_CTLR subroutine. Calls of the ETHx_XFR subroutine are not required for operating the server.

The CRC check is switched on.

The configuration (IP address, …) must be adapted to the current conditions. The “CP243” character string must be stored at address VB500 and higher.

NETWORK 1

The ETHT0_CTRL subroutine initializes and monitors the CP 243-1 IT.

Status bit SM0.0 status bit is generated at input "EN". It ensures that the subroutine is always active. As soon as the CP 243-1 IT has finished booting, the “CP_Ready” and “CH_Ready” outputs are set. If an error occurred in the configuration, the “Error” output is set. The error code that is carried over is stored in flag word 2. It can be read out in the status table.

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```
LD      Always_On
CALL    ETH0_CTRL, cp_ready, ch_ready, cp_error
```

Symbol	Address	Comment
Always_On	SM0.0	Always ON, always 1
ch_ready	MW8	
cp_error	MW2	
cp_ready	M0.0	
ETH0_CTRL	SBR1	This POU was generated by the Internet wizard for use for the CP 243-1 IT.

NETWORK 2

As soon as channel 0 is ready for the transmission and "ch0_ready" is set, the variable "start" is set. This may take several cycles.

```
LD      ch0_ready
S       start, 1
```

Symbol	Address	Comment
ch0_ready	M8.0	Bit for channel 0 in the return value CH_READY of the subroutine ETH0_CTRL
start	M4.0	Flip flop for automatic start of the data transmission

NETWORK 3

For an S7-200, the “First_Scan_ON” bit is anly set in the first cycle for systemre-lated reasons. Thus, the “start” variable is reset. This procedure is required so that the “start” variable always generates a switching edge for the start of the ETHx_XFR subroutine, even for repeated start/stop procedures of the CPU.

```
LD      First_Scan_On
R       start, 1
```

Symbol	Address	Comment
First_Scan_On	SM0.1	ON for the first scan cycle only
start	M4.0	Flip flop for automatic start of the data transmission

NETWORK 4

The local S7-200 station sends data from the VB500 (data length of 5 Byte) on the Ethernet connection to another S7-200 station. There the data is stored in VB500.

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The read/write command only takes place after a positive edge at the "START" parameter, if the "Done" bit of any preceding read command is set. The "Done" bit is carried over in the "ch0_done_read" variable. The outputs of the read and write command are linked in such a manner, that only one command per channel can be processed at any one time. Thus, a new command is only initiated after the preceding command is finished.

The "Chan_ID" parameter specifies the number of the channel through which the data access is to take place. In the present case, this would be the channel with the number 0. The "Data" parameter specifies the number of the channel-specific data block. A command that has been initiated can be aborted using the "Abort" parameter. To do so, the M7.0 flag must be set. In this example, this flag also acts on the read command from Network 5.

After flag M7.0 is cleared, read/write commands are again issued since the "Done" bit is always set along with the "Error" bit after a command is aborted.

Applying special flag SM0.0 ensures that the ETH0_XFR subroutine is always enabled.

As soon as the write command is finished, a 1 is returned in the "Done" return parameter. Any errors that occurred are returned by the "Error" parameter. Otherwise, a 0 is returned in this parameter.

```
LD      Always_On
=       L60.0
LD      ch0_done_read
EU
U       ch0_ready
LD      start
EU
OLD
=       L63.7
LD      L60.0
CALL    ETH0_XFR, L63.7, Connection0_0, Write_1,
        Connection_abort, ch0_done_write, ch0_error_write
```

Symbol	Address	Comment
Always_On	SM0.0	Always ON
ch0_done_read	M5.0	Done bit of the read command
ch0_done_write	M5.1	Done bit of the write command
ch0_error_write	MB14	Error flag of channel 0, "write" command
ch0_ready	M8.0	Bit for channel 0 in the CH_READY return value of the ETH0_CTRL subroutine
Connection0_0	VB233	
Connection_abort	M7.0	Transmission aborted
ETH0_XFR	SBR2	This POU was generated by the Internet wizard for use with the CP 243-1 IT.
start	M4.0	Flip flop for automatic start of the data transmission
Write_1	VB234	

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NETWORK 5

The local S7- 200 station now reads out data from the VB200 of another S7-200 station and stores these in the VB500 of the local S7-200 station.

Before the read command is executed, the two variables, "ch0_done_write" and "ch0_ready", are evaluated to ensure that, firstly, the preceding write command is finished and, secondly, that the status of channel 0 is "ready".

```
LD    Always_On
=     L60.0
LD    ch0_done_write
EU
U     ch0_ready
=     L63.7
LD    L60.0
CALL  ETH0_XFR, L63.7, Connection0_0, Read_1, Connec-
      tion_abort, ch0_done_read, ch0_error_read
```

Symbol	Address	Comment
Always_On	SM0.0	Always ON
ch0_done_read	M5.0	Done bit of the read command
ch0_done_write	M5.1	Done bit of the write command
ch0_error_read	MB6	Error flag of channel 0, "read" command
ch0_ready	M8.0	Bit for channel 0 in the CH_READY return value of the ETH0_CTRL subroutine
Connection0_0	VB233	
Connection_abort	M7.0	Transmission aboarted
ETH0_XFR	SBR2	This POU was generated by the Internet wizard for use with the CP 243-1 IT.
Read_1	VB235	

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Data block for this configuration

```
//
//DATA BLOCK COMMENTS
//
//Press F1 for help and example data block
//
//---------------------------------------------------------------------
// CP 243-1 IT Module Configuration block. Generated by the Internet
// wizard
//---------------------------------------------------------------------
VB0    'CP243'       // Module ID for CP 243-1 IT module at position 0
VW5    16#006C       // Length of CDB
VW7    16#0014       // Length of NPB
VB9    16#81         // Configuration Data Version
VB10   16#00         // Project Configuration Version
VW11   16#0000
VW13   16#0004       // Auto Detect Communications,  User Configured
                     // IP Address, CRC protection enabled.
VD15   16#C1012807   // IP Address for module (193.1.40.7)
VD19   16#FFFFFF00   // Subnet mask address for module (255.255.255.0)
VD23   16#C1012801   // Gateway Address (193.1.40.1)
VW27   30            // Keep Alive Interval in seconds
//---------------------------------------- Connection 0
VB29   16#83         // Client Connection,  Keep Alive Enabled.
VD30   16#C1012812   // Address of Server for this connection
                     //(193.1.40.18)
VW34   16#1000       // Local TSAP for this connection (10.00).
VW36   16#1000       // Remote TSAP for this connection (10.00).
//---------------------------------------- Connection 1
VB38   16#00         // Connection not defined.
VD39   16#00000000
VW43   16#0000
VW45   16#0000
//---------------------------------------- Connection 2
VB47   16#00         // Connection not defined.
VD48   16#00000000
VW52   16#0000
VW54   16#0000
//---------------------------------------- Connection 3
VB56   16#00         // Connection not defined.
VD57   16#00000000
VW61   16#0000
VW63   16#0000
//---------------------------------------- Connection 4
VB65   16#00         // Connection not defined.
VD66   16#00000000
VW70   16#0000
VW72   16#0000
//---------------------------------------- Connection 5
VB74   16#00         // Connection not defined.
VD75   16#00000000
VW79   16#0000
VW81   16#0000
//---------------------------------------- Connection 6
```


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```
VB83   16#00         // Connection not defined.
VD84   16#00000000
VW88   16#0000
VW90   16#0000
//---------------------------------------- Connection 7
VB92   16#00         // Connection not defined.
VD93   16#00000000
VW97   16#0000
VW99   16#0000
//----------------------------- STEP 7-Micro/WIN reserved connection.
VB101  16#82
VD102  16#00000000
VW106  16#A9A8
//------------------------------------------------------------------------
// Network Parameter Block Section
// This section is used by the CP 243-1 IT Module
//------------------------------------------------------------------------
VW108  16#0000
VD110  16#00000000
VD114  16#00000000
VD118  16#00000000
VB122  16#00
VB123  16#00
VB124  16#00
VB125  16#00
VB126  16#00
VB127  16#00
//------------------------------------------------------------------------
// Network Data Block Section
//------------------------------------------------------------------------
VW128  16#0026
VB130  16#00
VB131  16#03
VB132  16#0F
VB133  16#0F
VB134  'W=5,VB500,VB500' // Message 0 for Connection 0.
VB149  'R=5,VB500,VB500' // Message 1 for Connection 0.
VW164  16#D0C3
//------------------------------------------------------------------------
//Internet Data Block Section
//------------------------------------------------------------------------
VW166  16#0043
VB168  16#32
VB169  16#02
VB170  16#02
VB171  16#02
VB172  16#02
VB173  16#81
VB174  16#00      //Administrator Web access flag
VB175  'root$00$00$00$00$00$00$00$00$00$00$00'//Administrator Login
VB191
'R33~R33~$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$00$
00$00$00$00'            //Administrator Password
VW223  16#0000    //SMTP Client enable flag
VW225  16#0000    //FTP Client enable flag
VW227  16#0000
```


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```
VW229  16#0000       //HTTP Server enable flag
VW231  16#9E28
//------------------------------------------------------------------------
//Symbol Initializations
//------------------------------------------------------------------------
VB233  0
VB234  0
VB235  1
//------------------------------------------------------------------------
VB500  'CP243'       // Module ID for testing
```


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Appendix C Timeouts

The values in the following tables represent times which must pass before the related actions can be triggered.

On Ethernet

Meaning	Action for Timeout	Fixed Set Time in Seconds
Maximum wait time until a telegram is completely received via TCP/IP	Reject telegram fragment. CP disconnects the connection.	3
Maximum wait time until a telegram is completely sent via TCP/IP	Terminate sending. CP disconnects the connection.	3
Maximum wait time of the CP until a request sent to the CPU by an external client is answered by the CPU	Reject action. CP waits for new requests. Client receives no response.	60
Logout time when all channels are busy and STEP 7-Micro/WIN 32 is not yet connected (so that STEP 7-Micro/WIN 32 can always establish a connection).	Oldest of the connected TCP/IP servers which could not be assigned via TSAP disconnects the connection and waits for a new connection to be established.	60
Time before arriving requests for connection are processed	Delay of the next connection establishment	1
Wait time after an unsuccessful attempt by a client to establish a connection	Attempt to establish a connection is repeated.	10
Wait time of a client for confirmation of a request to establish a connection	Client disconnects the connection and connects itself again.	6
Maximum time for successful BOOTP request	Another attempt to obtain a valid configuration either from the memory of the S7-200 CPU or via a BOOTP server	24 attempts at intervals of 2.5 seconds = 60 seconds
Maximum wait time for sending confirmation of the test e-mail	The e-mail is not transferred. An appropriate error message is returned.	30
Idle time of an FTP connection after the expiration of which the connection of the FTP server is disconnected when a new FTP client wants to establish a connection	Disconnection of existing FTP connection and setup of a new FTP connection to the new FTP client	60
Maximum wait time of an FTP server for the establishment of a data connection	The FTP does not establish a data connection.	90

Table 33 Timeouts on Ethernet

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On S7-200 bus:

Meaning	Action for Timeout	Fixed Set Time in Seconds
Maximum time for one communication cycle between the CP 243-1 IT and the S7-200 CPU via the S7-200 bus **Note:** Three cycle times are usually required per read/write request with client. One cycle time with server. Long execution times of the read/write requests must be expected with user programs which require an extreme amount of time and simultaneous communication with many channels.	Request rejected. CP 243-1 IT performs a restart.	10 (per cycle)
Timeout for the successful transmission of CDB/NDB when CP boots	CP 243-1 IT performs a restart.	120
Time after which the booting S7 CPU must have detected the CP 243-1 IT physically	CP 243-1 IT performs a restart.	1
Maximum time until the configured e-mail server must have accepted a request for the establishment of a connection	Connection is not established. The CP 243-1 IT reports an error.	20
Maximum time until the configured FTP server must have accepted a request for the establishment of a connection	Connection is not established. The CP 243-1 IT reports an error.	20

Table 34 Timeouts on the S7-200 bus

On the user interface:

Meaning	Action for Timeout	Fixed Set Time in Seconds
Time after which an error or message code is returned by the ETHx_CTRL subroutine with the Error return parameter/is reset by the CP 243-1 IT at the latest. This code is also always located in the SM memory area used by the CP 243-1 IT in the two bytes with the offset 20 and 21.	Error or message code is set to 0.	60

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Appendix D Compatibility

Standard (STEP7) supported access from S7-300/400 Clients to:

	S7-200 mit CPU222, CPU224, CPU 226/XM		
CPU Firmware Version	<1.21	1.21	>1.21
Data Types			
BOOL	√	√	√
BYTE	√	√	√
CHAR		RO	√
WORD	√	√	√
INT		RO	√
DWORD	√	√	√
DINT		RO	√
REAL		RO	√
Data Areas			
INPUT	√	√	√
OUTPUT	√	√	√
MEMORY	√	√	√
DATA BLOCK			
VARIABLES *	√	√	√
ANALOG_INPUT			
SPECIAL MEMORY (FLAGS)			

√	means: supported
	means: generally not supported
	means: not possible if CPU with this firmware version is used
RO	means: “read only access”
*	means: the access to VBxx should be treated as DB1.DBBxx (Standard STEP7)

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STEP7 Micro/WIN 32 Wizard supported CP 243-1 IT access as client to...

	S7-300/400	S7-200 mit CPU222, CPU224, CPU 226/XM		
CPU Firmware Version		<1.21	1.21	>1.21
Data Types				
BOOL				
BYTE	√	√	√	√
CHAR				
WORD				
INT				
DWORD				
DINT				
REAL				
TIME				
COUNTER				
Data Areas				
INPUT	√	√	√	√
OUTPUT	√	√	√	√
MEMORY	√	√	√	√
DATA BLOCK	√			
VARIABLES		√	√	√
ANALOG_INPUT				
SPECIAL MEMORY (FLAGS)				
S7-COUNTER				
S7-TIMER				

√	means: supported
	means: generally not supported
	means: not possible if CPU with this firmware version is used

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JAVA Beans supported access to...

(The JAVA Beans are a common package for SIMATIC 200/300/400 communication processors)

	S7-300/400	S7-200 mit CPU222, CPU224, CPU 226/XM		
CPU Firmware Version		<1.21	1.21	>1.21
Data Types				
BOOL	√	√	√	√
BYTE	√	√	√	√
CHAR	√		RO	√
WORD	√	√	√	√
INT	√		RO	√
DWORD	√	√	√	√
DINT	√		RO	√
REAL	√		RO	√
TIME	√			
COUNTER	√			
Data Areas				
INPUT	√	√	√	√
OUTPUT	√	√	√	√
MEMORY	√	√	√	√
DATA BLOCK	√			
VARIABLES		√	√	√
ANALOG_INPUT				
SPECIAL MEMORY (FLAGS)		√ (RO up to address 30)	√ (RO up to address 30)	√ (RO up to address 30)
S7-COUNTER	√			
S7-TIMER	√			

√	means: supported
	means: generally not supported
	means: not possible if CPU with this firmware version is used
RO	means: “read only access”

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E-MAIL Tags (STEP7 Micro/WIN 32 Wizard) supported access to...

	S7-200 mit CPU222, CPU224, CPU 226/XM		
CPU Firmware Version	<1.21	1.21	>1.21
Data Types			
BOOL			
BYTE	RO	RO	RO
CHAR			
WORD	RO	RO	RO
INT			
DWORD	RO	RO	RO
DINT			
REAL			
Data Areas			
INPUT	RO	RO	RO
OUTPUT	RO	RO	RO
MEMORY	RO	RO	RO
DATA BLOCK			
VARIABLES	RO	RO	RO
ANALOG_INPUT	RO / word	RO / word	RO / word
SPECIAL MEMORY (FLAGS)	RO	RO	RO

√	means: supported
	means: generally not supported
	means: not possible if CPU with this firmware version is used
RO	means: “read only access”
RO / word	means: “read only access”, access as WORD only

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Simatic-NET OPC supported access to...

	S7-200 mit CPU222, CPU224, CPU 226/XM		
CPU Firmware Version	<1.21	1.21	>1.21
Data Types			
BOOL	√	√	√
BYTE	√	√	√
CHAR		RO	√
WORD	√	√	√
INT		RO	√
DWORD	√	√	√
DINT		RO	√
REAL		RO	√
Data Areas			
INPUT	√	√	√
OUTPUT	√	√	√
MEMORY	√	√	√
DATA BLOCK			
VARIABLES*	√	√	√
ANALOG_INPUT			
SPECIAL MEMORY (FLAGS)			

√	means: supported
	means: generally not supported
	means: not possible if CPU with this firmware version is used
RO	means: “read only access”
*	means: the access to VBxx should be treated as DB1.DBBxx (Standard STEP7)

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Abbreviations

AC	Alternating Current
ASCII	American Standard Code for Information Interchange
BDT	Block Data Transfer
BOOTP	Bootstrap Protocol
CDB	Configuration Data Block
CP	Communication Processor
CPU	Central Processing Unit
CRC	Cyclic Redundancy Code
DB	Data Block (in S7-200 systems this is called V-Memory)
DC	Direct Current
FB	Function Block
FTP	File Transfer Protocol
GUI	Graphical User Interface
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transmission Protocol
HW	Hardware
ICMP	Internet Control Message Protocol
ID	Identifier
IDB	Internet Data Block
IE	Industrial Ethernet
IP	Internet Protocol
IT	Information Technology
ISO	International Standardization Organization
LED	Light Emitting Diode
LSB	Least Significant Byte
MAC	Medium Access Control
MIME	Multipurpose Internet Mail Extension
MLFB	Maschinenlesbare Fabrikate Bezeichnung (machine-readable product designation)
MPI	Multi Point Interface
MSB	Most Significant Byte
MW	Memory Word
NDB	Network Data Block
NPB	Network Parameter Block
OPC	OLE for Process Control
PDU	Protocol Data Unit
PELV	Protective Extra Low Voltage
PG	Programmer
PPI	Point to Point Interface
RFC	Request For Comments

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SDRAM	Synchronous DRAM (volatile memory)
SFB	System Function Block
SM	System Memory / Special Flags
SMTP	Simple Mail Transport Protocol
SPS	Speicher-Programmierbare Steuerung (programmable logic controller)
TCP	Transmission Control Protocol
TSAP	Transport Service Access Point
VB	Variable Byte
Web	Word Wide Web
WWW	Word Wide Web

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The languages of the SIMATIC Hotlines and the authorization hotline are generally German and English.		

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Service & Support on the Internet

You can call up general current information on the Internet at

http://www.siemens.de/simatic-net

In addition to our documentation, we offer our Know-how online on the internet at:

http://www.siemens.com/automation/service&support

where you will find the following:

- The newsletter, which constantly provides you with up-to-date information on your products.
- The right documents via our Search function in Service & Support.
- A forum, where users and experts from all over the world exchange their experiences.
- Your local representative for Automation & Drives.
- Information on field service, repairs, spare parts and more under "Services".

Training center

Siemens offers a number of training courses to familiarize you with the SIMATIC S7 automation system. Please contact your regional training center or our central training center in D 90327 Nuremberg, Germany for details:

Telephone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

H/F Competence Center:

The H/F Competence Center in Nuremberg offers a special workshop on the subject of fault-tolerant SIMATIC S7 automation systems. The H/F Competence Center also provides support in the configuration and installation of the equipment and with any problems that may arise on location.

Telephone: +49 – (0) 911 – 895 – 4759

Fax: +49 – (0) 911 – 895 – 5193

E-Mail: hf-cc@nbgm.siemens.de

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Additional support

If you have any further questions on SIMATIC NET products, please contact your Siemens partner in the branch office responsible for your area.

The addresses are found:

- in our IK PI catalog
- in the Internet
  http://www.siemens.de/automation/partner
- in the Interactive Catalog CA01
  http://www.siemens.de/automation/ca01
- on the Quickstart CD

Internet

You will find additional detailed information on using the CP described in this manual on the Internet under:

http://www.ad.siemens.de/csi/net

By entering the following **Article IDs**, you can call up current information (FAQ - Frequently Asked Questions). At the time of printing of this handbook, the following articles of relevance for this CP were available:

Article ID	Topic / question
2073614	Assigning the subnet masks of IP addresses in the "Subnetting" operating mode in the IP memory address space
6810459	Settable range of "Keep Alive" time intervals for Industrial Ethernet CPs (V1.1.0 and higher).

Table 35 Frequently asked questions

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